



# HERE Android SDK

## Developer's Guide

Premium Edition Version 3.6

# Important Information

## Notices

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**Topics:**

This section contains document notices.

- [Legal Notices](#)
- [Document Information](#)
- [Service Support](#)

## Legal Notices

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## Document Information

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- If you have a HERE representative, contact them when you have questions/issues.
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- If you have questions about billing or your account, [Contact Us](#).
- If you have purchased your plan/product from a HERE reseller, contact your reseller.

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# Chapter 1

## Overview

---

### Topics:

- [What is the HERE Android S...](#)
- [Feature List](#)
- [Legal Requirements](#)

The articles that follow introduce the HERE Android SDK, explain essential concepts and describe the common use cases it supports.

## What is the HERE Android SDK?

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The HERE Android SDK provides a set of programming interfaces that enable developers to build an immersive, geographically-aware Android applications by leveraging a powerful and flexible mapping platform. Through this SDK, developers can add rich location features such as routing, interactive maps, and global place search to their applications. The powerful client-side HERE Android SDK also includes a sophisticated engine for rendering map data and calculated routes. In addition to dynamic map data downloads, the SDK also supports offline maps using previously cached map data or downloaded map packages.

## Feature List

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The main features offered by the HERE Android SDK are listed below.

Not all features are enabled by default. The features available to you are determined based on your business plan.

**Note:** The HERE Android SDK is designed for standalone Android APK development. Using the HERE SDK for platform-embedded app development (apps that ship with the device ROM) is not supported.

### Mapping:

- Dynamically download vector maps for more than 190 countries in over 60 languages
- Preload maps for offline usage
- Map styles: normal street map, satellite map, transit map, and more
- Textured 3D landmarks
- Street-level imagery
- Touch gestures (including rotate, tilt, pan, flick, and pinch zoom)
- Overlay objects on the map such as polylines, polygons, icons, and routes
- Map marker clusters
- Overlay 3D map objects
- Overlay custom raster tiles on the map (for example, to display heat maps)
- Ability to render raster tiles and map objects interleaved within different map layers
- 3D venue (indoor) maps
- Show real-time traffic flow and incidents
- 3D Extruded Buildings
- Transit object interaction

### Search:

- Search through a broad set of geographical content across the globe, (including streets, address points, and categorized places)
- Search for a specific place or explore by categories
- Access rich details for a Point of Interest from third-party content sources (including images, ratings, reviews, and editorials)

- Perform geocoding and reverse geocoding lookups
- Offline Places search, Geocoding, Reverse Geocoding

## Directions:

- Online Car, Public Transit, Bicycle, Truck, and Pedestrian Route Directions
- Routing options (Highways, Tolls, Fastest etc.)
- Specify preferred route type (fastest or shortest) and route options (such as avoiding toll roads, motorways, and parks)
- Alternate routes
- Saving a route as a file
- Offline route calculation
- Driving directions with traffic taken into account
- Public Transit directions using online timetables
- Indoor routing

## Turn-by-turn Navigation:

- Online turn-by-turn navigation for pedestrian, car, and truck routes
- Offline turn-by-turn navigation for pedestrian and car routes
- Natural-sounding guidance instructions, such as "turn left at the gas station" and "at the next light, turn right"
- Recorded audio and speech synthesis voices in a variety of languages. For a list of the available languages, see the Developer's Guide.
- Approximate user coordinates to the nearest road or navigation route
- Approximate user tunnel position, even when there is no GPS signal
- Dynamic information including signposts, the driver's current street lane, and speed
- Realistic previews of certain junctions and lanes

## HERE Positioning:

- Wi-Fi, Cellular, and BT network-based positioning, including:
  - Online Outdoor positioning
  - Online-Offline Hybrid Outdoor positioning
  - Indoor positioning
  - Private Indoor positioning

## LiveSight:

- Track the position of a device in space and animate view accordingly
- Seamless transitions from Map to LiveSight and back again
- Gesture support allows the user to interact with content, custom gestures can also be defined
- Content transitions and interaction are animated using hardware acceleration
- "Radar" UI support, which provides the user with more context regarding their position relative to content
- Highly configurable LiveSight engine allows the user experience to be customized

## Other Features:

- Custom location and custom location geometry search

- Support for fleet dispatching and connectivity
- Urban Mobility: transit station and departure information search
- Map information for fleet vehicles and trucks
- Congestion toll zones and the typical traffic patterns for a given time of the week
- Ability to retrieve the toll cost of a route
- Natural language interface (English only) beta

## Legal Requirements

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In addition to the applicable [terms and conditions](#) under which you have licensed the SDK, the following shall apply.

Components of the HERE SDK collect certain information from your application. Such information includes access credentials ( `licenseKey`, `App_Id` and `App_Code` – see also [Authenticating Applications](#) on page 17) and the types of features utilized by your application when used by end users. The information does not identify an individual end user. However, your application's privacy policy must disclose to the end users that you have licensed products and services from HERE and that such information is collected from your application as it is being used by end users and that HERE collects and processes such information from the application.

# Chapter 2

## Quick Start

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### Topics:

- [Run the Sample Application](#)

The example in this section provide information to help you start using the HERE Android SDK.

## Run the Sample Application

---

This tutorial contains instructions on how to run the basic sample application to render a map on an Android device. This tutorial assumes that you are using the *Android Studio* development environment and a supported Android device. For more details, see *System Requirements* on page 17.

Development tasks for this basic application include:

- Check HERE Credentials.
  - Open the sample project in Android Studio.
  - Import the necessary resources into the project.
- 📖 **Note:** HERE Android SDK is now distributed as an .AAR instead of a .JAR, and the basic sample app is also updated. If you are upgrading your existing project from an older version of the HERE SDK, be sure to modify the project by following the instructions in *Development Tips* on page 221.

### Check Credentials

This sample application is already configured with a set of HERE SDK credentials for evaluation purposes. You can check these credentials by opening the `BasicMapSolution/app/src/main/AndroidManifest.xml` file and inspecting the following `<meta-data>` tags:

- `<meta-data android:name="com.here.android.maps.appid" android:value="{SAMPLE_APP_ID}"/>`
  - `<meta-data android:name="com.here.android.maps.apptoken" android:value="{SAMPLE_APP_CODE}"/>`
  - `<meta-data android:name="com.here.android.maps.license.key" android:value="{SAMPLE_LICENSE}"/>/>`
- 📖 **Important:** Typically, before developing a new HERE SDK application, you need to acquire a set of credentials by registering your application on <http://developer.here.com>. Each application requires a unique set of credentials. When you register your app, the registered bundle identifier must match the package name in your project.

### Open the Sample Project in Android Studio

The next task before running the sample HERE SDK project is to locate the project folder and open it in Android Studio as follows:

1. In the **Welcome to Android Studio** dialogue box, select **Open an existing Android Studio project**.
2. In the **Open File or Project** dialogue box, select the `BasicMapSolution` folder from your file system and click **OK**. The main Android Studio project window should appear with an error "Error: Failed to resolve: :HERE-sdk:" in the **Messages** pane.

### Import the HERE SDK Android Archive

The HERE Android SDK library is shipped as an Android Archive (.AAR) file. You can import this library by doing the following:

1. On the **View** menu, click **Tool Windows > Project**.

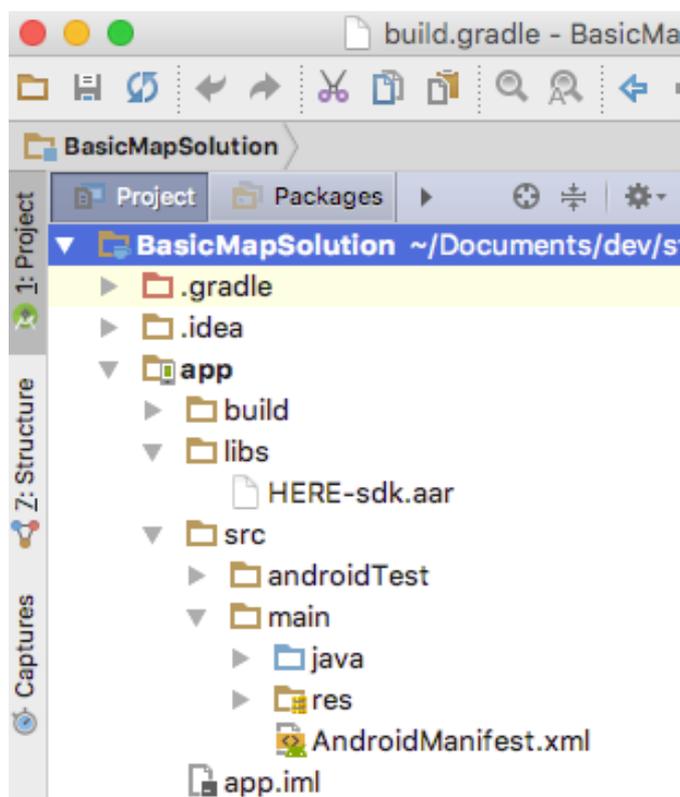
2. A few tabs are available in this tool window. Select the **Project** tab to show a file system view of the application structure.
3. Right-click on the app folder and select **New > Directory** to create a new folder. Use `libs` as the new folder name.
4. In your operating system's file system, navigate to the extracted HERE SDK directory. Copy the `HERE-sdk.aar` file and paste it into the newly created `libs` directory.
5. Open the `build.gradle` file under the app folder and ensure the following entries are present:

```
repositories {
    flatDir {
        dirs 'libs'
    }
}

dependencies {
    compile(name:'HERE-sdk', ext:'aar')
    // Depending on your specific project configuration, you may have other entries here.
}
```

6. Optional: To enable quick Javadoc reference within your Android Studio environment, scroll down to the **External Libraries** section, right-click on `HERE-sdk`, and then select **Library Properties**. Click the + button and locate `HERE-sdk-javadoc.jar` from the HERE SDK package.
- Note:** You can also import `HERE-sdk.aar` by using the menu, selecting **File > Project Structure...** and clicking the "+" button. If you use this method, ensure that `HERE-sdk` is listed properly under the app Module Dependencies.

Figure 1: Location of the .AAR file



## Run the Project

You can run your simple application by pressing the key combination **Shift + F10** (or **Ctrl + R** on macOS) from within Android Studio. The application renders a map retrieved from the HERE servers. When you are running your application on a device, make sure a data connection is enabled.

- 📄 **Note:** For detailed instructions on how to create a new HERE SDK app, see [Create a Simple App Using the HERE SDK](#) on page 204

## Chapter 3

# User Guide

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### Topics:

- [System Requirements](#)
- [Authenticating Application...](#)
- [Examples on GitHub](#)
- [HERE Map Data](#)
- [Embedding the Map Service](#)
- [Maps](#)
- [Positioning](#)
- [Directions](#)
- [Places](#)
- [Custom Locations and Geome...](#)
- [Toll Cost Extension](#)
- [Street-Level](#)
- [Turn-by-Turn Navigation fo...](#)
- [Audio Management](#)
- [Urban Mobility](#)
- [3D Venues](#)
- [LiveSight](#)
- [Platform Data Extension](#)
- [Natural Language Processin...](#)

The articles in this section provide a guide to using the HERE Android SDK.

## System Requirements

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HERE Android SDK is designed and tested with Android phones and tablets in mind. SDK performance will vary between devices, since it is primarily determined by CPU, GPU, and display resolution. Currently, Nexus 5 is a suitable reference for a device which delivers acceptable SDK performance. If your target device is not a phone or tablet, contact us to discuss performance requirements.

- Android 4.1.x "Jelly Bean" (API Level 16) or higher as the application Minimum API Level (`android:minSdkVersion`).
- Apps should be developed using Android Studio 2.3.2 or above
- For apps that implement basic use cases such as map rendering, search, and routing, a minimum of 60MB of memory (RAM) is recommended to be available. More complex use cases, such as turn-by-turn navigation, require more memory.
- A minimum of 25MB per application should be made available for the storage of the HERE SDK libraries
- A minimum of 50MB should be made available for the storage of map data
- Data connectivity (WiFi or Cellular) is required to download map data and ensure map data is updated when new versions are made available.

**Note:** HERE Android SDK does not support x86 Android devices.

## Authenticating Applications

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Developers using the HERE SDK with their app are required to register for a set of HERE credentials and to specify these credentials (`App_Id`, `App_Code`, and `LicenseKey`) in their app's Android manifest XML file. Failure to do so results in blocked access to certain features and degradation in the quality of other services.

To obtain these credentials, visit the developer portal at <https://developer.here.com/?create=Evaluation> and register for a free Evaluation license. Once your project is created, you can generate these credentials on your Project Details page. If you already have a commercial (public or business) plan, you can also retrieve these credentials from your Project Details page.

**Note:** Credentials are unique to your application's package namespace. Do not reuse credentials across multiple applications.

**Important:** When switching from an Evaluation plan to a commercial plan, new HERE credentials must be taken into use. Applications **must not** be commercially released (such as submitted to a store) using a license key obtained as part of an Evaluation plan. Once you have upgraded to a commercial license, you need to obtain your new license key on the Project Details page, add it to your app, and re-deploy your app. Please [contact HERE](#) for further information.

### Adding Credentials to the Manifest

You can add your HERE credentials as `<meta-data/>` attributes to the `AndroidManifest.xml` file as follows:

1. In your development environment, double-click your project's `AndroidManifest.xml` file and ensure that you are viewing the file in text editor mode.

2. Within the `<application></application>` block of tags, add the following markup directly beneath the `<activity></activity>` tag:

```
<meta-data android:name="com.here.android.maps.appid"
android:value="{YOUR_APP_ID}"/>
<meta-data android:name="com.here.android.maps.apptoken"
android:value="{YOUR_APP_CODE}"/>
<meta-data android:name="com.here.android.maps.license.key"
android:value="{YOUR_LICENSE_KEY}"/>
```

3. Replace `{YOUR_APP_ID}`, `{YOUR_APP_CODE}` and `{YOUR_LICENSE_KEY}` with the appropriate credentials for your application.

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
package="com.mapstutorial.livesightradar"
android:versionCode="1"
android:versionName="1.0">

<uses-sdk
android:minSdkVersion="14"
android:targetSdkVersion="16" />

<uses-permission android:name="android.permission.ACCESS_FINE_LOCATION" />
<uses-permission android:name="android.permission.WRITE_EXTERNAL_STORAGE" />
<uses-permission android:name="android.permission.ACCESS_NETWORK_STATE" />
<uses-permission android:name="android.permission.INTERNET" />
<uses-permission android:name="android.permission.ACCESS_WIFI_STATE" />

<!-- Additional permission for LiveSight -->
<uses-permission android:name="android.permission.ACCESS_MOCK_LOCATION" />
<uses-permission android:name="android.permission.CAMERA" />

<application
android:icon="@drawable/icon"
android:label="@string/app_name" >

<activity
android:name="com.mapstutorial.livesightradar.LiveSightRadarActivity"
android:label="@string/app_name" >
<intent-filter>
<action android:name="android.intent.action.MAIN" />

<category android:name="android.intent.category.LAUNCHER" />
</intent-filter>
</activity>

<meta-data
android:name="com.here.android.maps.appid"
android:value="{YOUR_APP_ID}" />
<meta-data
android:name="com.here.android.maps.apptoken"
android:value="{YOUR_APP_CODE}" />
<meta-data
android:name="com.here.android.maps.license.key"
android:value="YOUR_LICENSE_KEY" />
</application>
</manifest>
```

## Examples on GitHub

You can find more HERE SDK sample projects on GitHub: <https://www.github.com/heremaps>

## HERE Map Data

---

Much of the functionality offered through the HERE SDK depends on HERE Map Data being downloaded and cached on the device. This section describes different approaches that you can take to manage map data download.

### Passive Approach

The passive approach is where you allow the SDK to download map data as needed. A typical example is where a user is panning the map, and this triggers on-demand download of the needed map data to render the map.

Map data downloaded in this way is cached permanently and may be used for offline operation, in cases where a network connection is not available or not desired, such as when the device is in roaming mode. However, there is no way for you to know if sufficient data has been downloaded to enable all offline operations, such as offline search or routing.

### Active Approach

The active approach is where you explicitly preload map data. You do this by selecting from a list of map packages. A map package may be a state (such as California), region, or a country (such as England). Preloading map data guarantees that offline operations are possible in cases where a network connection is not available or not desired.

- **Note:** If map data is needed but not available in one of the preloaded map packages (for example, if a user panned the map to a new country), the SDK dynamically downloads the needed data. This means that the map data cache on the device contains a mixture of preloaded map packages and on-demand downloaded map data.

### Keep Data Up-to-Date

Irrespective of which approach your app supports, it is important that you are aware of your responsibility to ensure that your app is using the latest map data release. HERE releases quarterly (every three months) updates to the map data. You must use SDK APIs to check for map data updates, and if updates are available, trigger the update. It is recommended that your app perform such a check every time it starts. For more information on how to check for map data updates, see the [API Reference](#) for the `MapLoader` class.

- **Important:** Some SDK features may return errors if the map data is more than six months old.
- **Note:** Incremental or patch updates are supported when upgrading from one version to the next version, helping to reduce the amount of data downloaded. Skipping versions may result in a full update and a large amount of data downloaded.

## Embedding the Map Service

Map Service is an Android service that facilitates the use of a shared disk cache among applications that use the HERE SDK. This service must be embedded and deployed with your HERE-enabled application; otherwise, the `MISSING_SERVICE` error code is returned via the `onEngineInitializationCompleted()` callback.

To embed Map Service, add the following lines inside the `<application></application>` section in your `AndroidManifest.xml` file:

```
<service
  android:name="com.here.android.mpa.service.MapService"
  android:label="HereMapService"
  android:process="global.Here.Map.Service.v3"
  android:exported="true" >
  <intent-filter>
    <action android:name="com.here.android.mpa.service.MapService.v3" >
    </action>
  </intent-filter>
</service>
```

### Incompatibility with Older Versions

Starting in v3.4, the HERE SDK is no longer compatible with pre-3.4 versions of the HERE SDK disk cache. Map data downloaded on pre-3.4 versions of the HERE SDK cannot be used on v3.4 or later.

If your app uses the shared disk cache settings as described above, be aware of the following:

- The required `<service>...</service>` snippet, as described in the previous section, has changed.
- When your users update their pre-3.4 HERE SDK apps to a newer version, their previously-downloaded data will be unavailable. This occurs whether the app was automatically or manually updated.
- In the case where a user has multiple HERE SDK apps on their system, pre-3.4 apps share one cache, while post-3.4 apps share another.

If your app uses the isolated disk cache setting as described in the next section, be aware of the following:

- When your users update their pre-3.4 HERE SDK apps to a newer version, their previously-downloaded data will be unavailable. This occurs whether the app was automatically or manually updated.
- You can avoid this issue by upgrading the pre-3.4 cache using the `DiskCacheUtility.migrate(String sourcePath, String destPath)` method. This method takes the same path value as `setIsolatedDiskCacheRootPath(String, String)`, and it must be run before `MapEngine` is initialized for the first time.

**Note:** `migrate(String, String)` is marked as deprecated because it is offered temporarily to assist with the transition. It will be removed in a future release.

### Using an Isolated Map Disk Cache with the Map Service

The HERE SDK supports an isolated disk cache. This allows you to set the disk cache to another location, such as an SD Card.

**Note:**

- Migrating the disk cache contents from one location to another is not supported.
- If you are using an SD card, ensure the SD card is always present to avoid any unexpected behavior.
- You should only delete the map data cache when the app is in its early start-up stages, before any HERE SDK calls. Otherwise, map data corruption and unexpected app errors can occur.
- If you plan to support changing the storage location, such as switching between internal storage and an SD card, be aware that this requires an app restart, as the storage location switch must be done before initializing `MapEngine` or `MapFragment`. Also, your manifest entry for the `MapService` must not contain the `process` attribute, so that the `MapService` runs in the same process as your app. Doing so ensures it that the service is shut down properly when the app restarts (for example, using `System.exit()`), and that the disk cache location change can take effect.

The first step to use an isolated disk cache is to edit the `AndroidManifest.xml` with the following, providing the service label and intent name with your custom values.

```
<service
  android:name="com.here.android.mpa.service.MapService"
  android:label="{YOUR_LABEL_NAME}"
  android:exported="false" >
  <intent-filter>
    <action android:name="{YOUR_INTENT_NAME}" >
    </action>
  </intent-filter>
</service>
```

**Note:** Always provide custom values for `{YOUR_LABEL_NAME}` and `{YOUR_INTENT_NAME}` when you are using an isolated disk cache. Do not reuse the HERE SDK defaults.

After editing `AndroidManifest.xml`, add a call to `MapSettings.setIsolatedDiskCacheRootPath(String path, String intent)` with the desired cache location and the custom intent name. This call should occur before `MapEngine` initialization. For example, if you are modifying the application from the sample tutorial app, you can add the call in the `BasicMapActivity.java` file before `mapFragment.init()`.

```
public void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);

    // Search for the map fragment to finish setup by calling init().
    mapFragment = (MapFragment) getFragmentManager().findFragmentById(R.id.mapfragment);
    boolean success = com.here.android.mpa.common.MapSettings.setIsolatedDiskCacheRootPath(
        "/sdcard/foo/mysevice", "{YOUR_INTENT_NAME}");

    if (!success) {
        // Setting the isolated disk cache was not successful, please check if the path is valid and
        // ensure that it does not match the default location
        // (getExternalStorageDirectory()/here-maps).
        // Also, ensure the provided intent name does not match the default intent name.
    } else {
        mapFragment.init(new OnEngineInitListener() {
            ...
        });
    }
}
```

## Maps

---

The core feature of the HERE Android SDK is Maps. The key concepts covered in this section include adding a map to an Android application, changing the location displayed by the map and its various properties. The classes covered include `MapFragment` and `Map`. `MapFragment` and `Map` are parts of a Model-View-Controller (MVC) pattern where the Model is the Map, and the View is the `MapFragment`. The `MapFragment` is a standard Android Fragment derived component. You can create a controller class to coordinate all interactions using custom logic.

The first step to integrate a map into an application is to insert a `MapFragment` to the view layout of the application. This is accomplished by adding `com.here.android.mpa.mapping.MapFragment` to the *Android XML* layout file as follows.

```
<!-- Example fragment. This can be integrated and annotated
     like any other android Fragment or View widget -->
<fragment
  class="com.here.android.mpa.mapping.MapFragment"
  android:id="@+id/mapfragment"
  android:layout_width="fill_parent"
  android:layout_height="fill_parent"/>
```

The `MapFragment` class handles all user interactions such as panning, tapping or pinching, as well as other standard HERE SDK touch gestures documented in [MapGestures](#).

### Initializing MapFragment

After adding the `MapFragment` to the layout, the fragment must be initialized. The `MapFragment` initialization is processed asynchronously. During initialization, the `MapEngine` is initialized to create an instance of `Map` that is associated with the `MapFragment`. The `MapFragment.init(OnEngineInitListener)` method takes in an `OnEngineInitListener` input parameter to signal the caller when initialization is completed and if it was successful. The `MapFragment` also initializes a [MapEngine](#) instance and creates a `Map` object associated with the `MapFragment`. The following code illustrates the basic initialization flow when an `Activity` is created.

```
@Override
public void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    // Search for the Map Fragment
    final MapFragment mapFragment = (MapFragment)
        getSupportFragmentManager().findFragmentById(R.id.mapfragment);
    // initialize the Map Fragment and
    // retrieve the map that is associated to the fragment
    mapFragment.init(new OnEngineInitListener() {
        @Override
        public void onEngineInitializationCompleted(
            OnEngineInitListener.Error error) {
            if (error == OnEngineInitListener.Error.NONE) {
                // now the map is ready to be used
                Map map = mapFragment.getMap();
                // ...
            }
        }
    });
}
```

```

    } else {
        System.out.println("ERROR: Cannot initialize MapFragment");
    }
}
});
}

```

- **Note:** For performance reasons, `com.here.android.mpa.mapping.MapFragment` has set `Fragment.setRetainInstance(boolean)` to `true`, and therefore `onCreate(Bundle)` is not called again when Activity is re-created (for example, after a zoom-level change).
- **Note:** The `MapFragment` class provides an asynchronous method, `getScreenCapture(OnScreenCaptureListener)`, for creating map snapshots of the currently visible `MapFragment` area. When a snapshot has been created, an event callback to `OnScreenCaptureListener` occurs, and the screenshot is provided as an `android.graphics.Bitmap` object. This method of screen capture only works if the view is in the foreground and it is rendering. If a background or viewless screen capture is required, use `MapOffscreenRenderer`.

## Working with Map

Once the `MapFragment` is initialized, you get the `Map` associated with the `MapFragment` through `MapFragment.getMap()`. The `Map` class represents the virtual model of the world in a digital format. Key attributes of the `Map` include the center `GeoCoordinate`, zoom level, orientation, and tilt. For example, the following code snippet illustrates how to use `Map.setCenter(GeoCoordinate, Map.Animation)` to render the `Map` at Vancouver, Canada.

```

// map fragment has been successfully initialized
...

// now the map is ready to be used
Map map = mapFragment.getMap();

// Set the map center to Vancouver, Canada.
map.setCenter(new GeoCoordinate(49.196261,
    -123.004773), Map.Animation.NONE);
...

```

In the preceding code:

- The `GeoCoordinate` for the map center is created by a call to the new `GeoCoordinate(double, double)` constructor.
- When setting the center of a map, there is an option either to animate the change or to suppress animation by passing the constant `Map.Animation.NONE` as the relevant parameter.

## Map Center , Tilt, Orientation, and Zoom

Here are examples of setting and getting `Map` attributes:

### Map Center

The center of the `Map` is a `GeoCoordinate` location that your `Map` is focused on. You can move a `Map` by redefining its center `GeoCoordinate`:

```

// Move the map to London.
map.setCenter(new GeoCoordinate(51.51,-0.11),
    Map.Animation.NONE );

```

```
// Get the current center of the Map
GeoCoordinate coordinate = map.getCenter();
```

### Zoom Level

The size of the geographical area displayed by Map can be controlled by changing the zoom level. The zoom level ranges from `getMinZoomLevel()` to `getMaxZoomLevel()`, with the minimum value displaying the entire world. The following code sets the zoom level to the median zoom level.

```
// Get the maximum,minimum zoom level.
double maxZoom = map.getMaxZoomLevel();
double minZoom = map.getMinZoomLevel();

// Set the zoom level to the median (10).
map.setZoomLevel((maxZoom + minZoom)/2);

// Get the zoom level back
double zoom = map.getZoomLevel();
```

### Orientation

The map can be orientated in any direction. By default, the orientation is in a true North position. The following code changes the orientation to South-up.

```
// Rotate 180 degrees.
map.setOrientation(180);

// Get the orientation, should be 180.
float orientation = map.getOrientation();
```

### Tilt

The map can be tilted and rendered in a three-dimensional perspective. By default, the tilt is completely flat. You can retrieve the minimum and maximum possible tilt values by calling `getMinTilt()` and `getMaxTilt()`

```
// Set the tilt to 45 degrees
map.setTilt(45);

// Get the tilt
float tilt = map.getTilt();
```

### Animations

The map supports three types of animations when changing attributes:

- `Map.Animation.NONE`
- `Map.Animation.LINEAR`
- `Map.Animation.BOW`

```
// Move to Vancouver using bow animation
map.setCenter(new GeoCoordinate(49.0,-123.0),
    Map.Animation.LINEAR);
```

**Note:** If the map changes size or the app comes to the foreground while `Map.Animation.LINEAR` or `Map.Animation.BOW` is being used in a Map attribute setter method, then the animation aborts, and the transition appears to fail. To avoid this behavior, use the `Map.Animation.NONE` animation type or wait until the map is stable before performing the transition operation.

## Setting Multiple Attributes

`Map.setCenter(GeoCoordinate point, Animation animation, double level, float orientation, float tilt)` is an extended API provided for changing one or more attributes at the same time. The zoom level, tilt and perspective can be preserved and unchanged using `Map.MOVE_PRESERVE_ZOOM_LEVEL`, `Map.MOVE_PRESERVE_ORIENTATION`, `Map.MOVE_PRESERVE_TILT` respectively.

```
// Move to Vancouver using a bow animation, zoom level 17, 180
//degree orientation and 45 degree tilt.
map.setCenter(new GeoCoordinate(49.0,-123.0),
    Map.Animation.BOW, 17.0d, 180, 45);
```

## Map Projection Mode

By default, the map is set to a globe projection mode. You can change it to use *Mercator* projection by calling `setProjectionMode(Projection)`. For example:

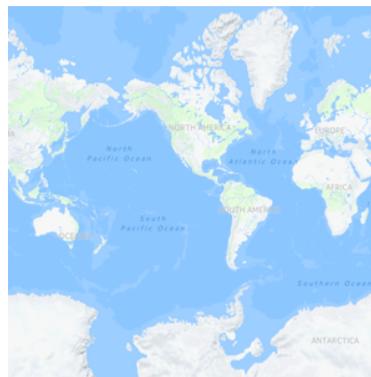
```
map.setProjectionMode(Map.Projection.MERCATOR);
```

It may be useful to set the projection modes when you need to predictably display certain types of map information, such as custom raster tiles.

Figure 2: Globe Projection



Figure 3: Mercator Projection



## MapState and Listening for Map Transform Events

`MapState` is an object that is a composite of the tilt, orientation, zoom level and center map attributes. Your application can listen for updates to the `MapState` by using an `OnTransformListener`.

Map transform events are triggered by any operation that causes the `MapState` to change. These operations include user interaction (for example, map gestures) as well as programmatic calls to the `Map` (for example, `map.setCenter(GeoCoordinate, MapAnimation)`). The `onMapTransformStart()` method is called before `MapState` begins to change, while the `onMapTransformEnd(MapState)` method is called after the `MapState` returns to a steady value. Because of this, there can be a significant amount of time between the two callbacks in cases such as animated map movement events and continuous user interaction.

The following code is an example of registering an `OnTransformListener` to listen for map transform events:

```
map.addTransformListener(new OnTransformListener() {
```

```
@Override
public void onMapTransformStart() {
    // map transform is about to start
}
@Override
public void onMapTransformEnd(MapState mapState) {
    // map transform has come to an end
}
});
```

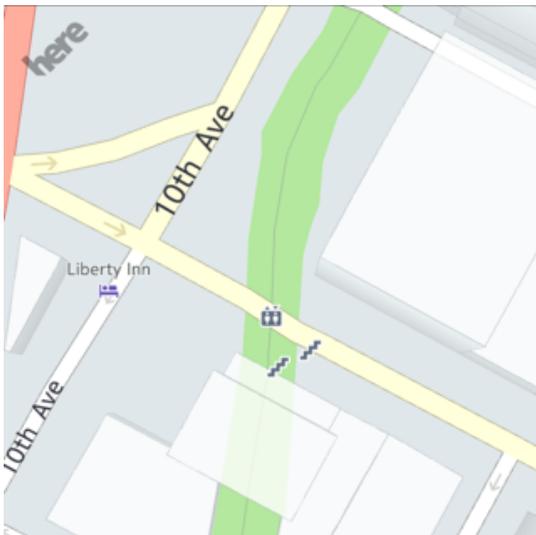
If you need to update UI widgets as the `MapState` changes between these two callbacks, the recommended approach is to trigger a `Runnable` when `onMapTransformStart()` is called, which periodically checks (at no more than 30 frames per second) the current map state via `map.getMapState()` and updates the UI widgets accordingly. This `Runnable` can then be canceled upon a call to `onMapTransformEnd(MapState)`. An `Android Handler` can be used to trigger these `Runnable` objects.

**Note:** Do not update UI widgets in `MapRenderListener.onPostDraw(boolean, long)`, as this method is frequently called.

## Pedestrian Features

By default, icons that indicate pedestrian access features (such as stairs or escalators) are not displayed on the map. To display a pedestrian feature on the map view, call the `Map.setPedestrianFeaturesVisible(EnumSet)` method with the desired set of `PedestrianFeature`. To find out whether a feature type is enabled, call the `Map.getPedestrianFeaturesVisible()` method.

Figure 4: Pedestrian Feature Icons



## Safety Spots

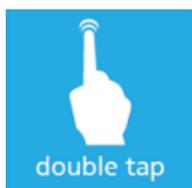
Speed cameras and traffic-light cameras are also known as safety spots in the HERE SDK. Similar to pedestrian features, icons that indicate safety spots are not displayed on the map by default. To display safety spots, set the `Map.setSafetySpotsVisible(boolean)` to `true`. To find out whether safety spots are enabled, call the `areSafetySpotsVisible()` method.

Individual safety spots icons can be selected on the map by using `SafetySpotObject`, which is a subclass of `MapProxyObject`. Each `SafetySpotObject` contains a reference to a corresponding `SafetySpotInfo`

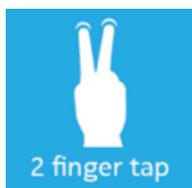
object that contains the location and other properties about the camera. For more information on selecting map proxy objects, refer to *Objects and Interaction* on page 34.

## Map Gestures

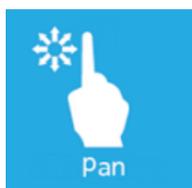
The MapGesture interface encapsulates all user interactions and touch gestures supported by the HERE Android SDK. The MapGesture associated with a particular fragment can be retrieved from MapFragment.getMapGesture(). The default behavior of the map for each gesture type may be used as-is, supplemented, or replaced entirely. The following table is a summary of the available gestures and their default behavior.



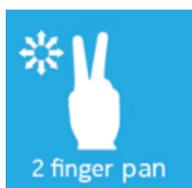
**To zoom the map in a fixed amount**, tap the screen twice with one finger



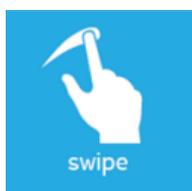
**To zoom out a fixed amount**, tap the screen with two fingers



**To move the map**, press and hold one finger to the screen, and move it in any direction.



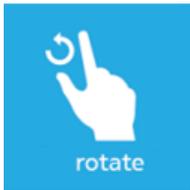
**To tilt the map**, press and hold two fingers to the screen, and move them in a vertical direction. No behavior is predefined for other directions.



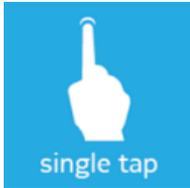
**To pan the map with momentum**, press and swipe one finger on the screen. The map continues to move in the same direction, and gradually slows to a stop.



**To zoom in or out continuously**, press and hold two fingers to the screen, and increase or decrease the distance between them



To rotate the map, press and hold two fingers to the screen, and rotate them together in a circle



Tap the screen with one finger. This gesture does not have a predefined map action.



Press and hold one finger to the screen. This gesture does not have a predefined map action.

## The OnGestureListener Interface

The `OnGestureListener` interface represents a listener to provide notification upon completion of a `Map` gesture event such as a single tap on a map.

For example, you can create a new `OnGestureListener()`, as illustrated below.

```
// Map gesture listener
private class MyOnGestureListener implements OnGestureListener {

    @Override
    public void onPanStart() {
    }

    @Override
    public void onPanEnd() {
    }

    @Override
    public void onMultiFingerManipulationStart() {
    }

    @Override
    public void onMultiFingerManipulationEnd() {
    }

    @Override
    public boolean onMapObjectsSelected(List<ViewObject> objects) {
        return false;
    }

    @Override
    public boolean onTapEvent(PointF p) {
        return false;
    }

    @Override
    public boolean onDoubleTapEvent(PointF p) {
        return false;
    }
}
```

```

}

@Override
public void onPinchLocked() {
}

@Override
public boolean onPinchZoomEvent(float scaleFactor, PointF p) {
    return false;
}

@Override
public void onRotateLocked() {
}

@Override
public boolean onRotateEvent(float rotateAngle) {
    return false;
}

@Override
public boolean onTiltEvent(float angle) {
    return false;
}

@Override
public boolean onLongPressEvent(PointF p) {
    return false;
}

@Override
public void onLongPressRelease() {
}

@Override
public boolean onTwoFingerTapEvent(PointF p) {
    return false;
}
}
}

```

-  **Note:** The `OnGestureListener` methods that mention "rotate" and "tilt", such as `onRotateEvent(float)`, are not supported. They are only defined here to maintain compatibility with the Premium Edition of the HERE SDK.

To add the listener to your map, include a call to `addOnGestureListener(OnGestureListener)` after the map fragment has been successfully initialized as follows:

```

...
mapFragment.init(new OnEngineInitListener() {
    @Override
    public void onEngineInitializationCompleted(OnEngineInitListener.Error error) {
        if (error == OnEngineInitListener.Error.NONE) {
            // map fragment has been successfully initialized
            mapFragment.getMapGesture().addOnGestureListener(new MyOnGestureListener());
        }
    }
});
...

```

-  **Note:** After you add an `OnGestureListener` to an application, remember to call `removeOnGestureListener(OnGestureListener)` when you no longer need to listen for map events to free up application resources.

The default implementation of a `OnGestureListener` does not affect any of the standard HERE SDK touch gestures. Each method within the `MyOnGestureListener` class returns a value of `false`, which stipulates

that the application should not override the underlying action that a device performs upon detecting a particular gesture.

If you want to customize an action that your application performs upon detection of a particular gesture, you must include appropriate commands within a relevant method of the `MyOnGestureListener` class and return a value of `true` to override the default action, as illustrated below with revisions to the `onTwoFingerTapEvent(PointF)` method.

```
@Override
public boolean onTwoFingerTapEvent(PointF p) {
    // Reset the map view
    double level = map.getMinZoomLevel() + map.getMaxZoomLevel() / 2;
    map.setCenter(new GeoCoordinate(49.196261, -123.004773),
        Map.Animation.NONE);
    map.setZoomLevel(level);
    return true;
}
```

**Note:** Since the `onTapEvent(PointF)` event is always triggered before the `onMapObjectsSelected(List<ViewObject>)` event, you can leverage this behavior to implement your own object selection logic. While implementing object selection, it is recommended that you use both `Map.getSelectedObject(PointF)` and `Map.getSelectedObject(ViewRect)` and combine the results, so that the user's tap input is interpreted over a larger area, rather than only a single point.

After the revision, the basic application responds to each two-finger tap gesture by returning to its initial view (the view displayed upon application launch). Other touch gestures continue to trigger standard HERE SDK actions.

## Map Schemes

The HERE Android SDK provides a variety of map appearances for your application to choose from, these appearances are otherwise known as *map schemes*.

`Map.Scheme` defines visualization types that the HERE map service supports. There is a variety of map schemes available that can be used, based on the specific use case:

- Explore - Normal, Terrain, Pedestrian
- Overlays - Grey, Transit, Reduced, Traffic
- Navigation - Car Navigation, Car Navigation with Traffic, Maneuver

You can set a desired scheme by making a call to the `Map.setMapScheme(String)` method.

## Examples of Map Scheme

All available schemes are defined as constant strings in the `Map.Scheme` class. The following are examples of string values that you can use to set the map scheme in your application:

Figure 5: `Scheme.NORMAL_DAY`

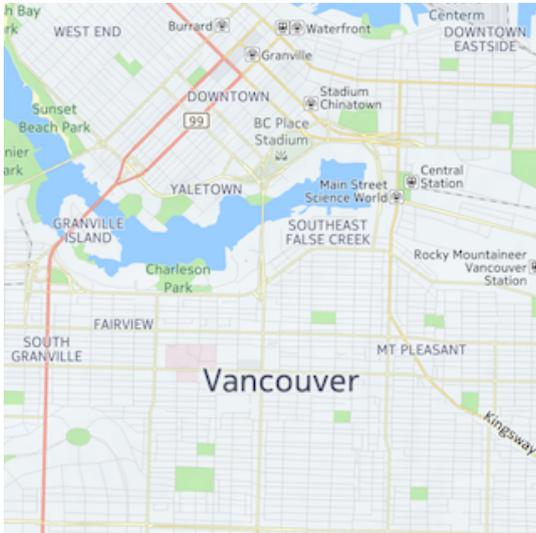


Figure 6: `Scheme.SATELLITE_DAY`

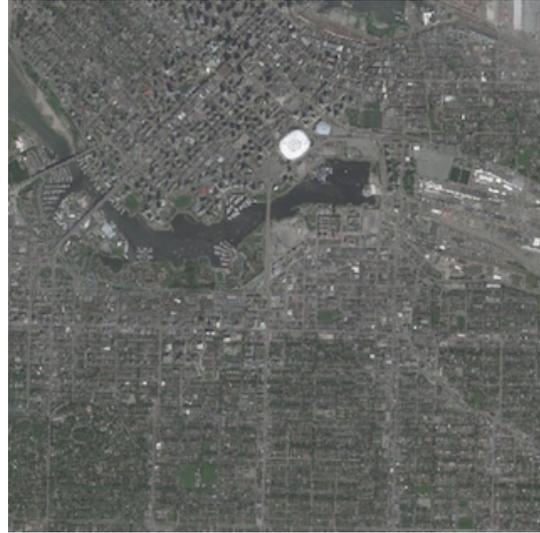
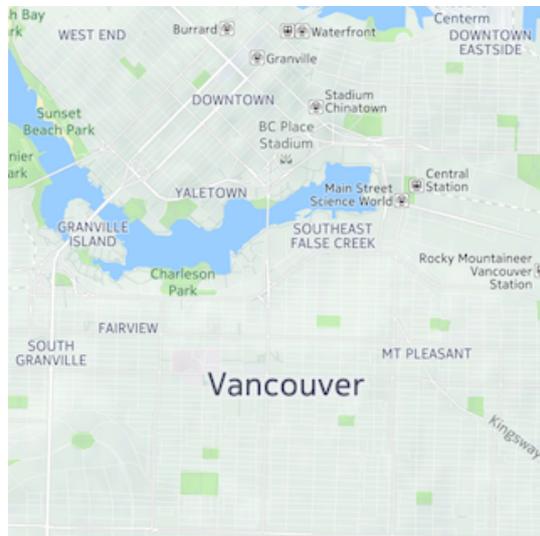


Figure 7: `Scheme.HYBRID_DAY`



Figure 8: `Scheme.TERRAIN_DAY`



**Note:** Your application also needs to switch to one of the following schemes if you enable traffic information with `Map.setTrafficInfoVisible(true)`. These map schemes are otherwise identical to their non-traffic counterparts.

- `Scheme.HYBRID_TRAFFIC_DAY`
- `Scheme.HYBRID_TRAFFIC_NIGHT`
- `Scheme.NORMAL_TRAFFIC_DAY`
- `Scheme.NORMAL_TRAFFIC_NIGHT`

**Note:** In addition to the preceding schemes, Scheme.SATELLITE\_NIGHT is also available. It is similar to Scheme.SATELLITE\_DAY, but the color of the sky is different when the map is tilted.

Figure 9: Scheme.HYBRID\_DAY\_TRANSIT

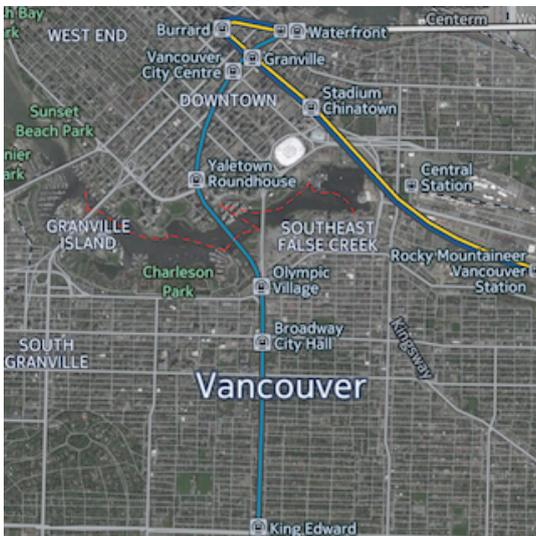


Figure 10: Scheme.NORMAL\_NIGHT\_TRANSIT

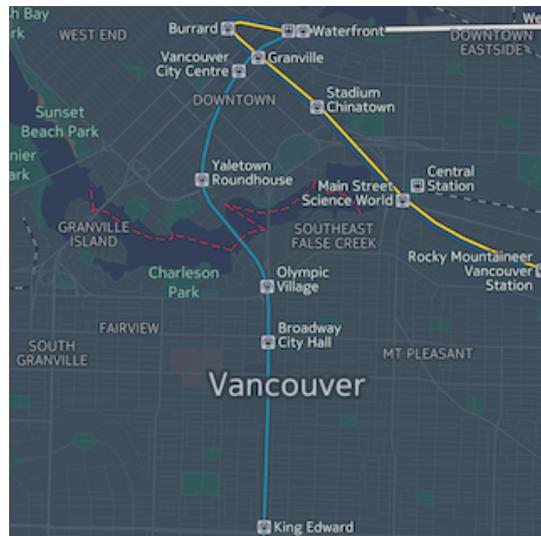


Figure 11: Scheme.NORMAL\_NIGHT

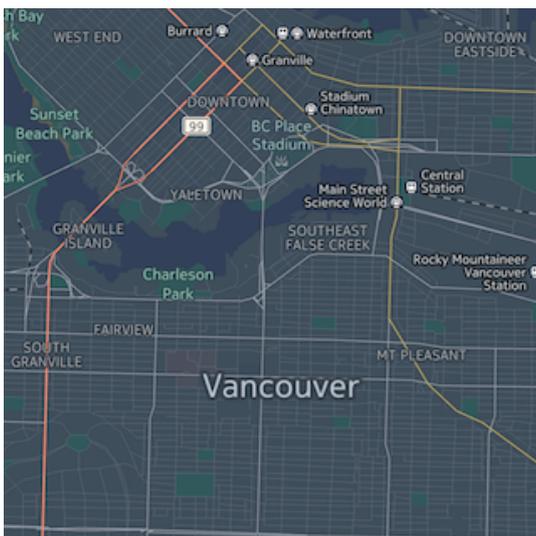
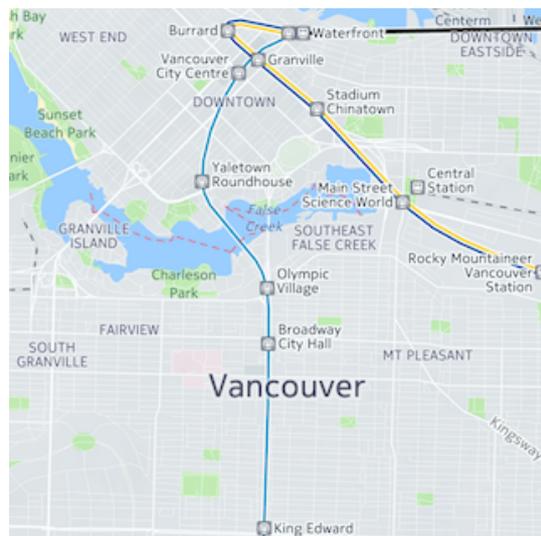


Figure 12: Scheme.NORMAL\_DAY\_TRANSIT



## Navigation Schemes

The HERE SDK also offers the following schemes to be used with navigation:

- Scheme.CARNAV\_DAY
- Scheme.CARNAV\_NIGHT
- Scheme.CARNAV\_HYBRID\_DAY
- Scheme.CARNAV\_HYBRID\_NIGHT
- Scheme.CARNAV\_TRAFFIC\_DAY
- Scheme.CARNAV\_TRAFFIC\_NIGHT
- Scheme.CARNAV\_TRAFFIC\_HYBRID\_DAY
- Scheme.CARNAV\_TRAFFIC\_HYBRID\_NIGHT

- `Scheme.CARNAV_DAY_GREY`
- `Scheme.CARNAV_NIGHT_GREY`
- `Scheme.PEDESTRIAN_DAY`
- `Scheme.PEDESTRIAN_NIGHT`
- `Scheme.PEDESTRIAN_DAY_HYBRID`
- `Scheme.PEDESTRIAN_NIGHT_HYBRID`
- `Scheme.TRUCKNAV_DAY`
- `Scheme.TRUCKNAV_NIGHT`
- `Scheme.TRUCKNAV_HYBRID_DAY`
- `Scheme.TRUCKNAV_HYBRID_NIGHT`

If you are using a pedestrian navigation scheme, it is recommended that you also enable the pedestrian features using the `Map` class. See [Maps](#) on page 22 for more details.

**Note:** The HERE SDK does not automatically switch map schemes during navigation mode. Before starting car or pedestrian navigation, be sure to save the current map scheme and switch to the appropriate navigation map scheme. When navigation has completed, your application code should switch back to the previously saved scheme.

For more information on how to perform navigation operations, see [Turn-by-Turn Navigation for Walking and Driving](#) on page 145.

## Setting a Map Scheme

The following example demonstrates how to retrieve available map schemes and change the current map scheme:

```
// Array containing string values of all available map schemes
List<String> schemes = map.getMapSchemes();
// Assume to select the 2nd map scheme in the available list
map.setMapScheme(schemes.get(1));
```

## Listening for MapScheme Change Events

Applications can listen for map scheme change events by way of the `Map.OnSchemeChangeListener`:

```
map.addSchemeChangeListener(new OnSchemeChangeListener() {
    @Override
    public void onMapSchemeChanged(String mapScheme) {
        // react to map scheme change here
    }
});
```

For information on the fleet map scheme, see [Mobile Asset Management](#) on page 63.

## MapEngine Class

`MapEngine` is a singleton class used to manage active mapping resources for use in applications developed with the HERE SDK. `MapEngine` must be initialized before `Map` and map-related objects, such as `MapMarker` and `Places`, can be instantiated and retrieved from the API. A runtime exception occurs if `MapEngine` is not properly initialized before map-related objects are used.

## Initialization

MapEngine must be initialized before it can be used. MapEngine is automatically initialized for your application by using MapFragment. *MapFragment* is a fragment class that applications can use as an UI module in an activity for map display. However, if your application does not use MapFragment classes, then the application should initialize the MapEngine directly before using any HERE APIs. You can do this by calling `MapEngine.init(ApplicationContext, OnEngineInitListener)` as shown below:

```
MapEngine mapEngine = MapEngine.getInstance();
ApplicationContext appContext = new ApplicationContext(context);
mapEngine.init(appContext, new OnEngineInitListener() {
    @Override
    public void onEngineInitializatonCompleted(Error error) {
        if (error == OnEngineInitListener.Error.NONE) {
            // Post initialization code goes here
        } else {
            // handle factory initialization failure
        }
    }
});
```

If map engine initialization is in progress or has failed, calling any other HERE SDK APIs fails because invalid objects cannot be created. To avoid this problem, check for `MapEngine.isInitialized()` in your app lifecycle callbacks. For example, the following example avoids problems with using the `PositionManager` before an instance can be properly created:

```
public void onDestroy()
{
    //Set initComplete using MapEngine.isInitialized()
    if (initComplete) {
        PositioningManager.getInstance().removeListener(this);
    }
    super.onDestroy();
}
```

For examples of typical scenarios using the MapFragment that automatically initializes the MapEngine, see [Maps](#) on page 22.

## Objects and Interaction

You can select `ViewObject` objects by using a single tap gesture. To enable this in your code, create an `OnGestureListener` object and pass it to `MapFragment.getMapGesture().addOnGestureListener(OnGestureListener)`. When a single tap occurs, the listener receives the `onTapEvent(PointF)` callback, and if that event is not handled, then the listener receives the `onMapObjectsSelected(List<ViewObject>)` callback. The application can then define what to do with the selected `ViewObject`.

Types of `ViewObject` objects that are selectable are defined within the `ViewObject.Type` enumeration, which includes:

- `USER_OBJECT` - an object that the application adds to a map with a `MapObject` base class (`MapPolygon` for example).
- `PROXY_OBJECT` - an object that is added automatically to a map with a `MapProxyObject` base class. A proxy object may contain special information about the object, depending on the type (for example,

TransitStopObject may provide transit stop-related information), but it cannot be created or modified.

- UNKNOWN\_OBJECT - a selectable map object that is not a USER\_OBJECT nor a PROXY\_OBJECT

## The ViewObject Abstract Class

The ViewObject abstract class represents the base implementation for all objects that are selectable on a MapView or MapFragment. The MapFragment features user-selectable objects.

Sub-classes of the ViewObject class include MapObject and MapProxyObject.

## MapObject and Geo Objects

MapObject represents an abstract class for all map-related objects that can be added on a Map. The subclasses of this abstract class include:

- MapContainer
- MapCircle
- MapPolyline
- MapPolygon
- MapRoute
- MapMarker
- MapLocalModel
- MapGeoModel
- MapLabeledMarker
- MapScreenMarker

These objects can be created by calling the appropriate constructor methods. In some cases, a geo object is required in the constructor. Geo objects (for example, GeoPolyline and GeoPolygon) are geographical data representations that act as models to MapObjects, which act as views. Unlike map objects, geo objects cannot be added directly to a Map. For more information on geo objects and creating map objects, see the API Reference.

The following code snippet demonstrates how to create a MapPolyline and a GeoPolyline object:

```
List<GeoCoordinate> testPoints = new ArrayList<GeoCoordinate>();
testPoints.add(new GeoCoordinate(49.163, -123.137766, 10));
testPoints.add(new GeoCoordinate(59.163, -123.137766, 10));
testPoints.add(new GeoCoordinate(60.163, -123.137766, 10));
GeoPolyline polyline = new GeoPolyline(testPoints);
MapPolyline mapPolyline = new MapPolyline(polyline);
```

To add a MapObject to the map, use Map.addMapObject(MapObject) or Map.addMapObjects(List<MapObject>). You can use the setOverlayType(MapOverlayType) method to set the display layer for the map object. By default, map objects are assigned to the foreground.

- **Note:** For use cases where a map object needs to be viewable in 3D space, use MapLocalModel or MapGeoModel. Other map objects are not guaranteed to support 3D.

## MapContainer

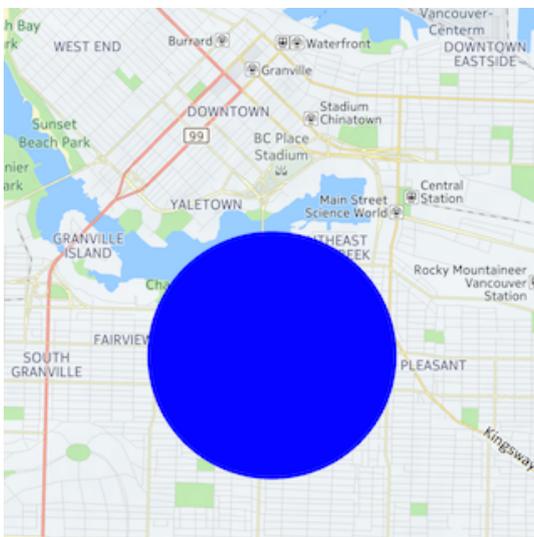
You can use `MapContainer` as a container for other `MapObject` instances. Map containers determine the stacking order of objects displayed on a map. To add a map object, call the `MapContainer.addMapObject(MapObject)` method.

- **Note:** `MapRoute` and `MapContainer` cannot be added to a `MapContainer`.
- **Note:** If a map object is a part of a `MapContainer`, it has the same `MapOverlayType` as the map container.

## MapCircle

A `MapCircle` represents a type of `MapObject` in the shape of a circle, with an assigned radius distance and a `GeoCoordinate` center. It can be created by calling the constructor `MapCircle(double radius, GeoCoordinate center)`.

Figure 13: A `MapCircle` object

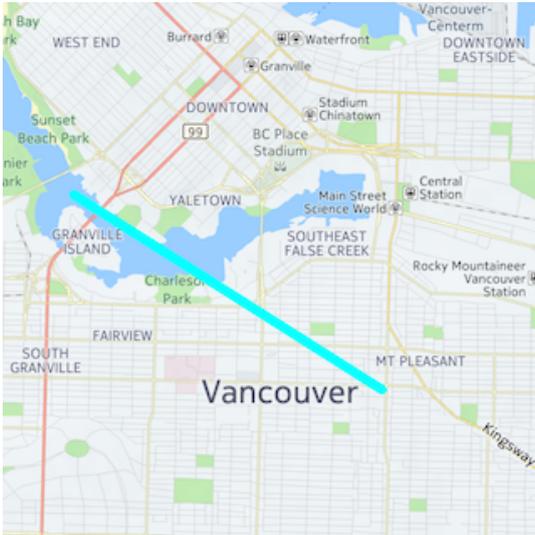


## MapPolyline

A `MapPolyline` is a `MapObject` in the shape of a polyline with anchor points at any number of `GeoCoordinate` points. It can be created via a `GeoPolyline` object, which can be created by calling the `GeoPolyline(List<GeoCoordinate> points)` constructor.

**Note:** A MapPolyline or MapPolygon can only contain up to 65536 vertices.

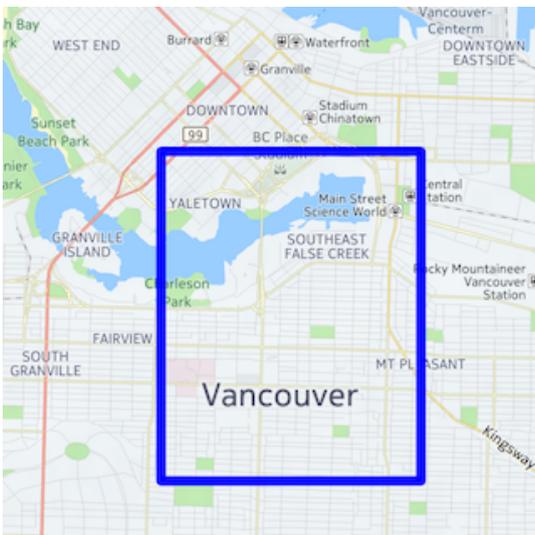
**Figure 14: A MapPolyline object**



## MapPolygon

A MapPolygon is a MapObject in the shape of a polygon. In contrast with a MapPolyline, it is assumed that the last coordinate in the line's path is connected to the first coordinate, thereby constructing an enclosed geometry. A MapPolygon may define separate border and fill colors. To create a MapPolygon, use the constructor `MapPolygon(GeoPolygon polygon)`. A GeoPolygon can be created by calling `GeoPolygon(List<GeoCoordinate> points)`.

**Figure 15: A MapPolygon object**



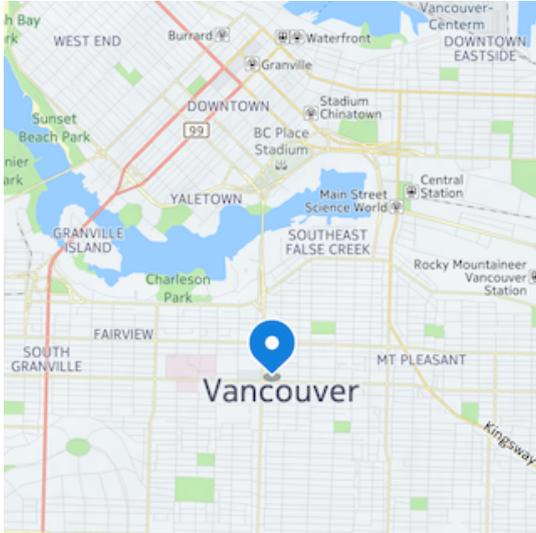
## MapRoute

A MapRoute is a MapObject that displays a calculated route on a map. For more information on MapRoute, see [Routing](#).

## MapMarker

A `MapMarker` is a `MapObject` that displays an icon at a geographical position on a map. You can create a `MapMarker` with your own custom icon by calling `MapMarker(GeoCoordinate, Image)`.

Figure 16: A `MapMarker` object



`MapMarker` instances are always placed on top of other map objects. Refer to the diagram below for more information about z-index ordering for multiple map markers.

Figure 17: `MapMarker` order

The closer to the bottom of the screen it is, the closer to the viewer the marker appears



If the y position is the same, then z-index decides ordering



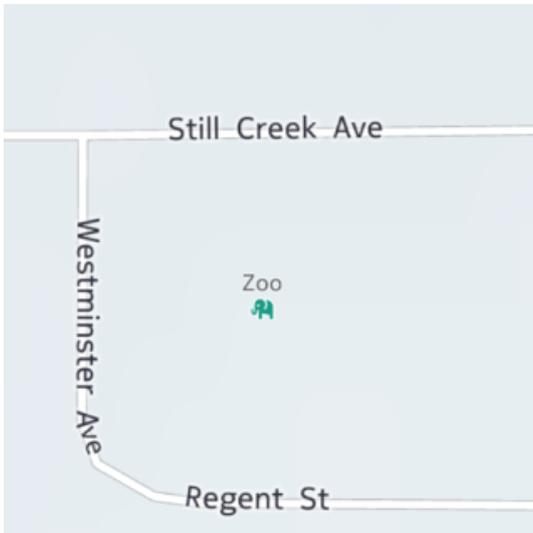
You can set `MapMarker` to be draggable by using the `MapMarker.setDraggable(true)` method. To listen for drag events, such as marker position changes, use `MapMarker.OnDragListener`.

## MapLabeledMarker

A `MapLabeledMarker` is a different type of marker object that avoids overlapping with other icons and text on the map. By default, the visual appearance of a `MapLabeledMarker` is similar to a point of interest. You

can choose a preset category icon (for example, `IconCategory.ZOO`) or set your own `Image` as the marker icon.

Figure 18: A `MapLabeledMarker` object



Unlike `MapMarker`, setting the label text to a `MapLabeledMarker` does not require enabling an info bubble. You can set the marker label text by providing a language and a localized string to the `MapLabeledMarker.setLabelText(String, String)` method. The localized text in the language that matches the current `Map.getMapDisplayLanguage()`, if available, is displayed. Otherwise, the first-added localized text is displayed.

**Note:** Although a `MapLabeledMarker` is visually similar to a point of interest, its overlay type is set to `FOREGROUND_OVERLAY` by default.

## MapLocalModel

A `MapLocalModel` is an arbitrary 3D map object that is drawn using a local coordinate (as opposed to a geocoordinate) mesh. You can create a custom `MapLocalModel` by calling `MapLocalModel()`, and setting the model mesh, texture, orientation, and geographical location before adding it to the map. For example:

```
FloatBuffer buff = FloatBuffer.allocate(12); // Two triangles
buff.put(0 - delta);
buff.put(0 - delta);
buff.put(1.f);
buff.put(0 + delta);
buff.put(0 - delta);
buff.put(1.f);
buff.put(0 - delta);
buff.put(0 + delta);
buff.put(1.f);
buff.put(0 + delta);
buff.put(0 + delta);
buff.put(1.f);

// Two triangles to generate the rectangle. Both front and back face
IntBuffer vertIndicieBuffer = IntBuffer.allocate(12);
vertIndicieBuffer.put(0);
vertIndicieBuffer.put(2);
vertIndicieBuffer.put(1);
vertIndicieBuffer.put(2);
vertIndicieBuffer.put(3);
```

```
vertIndicieBuffer.put(1);
vertIndicieBuffer.put(0);
vertIndicieBuffer.put(1);
vertIndicieBuffer.put(2);
vertIndicieBuffer.put(1);
vertIndicieBuffer.put(3);
vertIndicieBuffer.put(2);

// Texture coordinates
FloatBuffer textCoordBuffer = FloatBuffer.allocate(8);
textCoordBuffer.put(0.f);
textCoordBuffer.put(0.f);
textCoordBuffer.put(1.f);
textCoordBuffer.put(0.f);
textCoordBuffer.put(0.f);
textCoordBuffer.put(1.f);
textCoordBuffer.put(1.f);
textCoordBuffer.put(1.f);

LocalMesh myMesh = new LocalMesh();
myMesh.setVertices(buff);
myMesh.setVertexIndices(vertIndicieBuffer);
myMesh.setTextureCoordinates(textCoordBuffer);

MapLocalModel myObject = new MapLocalModel();
myObject.setMesh(myMesh); //a LocalMesh object
myObject.setTexture(myImage); //an Image object
myObject.setAnchor(myLocation); //a GeoCoordinate object
myObject.setScale(20.0f);
myObject.setDynamicScalingEnabled(true);
myObject.setYaw(45.0f);
map.addMapObject(myObject);
```

While translating the 3D model mesh to the map, a unit of 1.0f represents 1 meter in the real world. For example, a `Vector3f(100, 200, 300)` represents an offset of +100 meters in the x-axis (East), +200 meters in the y-axis (North), and +300 meters in the z-axis direction (Up). You can further control the size of the 3D model mesh by setting a scaling factor with the `setScale()` method.

**Figure 19: A MapLocalModel object**



Aside from setting a texture, a `MapLocalModel` can also be customized by setting its material and lighting using the Phong reflection model. For example, the following code sets the ambient color, diffuse color, and light source to the `MapLocalModel`.

```
// This light shines from above in the Z axis
DirectionalLight light = new DirectionalLight(new Vector3f(0, 0.5f, 1));
m_model.addLight(light);

// Give this a default color
PhongMaterial mat = new PhongMaterial();
mat.setAmbientColor(0xffffffff);
mat.setDiffuseColor(0x00000000);
m_model.setMaterial(mat);
```

#### Note:

- As 3D objects consume large amounts of memory, avoid using `MapLocalModel` and `MapGeoModel` to replace 2D map markers. Two examples of recommended uses of these classes are adding a few 3D structures to the map, or showing a realistic car model during guidance.
- If you use `MapLocalModel` to create a two-dimensional object, and if you use an anchor with an undefined or zero altitude value, there is a known rendering issue with OpenGL where parts of the object may conflict with the map layer, causing the object to flicker. To get around this issue, use a z-coordinate offset that is greater than 0. For example, you can use a small floating point number such as, `0.001`, so that the user is unable to distinguish between the object's altitude and the map.

## MapGeoModel

A `MapGeoModel` is an arbitrary 3D map object that is drawn using geocoordinate vertices. You can create a `MapGeoModel` by calling its constructor and setting a list of geocoordinates, a list indicating the vertex order, a list of *UV coordinates*, and a texture `Image`. For example:

```
List<GeoCoordinate> myLocations = Arrays.asList(
    new GeoCoordinate(37.783409, -122.439473),
    new GeoCoordinate(37.785444, -122.424667),
    new GeoCoordinate(37.774149, -122.429345));

// vertices must be specified in a counter-clockwise manner

IntBuffer vertIndicieBuffer = IntBuffer.allocate(3);
vertIndicieBuffer.put(0);
vertIndicieBuffer.put(2);
vertIndicieBuffer.put(1);

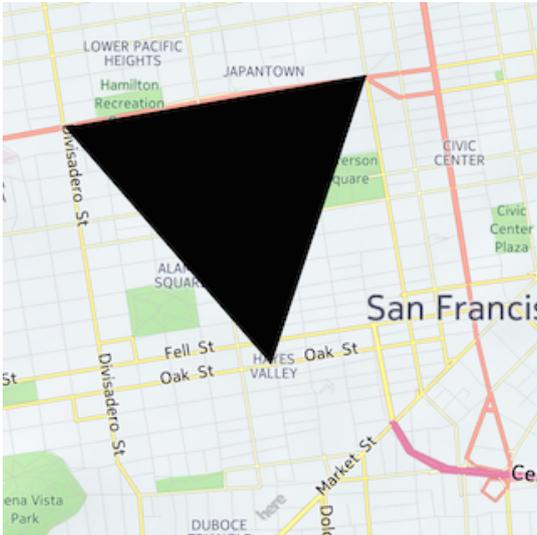
FloatBuffer textCoordBuffer = FloatBuffer.allocate(6);
textCoordBuffer.put(0.5f);
textCoordBuffer.put(0.5f);
textCoordBuffer.put(0.5f);
textCoordBuffer.put(0.5f);
textCoordBuffer.put(0.5f);
textCoordBuffer.put(0.5f);

GeoMesh meshy = new GeoMesh();
meshy.setVertices(myLocations);
meshy.setVertexIndices(vertIndicieBuffer);
meshy.setTextureCoordinates(textCoordBuffer);

MapGeoModel myGeoModel = new MapGeoModel();
myGeoModel.setMesh(meshy);
myGeoModel.setTexture(myTexture);
```

As with `MapLocalModel`, you can also set the lighting and color properties for a `MapGeoModel` using the `addLight(DirectionalLight)` and `setMaterial(PhongMaterial)` methods.

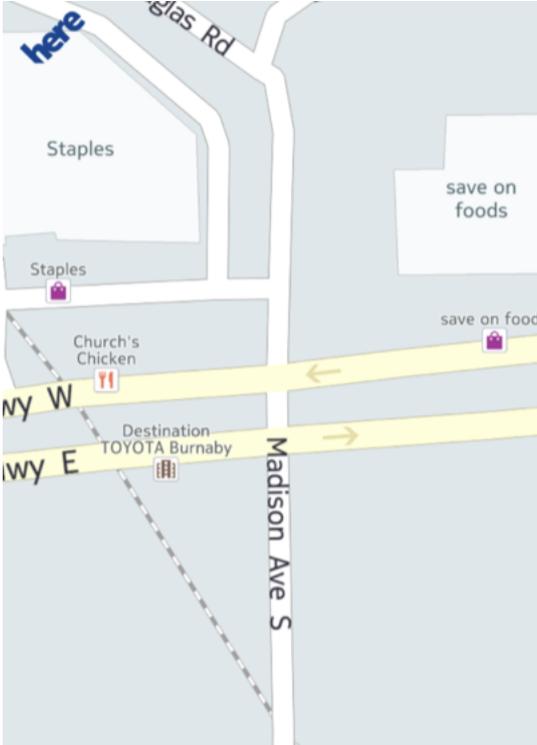
Figure 20: A `MapGeoModel` object



## MapCartoMarker

Points of interest are represented by instances of the `MapCartoMarker` proxy object class.

Figure 21: Examples of Points of Interest



In the above screenshot, there are four points of interests: two shops, one restaurant, and one car dealership. Each of these points of interest may be selected by either tapping on the map.

The following is an example of how to retrieve point of interest information from a `MapCartoMarker`:

```
switch (proxyObj.getType()) {
    case MAP_CARTO_MARKER:
        MapCartoMarker mapCartoMarker =
            (MapCartoMarker) proxyObj;
        Location location = mapCartoMarker.getLocation();
        String placeName =
            location.getInfo().getField(Field.PLACE_NAME);
        String placeCategory =
            location.getInfo().getField(Field.PLACE_CATEGORY);
        String placePhone =
            location.getInfo().getField(Field.PLACE_PHONE_NUMBER);
        //...
        break;
    //...
    default:
        Log.d(TAG, "ProxyObject.getType() unknown");
}
```

You can extract further Point of Interest (POI) information from a cartographic marker by using the Places feature in the HERE SDK, since cartographic markers contain identifying data that can be passed to a Place search request. For example:

```
if (mapCartoMarker.getLocation() != null &&
    mapCartoMarker.getLocation().getInfo() != null)
{
    LocationInfo info = mapCartoMarker.getLocation().getInfo();
    String foreignSource = info.getField(Field.FOREIGN_ID_SOURCE);
    String foreignId = info.getField(Field.FOREIGN_ID);

    PlaceRequest request = new PlaceRequest(foreignSource, foreignId);
    request.execute(new ResultListener<Place>() {
        @Override
        public void onCompleted(Place data, ErrorCode error) {
            if (error == ErrorCode.NONE) {
                //extract Place data
            }
        }
    });
}
```

For more information about this feature, see the [External References](#) section.

## User Interactions with MapObject

This section provides an example on handling `MapObject` tap events. In the following code:

- `addMapObject()` adds the object on the Map.
  - `List<ViewObject>` holds the objects that have been selected in this tap event. By looping through this list of objects, your code can find the `MapObject` that should respond to this tap event.
- Note:** The `onMapObjectsSelected(List)` callback is triggered after the `onTapEvent(PointF)` callback. For more information on this, refer to [Map Gestures](#) on page 27

```
// Create a custom marker image
com.here.android.mpa.common.Image myImage =
    new com.here.android.mpa.common.Image();

try {
```

```

myImage.setImageResource(R.drawable.my_png);
} catch (IOException e) {
    finish();
}

// Create the MapMarker
MapMarker myMapMarker =
    new MapMarker(new GeoCoordinate(LAT, LNG), myImage);

map.addMapObject(myMapMarker);

...

// Create a gesture listener and add it to the MapFragment
MapGesture.OnGestureListener listener =
    new MapGesture.OnGestureListener.OnGestureListenerAdapter() {
        @Override
        public boolean onMapObjectsSelected(List<ViewObject> objects) {
            for (ViewObject viewObj : objects) {
                if (viewObj.getBaseType() == ViewObject.Type.USER_OBJECT) {
                    if (((MapObject)viewObj).getType() == MapObject.Type.MARKER) {
                        // At this point we have the originally added
                        // map marker, so we can do something with it
                        // (like change the visibility, or more
                        // marker-specific actions)
                        ((MapObject)viewObj).setVisible(false);
                    }
                }
            }
            // return false to allow the map to handle this callback also
            return false;
        }
        ...
    };

```

## The MapOverlay Class

The `MapOverlay` class represents a special type of map object that does not inherit from the `MapObject` base class. Instead, it provides a way for any Android View to be displayed at a fixed geographical location on the map.

You can add content to a map overlay by using the `MapOverlay(View, GeoCoordinate)` constructor. If complex view contents are required, such as a view with subviews of its own, the content should be fully initialized before adding it to the map overlay.

Due to the extra performance cost of Android views, it is recommended that the `MapOverlay` only be used in situations where the additional functionality provided by a `View`, such as a button, is needed. If the map object only needs to display a static image, use `MapMarker`.

**Note:** `MapOverlay` does not inherit from `MapObject`, but overlays are returned as a `MapMarker` from a a tap gesture callback by default. To avoid this behavior and these substitute markers, the appropriate gesture handling must be implemented either in a `MapOverlay` subclass, or in a custom view that is added as a subview to a standard `MapOverlay`.

The following code shows how to use a simple button in a `MapOverlay`.

```

private Button button;

private void onMapFragmentInitializationCompleted() {
    // retrieve a reference of the map from the map fragment
    map = mapFragment.getMap();
    // Set the map center coordinate to the Vancouver region (no animation)

```

```

map.setCenter(new GeoCoordinate(49.196261, -123.004773, 0.0),
    Map.Animation.NONE);
// Set the map zoom level to the average between min and max (no
// animation)
map.setZoomLevel((map.getMaxZoomLevel() + map.getMinZoomLevel()) / 2);
// create the button
button = new Button(this);
button.setText("TEST");
// create overlay and add it to the map
map.addMapOverlay(
    new MapOverlay(button,
        new GeoCoordinate(37.77493, -122.419416, 0.0)));
}

```

## Handling MapProxyObject objects

The following code demonstrates how to handle tap events on a MapProxyObject:

- The `onMapObjectsSelected` event of the `OnGestureListener` listens to object selected. For more information on `OnGestureListener`, refer to [Map Gestures](#) on page 27.
- If the selected object is a `PROXY_OBJECT` then you can safely cast the `ViewObject` into a `MapProxyObject`.
- If the selected object is a `USER_OBJECT` then you need to find the object using the hash map; refer to the preceding example.

```

private MapGesture.OnGestureListener listener =
new MapGesture.OnGestureListener.OnGestureListenerAdapter() {
    ...
    @Override
    public boolean onMapObjectsSelected(List<ViewObject> objects) {
        for (ViewObject obj : objects) {
            switch (obj.getBaseType()) {
                case PROXY_OBJECT:
                    MapProxyObject proxyObj = (MapProxyObject) obj;
                    switch (proxyObj.getType()) {
                        case TRANSIT_ACCESS:
                            TransitAccessObject transitAccessObj =
                                (TransitAccessObject) proxyObj;
                            Log.d(TAG, "Found a TransitAccessObject");
                            break;
                        case TRANSIT_LINE:
                            TransitLineObject transitLineObj =
                                (TransitLineObject) proxyObj;
                            Log.d(TAG, "Found a TransitLineObject");
                            break;
                        case TRANSIT_STOP:
                            TransitStopObject transitStopObj =
                                (TransitStopObject) proxyObj;
                            Log.d(TAG, "Found a TransitStopObject");
                            break;
                        default:
                            Log.d(TAG, "ProxyObject.getType() unknown");
                    }
                    break;

                // User objects are more likely to be handled
                // as in the previous example
                case USER_OBJECT:
                    default:
                        Log.d(TAG,
                            "ViewObject.getBaseType() is USER_OBJECT or unknown");
                    break;
            }
        }
    }
}

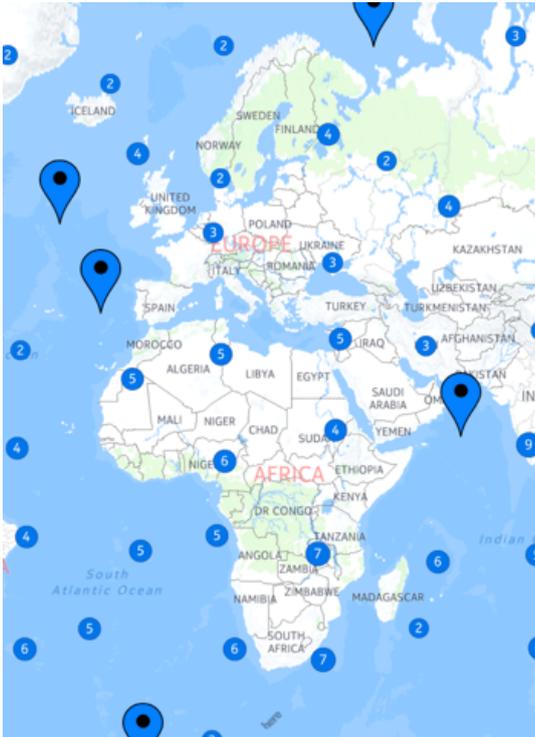
```

```
    }  
    return true;  
  }  
  ...  
};
```

## Marker Clustering

You can use marker clustering to reduce the visual overload caused by too much markers being displayed on the map at once. With this feature, markers that are close together are automatically replaced by numbered cluster markers to indicate that multiple map markers are represented.

Figure 22: Cluster Markers



### Showing Cluster Markers

You can enable cluster markers on a map by using a `ClusterLayer` and adding map markers to it. All markers that are on a layer are automatically clustered based on a grid-based clustering algorithm that depends on the map zoom level.

The following steps demonstrates how to use the `ClusterLayer` class:

1. Create map markers as normal:

```
MapMarker mm = new MapMarker();  
mm.setIcon(myImage);  
mm.setCoordinate(new GeoCoordinate(52.53,13.23));
```

2. Create a `ClusterLayer` object.

```
ClusterLayer cl = new ClusterLayer();
```

3. Add markers to the cluster layer, instead of the map directly. You can also add a `Collection` of `MapMarker` instead of setting just adding a single marker.

```
cl.addMarker(mm);
```

4. Add the cluster layer to the map.

```
mMap.addClusterLayer(cl);
```

**Note:** The order of these two steps is not important. You can also add the cluster layer to the map first and add markers to the cluster layer afterwards.

5. To remove a marker or collection or markers from the cluster layer again, call:

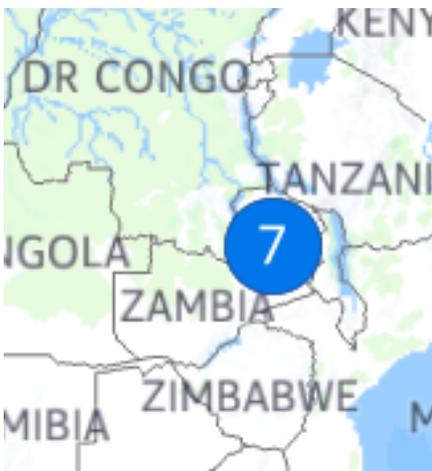
```
cl.removeMarker(mm);
```

You can also retrieve all markers on a cluster layer with the `ClusterLayer.getMarkers()` method. This is useful in the case where you would like to remove all markers by using the `removeMarkers(Collection<MapMarker>)` method.

## Theming

You can customize clusters by assigning a `ClusterTheme` object to the `ClusterLayer`. Every theme consists of several styles, where a cluster style defines the look of marker cluster objects at a particular density. Cluster density is the amount of markers that is being represented by a cluster.

Figure 23: Marker Cluster with Density of 7



There are three available cluster styles that you can use with a `ClusterTheme`:

- Default cluster style - the predefined markers behavior. This is the default style that is used if you do not set a theme. It is also used for ranges that are not covered by your own theme.
- `BasicClusterStyle` - similar to the default style, but you can change the fill color, text color, and stroke color for the markers.
- `ImageClusterStyle` - use your own bitmap image as a marker.

To set a style, use the `setStyleForDensityRange(int, int, ClusterStyle)` or `setStyleForDensityRange(ClusterDensityRange, ClusterStyle)` methods in `ClusterTheme`. For example, if you want red for all clusters between density 10 to 19, and green for 20 to 49, and the default blue for all other cases, you can use `BasicClusterStyle` as follows:

1. Create a style with a red circle and a style with a green one:

```
BasicClusterStyle redStyle = new BasicClusterStyle();
redStyle.setFillColor(Color.RED);
BasicClusterStyle greenStyle = new BasicClusterStyle();
greenStyle.setFillColor(Color.GREEN);
```

2. Create a new theme and add those styles to the theme with defining the density ranges they should be used for:

```
ClusterTheme theme = new ClusterTheme();
theme.setStyleForDensityRange(10, 19, redStyle);
theme.setStyleForDensityRange(20, 49, greenStyle);
```

Instead of setting the integer values directly, you can also make use of the `ClusterDensityRange` class.

**Note:** Do not overlap density ranges. Overlapping ranges causes `InvalidArgumentException`.

3. Finally, add this theme to the cluster layer you use:

```
cl.setTheme(theme);
```

To use your own image as a cluster icon, set an `Image` to an `ImageClusterStyle` instance before setting the style to the cluster theme. For example:

```
Image img = new Image();
try {
    img.setImageResource(R.drawable.banner);
} catch (IOException e) {
    e.printStackTrace();
}
ImageClusterStyle imageCluster = new ImageClusterStyle(img);

ClusterTheme theme = new ClusterTheme();
theme.setStyleForDensityRange(2, 9, imageCluster);
cl.setTheme(theme);
```

Although you can only set one theme per layer, you can mix styles for different densities in a single theme. For example, you can set a `BasicClusterStyle` from density of 10 to 19 and an `ImageClusterStyle` from 20 to 30. The default theme applies for all other densities that are not covered by the custom themes.

## Cluster Marker Events

Cluster markers are similar to normal markers on the map. You can also use map object gesture listeners in a similar manner as normal map markers. For example:

1. Add a gesture listener to the map via:

```
mMapFragment.getMapGesture().addOnGestureListener(mMyGestureHandler);
```

2. Next, listen for

```
public boolean onMapObjectsSelected(List<ViewObject> viewObjects)
```

to get the map click event.

3. Iterate over the `ViewObjects` and check for type `PROXY_OBJECT` and sub-type `CLUSTER_MARKER`. Alternatively, you can also use the `instanceof` keyword.

```
@Override
public boolean onMapObjectsSelected(List<ViewObject> viewObjects) {
```

```
for (ViewObject obj : viewObjects){
    if (obj.getBaseType() == ViewObject.Type.PROXY_OBJECT){
        if (proxyObj.getType() == MapProxyObject.Type.CLUSTER_MARKER) {
            ClusterViewObject cv = (ClusterViewObject) proxyObj;
            Log.i(TAG, "Cluster clicked: markers#" + cv.getMarkers().size());
            return true;
        }
    }
    return false;
}
```

## Working with Clusters

The HERE SDK also provides a few other ways for you to interact with marker clusters. You can get all markers inside one specific cluster by using the `ClusterViewObject`, which is a proxy object representing a cluster. For example:

```
Collection<MapMarker> ClusterViewObject.getMarkers()
```

You can also retrieve the bounding box around all markers that are in a cluster marker by calling the following:

```
BoundingBox ClusterViewObject.getBoundingBox();
```

## Traffic Information

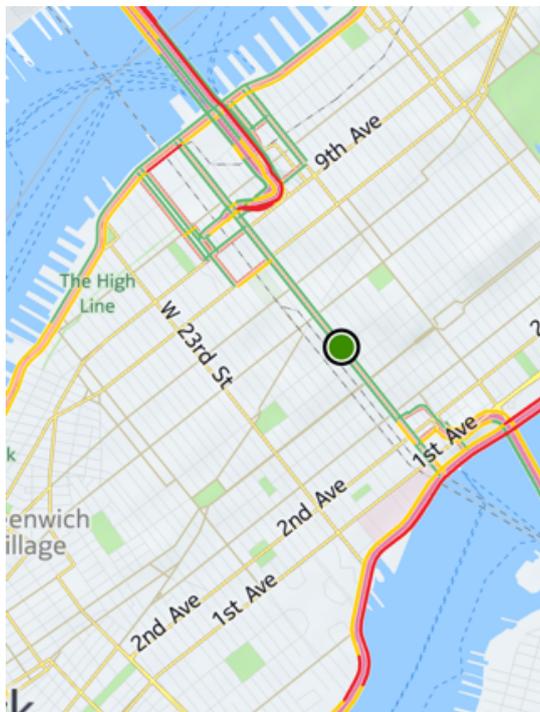
Traffic information can be displayed on the Map, depending on traffic data availability, by using `Map.setTrafficInfoVisible(true)` and setting the map to a traffic-enabled map scheme. Traffic visualization requires a network data connection to download real time traffic information. However, traffic information may continue to be displayed thereafter without a connection until the traffic events expire or the visibility is toggled.

The current traffic-enabled map schemes are:

- `Map.Scheme.HYBRID_TRAFFIC_DAY`
- `Map.Scheme.HYBRID_TRAFFIC_NIGHT`
- `Map.Scheme.NORMAL_TRAFFIC_DAY`
- `Map.Scheme.NORMAL_TRAFFIC_NIGHT`
- `Map.Scheme.CARNAV_TRAFFIC_DAY`
- `Map.Scheme.CARNAV_TRAFFIC_NIGHT`
- `Map.Scheme.CARNAV_TRAFFIC_HYBRID_DAY`
- `Map.Scheme.CARNAV_TRAFFIC_HYBRID_NIGHT`

The following figure shows a sample traffic visualization.

**Figure 24: Traffic information with color-coded lines**



Traffic flow lines are color coded as follows:

Green	Normal
Amber	High
Red	Very High
Black	Blocking

## Controlling Traffic Display

You can further control traffic display by calling `Map.getMapTrafficLayer()` and using the `MapTrafficLayer` object.

With `MapTrafficLayer`, you can individually disable Traffic Flow, Traffic Incidents, or On-Route Traffic, as well as filter traffic that is displayed according to the minimal severity level.

For example, you can set the map to only display traffic flow lines that are "very high" (red) or "blocking" (black) by performing the following:

```
MapTrafficLayer traffic = map.getMapTrafficLayer();
//set the minimum displayed traffic level
traffic.setDisplayFilter(TrafficEvent.Severity.VERY_HIGH);
```

## Controlling Traffic Updates

By default, traffic events are automatically loaded inside the viewport when traffic is enabled. You can also explicitly fetch traffic around a given set of geocoordinates by using `TrafficUpdater.request(GeoCoordinate, int, Listener)`.

To completely customize the traffic-updating implementation in your app, first turn off automatic traffic updates via the `Map.disableTrafficAutoUpdate()` method, then use the above mentioned method to fetch traffic only where it is required.

- Note:** Since downloading and decoding traffic data can be computationally costly, do not fetch traffic for the same area too frequently. For example, if you are fetching traffic only around the user position, do not fetch more frequently than once a minute. For lower end devices, fetch data in even less frequent intervals, such as once every five minutes.

## Selecting Traffic Objects and Events

Traffic events are selectable through map gestures and `OnGestureListener.onMapObjectsSelected(List<ViewObject>)`. A user selectable `TrafficEventObject` contains live traffic event information and is presented on the map in different forms. The following figures illustrate three examples:

Figure 25: TrafficEventObject example: Roadwork

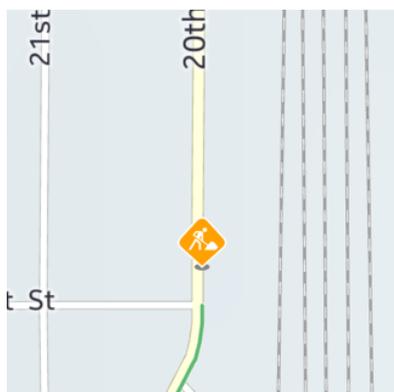


Figure 26: TrafficEventObject example: Accident

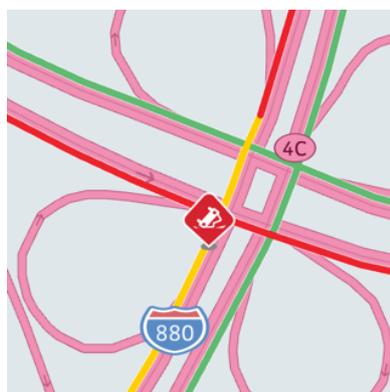
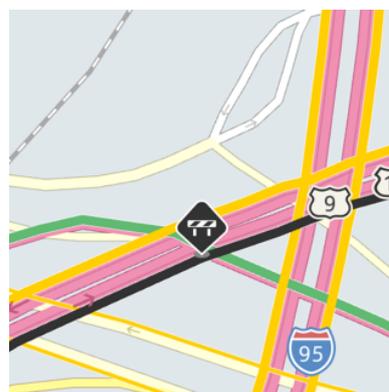


Figure 27: TrafficEventObject example: Road Closed



To acquire information about a tapped `TrafficEventObject` (see [MapObjects](#)), use `onMapObjectsSelected(List<ViewObject>)` as in the following:

```
private MapGesture.OnGestureListener listener = new MapGesture.OnGestureListener() {
    ...
    @Override
    public boolean onMapObjectsSelected(List<ViewObject> objects) {
        for (ViewObject obj : objects) {
            if (obj.getBaseType() == ViewObject.Type.PROXY_OBJECT) {
                MapProxyObject proxyObj = (MapProxyObject) obj;
                if (proxyObj.getType() == MapProxyObject.Type.TRAFFIC_EVENT) {
                    TrafficEventObject trafficEventObj =
                        (TrafficEventObject) proxyObj;
                    TrafficEvent trafficEvent =
                        trafficEventObj.getTrafficEvent();
                    Toast.makeText(getApplicationContext(), trafficEvent.getEventText(),
                        Toast.LENGTH_LONG).show();
                }
            }
        }
        return true;
    }
};
```

## Offline Maps (MapLoader)

Even without an active data connection, applications developed with the HERE Android SDK let you browse, search and interact with maps. Classes involved with providing Offline Maps functionality include `MapLoader`, `MapLoader.Listener`, `MapLoader.ResultCode` and `MapPackage`.

An application can use `MapLoader` while it is performing another map operation. For example, an app can download map data while a user is panning a map.

Offline map functionality is invoked automatically, or you can also disable connectivity for the entire HERE SDK by using `MapEngine.setOnline(false)`. Note that you can only set `MapEngine.setOnline(true)` when the device is online. If not, then the request is ignored.

### MapLoader and MapLoader.Listener

Offline maps capabilities are enabled through the use of `MapLoader` and its associated objects. The `MapLoader` class provides a set of APIs that allow manipulation of the map data stored on the device. Operations include:

- `getMapPackages()` - To retrieve the state of the map data on the device
- `installMapPackages(List<Integer> packageIdList)` - To download and install new country or region data
- `uninstallMapPackages(List<Integer> packageIdList)` - To uninstall and delete country or region data that is no longer desired
- `checkForMapDataUpdate()` - To check whether a new map data version is available
- `performMapDataUpdate()` - To perform a map data version update, if available
- `cancelCurrentOperation()` - To cancel the running `MapLoader` operation

To use `MapLoader`, you must call `MapLoader.getInstance()` to retrieve a `MapLoader` object instance. Note that `com.here.android.mpa.mapping.MapEngine` must be successfully initialized before this method can be used.

`MapLoader` operations are performed asynchronously. Results of the various operations are returned by way of a `MapLoader.Listener` implementation that must be set to listen for notifications from the `MapLoader` as in the code snippet below:

```
MapLoader.Listener mapLoaderListener = new MapLoader.Listener() {
    public void onUninstallMapPackagesComplete(MapPackage rootMapPackage,
        MapLoader.ResultCode mapLoaderResultCode) {
    }
    public void onProgress(int progressPercentage) {
    }
    public void onPerformMapDataUpdateComplete(MapPackage rootMapPackage,
        MapLoader.ResultCode mapLoaderResultCode) {
    }
    public void onInstallationSize(long diskSize, long networkSize) {
    }
    public void onInstallMapPackagesComplete(MapPackage rootMapPackage,
        MapLoader.ResultCode mapLoaderResultCode) {
    }
    public void onGetMapPackagesComplete(MapPackage rootMapPackage,
        MapLoader.ResultCode mapLoaderResultCode) {
    }
    public void onCheckForUpdateComplete(boolean updateAvailable,
```

```
String currentMapVersion,String newestMapVersion,  
    MapLoader.ResultCode mapLoaderResultCode) {  
    }  
};  
  
MapLoader mapLoader = MapLoader.getInstance();  
mapLoader.addListener(mapLoaderListener);
```

Also, all operations of the `MapLoader` are mutually exclusive. For example, if method XYZ is called before the callback method ABC has returned a result, method XYZ returns `false` to indicate that the `MapLoader` is busy with another operation.

## The MapPackage Class

The map data packages available for download are represented as a tree structure with the root map package representing the world map. The `MapPackage` class represents the model through which this tree structure is accessed. As shown in the preceding code snippet, many of the `MapLoader.Listener` callbacks returns the root `MapPackage`. The other `MapPackage` instances are accessed by recursing through the tree structure from the root.

The `MapPackage` state of a particular instance is not updated dynamically to reflect changes to map data on disk. Therefore if you retrieve `MapPackage` instance A, and then perform an installation operation (which returns `MapPackage` instance B through `onInstallMapPackagesComplete()`), `MapPackage` instance A does not reflect the updated map data state, but `MapPackage` instance B does. Therefore, always use the new `MapPackage` object returned by a given operation and update the representation in your application accordingly.

- **Note:** The `getSize()` method returns the maximum install size of the map package, in kilobytes. If this is the first `MapPackage` to be installed, then the package takes up the same amount of memory storage as returned by this method. However, if other packages have already been installed, then the required disk space for this map package is considerably less than the value returned by `getSize()`, because common data between map packages does not need to be installed again. To get an accurate representation of the disk space that is used for a given installation operation, use the `MapLoader.Listener.onInstallationSize(long, long)` callback method.
- **Note:** Map data packages may need to be reinstalled if the application crashes or is forced closed during `MapLoader` installation or uninstallation.

## Incremental Map Data Updates

`MapLoader` exposes the ability to update the map data version to provide the user with the freshest map data available. The map data version applies not only to map data pre-installed using the `MapLoader`, but also to data that is retrieved dynamically by browsing new areas.

Map data version is consistent for all map data across the entire system, whether the map data is downloaded or not. It is not possible to have some data from one map version and other data from another map version concurrent in the disk cache. Therefore, it is important to keep the map version of the system up to date. However, map version updating does not require re-downloading everything. Instead, only incremental changes need to be downloaded, making typical updates small and quick. Map version updating is exposed through the `checkForMapDataUpdate()` and `performMapDataUpdate()` methods.

## Data Groups

Map packages are made up of several groups, each of which contains a different type of map data. Some of these groups may be selected or deselected before map packages are downloaded for offline use, depending on the needs of the application. The optional data groups are given in the `SelectableDataGroup` enum. To select or deselect a data group for download, pass the appropriate enum value to the `NMAMapLoader.selectDataGroup(SelectableDataGroup)` or `deselectDataGroup(SelectableDataGroup)` method.

**Note:** This feature can only be used with an isolated disk cache. For more information, see [Embedding the Map Service](#) on page 20.

The selected data groups of the map loader are used for all future installation operations. However, changes to the data group selection do not affect previously installed packages. To update these packages, call `performMapDataUpdate()` after changing the data group selection.

The default data group selection may not be optimal for some applications. To minimize disk space usage, it's recommended that any applications which allow offline map downloads ensure they are only downloading the required data groups.

## Shared Map Resources

The HERE SDK utilizes a shared disk cache on external device memory where it keeps map resources. This disk cache is shared between all applications and components that use the HERE SDK. The disk cache can be accessed by multiple applications concurrently, even while map data is being loaded. (For more information, see [Offline Maps \(MapLoader\)](#) on page 52)

Usage of map resources must be properly handled on an application level. When an application is in active use, it must hold a reference to map resources for HERE SDK functionality to work. When an application is not being used (for example, it has been sent to the background), it should release its reference to map resources.

For `MapFragment` users, map resource usage is handled automatically, so explicit handling of map resource references is not required.

Reference handling can be performed manually. This is useful if an application wishes to support a use case that is outside the scope of classes that provide automatic reference handling. Some examples of this include performing route calculations in a background service or directly using a `MapView` component.

- `onPause()` - Decrements the reference count of map resource usage.
- `onResume()` - Increments the reference count of map resource usage.
- `getResourceReferenceCount()` - Get the current reference count of map resource usage for your application

For more info on these methods and their usage, consult the API reference.

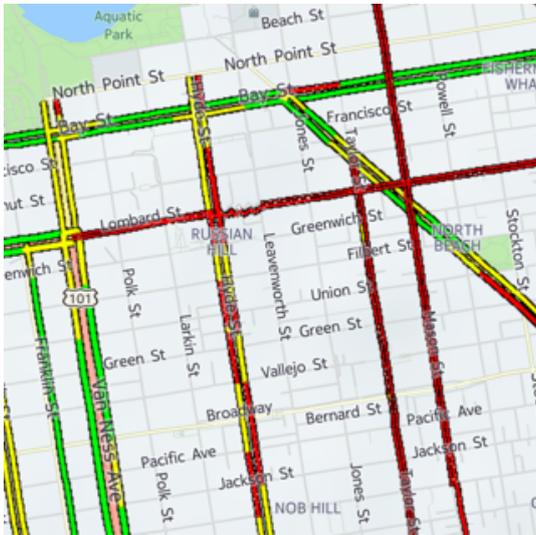
## Traffic History

Traffic History allows the user to obtain map tiles that show the typical traffic pattern for a specific time point during the week. To display Traffic History tiles, create an instance of

HistoricalTrafficRasterTileSource by specifying a day of the week and a time. For example, to show the traffic tiles for Wednesdays at 5:40pm, add the following:

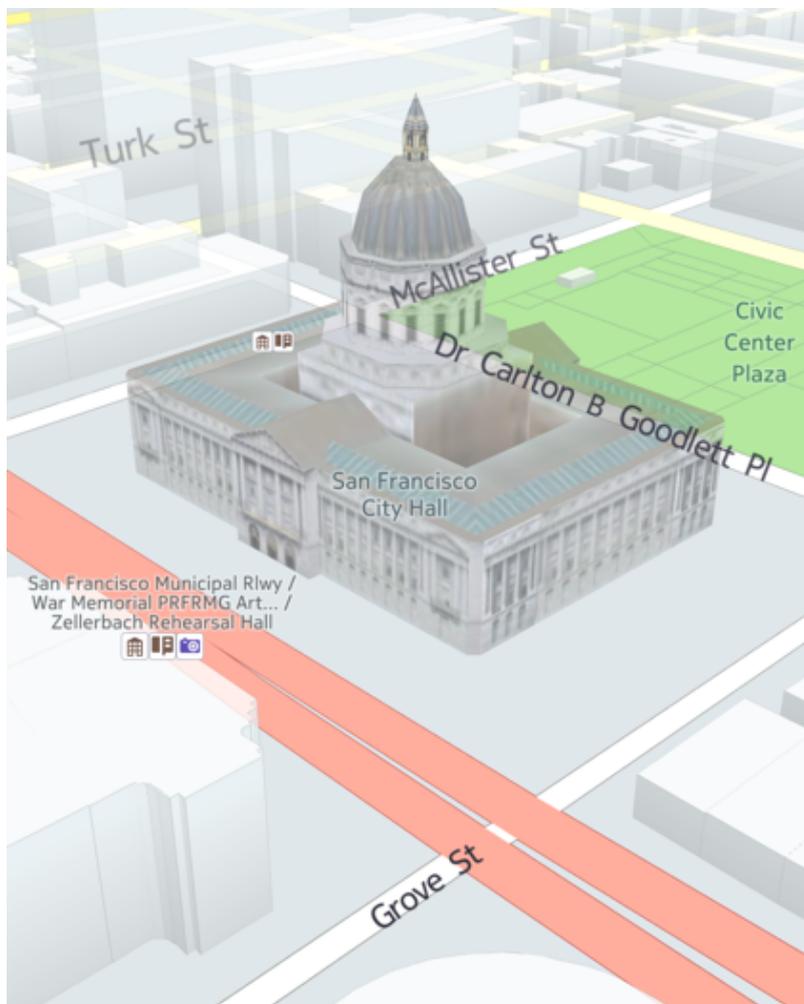
```
HistoricalTrafficRasterTileSource tileSource =  
new HistoricalTrafficRasterTileSource(DaysOfTheWeek.WEDNESDAY, 17, 40);  
map.addRasterTileSource(tileSource);
```

Figure 28: Traffic History in San Francisco



## 3D Landmarks

Figure 29: A Landmark on a Map of San Francisco



Another related feature in the `Map` class is *3D landmarks*. By calling `setLandmarksVisible(true)`, you can make certain landmark structures visible. These structures are presented with textures and more details in their 3D geometry, as seen in the screenshot above. Landmarks are not visible when the map is set to a Hybrid or Satellite *map scheme*.

## Extruded Buildings

Figure 30: Extruded Buildings on a Map of San Francisco



HERE Android SDK supports 3D representations of buildings and structures. This feature is called extruded buildings, and you can display them by using the `setExtrudedBuildingsVisible()` method in `com.here.android.mpa.mapping.Map`. Extruded buildings are available for most metropolitan areas in North America and Europe.

### The MapBuildingLayer Class

The main entry point for extruded buildings is the `MapBuildingLayer` class, which can be retrieved by calling `getMapBuildingLayer()` from a `Map`. `MapBuildingLayer` provides methods for working with building groups and individual buildings such as:

- `getBuilding()`
- `createNewBuildingGroup()`
- `releaseBuildingGroup()`
- `getDefaultBuildingGroup()`

These APIs provide a way for the developer to create groups of buildings (for example, to highlight them in a blue color), or to retrieve a default group containing all possible extruded buildings on-screen.

**Note:** The extruded building methods are available even when buildings are invisible. For example, calling `getDefaultBuildingGroup()` returns the default group, even if you have called `setExtrudedBuildingsShown(false)` or if the current zoom level does not allow visible extruded buildings.

### The MapBuildingGroup Class

The `MapBuildingGroup` class represents a group of buildings. There are two types of groups:

- New building groups - Created by calling `createNewBuildingGroup()`. No building is attached to this group when it is created. An application can have a maximum of six new building groups at a time.
- Default building groups - Retrieved by calling `getDefaultBuildingGroup()`. The default building group is a generic group that represents all possible buildings in the entire world. There are two distinct

types of default building groups— `IMPORTANT_BUILDINGS`, which are textured landmark buildings, and `NORMAL_BUILDINGS`, which include all other buildings.

Each `MapBuildingGroup` holds an `EnumSet` of building faces, a color, as well as a building height scaling factor. To control the appearance of extruded buildings, you can set these attributes and add buildings to the group. For example, to highlight a building's roof, create a new building group, set the group's roof color to `Color.RED`, and then add a building to this group, as in the following code:

```
// retrieve a reference of the map from the map fragment
map = mapFragment.getMap();

// Create a custom building group
buildingGroup = map.getMapBuildingLayer().createNewBuildingGroup();

// Set the buildingGroup's roof color to "red"
buildingGroup.setColor(Color.RED, EnumSet.of(MapBuildingGroup.BuildingFace.ROOF));

// Set the buildingGroup's height
buildingGroup.setVerticalScale(0.90f);

buildingGroup.addBuilding(myBuildingIdentifier);
```

- Note:** Remember to call `releaseBuildingGroup()` to release any unused building groups. Otherwise, users may receive a null pointer exception after the device has been rotated a few times.

**Figure 31: Highlighting a Building**

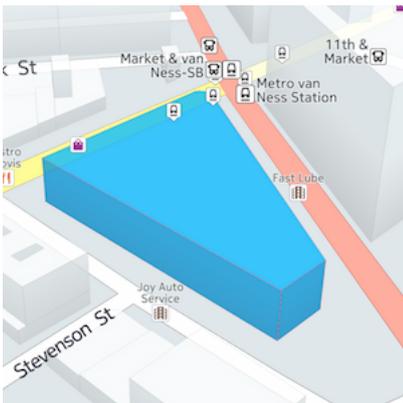


- Note:** By default, a new `MapBuildingGroup` has the color `MapBuildingLayer.DefaultBuildingColor.SELECTED` on all building faces.

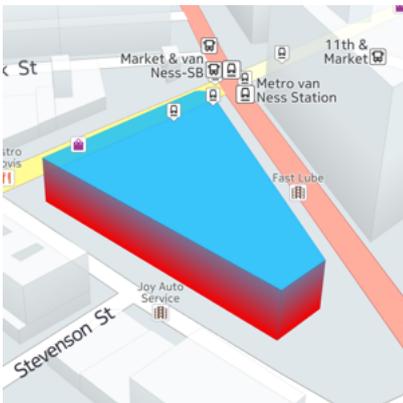
The following images show the values that can be used to highlight building faces:



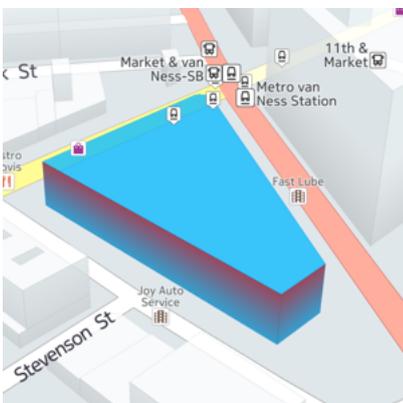
`MapBuildingGroup.BuildingFace.ROOF`



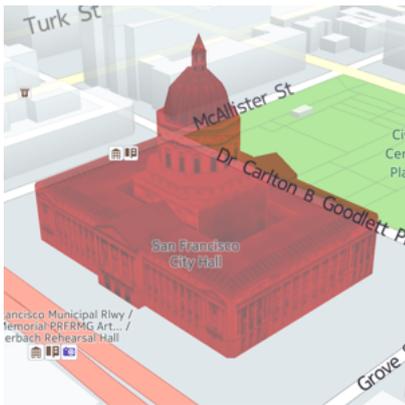
`MapBuildingGroup.BuildingFace.OUTLINE`



`MapBuildingGroup.BuildingFace.WALLBOTTOM`



`MapBuildingGroup.BuildingFace.WALLTOP`



`MapBuildingGroup.Builder.FACE.LANDMARKS` - Note that this value is only applicable for landmarks. When this value is used, the entire landmark is shaded.

## The MapBuildingObject Class

The `MapBuildingObject` class represents a single building, with the following attributes:

- a name
- a geocoordinate position
- the building height, in meters
- a unique map building identifier

To detect whether a user has tapped on an extruded building, use `MapGesture.OnGestureListener` and look for the selected `MapBuildingObject`:

```
private MapGesture.OnGestureListener gestureListener =
    new MapGesture.OnGestureListener.OnGestureListenerAdapter() {
        public boolean onMapObjectsSelected(List<ViewObject> objects) {
            for (ViewObject vo : objects) {
                if (vo instanceof MapBuildingObject) {
                    // Remove currently selected building
                    buildingGroup.removeAllBuildings();

                    // Add this building to the group.
                    MapBuildingObject building = (MapBuildingObject) vo;
                    buildingGroup.addBuilding(building.getIdentifier());
                }
            }
            return false;
        }
    };
```

## Custom Raster Tiles

You can use the HERE Android SDK to enhance maps with custom raster tiles. Custom raster tiles are tile images that you can add to a map to customize it with enhanced information. For example, you may wish to use this feature to add heat maps over a map of New York City. You can store custom raster tile images locally or on a remote server for users to access when they navigate in a map. If the application is set to display custom raster tiles, then tiles are displayed when users view a designated geographical area at a specified zoom level or range of zoom levels.

## Dividing a Map and Tile Lookup

To use your own custom raster tile images, you need to have a scheme for dividing your map according to the zoom level and map coordinates, and then provide map tiles according to this scheme. Your application must then use this scheme in the implementation of one of the following classes:

- `MapRasterTileSource` - Implement this class if you plan to fetch local tile images, create dynamic images, or if you would like to provide your own method of retrieving images from a remote server.
- `UrlMapRasterTileSourceBase` - This is a convenience child class of `MapRasterTileSource`. Implement this if you plan to fetch tile images from a remote server using a URL over HTTP.

 **Note:** Raster tiles can be one of the following supported image types:

- PNG
- JPEG
- BMP

Once a tile source has been implemented, you can toggle its display by adding or removing it to the map using `Map.addRasterTileSource(MapRasterTileSource)` or `Map.removeRasterTileSource(MapRasterTileSource)`.

## The MapRasterTileSource Abstract Class

`MapRasterTileSource` is the common way for you to define your raster tile source. If your application uses local tile images or remote images that require custom server authentication, then you should implement this class by defining the `hasTile()` and `getTileWithError()` methods. For example:

```
public class MyTileSource extends MapRasterTileSource {

    @Override
    public boolean hasTile(int x, int y, int zoomLevel) {
        return true;
    }

    @Override
    public TileResult getTileWithError(int x, int y, int zoomLevel) {
        byte[] myImageData = null;
        // perform tile retrieval logic such as server authentication
        // also translate the x, y, and zoomlevel to address an image

        TileResult result = new TileResult(Error.NONE, myImageData);
        return result;
    }
}
```

 **Note:** Ensure that `getTileWithError()` returns within a reasonable amount of time. If your operation takes a longer period of time, launch an asynchronous operation and return the `TileResult.Error.NOT_READY` error code while the operation is in progress.

## The UrlMapRasterTileSourceBase Abstract Class

`UrlMapRasterTileSourceBase` is a child abstract class of `MapRasterTileSource` that you can use if you plan to fetch tile images from a remote server using image URLs. The following is a sample implementation of `UrlMapRasterTileSourceBase`. In this example, we use the `MapRasterTileSource.MapTileSystemHelper.tileXYToQuadKey()` method to address our map tiles.

This helper method assumes that we are using a quadtree/quadkey scheme, where the map is divided into a quadtree (a tree data structure where each node has exactly four children) with 20 levels. Each level of this map quadtree has  $(2^x)^2$  tiles, where  $x$  represents the floor function value of the current zoom level. So for level 0, there is  $1 \times 1 = 1$  tile, level 1 has  $2 \times 2 = 4$  tiles, level 2 has  $4 \times 4 = 16$  tiles, and level 3.7 has  $8 \times 8 = 64$  tiles—since the floor value of 3.7 is 3.

For more information about the quadkey/quadtree division scheme, see the `tileXYToQuadKey()` API reference.

```
public class LiveMapRasterTileSource extends UrlMapRasterTileSourceBase {

    private final static String URL_FORMAT =
        "http://1.communitymaptiles.example.org/tilehub/live/map/png/%s";

    public LiveMapRasterTileSource() {
        // We want the tiles placed over everything else
        setOverlayType(MapOverlayType.FOREGROUND_OVERLAY);
        // We don't want the map visible beneath the tiles
        setTransparency(Transparency.OFF);
        // We don't want the tiles visible between these zoom levels
        hideAtZoomRange(12, 20);
        // Do not cache tiles
        setCachingEnabled(false);
    }

    // Implementation of UrlMapRasterTileSourceBase
    public String getUrl(int x, int y, int zoomLevel) {
        String url = null;

        // Utility to map the x, y coordinates easily into an equivalent
        // quadkey at a specified zoomLevel
        String quadKey =
            MapTileSystemHelper.tileXYToQuadKey(x, y, zoomLevel);

        try {
            // Append the quadkey to the URL template to get a real URL
            url = String.format(URL_FORMAT, quadKey);
        } catch (Exception ex) {
            ex.printStackTrace();
        }

        return url;
    }
}
```

The example above generates a quadkey from the  $x, y$  coordinates and the zoom level and appends it to the URL. However, this is server-specific and the method of converting  $x, y$  and zoom level to a URL can be done in many ways. Also, it is worth noting that tiles can be cached with `setCachingEnabled(true)`.

## Changing the Overlay Rendering Order

You can choose to customize the order that raster tiles are rendered by calling `MapRasterTileSource.setOverlayType(MapOverlayType)`. For example `MapOverlayType.BACKGROUND_OVERLAY` and `MapOverlayType.BACKGROUND_REPLACEMENT` are similar to rendering raster tiles with streets rendered on top. `MapOverlayType.FOREGROUND_OVERLAY` renders tiles on top of everything on the map.

## Caching Tiles

Tiles can be cached to the disk by calling the following:

```
// Give the tile source a custom prefix so it can be cached on the disk
MapRasterTileSource.setCachePrefix(String cache)

// Give each raster tile file an expiration time in seconds.
MapRasterTileSource.setCacheExpiration( int seconds )
```

If no expiration time is set, then the raster tiles remains on the device. We recommend that both a cache prefix and an expiration time be set.

## Mobile Asset Management

The Mobile Asset Management (MAM) features provide useful information for logistics companies to manage their fleet vehicles. You can enable features one at a time, or multiple at the same time, using `setFleetFeaturesVisible(EnumSet)`. `setFleetFeaturesVisible(EnumSet.noneOf(Map.FleetFeature.class))` disables all fleet features.

### Fleet Vehicle Map

The fleet vehicle map scheme is a scheme optimized for fleet management. These schemes can be used to show road networks, as well as truck toll and highway exits.

To display fleet maps, pick one of the following truck map schemes:

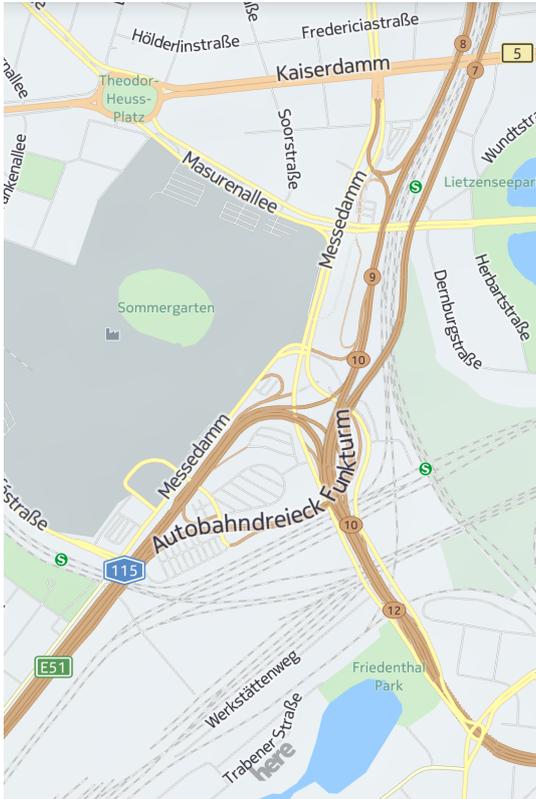
- TRUCK\_DAY
- TRUCK\_NIGHT
- TRUCK\_HYBRID\_DAY
- TRUCK\_HYBRID\_NIGHT

For example:

```
map.setMapScheme(Map.Scheme.TRUCK_DAY);
```

The screenshot below shows highways with truck toll highlighted in purple and highway exit signs in Berlin.

**Figure 32: Fleet Map of Berlin**



For information about other map schemes, see [Map Schemes](#) on page 30.

## Truck Restrictions

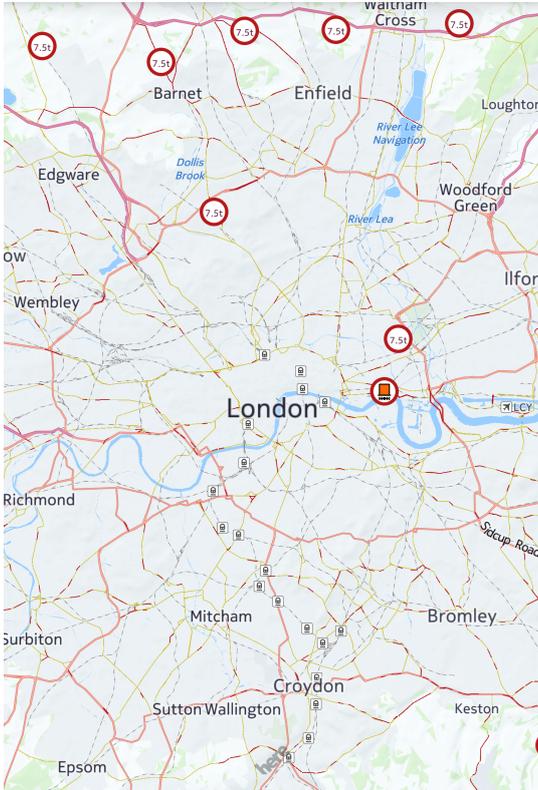
This fleet feature contains information about heavy vehicle route restrictions, such as height, weight, or environmental restrictions. For example, trucks carrying flammable materials may not travel on certain roads.

To display truck restrictions, add TRUCK\_RESTRICTIONS to your fleet features as follows:

```
map.setFleetFeaturesVisible(EnumSet.of(Map.FleetFeature.TRUCK_RESTRICTIONS));
```

The screenshot below shows truck restrictions in London.

**Figure 33: Truck Restrictions in London**



## Congestion and Environmental Zones

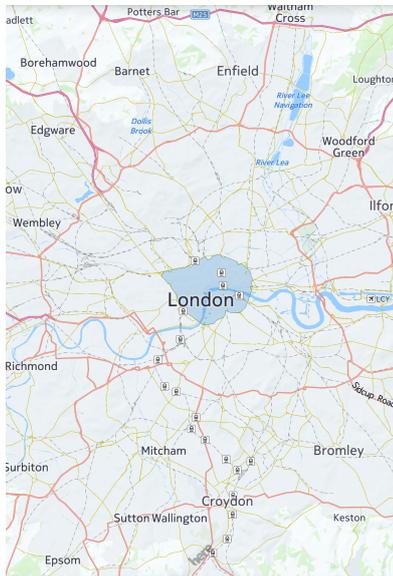
This fleet feature highlights congestion and environmental zones. Congestion zones are areas where certain classes of vehicles must pay a toll to enter. Environmental Zones areas only admit certain kinds of vehicles depending on their emissions class.

To display congestion and environmental zones, add CONGESTION\_ZONES and ENVIRONMENTAL\_ZONES to your fleet features:

```
EnumSet<Map.FleetFeature> features = map.getFleetFeaturesVisible();
features.add(Map.FleetFeature.CONGESTION_ZONES);
features.add(Map.FleetFeature.ENVIRONMENTAL_ZONES);
map.setFleetFeaturesVisible(features);
```

The screenshots below show congestion and environmental zones in London.

**Figure 34: London Congestion Zones**



**Figure 35: London Environmental Zones**



**Figure 36: London Congestion and Environmental Zones (with Truck Restrictions)**



## Fleet Connectivity

The Fleet Connectivity features allows applications that use the HERE Android SDK to receive job dispatches from a fleet dispatcher. Each job dispatch contains custom information, such as a geocoordinate to a destination, that can be used by your application for navigation or other purposes.

Your application, which is known as an *asset* in a fleet connectivity context, can also use this feature to indicate its job status to the dispatcher. These job statuses include whether it is available to receive a job, whether the job was accepted, and whether the job is finished.

- 📄 **Note:** The HERE Android SDK contains APIs for you to implement a fleet connectivity client. For instructions on how to use the fleet dispatcher features, see the Fleet Connectivity Extension Developer's Guide at [developer.here.com](https://developer.here.com).

### FleetConnectivityService

This singleton class holds information such as this fleet asset ID, the fleet dispatcher to connect to, the running job, and job event polling interval.

- 📄 **Note:** At a minimum, you must set the fleet asset and dispatcher IDs before starting the fleet connectivity service.

### FleetConnectivityEvent and FleetConnectivityService.Listener

You can set a `FleetConnectivityService.Listener` to the service to listen for dispatcher events. Dispatcher events are highly customizable, with the only mandatory information being a Job ID. Otherwise, you can define any type of information in its content payload, such as a set of geocoordinates, a Place ID, or an address string.

There are two methods that need to be implemented in `Listener`:

- `onMessageReceived(FleetConnectivityMessage)`
- `onEventAcknowledged(FleetConnectivityEvent, FleetConnectivityError)`

## Using the Fleet Connectivity Feature

The basic flow of how to use the Fleet Connectivity feature is as follows:

1. Start the fleet connectivity service and begin listening for fleet connectivity events.

```
FleetConnectivityService service = FleetConnectivityService.getInstance();
service.setDispatcherId("Driver-321");
service.setAssetId("Truck-987");
if (service.start()) {
    // service has started
} else {
    // service has failed to start
}
```

2. Implement Listener. Once a message is received, check if it is a dispatch job.

```
public void onMessageReceived(FleetConnectivityMessage message) {
    if (message.getMessage() != null) {
        // Display the optional message content
    }
    if (message instanceof FleetConnectivityJobMessage) {
        // This message represents a job

        FleetConnectivityJobMessage newDestinationMessage =
            (FleetConnectivityJobMessage) message;
        // Get job ID from newDestinationMessage.getJobId()
        // Get location (in your preferred format) from
        // newDestinationMessage.getMessage()
        // Get threshold from newDestinationMessage.getEtaThreshold()
        // (this threshold controls when ETA updates are sent back to dispatcher)
    } else if (message instanceof FleetConnectivityCustomMessage) {
        // This message does not represent a job

        FleetConnectivityCustomMessage customMessage =
            (FleetConnectivityCustomMessage) message;

        // Get job ID from customMessage.getJobId()
        // Get message from customMessage.getContent()
    }
}
```

3. Send an event to the dispatcher that the job has been accepted.

```
FleetConnectivityJobStartedEvent event =
    new FleetConnectivityJobStartedEvent();
// populate event.setJobId(String)
// populate event.setEtaThreshold(long)
if (FleetConnectivityService.getInstance().sendEvent(event)) {
    // job is running
    // for example, your application can begin navigating to the job destination
} else {
    // job has failed to start
}
```

Alternatively, you can also reject the the job by sending a rejection event.

```
FleetConnectivityJobRejectedEvent event =
    new FleetConnectivityJobRejectedEvent();
// populate event.setJobId(String)
```

```
if (!FleetConnectivityService.getInstance().sendEvent(event)) {
    // failed to reject job
}
```

4. While a job is in the accepted state, you can tell the dispatcher that the job is canceled.

```
FleetConnectivityJobCancelledEvent event = new FleetConnectivityJobCancelledEvent();
if (!FleetConnectivityService.getInstance().sendEvent(event)) {
    // failed to cancel job
}
```

5. Upon job completion, notify the server that the job is finished. For example, you can choose to send this event when your application has successfully finished the navigation session.

```
FleetConnectivityJobFinishedEvent event = new FleetConnectivityJobFinishedEvent();
if (!FleetConnectivityService.getInstance().sendEvent(event)) {
    // failed to mark job as finished
}
```

6. In the previous steps, after sending each event, your application receives an acknowledgment from the dispatching server through the `onEventAcknowledged(FleetConnectivityEvent, FleetConnectivityError)` callback.

```
public void onEventAcknowledged(FleetConnectivityEvent event, FleetConnectivityError error)
{
    if (event instanceof FleetConnectivityJobStartedEvent) {
        // the job start event is acknowledged
    } else if (event instanceof FleetConnectivityJobRejectedEvent) {
        // the job rejection event is acknowledged
    } else if (event instanceof FleetConnectivityJobFinishedEvent) {
        // the job completion event is acknowledged
    } else if (event instanceof FleetConnectivityJobCancelledEvent) {
        // the job cancellation event is acknowledged
    } else if (event instanceof FleetConnectivityCustomEvent) {
        // the custom event is acknowledged
    }
}
```

7. Stop the service by calling `FleetConnectivityService.getInstance().stop()`.

## Transit Information

Your application can use API calls from the HERE Android SDK to display transit information for users.

- **Note:** The transit map schemes (`NORMAL_DAY_TRANSIT`, `NORMAL_NIGHT_TRANSIT`, and `HYBRID_DAY_TRANSIT`) are specifically designed for displaying transit information. You can opt to use one of these schemes when your app displays transit information.

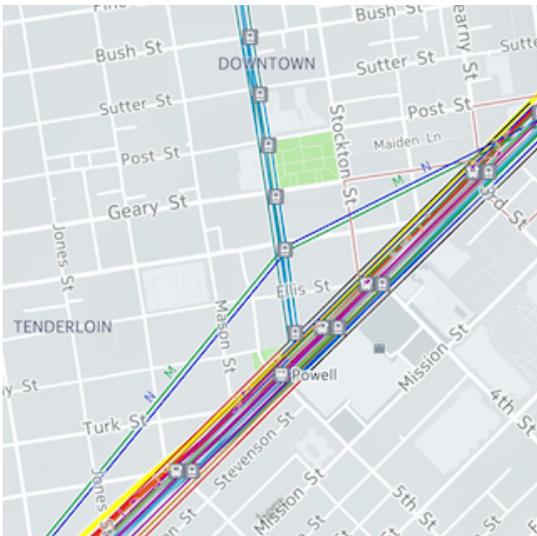
### MapTransitLayer

`MapTransitLayer` is a layer that displays the available transit data for a map area. To customize the transit layer, call `Map.getMapTransitLayer()` to access the methods available through the `MapTransitLayer` class. For example, to show all transit information available:

```
// Assumes map is instantiated
map.getMapTransitLayer().setMode(MapTransitLayer.Mode.EVERYTHING);
```

- **Note:** MapTransitLayer settings may be affected when you change map schemes. For example, changing the map scheme to NORMAL\_DAY\_TRANSIT enables the "everything" mode. It is recommended that map scheme changes occur before changes in the MapTransitLayer.

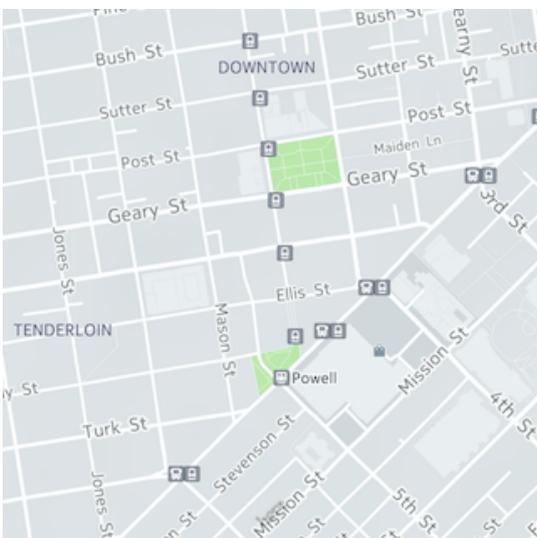
**Figure 37: MapTransitLayer set to show everything**



To show only transit stops and accesses call:

```
// Assumes map is instantiated
map.getMapTransitLayer().setMode(MapTransitLayer.Mode.STOPS_AND_ACCESES);
```

**Figure 38: MapTransitLayer set to show only transit stops and accesses**



To hide all transit information call:

```
// Assumes map is instantiated
map.getMapTransitLayer().setMode(MapTransitLayer.Mode.NOTHING);
```

## Highlighting Transit Objects

The following four types of transit data objects are available:

- Transit Stop data - represented by `TransitStopObject`
- Transit Line data - represented by `TransitLineObject`
- Transit Access data - represented by `TransitAccessObject`
- Transit Line Segment data - represented by `TransitLineSegmentObject`

Transit objects can be selected through tap gestures. For example, to highlight one or more `TransitLineObject`, you need to know the unique identifier of the line objects. Depending on the use case, there are several ways of getting a single or a list of `Identifier` objects:

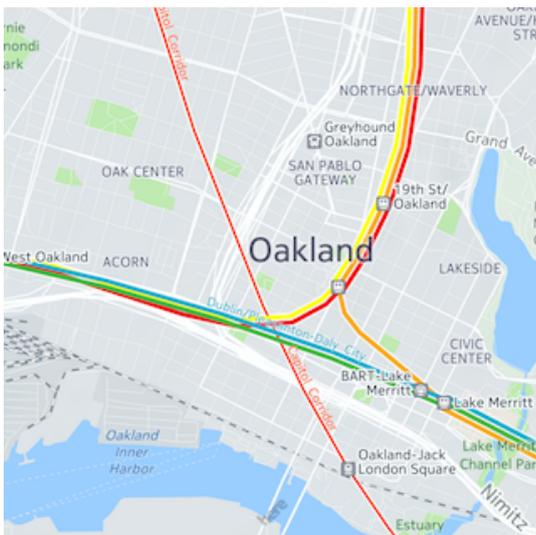
- Call `TransitLineObject.getLineId()` when a user has selected a `TransitLineObject` by tapping on it. It returns an `Identifier` of the selected transit line.
- Call `TransitStopObject.getTransitStopInfo().getLines()` when a user has selected a `TransitStopObject` via tapping. `getLines()` returns a list of `Identifier` of the lines connected to the selected transit stop.

For details of handling tappable `MapProxyObjects`, see [Handling MapProxyObject objects](#) on page 45.

With a single or a list of `Identifier` objects, you call the following API to highlight the lines:

```
// Assumes map is instantiated and identifierList is
// filled with a list of Identifiers
map.getMapTransitLayer().highlightTransitLines(identifierList);
```

**Figure 39: MapTransitLayer highlighting transit lines connected to the selected transit stop**



## TransitStopObject

A `TransitStopObject` is a type of `MapProxyObject` that contains information about a transit stop. The following figures show the different types of transit stops:

Figure 40: `TransitStopObject`: A metro station

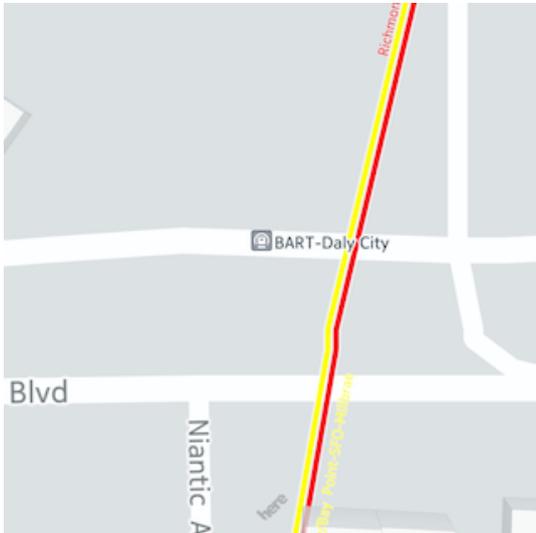
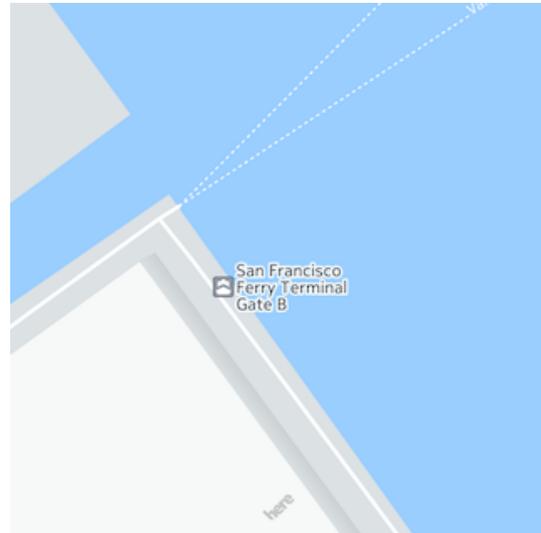


Figure 41: `TransitStopObject`: A ferry station



To acquire information about a tapped `TransitStopObject` (see [Handling MapProxyObject objects](#) on page 45) use `onMapObjectsSelected(List<ViewObject>)` as follows:

```
private MapGesture.OnGestureListener listener = new MapGesture.OnGestureListener() {
    ...
    @Override
    public boolean onMapObjectsSelected(List<ViewObject> objects) {
        for (ViewObject obj : objects) {
            if (obj.getBaseType() == ViewObject.Type.PROXY_OBJECT) {
                MapProxyObject proxyObj = (MapProxyObject) obj;
                if (proxyObj.getType() == MapProxyObject.Type.TRANSIT_STOP) {
                    TransitStopObject transitStopObj
                        = (TransitStopObject) proxyObj;
                    Log.d(TAG, "Found a TransitStopObject");
                    Log.d(TAG, "position is "
                        + transitStopObj.getCoordinate().toString());
                    TransitStopInfo transitStopInfo
                        = transitStopObj.getTransitStopInfo();
                    ...
                }
            }
        }
        return true;
    }
}
```

The `TransitStopObject` provides two methods for getting information about the transit stop:

- `getCoordinate()` gets the location coordinates of the transit stop.
- `getTransitStopInfo()` gets further information about the transit stop.

## TransitStopInfo

The `TransitStopInfo` class contains transit stop information that is accessed by calling one or more of the following methods

- `getOfficialName()` gets the official name of the transit stop
- `getInformalName()` gets the informal name of the transit stop
- `getId()` gets the `Identifier` of the transit stop
- `getTransitTypes()` gets the transit types this transit stop belongs to; there can be more than one.
- `getLines()` gets a list of `Identifier` objects for transit lines connected to this transit stop

Each `Identifier` is submitted to the `TransitDatabase` to get further information. For more details, see [TransitDatabase](#). Also they can be submitted to the `MapTransitLayer` to get highlighted on the map. (See [MapTransitLayer](#) on page 68)

An example of getting information about the first transit line connected to the transit stop is provided below. A `TransitDatabase.OnGetTransitInfoListener` needs to be implemented to receive the `TransitLineInfo`. (See [TransitLineInfo](#) on page 74)

An asynchronous request is submitted to the `TransitDatabase` along with the `OnGetTransitInfoListener`.

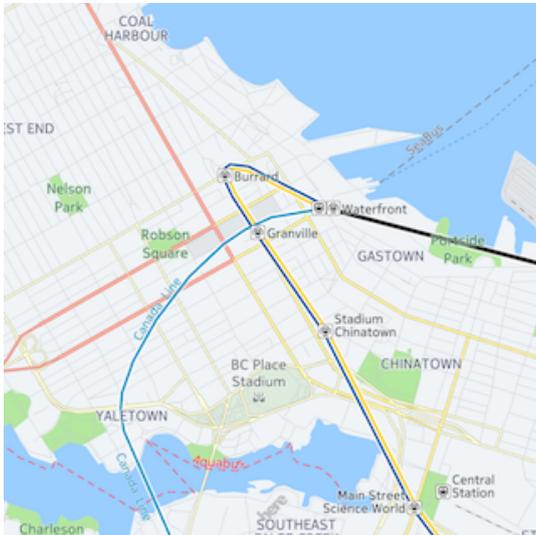
```
TransitDatabase.OnGetTransitInfoListener listener
= new TransitDatabase.OnGetTransitInfoListener() {
    .....
    @Override
    public void onTransitLineInfo(TransitLineInfo info) {
        .....
    }
}

// transitStopInfo is a TransitStopInfo object
.....
mTransitDatabase.getLineInfo(transitStopInfo.getLines().get(0), listener);
```

## TransitLineObject

A `TransitLineObject` is a type of `MapProxyObject` that contains information about a transit line. The following figure shows examples of different types of transit lines:

**Figure 42: Three types of transit lines: Metro, Train and Water**



To acquire information about a tapped `TransitLineObject` (see [Handling MapProxyObject objects](#) on page 45) use `onMapObjectsSelected(List<ViewObject>)` as illustrated in the following code:

```
private MapGesture.OnGestureListener listener = new MapGesture.OnGestureListener() {
    ...
    @Override
    public boolean onMapObjectsSelected(List<ViewObject> objects) {
        for (ViewObject obj : objects) {
            if (obj.getBaseType() == ViewObject.Type.PROXY_OBJECT) {
                MapProxyObject proxyObj = (MapProxyObject) obj;
                if (proxyObj.getType() == MapProxyObject.Type.TRANSIT_LINE) {
                    TransitLineObject transitLineObj
                        = (TransitLineObject) proxyObj;
                    Log.d(TAG, "Found a TransitLineObject");
                    Log.d(TAG, "Id is "
                        + transitLineObj.getLineId().toString());
                    mTransitDatabase.getLineInfo(m_lineIdList.get(0),
                        mOnGetTransitInfoListener);
                }
            }
        }
        return true;
    }
}
```

The `TransitLineObject` provides a single method for getting the `Identifier` of the transit line. This `Identifier` can be submitted to the `MapTransitLayer` to get highlighted on the map. (For more information, refer to [MapTransitLayer](#))

As shown in the example above, the `Identifier` can also be submitted to the `TransitDatabase` (see [TransitDatabase](#)) along with the `OnGetTransitInfoListener` to get more information about the transit

line.mOnGetTransitInfoListener is implemented to receive the TransitLineInfo object from the TransitDatabase.

```
TransitDatabase.OnGetTransitInfoListener mOnGetTransitInfoListener
= new TransitDatabase.OnGetTransitInfoListener() {
    ...
    @Override
    public void onTransitLineInfo(TransitLineInfo info) {
        ...
    }
}
```

## TransitLineInfo

The TransitLineInfo class contains transit line information that is accessed by calling one or more of the following methods:

- getOfficialName() gets the official name of the transit line
- getInformalName() gets the informal name of the transit line
- getShortName() gets the short name of the transit line
- getTransitType() gets the transit types this transit line belongs to.

## TransitAccessObject

A TransitAccessObject is a type of MapProxyObject that contains information about a transit access. A transit access is an entrance/exit to a transit stop. There can be multiple transit accesses to a transit stop.

Transit access is presented as a smaller transit stop with a downward triangle attached to the bottom and is visible only in higher zoom levels. The icons presenting the transit stops and access vary between different countries and companies. The following figures show two examples:

Figure 43: Transit Stop and Access: Metro Station with Single Access

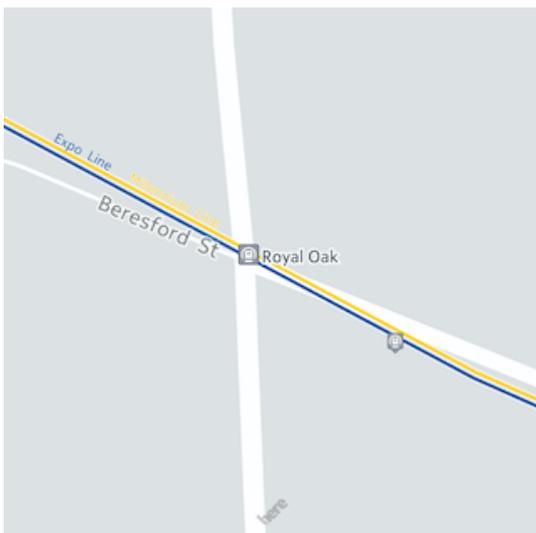
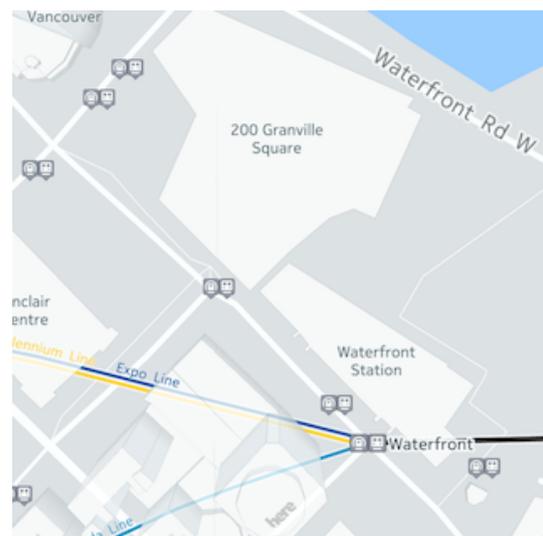


Figure 44: Transit Stop and Access: Metro Station with Multiple Accesses



To acquire information about a tapped `TransitAccessObject` (see [Handling MapProxyObject objects](#) on page 45) use `onMapObjectsSelected(List<ViewObject>)` as in the following code:

```
private MapGesture.OnGestureListener listener = new MapGesture.OnGestureListener() {
    ...
    @Override
    public boolean onMapObjectsSelected(List<ViewObject> objects) {
        for (ViewObject obj : objects) {
            if (obj.getBaseType() == ViewObject.Type.PROXY_OBJECT) {
                MapProxyObject proxyObj = (MapProxyObject) obj;
                if (proxyObj.getType() == MapProxyObject.Type.TRANSIT_ACCESS) {
                    TransitAccessObject transitAccessObj
                        = (TransitAccessObject) proxyObj;
                    Log.d(TAG, "position is " +
                        transitAccessObj.getCoordinate().toString());
                    TransitAccessInfo transitAccessInfo
                        = transitAccessObj.getTransitAccessInfo();
                    ...

                    break;
                }
            }
        }
        return true;
    }
}
```

The `TransitAccessObject` provides two methods for getting information about the transit access:

- `getCoordinate()` gets the location coordinates of the transit access.
- `getTransitAccessInfo()` gets further information about the transit access.

### TransitAccessInfo

The `TransitAccessInfo` class contains transit access information that can be accessed by calling one or more of the following methods

- `getTransitTypes()` gets the transit types this transit access belongs to; there can be more than one.
- `getStopId()` gets a unique Identifier of the transit stop that this transit access leads to.

In the next example, the unique identifier of the transit stop is submitted to the `TransitDatabase` to get further information. For more details, see [TransitDatabase](#).

```
// transitAccessInfo is a TransitAccessInfo object
Log.d(TAG, "transit type is " +
    transitAccessInfo.getTransitTypes().toString());
Log.d(TAG, "Stop Id is " +
    transitAccessInfo.getStopId().toString());
mTransitDatabase.getStopInfo(transitAccessInfo
    .getStopId(), mOnGetTransitInfoListener);
```

An example of getting information about the destination transit stop of a transit access is provided below. An `OnGetTransitInfoListener` needs to be implemented to receive the `TransitStopInfo` object. An asynchronous request is submitted to the `TransitDatabase` along the `OnGetTransitInfoListener`. For more information, see [TransitStopInfo](#).

```
TransitDatabase.OnGetTransitInfoListener mOnGetTransitInfoListener
= new TransitDatabase.OnGetTransitInfoListener(){
    .....
}
```

```
@Override
public void onTransitStopInfo(TransitStopInfo info) {
    .....
}
}
```

```
// transitAccessInfo is a TransitAccessInfo object
.....
mTransitDatabase.getStopInfo(transitAccessInfo.getStopId(),
    mOnGetTransitInfoListener);
```

## TransitSystemInfo

The `TransitSystemInfo` class contains information about a public transit system that can be accessed by calling one or more of the following methods:

- `getSystemOfficialName()` - gets the official name of the transit system
- `getSystemWebsiteUrl()` - gets the website URL of the transit system
- `getCompanyOfficialName()` - gets the official transit system company name
- `getCompanyWebsiteUrl()` - gets the website URL of the transit system company
- `getCompanyRoutePlannerUrl()` - gets the route planner URL of the transit system company
- `getCompanyScheduleUrl()` - gets the schedule url of the transit system company
- `getCompanyPhone()` - gets the phone number for the transit system company
- `getBicycleHours()` - gets the transit system's bicycle parking hours
- `getSystemLogo()` - gets the system logo (if present)
- `getCompanyLogo()` - gets the companyLogo (if presents)

An example of retrieving transit system information is provided below. In this example, an `OnGetTransitInfoListener` is implemented to receive the `TransitSystemInfo` object. For more information, see the [TransitDatabase](#) section.

```
TransitDatabase.OnGetTransitInfoListener mOnGetTransitInfoListener =
new TransitDatabase.OnGetTransitInfoListener() {
    ...
    @Override
    public void onTransitSystemInfo(TransitSystemInfo systemInfo) {
        String officialName = systemInfo.getSystemOfficialName();
    }
    ...
}
```

```
// transitLineInfo is a TransitLineInfo object
mTransitDatabase.getSystemInfo(transitLineInfo.getSystemId(),
    mOnGetTransitInfoListener);
```

## TransitDatabase

The `TransitDatabase` class is responsible for querying transit information of various types using a unique Identifier, with a `OnGetTransitInfoListener` for monitoring query results and triggering appropriate callback methods upon completion. Applications can call the `TransitDatabase` constructor to activate a `TransitDatabase` for querying transit information.

The `OnGetTransitInfoListener` interface can be used to monitor query results of the `TransitDatabase`. It must be implemented within the application and submitted as part of the asynchronous query request.

```
TransitDatabase.OnGetTransitInfoListener mOnGetTransitInfoListener
= new TransitDatabase.OnGetTransitInfoListener() {

    @Override
    public void onTransitLineInfo(TransitLineInfo info) {
        //...
    }

    @Override
    public void onTransitStopInfo(TransitStopInfo info) {
        //...
    }

    @Override
    public void onTransitAccessInfo(TransitAccessInfo info) {
        //...
    }

    @Override
    public void onTransitSystemInfo(TransitSystemInfo info) {
        //...
    }

    @Override
    public void onEnd(TransitDatabase.Error error) {
        //...
    }
};
```

The `OnGetTransitInfoListener` class provides five callbacks:

- `onTransitLineInfo` provides a `TransitLineInfo` object. (See [TransitLineInfo](#) on page 74)
- `onTransitStopInfo` provides a `TransitStopInfo` object. (See [TransitStopInfo](#) on page 72)
- `onTransitAccessInfo` provides a `TransitAccessInfo` object. (See [TransitAccessInfo](#) on page 75)
- `onTransitSystemInfo` provides a `TransitSystemInfo` object. (See [TransitSystemInfo](#) on page 76)
- `onEnd` is a callback that signifies the asynchronous query request has completed.

**Note:** `TransitDatabase` rejects all subsequent requests unless it has completed the current request. If the `TransitDatabase` is busy, `INVALID_OPERATION` is returned.

An asynchronous request is submitted to the `TransitDatabase` along with the `OnGetTransitInfoListener`. Note that the `TransitDatabase` instance is created by calling the `TransitDatabase` constructor.

The following lists the main use cases of the `TransitDatabase`:

- `getLineInfo()` - Pass in `TransitLineObject.getLineId()` when a user has selected a `TransitLineObject` by tapping on it. This method returns an `Identifier` of a selected transit line.

```
// transitLineObject is a TransitLineObject object
.....
mTransitDatabase.getLineInfo(transitLineObject
    .getLineId(), mOnGetTransitInfoListener);
```

- `getLineInfo()` - Pass in `TransitStopObject.getTransitStopInfo().getLines()` when a user has selected a `TransitStopObject` by tapping on it. This method returns a list of `Identifiers` for the lines connected to the selected transit stop.

```
// transitStopInfo is a TransitStopInfo object
.....
// Requesting transit line info of the first identifier on the list.
mTransitDatabase.getLineInfo(transitStopInfo
    .getLines().get(0), mOnGetTransitInfoListener);
```

- `getStopInfo()` - Pass in `TransitAccessInfo.getStopId()` when a user has selected a `TransitAccessObject` by tapping on it. This method returns an `Identifier` of the stop that the transit access leads to.

```
// transitAccessInfo is a TransitAccessInfo object
.....
mTransitDatabase.getStopInfo(transitAccessInfo
    .getStopId(), mOnGetTransitInfoListener);
```

## Transit-related enumerations

- The `TransitType` enum - represents values describing different transit types, such as `BUS_PUBLIC`, `RAIL_METRO` or `TRAIN_REGIONAL`.
- The `TransitDatabase.Error` enum - represents values describing possible transit database errors, such as `NONE` or `INVALID_PARAMETERS`

## Map Customization

Whether you want to optimize your map for a certain display size, use case, branding, or highlight objects which are important to your users, the HERE SDK map customization feature allows a high degree of customization freedom so that you can achieve fine control of your map view's rendering characteristics.

This section presents the components and concepts which you need to create your own map look-and-feel.

### Map Schemes

Map customization starts by using one of the predefined schemes (such as "Normal Day" and "Normal Night") to serve as a starting point. These predefined schemes are not customizable themselves, but provide the initial values that a custom scheme derives from.

The following screenshots show examples of pre-defined schemes available in HERE SDK.

Figure 45: Normal Day scheme



Figure 46: Normal Night scheme



To customize the map, the first step is to obtain a Customizable Scheme object from the map view. With this object, you can then set properties to modify the map. You can change color, icon size, width, length, and other properties of almost all map objects such as buildings, land features, and roads. Whether property changes are visible depends on if the map you are customizing is currently at the affected zoom level, and the map scheme is active.

**Note:** A custom scheme is not permanently saved, but it lives as long as the map view object is in memory.

## Creating Your First Map Scheme Customization

After you decide on which scheme to base on, create a Customizable Scheme object with the map view method:

```
CustomizableScheme scheme = map.createCustomizableScheme("newCustomScheme", Map.Scheme.NORMAL_DAY);
```

After creating the customizable scheme, you can retrieve it again with the following method, as long as the map view object was not destroyed. Customizable Schemes are created and valid only to the specific Map View from which was obtained:

```
CustomizableScheme scheme = map.getCustomizableScheme("newCustomScheme");
```

You can then get map attributes for a particular zoom level. To set attributes, specify a zoom range. A helper `ZoomRange` class is provided, which takes a minimum and maximum zoom level value.

```
ZoomRange range = new ZoomRange (0, 20);
```

The HERE SDK has a class called `CustomizableVariables` which list all the attributes that the HERE SDK supports for customization.

Note that in the `CustomizableVariables` class, map attributes are wrapped in their respective types to identify their type. For example, `CustomizableVariables.CountryBoundary.WIDTH` is of `SchemeFloatProperty` type which means that it is holding float value. The same applies for the others.

The SDK provides following helper classes to handle the different types of properties:

- `CustomizableColorProperty` - specify color type (In Android, Color is represented as ARGB integer color value)
- `SchemeFloatProperty` - specify float type
- `CustomizableIntegerProperty` - specify int type

To change map attributes for color, float, and integer types, perform the following:

```
// change 0M water color
CustomizableScheme.ErrorCode errorCode =
scheme.setVariableValue(CustomizableVariables.Water.COLOR_0M, Color.RED, range);
// get water color for zoom level 10
int waterColor0M = scheme.getVariableValue(CustomizableVariables.Water.COLOR_0M, 10.0f);

// change 3d landmark
CustomizableScheme.ErrorCode errorCode =
scheme.setVariableValue(CustomizableVariables.Landmark3d.ALPHA, 1, range);
// get 3d landmark for zoom level 10
int waterColor0M = scheme.getVariableValue(CustomizableVariables.Landmark3d.ALPHA, 10.0f);

// change CountryBoundary WIDTH
```

```
CustomizableScheme.ErrorCode errorCode =
scheme.setVariableValue(CustomizableVariables.CountryBoundary.WIDTH, 2.0f, range);
// get CountryBoundary WIDTH for zoom level 10
float countryBoundaryWidth = scheme.getVariableValue(CustomizableVariables.CountryBoundary.WIDTH,
10.0f);
```

After customizing, you should activate your scheme by calling one of following methods:

```
Map.setMapScheme(CustomizableScheme customizableScheme);
```

or

```
Map.setMapScheme(String scheme)
```

- **Note:** You can customize the current activated custom scheme, but changes are not automatically applied. Remember to call one of the above methods to refresh the map scheme.

The following is a more complete example:

```
// create a new scheme
CustomizableScheme scheme = map.createCustomizableScheme("newCustomScheme", Map.Scheme.NORMAL_DAY);

// change water color 0m
int lightYellow = Color.argb(0, 255,255,224);
CustomizableScheme.ErrorCode err = scheme.setVariableValue(CustomizableVariables.Water.COLOR_0M,
lightYellow , range);
Log.i(TAG, "Error: " + err);

// change water color 3000m
err = scheme.setVariableValue(CustomizableVariables.Water.COLOR_3000M, Color.YELLOW, range);
Log.i(TAG, "Error: " + err);

// activate scheme
```

```
map.setMapScheme(scheme);
```

Figure 47: Example Output



## Positioning

HERE Android SDK positioning interface allows applications to choose from two different location information sources:

- Basic Positioning is described in [Basic Positioning](#) on page 81 and provides a simple interface to the location information provided by the Android platform. This location source is always at the developer's disposal regardless of the HERE Android SDK license.
- Advanced Positioning by HERE is described in [Advanced Positioning by HERE](#) on page 85. Advanced positioning is accessed via the same interface as the Basic Positioning, but the underlying location source is HERE Positioning that provides developers, amongst other things, advanced offline network positioning as well as indoor positioning.

**Note:** To use HERE Positioning, one or more HERE Positioning features needs to be enabled in the HERE Android SDK license.

## Basic Positioning

The HERE Android SDK provides the following interfaces for users to retrieve location updates and to display their current location on a map:

- `PositioningManager`
- `OnPositionChangeListener`

- PositionIndicator

**Note:** The Android permission `android.permission.ACCESS_FINE_LOCATION` is required when your app calls `PositioningManager.start(LocationMethod)`. Otherwise, the method returns `false`. In addition, to ensure that the app receives location updates, the user needs to have the Location permission enabled (toggled to "on") during runtime.

## PositioningManager Class

A `PositioningManager` class provides information related to the device's geographical location, like the current position and the average speed. Applications can register to receive position updates using one of the positioning mechanisms described in the `LocationMethod`:

- GPS - positioning using the real GPS available on the device.
- GPS\_NETWORK - positioning is provided using a wireless network or the real GPS available on the device
- NETWORK - positioning using a wireless network.

**Note:** See [Advanced Positioning by HERE](#) on page 85 for more information about additional Location Method types.

The current status of a particular location method is represented by the `LocationStatus` value returned from the `PositioningManager.getLocationStatus(LocationMethod)` method.

`PositioningManager` can be accessed by calling `PositioningManager.getInstance()`.

An application can start receiving real time positioning updates by calling

`PositioningManager.start(LocationMethod)` with one of the location methods listed above

and can stop the positioning updates by calling `PositioningManager.stop()`. While position

updates are being received, an application can retrieve the current position of the client device via the

`PositioningManager.getPosition()` method.

## OnPositionChangeListener Interface

In addition to the `PositioningManager`'s `getPosition()` method, applications can subscribe to position update notifications from the `PositioningManager` through the `PositioningManager.OnPositionChangeListener` interface. To add or remove `OnPositionChangeListener`, applications can use the following methods:

```
PositioningManager.addListener(WeakReference<OnPositionChangeListener>)
```

```
PositioningManager.removeListener(OnPositionChangeListener)
```

The positioning manager enhances your application with the current position of the user's device. The registration of the positioning listener should be performed after the `MapFragment`, `MapView`, or `MapEngine` is initialized as described in the following code snippet.

```
// Define positioning listener
private OnPositionChangeListener positionListener = new
    OnPositionChangeListener() {

    public void onPositionUpdated(LocationMethod method,
        GeoPosition position, boolean isMapMatched) {
        // set the center only when the app is in the foreground
        // to reduce CPU consumption
        if (!paused) {
            map.setCenter(position.getCoordinate(),
                Map.Animation.NONE);
        }
    }
}
```

```

    }
}

public void onPositionFixChanged(LocationMethod method,
    LocationStatus status) {
}
};

// Register positioning listener
PositioningManager.getInstance().addListener(
    new WeakReference<OnPositionChangeListener>(positionListener));
...

```

In order to avoid unnecessary position updates while the activity is in the background, you need to start or stop the `PositioningManager` within your activity's `onResume()` and `onPause()` methods.

```

// Set this to PositioningManager.getInstance() upon Engine Initialization
private PositioningManager posManager;
...

// Resume positioning listener on wake up
public void onResume() {
    super.onResume();
    paused = false;
    if (posManager != null) {
        posManager.start(
            PositioningManager.LocationMethod.GPS_NETWORK);
    }
}

// To pause positioning listener
public void onPause() {
    if (posManager != null) {
        posManager.stop();
    }
    super.onPause();
    paused = true;
}

// To remove the positioning listener
public void onDestroy() {
    if (posManager != null) {
        // Cleanup
        posManager.removeListener(
            positionListener);
    }
    map = null;
    super.onDestroy();
}

```

## PositionIndicator Class

`PositionIndicator` is a special map marker object that allows the current client device position to be shown on a map. Every HERE SDK `Map` object has an integrated position indicator, set to invisible, by default. The indicator can be retrieved and set to visible by calling `MapFragments.getPositionIndicator()` and `PositionIndicator.setVisible()`, as follows:

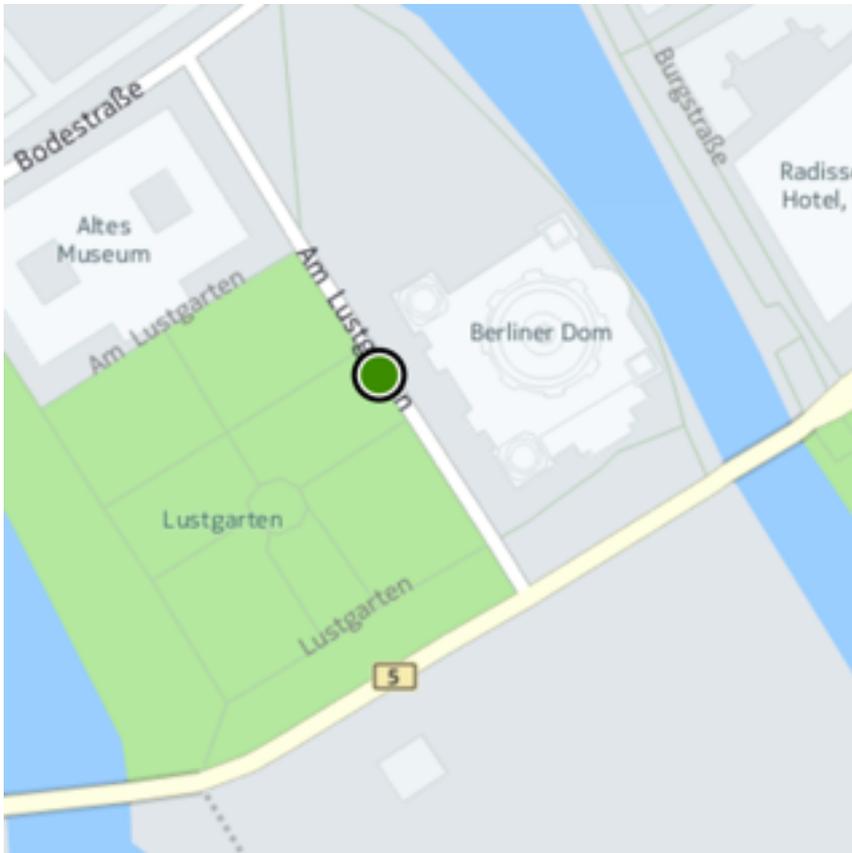
```

// Display position indicator
mapFragment.getPositionIndicator().setVisible(true);

```

By default, the position indicator is rendered as a marker surrounded by a circle, the diameter of which illustrates the accuracy of the indicated position. You can change this marker by calling `PositionIndicator.setMarker(Image)`.

**Figure 48: A PositionIndicator**



- **Note:** For the position indicator to stay in the center of the map and illustrate real-time updates of the device's position, it is necessary to update the map's center whenever a new location update is received.
- **Note:** `PositionIndicator` only works if the application has started the `PositioningManager`.

## Position Simulation and Creating Position Logs

You can use `PositionSimulator` to simulate device position by injecting locations into the Android `LocationManager`. Locations are read from GPX log files. After calling `PositionSimulator.startPlayback(String)`, the positions in the log file are processed until the end of the log is reached or `stopPlayback()` is called.

You can also use the HERE SDK to create the GPX logs that can be replayed by `PositionSimulator`. To do this, call `setLogType(EnumSet<LogType>)` in `PositioningManager` to include `LogType.DATA_SOURCE`. GPX logs are written to a "gpx" sub-directory of your application's data directory – for example, `"/sdcard/Android/data/com.companyName.appName/files/gpx/`. To disable logging, call `setLogType(EnumSet.noneOf(LogType.class))`.

- **Note:** This feature is only intended for debugging purposes. Do not use Position Logging in a production application.
- **Note:** `PositionSimulator` does not support indoor positioning.

## Advanced Positioning by HERE

In addition to the basic platform positioning, HERE Android SDK provides advanced HERE Positioning with the following key features:

- Cellular network positioning in GSM, CDMA, WCDMA, TD-SCDMA and LTE networks
- Wifi network positioning
- High accuracy indoor positioning with building and floor detection using wifi and Bluetooth radios
- Automatic, on-demand download of radio positioning data for positioning without network connection (offline)
  - 📄 **Note:** Offline functionality is not supported for CDMA positioning.
- Automatic positioning method switching between satellite-based (GNSS), wifi, Bluetooth, and cellular network positioning, providing the best possible position information using the available methods.
- HERE Indoor Positioning supports both private and public data. You can have a private venue that is mapped through HERE [Private Venues](#) on page 174 or your own custom indoor map, with the indoor location information being only available for your applications. In contrast, indoor location information for public venues is available for all HERE SDK users with an appropriate license.
- Global positioning coverage and data hosting infrastructure for the optimal availability, reliability, and user experience.

### HERE Positioning Feature Groups

HERE Positioning is split into features groups. Depending on your business plan, you may have access to one or more of the following:

- **Online Positioning**

This feature group provides *online* positioning by sending anonymous network measurements (cellular and wifi) to the HERE Positioning servers to resolve the device location based on the provided measurements. Online positioning offers limited *offline* positioning capabilities through caching: measurements and resolved positions are stored into a local cache from which they can be later used without network connection.

- **Offline Positioning**

This feature group provides *offline* network positioning (cellular and wifi) by utilizing downloaded positioning assistance data, i.e. *radiomaps*, for the position estimation within the device. In this context *offline* means that network connectivity is only required for the radiomap download after which no connectivity is needed unless further radiomap tiles are needed. This may happen due to the device movement or radiomap expiration.

Radiomap download is handled by the *on-demand downloader*, which automatically downloads radiomap tiles in the vicinity of the device. The downloader also handles the maintenance of the radiomaps in the device by updating the radiomap tiles at regular intervals as needed, and by removing the oldest radiomap tiles in case the storage consumed by the radiomap tiles exceed the quota. This quota is defined per technology and is configured as specified in the table below. The table also defines, how often the HERE Android SDK attempts to update the radiomaps.

- **Public Indoor**

This feature group provides high accuracy indoor positioning for *public* venues from which indoor radio data (wifi or Bluetooth) has been collected using the HERE Indoor Radio Mapper tool. The feature uses HERE Indoor Positioning community radiomaps that are accessible by all HERE Android SDK users having access to this feature. Further details can be found in the HERE Indoor Positioning Installation Guide.

Similarly to **Offline Positioning**, HERE Public Indoor Positioning works in offline mode. The storage quota and the radiomap tile update interval is specified in the table below.

- **Private Indoor**

This feature group provides high accuracy indoor positioning for *private* venues from which indoor radio data (wifi or Bluetooth) has been collected using the HERE Indoor Radio Mapper tool. In contrast to the **Public Indoor** feature, the **Private Indoor** feature provides indoor positioning capability that is accessible only by the owner of the radiomap. Further details can be found in the HERE Indoor Positioning Installation Guide.

Similarly to the **Offline Positioning**, also HERE Private Indoor Positioning works in the offline mode. The storage quota and the radiomap tile update interval is specified in the table below.

**Table 1: Maximum Storage Consumption and Update Interval Per Technology**

Technology	Quota	Update interval	Description
Offline cellular	32MB	23 days	Radiomaps for cellular network positioning (all network technologies).
Offline wifi	32MB	23 days	Radiomaps for wifi network positioning.
Indoor wifi and Bluetooth	32MB	7 days	Radiomaps (private and community) for high accuracy indoor wifi and Bluetooth positioning.

## Using HERE Positioning

To start using HERE Positioning in the Android applications, complete the following steps:

1. Embed the HERE Positioning service in your application
2. Add the required Android permissions to your application
3. Set the positioning data source to HERE Positioning and start the Positioning Manager
4. Receive and handle location updates

In detail, the following actions need to be taken:

### 1) Embedding the HERE Positioning service

To embed the HERE Positioning service, add the following lines to the `<application></application>` section in `AndroidManifest.xml`:

```
<!-- HERE Positioning Service definition. -->
<service
    android:name="com.here.services.internal.LocationService"
    android:enabled="true"
    android:exported="false"
    android:process=":remote">
</service>
```

### 2) Add the Android permissions to your application

Add the following permissions to `AndroidManifest.xml`:

```
<uses-permission android:name="android.permission.ACCESS_COARSE_LOCATION" />
<uses-permission android:name="android.permission.BLUETOOTH" />
<uses-permission android:name="android.permission.BLUETOOTH_ADMIN"/>
<uses-permission android:name="android.permission.CHANGE_NETWORK_STATE" />
<uses-permission android:name="android.permission.CHANGE_WIFI_STATE" />
<uses-permission android:name="android.permission.READ_PHONE_STATE" android:maxSdkVersion="22" />
<uses-permission android:name="android.permission.WAKE_LOCK" />
```

- **Note:** If your application uses Android target SDK version level 23 or above, you must add code to request permissions at runtime. For more detailed instructions and example code, see [Requesting Android Permissions](#) on page 210.

### 3) Change the positioning data source and start `PositioningManager`

After completing the previous configuration steps, change the Positioning Manager data source to HERE Positioning and start the Positioning Manager with the suitable location method to start receiving HERE Positioning location updates:

```
m_hereDataSource = LocationDataSourceHERE.getInstance();
if (m_hereDataSource != null) {
    PositioningManager pm = PositioningManager.getInstance();

    pm.setDataSource(m_hereDataSource);
    pm.addListener(new WeakReference<PositioningManager.OnPositionChangedListener>(this));
    if (pm.start(PositioningManager.LocationMethod.GPS_NETWORK_INDOOR)) {
        // Position updates started successfully.
    }
}
```

For detailed description of the location methods available for the HERE Positioning location data source, please see the section [Location Methods](#) on page 88.

■ **Note:**

- `LocationDataSourceHERE.getInstance()` cannot be instantiated if no HERE Positioning features are enabled in the SDK license.
- You cannot start `PositioningManager` with a location method containing indoor positioning without first setting location data source to HERE
- You can only start `PositioningManager` with a location method that is enabled by your business plan.
- When using a location method containing indoor positioning, the *indoor positioning mode* can be controlled. Please see the section [Indoor Positioning Mode](#) on page 89 below for further information.

### 4) Receive and handle location updates

The location updates are handled by `onPositionUpdated()` (when the device location changes) and `onPositionFixChanged()` (when location method changes) methods from `OnPositionChangedListener`:

```
@Override public void onPositionUpdated(final PositioningManager.LocationMethod locationMethod,
    final GeoPosition geoPosition, final boolean mapMatched) {
    // new position update received
}

@Override public void onPositionFixChanged(PositioningManager.LocationMethod locationMethod,
    PositioningManager.LocationStatus locationStatus) {
    // positioning method changed
```

}

#### Note:

- `PositioningManager.OnPositionChangedListener` represents an interface for the position update listeners.
- `GeoPosition` carries `GeoCoordinate` that contains the device WGS84 Latitude/Longitude coordinates and altitude with double precision. In addition, `GeoPosition` carries location uncertainty estimate as well as speed and heading information.
- For indoor positioning, `GeoPosition` carries building information (building name and building ID) as well as floor level information.

## Location Methods

The *Location methods* refers to the set of technologies used in the location determination. HERE Positioning supports a plethora of location methods. The following table introduces the location methods that the `PositioningManager` can be started with, when the location data source is `LocationDataSourceHERE`.

Table 2: Supported Location Methods

Method	Description
GPS	Uses the satellite-based positioning (GNSS) as provided by the Android platform.
NETWORK	Uses the <i>online</i> or <i>offline</i> wifi or cellular network positioning methods, depending upon the device capabilities, always selecting the best radio technology for location estimation.
INDOOR	Uses either wifi or Bluetooth radio to provide indoor location estimates, with building and floor information, always selecting the best radio technology in case both are available.
GPS_NETWORK	Uses satellite-based positioning and network positioning, always selecting the best technology for optimal location estimation.
GPS_NETWORK_INDOOR	Uses satellite-based positioning, network positioning and indoor positioning, always selecting the best technology for optimal location estimation.

## Pre-downloading radiomaps to the device

The `RadioMapLoader` interface provides a mechanism to pre-download radiomaps surrounding a specified center point to the device. Having pre-downloaded radiomaps to the device, the device can be located without data connectivity. In addition to the center point, the interface needs to be provided with the type of the radiomap to be downloaded. The available types are:

Table 3: Radiomap types available for pre-download

Mode	Description
SPARSE	Configures the download of the cellular radiomaps for coarse positioning (accuracy hundreds of meters) within 15 kilometers from the center point.
COARSE	Configures the download of the cellular radiomaps and the highly compressed wifi radiomaps to balance data consumption and positioning accuracy. Radiomaps are downloaded within 5 km from the center point.
DETAILED	Configures the download of the cellular radiomaps and the less compressed wifi radiomaps to favor accuracy over data consumption. Radiomaps are downloaded within one km from the center point.
INDOOR	Configures the download of the radiomaps necessary for indoor positioning. Radiomaps are downloaded within 500 m from the center point.

Instead of defining the center point and the radiomap type to the interface, it is also possible to provide the Venue Map information as `com.here.android.mpa.venues3d.Venue` to the interface. In this case the job downloads the radiomaps necessary for indoor positioning at that particular venue.

The interface also provides a mechanism to delete all the downloaded radiomaps as well as to observe the status and the progress of the download job.

## Indoor Positioning Mode

The *indoor positioning mode* refers to the set of radiomaps used by the indoor positioning engine. For detailed discussion on the different radiomaps, please refer to [HERE Indoor Positioning Installation Guide](#).

Indoor positioning can be configured to run in four different modes, which are defined by the `LocationDataSourceHERE.IndoorPositioningMode` enumeration. Use the method `setIndoorPositioningMode()` from the `LocationDataSourceHERE` class to change the indoor positioning mode. Use the method `getIndoorPositioningMode()` from the same class to check the current mode.

The following table introduces the four indoor positioning modes.

**Table 4: Indoor Positioning Modes Supported by the HERE Positioning**

Mode	Description
AUTOMATIC	HERE Positioning automatically chooses which mode to apply. Requires that the SDK license has both public and private indoor positioning features enabled. If both features are enabled in the SDK license, then this positioning mode is set as the default.
COMMUNITY	Community indoor radiomap is used by the indoor positioning engine. Requires that the SDK license has the public indoor positioning feature enabled. If only the public indoor positioning feature is enabled in the SDK license, then this indoor positioning mode is set as the default.
PRIVATE	The customer's private indoor radiomap is used by the indoor positioning engine. Requires that the SDK license has private indoor positioning feature enabled. If only the private indoor positioning feature is enabled in the SDK license, then this indoor positioning mode is set as the default.
DRAFT	Mode used for testing the draft indoor radiomap before publishing the draft to production servers. Requires that either public or private indoor feature is enabled in the SDK license. Please see the <a href="#">Using the Draft Indoor Positioning Mode</a> on page 89 section below for further details.

## Using the Draft Indoor Positioning Mode

A *Draft Radiomap* is a sandbox for the system operators and developers to test and try out positioning without affecting the applications using HERE Indoor Positioning. When radio data is collected and tested in the HERE Indoor Radio Mapper, the tool always uses a Draft Radiomap. Once the Draft Radiomap shows good performance, the radio data is published to the production radiomap (private or public one, depending upon the venue type) for the use by HERE Android SDK.

In the production configuration, HERE Android SDK fetches positioning data from the production radiomaps. However, for R&D purposes, HERE Android SDK can be configured to use a draft radiomap. The DRAFT indoor positioning mode allows testing the unpublished draft indoor radiomap in the actual application (as opposed to testing only in the HERE Indoor Radio Mapper) before publishing the Draft Radiomap to production. However, since this is an R&D feature, this mode is limited to a maximum of ten devices that have to be defined before compiling the application.

For detailed discussion on the radiomaps and data flows, please refer to HERE Indoor Positioning Installation Guide.

To enable the DRAFT indoor positioning mode for a specific device, do the following:

1. Find out the *Android ID* of the device that you want to enable the DRAFT indoor positioning mode for.
  - a. Run command `adb shell getprop | grep net.hostname` via the Android debug bridge
  - b. Inspect the command output. For example:

```
[net.hostname]: [android-1234567812345678]
```

The *Android ID* is what appears after the string "android-".

- c. Please note that the *Android ID* may change when the device factory settings are returned or when switching the user profile in a device with multi-user support
2. Add a new XML resource to your project using the Android Studio and name it, for example, as `draft_enabled_devices.xml`
3. Add the *Android ID* to the `string-array` within `resources` as follows in `draft_enabled_devices.xml`:

```
<?xml version="1.0" encoding="utf-8"?>
<resources>
  <string-array name="draft_enabled_devices">
    <!--My Android device -->
    <item>1234567812345678</item>
  </string-array>
</resources>
```

**Note:** Up to ten *Android IDs* can be defined in the `string-array`. If more than ten *Android IDs* are defined, none of them will work.

4. Add a new metadata element defining the draft-enabled devices to your `AndroidManifest.xml`:

```
<meta-data android:name="com.here.location.indoor_draft_access"
           android:resource="@array/draft_enabled_devices" />
```

**Note:** This field must be added at the same level with the HERE Application ID, Application Code and the SDK License.

**Note:** The resource name must match to the `string-array` name created in the step 3.

## Indoor Positioning-specific Methods

HERE Positioning has three indoor positioning-specific methods, which are methods of `geoPosition` class:

- `String getBuildingName()`

Returns the `BuildingName`, if known. If the `BuildingName` is not present, `null` is returned.

For HERE Venue Maps the `BuildingName` is assigned by HERE, when creating the Venue Map. This method returns that name.

For custom indoor maps, the `BuildingName` is the one given when the indoor map was imported using HERE Indoor Radio Mapper. However, illegal characters are removed from the name.

- `String getBuildingId()`

Returns the `BuildingID`, if known. If the `BuildingID` is not present, `null` is returned.

For HERE Venue Maps, the `BuildingID` is the globally unique ID assigned by HERE, when creating the Venue Map. An example of a HERE Venue Map `BuildingID` is `DM_8213`.

For custom indoor maps, the `BuildingID` is the customer-defined `BuildingName`, prefixed with `BM_`.

If the position estimate is outdoors, but indoor positioning is used for producing the location estimate, the string `OUTDOOR` is returned.

- `Integer getFloorId()`

Returns the floor level. If the `FloorId` is not present, `null` is returned.

For HERE Venue Maps, the floor levels are returned as defined for the particular the HERE Venue Map.

For custom indoor maps, the `FloodId` follows the customer-defined floor levels specified in HERE Indoor Radio Mapper, when the indoor maps were imported.

## Receiving Detailed Status Reports and Diagnostics

### Status Listener

`StatusListener` provides information on the few most typical issues that prevent the usage of HERE Indoor Positioning. An instance of `StatusListener` is given as an input parameter, when creating an instance of HERE Positioning: `LocationDataSourceHERE.getInstance(StatusListener)`.

The following table details the return codes as defined in `StatusListener.PositioningError`.

**Table 5: Status messages provided by StatusListener**

Status message	Description
<code>INJECT_ERROR</code>	Coarse location could not be resolved. HERE Indoor Positioning requires coarse location to retrieve the correct positioning data from the HERE positioning servers.
<code>NO_COVERAGE</code>	No radiomaps were found in the vicinity of the resolved coarse location. Please ensure you have created indoor positioning coverage with HERE Indoor Radio Mapper and that the data has been published for use.
<code>NOT_FOUND</code>	HERE Indoor Positioning coverage exists for the area, but resolving position failed. Please make sure that your latest data has been published in HERE Indoor Radio Mapper.

### Diagnostics Listener

`DiagnosticsListener` provides more detailed information on the most typical issues preventing the usage of HERE Indoor Positioning. The diagnostics listener can be set up via the method `setDiagnosticsListener`.

The following table lists the events that can be received through the `DiagnosticsListener`.

**Table 6: Diagnostics messages provided by DiagnosticsListener**

Diagnostics message	Category	Description
List of the enabled positioning methods	<code>info</code>	Lists the positioning methods at your disposal.
List of the requested and enabled positioning methods	<code>info</code>	Lists the requested positioning methods in addition to the allowed positioning methods. In case you are missing a method you would like to use, please contact your HERE representative.

Diagnostics message	Category	Description
No license to use any of the requested positioning methods	error	In case none of the requested methods is enabled in your license, positioning cannot be performed. Please use a method allowed by your license.
Dynamic permissions are not set for the application and service cannot be started	error	Please set the permissions as instructed in <a href="#">Using HERE Positioning</a> on page 86
No reference position	error	The same as INJECT ERROR above.
No coverage	error	The same as NO COVERAGE above.
Not found	error	The same as NOT FOUND above.

## Device Settings

The device settings may have a major impact on positioning accuracy and may even prevent HERE Positioning from functioning altogether—for example, disabling GPS/GNSS, network location support, or radio technologies prevent HERE Positioning from functioning normally. As a developer you should detect these situations, let the application user know about the situation, and inform the user about the possible corrective action. The following table lists the situations that may impact positioning, and the corrective action for each case.

**Table 7: Device Settings and Corrective Actions**

Situation	Impact	Corrective Action
<b>Device Only</b> <i>Location mode</i> is selected from the device location settings.	HERE Positioning is not allowed to perform network or indoor positioning.	Notify the user about the situation and inform the user to switch the <i>Location mode</i> to <b>High accuracy</b> .
<b>Battery Saving</b> <i>Location mode</i> is selected from the device location settings.	HERE Positioning is not able to use satellite-based positioning.	Notify the user about the situation and inform the user to switch the <i>Location mode</i> to <b>High accuracy</b> .
Airplane mode is enabled.	By default, the airplane mode shuts down device radios preventing either all the network measurements or only cellular measurements, depending on how the user has modified device settings after enabling the airplane mode.	Notify the user about the situation. Do not inform the user to turn off the airplane mode without warning, because there might be a valid reason why airplane mode is enabled.
wifi is disabled.	Disabling wifi scans prevents wifi-based outdoor and indoor positioning.	Notify the user about the situation and inform the user to switch the wifi radio on, or to turn on <i>Scanning always available</i> option from the wifi advanced settings or from the location settings.
Bluetooth is disabled.	Disabling Bluetooth prevents Bluetooth-based indoor positioning.	Notify the user about the situation and inform the user to switch the Bluetooth radio on, or to turn on <i>Scanning always available</i> option from the Bluetooth advanced setting or from the location settings.

## Power Consumption Considerations

HERE Positioning power consumption depends heavily on the used `LocationMethod`. As a rule of thumb, network (wifi or cellular) positioning consumes less power than GNSS and indoor positioning. If your application does not require the highest possible accuracy, you should consider using network positioning to save energy.

Online network positioning consumes more energy than offline network positioning. In a typical setting offline positioning uses up to 80-90% less energy than online positioning. The difference is mainly because of the network connection usage in online network positioning.

In order to save energy, you should also consider pausing position updates when your application is moved to the background, unless your application is dependent on frequent location updates even when the application is in the background.

## Troubleshooting HERE Positioning

If your application does not receive any position updates while using HERE Positioning, try the following:

- Check that the Android permissions are set as defined in this document
- Check that the positioning service is correctly defined in the application manifest
- Make sure that the relevant network settings are enabled:
  - Go to System settings and check that Wifi, Cellular and Bluetooth (if the indoor feature is used) are enabled.
- Make sure that the device has network connection
- Check that the **high accuracy** location settings is enabled:
  - **Device-only** location setting prevents network and indoor positioning
  - **battery-saving** location setting prevents GNSS positioning
- Make sure the *indoor positioning mode* is correctly set
- Log events from `StatusListener` and `DiagnosticsListener`

If your application receives inaccurate position estimates while using HERE Positioning, try the following:

- Make sure that you have wifi and Bluetooth (for indoor positioning) network measurements enabled
- Use the best-suited `LocationMethod` for your applications when requesting location updates
- Check that the **high accuracy** location settings is enabled
- If you are trying to use indoor positioning, make sure that the location estimates really originate from the indoor positioning engine by checking the position source through `GetPositionSource` on `GeoPosition`. Moreover, please check that the positioning technology is as expected through `GetPositionTechnology`.
- Force the download of the latest indoor positioning data by deleting the folder `sdcard/Android/data/{your_package_name}/files/rmb` and restarting the application.

## Map Matching

The HERE Android SDK performs Map Matching automatically when it needs to match a raw position to the road network, such as during drive guidance, where there may be inaccuracies in the road rendering or GPS data. Map matching also supports instances where the GPS signal is lost while entering a road tunnel. The position is extrapolated and updated based on the driver's speed and knowledge of the tunnel layout.

## Automotive Map Matching

The HERE Android SDK supports high-accuracy map matching through the `LocationDataSourceAutomotive` class. As a requirement to use this class, you must have positioning data input from a GNSS module that supports dead reckoning. This ensures a continuous and reliable stream of position updates even in cases where the GPS becomes unavailable (for example, when the user is driving in a tunnel). It is strongly recommended that position updates are provided, at a constant rate of 10 Hz, together with standard deviations of the following:

- Horizontal radial error (large component)
- Horizontal radial error (small component)
- Course
- Speed
- Elevation

### Note:

- Automotive Map Matching is currently offered as a beta feature. APIs may change without notice.
- Automotive Map Matching does not support tunnel extrapolation.

## Custom Data Sources

In general, you can use any custom positioning data by implementing the `LocationDataSource` class and set it by calling `PositioningManager.setDataSource(LocationDataSource)` before starting the positioning manager.

- **Note:** While `LocationDataSource.start(LocationMethod)` requires a `LocationMethod` parameter, it is not necessary for your data source to support all `PositioningManager.LocationMethod` types.

You can support tunnel extrapolation while using a Custom Data Source by following these steps:

1. When the data source location data is unavailable, check to see if the device is currently in a tunnel:

```
RoadElement roadElement = getPositioningManager().getRoadElement();
if (roadElement != null
    && roadElement.getAttributes().contains(RoadElement.Attribute.TUNNEL)) {
    return true;
}
return false;
```

2. If the device is in a tunnel, submit a `null` location through `LocationDataSource.onLocationUpdated(LocationMethod, Location)` at an interval of *once per second*. The HERE SDK then provides an extrapolated position in the tunnel.
3. Continue to periodically send `null` positions to the positioning manager while the device is in a tunnel. You can implement a timer so that `onLocationUpdated(LocationMethod, Location)` calls `stop` after a period of time (after one minute, for example), and re-enable updates when location data is available again.

## Directions

---

This section provides an overview of the Directions feature in the HERE SDK. The Directions feature allows developers to define and display routes between a start and a destination point within their application. It supports many navigation options such as toll road preference and transport type.

### Car and Pedestrian Routing

The HERE Android SDK supports route calculation with multiple waypoints, optimized for walking or driving. A route describes a path between at least two waypoints, the starting point and the destination, with optional intermediate waypoints in between. Applications can provide route information to users in two ways:

- A line rendered on a map that displays a connecting path between all waypoints
- Turn-by-turn directions in text format

### Route Calculation Classes

This section introduces the following classes that are used for route calculations:

- `CoreRouter`
- `RoutePlan`
- `RouteWaypoint`
- `RouteOptions`

The `CoreRouter` class is responsible for calculating car, pedestrian, and truck routes. An application can initiate a route calculation by calling the `CoreRouter.calculateRoute(RoutePlan, CoreRouter.Listener)` method, providing options and waypoints through `RoutePlan`, and receive progress events through the `Router.Listener` instance.

**Note:** The `CoreRouter` can also calculate routes with traffic taken into account by using `Route.TrafficPenaltyMode` and `setDynamicPenalty(DynamicPenalty)` before calling `calculateRoute()`. For more information on the `DynamicPenalty` class, see [Dynamic Routing Penalty](#) on page 98.

`RoutePlan` is a waypoint container that is used for route calculation. A `RoutePlan` object is comprised of a list of waypoint objects and an optional `RouteOptions`. If `RouteOptions` is not specified, default values are used.

You can use `RouteWaypoint` to add more waypoint details to a route calculation. These details include whether a waypoint is a deliberate stopover or a via point that the route must pass through. This affects routing, as routes containing stopovers or via waypoints may be different. For example, a calculated route may suggest a U-turn maneuver after a stopover, while a route containing the same location as a via waypoint suggests continuing on the same street. The via waypoint type is only supported in car routes, and it is not supported in other route types.

The `RouteOptions` class is a model of the parameters required to calculate one route. It encapsulates "building block" parameters for a route such as:

- The desired number of routes

- The direction of travel that the route should start in
- The routing type, such as fastest travel time or shortest distance
- The departure time
- The allowed types of route segments, such as dirt roads or highways

The HERE SDK supports alternate routes between two waypoints. The alternate route feature allows more than one route to be returned after a route calculation. You can use the `RouteOptions` class to set the desired number of routes, and the HERE SDK then returns different routes according to this limit. Note that the first element of the returned list of `RouteResult` is the main route, and the rest of the returned routes are not listed in any specific order.

- **Note:** Do not set more than three desired routes in offline mode, as these route calculations take significantly more time to complete.
- **Note:** In some cases, specifying a higher route count than a previous working query can result in a `GRAPH_DISCONNECTED` error. This is due to a limit on the complexity and size of the calculated routes that can be processed. The higher the route count and the more complex a route is, the more likely that this limit is exceeded.

## RouteResult and Route

The `RouteResult` class represents a route calculation result. Applications can retrieve a `Route` object and the corresponding set of violated routing conditions. *Violated routing options* are the conditions that a routing result was unable to adhere to. For example, after specifying a route calculation that avoids tolls and ferries, you may get a `RouteResult` that contains a `Route` object along with `RouteResult.ViolatedOption.AVOID_TOLL_ROADS`. This indicates that although a route was found, this route goes through at least one toll road—violating a condition of your route request.

The `Route` class is a distinct calculated path connecting two or more waypoints, consisting of a list of maneuvers and route links. By using `CoreRouter.calculateRoute(RoutePlan, CoreRouter.Listener)` to trigger a route calculation, your application can use the `CoreRouter.Listener` to monitor the calculation and trigger callback methods. These callback methods have parameters that include a list of the calculated `RouteResult` objects. Using these `RouteResult` objects, you can call `getRoute()` to retrieve the routes.

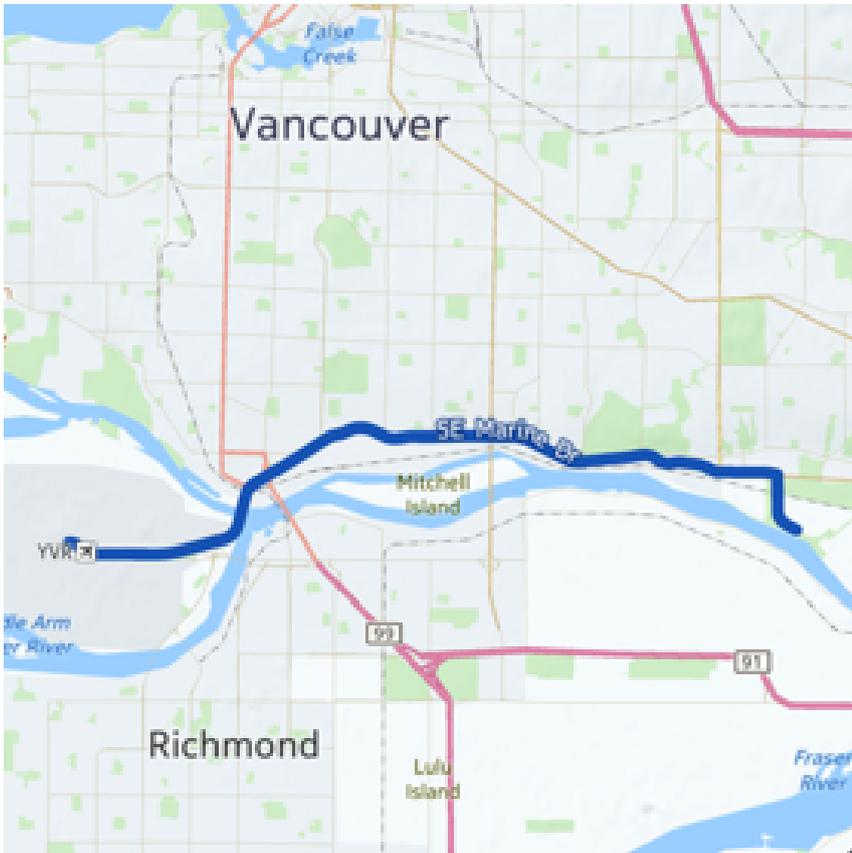
## The MapRoute map object

The `MapRoute` class is a type of `MapObject` that displays a calculated route on a map. Typically, an application creates a `MapRoute` after a route calculation, passing the relevant `Route` object as a parameter to the `MapRoute(Route)` constructor before adding the `MapRoute` to the map by calling `Map.addMapObject(MapRoute)`.

- **Note:** `MapRoute.setRenderType(RenderType)` must be called after the `MapRoute` is added to a `Map`.

For example, if you want to render a route that connects two waypoints (start and destination), you can add the following application logic:

**Figure 49: Calculate Route**



1. Declare a `CoreRouter` instance.

```
// Declare the variable (the CoreRouter)
CoreRouter router = new CoreRouter();
```

2. Create a `RoutePlan` and add two `GeoCoordinate` waypoints.

```
// Create the RoutePlan and add two waypoints
RoutePlan routePlan = new RoutePlan();
routePlan.addWaypoint(new RouteWaypoint(new GeoCoordinate(49.1966286, -123.0053635)));
routePlan.addWaypoint(new RouteWaypoint(new GeoCoordinate(49.1947289, -123.1762924)));
```

3. Create a new `RouteOptions` object, set its `Type` and `TransportMode` values by calling appropriate `RouteOptions` methods, and then add it to `RoutePlan`.

```
// Create the RouteOptions and set its transport mode & routing type
RouteOptions routeOptions = new RouteOptions();
routeOptions.setTransportMode(RouteOptions.TransportMode.CAR);
routeOptions.setRouteType(RouteOptions.Type.FASTEST);

routePlan.setRouteOptions(routeOptions);
```

4. To make sure route calculation can handle returning a `Route` object that in turn can be used to create a `MapRoute` instance for rendering on the map, add an inner class by implementing `CoreRouter.Listener` in the appropriate activity class.

```
private class RouteListener implements CoreRouter.Listener {
```

```
// Method defined in Listener
public void onProgress(int percentage) {
    // Display a message indicating calculation progress
}

// Method defined in Listener
public void onCalculateRouteFinished(List<RouteResult> routeResult, RoutingError error) {
    // If the route was calculated successfully
    if (error == RoutingError.NONE) {
        // Render the route on the map
        mapRoute = new MapRoute(routeResult.get(0).getRoute());
        map.addMapObject(mapRoute);
    }
    else {
        // Display a message indicating route calculation failure
    }
}
}
```

5. After adding the inner listener class (named `RouteListener` for this example), calculate the route by calling `CoreRouter.calculateRoute(RoutePlan, CoreRouter.Listener)`. Note that `CoreRouter.Listener` extends `Router.Listener<List<RouteResult>, RoutingError>`.

```
// Calculate the route
router.calculateRoute(routePlan, new RouteListener());
```

## Dynamic Routing Penalty

You can use `DynamicPenalty` to create a policy of roads and area restriction factors that are applied during routing calculations. For example, you can use this class to indicate that the travel speed in an area is 50 percent slower than usual. The `DynamicPenalty` class also allows you to set the mode used for handling traffic events in a route calculation through the `setTrafficPenaltyMode(TrafficPenaltyMode)` method.

You can change the active policy by calling `CoreRouter.setDynamicPenalty(DynamicPenalty)`. The policy must be set before a route calculation for the restrictions to be taken into account.

## Retrieving Traffic Event Objects

You can use the `TrafficUpdater` class to retrieve traffic events such as road closures or congestions. Before using the traffic updater, it must be enabled via `TrafficUpdater.enableUpdate(boolean update)` for the traffic requests to take effect.

Using the `TrafficUpdater` is a two-step process. First, create a `TrafficUpdater.Listener` and use it with one of the following methods:

- `request(GeoCoordinate center, Listener listener)` - request traffic with given center coordinates and the default radius
- `request(GeoCoordinate center, int radius, Listener listener)` - request traffic with given center coordinates and radius
- `request(Route route, Listener listener)` - request traffic for the given route and default radius around each waypoint
- `request(Route route, int radius, Listener listener)` - request traffic for given route and radius around each waypoint

- `request(RouteElements elements, Listener listener)` - request traffic for a route element (`RouteElement`) object

Upon the successful callback from `TrafficUpdater.Listener` (with the state `TrafficUpdater.RequestState.DONE`), you should retrieve a list of traffic events that affect the given route or route element by using one of the following methods:

- `getEvents(Route route, GetEventsListener listener)`
- `getEvents(RouteElement element, GetEventsListener listener)`
- `getEvents(List<RouteElement> elements, GetEventsListener listener)`
- `getEvents(RouteElements elements, GetEventsListener listener)`

`TrafficUpdater.GetEventsListener` contains one callback method, `onComplete(List<TrafficEvent> events, Error error)`, which provides a newly updated list of traffic events.

## Routing-related Enumerations

Route calculations make use of HERE SDK enumerations that include:

- The `Route.TrafficPenaltyMode` enum - represents values describing how the `CoreRouter` should handle traffic events in a route calculation, such as `DISABLED`, `AVOID_LONG_TERM_CLOSURES`, or `OPTIMAL`.
- The `RouteOptions.Type` enum - represents values describing different routing types, such as `FASTEST` or `SHORTEST`
- The `RouteOptions.TransportMode` enum - represents values describing different transport modes, such as `CAR`, `TRUCK`, `TRACK` (which connects waypoints using straight lines), or `PEDESTRIAN`
- The `RoutingError` enum - represents values describing possible route calculation errors, such as `NONE` or `VIOLATES_OPTIONS`
- The `RouteResult.ViolatedOption` enum - represents values describing possible route option violations, such as `AVOID_HIGHWAYS` or `AVOID_FERRIES`

## Bicycle Routing

The bicycle routing feature provides route calculation using car and pedestrian roads with bicycle-specific speed estimations. This type of routing can be performed online or offline, with elevation data being available in an online request.

### Note:

- Bicycle routing is currently offered as a beta feature. APIs may change without notice. Do not use this feature in a commercial application.
- Bike-specific roadways are not yet supported.

Bicycle routing includes pedestrian-only roads and road segments that require traversing a one-way road opposite the allowed direction of travel. When a road is not open for driving in the travel direction, the routing algorithm assumes that the user must walk the bicycle, and therefore it uses the pedestrian walking speed for such segments. As a special exception to this rule, pedestrian segments located in parks are assumed to be open for bicycles, so full bicycle speed is used there. Generally, such walk-only segments are used in bicycle routing only when they provide a big shortcut, or when a waypoint is located on such a segment.

## Performing a Bicycle Routing Request

You can perform bicycle routing by using the `CoreRouter` class and `RouteOptions.TransportMode.BICYCLE`, as shown in the following example:

```
CoreRouter router = new CoreRouter();
// Create the RoutePlan and add two waypoints
RoutePlan routePlan = new RoutePlan();
routePlan.addWaypoint(new RouteWaypoint(new GeoCoordinate(49.276271, -123.113224)));
routePlan.addWaypoint(new RouteWaypoint(new GeoCoordinate(49.1947289, -123.1762924)));

RouteOptions routeOptions = new RouteOptions();
routeOptions.setTransportMode(RouteOptions.TransportMode.BICYCLE);
routeOptions.setRouteType(RouteOptions.Type.FASTEST);

routePlan.setRouteOptions(routeOptions);

// Calculate the route, assuming that you have already implemented RouteListener.
// See the Car Routing section for more details.
router.calculateRoute(routePlan, new RouteListener());
```

## Route Elevation

In an online bicycle routing session, the HERE SDK considers elevation changes when determining what speed should be used on the given road. When going uphill, speed decreases, possibly down to the pedestrian speed. When going downhill, speed increases.

**Note:** Elevation-based speed estimations may change in the future.

You can also create an elevation profile of a route, similar to the following screenshot, by using altitude data of the points on a calculated route.

Figure 50: Plotted Chart of Elevations



To retrieve this elevation data, call the `Route.getRouteGeometryWithElevationData()` method and inspect the altitude on each returned `GeoCoordinate` object. If the altitude is not known at that location, calling `GeoCoordinate.getAltitude()` returns the `GeoCoordinate.UNKNOWN_ALTITUDE` value.

**Note:** Route altitude data is available in online calculated routes for cars, pedestrians, trucks, and bicycles.

## Truck Routing

The Truck Routing feature in the HERE SDK allows users to calculate routes that can be specifically traveled by trucks and commercial vehicles. Commercial vehicles typically have different regulations for their transportation routes. For example, a government may have laws that restrict trucks carrying flammable materials from traveling in a residential area. By using the Truck Routing feature, you can launch a route calculation that specifically adheres to these restrictions.

## Truck Routing and the RouteOptions Class

The `RouteOptions` class contains a number of truck-specific methods and enums that you should use before performing a route calculation. To perform a truck route calculation, use the `TransportMode.TRUCK` enum with the `setTransportMode(TransportMode)` method to specify the route transportation type. You can also set the following truck-specific route options before performing the route calculation:

- The number of truck trailers
- The truck height
- The truck length
- The truck width
- The maximum allowed truck weight
- Hazardous goods that are transported by the truck
- The category of tunnels that the truck can travel on
- The truck's weight per axle
- Difficult turns

**Note:** Truck routing only supports the `RouteOptions.Type.FASTEST` routing type. Other routing types are not supported.

## A Route Calculation Example

1. As with the previous routing example, retrieve the `CoreRouter`, create a `RoutePlan` and set its waypoints.
2. Create a new `RouteOptions` object. The `TransportMode` should be set to `TRUCK`.

```
// Create the RouteOptions and set its transport mode & routing type
RouteOptions routeOptions = new RouteOptions();
routeOptions.setTransportMode(RouteOptions.TransportMode.TRUCK);
routeOptions.setRouteType(RouteOptions.Type.FASTEST);
```

3. Set other truck routing options.

```
routeOptions.setTruckTunnelCategory(TunnelCategory.E)
    .setTruckLength(25.25f)
    .setTruckHeight(2.6f)
    .setTruckTrailersCount(1);
```

4. Set the `RouteOptions` to the `RoutePlan`.

```
routePlan.setRouteOptions(routeOptions);
```

5. Create a `CoreRouter.Listener` and then calculate the route by calling `CoreRouter.calculateRoute(RoutePlan, Listener)`.

## Transit Routing

Transit Routes are routes calculated by using `CoreRouter` with the the `RouteOptions` transport mode set to `PUBLIC_TRANSPORT`. With the transit routing feature, you can calculate transit routes by using known online timetable information.

**Note:**

- `RouteOptions.TransportMode.PUBLIC_TRANSPORT` is no longer deprecated as of HERE SDK v3.4.
- To use this feature, your application must include the **Gson** library (release 2.2.4 or a compatible version) on its class path.

Before displaying transit routing, you should set the map scheme to include transit so that the `MapRoute` shows the color of the transit lines.

```
// sets the map scheme to include transit.
map.setMapScheme(Map.Scheme.NORMAL_DAY_TRANSIT);
```

The following is an example of a transit route using `CoreRouter`:

```
...
CoreRouter router = new CoreRouter();

// Select routing options
RoutePlan routePlan = new RoutePlan();

RouteOptions routeOptions = new RouteOptions();
routeOptions.setTransportMode(RouteOptions.TransportMode.PUBLIC_TRANSPORT);
routeOptions.setRouteType(RouteOptions.Type.FASTEST);
routePlan.setRouteOptions(routeOptions);

// Select Waypoints for your routes
routePlan.addWaypoint(new RouteWaypoint(new GeoCoordinate(49.1966286, -123.0053635)));
routePlan.addWaypoint(new RouteWaypoint(new GeoCoordinate(49.1947289, -123.1762924)));
router.calculateRoute(routePlan, new RouterListener());

...

private final class RouterListener implements CoreRouter.Listener {

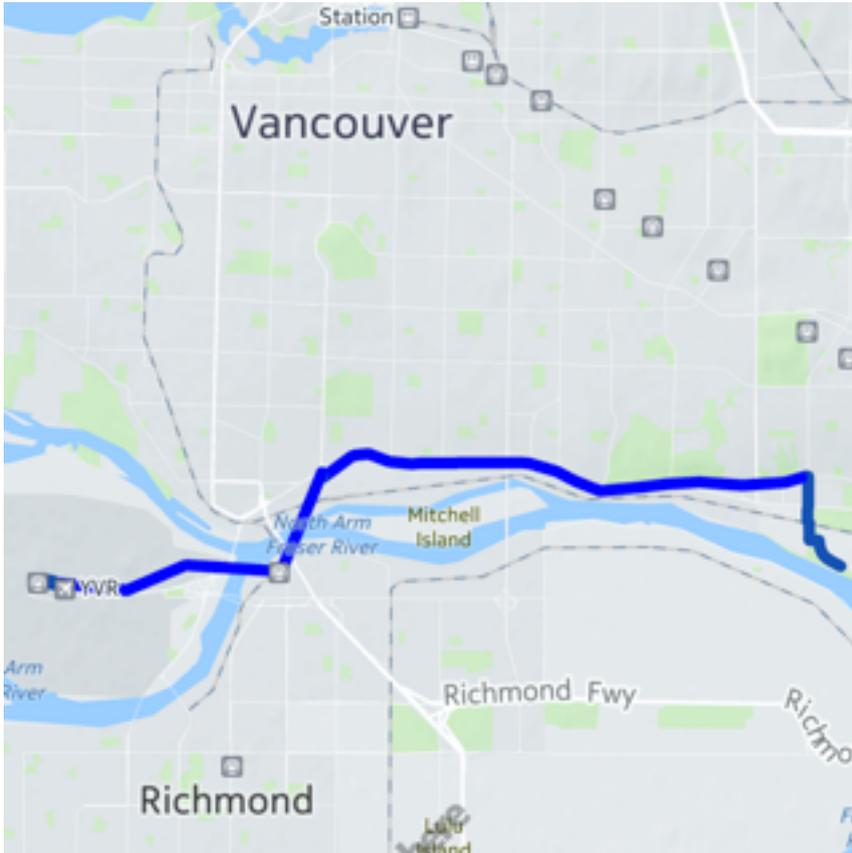
    // Method defined in Listener
    public void onProgress(int percentage) {
        // Display a message indicating calculation progress
    }

    // Method defined in Listener
    public void onCalculateRouteFinished(List<RouteResult> routeResult, RoutingError error) {
        // If the route was calculated successfully
        if (error == RoutingError.NONE) {
            // Render the route on the map
            mapRoute = new MapRoute(routeResult.get(0).getRoute());
            map.addMapObject(mapRoute);

            // Get the bounding box containing the route and zoom in (no animation)
            GeoBoundingBox gbb = routeResult.get(0).getRoute().getBoundingBox();
            map.zoomTo(gbb, Map.Animation.NONE, Map.MOVE_PRESERVE_ORIENTATION);
        }
        else {
            // Display a message indicating route calculation failure
        }
    }
}
```

```
}
```

Figure 51: Transit Route



### The TransitRouteElement Class

Transit route elements, which are route element objects specific to public transit, can be retrieved from the `getTransitElement()` method in the `RouteElement` class.

## Urban Mobility Routing

With the Urban Mobility Routing feature, you can calculate transit routes and fare costs by using real time online timetable information.

To perform this type of transit routing, use `UMRouter` in a similar manner to `CoreRouter`, while specifying options through the `UMRouteOptions` class.

### Notes and Disclaimers

Before using the Transit Routing feature, be aware of the following:

- Transit routing is currently offered as a beta feature. APIs may change without notice.
- Access to the Transit Routing feature is restricted. Contact a HERE representative (<https://developer.here.com/contact-us?interest=mobile-sdk#contact-sales>) for more information and to request for access.
- To use this feature, your application must include the `Gson` library (release 2.2.4 or a compatible version) on its class path.

- Urban Mobility routing is now offered as an additional feature outside of the evaluation package.

## Urban Mobility Routing Example

The following is an example of how to calculate a public transit route that connects two waypoints (start and destination):

1. Declare a `UMRouter` instance.

```
// Declare the variable (the UMRouter)
UMRouter router = new UMRouter();
```

2. Create a `RoutePlan` and add two `GeoCoordinate` waypoints.

```
// Create the RoutePlan and add two waypoints
RoutePlan plan = new RoutePlan();
// add start point to route plan
plan.addWaypoint(new RouteWaypoint(new GeoCoordinate(40.750488, -73.993546)));
// add end point to route plan
plan.addWaypoint(new RouteWaypoint(new GeoCoordinate(40.749877, -73.845853)));
```

**Note:** Destinations that are too close to the starting waypoint are not supported. Use a pedestrian route calculation instead.

3. Create a new `UMRouteOptions` object and set the desired options. Add the route options to `RoutePlan`.

```
// Create the UMRouteOptions and set its options
UMRouteOptions options = new UMRouteOptions();
// setup walk parameters
options.setTransitWalkMaxDistance(1000);
options.setTransitWalkTimeMultiplier(0.75f);
plan.setRouteOptions(options);
```

4. Create a `UMRouter.Listener` instance by implementing the `onCalculateRouteFinished(UMCalculateResult, ErrorCode)` and `onProgress(int)` methods. Note that the returned object, `UMCalculateResult`, may contain multiple route results (`UMRouteResult`), each of which contains a single `UMRoute`.

`UMRoute` can be used to create a `MapRoute` instance for rendering purposes.

```
UMRouter.Listener listener = new UMRouter.Listener() {
    @Override
    public void onCalculateRouteFinished(UMCalculateResult response, ErrorCode error) {
        if (error == ErrorCode.NONE) {
            for (UMRouteResult result: response.getResults()) {
                int changesCount = result.getUMRoute().getChangesCount();
                List<Tariff> tariffs =
                    result.getUMRoute().getTariffs();

                for (RouteSection section: result.getUMRoute().getSections()) {
                    Departure departure = section.getDeparture();
                    Collection<Alert> alerts = section.getAlerts();
                }
                // ...

                MapRoute mapRoute = new MapRoute(result.getUMRoute());
                // show mapRoute on the map
            }
            if (response.isSubsequentRouteSupported()) {
                // UMRouter.calculateSubsequentRoute() can be used to calculate later routes
            }
        } else {
```

```
String errorMessage = response.getErrorMessage();
// display error
}
}

@Override
public void onProgress(int percentage) {
    // update progress
}
};
```

- To perform subsequent route calculations, check if the returned `UMCalculateResult` object supports subsequent routes, and call `calculateSubsequentRoute(UMCalculateResult, SubsequentRouteType, int, UMRouter.Listener)` as needed. For more information on subsequent routes, see the Subsequent Routes section in this chapter.
- After adding the listener class (named `listener` for this example), calculate the route by calling `UMRouter.calculateRoute(RoutePlan, UMRouter.Listener)`. Note that `UMRouter.Listener` extends `Router.Listener<List<RouteResult>, RoutingError>`.

```
// Calculate the route
router.calculateRoute(routePlan, listener);
```

- You are required to display the source attribution, retrieved through the `Route.getTransitRouteSourceAttribution()` method somewhere near the route results.
- Geometry, line color, and other types of display information can be retrieved through `TransitRouteElement` objects, available through the `UMRoute`. You can retrieve and display ticket fare information by using the `Ticket` objects inside `UMRoute`.

## Subsequent Routes

The `UMRouter` class supports subsequent route calculations based on an initial set of route results. For example, you can use `UMRouter` to launch a route calculation, and then use the returned `UMCalculateResult` to launch a subsequent route calculation for three routes that have the same waypoints, but have an earlier departing time.

You do not need to specify a timestamp for the subsequent calculation. The HERE SDK will automatically return your desired number of results based on whether you specified earlier or later. In other words, you can "slide" the window of interested route results by specifying `SubsequentRouteType.EARLIER` or `SubsequentRouteType.LATER` and the desired number of results.

The method to perform this calculation is

```
UMRouter.calculateSubsequentRoute(UMCalculateResult, SubsequentRouteType, int,
UMRouter.Listener).
```

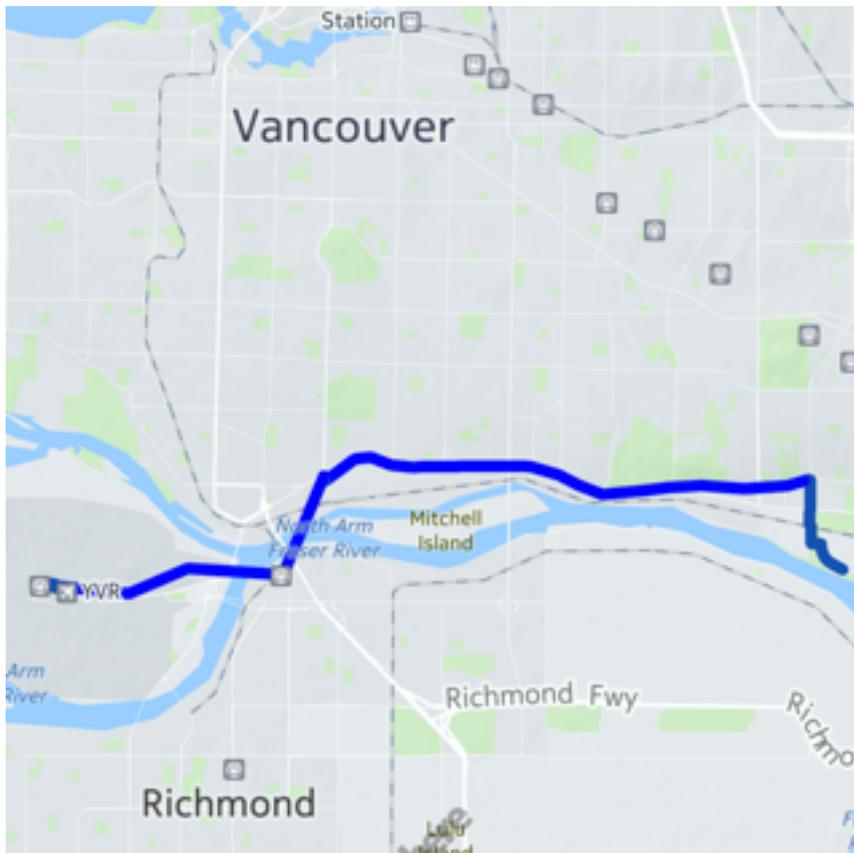
## Displaying Transit Routes

Before displaying transit routing, you should set the map scheme to include transit so that the `MapRoute` shows the color of the transit lines.

```
// sets the map scheme to include transit.
```

```
map.setMapScheme(Map.Scheme.NORMAL_DAY_TRANSIT);
```

Figure 52: Transit Route



### The TransitRouteElement Class

Transit route elements, which are route element objects specific to public transit, can be retrieved from the `getTransitElement()` method in the `RouteElement` class.

### Online Timetables and Fallback Scenarios

Wherever possible, the HERE SDK performs route calculations using the latest online timetable data from municipalities. This is performed automatically when you launch a transit routing request, but the following conditions must be fulfilled:

- Your application must have an active data connection. If there is no data connection, an estimated routing is performed instead.
- The route must be between two endpoints—an origin and a destination. Multiple endpoints are not supported.

This type of calculation only returns a maximum of ten route results, even if the limit set in the `RouteOptions.setRouteCount(int)` exceeds it.

**Note:** The following route options are ignored in this route calculation mode:

- `setTransitMinimumChangeTime(int)`
- `setTransitWalkTimeMultiplier(int)`

In addition, the `setTransitMaximumChanges(int)` option is supported in the primary route result, but the maximum number of changes is capped at ten.

- **Note:** Contractual limitations exist for Online Timetable coverage in Paris, France and Germany. Contact your HERE SDK Sales, Marketing, or Product representative for additional details.

## Indoor Venue Routing

For more information on 3D venues and indoor routing, see [3D Venues](#) on page 164 and [Venue Routing](#) on page 175.

## Offline Routing

Even without an active data connection, the applications developed with the HERE Android SDK are able to request routing information to assist travelling from one location to another.

Your application's users do not need to maintain active, data connections to calculate routes and render them on a map. It is possible to pre-download updated maps and database information for initiating routing requests while offline. For example, if a user has downloaded offline maps of California and Oregon, a route from San Diego to Portland can be created without any data connection.

For more information about downloading offline maps, refer to [Offline Maps \(MapLoader\)](#) on page 52.

### Force Online or Offline

You can launch online or offline routing without changing the device or the HERE SDK connectivity by using the `setConnectivity(Connectivity)` method on a `CoreRouter` instance. `Connectivity` has three possible values:

- If you launch a request using the `DEFAULT` connectivity mode, the request is performed according to the `MapEngine` connectivity setting. If the device is offline while `MapEngine` is set to online mode, the request fails.
- If you launch a request using the `ONLINE` connectivity mode, an online request is performed, regardless of the `MapEngine` connectivity setting.
- If you launch a request using the `OFFLINE` connectivity mode, an offline request is performed using cached data, regardless of the `MapEngine` connectivity setting.

In all cases, if the request fails, no fallback action is automatically performed.

To ensure that the connectivity mode is applied, call `setConnectivity(Connectivity)` before launching a `CoreRouter` calculation request. If a `Connectivity.ONLINE` route calculation request fails due to connection issues, the HERE SDK returns the `RoutingError.NETWORK_COMMUNICATION` error code. If a `Connectivity.OFFLINE` route calculation request fails due to not enough cached data, the HERE SDK returns the `RoutingError.GRAPH_DISCONNECTED` error code.

- **Note:** This feature is only applicable to car, bicycle, truck, and pedestrian routing through the `CoreRouter` class.

## Route Consumption

Route consumption calculation is a beta feature which allows the consumption of fuel resources, such as gasoline or electricity, to be calculated for a given, already calculated route.

Vehicles have a limited range depending on the amount of fuel remaining and how much fuel the vehicle consumes per kilometre under different driving conditions. This is especially important for electric vehicles, which can typically travel less distance on a full charge than a gasoline powered vehicle could travel on a full tank.

In order to ensure that a vehicle is able to complete a calculated route, the HERE Android SDK can calculate the consumption for each element in that route given certain consumption parameters. This allows the developer to, firstly, determine how much fuel the vehicle will have left at the end of the route and, secondly, check where vehicle would run out of fuel in the case that the final destination is not reachable.

Since different vehicles consume different types of fuel (such as gasoline and electricity) and also have different rates of consumption, the consumption calculation must be configured with consumption parameters for a given vehicle before the calculation is performed.

An important concept for consumption calculation is the capacity unit. The capacity unit is how fuel is measured for a given vehicle. Because consumption calculation is general, the unit is effectively defined by the developer. For an electric vehicle the capacity unit is generally kilowatt hours (kWh), for a gasoline powered vehicle it could be liters of gasoline.

A vehicle will have a maximum capacity and current capacity, which indicates how much fuel it can hold in total and the current amount respectively.

In the following description, we will assume that we are calculating consumption for an electric vehicle, since this is the most common use case. The capacity unit used will be kilowatt hours (kWh).

The consumption parameters are grouped onto the `ConsumptionParameters` class. The API documentation provides descriptions of each of the individual values that can be modified. Here we will describe the more complex and important values. To begin, we'll create an empty consumption parameters object

```
ConsumptionParameters consumptionParams = new ConsumptionParameters();
```

The speed consumption table is the basis for much of the consumption calculation, this is stored as a table, represented as list of `ConsumptionForSpeed` objects. The table represents the consumption of the vehicle per meter in kilowatt hours (the capacity unit) for ranges of speeds.

Consider a very simple example with three ranges of speeds and a consumption for each.

**Table 8:**

Speed range (km/h)	Consumption per meter (kWh)
0 - 30	38.82
31 - 90	18.20
> 90	27.41

From this table, we see that our vehicle consumes 38.82 kWh of capacity per metre when traveling between 0 and 30 km/h, 18.20 kWh of capacity per metre when traveling between 31 and 90 km/h and 27.41 kWh of capacity per metre when traveling at 90 km/h or faster. Of course this example is very simple, a real world speed consumption table would have finer grained values.

To use this table in our consumption parameters, call the `setSpeedParameters(List<ConsumptionForSpeed>)` method, with the upper bound of each range as the key and the consumption per metre as the value. The final key (for > 90 km/h) should use the key 250.

```
List<ConsumptionForSpeed> consumptionSpeed = new ArrayList<ConsumptionForSpeed>();
consumptionSpeed.add(new ConsumptionForSpeed(30, 38.82));
consumptionSpeed.add(new ConsumptionForSpeed(90, 18.20));
consumptionSpeed.add(new ConsumptionForSpeed(250, 27.41));

consumptionParams.setSpeedParameters(consumptionSpeed);
```

The speed consumption table is enough to calculate simplistic consumption for a route. Assuming that we already have a `Route` object called `route`, which contains a calculated route, calculate the consumption for this route.

```
RouteConsumption consumption =
    route.getConsumption(consumptionParameters, null);
```

Once we have the route consumption we can determine the last reachable position on the same route given current capacity of our vehicle. In this example we'll suppose that our vehicle has 100,000 kWh of remaining capacity at the beginning of the route.

```
GeoCoordinates lastPosition =
    route.getLastReachablePosition(consumption, 100000);
```

The variable `lastPosition` will now contain the last point that our vehicle will be able to reach before the capacity reaches zero. In the case that the final destination of the route is reachable, `lastPosition` will be `nil`.

We can also use the route consumption to obtain the consumption for each route element that comprise the route itself. The following code snippet prints out the starting and ending geo-coordinates for each route element as well as the consumption for that route element.

```
List<RouteElement> routeElements = route.getRouteElements().getElements();
for (int i = 0; i < routeElements.size(); i++) {
    RouteElement element = routeElements.get(i);
    List<GeoCoordinate> geometry = element.getGeometry();
    double startLat = geometry.get(0).getLatitude();
    double startLong = geometry.get(0).getLongitude();
    double endLat = geometry.get(geometry.size() - 1).getLatitude();
    double endLong = geometry.get(geometry.size() - 1).getLongitude();
    Log.d(TAG, String.format("Route element (%.4f, %.4f) ---> (%.4f, %.4f) consumption %d",
        startLat, startLong, endLat, endLong, consumption.getConsumption(i)));
}
```

As mentioned above, setting only the `consumptionSpeed` property is sufficient for basic consumption calculation. There are more specialised values which can be set to more closely model the consumption of a real vehicle across different road and traffic conditions. For more details on these properties, please see the API documentation.

## Route Serialization

Route serialization is a feature that allows users to use the `Route` methods to serialize a route into binary data, which can then be saved as a file. You can also use `Route` class to generate a route from a previously

serialized route without going through the route calculation process. This is useful when a user wants to recover from a crash during navigation or when a user wants to transfer a route from another device.

**Note:** Route serialization is currently offered as a beta feature. APIs may change without notice.

Route serialization currently only supports car, bike, truck, and pedestrian routes. Public Transit, Indoor Venue, and Urban Mobility routes cannot be serialized. Route serialization also does not work when the map version from which a route is serialized does not match the current map version. Route serialization also fails if the binary data containing the serialized route is tempered with or corrupted. In these cases, a specific `SerializerError` error code is returned.

Both asynchronous and synchronous operations are supported. To asynchronously serialize a route, perform the following:

```
Route route;
//assume that route calculation was already performed

Route.SerializationCallback sCallback = new SerializationCallback() {
    @Override
    public void onSerializationComplete(Route.SerializationResult result) {
        //do something with data
        byte[] data = result.data;
    }
};

Route.serializeAsync(route, sCallback);
```

To asynchronously deserialize a route:

```
byte[] data;
//assume 'data' is a previously-serialized route

Route.DeserializationCallback dCallback = new DeserializationCallback() {
    @Override
    public void onDeserializationComplete(Route.Deserialization result){
        //do something with the route
        Route route = result.route;
    }
};

Route.deserializeAsync(data, dCallback);
```

## Places

---

This section provides an overview of the Places feature in the HERE SDK. The Places feature enables developers to build rich, location-aware applications by adding point of interest search, discovery, interaction, and information retrieval.

For example, when an application submits a place discovery request using this API, the application receives a response that contains a list of links to places resources (among other information). By accessing one of the linked Place resources, the application can get detailed information about that place, including ratings, images, reviews, editorials, and owner content. This detailed place response also contains references to other related places, allowing the application's users to discover other places relevant or related to their original search.

- **Note:** To use this feature, your application must include the **Gson** library (release 2.2.4 or a compatible version) on its class path.

## Geocoding and Reverse Geocoding

Geocoding and reverse geocoding APIs from the HERE Android SDK allow application developers to offer search functionality for requesting location information and structured addresses. Geocoding APIs resolve to a `GeoCoordinate` from a text query, while reverse geocoding APIs resolve to a geographic data, such as `Address`, from a `GeoCoordinate`. `Address` provides textual address information, which includes house number, street name, city, country, and district. It encompasses everything about an address or a point on the map. `Location` represents a physical point on the map where additional attributes can be retrieved. These additional attributes include a unique identifier, label, `Address`, `GeoCoordinate` positions, and `GeoBoundingBox` for the `Location`.

### The GeocodeRequest Class

`GeocodeRequest` represents an extended `Request`. `GeocodeRequest` can be created using a one-box (free-formatted text) search using a combination of a text query string and geographical area arguments. The following shows the method used to create a one-box request:

```
GeocodeRequest request = new GeocodeRequest(String).setSearchArea(GeoCoordinate, int)
```

The preceding method returns a `GeocodeRequest` object. To begin the search, call `GeocodeRequest.execute()`. This method requires a `ResultListener` as an argument. When the search is completed, the `ResultListener.onCompleted()` method is called with a result status and a list of found locations.

After a request is invoked, it can be canceled using the `GeocodeRequest.cancel()` method, which returns `true` if the request was cancelled successfully. For `GeocodeRequest`, a list of `Location` objects are expected at the completion of the request.

The following code example demonstrates how to perform a `GeocodeRequest`:

```
// Implementation of ResultListener
class GeocodeListener implements ResultListener<List<Location>> {
    @Override
    public void onCompleted(List<Location> data, ErrorCode error) {
        if (error != ErrorCode.NONE) {
            // Handle error
            ...
        } else {
            // Process result data
            ...
        }
    }
}

// Instantiate a GeoCoordinate object
GeoCoordinate vancouver = new GeoCoordinate( 49.2849,- 123.1252);

// Example code for creating a OneBox Request
ResultListener<List<Location>> listener = new GeocodeListener();
GeocodeRequest request = new GeocodeRequest("Granville").setSearchArea(vancouver, 5000);
if (request.execute(listener) != ErrorCode.NONE) {
    // Handle request error
    ...
}
```

```
}
```

## The ReverseGeocodeRequest2 Class

The `ReverseGeocodeRequest2` class represents an extended `Request` used to retrieve `Location` data. The request is created using a `GeoCoordinate` as shown below:

```
new ReverseGeocodeRequest2(GeoCoordinate)
```

The above method returns a `ReverseGeocodeRequest2` object. To invoke the request, you can then call the `execute()` method of the returned `ReverseGeocodeRequest2` object and pass in a `ResultListener` to retrieve the information about the completion of the request. Once a request is invoked, the request can be canceled via the `ReverseGeocodeRequest2.cancel()` method. `cancel()` returns `true` if the request was cancelled successfully. For `ReverseGeocodeRequest2`, a structured `Location` is expected at the completion of the request.

The following is an example of creating `ReverseGeocodeRequest2` using `new ReverseGeocodeRequest2(GeoCoordinate)`:

```
// Implementation of ResultListener
class ReverseGeocodeListener implements ResultListener<Location> {
    @Override
    public void onCompleted(Location data, ErrorCode error) {
        if (error != ErrorCode.NONE) {
            // Handle error
            ...
        } else {
            // Process result data
            ...
        }
    }
}

// Instantiate a GeoCoordinate object
GeoCoordinate vancouver = new GeoCoordinate( 49.2849,- 123.1252);

// Example code for creating ReverseGeocodeRequest2
ResultListener<Location> listener = new ReverseGeocodeListener();
ReverseGeocodeRequest2 request = new ReverseGeocodeRequest2(vancouver);
if (request.execute(listener) != ErrorCode.NONE) {
    // Handle request error
    ...
}
```

By default, the reverse geocode request above searches for the closest street address. Alternatively, you can also create a reverse geocoding request in one of the following modes (`ReverseGeocodeMode`):

- `RETRIEVE_ADDRESSES` - Search for the closest street address or addresses (same as above)
- `RETRIEVE_AREAS` - Retrieve the administrative area information for the position provided in the request
- `RETRIEVE_LANDMARKS` - Search for landmarks like parks and lakes in the proximity provided in the request
- `RETRIEVE_ALL` - Search for streets, administrative areas and landmarks. This mode aggregates the results of the previous three modes in one call
- `TRACK_POSITION` - Retrieve street and address information based on a position and bearing

See the following for an example of how to use this type of request. Note that the bearing parameter is only used when you use `TRACK_POSITION`.

```
ResultListener<Location> listener = new ReverseGeocodeListener();
ReverseGeocodeRequest2 request = new ReverseGeocodeRequest2(geoCoord, null, RETRIEVE_ADDRESSES,
    bearing);
if (request.execute(listener) != ErrorCode.NONE)
{
    // Handle request error ...
}
```

## Offline Geocoding

Applications developed with the HERE Android SDK can perform offline geocoding, which allows geocode and reverse geocode requests to be performed without an active data connection. This is performed automatically when an active data connection is not available and when the map and database information have already been downloaded and cached.

## Search and Discovery

The HERE Android SDK provides application developers the Places API, which allows places discovery and information retrieval.

### Steps for performing a search

1. Implement the `ResultListener` interface to handle the completion of the search
2. Create a request and apply request options
3. Invoke the request by calling `Request.execute(ResultListener)`
4. The `ResultListener.onCompleted()` callback is triggered when the request is finished

**Note:** Applications that use the Places API must honor the following prescribed workflow:

1. Search
2. Request for Details
3. Perform Actions

Do not preload results linked from a response to improve performance, as doing so violates HERE's guidelines. For more information about usage restrictions, consult the [API Implementation Check List](#) in the REST HERE Places API documentation.

### The Place Class

The `Place` class represents a detailed set of data about a physical place, acting as a container for various attributes, collections of media about a place, and key-value pairs of related places. A `Place` object can belong to a specific `Category`, and has attributes such as:

- A unique identifier (ID)
- A name
- A `Location` object representing the physical location of the place, including access locations
- A `List` of `Category` objects that link to the categories assigned to the place
- A URL to the icon that best represents the place
- Optional information, such as related places, user ratings, reviews, and other editorial media.

For more information, please see the API Reference.

## Discovery Requests

The HERE Places Search API supports the following discovery requests:

Request	HERE SDK class	Purpose
Search	SearchRequest	Finds places that match user-provided search terms.
Explore	ExploreRequest	Finds interesting places nearby, or in the map viewport, sorted by popularity. Use this type of request if you are trying to answer the question "What are the interesting places near here?" The results may be optionally restricted to a given set of categories, which acts as a filter in terms of what places get returned.
Here	HereRequest	<p>Helps users identify places at the given location by finding places of interest near a given point, sorted by distance. Use this type of request if you are trying to answer the question "What is near this location?" or "Where am I?" You can use this endpoint to implement features like "check-in" (by identifying places at the user's current position) or "tap to get more information about this place of interest".</p> <p><b>Note:</b> Normally, the closest known places are returned with the Here Discovery request, but if the uncertainty in the given position is high, then some nearer places are excluded from the result in favor of more popular places in the area of uncertainty.</p>
Around	AroundRequest	<p>Allows users to request places near a given point, based on a location precision parameter. The places around that point are returned in order of proximity. This type of request is intended for applications that employ features such as augmented reality, where places around the user's location are displayed on a device. It is intended to provide places that are likely to be visible to the user as well as important places that are farther away. The Around request is considered experimental, and its behavior and functionality are still evolving. Check future documentation for updates to this feature.</p>

The following code example demonstrates how to perform a search discovery request:

```
// Example Search request listener
class SearchRequestListener implements ResultListener<DiscoveryResultPage> {

    @Override
    public void onCompleted(DiscoveryResultPage data, ErrorCode error) {
        if (error != ErrorCode.NONE) {
            // Handle error
            ...
        } else {
            // Process result data
            ...
        }
    }
}

// Create a request to search for restaurants in Seattle
try {
    GeoCoordinate seattle
        = new GeoCoordinate(47.592229, -122.315147);

    DiscoveryRequest request =
        new SearchRequest("restaurant").setSearchCenter(seattle);
}
```

```
// limit number of items in each result page to 10
request.setCollectionSize(10);

ErrorCode error = request.execute(new SearchRequestListener());
if( error != ErrorCode.NONE ) {
    // Handle request error
    ...
}
} catch (IllegalArgumentException ex) {
    // Handle invalid create search request parameters
    ...
}
}
```

The result of a discovery request is a `DiscoveryResultPage`. The `DiscoveryResultPage` represents a paginated collection of items from which the following can be retrieved:

- Next page and previous page requests - discovery requests used to retrieve additional pages of search items
- Items for the current page - a `List` of `DiscoveryResult`

When additional pages of search results are needed, retrieve and invoke the `DiscoveryRequest` returned by `DiscoveryResultPage.getNextPageRequest()`. If the next page request is null, no additional results are available.

The following is an example:

```
DiscoveryResultPage mResultPage = null;

// Example Search request listener
class SearchRequestListener implements ResultListener<DiscoveryResultPage> {

    @Override
    public void onCompleted(DiscoveryResultPage data, ErrorCode error) {
        if (error != ErrorCode.NONE) {
            // Handle error
            ...
        } else {
            // Store the last DiscoveryResultPage for later processing
            mResultPage = data;
            ...
        }
    }
}
...

// When the next page of results is needed...
DiscoveryRequest nextPageRequest = mResultPage.getNextPageRequest();

if (nextPageRequest != null) {
    // More data is available if the nextPageRequest is not null
    ErrorCode error = nextPageRequest.execute(new SearchRequestListener());
    if( error != ErrorCode.NONE ) {
        // Handle request error
        ...
    }
}
}
```

Calling `DiscoveryResultPage.getItems()`, returns a `List` containing one of the following types of objects, which are `DiscoveryResult` instances. `DiscoveryResult` is a collection of `Link` subtypes.

- `PlaceLink` - Represents discovery information about a `Place`. The `PlaceLink` contains a brief summary about a place. Details about a place are available from the `Place` that the `PlaceLink` references.

- **DiscoveryLink** - Represents a discovery-related API link used to retrieve additional **DiscoveryResultPage**. This type of **Link** can be a result item in an **Explore** or **Here** type of search. The **DiscoveryLink** references refined discovery requests resulting in more specific results. For example, the **DiscoveryLink** may link to a discovery request to search for 'Eat & Drink', 'Going Out', 'Accommodation', and so on.

Since there may be new types of **Link** items in the future, it is recommended that each type of **DiscoveryResult** be checked before it is used (as shown in the following code snippet). In the following example, it is shown how a **Place** is retrieved through a **PlaceLink**:

```
// Implement a search result listener
ResultListener<DiscoveryResultPage> searchListener = new ResultListener<DiscoveryResultPage>() {
    @Override
    public void onCompleted(DiscoveryResultPage results, ErrorCode error) {

        if (error == ErrorCode.NONE) {
            // The results is a DiscoveryResultPage which represents a
            // paginated collection of items.
            List<DiscoveryResult> items = results.getItems();

            // Iterate through the found place items.
            for (DiscoveryResult item : items) {
                // A Item can either be a PlaceLink (meta information
                // about a Place) or a DiscoveryLink (which is a reference
                // to another refined search that is related to the
                // original search; for example, a search for
                // "Leisure & Outdoor").

                if (item.getResultType() == ResultType.PLACE) {
                    PlaceLink placeLink = (PlaceLink) item;

                    // PlaceLink should be presented to the user, so the link can be
                    // selected in order to retrieve additional details about a place
                    // of interest.
                    ...

                } else if (item.getResultType() == ResultType.DISCOVERY) {
                    DiscoveryLink discoveryLink = (DiscoveryLink) item;

                    // DiscoveryLink can also be presented to the user.
                    // When a DiscoveryLink is selected, another search request should be
                    // performed to retrieve results for a specific category.
                    ...
                }
            }
        } else {
            // Handle search request error.
        }
    }
};

...

// Implement a Place listener for handling user interaction with a displayed PlaceLink
class PlaceListener implements ResultListener<Place> {
    @Override
    public void onCompleted(Place data, ErrorCode error) {
        if (error != ErrorCode.NONE) {
            // Handle error
            ...
        } else {
            // Present the place details to the user.
            String placeName = data.getName();
            List<Category> placeCategories = data.getCategories();
            ...
        }
    }
}
```

```

    }
  }
}

// Retrieve the place details when the user selects a displayed PlaceLink.
private void onPlaceLinkSelected(PlaceLink placeLink) {
  PlaceRequest placeRequest = placeLink.getDetailsRequest();
  if( placeRequest.execute(new PlaceListener()) == ErrorCode.NONE ) {
    // Request successful. Additional work can be done here, however, place details will
    // be returned in PlaceListener.onCompleted().
    ...
  } else {
    // Handle the error
    ...
  }
}
}

```

## Text AutoSuggestion Requests

The HERE Places Search API also supports text autosuggestion requests. This type of request is used for retrieving a list of instant results (`AutoSuggestPlace`) and refined search links (`AutoSuggestSearch`) that are related to a specified location context and a partial search term. For example, if you make a request with the String "rest" in Berlin, the results contain search terms such as "Restaurant", "Rest area", and "Restorf, Hohbeck, Germany".

- **Note:** Text AutoSuggestion is currently offered as a beta feature. APIs may change without notice. Offline requests are not supported.

To use text suggestions, implement a listener to handle a list of `AutoSuggest` objects and call `new TextAutoSuggestionRequest(String)` as follows:

```

// Example request listener
class AutoSuggestionQueryListener implements ResultListener<List<AutoSuggest>> {

  @Override
  public void onCompleted(List<AutoSuggest> data, ErrorCode error) {
    for (AutoSuggest r : data) {
      try {
        String term = "rest";
        TextAutoSuggestionRequest request = null;
        request = new TextAutoSuggestionRequest(term).setSearchCenter(myMap.getCenter());
        if (request.execute(new AutoSuggestionQueryListener()) !=
            ErrorCode.NONE ) {
          //Handle request error
          //...
        }
      } catch (IllegalArgumentException ex) {
        //Handle invalid create search request parameters
      }
    }
  }
}
}

```

You can retrieve the results of a `TextAutoSuggestionRequest` by first checking the `autosuggest` object type, as shown in the following example. Note that it is possible for `AutoSuggestSearch` to contain additional paginated results through the `DiscoveryRequest` object. If the object is `AutoSuggestPlace`, you can request for more details through its `PlaceRequest` object.

```

//assume autoSuggestList contains the list of results
try {
  AutoSuggest autoSuggest = autoSuggestList.get(index);

```

```
// set title
String title = autoSuggest.getTitle();
// get highlightedTitle
String highlightedTitle = Html.fromHtml(autoSuggest.getHighlightedTitle()).toString();

if (autoSuggest instanceof AutoSuggestPlace) {

    AutoSuggestPlace autoSuggestPlace = (AutoSuggestPlace)autoSuggest;

    // vicinity
    if (autoSuggestPlace.getVicinity() != null) {
        String vicinity = autoSuggestPlace.getVicinity();
    }

    // set category
    if (autoSuggestPlace.getCategory() != null) {
        String category = autoSuggestPlace.getCategory();
    }

    // set position
    if (autoSuggestPlace.getPosition() != null) {
        String position = autoSuggestPlace.getPosition().toString();
    }

    // set boundaryBox
    if (((AutoSuggestPlace)autoSuggest).getBoundingBox() != null) {
        String boundingBox = ((AutoSuggestPlace)autoSuggest).getBoundingBox().toString();
    }
} else if (autoSuggest instanceof AutoSuggestSearch) {

    AutoSuggestSearch autoSuggestSearch = (AutoSuggestSearch)autoSuggest;

    // set category
    if (autoSuggestSearch.getCategory() != null) {
        String category = autoSuggestSearch.getCategory();
    }

    // set position
    if (autoSuggestSearch.getPosition() != null) {
        String position = autoSuggestSearch.getPosition().toString();
    }

    // set boundaryBox
    if (autoSuggestSearch.getBoundingBox() != null) {
        String boundingBox = autoSuggestSearch.getBoundingBox().toString();
    }

    DiscoveryRequest myDiscoveryRequest = autoSuggestSearch.getSuggestedSearchRequest();
    myDiscoveryRequest.execute(myDiscoveryResultPageListener);

} catch (Exception e) {
    Log.e("ERROR: ", e.getMessage());
}
```

## External References

A place of interest can contain a reference to a foreign system outside of the HERE SDK. For example, a Place representing a restaurant contains an external reference to an entry in a restaurant reviews website. Each external reference is tied to a single reference source. However, each reference can have one or multiple identifiers.

The following external reference sources are supported in PlaceRequest and DiscoveryRequest:

- `Request.PVID_ID_REFERENCE_NAME` - Source for HERE Core Maps POI data
- `"yelp"` - Source for Yelp IDs

An external reference is returned in the form of one or multiple `String` identifiers in `Place`, `PlaceLink`, or `Location`. To retrieve a reference, add a source to the `PlaceRequest` or `DiscoveryRequest`, as shown in the following example:

```
// Create a request to search for restaurants in Vancouver
GeoCoordinate vancouver =
    new GeoCoordinate(48.263392, -123.12203);

DiscoveryRequest request =
    new SearchRequest("restaurant").setSearchCenter(vancouver);

// We also want to retrieve the Yelp ID external reference
request.addReference("yelp");

request.setCollectionSize(10);
ErrorCode error = request.execute(new SearchRequestListener());
```

After the request execution is complete, you can retrieve the results by using the `getReference(String)` method. If an external reference returns multiple results, such as the case where a single `Place` is associated with multiple identifiers, use the `getAlternativeReferenceIds(String)` method in `Place` or `PlaceLink` to retrieve the remaining result items.

```
//...
class SearchRequestListener implements ResultListener<DiscoveryResultPage> {
    @Override
    public void onCompleted(DiscoveryResultPage data, ErrorCode error) {
        if (error != ErrorCode.NONE) {
            // Handle error
            //...
        } else {
            //...
            mResultPage = data;
            for (PlaceLink link : mResultPage.getPlaceLinks())
            {
                String yelpReferenceID = link.getReference("yelp");
            }
            //...
        }
    }
}
//...
```

Additional external reference sources are supported through details requests, as shown in the next example. For example, you can use `getDetailsRequest()` from a `PlaceLink` object and retrieve reference IDs by executing the details request.

**Note:** The following external references can be retrieved through a details request:

- `Request.PVID_ID_REFERENCE_NAME` - Source for HERE Core Maps POI data
- `Request.VENUES_VENUE_ID_REFERENCE_NAME` - Source for HERE Venue IDs
- `Request.VENUES_CONTENT_ID_REFERENCE_NAME` - Source for HERE Venue Content IDs
- `Request.VENUES_DESTINATION_ID_REFERENCE_NAME` - Source for HERE Venue Destination IDs
- `Request.BUILDING_ID_REFERENCE_NAME` - Source for HERE Building IDs

- "tripadvisor" - Source for TripAdvisor IDs, to be used with TripAdvisor Content API. [\*]
- "facebook" - Source for Facebook unique page IDs, to be used with Facebook Graph API. [\*]
- "yelp" - Source for Yelp IDs, to be used with Yelp Business API. [\*]
- "opentable" - Source for OpenTable restaurant unique IDs, to be used with OpenTable reservation widget. [\*]

```
//...
class SearchRequestListener implements ResultListener<DiscoveryResultPage> {
    @Override
    public void onCompleted(DiscoveryResultPage data, ErrorCode error) {
        if (error != ErrorCode.NONE) {
            // Handle error
            //...
        } else {
            //...
            mResultPage = data;
            for (PlaceLink link : mResultPage.getPlaceLinks())
            {
                PlaceRequest detailsRequest = link.getDetailsRequest();
                detailsRequest.addReference("tripadvisor");

                //assuming you have created DetailsListener()
                if( placeRequest.execute(new DetailsListener()) == ErrorCode.NONE ) {
                    // Request successful.
                    // Check the returned Place objects in DetailsListener.onCompleted().
                    ...
                } else {
                    // Handle the error
                    ...
                }
            }
        }
        //...
    }
}
//...
```

**Note:** Sources marked with [\*] cannot be used with the `PlaceRequest(String, String)` constructor.

You can also use an external reference in the reverse scenario to retrieve a particular Place by using a `PlaceRequest` created using the `PlaceRequest(String, String)` constructor. For example:

```
PlaceRequest placeRequest =
    new PlaceRequest(Request.BUILDING_ID_REFERENCE_NAME, "12345");
```

## Offline Search

When internet connectivity is unavailable, the HERE Places supports offline search by providing results using available cached map data. The search results in this offline mode may be limited.

The main differences compared to online search results are:

- Fewer POIs (Point of Interests) are available
- No detailed POI's information is available (for example: ratings, reviews, editorials, images, and so on)

## Force Online or Offline

You can launch online or offline searches without changing the device or HERE SDK connectivity by using the `setConnectivity(Connectivity)` method on a `Request` instance. This property is applicable to all `Request` subclasses, except `TextAutoSuggestionRequest`, which can only be used online.

`Connectivity` has three possible values:

- If you launch a request using the `DEFAULT` connectivity mode, the request is performed according to the `MapEngine` connectivity setting. If the device is offline while `MapEngine` is set to online mode, the request fails.
- If you launch a request using the `ONLINE` connectivity mode, an online request is performed, regardless of the `MapEngine` connectivity setting.
- If you launch a request using the `OFFLINE` connectivity mode, an offline request is performed, regardless of the `MapEngine` connectivity setting.

In all cases, if the request fails, no fallback action is automatically performed.

To ensure that the connectivity mode is applied, `setConnectivity(Connectivity)` before executing a `Request`.

- If a `Connectivity.ONLINE` search request fails due to connection issues, HERE SDK returns the `ErrorCode.UNKNOWN` error code.
- If a `Connectivity.ONLINE` Geocoding or Reverse Geocoding request fails due to connection issues, HERE SDK returns the `ErrorCode.NETWORK_COMMUNICATION` error code.
- If a `Connectivity.OFFLINE` search request fails due to not enough cached data, HERE SDK returns with zero results.
- If you attempt to execute a `TextAutoSuggestionRequest` with the `Connectivity.OFFLINE` connectivity mode, HERE SDK returns the `ErrorCode.SERVICE_UNAVAILABLE` error code, since auto suggestions are only supported online.

## Custom Locations and Geometries

---

This section describes the Custom Locations feature. This feature allow user-defined locations and geometries to be retrieved through different search requests.

You can find more information about using Custom Locations, including how to import locations and how to manage location layers, by using the Custom Locations API Developer's Guide and the Custom Location Extension User Guide on <http://developer.here.com>.

- **Note:** To use this feature, your application must include the **Gson** library (release 2.2.4 or a compatible version) on its class path.

## Custom Location Extension 2

Custom Location Extension 2 (CLE2) allows you to easily distribute custom geospatial information in your mobile applications. Through CLE2, you can programatically insert spatial content to the local database and upload them to the server for data-sharing purposes. You can also also perform online or offline searches. These features effectively turns the HERE Android SDK into a lightweight spatial storage solution that enables insertion and query for geospatial information using optimized algorithms.

The classes that support this feature are located under `com.here.android.mpa.customlocation2`. Instead of having specific interfaces for location and geometry requests, CLE2 unifies all use cases in one flexible approach: the returned value always contains one of the geometry types (such as `CLE2PointGeometry`), along with a set of 0 to N user-defined attributes that can represent any information. There is no implied structure in these attributes. These attributes are made available as a `Map` of keys and attribute values.

Some examples of how you can use these CLE2 features include:

- Show all users' custom Points of Interest (POIs) within a 2km radius.
- Online or offline search for all customer offices within Germany using an area defined by a polygon, then display the office's reception phone numbers, employee counts, and other details.
- Edit geometry shapes in real time in offline mode and perform queries against it to get notifications when such shapes intersect with other existing fixed shapes and other basic Geofencing solutions. For example, this can be a 'moving platform', such as ships near ship docks, where locations are relative to GPS movements.
- Sharing Points of Interest that are not officially available as a part of HERE map data, such as a city's facilities and outdoor basketball courts.
- Persist GPS data that is tied to arbitrary data, such as hiking trails with speed, even during offline mode.
- Search for specific types of objects that are near a given route.

## Layers and Filtering

All data is organized in the form of layers. When uploading, storing or search for information, a layer name string is specified and can be used to better filter relevant information.

A further filtering is possible by checking the geometry's attributes. These attributes are user-defined fields that are linked to a geometry, such as `CLE2PointGeometry`, and can be text or number fields.

**Note:** CLE2 search is restricted per layer by app credentials. To manage the access restriction of a Custom Location layer, contact your Custom Location administrator. If you do not have one, contact your HERE representative.

## Inserting and Uploading Data

To upload data to the CLE2 servers, you can use the web interface or REST APIs. Refer to the following User Guide for more details: <https://developer.here.com/documentation/versions#custom-location>.

It is also possible to insert data locally and to the server via HERE Android SDK. The HERE SDK makes it straightforward to generate any location-referenced data, even when storing it locally offline, and sequentially sharing that information to other devices when a connection is established.

## Performing Spatial Searches

To perform a search, choose one of the search types as shown below. A common input parameters to all requests is the searched layer's name.

**Table 9: Search Classes**

Search Type	Description	Class Name
Proximity	Retrieve geometries that are within a given radius from a center.	<code>CLE2ProximityRequest</code>

Search Type	Description	Class Name
Corridor	Retrieve geometries along a route specified by a sequence of coordinates.	CLE2CorridorRequest
Bounding box	Retrieve geometries within a specified rectangular geographic area.	CLE2BoundingBoxRequest
Quadkey	Retrieve geometries that falls within a specified QuadKey.	CLE2QuadkeyRequest
Attribute	Retrieve all geometries that matches with a specified query. This type of search is only available online.	CLE2AttributeRequest

Each of the search request types supports some common parameters, as listed below.

**Table 10: Common CLE2Request Members**

Setter Method	Description	Example Values
setGeometry(CLE2GeometryType)	Specifies the geometry type to be given in the result (online only), see details below on "Understanding the search results"	<ul style="list-style-type: none"> <li>CLE2GeometryType.FULL</li> <li>CLE2GeometryType.LOCAL</li> <li>CLE2GeometryType.NONE</li> </ul>
setCachingEnabled(boolean)	Default is false. If enabled, geometries received from such online search request will be stored locally.	
setQuery(String)	Currently available for online requests only. This variable allows a query filter to be specified on the user's geometry attributes so that only geometries that passes the filter are returned. Free form text with simple equality and comparison operators.	

Once you have a search request object created and set up according to your needs, call its `execute(CLE2ResultListener)` method. The result of the search will be delivered to the provided listener. You can get the geometries that matched search criteria from a `CLE2Result` object by calling `getGeometries()`. This list of geometry results may contain objects of the following types:

**Table 11: Geometry Return Types**

Class	Geometry Description	Relevant Getter Methods
CLE2Geometry	Base class for all other geometry return values, containing user-defined attributes.	<code>Map&lt;String, String&gt; getAttributes()</code>
CLE2PointGeometry	Represents a point in coordinates. Relates to a <code>Point</code> in WKT.	<code>GeoCoordinate getPoint()</code>
CLE2MultiPointGeometry	Represents a multi-point as a coordinates array. Relates to a <code>MultiPoint</code> in WKT.	<code>List&lt;GeoCoordinate&gt; getMultiPoint()</code>
CLE2PolylineGeometry	Represents a polyline as an <code>GeoPolyline</code> . Relates to a WKT <code>LineString</code> object.	<code>GeoPolyline getPolyline()</code>
CLE2MultiPolylineGeometry	Represents a multi-polyline as an array of <code>GeoPolyline</code> . Relates to a WKT <code>MultiLineString</code> object.	<code>List&lt;GeoPolyline&gt; getPolylines()</code>

Class	Geometry Description	Relevant Getter Methods
CLE2PolygonGeometry	Represents a polygon with a GeoPolygon for the outer ring, and an array of GeoPolygon for inner holes. Relates to a WKT polygon object containing all rings of this geometry.	GeoPolygon getOuterRing(), List<GeoPolygon> getInnerRings()
CLE2MultiPolygonGeometry	Represents a multi-polygon as an array of CLE2GeometryPolygon. Relates to a MultiPolygon object in WKT.	List<CLE2PolygonGeometry> getPolygons()

In the OpenGIS (the implementation standard for Geographic Information) and WKT representation formats, the concept of a polygon is defined by one outer ring polygon plus zero or more inner hole polygons. This is the reason that the class CLE2PolygonGeometry contains a GeoPolygon and a secondary GeoPolygon array.

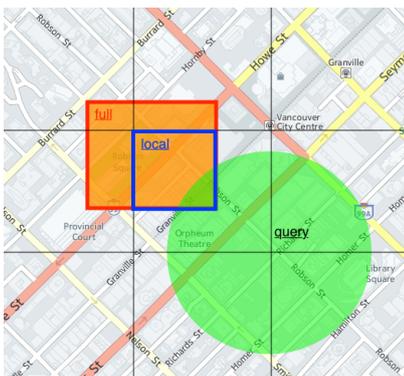
## Understanding Local and Full Search Results

While processing user-uploaded data, CLE2 creates a look-up index where geometries are divided by an internal fixed grid. If a geometry spans across several grid tiles, then the search index may contain smaller slices of this uploaded geometry. This behavior allows for better search performance, as well as optimized return values, since it is possible to only return the relevant part of the originally submitted geometry, and thus reducing the response size and processing time.

Before executing a search, you can specify if you are only interested in the part of the geometry that falls within the tiles around the search area (in other words, the tiled "local" geometry), or if you would like to receive the full geometry as originally uploaded.

**Note:** By default, HERE SDK returns full geometries.

**Figure 53: Local and Full Geometry**



You can use the following three options to define whether you are requesting for full or local results. These options are available for all search types:

CLE2GeometryType value	Meaning
FULL	The result contains the original geometry (as uploaded).
LOCAL	The result contains the processed geometries that falls within the search area for the tiles in reach.
NONE	No geometry is returned at all, only the properties/attributes of the geometries that match the given search are returned.

## Proximity Search Request Example

To perform a custom location search, you need to create a `CLE2ProximityRequest` using the `CLE2ProximityRequest(String layerId, GeoCoordinate center, int radius)` or `CLE2ProximityRequest(List<String> layerIds, GeoCoordinate center, int radius)` constructor methods.

A proximity search returns a list of custom locations that fall within a specified radius of a `GeoCoordinate` location. For example, the following code shows how to perform a search for all locations in the previously-mentioned stores layer that exists within a 0.5 kilometer radius of Frankfurt Central Station:

```
String layerId = "HERE_SITES";
int radius = 8000; // 8 km
GeoCoordinate location = new GeoCoordinate(49.196261, -123.004773);
CLE2ProximityRequest req = new CLE2ProximityRequest(layerId, location, radius);
req.execute(new CLE2Request.CLE2ResultListener() {
    @Override
    public void onCompleted(CLE2Result result, String error)
    {
        //if CLE2Error.NONE.equals(error) is true, the request was successful
        if (error.equals(CLE2Error.NONE)) {
            List<CLE2Geometry> geometry = result.getGeometries();
            for (CLE2Geometry geo : geometry) {
                java.util.Map<String, String> attributeMap = geo.getAttributes();
                String name = attributeMap.get("NAME1");
                double distance = geo.getDistance();
            }
        }
    }
});
```

The `layerId` parameter represents a set of custom locations. For example, `layerID="HERE_SITES"` represents an example layer that contains HERE locations in Germany. You can also perform a proximity search on different layers at the same time:

```
List<String> layerIds = new ArrayList<String>():
layerIds.add("LAYER_1");
layerIds.add("LAYER_2");
int radius = 500; // 500 meters
GeoCoordinate location = new GeoCoordinate(50.113905,8.677608);
CLE2ProximityRequest req = new CLE2ProximityRequest(layerIds, location, radius);
req.execute(new CLE2Request.CLE2ResultListener() {
    @Override
    public void onCompleted(CLE2Result result, String error)
    {
        //if CLE2Error.NONE.equals(error) is true, the request was successful
        if (error.equals(CLE2Error.NONE)) {
            List<CLE2Geometry> geometry = result.getGeometries();
            for (CLE2Geometry geo : geometry) {
                java.util.Map<String, String> attributeMap = geo.getAttributes();
                String name = attributeMap.get("NAME1");
                double distance = geo.getDistance();
            }
        }
    }
});
```

After creating a request object, you can call the `execute(ResultListener)` method to launch the search request and listen for search results.

You can also add a filter to the request. A filter is a JavaScript-like expression that is evaluated for each location-matching search query. When specified, only locations where the expression evaluates to `true` are returned. For example, if you want to filter for location results that have the custom location parameter of `rating` that is greater than 3 and the name `"MyPlace23"`, perform the following:

```
String layerId = "HERE_SITES";
int radius = 8000; // 8 km
GeoCoordinate location = new GeoCoordinate(49.196261, -123.004773);
CLE2ProximityRequest req = new CLE2ProximityRequest(layerId, location, radius);
String filter = "CITY == 'Burnaby' && NAME1 != 'MyPlace'";
req.setQuery(filter);
req.execute(new CLE2Request.CLE2ResultListener() {
    @Override
    public void onCompleted(CLE2Result result, String error)
    {
        //if CLE2Error.NONE.equals(error) is true, the request was successful
        if (error.equals(CLE2Error.NONE)) {
            List<CLE2Geometry> geometry = result.getGeometries();
            for (CLE2Geometry geo : geometry) {
                java.util.Map<String, String> attributeMap = geo.getAttributes();
                String name = attributeMap.get("NAME1");
                double distance = geo.getDistance();
            }
        }
    }
});
```

## Iterating Over Results

The `CLE2Result` object contains a list of geometries that are a result of the search and make them available with `getGeometries()` method. Since different types of geometry can be returned, it is recommended to test for the type before using it. For example, you can use `CLE2ResultListener` in a similar manner as the following example:

```
CLE2ResultListener resultListener = new CLE2Request.CLE2ResultListener() {
    @Override
    public void onCompleted(CLE2Result result, String error) {
        if (!error.equals(CLE2Request.CLE2Error.NONE)) {
            // process search results
            for (CLE2Geometry geometry : result.getGeometries()) {
                if (geometry instanceof CLE2PointGeometry) {
                    CLE2PointGeometry point = (CLE2PointGeometry) geometry;
                    // work with point geometry data
                }
            }
        } else {
            // handle error
        }
    }
};
```

## Using CLE2 Offline

You can perform search requests online to the server or offline to the local device. To enable offline searches against local data, the HERE SDK provides different ways for you to pre-fetch data.

Use offline mode as much as possible, since it provides the following advantages:

- Resilience to network instability.
- More efficient use of network bandwidth. Instead of sending one request per object, you can aggregate requests locally and transmit data in batches.
- Savings in network bandwidth. Your app can cache and update data that is only near the user's current location or pre-download a layer only when a WiFi network becomes available.
- Potentially making the application more responsive and improving the user experience and interface interactions, since the data is already available locally on the device.
- Create or modify geometries with the HERE SDK, and then store them locally, effectively using the HERE SDK as a data source and a storage of information.

The offline CLE2 feature is designed to be simple to use. Since all database synchronization and geospatial-related complexities are handled by the SDK, you can focus on other parts of app development.

## Querying the Local Storage

To search using locally stored data, set the connectivity mode to OFFLINE for a desired CLE2Request and perform the request:

```
CLE2ProximityRequest proximitySearch =
    new CLE2ProximityRequest("HERE_TEST", map.getCenter(), 1000);
proximitySearch.setConnectivityMode(CLE2Request.CLE2ConnectivityMode.OFFLINE);

proximitySearch.execute(new CLE2Request.CLE2ResultListener() {
    @Override
    public void onCompleted(CLE2Result result, String error) {
        if (!error.equals(CLE2Request.CLE2Error.NONE)) {
            // process search results
        } else {
            // handle error
        }
    }
});
```

You can configure the search request to hybrid or automatic mode, indicating that if during an online request the connection drops or there is a network error, then the request automatically falls back to an offline operation. You can see whether the search was performed online or offline by checking the connectivity mode that was used to perform the search. This can be done by calling `getConnectivityModeUsed()` on the CLE2Result object.

```
CLE2ProximityRequest proximitySearch
    = new CLE2ProximityRequest("HERE_TEST", map.getCenter(), 1000);
proximitySearch.setConnectivityMode(CLE2Request.CLE2ConnectivityMode.AUTO);

proximitySearch.execute(new CLE2Request.CLE2ResultListener() {
    @Override
    public void onCompleted(CLE2Result result, String error) {
        if (!error.equals(CLE2Request.CLE2Error.NONE)) {
            // check if data came from online or offline search
            boolean isDataFromServer = result.getConnectivityModeUsed() ==
                CLE2Request.CLE2ConnectivityMode.ONLINE;
        } else {
            // handle error
        }
    }
});
```

## Ways to Populate the Local Storage

By default, the offline feature is disabled and the local storage contains no data. There are three ways to add geometries to make them available for offline searches:

1. Caching search results after performing one or more requests, such as `CLE2ProximityRequest`. Note that you cannot cache attribute requests.
2. Download one or more layers.
3. Direct insertion of data into the local database.

After populating the database, you can query for the data in offline mode as usual by switching the connectivity mode of the respective request to `CLE2ConnectivityMode.OFFLINE`.

## CLE2DataManager and CLE2Task

The `CLE2DataManager` object is the central interaction point with the local storage. With it, it is possible to:

- Download all geometries of a specific layer
- Check how many geometries are currently stored in total, or in a specific layer
- Delete geometries belonging to a specific layer
- Purge the local storage by deleting all items
- Create, update, or delete a local or remote geometry

All the operations relating to data management that `CLE2DataManager` exposes make use of a `CLE2Task` that represent a unit of work. Since all of the data management operations involve database access, network communication or both, `CLE2Task` runs asynchronously. You can obtain a `CLE2Task` object from `CLE2DataManager`.

With `CLE2Task`, you can:

- Pass it to other parts of your code. `CLE2Task` is a self-contained unit of work.
- Subscribe for results of the operation. Multiple subscribers are supported and they are called on the main thread.
- Start execution of the task. Tasks are reusable. You can run them repeatedly multiple times, which makes retrying a failed operation very easy.
- Cancel a running task.
- Check if the task is started.
- Check if the task has finished.
- Wait for the task to finish.
- Retrieve the status of a finished operation directly from the task (check for errors).
- Retrieve the result of a successfully finished operation directly from the task.

## Storing Data by Caching Search Results

When caching is enabled in a `CLE2Request`, any returned geometries are automatically stored locally. To activate it, call `setCachingEnabled(true)` before performing the request:

```
// set query
String query = "CITY=='Berlin'";
request.setQuery(query);

// set Geometry type
request.setGeometry(CLE2GeometryType.LOCAL);
```

```
// to cache response
request.setCachingEnabled(true);

request.execute(new CLE2Request.CLE2ResultListener() {
    @Override
    public void onCompleted(CLE2Result result, String error) {
        if (!error.equals(CLE2Request.CLE2Error.NONE)) {
            // request succeeded, which means that the results are now stored locally
        } else {
            // handle error
        }
    }
});

//Now some geometries are in local storage.
//At a later point in time if you'd like to make an offline search,
//switch the connectivity mode to offline
```

## Storing Data by Downloading Layers

The second option is to use `CLE2DataManager` to insert data to the local storage using the `newDownloadLayerTask()` method.

The following is an example of how to download a whole layer from the CLE2 server:

```
CLE2DataManager.getInstance().newDownloadLayerTask("MYLAYER").start(
    new CLE2Task.Callback<CLE2OperationResult>() {
        @Override
        public void onTaskFinished(CLE2OperationResult result, CLE2Error error) {
            if (error.getErrorCode() == CLE2ErrorCode.NONE) {
                // download succeeded
            } else {
                // handle download error
            }
        }
    });
```

It is also possible to delete individual layers from local storage or completely wiping out all data stored locally:

```
// fire and forget method of running tasks (no callback)
CLE2DataManager.getInstance().newDeleteLayersTask(Arrays.asList(new String[]{"MYLAYER"}),
    StorageType.LOCAL).start();

// by specifying StorageType.REMOTE, it is possible to delete the layers from CLE2 server, so be
// careful

// wipe out all local data
CLE2DataManager.getInstance().newPurgeLocalStorageTask().start(new
    CLE2Task.Callback<CLE2OperationResult>() {
        @Override
        public void onTaskFinished(CLE2OperationResult result, CLE2Error error) {
            if (error.getErrorCode() == CLE2ErrorCode.NONE) {
                // notify user that all his data is gone
            }
        }
    });
```

## Storing Data by Inserting Geometries

You can generate location-based data and persist it locally, remotely, or both, by using the method `newGeometryTask()` from the `CLE2DataManager` class. This factory method returns a `CLE2Task` object that can be used to start, cancel, or to fetch results of operations at any given time.

```
public CLE2Task<CLE2OperationResult> newGeometryTask(
    OperationType operationType,
    String layerId,
    List<CLE2Geometry> geometryData,
    StorageType storageType)
```

- The first parameter in this method describes the operation type, which can be one of the following:
  - `OperationType.CREATE`
  - `OperationType.UPDATE`
  - `OperationType.DELETE`

Note that querying for geometries is accomplished through the respective `CLE2Request` specialized classes, so there is no "read" operation here.

- The second parameter is the layer the operation should be applied to.
- The third parameter is a list with the geometries themselves.
- The last parameter defines whether to operate on local storage (`StorageType.LOCAL`), or remote storage (`StorageType.REMOTE`) using the HERE CLE2 server.

**Note:** While this section covers usage of this method for the local option, all operations (create, update, delete) can also be used to change remote layers.

The following is an example on how to create a geometry and store it locally:

```
final int geometryCount = 100;
Random rand = new Random();
List<CLE2Geometry> geometries = new ArrayList<>(geometryCount);

// generate random point across the globe
for (int i = 0; i < geometryCount; i++) {
    GeoCoordinate newPoint = new GeoCoordinate(
        (rand.nextFloat() * 180 - 90),
        (rand.nextFloat() * 360 - 180));

    CLE2PointGeometry point = new CLE2PointGeometry(newPoint);
    point.setAttribute("i", Integer.toString(i));
    point.setAttribute("COLOR", rand.nextInt() % 2 == 0 ? "BLUE" : "RED");
    geometries.add(point);
}

// create task for storing new geometries locally
// if the layer does not exist already, it is created,
// otherwise the geometries is added to existing layer
CLE2Task<CLE2OperationResult> createLocal = CLE2DataManager.getInstance().newGeometryTask(
    OperationType.CREATE, "RED_VS_BLUE", geometries, StorageType.LOCAL);

createLocal.start(new CLE2Task.Callback<CLE2OperationResult>() {
    @Override
    public void onTaskFinished(CLE2OperationResult result, CLE2Error error) {
        if (error.getErrorCode() == CLE2ErrorCode.NONE) {
            // success
        }
    }
});
```

## Uploading a Local Layer

It is possible to upload a locally-stored layer to the server. Since this requires two operations (fetch from local storage and upload), it's a good candidate to run individual tasks in synchronous manner to avoid callback hell creeping in. Of course, this needs to be done on it's own thread, for example using `AsyncTask`.

```

AsyncTask<String, Void, Boolean> localToRemoteAsyncTask = new AsyncTask<String, Void, Boolean>() {
    @Override
    protected Boolean doInBackground(String... strings) {
        CLE2DataManager dataManager = CLE2DataManager.getInstance();
        boolean success = false;
        for (String layerId : strings) {
            // grab data from local storage
            CLE2Task<List<CLE2Geometry>> fetchLocalTask = dataManager
                .newFetchLocalLayersTask(Arrays.asList(new String[] {layerId}))
                .start()
                .waitForResult(5, TimeUnit.SECONDS);

            success = fetchLocalTask.isFinished()
                && fetchLocalTask.getError().getErrorCode() == CLE2ErrorCode.NONE;
            if (!success) {
                break;
            }

            // upload the data to the server, creating a new layer or replacing existing one
            CLE2Task<CLE2OperationResult> uploadTask = dataManager
                .newUploadLayerTask(layerId, fetchLocalTask.getResult())
                .start()
                .waitForResult(15, TimeUnit.SECONDS);

            success = uploadTask.isFinished()
                && uploadTask.getError().getErrorCode() == CLE2ErrorCode.NONE;
            if (!success) {
                break;
            }
        }
        return success;
    }
};

```

## Data Management Considerations

The following are a few tips to help with data management when using CLE2 in an offline context.

### Local-only Geometries

All `CLE2Geometry` objects have the following properties:

1. Geometry ID, accessible with `getGeometryId()`
2. Locality flag, accessible with `isLocal()`

The geometry ID is unique to a layer. If a geometry object has just been created, its geometry ID is `null` and the locality flag is `false`.

The locality flag tells whether this geometry belongs to a local context only, meaning it was not retrieved or passed through the CLE2 server. A geometry with a `true` locality flag has a locally generated unique geometry ID. Otherwise, it contains a server-provided ID. This server-provided ID is not related to the locally generated IDs of geometries stored directly in the database created via `newGeometryTask()`.

- Note:** The functionality of locally storing geometries without passing through the server is provided so that you do not need to manage data persistence on these objects when a connection is not available.

For simplicity, when saving geometries directly to the local database, keep them using a separate layer name. If at a later desired point in time these geometries should be shared with the server, fetch all local geometries using `newFetchLocalLayersTask()` method of `CLE2DataManager` and then upload them either using `newUploadLayerTask()` or `newGeometryTask()` with a create operation (`OperationType.CREATE`). This avoids the requirement to check for the `isLocal()` property.

By using these concepts, you can move geometries to different layers, contexts, and use these tools to organize data.

### Data Consistency

Use of `newUploadLayer()` should be primarily restricted to administrative users, because this method deletes all existing geometries in the server and recreate the layer with the provided ones. If the user does not have the latest information for this layer, data loss may occur, as it can overwrite another user's upload.

Therefore, for a scenario with continuous or concurrent geometry upload, use the `newGeometryTask()` method with `OperationType.CREATE` or `OperationType.UPDATE`. Operating in a "append only" manner or only updating the existing geometries avoids data loss, even if users are uploading geometries concurrently to the server.

### Current Limitations

Currently, individualized user account management for the CLE2 server is not available. For security reasons, care must be taken that your app credentials are kept well hidden. Please contact HERE if your application requires a user account access feature.

- Note:** Since geospatial queries are the focus of CLE2, HERE SDK does not support attribute searches in offline mode. You can filter the data using one of the geospatial queries (such as proximity) to narrow down the results to a small enough number that most applications do not suffer performance impact by iterating the geometry's attributes key-value dictionary to filter results further.

## Toll Cost Extension

Toll Cost Extension provides you the possibility to easily access Toll Cost Extension API from the HERE SDK. The HERE Toll Cost Extension (TCE) allows you to determine the toll costs for a specified route for a defined vehicle profile.

### TCE Classes

Class	Description
<code>TollCostOptions</code>	Specify all input parameters of <code>TollCostRequest</code> which includes vehicle profile currency and departure date.
<code>TollCostRequest</code>	Allows you to determine the toll costs for a specified route for a defined vehicle profile.
<code>TollCostResult</code>	Represents a result from a TCE request.

Class	Description
TollCostVehicleProfile	Specify different vehicle parameters and optional input parameters.

## Requesting the Toll Cost Data

To use Toll Cost Extension, you need to first have a route calculated in online mode, as the Toll Cost Extension requires permanent directed link IDs. After having a route from the core router, you can then retrieve the toll cost of the route.

```
// Create the core router
CoreRouter router = new CoreRouter();

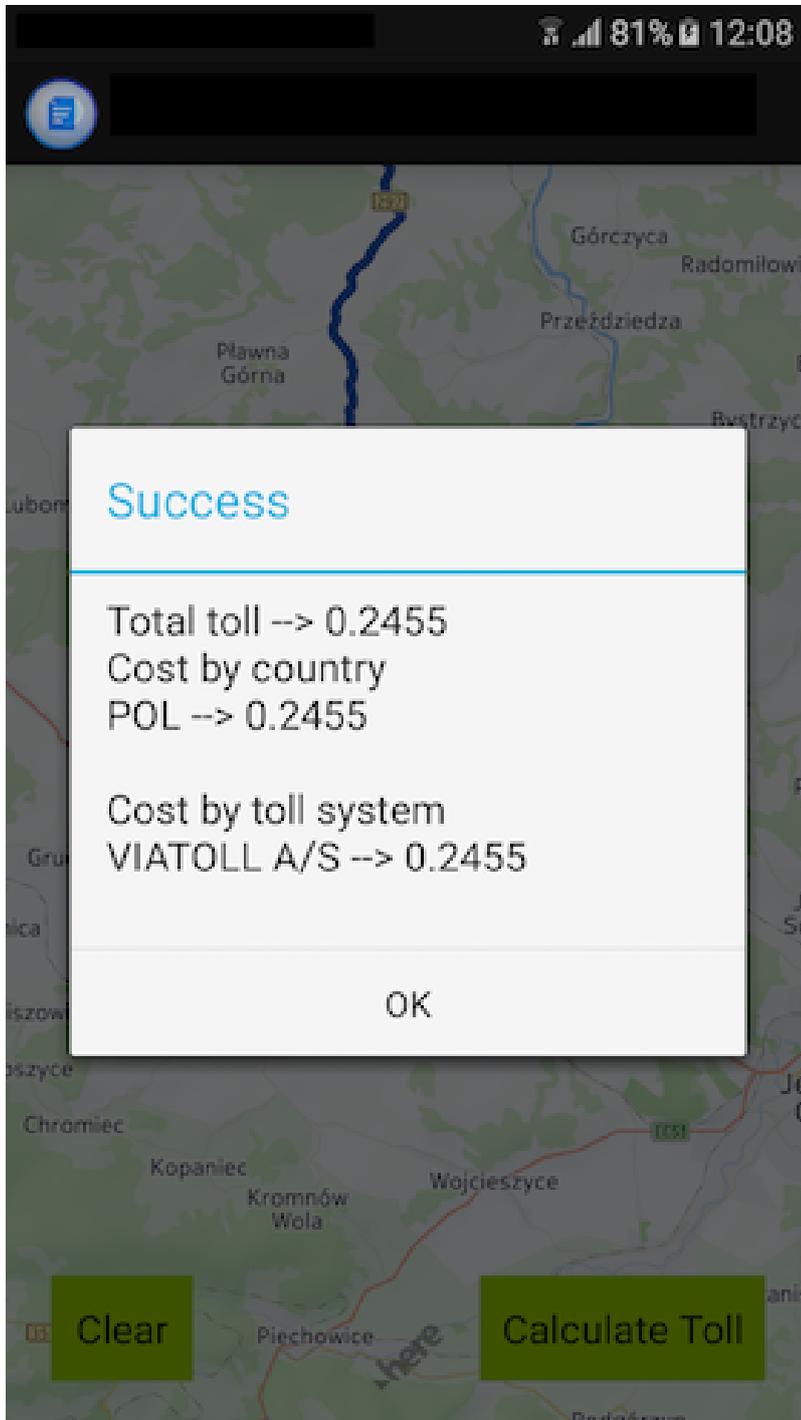
// We need link IDs, Route.getPermanentLinkIds(), so we force online routing
router.setConnectivity(Connectivity.ONLINE);
```

You can provide options for the toll cost request through an instance of `TollCostOptions`. If the vehicle needs non-default settings, such as if this toll request is for a specific type of vehicle, create an `TollCostVehicleProfile` object.

- **Note:** It is your responsibility to provide a compatible route and toll cost options. When setting the toll cost options, make sure that they match the route options. For example, if the toll cost option vehicle type is set as truck, but the route is created for a car, they are incompatible. In this case, the toll cost result may not be valid.

Next, create a `TollCostRequest` request object. If the request object is valid and the route contains permanent directed linkids, then you can execute the toll cost request via a result listener. When the result is received, first it is checked for any error. If there is no error, its toll cost contents are retrieved.

Figure 54: A Toll Cost Example



```
// Step 1: Provide input and calculate toll cost.
Route route = null; // Required
Date departureTime = null; // Optional

// Step 2: Wrap all input.
// Vehicle profile -> Type Bus, EmissionType EURO_IV, TrailerType NONE. Optional.
TollCostVehicleProfile vehicleProfile = new TollCostVehicleProfile();
```

```
vehicleProfile.setVehicleType(TollCostVehicleProfile.VehicleType.BUS);
vehicleProfile.setEmissionType(TollCostVehicleProfile.EmissionType.EURO_IV);
vehicleProfile.setTrailerType(TollCostVehicleProfile.TrailerType.NONE);

TollCostOptions options = new TollCostOptions();
parameter.setDeparture(departureTime);
parameter.setVehicleProfile(vehicleProfile);

// Step 3: Create request
TollCostRequest request = new TollCostRequest(route, parameter); // request created, can not be
modify.

// Step 4: Execute with result listener
request.execute(new TollCostRequest.Listener<TollCostResult>() {
    @Override
    public void onComplete(TollCostResult result, TollCostError error) {
        // Step 5: process result
        if(error.getErrorCode() != TollCostError.ErrorCode.SUCCESS) {
            // what is the error?
            error.getErrorMessage();
            return;
        }

        // if success

        // get total toll cost of a route
        result.getTotalTollCost();

        // get toll cost by country
        java.util.Map<String, Double> tollCostByCountry = result.getTollCostByCountry();

        // get toll cost by toll system name
        java.util.Map<String, Double> tollCostByTollSystem = result.getTollCostByTollSystemName();
    }
});
```

## Street-Level

---

This section provides an overview of Street-Level Imagery and Street-Level Objects in the HERE Android SDK. With Street-Level Imagery, developers can add an immersive street visualization experience to their application; with Street-Level Objects, developers can add objects, such as billboards and markers, to custom locations in the Street-Level View.

### Street-Level Imagery

The HERE Android SDK allows application developers to offer users panoramic street-level imagery for many cities.

Street-level imagery is a collection of interconnected 360-degree panoramas. You can navigate from one panorama to another by tapping on links that appear on-screen as arrows pointing in various navigable directions.

**Figure 55: Street-level imagery at San Francisco**



The key concepts covered in this section include:

- how to display the street-level coverage on a map
- how to display the street-level imagery in an Android application
- how to select the displayed street-level location
- how to add, remove and interact with components of the street-level scene

The street-level imagery APIs follow a similar design as the mapping classes: `StreetLevelFragment` acts as a View, and `StreetLevelModel` act as a Model in a Model-View-Controller (MVC) pattern. You can create a controller class to coordinate interactions using custom logic.

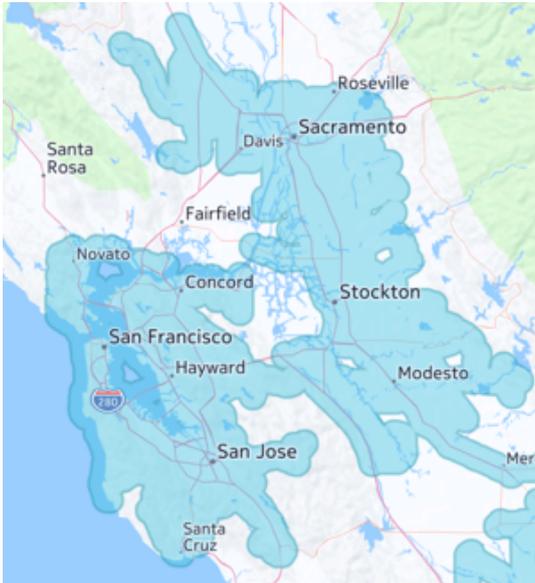
## Coverage

Street-level imagery is available in more than ninety cities. To display the street-level imagery coverage area on a map, the `Map.setStreetLevelCoverageVisible(boolean)` method from the `com.here.android.mpa.mapping.Map` class can be used as described in the code snippet below. The area where the imagery is available is highlighted on the map.

```
//Assume that map is instantiated
```

```
map.setStreetLevelCoverageVisible(true);
```

Figure 56: Map of San Francisco



## Using Street-level Imagery

This section describes how to enhance an application by displaying the appropriate street-level imagery when a user taps on a location on a map. Map data for a specified location must be already downloaded and available before the imagery is requested for that location. This is achieved by displaying the map for that location first, or by pre-downloading the map data for that region.

The first step to integrate street-level imagery into an application is to insert a `StreetLevelFragment` into a view layout. This is accomplished by adding `com.here.android.mpa.streetlevel.StreetLevelFragment` to the Android XML layout file as per the following example. `StreetLevelFragment` is a standard Android `Fragment`-derived component that enables the display and gesture interactions with street-level scenes.

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:id="@+id/streetlevel_layout"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical">

    <fragment
        class="com.here.android.mpa.streetlevel.StreetLevelFragment"
        android:id="@+id/streetlevelfragment"
        android:layout_width="fill_parent"
        android:layout_height="fill_parent"
        android:layout_weight="1"/>
    ...
</LinearLayout>
```

After adding a `StreetLevelFragment` to the layout, the fragment must be initialized by calling the function `StreetLevelFragment.init(OnEngineInitListener)`. During initialization, a default `StreetLevelModel` is created and associated to the street-level fragment. Street-level imagery can be

enhanced by displaying an arrow to show the possible navigation directions. This is achieved by adding an image (for example: an arrow) to the street-level model and making it visible, as shown below:

```

...
streetLevelFragment = (StreetLevelFragment) getFragmentManager()
    .findFragmentById(R.id.streetlevelfragment);
streetLevelFragment.init(new OnEngineInitListener() {
    @Override
    public void onEngineInitializationCompleted(OnEngineInitListener.Error error) {
        if (error == OnEngineInitListener.Error.NONE) {
            com.here.android.mpa.common.Image arrow = new com.here.android.mpa.common.Image();
            try {
                arrow.setImageResource(R.drawable.panoarrow);
            } catch (IOException e) {
                //handle error
                e.printStackTrace();
            }
            streetLevelFragment.getStreetLevelModel().setNavigationArrow(arrow);
            streetLevelFragment.getStreetLevelModel()
                .setNavigationArrowVisible(true);
            streetLevelFragment.getStreetLevelModel().setOverlayTransparency(
                0.5f);
        }
    }
});
...

```

The logic required to launch street-level imagery for a particular user-selected map location is illustrated in the following `MapGesture.OnGestureListener.onTapEvent(PointF p)` method. First, the street-level scene for the specified location is retrieved by calling the `StreetLevelModel.getStreetLevel(GeoCoordinate center, int searchRadius)` method. This method searches for the street level that is closest to the specified coordinate. The search area around the coordinate is defined by the `searchRadius` which is expressed in meters. The street-level imagery for the specified location is then rendered by calling `StreetLevelModel.moveTo(StreetLevel streetLevel, boolean animation, float heading, float pitch, float zoom)`.

```

// Map event listener
private MapGesture.OnGestureListener mapGestureListener =
    new MapGesture.OnGestureListener() {
        ...
        @Override
        public boolean onTapEvent(PointF p) {
            final StreetLevelFragment streetLevelFragment =
                (StreetLevelFragment) getFragmentManager()
                    .findFragmentById(R.id.streetlevelfragment);
            if (streetLevelFragment.getStreetLevelModel() != null) {
                GeoCoordinate coordinate = map.pixelToGeo(p);
                // Get street level meta data
                StreetLevel level =
                    streetLevelFragment.getStreetLevelModel()
                        .getStreetLevel(coordinate, 100);
                if (level != null) {
                    // Render street level imagery
                    streetLevelFragment.getStreetLevelModel().moveTo(
                        level, false, map.getOrientation(), 0, 1.0f);
                }
            }
            return false;
        }
    }
...

```

```
};
```

## Issue-Reporting Link

To comply with government regulations, street-level imagery in the HERE SDK is always accompanied by a link to report incorrect imagery and privacy concerns. By default, the issue-reporting link is displayed in English. If the user's device language is set to French or German, then the issue-reporting link appears in these languages.

- **Note:** It is a requirement for the issue-reporting link to be unobscured while street-level imagery is visible.

## Using Gestures in a Street-level Scene

Street-level imagery supports the following default gestures:

- Rotate: Pan the Street-level view to rotate or change the pitch
- Pinch/Spread to Zoom: Zoom out or zoom in by respectively, pinching or spreading two fingers being held on the screen
- Single Tap: Select and highlight the object tapped
- Double Tap: Move to a new location with the center in the vicinity of where the screen was tapped.

The `StreetLevelGesture` class allows an app to enable, disable, and handle gestures in a street-level scene. `StreetLevelGesture` is used in a similar manner as the `MapGesture` class. To use it, call `StreetLevelFragment.getStreetLevelGesture()` to retrieve the associated object instance, then use setter methods (such as `setPinchEnabled(false)`) to disable any unwanted gestures.

- **Note:** By default, rotation, pinch, single-tap and double-tap are enabled in `StreetLevelGesture`.

As with `MapGesture.OnGestureListener`, you can add custom logic to handle street-level gestures by implementing `StreetLevelGesture.OnGestureListener`. The `OnGestureListener` class contains methods such as `onPinchZoom` that are called when a user performs the particular gesture. As with `MapGesture.OnGestureListener`, you can allow or prevent the default gesture behavior to be performed after your implemented callback by returning a boolean value.

```
private StreetLevelGesture.OnGestureListener myStreetLevelGestureListener =
    new StreetLevelGesture.OnGestureListener() {
    ...
    @Override
    public boolean onObjectsSelected(List<StreetLevelSelectedObject> selectedObjects) {
        boolean consumed = false;

        for (StreetLevelSelectedObject o : selectedObjects) {
            if (o != null) {
                ViewObject vo = (ViewObject) o.getObject();
                if (vo instanceof StreetLevelBuilding) {
                    StreetLevelBuilding b = (StreetLevelBuilding) vo;
                    b.setHighlight(0.5f);

                    consumed = true;
                    break;
                }
            }
        }
        return consumed;
    }
}
```

```
...
// implement the other gesture callbacks
}
```

To add the listener to your street-level view, include a call to `addOnGestureListener(StreetLevelGesture.OnGestureListener)` after the street-level fragment has been successfully initialized as follows:

```
...
streetLevelFragment.init(new OnEngineInitListener() {
    @Override
    public void onEngineInitializationCompleted(OnEngineInitListener.Error error) {
        if (error == OnEngineInitListener.Error.NONE) {
            // fragment has been successfully initialized
            if (streetLevelFragment.getStreetLevelGesture() != null) {
                streetLevelFragment.getStreetLevelGesture().addOnGestureListener(
                    myStreetLevelGestureListener);
            }
        }
    }
});
...
```

■ **Note:** Remember to call `removeOnGestureListener(OnGestureListener)` when you no longer need to listen for street-level gesture events to free up application resources.

## OnEventListener Interface

The `StreetLevelModel.OnEventListener` interface represents a listener to provide notification upon completion of a `StreetLevel` event such as user interaction with a street-level object. Relevant `StreetLevelModel` methods that control adding and removing this kind of listener include:

- `StreetLevelModel.addStreetLevelModelListener(OnEventListener);`
- `StreetLevelModel.removeStreetLevelModelListener(OnEventListener)`

Registration of the `OnEventListener` should be performed after the `StreetLevelFragment` is initialized as described in the code snippet below.

```
...
streetLevelFragment = (StreetLevelFragment) getFragmentManager().findFragmentById(
    R.id.streetlevelfragment);
streetLevelFragment.init(new FragmentInitListener() {
    @Override
    public void onFragmentInitializationCompleted(InitError error) {
        if (error == InitError.NONE) {
            StreetLevelModel model =
                streetLevelFragment.getStreetLevelModel();
            if (model != null) {
                model.addStreetLevelModelListener(onEventListener);
            }
        }
    }
});
...
```

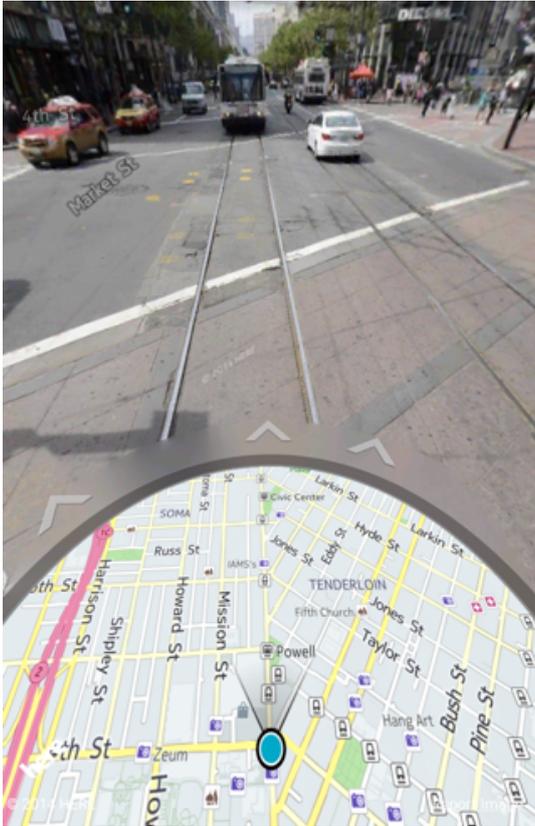
Removing the street-level listener can be performed as described in the code snippet below.

```

...
StreetLevelFragment streetLevelFragment =
    (StreetLevelFragment) getFragmentManager()
        .findFragmentById(R.id.streetlevelfragment);
streetLevelFragment.getStreetLevelModel()
    .removeStreetLevelModelListener(onEventListener);
...

```

## Compass Map



By default, a circular map view called a Compass Map is presented with street-level imagery. Users can view it by panning a street-level view downward towards the ground. Compass Map provides users with their direction and location context while they are viewing the street-level scene. Users cannot directly manipulate a Compass Map, but changes from panning or navigating the street-level imagery are immediately reflected in it.

To disable the Compass Map, use the `setCompassMapVisible(boolean)` method in `StreetLevelModel`.

## Street-Level Objects

The street-level API exposes access and allows interaction with two different types of objects that are part of the street-level scene:

- `PROXY_OBJECT` - provided automatically in the street-level scene when it is displayed.
- `USER_OBJECT` - provided by the application and can be added in to the street-level scene.

The supported street-level proxy objects are:

- `StreetLevelBuilding` - a building that is visible in the street-level scene

- `StreetLevelLink` - a navigation arrow that can be clicked by the user to navigate from one panorama to another

The following code snippet highlights the selected building from a street-level scene. All the logic is implemented in the

`StreetLevelGesture.OnGestureListener.onObjectsSelected(List<StreetLevelSelectedObject> selectedObjects)` method.

```
private StreetLevelGesture.OnGestureListener listener
= new StreetLevelGesture.OnGestureListener() {

    ...
    @Override
    public boolean onObjectsSelected
        (List<StreetLevelSelectedObject> selectedObjects) {
        boolean consumed = false;

        for (StreetLevelSelectedObject object : selectedObjects) {
            if (object != null) {
                ViewObject viewObject = (ViewObject) object.getObject();
                if (viewObject instanceof StreetLevelBuilding) {

                    StreetLevelBuilding building
                        = (StreetLevelBuilding) viewObject;
                    building.setHighlight(0.5f);
                    consumed = true;
                    break;
                }
            }
        }
        return consumed;
    }
    ...
};
```

The supported street-level user objects are:

- `StreetLevelIcon` - an image that has a specified location on the street level map
- `StreetLevelBillboard` - a billboard that has a specified location on the street-level map

**Note:** Both objects can also be attached to a `StreetLevelBuilding`.

The major differences between these objects are the way the size is specified and how they are rendered when a zoom operation is performed. The billboard has the size specified in meters so it is always rendered relative to the size of the building, while the `StreetLevelIcon` has the size specified in pixels and has a `StreetLevelIconSize.ScalePolicy` to define the rendering size. Relevant `StreetLevelModel` methods that control adding and removing street-level objects are:

- `StreetLevelModel.addStreetLevelObject(StreetLevelObject streetLevelObject)`
- `StreetLevelModel.removeStreetLevelObject(StreetLevelObject streetLevelObject)`

The easiest way to enhance an application by displaying a street-level user object is to create the object, set the content (desired image) and properties (image size and building identifier) and add it to the street-level model as described in the code snippet below.

```
@Override
public boolean onObjectsSelected(List<StreetLevelSelectedObject> selectedObjects) {
    boolean consumed = false;
```

```

for (StreetLevelSelectedObject object : selectedObjects) {
    if (object != null) {
        ViewObject viewObject = (ViewObject) object.getObject();
        if (viewObject instanceof StreetLevelBuilding) {
            StreetLevelBuilding building = (StreetLevelBuilding) viewObject;
            building.setHighlight(0.5f);
            consumed = true;
            // Create Image
            com.here.android.mpa.common.Image streetLevelImage =
                new com.here.android.mpa.common.Image();
            try {
                streetLevelImage.setImageResource(
                    R.drawable.streetLevelIconImage);
            } catch (Exception io) {
                System.out.println(
                    "ERROR: Cannot create street " + "level icon image");
            }
            // Create Icon and set properties
            StreetLevelIcon streetLevelIcon = new
                StreetLevelIcon(building.getPosition(),streetLevelImage);

            StreetLevelIconSize size = new StreetLevelIconSize(100,100);
            streetLevelIcon.setSize(size);
            streetLevelIcon.setAttachmentIdentifier(building.getIdentifier());
            // Add icon to the street level
            streetLevelModel.addStreetLevelObject(streetLevelIcon);
            break;
        }
    }
}
return consumed;
}

```

- **Note:** It is not necessary to have both the `StreetLevelFragment` and the `MapFragment` in the same activity. However, before a `StreetLevelFragment` can be used, the area to be displayed in the `StreetLevelFragment` must be previously shown on the `Map` in order for the related data to be downloaded onto the device.

## Placing Street-level Objects

The HERE Android SDK also allows you to control the placement of a street-level object. For example, you may wish to put a large billboard to cover the entire side of a building, or you may want a small icon in the middle of a road. Whether it is a billboard or an icon, you can use the `StreetLevelIconPlacement` class to control how your street-level object is presented to the user.

The first step to place your object is to determine whether your street-level object is attached to a building, or placed according a geocoordinate location.

- For objects attached to a building, call `setAttachmentIdentifier(Identifier)` with a building Id.
- For objects not attached to a building, the HERE SDK places the object at its geocoordinate position. You can optionally call `setAnchorPoint(PointF)` to indicate which part of the billboard is used as the anchor, hovering exactly over the specified geocoordinate position.

- **Note:** Using the `StreetLevelIconPlacement.HorizontalPlacement.DEFAULT` placement mode places the object at its geocoordinate position, even if `setAttachmentIdentifier()` has been set.

Next, call the `StreetLevelIconPlacement` constructor to create a `StreetLevelIconPlacement` object, and call `setPlacementMode()` to set it to the street-level object. See the following tables to see descriptions of the valid vertical and horizontal placement modes.

VerticalPlacement value	Notes
TERRAIN	The vertical placement height parameter is evaluated as meters above the current terrain.
ATTACHMENT	Used with objects that are attached to buildings. The height parameter is evaluated as a ratio of the building height, with 0 indicating the ground level, and 1 being the top of the building.
FACADE	Used with <code>HorizontalPlacement.FACADE</code> . Refer to the table below. (If this value is used with another horizontal placement mode, the HERE SDK treats it as <code>HorizontalPlacement.TERRAIN</code> .)
DEFAULT	The vertical placement height parameter is evaluated as meters above sea level.

HorizontalPlacement value	Notes
FACADE	<ul style="list-style-type: none"> <li>Used for objects attached to buildings</li> <li>Places the street-level object on the side of the building that is most visible to the camera</li> <li>Object placement is updated as the camera moves</li> <li>Using it with <code>VerticalPlacement.FACADE</code> places the object at a height as defined by you or the HERE SDK, whichever is higher</li> </ul>
SURFACE	<ul style="list-style-type: none"> <li>Used for objects attached to buildings</li> <li>"Snaps" object to the closest point on the building, as determined by the object's geocoordinate position</li> <li>Object is viewable through the attached building's faces (For example, an object that has "snapped" to building face A is viewable through building face B, even if A is obstructed)</li> </ul>
TRACK_CAMERA	<ul style="list-style-type: none"> <li>Used for objects not attached to buildings</li> <li>Object is placed at the camera location. The object's geocoordinate is ignored</li> <li><code>VerticalPlacement</code> mode is ignored, regardless of the set value</li> <li>Vertical placement height is evaluated as meters above or below the camera</li> </ul>
CENTROID	<ul style="list-style-type: none"> <li>Used for objects attached to buildings</li> <li>Can only be used for icons, not billboards</li> <li>When used, icon is placed as if it is in the center of the attached building</li> <li>You can see the icon through the faces of the attached building</li> </ul>
DEFAULT	<ul style="list-style-type: none"> <li>The object is placed at its geocoordinate position, even if it is associated with a building.</li> </ul>

## Orienting Street-level Objects

You can control the orientation of street-level billboards by using the `StreetLevelBillboardOrientation` class. To use this class, call its constructor to create an object instance, and then set it to your billboard object using `StreetLevelBillboard.setOrientation()`.

The `StreetLevelBillboardOrientation` constructor has three arguments: an orientation mode enum, a normal vector indicating how the billboard is oriented, and an up vector indicating how the billboard stands. Vectors may be ignored depending on the orientation mode.

The following is a list of the possible orientation mode values:

- **FIXED** - Orients the billboard according to a normal and up vector.
- **VERTICAL\_FIXED** - The billboard is always upright. The horizontal orientation of the billboard is set according to a normal vector.
- **BILLBOARD** - The billboard is always upright and oriented towards the camera.

## Turn-by-Turn Navigation for Walking and Driving

---

**Note: [Important]** Application developers using the Turn-by-turn Guidance APIs are required to thoroughly test their applications in all expected usage scenarios to ensure safe and correct behavior. Application developers are responsible for warning their users of the following obligations:

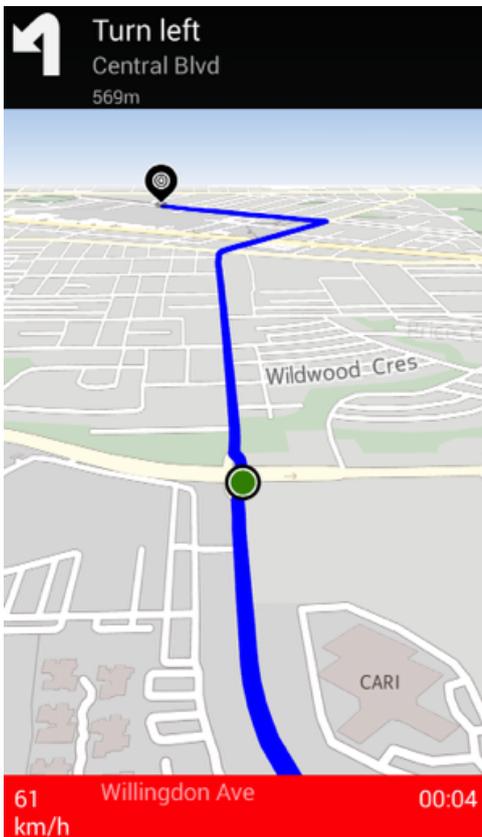
1. Do not follow instructions that may lead to an unsafe or illegal situation
2. Obey all local laws.
3. Be aware that using a mobile phone or some of its features while driving may be prohibited.
4. Always keep hands free to operate the vehicle while driving.
5. The first priority while driving should be road safety.

The HERE Android SDK supports navigation on pedestrian, truck, and car routes. Using this feature, your app can check the current device position against a calculated route and get just-in-time navigational instructions. Both visual and audio instructions are supported.

The HERE Android SDK can also track the current position and display it on the map without a calculated route.

- ☰ **Note:** Your application should switch to the navigation-specific map schemes while performing navigation. For more information on using these schemes, see [Map Schemes](#) on page 30.

**Figure 57: Turn-by-turn Navigation with Speed Warning**



- ☰ **Note:** `MapEngine.getInstance().onResume()` should be called when the engine is required for headless navigation operations. (For example, if you are providing your own map tiles.) This puts the engine in the "active state". `MapEngine.getInstance().onPause()` puts the engine into a suspended state and release cached in memory data. The `onResume()` and `onPause()` methods are reference-counted and should be called an equal number of times.

## The NavigationManager Class

The `NavigationManager` class is responsible for providing voice and visual instructions to the user while driving or walking. An instance of `NavigationManager` can be retrieved using `NavigationManager.getInstance()`. It should be associated with a map with the `setMap(Map)` method before navigation is started.

Navigation can be started in three different modes:

- Simulation Mode - `simulate(Route, long)` - This mode does not require any GPS data from the device, as the position is simulated along the given route.
- Navigation Mode - `startNavigation(Route)` - This mode takes the calculated route and matches the position against the route. Before using this mode, `PositioningManager` is required to be running using GPS data.
- Tracking Mode - `startTracking()` - This mode does not require a calculated route, as it only tracks and shows the current position on the map.

- **Note:** The Android permission `android.permission.ACCESS_FINE_LOCATION` is required to use the `NavigationManager`. Otherwise, the class returns `Error.POSITIONING_FAILED`. In addition, to ensure that the app receives location updates, the user needs to have the Location permission enabled (toggled to "on") during runtime.

The following is an example of performing navigation on a calculated route:

```
NavigationManager navigationManager = NavigationManager.getInstance();

//set the map where the navigation will be performed
navigationManager.setMap(getMap());

// if user wants to start real navigation, submit calculated route
// for more information on calculating a route, see the "Directions" section
NavigationManager.Error error = navigationManager.startNavigation(route);
```

- **Note:** During a navigation session, it is recommended that you handle gestures by calling `NavigationManager.setMapUpdateMode(MapUpdateMode.NONE)`. This stops the map from moving, but it does not affect position indicator movement and voice navigation. To re-enable map movement, call `NavigationManager.setMapUpdateMode(MapUpdateMode)` with the previous update mode enum, such as `MapUpdateMode.ROADVIEW`.

## Background Navigation

If you are using the Turn-by-Turn Navigation Mode for driving, you can also set the HERE SDK to perform guidance (including voice instructions and event callbacks) while the app is in the background. However, unlike the foreground navigation scenario, HERE SDK does not stream map data during background navigation. To properly support background navigation, HERE SDK requires your app to preload map data (such as for the current city or state) using the [MapLoader](#) class.

## Map Matching During Navigation

Map Matching is automatically enabled in both navigation mode and tracking mode. In simulation mode, the map-matched position is simulated along the route with a user-defined speed.

## Tunnel Extrapolation

Tunnel extrapolation is also performed internally by `NavigationManager`. It uses the last available position data, which contains speed, orientation and `GeoCoordinate`, to estimate the position of your vehicle inside a tunnel. If your application listens to position updates from `NavigationManager.PositionListener`, there are regular position updates during tunnel extrapolation. However, if your application also listens to the `onPositionFixChanged()` callback from `PositioningManager.OnPositionChangeListener`, then it receives this callback, signifying a position fix change. (For more information on the `OnPositionChangeListener`, see the [Positioning](#) section.) If the road element at position contains the `tunnel` attribute, it implies that the current location is provided by tunnel extrapolation. Position updates during tunnel extrapolation should be treated the same way as regular updates.

The following sample code demonstrates how to determine if tunnel extrapolation is active:

```
// At startup, have a member variable position manager setup
// and listening to events
positioningManager = PositioningManager.getInstance();
```

```
positioningManager.addListener(  
    new WeakReference<PositioningManager.OnPositionChangedListener>(this);  
positioningManager.start(LocationMethod.GPS_NETWORK);  
  
.....  
  
// upon callback, determine if tunnel extrapolation is active  
  
public void onPositionFixChanged(LocationMethod method, LocationStatus status) {  
    if (method == LocationMethod.GPS) {  
        boolean isExtrapolated =  
            ((positioningManager.getRoadElement() != null) &&  
            ((positioningManager.getRoadElement().getAttributes()  
                .contains(RoadElement.Attribute.TUNNEL))));  
        boolean hasGps = status == LocationStatus.AVAILABLE;  
    }  
}
```

## Natural Guidance

The `NavigationManager.setNaturalGuidanceMode()` method can be used to enable natural guidance. Natural guidance refers to a type of dynamic information available during navigation where route guidance instructions contain contextual elements around a decision point. These contextual elements may include services, catographic features, traffic signals, and stop signs. Some examples of natural guidance instructions are:

- "Go past the park on your right, then turn left at Anderson school on Bayview street"
- "Go through the traffic light and turn right before the petrol station"
- "Continue on your route, passing the dome building on your right"

Three options are available for natural guidance, and they are defined by the `NavigationManager.NaturalGuidanceMode` enumerations. Note that `STOP_SIGN`, `TRAFFIC_LIGHT` and `JUNCTION` can be used together. To disable natural guidance, call the `setNaturalGuidanceMode(EnumSet<NaturalGuidanceMode>)` method with an empty `EnumSet`.

- `TRAFFIC_LIGHT` - Natural guidance for traffic lights
- `STOP_SIGN` - Natural guidance for stop signs
- `JUNCTION` - Natural guidance for junctions such as landmarks

To use the natural guidance feature, set your voice package to the map display language. Also, to get the best results, use the appropriate voice package for the current location. For example, use the French voice package in the city of Paris. Natural guidance currently supports the following text-to-speech voice packages:

- U.S. English
- U.K. English
- Italian
- Spanish
- German
- French

## Navigation Events

### NavigationManager Listeners

The `NavigationManager` contains a number of listeners that are responsible for monitoring navigation status and getting instructions during navigation. The following table shows the name of the available listeners and the information provided them.

Listener Name	Purpose
<code>PositionListener</code>	Whether the current position has updated
<code>NavigationManagerEventListener</code>	Whether the navigation session has started, updated, or ended
<code>NewInstructionEventListener</code>	Whether a new navigation instruction is available to be fetched
<code>GpsSignalListener</code>	Whether the system has lost its GPS signal
<code>RerouteListener</code>	Whether a route recalculation has begun as a result of the current position deviating from the original route
<code>TrafficRerouteListener</code>	Whether a route recalculation to avoid traffic has begun
<code>SpeedWarningListener</code>	Whether the user has exceeded the speed limit
<code>SafetySpotListener</code>	Whether safety spots, such as speed cameras and red light cameras, are upcoming
<code>LaneInformationListener</code>	Whether lane information should be presented
<code>RealisticViewListener</code>	Listens for events related to a realistic view image
<code>AudioFeedbackListener</code>	Whether a voice command or vibration alert is available

Listener instances can be added to `NavigationManger` through their respective add and remove methods. For example, the `LaneInformationListener` can be added and removed by using `addLaneInformationListener(WeakReference<LaneInformationListener>)` and `removeLaneInformationListener(WeakReference<LaneInformationListener>)`.

**Note:** `NavigationManager.SpeedWarningListener` only returns car speed warnings. Truck speed warnings are not currently supported.

### New Instructions and Maneuvers

The `Maneuver` class represents the action required to go from one segment to the next within a calculated `Route`. Each `Maneuver` object provides information such as:

- Location of the maneuver
- Action required to complete the maneuver
- Distance between maneuvers
- Current road
- Next road
- Estimated times of the maneuver
- Signposts (if any) indicating entrance, exit, or merge information

The `NavigationManager` provides a new `Maneuver` object after every `onNewInstructionEvent()` callback. You can implement `NewInstructionEventListener` and implement this callback to provide display logic. For example:

```
@Override
public void onNewInstructionEvent() {
    Maneuver maneuver = navigationManager.getNextManeuver();
    if (maneuver != null) {
        if (maneuver.getAction() == Maneuver.Action.END) {
            //notify the user that the route is complete
        }

        //display current or next road information
        //display maneuver.getDistanceToNextManeuver()
    }
}
```

## Rerouting

While navigation is in progress, the following three types of rerouting can occur:

- **Basic Route Recalculation** - This is performed automatically by the guidance engine. The guidance engine checks the current position to see if it is on the route and approaching the target destination. If it is not, then it triggers a route recalculation and updates the navigation session. The `RerouteListener.onRerouteBegin()` and `RerouteListener.onRerouteEnd()` callbacks also occur.
- **Dynamic Traffic Reroute** - This mode is enabled by default. In this mode, the HERE SDK regularly requests a traffic-aware route recalculation from the server, and the navigation manager switches to this route automatically. For more information, see [Traffic-Aware Navigation](#) on page 155.
- **Manual Traffic Reroute** - This mode can be optionally enabled. In this mode, the HERE SDK also requests a traffic-aware route recalculation from the server, but it notifies the client before using the new route in the navigation manager. For more information, see [Traffic-Aware Navigation](#) on page 155.

## Lane Information

`NavigationManager.LaneInformationListener` provides the `onLaneInformation(List<LaneInformation>, RoadElement)` callback method. This callback occurs when the user has arrived at a point in the route where lane information should be presented, such as before a highway exit. The `LaneInformation` class represents a lane turn direction and whether this lane is on the current route. For example, an application may receive the `onLaneInformation(List<LaneInformation>, RoadElement)` callback as the user navigates to an intersection. If the route requires a left turn, and the current road has three lanes—a left-turn lane and two straight lanes—then the callback returns with three `LaneInformation` objects. Since `LaneInformation` objects are always returned in the callback method in a left-to-right order, the first `LaneInformation` has a direction of `LEFT` and `LaneInformation.getRecommendationState()` returns a recommendation on whether the lane can be taken for the current route. If there isn't enough data to determine whether the lane is on or off-route, `getRecommendationState()` returns `NOT_AVAILABLE`.

## Realistic View: 2D Signposts and Junction View

In addition to the data offered through the Lane Info feature, the HERE Android SDK also offers image previews of signposts and junctions on certain highways. These two features together are known as Realistic View.

Figure 58: An Example of a 2D Signpost

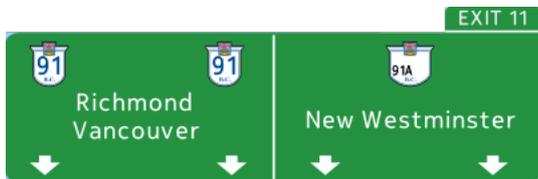


Figure 59: An Example of a Junction View



The 2D Signpost feature provides images that illustrate road signposts. For example, as a user approaches a fork on a highway, your application can use show a preview of the instruction signs above the highway. The Junction View feature provides images that illustrate road junctions. For example, as a user approaches a junction on a highway, your application can show the lanes near the junction, with indicator arrows highlighting the correct lane to take. Signpost and junction view images are provided as SVG images through the following `RealisticViewListener` callback methods, which occur just after the previous maneuver and before entering the junction:

- `onRealisticViewShow(AspectRatio, Image, Image)`
- `onRealisticViewNextManeuver(AspectRatio, Image, Image)`

Realistic view is disabled by default. To enable it, call `NavigationManager.setRealisticViewMode(RealisticViewMode)` and set the view mode to `RealisticViewMode.DAY` or `RealisticViewMode.NIGHT`. Next, register the desired image aspect ratios by using `addRealisticViewAspectRatio(AspectRatio ratio)`. After adding your listener implementation, your application begins to receive the above event callbacks as the HERE SDK arrives to a highway section that supports Realistic View.

**Note:** It is possible to add multiple aspect ratios and receive multiple images of the same signpost or junction view.

The following is an example of `onJunctionViewShow()` and enabling realistic view:

```
// In the RealisticViewListener implementation
public void onRealisticViewShow(AspectRatio ratio, Image junction, Image signpost) {
    if (junction.getType() == Image.Type.SVG) {
        // full size is too big (will cover most of the screen), so cut the size in half
        Bitmap bmpImage = junction.getBitmap((int) (junction.getWidth() * 0.5),
            (int) (junction.getHeight() * 0.5));
        if (bmpImage != null) {
            //
            // show bmpImage on-screen
            //
        }
    }
}
```

```
}  
...  
}
```

```
navigationManager.setRealisticViewMode(NavigationManager.RealisticViewMode.DAY);  
navigationManager.addRealisticViewAspectRatio(AspectRatio.AR_4x3);  
navigationManager.addRealisticViewListener(  
    new WeakReference<NavigationManager.RealisticViewListener>(viewListener));
```

## Voice Instructions

You can use voice instructions with turn-by-turn navigation. Voice instructions are offered in a variety of languages, which are available through downloadable text-to-speech (TTS) and pre-recorded voice skins. Pre-recorded voice skins provide basic maneuver instructions, such as "turn right in 300 meters", while text-to-speech voices also supports spoken street names, such as "turn right in 300 meters onto Granville Street".

You can check [Navigation Voices](#) on page 234 for a list of the supported voices in the HERE SDK.

Voice skins information and voice skins downloads can be managed through the voice catalog. The following section describes how you can use the voice catalog, download voice skins, and use a voice skin with turn-by-turn navigation.

- **Note:** Voice instructions are only supported in Navigation Mode for driving. Users of the pedestrian Navigation Mode receive audio beeps and vibrations alerts at the change of each maneuver.
- **Note:** Voice navigation with routes that contain via waypoints is only supported through pre-recorded voices.

### The VoiceCatalog Class

The `VoiceCatalog` class is used to access voice skin files from the local device. A `VoiceCatalog` object instance can be retrieved by calling `VoiceCatalog.getInstance()`. Then, using `getLocalVoiceSkins()` method, you can fetch a list of `VoiceSkin` files that are stored on the device.

Be sure to check if `VoiceCatalog.getCatalogList()` is empty. Since the voice catalog is downloaded based on the current device language, changing the device language causes an empty list of downloadable voice skins. When this happens, the user needs to re-download the voice catalog.

- **Note:** A set of sample voice skins are packaged with the HERE Android SDK in the **{HERE Android SDK}.zip/misc** directory. To deploy these voice skins into your test device, extract the `voiceskins.tar.gz` file, then call the following ADB command from the parent folder of the `voices` folder:

```
adb push voices /sdcard/Android/data/{YourAppNamespace}/files/voices-download
```

### The VoicePackage Class

The `VoicePackage` class represents an entry within the voice catalog. Each voice package shares a common ID value with a downloadable voice skin. You can use this class to display information about the voice skin before launching a download.

A list of `VoicePackage` can be accessed by using the `VoiceCatalog.getCatalogList()` method.

## The VoiceSkin Class

The `VoiceSkin` class encapsulates voice-generation scripts. The scripts are used to generate voice instructions for navigation. A voice skin is language-specific and can either support Text-to-Speech or voice audio files. Multiple voice skins can be loaded to the device, but only one can be selected for navigation voice playback.

A list of loaded `VoiceSkin` instances can be accessed by using the `VoiceCatalog` singleton instance. Each `VoiceSkin` can be fetched by the `getLocalVoiceSkins()` method. Voice skins can be passed to `NavigationManager` by calling `NavigationManager.setVoiceSkin(VoiceSkin)`.

## Selecting a Voice Skin and Starting Navigation

The following is an example of how to start navigation using a calculated route and an English text-to-speech voice skin:

1. Get a `NavigationManager` by calling `NavigationManager.getInstance()`

```
// Declare the navigationManager member variable
private NavigationManager navigationManager = null;
...
...
// Get the NavigationManager
navigationManager = NavigationManager.getInstance();
```

2. Get a calculated Route from `CoreRouter`. Refer to the code samples in the [Routing](#) section.
3. Declare `NewInstructionEventListener` and `PositionListener` member variables

```
// declare the listeners
// add application specific logic in each of the callbacks.

private NavigationManager.NewInstructionEventListener instructListener
= new NavigationManager.NewInstructionEventListener() {

    @Override
    public void onNewInstructionEvent() {
        // Interpret and present the Maneuver object as it contains
        // turn by turn navigation instructions for the user.
        navigationManager.getNextManeuver();
    }
};

private NavigationManager.PositionListener positionListener
= new NavigationManager.PositionListener() {

    @Override
    public void onPositionUpdated(GeoPosition loc) {
        // the position we get in this callback can be used
        // to reposition the map and change orientation.
        loc.getCoordinate();
        loc.getHeading();
        loc.getSpeed();

        // also remaining time and distance can be
        // fetched from navigation manager
        navigationManager.getTta(TrafficPenaltyMode.DISABLED, true);
        navigationManager.getDestinationDistance();
    }
};
```

#### 4. Add the listeners to NavigationManager to listen to the callbacks

```
// start listening to navigation events
navigationManager.addNewInstructionEventListener(
    new WeakReference<NewInstructionEventListener>(instructListener));
```

```
// start listening to position events
navigationManager.addPositionListener(
    new WeakReference<PositionListener>(positionListener));
```

#### 5. Retrieve the VoiceCatalog and download the latest updates.

```
VoiceCatalog voiceCatalog = VoiceCatalog.getInstance();
voiceCatalog.downloadCatalog(new OnDownloadDoneListener() {
    @Override
    public void onDownloadDone(Error errorCode) {
        if (errorCode == Error.NONE) {
            // catalog download successful
        }
    }
});
```

#### 6. Using the voice catalog, find the desired voice package. In this example, choose "English TTS" from the voice catalog.

```
// Get the list of voice packages from the voice catalog list
List<VoicePackage> voicePackages = VoiceCatalog.getInstance().getCatalogList();

long id = -1;

// select
for (VoicePackage vPackage : voicePackages) {
    if (vPackage.getMarcCode().compareToIgnoreCase("eng") == 0) {
        if (vPackage.isTts()) {
            id = vPackage.getId();
            break;
        }
    }
}
```

**Note:** Some voice packages in the voice catalog may not be supported by the installed TTS engine. You can check whether the language is supported by using the `isLanguageAvailable(Locale)` method in `android.speech.tts.TextToSpeech`.

#### 7. If the ID of the voice package does not match an item in the list of installed voice skins, install it. When the installation operation completes, a callback to the `onDownloadDone(Error)` method occurs.

```
if (!voiceCatalog.isLocalVoiceSkin(id))
{
    voiceCatalog.downloadVoice(id, new OnDownloadDoneListener() {
        @Override
        public void onDownloadDone(Error errorCode) {
            if (errorCode == Error.NONE){
                //voice skin download successful
            }
        }
    });
}
```

#### 8. Start navigation according to user selection. Navigation can be started in three different modes, but only one of them can be started at a time:

```
// if user wants to start simulation,  
// submit calculated route and a simulation speed in meters per second  
error = navigationManager.simulate(route, 60);  
  
// set the voice skin for use by navigation manager  
navigationManager.setVoiceSkin(voiceCatalog.getLocalVoiceSkin(id));
```

9. If the user decides to abort navigation, call `stop()`.

```
// abort navigation  
navigationManager.stop();
```

## Traffic-Aware Navigation

With the HERE SDK, developers can enable turn-by-turn route navigation that takes live traffic information into account. `NavigationManager.setTrafficAvoidanceMode()` can be used to set the way in which traffic should be handled during navigation.

Three modes are available for traffic avoidance, and they are defined by the following `NavigationManager.TrafficAvoidanceMode` enumerations. The default mode is `DISABLE`.

- **DYNAMIC** - Performs traffic-aware rerouting without user input.  
In this mode, the guidance engine performs periodic route calculations while the device is online. A route calculation is a server request where the server finds the most optimal route by avoiding traffic congestions and calculating speed limits. If the calculated route is different from the current route, the navigation manager automatically switches to the new route. It also triggers the `NavigationManager.NavigationManagerEventListener.onRouteUpdated(Route)` callback method.  
 **Note:** You can set the frequency of the route request by using `NavigationManager.setRouteRequestInterval()`.
- **MANUAL** - Provides notifications about upcoming traffic incidents and requires user confirmation before rerouting. For more information, see the next section.
- **DISABLE** - Disables traffic-based rerouting.

### Manual Traffic-Based Rerouting

If the device is online and `NavigationManager.TrafficAvoidanceMode.MANUAL` is selected, the guidance engine considers all incoming traffic event within proximity and checks if the event is on the current route route, and whether the route is reroutable. If these conditions are true, the engine triggers a route calculation. You can listen to this recalculation event by implementing the `onTrafficRerouteBegin(TrafficNotification)` method in `TrafficRerouteListener`.

Route recalculation is a server request where the server finds the most optimal route by avoiding live traffic congestions and calculating road speed limits. If the calculated route is different from the current route, the new route is returned through the `NavigationManager.TrafficRerouteListener.onTrafficRerouted(Route)` callback method. A voice note is also played by the guidance engine. You can then set the new Route to the `NavigationManager` manually.

## The TrafficWarner Class

The `TrafficWarner` class is responsible for enabling and handling traffic notifications. Traffic notifications occur if there is a traffic event on the current route and the user's current position is near the event.

To retrieve an instance of the `TrafficWarner` object, call `NavigationManager.getTrafficWarner()`. You then can call `TrafficWarner.init()` to initialize and start the `TrafficWarner`.

One or more of the following methods can be used to operate traffic warner, or to retrieve further information about traffic notifications:

- `isAhead(TrafficNotification)` - determines whether or not a traffic notification is ahead of the last callback position
- `isOnRoute(Route, TrafficNotification)` - determines if a traffic notification is on a given route
- `isValid()` - determines if the traffic warner is valid
- `setAskAvoidOutput(TrafficNotification)` - sets the output of the traffic notification to "Do you want to avoid..?"
- `setInformAvoidOutput(TrafficNotification)` - sets the output of the traffic notification to "You are rerouted because of..."
- `stop()` - stops the traffic warner
- `start()` - starts the traffic warner

To listen for traffic notifications, a listener must be added via `TrafficWarner.addListener()`.

## The TrafficNotification and TrafficNotificationInfo Classes

`TrafficWarner.Listener` provides a callback that returns a `TrafficNotification` object that is relevant to the current navigation session. This `TrafficNotification` contains a list of `TrafficNotificationInfo` instances associated with the traffic notification, retrievable through `TrafficNotification.getInfoList()`.

The `TrafficNotificationInfo` class encapsulates the details of a traffic notification.

`TrafficNotificationInfo.Type` defines the type of traffic notification with regards to the current route.

The following methods can be used to retrieve details about a `TrafficNotificationInfo` instance:

- `getType()` - gets the type of traffic notification info
- `getEvent()` - gets the traffic event (`TrafficEvent`) associated with the traffic notification info
- `getDistanceInMeters()` - gets the distance from the last callback position to the traffic notification

# Audio Management

---

## Manage Voice Volume

If your application uses voice navigation, it is recommended that you implement volume ducking and volume control through hardware keys.

Volume ducking is the practice of manipulating volume based on audio focus. It allows another app, such as a phone call, to flag its audio as having higher priority and "takes over" the current device audio. To grant

or request audio focus, call `NavigationManager.AudioPlayer.getStreamId()` to retrieve the current audio stream, and then use it with the Android `AudioManager`. For example:

```
int result = audioManager.requestAudioFocus(afChangeListener,
    NavigationManager.getInstance().getAudioPlayer().getStreamId(),
    AudioManager.AUDIOFOCUS_GAIN_TRANSIENT_MAY_DUCK);
```

By default, the HERE SDK uses `AudioManager.STREAM_MUSIC` as the audio stream. For more information on volume ducking, consult this article: ["Managing Audio Focus"](#).

To control voice navigation volume through hardware keys, call `Activity.setVolumeControlStream(NavigationManager.AudioPlayer.getStreamId())` at an early point in your app's lifecycle. This ensures that presses on the hardware keys modify the volume for the navigation manager's audio stream. For more information on hardware keys and application audio volume, consult this article: ["Controlling Your App's Volume and Playback"](#).

## Overriding Default Audio Playback

The HERE SDK provides a way for you to take over audio playback by the `NavigationManager`. To do this, implement the `AudioPlayerDelegate` class, and call `NavigationManager.AudioPlayer.setDelegate(AudioPlayerDelegate)`. Note that setting a delegate stops all audio and text-to-speech playback by the SDK.

The `AudioPlayerDelegate` interface contains two callback methods. When you are implementing your own delegate, follow these recommendations:

`AudioPlayerDelegate.playText(String)`

- If you are using your own text-to-speech engine, the locale used in the engine should match up with the `VoiceSkin`.
- In most cases, the text can be directly submitted to the engine's playback API. For example, for the Android system text-to-speech engine, you can submit the text to `TextToSpeech.speak(String, int, HashMap)`.
- For the best user experience, the speech rate and pitch should be adjusted.

`AudioPlayerDelegate.playFiles(String[])`

- The list of file paths come in a sequence. The order in the array indicates the exact order the files should be played. The files are single words used for composing commands with numbers and units.
- Since recordings may contain padding in the end, do not play the files in a sequence, as this sounds too slow and robotic. Instead, you can add each file into individual instances of `android.Media.MediaPlayer`, and at almost the end of playback for one file, start the next one in parallel. In this manner, the resulting sentence sounds more natural. The finite timing before the end of playback can be adjusted and experimented to achieve the best user experience.

## Urban Mobility

---

This section provides an overview of the Urban Mobility features in the HERE SDK. These features allow developers to query and use advanced information related to public transit systems.

**Note:** Before using Urban Mobility, be aware of the following:

- All Urban Mobility features is currently offered as a beta feature. APIs may change without notice.
- Access to the Next Nearby Departures, All Next Departures, and Transit Routing features are restricted. Please contact a HERE representative (<https://developer.here.com/contact-us?interest=mobile-sdk#contact-sales>) for more information.

## Coverage Search

Urban Mobility Coverage Search provides detailed information about the regions and cities with public transit data that are supported by HERE SDK. For example, you can get a list of cities that have transit data coverage by using a query request with a search area. You can create this type of request by using `RequestManager.createCityCoverageRequest(ResponseListener<CityCoverageResult>)` to generate a city coverage request object.

```
// Geo coordinate of a reference point
GeoCoordinate coordinates = new GeoCoordinate(40.750488, -73.993546); //somewhere in NY

// listener that will be notified after request is completed
RequestManager.ResponseListener<CityCoverageResult> responseListener = new
RequestManager.ResponseListener<CityCoverageResult>() {
    @Override public void onSuccess(CityCoverageResult searchResult) {
        List<City> foundCities = searchResult.getCities();
        for (City city : foundCities)
        {
            String cityName = city.getDisplayName();
            float percentCovered = city.getQuality();
            // ...
        }
    }
}

@Override public void onError(ErrorCode errorCode, String errorMessage) {
    // report error
}
};

// creating and executing the request
// search coverage by city name
CityCoverageRequest request = new RequestManager()
    .createCityCoverageRequest(responseListener).setLocation(coordinates) // if not specified,
    returns all cities
    .setRadius(150000) // meters
    .setUpdateType(CityCoverageRequest.UpdateType.ALL) // all cities
    .setTime(null); // works together with the UpdateType parameter
request.execute();
```

Another supported type of coverage search uses a query string to look for cities with names that begin with this substring. You can create this type of request by using `RequestManager.createCitySearchRequest(String, ResponseListener<CitySearchResult>)`.

```
// name of the city to search
String name = "New York";

// listener that will be notified after request is completed
RequestManager.ResponseListener<CitySearchResult> responseListener = new
RequestManager.ResponseListener<CitySearchResult>() {

    @Override public void onSuccess(CitySearchResult citySearchResult) {
        for (City city: citySearchResult.getCities())
        {
            String name = city.getName();
```

```
        GeoCoordinate coordinates = city.getLocation();
        int population = city.getPopulation();
        // ...
    }
}

@Override public void onError(ErrorCode errorCode, String errorMessage) {
    // report error
}
};

// creating and executing the request
// search coverage by city name
CitySearchRequest request = new RequestManager().createCitySearchRequest(
    name, responseListener);
request.execute();
```

You can also use `RequestManager.createNearbyCoverageRequest(GeoCoordinate, ResponseListener<NearbyCoverageResult>)` to search for coverage information around a given location. This type of search returns information of the city that contains this location. If there is no transit stop within 2 kilometers of the location, the request returns the first five nearest transit stops outside of the 2 kilometers area. This type of search result is also known as an "Explored Coverage". The following code demonstrates how to retrieve both nearby and explored coverage results.

```
GeoCoordinate coordinates = new GeoCoordinate(40.750488, -73.993546); //somewhere in NY

// listener that will be notified after request is completed
RequestManager.ResponseListener<NearbyCoverageResult> responseListener = new
RequestManager.ResponseListener<NearbyCoverageResult>() {

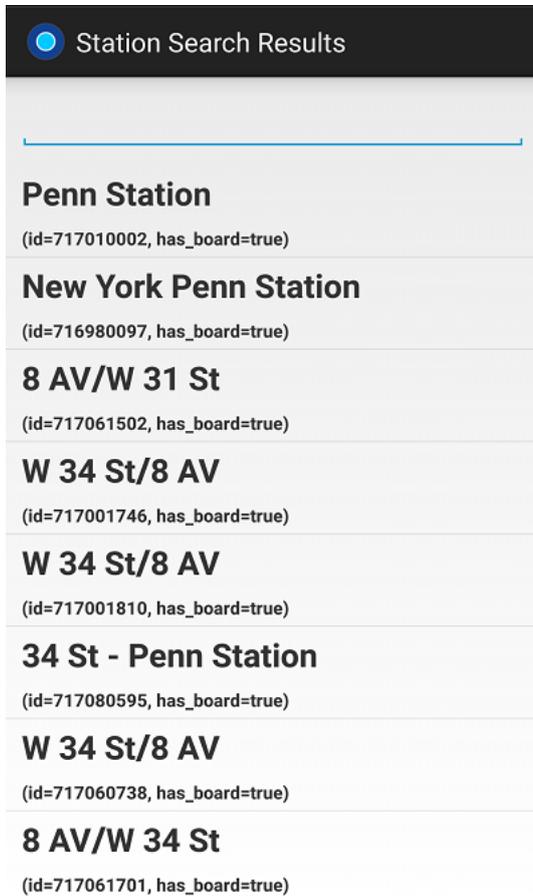
    @Override public void onSuccess(NearbyCoverageResult nearbyCoverage) {
        City city = nearbyCoverage.getCity();
        ExploredCoverage exploredCoverage = nearbyCoverage.getExploredCoverage();
        ...
    }

    @Override public void onError(ErrorCode errorCode, String errorMessage) {
        // report error
    }
};

// creating and executing the request
// search coverage nearby
NearbyCoverageRequest request = new RequestManager().createNearbyCoverageRequest(coordinates,
responseListener);
request.execute();
```

## Transit Station Search

Figure 60: Station Search by Coordinates



The Transit Stations Search feature allows users to discover transit stations by searching for stations around a specified location. For example, your application can look for the nearest subway station by retrieving all subway stations at the current location with the specified radius.

The following code demonstrates how to trigger a station search by location:

```
GeoCoordinate centerCoordinates = new GeoCoordinate(40.750488, -73.993546); //somewhere in NY

// listener that will be notified after request is completed
RequestManager.ResponseListener<StationSearchResult> responseListener = new
RequestManager.ResponseListener<StationSearchResult>() {

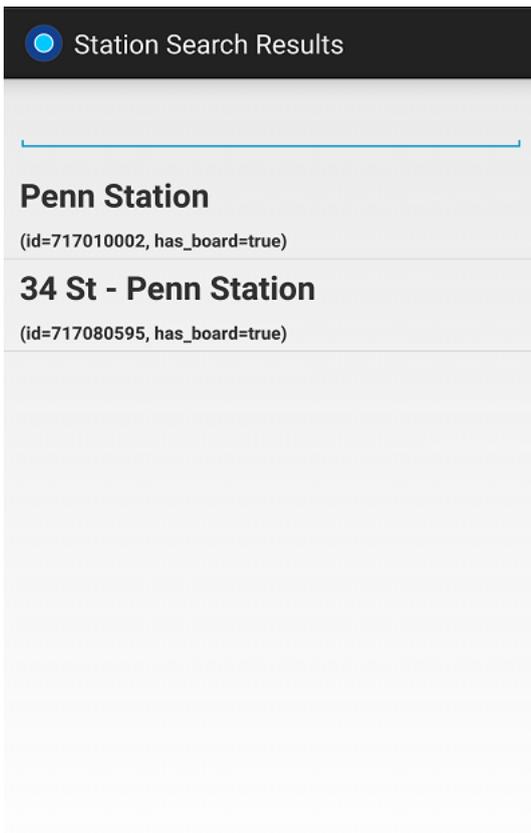
    @Override public void onSuccess(StationSearchResult searchResult) {
        List<Station> foundStations = searchResult.getStations();
        Collection<Transport> transports = searchResult.getTransports();
        for (Station station: foundStations) {
            String stationName = station.getAddress().getName();
            // ...
        }
        // ...
    }

    @Override public void onError(ErrorCode errorCode, String errorMessage) {
        // report error
    }
}
```

```
};

// creating and executing the request
// search stations nearby
StationSearchRequest requestNearby = new RequestManager().createStationSearchRequest(
    centerCoordinates, "", responseListener)
    .setMaximumResults(3)
    .setRadius(1000);
requestNearby.execute();
```

Figure 61: Station Search by Name



You can also search for public transit stations by providing its name. For example, a user searching for "Penn" retrieves all stations that match that name. This search is location-aware, so results are sorted by proximity to the current location.

The following code demonstrates how to perform a station search and filter by the specified name:

```
// search stations nearby with given name filter, returning transports information
StationSearchRequest requestName = new RequestManager().createStationSearchRequest(
    centerCoordinates, "Penn", responseListener)
    .setStationNameMatchingMethod(StationSearchRequest.NameMatchingMethod.FUZZY)
    .setRequestStationDetailsEnabled(true);
requestName.execute();
```

You can also retrieve a station directly by specifying the station IDs while creating the `StationSearchRequest`, as demonstrated in the following:

```
Set<String> ids = new HashSet<String>();
ids.add("717010002");
```

```
ids.add("717001746");

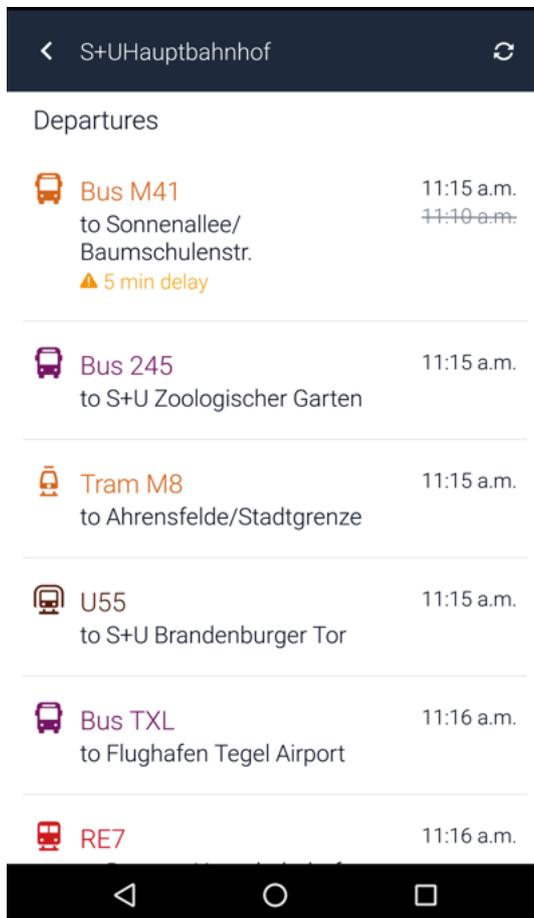
// search stations by given IDs
StationSearchRequest requestIds = new RequestManager().createStationSearchRequest(
    ids, responseListener);
requestIds.execute();
```

## Next Nearby Departures

You can use the HERE SDK to query for the next transit departures for a particular station. Next nearby departure information is based on the timetable information provided by transit agencies, and it includes all types and times of departures from one station at a given time.

**Note:** Next Nearby Departures and All Next Departures are currently offered as beta features. APIs may change without notice.

Figure 62: Station Departures



To query for the departures, create a request by using the `stationId` and `stationCoordinates` and implement a `ResponseListener`. The returned `DepartureBoard` contains a list of `Departure` objects that is sorted by the departure times.

```
// ID of a station, can be obtained from station search
String stationId = "717010002";
// Geocoordinate of a station
GeoCoordinate stationCoordinates = new GeoCoordinate(40.750488, -73.993546); //somewhere in NY

// listener that will be notified after request is completed
```

```

RequestManager.ResponseListener<DepartureBoard> responseListener = new
RequestManager.ResponseListener<DepartureBoard>() {

    @Override
    public void onSuccess(DepartureBoard departureBoard) {
        List<Departure> departures = departureBoard.getDepartures();
        for (Departure departure : departures) {
            Station station = departure.getStation();
            Date departureTime = departure.getTime();
            Transport line = departure.getTransport();
            String direction = departure.getTransport().getDirection();
            // ...
        }
    }

    @Override public void onError(ErrorCode errorCode, String errorMessage) {
        // Handle error
    }
};

// creating and executing the request
DepartureBoardRequest request = new RequestManager().createDepartureBoardRequest(
    stationCoordinates, stationId, responseListener);
request.execute();

```

## All Next Departures

To query for departure information of stations in a given area, create a request by using the coordinates and implement a `ResponseListener`. The returned `MultiBoardResult` contains a list of `StationWithDepartureBoard` objects that contain departure information, which are sorted by the departure times. `StationWithDepartureBoard` is a child implementation of the `Station` class.

```

// Geocoordinate of a reference point
GeoCoordinate coordinates = new GeoCoordinate(40.750488, -73.993546); //somewhere in NY

// listener that will be notified after request is completed
RequestManager.ResponseListener<MultiBoardResult> responseListener = new
RequestManager.ResponseListener<MultiBoardResult>() {

    @Override
    public void onSuccess(MultiBoardResult multiBoard) {
        Collection<StationWithDepartureBoard> stations = multiBoard.getStations();
        Collection<Transport> transports = multiBoard.getTransports();
        for (StationWithDepartureBoard station: stations) {
            String stationName = station.getAddress().getName();
            List<Departure> departures = station.getDepartureBoard().getDepartures();
            for (Departure departure : departures) {
                Date departureTime = departure.getTime();
                Transport transport = departure.getTransport();
                String direction = departure.getTransport().getDirection();
                // etc.
            }
        }
    }

    @Override public void onError(ErrorCode errorCode, String errorMessage) {
        // Handle error
    }
};

// creating and executing the request
MultiBoardRequest requestNearby = new RequestManager().createMultiBoardRequest(
    coordinates, responseListener);

```

```
// You can set other search parameters here before calling execute()
requestNearby.execute();
```

You can call `requestNearby.setRadius(int)` to limit the search area before executing the search. You can also limit the search to specific stations by using an overloaded `createMultiBoardRequest`.

## 3D Venues

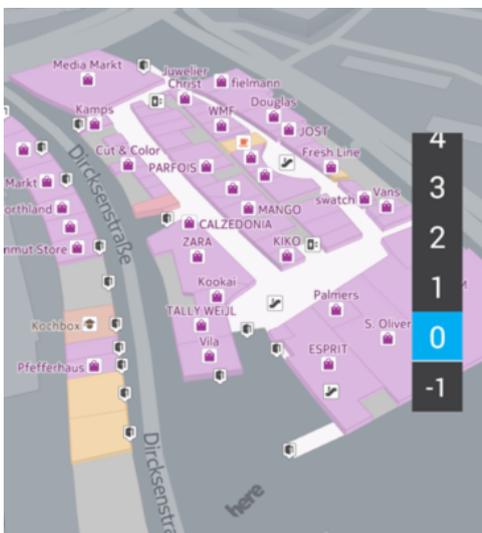
This section gives an overview of the classes and interfaces associated with the 3D Venues feature. Examples of available 3D venues include shopping malls and airports. This section also explores three use cases: searching for a venue, opening a venue, and getting a notification when a venue is visible in the viewport.

The classes covered in this section include:

- `VenueMapFragment`
- `VenueMapView`
- `VenueService`
- `VenueMapFragment.VenueListener`
- `VenueLayerAdapter`
- `VenueService.VenueServiceListener`

**Note:** To use this feature, your application must include the **Gson** library (release 2.2.4 or a compatible version) on its class path.

**Figure 63: 3D venue map of a Berlin shopping center**



The 3D Venues feature can be used with or without a map. To use it with a map, use the `VenueMapFragment` or `VenueMapView`. To use 3D Venues without a map, use the `VenueService` class.

## Using VenueMapFragment

VenueMapFragment provides developers with access to all 3D venue-related features. As with MapFragment, VenueMapFragment needs to be added to the layout file of the application, for example:

```
<!-- Example fragment. This can be integrated and annotated like any other android
Fragment of View widget -->
<fragment
  android:id="@+id/map_fragment"
  android:layout_width="fill_parent"
  android:layout_height="fill_parent"
  class="com.here.android.mpa.venues3d.VenueMapFragment" />
```

The fragment must then be initialized in the same manner as MapFragment.

## VenueListener

To receive venue-related events, implement `VenueMapFragment.VenueListener` and add it to the `VenueMapFragment`, similar to the following code example. As with a `MapFragment`, you can mark `VenueMapFragment` initialization as successfully completed by looking for the `OnEngineInitListener.ERROR.NONE` error status code.

```
@Override
public void onCreate(Bundle savedInstanceState) {
  super.onCreate(savedInstanceState);
  setContentView(R.layout.activity_main);

  // Search for the VenueMapFragment
  final VenueMapFragment mapFragment = (VenueMapFragment)
  fragmentManager().findFragmentById(R.id.mapfragment);

  // initialize the Map Fragment and
  // retrieve the map that is associated to the fragment
  mapFragment.init(new OnEngineInitListener() {
    @Override
    public void onEngineInitializationCompleted( OnEngineInitListener.Error error) {
      if (error == OnEngineInitListener.Error.NONE) {
        // add listeners
        mapFragment.addListener(myVenueListener);
        mapFragment.getVenueService().addListener(myVenueServiceListener);
        map = mapFragment.getMap();
      } else {
        System.out.println("ERROR: Cannot initialize VenueMapFragment");
      }
    }
  });
}
```

In this example, `myVenueListener` is assumed to implement `VenueMapFragment.VenueListener`, and `myVenueServiceListener` implements `VenueService.VenueServiceListener`. For more information about these listener classes, see [VenueService and VenueServiceListener](#) on page 168.

## Using VenueMapView

VenueMapView provides developers with similar features as `VenueMapFragment`, but as a `MapView`-based class. Like `MapView`, `VenueMapView` needs to be added to the layout file of the application:

```
<!-- An example VenueMapView -->
<com.here.android.mpa.venues3d.VenueMapView
```

```
android:id="@+id/mapcanvas"
android:layout_width="fill_parent"
android:layout_height="fill_parent" />
```

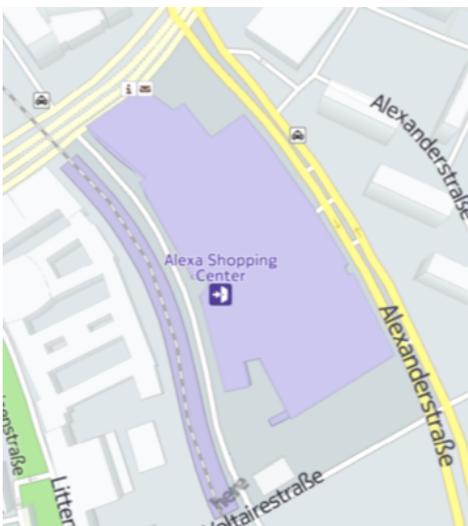
The view must then be initialized in the same manner as `MapView`. As with a `MapView`, you can mark `VenueMapView` initialization as successfully completed by looking for the `OnEngineInitListener.Error.NONE` error status:

```
@Override
public void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    // Search for the VenueMapView
    final VenueMapView mVenueMapView = (VenueMapView)findViewById(R.id.venueMapView);
    // get and initialize the MapEngine and
    // assign the VenueMapView to it
    ApplicationContext context = new ApplicationContext(this);
    MapEngine.getInstance().init(context, new OnEngineInitListener() {
        @Override
        public void onEngineInitializationCompleted( OnEngineInitListener.Error error) {
            if (error == OnEngineInitListener.Error.NONE) {
                // create and assign map
                mMap = new Map();
                mVenueMapView.setMap(mMap);
                mVenueMapView.init(this, mVenueServiceListener);
                mVenueMapView.addListener(mVenueListener);
            } else {
                System.out.println("ERROR: Cannot initialize VenueMapView");
            }
        }
    });
}
```

## Working with 3D Venue Models

Once a `VenueMapFragment` or `VenueMapView` is correctly initialized, 3D-enabled venues become visible on the map. These venues can be distinguished by their colors and icons, as in the screenshot below. This screenshot was taken from an app that uses `VenueMapFragment`, but the same visuals also appear on a `VenueMapView`.

Figure 64: A 3D venue on the Map



VenueMapFragment offers two ways to select a venue and open the indoor map view. When a user taps the venue, the `onVenueTapped(VenueController, float, float)` method in `VenueMapFragment.VenueListener` is called with a Venue object as a parameter. The venue can then be opened by giving the Venue object to `selectVenue(Venue)`. For example:

```
public void onVenueTapped(Venue venue, float x, float y) {
    mapFragment.selectVenue(venue);
}
```

When the venue is selected, the `onVenueSelected(Venue)` callback of the `VenueMapFragment.VenueListener` interface is called. A venue can also be selected and opened by giving its identifier by using the `selectVenueAsync(String venueId)` method of `VenueLayerAdapter`, which is implemented by `VenueMapFragment`. For example, a typical scenario is a venue search where a successful search results in an opened venue.

The `selectVenue(Venue)` method opens the venue right away in a synchronous manner by taking a downloaded Venue object as a parameter. However, the `selectVenueAsync(String)` and `selectVenueAsync(String, String)` methods may involve downloading the venue from the backend, asynchronously, while the venue is selected and opened. You can get a notification for when asynchronous loading is complete by listening to the `onGetVenueCompleted(Venue)` callback in `VenueService.ServiceListener`.

It is also possible to receive a notification when there is a venue in the viewport. You can use this callback to implement a feature, such as drawing user attention to the venue when it is visible.

The triggering area for this is a rectangle at the center of the viewport. The width of the area is two-thirds of the screen width, and the height is equal to the width. When the center point of the venue enters this triggering area, such as during map panning, `onVenueVisibleInViewport(Venue, boolean)` of `VenueMapFragment.VenueListener` is called. The boolean parameter indicates whether the venue is entering or exiting from the triggering area. Note that to get the notifications, you must first set `setVenuesInViewportCallback(boolean)` to true. For example:

```
// enabling onVenueVisibleInViewport notification
mapFragment.setVenuesInViewportCallback(true);
//...
@Override
public void onVenueVisibleInViewport(Venue venue, boolean visible) {
    if (visible) {
        // venue entered triggering area
    } else {
        // venue disappeared from triggering area
    }
}
```

- **Note:** This feature is not processor-intensive, as checking only occurs once as map movement stops. The notification is not sent during continuous movement, even when there is a venue in the triggering area.

To change the current floor for a given venue, retrieve a `VenueController` object by using the `getVenueController(String venueId)` method, and then call the `VenueController.selectLevel(Level)` method.

You can enable animations for venue selection and floor transitions by calling `setFloorChangingAnimation(true)` and `setVenueEnteringAnimation(true)`.

## VenueService and VenueServiceListener

In the case where you are not using a `VenueMapFragment`, you can use the `VenueService` instead. The service initialization status is provided as a parameter to the `onInitializationCompleted(InitStatus)` callback method in the `VenueService.VenueServiceListener` interface. You can also retrieve the status using the `getInitStatus()` method in `VenueService`.

```
boolean cacheInUse = false
//...
@Override
public void onInitializationCompleted(InitStatus result) {
    if (result == InitStatus.ONLINE_SUCCESS) {
        // init ok, online content available
    } else if (result == InitStatus.OFFLINE_SUCCESS) {
        // cached content available
        cacheInUse = true;
    } else if (result == InitStatus.ONLINE_FAILED && cacheInUse) {
        // failed to authenticate, but cached content available
    } else {
        // something else has gone wrong
    }
}
```

`VenueService` offers methods for searching and loading venues without using a map. For example, the code below retrieves the closest venue inside a given radius near a given location. The area can also be defined by `GeoBoundingBox` rather than a radius.

```
private void loadClosestVenue() {
    VenueService venueService = VenueService.getInstance(getActivity().getApplicationContext());
    GeoCoordinate myLocation = new GeoCoordinate(60.43704, 22.21710);
    float radiusInMeters = 5000.0f;
    VenueInfo closestVenue = venueService.getVenuesAt(myLocation, radiusInMeters);
    venueService.getVenueAsync(closestVenue);
}

@Override
public void onVenueLoadCompleted(Venue venue, VenueInfo venueInfo, VenueLoadStatus loadStatus) {
    // closest venue available through the venue object
}
```

- **Note:** The `VenueService` is also invoked when `VenueMapFragment` is used. As such, some venue features can be used in a common manner between these classes.

## Venue Objects

The following is a list of venue objects (as Java classes) in the `com.here.android.mpa.venues3d` package. These objects are presented here from the lowest to the highest level of conceptual detail, and each level is related in a *has-a* relationship. For example, each `Venue` object may have multiple `Level` member objects, which contain multiple `OuterArea` objects.

Java class	Description
<code>com.here.android.mpa.venues3d.Venue</code>	Represents a building which may contain one or more structures and levels.
<code>com.here.android.mpa.venues3d.Level</code>	Represents a floor or horizontal layer within a Venue.
<code>com.here.android.mpa.venues3d.OuterArea</code>	Represents a part of one Level, contained within one exterior wall of a structure.
<code>com.here.android.mpa.venues3d.Space</code>	Represents a spatial area on a Level, like a store or a facility, such as an escalator. It may contain subspaces which represent the next level of detail about a space.
<code>com.here.android.mpa.venues3d.Content</code>	Point of interest information about a spatial area within the venue.

A Venue object consists of one or more Level objects. The Level objects represents physical levels of the venue. Each Level object consist of one or more OuterArea objects. For example, a building with common ground level areas can contain two separate towers on top of that common area, and so there would be two OuterArea objects in higher levels in that venue. An OuterArea consist of one or more Space objects.

Note that both Venue and Space classes have a member Content class, which holds point-of-interest information. This allows for a venue (such as a museum) and a space (such as a shop within a shopping mall) to hold separate address and phone numbers. Your app can use methods such as `getPhoneNumber()`, `getWebsite()` and `getOpeningTimes()` to retrieve the relevant directory information from Content objects.

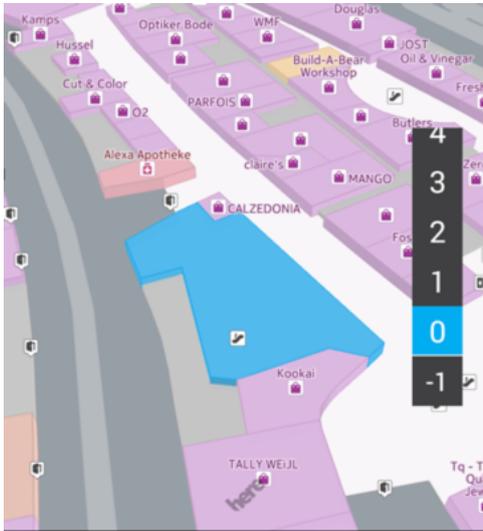
## Working with Venues

Venue, OuterArea and Space objects can be interacted by the user through tapping. For an opened venue, use the `VenueMapFragment.VenueListener.onVenueSelected(Venue)` callback. For a selected space, use the callback `VenueMapFragment.VenueListener.onSpaceSelected(Venue, Space)`. Selected spaces are highlighted with different color in an opened venue.

Both Venue and Space objects contain Content objects. Content encapsulates information related to the object, such as name, address, other contact information and category of the venue or space. There is

also a concept of selected floor, which is the same as the visible floor. This is demonstrated in the following screenshot. Note that the floor selection widget in this screenshot is not a part of the HERE SDK.

**Figure 65: Selected Space**



The following example shows how to add a `MapMarker` to a space upon a `onSpaceSelected` event, and how to remove it when the space is deselected.

```

@Override
public void onSpaceSelected(Venue venue, Space space) {
    removeMarker();
    Bitmap bitmap = BitmapFactory.decodeResource(getResources(), R.drawable.pin_start);
    Image image = new Image();
    image.setBitmap(bitmap);
    m_marker = new MapMarker(space.getCenter(), image);
    m_marker.setAnchorPoint(new PointF(image.getWidth() / 2f, 0.9f * image.getHeight()));
    m_marker.setOverlayType(MapOverlayType.FOREGROUND_OVERLAY);
    m_marker.setZIndex(100);
    getMap().addMapObject(m_marker);
}

@Override
public void onSpaceDeselected(Venue venue, Space space) {
    removeMarker();
}

private void removeMarker() {
    if (m_marker != null) {
        getMap().removeMapObject(m_marker);
        m_marker = null;
    }
}

```

## Open Mode

When open mode is enabled, venues that are in the viewport are opened automatically, rather than requiring the user to click on the venue to open it. The venue closest to the center of the screen is always selected.

Open mode can be enabled on `VenueMapLayer`, `VenueMapView`, `VenueMapFragment`, or `VenueMapAdapter`.

```
venueMapLayer.setOpenMode(true);
```

```
boolean isOpenMode = venueMapLayer.getOpenMode();
```

## Dynamic Styles

`StyleSettings` encapsulates the parameters that have an impact on the visual appearances of opened venues. You can set space names, icons, and colors by using this object. The fill and outline colors can be also set separately to selected and unselected spaces.

The following example shows how to set the name, label, fill color, and outline color to the given `Space` object. The code snippet does not contain completed code but assumes that variables have been initialized.

```
import com.here.android.mpa.common.Image;
//...
private void updateStyles(Venue venue, Space space) {

    Integer selectedColor = 0xFFFF0000; // red, format 0xAARRGGBB
    Integer unselectedColor = 0xFFFFFF00; // yellow
    Integer outlineColor = 0xFF0000FF; // blue

    VenueController controller = m_venueMapFragment.getVenueController(venue);

    StyleSettings settings = new StyleSettings();

    settings.setLabelName("My Space");

    Image img = new Image();
    img.setImageResource(com.example.android.UnitTest.R.drawable.png);
    settings.setLabelImage(img);

    settings.setSelectedFillColor(selectedColor);
    settings.setFillColor(unselectedColor);
    settings.setOutlineColor(outlineColor);

    controller.setStyleSettings(settings, space);
}
```

## Nearby Spaces

You can find all spaces in a radius around a given position by using a `Level` or an `OuterArea` object. The position needs to be given as a geocoordinate, and the radius in meters. The returned list of spaces contains all spaces that fall within or intersect the radius.

```
GeoCoordinate myLocation = new GeoCoordinante(60.43704, 22.21710);
List nearbySpaces = level.getNearbySpaces(myLocation, 10.0);
```

## Area at Position

You can retrieve areas in a level by specifying a position. The area returned will either be a `Space` or an `OuterArea`. Similarly, you can also get spaces in a `OuterArea`.

In case of nested spaces, the innermost nested space encompassing the position is be returned.

```
GeoCoordinate myLocation = new GeoCoordinante(60.43704, 22.21710);
Area area = level.getAreaAtPosition(myLocation);
Space space = outerArea.getSpaceAtPosition(myLocation);
```

## Frequently Asked Questions

You can find additional information about 3D Venues in the [3D Venues FAQ](#) on page 213.

## Venue Zoom

Certain 3D venues may have fine details that are not visible even at the maximum map zoom level. The HERE SDK offers a way to activate a venue-focused extended zoom mode to show a venue in a closer view. These fine details are not available for all venues.

Figure 66: A venue at the max zoom level



Figure 67: A venue with Venue Zoom enabled



To enable this extended Venue Zoom feature, call `VenueService.enableVenueZoom(true)` at any time.

```
// Get an instance of VenueService:
VenueService service = m_mapFragment.getVenueService();

// To enable Venue Zoom:
service.enableVenueZoom(true);

//...

// To disable Venue Zoom:
service.enableVenueZoom(false);
```

After enabling Venue Zoom, you can use one of the following ways to activate the feature. If the application input is based on gestures, the most convenient way is to register an instance of `VenueGestureListener`, which implements `OnGestureListener` to receive gesture events. When the map is zoomed using gestures

to the maximum level and Venue Zoom is enabled, 3D venues are automatically shown in an enlarged mode. Note that `VenueGestureListener` only handles pinch zoom events and activates Venue Zoom in a supported area. In all other situations it returns `false` for the gesture events, and thus has effectively no impact on gesture handling.

The example code below shows how the gesture handler can be used with Venue Zoom:

```
private VenueGestureListener m_gestureListener = null;

// to be done in onCreate/onResume:
if ( myExtendedZoomLevel == false ) {
    // Max map zoom level is depending on display metrics
    DisplayMetrics metrics = getResources().getDisplayMetrics();
    m_gestureListener = new VenueGestureListener(m_mapFragment, m_zoomLevelText,
metrics.densityDpi);
    m_mapFragment.getMapGesture().addOnGestureListener(m_gestureListener);
    service.enableVenueZoom(true);
} else if (m_gestureListener != null) {
    m_mapFragment.getMapGesture().removeOnGestureListener(m_gestureListener);
    m_gestureListener = null;
    service.enableVenueZoom(false);
}
```

**Note:** You can also use `VenueMapFragment.VenueZoomListener` to determine whether the Venue Zoom feature was successfully activated.

Another way to activate Venue Zoom is to use the `useVenueZoom(true)` method of `VenueController` to immediately and activate Venue Zoom in a supported area.

```
// Get VenueController:
venueController = m_mapFragment.getVenueController(venue);

// To activate Venue Zoom (only works in a supported Venue)
venueController.useVenueZoom(true);

// To return to a normal zoom level
venueController.useVenueZoom(false);
```

While venue zoom is activated, only 3D Venues are shown, and the base map becomes hidden. If venue zoom is activated while a venue route is being displayed, only the indoor portions of the routes are shown. You can use `VenueZoomListener` to determine whether the feature was successfully activated.

Once activated, the visible map becomes two zoom levels larger than they would appear without Venue Zoom. For example, if Venue Zoom is activated at map zoom level 18, the venues are shown as if the map is at zoom level 20. Note that this behavior only occurs when the map is at zoom level 18 or higher.

## Scaling Custom Map Objects

For custom polygon-based map objects, the HERE SDK offers scaling methods to scale them to be used with Venue Zoom. Each point of the polygon need to be scaled to be used in Venue Zoom using `VenueController.getScaledGeoCoordinate(GeoCoordinate)`. If the reverse operation is desired, where the starting point is a scaled polygon or geolocation, the `getNormalGeoCoordinate(GeoCoordinate)` method returns geocoordinates for a non-scaled geolocation.

- **Note:** While both `MapGeoModel` and `MapLocalModel` can be scaled by these scaling methods, it is recommended to use `MapGeoModel`, since only the anchor point location can be scaled in a `MapLocalModel`.

In most cases it makes most sense to create two map objects, one for used in normal zoom mode and one used in Venue Zoom mode. Use `Map.addMapObject(MapObject)` and `Map.removeMapObject(MapObject)` to swap between objects when changing between normal and Venue Zoom mode.

## Enlarged 3D Models and Venue Zoom

Venue Zoom displays enlarged venue models that are automatically generated. Model generation happens in the following situations:

- Venue Zoom is enabled and a venue is downloaded from the backend.
- Venue Zoom is enabled and a venue is opened, and there is no enlarged model generated yet.

Note that if a venue is opened in 3D mode and then Venue Zoom is enabled, Venue Zoom would not successfully activate if the enlarged venue model has not been generated. In this case, the Venue Zoom can be used after the venue is closed and then opened again. If an enlarged model has already been generated earlier, then Venue Zoom can be used immediately after it has been enabled.

## Private Venues

This feature allows you to use a different source of venue data in addition to or instead of the default HERE backend. The private content backend must be configured by HERE, which is an operation transparent to a developer using the HERE Android SDK. Access to private venue data is at the discretion of its legal owner, and by definition, it is not public.

- **Note:** For more information about configuring a private venue data backend, contact your HERE representative.

If a private backend has been configured, call the `setPrivateContent(boolean)` method on the `VenueService` class at `MapFragment` initialization to indicate that you want your application to use it.

The code below demonstrates a call to this method. Note that the code does not show the entire `MapFragment` initialization sequence.

```
public void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);

    // Initialize the Map Fragment to have a map created and attached to
    // the fragment
    m_mapFragment.init(new OnEngineInitListener() {
        @Override
        public void onEngineInitializationCompleted(Error error) {
            if (error == Error.NONE) {
                m_map = (Map) m_mapFragment.getMap();

                // Set access to private venue data:
                m_mapFragment.getVenueService().setPrivateContent(true);
                // Remember to start or restart Venue Service after setting private content
            } else {
                System.out.println("ERROR: Cannot initialize Map Fragment" + error.toString());
            }
        }
    });
}
```

```
}
```

## Dynamic Content

By default, the HERE SDK uses public HERE 3D venue content. It is possible to use customer-specific content instead by calling the `VenueService.setPrivateContent(boolean)` method, as shown in the examples below. It is also possible use both private and public content together, and define which one has priority. If this kind of combined content is needed, use `VenueService.setIsCombinedContent(boolean)`.

```
// Obtain VenueService
VenueService service = m_mapView.getVenueService();

// Use only HERE SDK content (this is the default behavior)
Service.setPrivateContent(false);
Service.setIsCombinedContent(false);

// Use only private content
Service.setPrivateContent(true);
Service.setIsCombinedContent(false);

// Prefer HERE SDK content and use private as an alternative
Service.setPrivateContent(false);
Service.setIsCombinedContent(true);

// Prefer private content and use HERE SDK as an alternative
Service.setPrivateContent(true);
Service.setIsCombinedContent(true);
```

Multiple `VenueService` objects can run at the same time. For example, if some part of an application requires access to only private content, and another part requires HERE SDK content, two `VenueService` objects can be instantiated and configured differently. Activities in one service do not have an impact on another service. For example, notifications related to loading (`onVenueLoadCompleted(Venue, VenueInfo, VenueLoadStatus)`) are sent only to the client that initiated the load. To obtain an additional `VenueService` object, use the static `createAdditionalService(Context)` method.

```
VenueService mMainInstance;
VenueService mAdditionalInstance;
mMainInstance =
    VenueService.getInstance(getActivity().getApplicationContext());
mAdditionalInstance =
    VenueService.createAdditionalService(getActivity().getApplicationContext());
```

For more information, see the [API Reference](#).

**Note:** `VenueService` is also invoked when `VenueMapFragment` or `VenueMapView` is used. As such, some venue features can be used in a common manner between these classes.

## Venue Routing

The HERE Android SDK extends its 3D venue maps functionality to provide indoor routing. The SDK supports the following use cases:

- Routing from store A to store B within a venue
- Routing from an outside point to a point in a venue
- Routing from a point in a venue to an outside point
- Routing from a venue to another venue, with endpoints being a store or a point in a venue

Both on-line and off-line routing are supported. The classes that support this feature can be found in the `com.here.android.mpa.venues3d` and `com.here.android.mpa.routing` packages.

Note that if HERE has no routing information for an area between the outdoor part of the route and the venue entry point, the route visualization represents the unknown section of the route with a dotted line.

## Routing Between Locations in a Venue

This section demonstrates how to calculate and display an indoor route by using a code example. The example is based on a scenario where a device user wants to find out how to reach another location in the same venue. In real life, the user would select the starting point and destination for the route by tapping on the map of the venue. However, for the sake of simplicity, the code below calculates a route by assuming the spaces are already selected.

**Note:** See the *Getting Indoor Location Based on a Tap Point* section for a code example of how to handle tap events to get a location for indoor venue routes.

The code below shows the implementation and is assumed to be part of an application. Previous initialization steps are assumed.

```
// Add the application as a listener for route-calculation-completed:
m_venueMapFragment.getRoutingController().addListener(m_activity);

// Route start and end set-up – they are spaces in a user-selected 3D venue.

// Set route start. You can choose an item from all spaces associated with the venue, or
// allow the application user to select an item and then use the callback onSpaceSelected().
SpaceLocation startLocation = new SpaceLocation(startSpace,
    m_venueMapFragment.getVenueController(venue));

// Set route end.
SpaceLocation endLocation = new SpaceLocation(endSpace,
    m_venueMapFragment.getVenueController(venue));

// Get route option objects
VenueRouteOptions venueRouteOptions = new VenueRouteOptions();
RouteOptions options = venueRouteOptions.getRouteOptions();

// Set route type, transport mode, number of routes to calculate:
options.setRouteType(Type.values()[m_routingOptionType.getSelectedItemPosition()]);
options.setTransportMode(
    TransportMode.values()[m_routingOptionMode.getSelectedItemPosition()]);
options.setRouteCount(1);

// Set route options:
venueRouteOptions.setRouteOptions(options);

// Calculate route - this is an asynchronous call, once the calculation is done
// onCombinedRouteCompleted() is called – see below.
routingController.calculateCombinedRoute(startLocation, endLocation,
    venueRouteOptions);

//...

// Callback invoked when the route calculation is done to display the route passed
// to it as an argument.
public void onCombinedRouteCompleted(CombinedRoute route) {
    // Use RoutingController to show route:
    m_venueMapFragment.getRoutingController().showRoute(route);
}
```

## Routing Between Venues

You can perform routing between venues by using separate `VenueController` objects. For example, in the following, two different venues are used to retrieve `VenueController` objects:

```
// In this example m_startVenue and m_endVenue are assumed to be initialized
// with proper references.
SpaceLocation startLocation = new SpaceLocation(startSpace,
        m_venueMapFragment.getVenueController(m_startVenue));
SpaceLocation endLocation = new SpaceLocation(endSpace,
        m_venueMapFragment.getVenueController(m_endVenue));
}
// Other parts like in the previous example
```

## Routing Using an Arbitrary Indoor Location

It is also possible to use an arbitrary indoor location that is not at a store or designated space as a route endpoint. An example of this kind of location is a point in a corridor. The next code snippet demonstrates the initialization of such an endpoint.

```
// Create a free point location to be used as a start location
// Here we assume that both current level and geo position is available in
// m_currentPosition. This can be obtained from, for example, some indoor positioning service.
LevelLocation startLocation = new LevelLocation(m_currentPosition.getLevel(),
        m_currentPosition.getGeoCoordinate(),
        m_venueMapFragment.getVenueController(venue));
```

The `LevelLocation` class extends `BaseLocation` and can be used as start or end location in `calculateCombinedRoute()` method of `RoutingController`, similar to `SpaceLocation` and `OutdoorLocation`.

The next example demonstrates route calculation from an indoor location, using type `LevelLocation`, to some location outside the venue, represented by an `OutdoorLocation` class.

```
// Create a free point location to be used as a start location
// Here we assume that both current level and geo position is available in
// m_currentPosition. This could be obtained from some indoor positioning
// service (not covered in this section).
LevelLocation startLocation = new LevelLocation(m_currentPosition.getLevel(),
        m_currentPosition.getGeoCoordinate(),
        m_venueMapFragment.getVenueController(venue));

// Create an outdoor location.
GeoCoordinate endPosition = new GeoCoordinate(52.517072, 13.411232);
OutdoorLocation endLocation = new OutdoorLocation(endPosition);

// Get route options objects
VenueRouteOptions venueRouteOptions = new VenueRouteOptions();
RouteOptions options = venueRouteOptions.getRouteOptions();

// Set route type, transport mode, number of routes to calculate:
options.setRouteType(Type.FASTEST);
options.setTransportMode(TransportMode.CAR);
options.setRouteCount(1);

// Set route options:
venueRouteOptions.setRouteOptions(options);
```

```
// Calculate route - this is an asynchronous call, once the calculation is done
// onCombinedRouteCompleted() is called - see below.
routingController.calculateCombinedRoute(startLocation, endLocation,
    venueRouteOptions);

//...

// Callback invoked when the route calculation is done to display the route passed
// to it as an argument.
public void onCombinedRouteCompleted(CombinedRoute route) {
    // Use RoutingController to show route:
    m_venueMapFragment.getRoutingController().showRoute(route);
}
```

## Venue Route Options

`VenueRouteOptions` encapsulate options used in indoor routing. It is possible to set many parameters related to visualization of the route line (for example color, line width, visibility of start and end flags) as well as parameters related to how the route is calculated (for example if elevators are allowed, if stairs are allowed, if corridors are preferred). The next example shows route calculation from one level to another level while avoiding stairs. Initialization steps for used variables are assumed.

```
// set up start and end locations, assuming they're on different levels
// ...

// Set venue route options, including flag to avoid stairs:
VenueRouteOptions venueRouteOptions = new VenueRouteOptions();
venueRouteOptions.setStairsAllowed(false);
venueRouteOptions.setCorridorsPreferred(true);

// Set other route options
RouteOptions options = venueRouteOptions.getRouteOptions();
options.setRouteType(Type.SHORTEST);
options.setTransportMode(TransportMode.PEDESTRIAN);
options.setRouteCount(1);
venueRouteOptions.setRouteOptions(options);

// Calculate route - this is an asynchronous call, once the calculation is done
// onCombinedRouteCompleted() is called
routingController.calculateCombinedRoute(startLocation, endLocation,
    venueRouteOptions);

//...
```

## Getting Indoor Location Based on a Tap Point

The next code example shows how to add a route point to an indoor route using the `onTapEvent(PointF point)` method of `com.here.android.mpa.mapping.MapGesture.OnGestureListener`.

```
public boolean onTapEvent(PointF point) {

    // convert tap point to GeoCoordinate
    Map map = m_venueLayer.getMap();
    GeoCoordinate tapPoint = map.pixelToGeo(point);
    if (tapPoint == null || !tapPoint.isValid()) {
        return false;
    }

    // If any venue is selected, get related VenueController
    Venue venue = m_venueLayer.getSelectedVenue();
```

```

VenueController venueController = null;
if (venue != null) {
    venueController = m_venueLayer.getVenueController(venue);
}

// If no venue was selected, consider tapped location as OutdoorLocation
// and add it as route point.
if (venueController == null) {
    BaseLocation location = new OutdoorLocation(tapPoint);
    addRoutePoint(location);
    return false;
}

// Otherwise consider tapped location as SpaceLocation and add it as route point.
BaseLocation location = venueController.getLocation(point, m_preferSpaceSelection);
addRoutePoint(location);

return false;
}

private void addRoutePoint(BaseLocation location) {
    //Logic for saving route points.
}
}

```

## Calculating Route Length

The following code example shows how the total length of a route can be calculated:

```

@Override
public void onCombinedRouteCompleted(CombinedRoute combinedRoute) {

    double distance = 0.0;
    final List<IRouteSection> routeSections = route.getRouteSections();
    for (IRouteSection section : routeSections) {
        switch (section.getRouteSectionType()) {
            case VENUE:
                List<VenueManeuver> maneuvers = ((VenueRoute)section).getVenueManeuvers();
                distance += maneuvers.get(maneuvers.size() - 1).getDistanceFromStart();
                break;
            case LINK:
                GeoCoordinate from = ((LinkingRoute)section).getFrom();
                GeoCoordinate to = ((LinkingRoute)section).getTo();
                distance += from.distanceTo(to);
                break;
            case OUTDOOR:
                com.here.android.mpa.routing.Route route = ((OutdoorRoute)section).getRoute();
                distance += route.getLength();
                break;
            default:
                break;
        }
    }
    // do something with distance information
};

```

## Natural Guidance for Venue Maneuvers

Venue maneuvers provide the names of the closest POIs for natural guidance purposes. For each maneuver, this is the closest POI within a natural guidance radius around the position of the maneuver. If no POI exists

within this radius, an empty string is returned. The natural guidance radius is a global parameter common to all maneuvers that may be set and queried by the user.

■ **Note:** For more information about natural guidance, see *Turn-by-Turn Navigation for Walking and Driving* on page 145.

```
VenueManeuver.setNaturalGuidanceRadius(10.0);  
float naturalGuidanceRadius = VenueManeuver.getNaturalGuidanceRadius();  
String naturalGuidance = myManeuver.getNaturalGuidancePOI();
```

## Bounding Boxes for Parts of Venue Routes

Venue and outdoor route sections provide axis-aligned bounding boxes for the route. Axis-aligned bounding boxes are provided for individual route segments for each level. These methods return `null` if a route has no segment on the given level.

```
GeoBoundingBox obb = outdoorRoute.getBoundingBox();  
GeoBoundingBox vbb = venueRoute.getBoundingBox();  
GeoBoundingBox lbb = venueRoute.getBoundingBox(level);
```

The bounding box for the venue route (`vbb` in the example) also provides altitude information that may be extracted using the `getTopLeftFront()` and `getBottomRightBack()` methods of `GeoBoundingBox`.

## LiveSight

---

LiveSight enables user experiences that use the real world as an interface. With LiveSight, developers can overlay geospatial content on the real world, which is displayed using the device's camera. Additionally, an immersive experience is created by using the device's sensors to track movement in space and update the view accordingly.

The key concepts covered in this section include adding LiveSight to an Android application, transitioning from Map Mode to LiveSight Mode, and customizing the LiveSight experience. The classes covered include `CompositeFragment` and `ARController`.

■ **Note:** LiveSight requires the following sensors enabled:

- GPS
- Compass
- Accelerometer
- Gyroscope

LiveSight does not function properly, or does not function at all, if these sensors are not working or incorrectly calibrated.

## CompositeFragment

The `Fragment` subclass related to LiveSight functionality is the `CompositeFragment`. It is called "composite" because it exposes both Map and LiveSight functionality in one Android UI component, with an easy way to switch between the two; therefore, in addition to methods related to LiveSight functionality, the `CompositeFragment` also includes all of the methods found in the `MapFragment`. The `CompositeFragment` is useful in the situation where an application wants to include both map and LiveSight functionality.

The remainder of this section uses the `CompositeFragment` in code samples and discussions.

- **Note:** The `CompositeFragment.getScreenCapture(OnScreenCaptureListener)` method has the same functionality as `MapFragment.getScreenCapture(OnScreenCaptureListener)`. It does not support taking screen snapshots of the LiveSight Camera View or AR Objects on a map.

## Adding and Initializing the CompositeFragment

The first step to integrate LiveSight functionality into an application is to insert a `CompositeFragment` into the view layout. This is accomplished by adding `com.here.android.mpa.ar.CompositeFragment` to the Android XML layout file as follows:

```
<!-- Example fragment. This can be integrated and annotated
like any other android Fragment or View widget -->
<fragment
  class="com.here.android.mpa.ar.CompositeFragment"
  android:id="@+id/compositefragment"
  android:layout_width="fill_parent"
  android:layout_height="fill_parent"/>
```

- **Note:** When using the `CompositeFragment`, you do not have to also use the `MapFragment`. The `CompositeFragment` is a superset of the `MapFragment`.

After adding the `CompositeFragment` to the layout, the fragment must be initialized by calling the `CompositeFragment.init(OnEngineInitListener)` method. During this asynchronous initialization, the `MapEngine` is initialized to create an instance of `Map` that is associated with the `CompositeFragment`. The `ARController` is also created. For more information about `ARController`, see [Customizing LiveSight](#) on page 188.

The following code example illustrates the basic initialization flow when an `Activity` is created. The `init(OnEngineInitListener)` method uses the `OnEngineInitListener` parameter to signal the caller when the asynchronous initialization is completed.

```
@Override
public void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    // Search for the Composite Fragment
    final CompositeFragment compositeFragment = (CompositeFragment)
        getSupportFragmentManager().findFragmentById(R.id.compositefragment);
    // initialize the Composite Fragment and
    // retrieve the map that is associated to the fragment
    compositeFragment.init(new OnEngineInitListener() {
        @Override
        public void onEngineInitializationCompleted(
            OnEngineInitListener.Error error) {
            if (error == OnEngineInitListener.Error.NONE) {
                // now the map is ready to be used
                map = compositeFragment.getMap();
                // the arController is also ready to be used now
                arController = compositeFragment.getARController();
            } else {
                System.out.println(
                    "ERROR: Cannot initialize CompositeFragment");
            }
        }
    });
}
```

- Note:** `com.here.android.mpa.ar.CompositeFragment` has `Fragment.setRetainInstance(boolean)` set to `true`; therefore, `onCreate(Bundle)` should not be called again when `Activity` is re-created (for example, after an orientation change).

## Starting and Stopping LiveSight

It is important to make a distinction between the two operating modes provided by the `CompositeFragment`, `Map Mode` and `LiveSight Mode`. `Map Mode` is the mode of operation that is the same as that provided by the `MapFragment`. As with `MapFragment`, `Map Mode` behavior and functionality are as described under [Maps](#). `LiveSight Mode` is the mode of operation that provides the `LiveSight` experience and has separate functionality and behavior.

- Note:** It may be confusing that the map is still displayed even when `LiveSight Mode` is enabled. While this map view is a part of the `LiveSight` experience, it has different functionality and behavior than `Map Mode`.

Figure 68: Map Mode

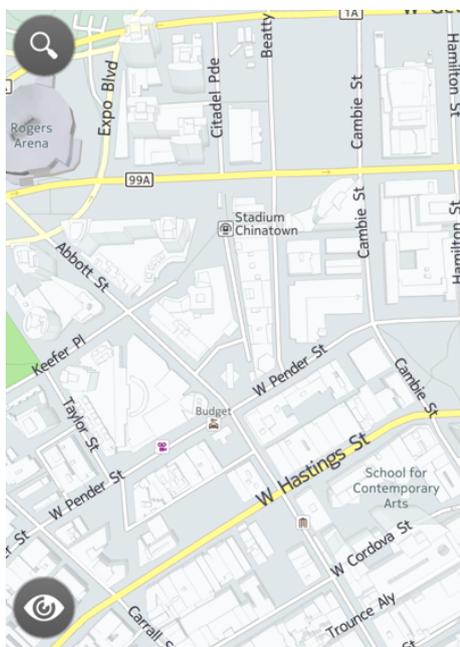


Figure 69: LiveSight Mode



To switch between `Map Mode` and `LiveSight Mode`, two methods from the `ARController`, `start()` and `stop()`, are used. The `start()` method triggers the transition from `Map Mode` to `LiveSight Mode`, which includes a short cinematic transition animation by default. Calling `start()` while already in `LiveSight Mode` results in the `Error.INVALID_OPERATION` error code being returned. Use the `stop()` method to transition from `LiveSight Mode` to `Map Mode`. By default the `CompositeFragment` starts in `Map Mode`.

```
// Triggers the transition from Map Mode to LiveSight Mode
Error error = arController.start();
...
// Exits LiveSight Mode and returns to Map Mode
Error error = arController.stop(true);
```

## Reading the Current Pose

The `ARController` provides a convenient way to retrieve the current positional and directional (pose) values of your LiveSight session. By calling `ARController.getPose()`, you can retrieve the `ARPoseReading` instance, which contains the following values:

- Heading
- Pitch
- Roll
- Latitude
- Longitude
- Altitude
- Timestamp

Although these `ARPoseReading` values are derived from device sensors, they are interpolated and smoothed by the LiveSight engine.

## Adding and Interacting with LiveSight Content

This section covers how to add content to be displayed in LiveSight and how to handle user interactions with that content. The classes covered in this section are `ARObject` and `ARIconObject`. Additionally, several `ARController` methods are used:

- `addARObject(ARObject)`
- `removeARObject(ARObject)`
- `addOnTapListener(OnTapListener)`
- `press(PointF)`
- `focus(ARObject)`
- `defocus()`
- `getObjects(PointF)`
- `getObjects(ViewRect)`

### The LiveSight Object Model

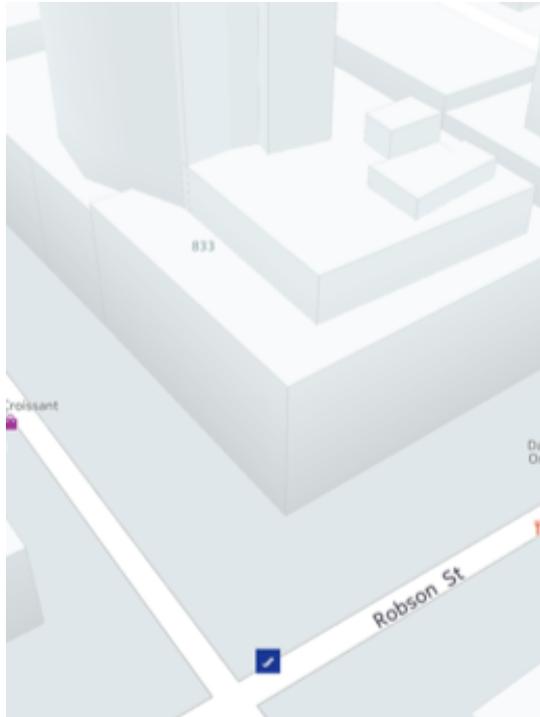
A LiveSight object has several visual representations. The representation to be displayed is determined based on the current state of the LiveSight view, which is defined as a function of the device's pitch by default, as well as the state of the object itself. The object state that influences display is the Focus state. The Focus state is discussed in detail later.

The LiveSight view states are the "Down" state and the "Up" state. By default, when the view is pitched downwards (for example, if the device screen is face-up), then LiveSight is in the Down state and set to the default Map view. As the device is pitched further upwards (angled negatively around the x-axis), LiveSight transitions to the Up state, which has the Camera view as its default view.

- **Down Object Representation**

While in the Down state, a LiveSight object is represented by an icon associated with the Down state. When transitioning to the Up state, a fly-in transition animation occurs, and the larger front icon is displayed.

**Figure 70: An Icon in the Down State**



- **Up Object Representation**

While the Down state representation consists of just a single icon, the Up state representation is more complex. While in the Up state, there are two planes where an object can be displayed, and the object representation is different in each. The planes are the "Front" plane and the "Back" plane. By default, objects that are geographically closer to the LiveSight center are displayed in the Front plane, and

objects that are further away are displayed in the Back plane. Objects can be moved from one plane to the other using the vertical pan gesture.

Figure 71: Icons in the Up State

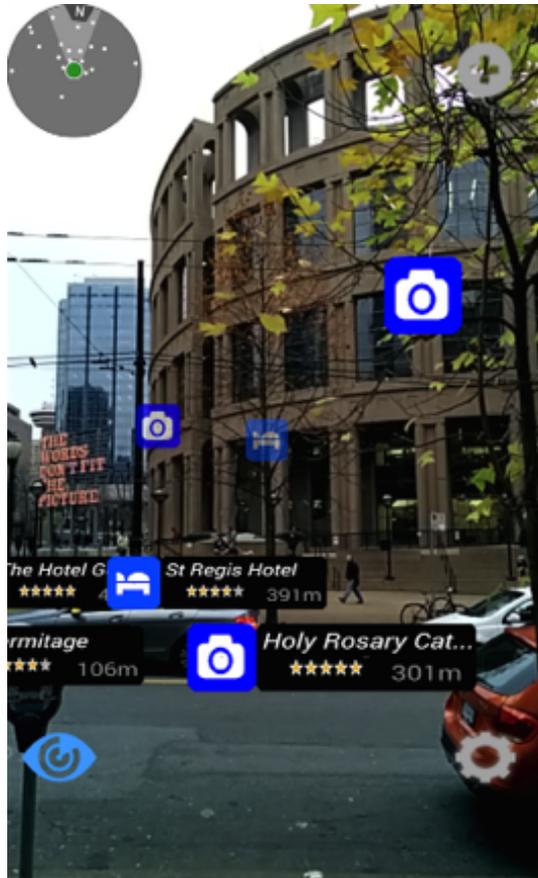
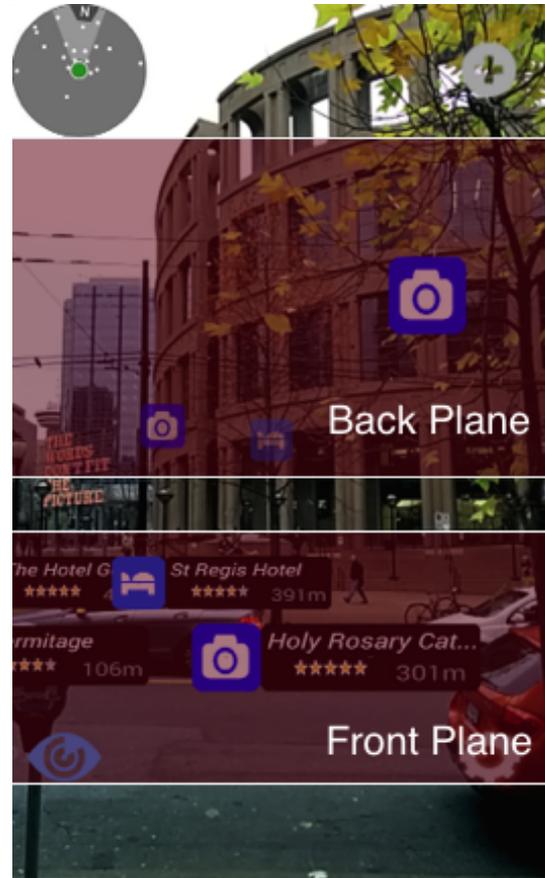


Figure 72: Visualization of the Front and Back Planes



While in the Front plane, a LiveSight object is represented by both its icon and an information view (Info View) that extends out from the side of the icon. This information view is intended to act as a mechanism for displaying more detailed information about the object. In the Back plane, an object is initially represented by a single icon. It is possible to have an object in the Back plane display its Info View by putting it in focus. The icon for the Front plane and the Back plane can be different, and by default, the transition from one plane to the other is animated.

## The ARObjct Abstract Class

ARObjct is the base implementation for all other objects that can be added to LiveSight in order to be displayed. It contains methods common to all LiveSight objects, enabling the following operations:

- Set and retrieve the object's current position
- Set and retrieve the object's down, front, or back icon
- Set and retrieve the object's down, front, and back icon sizes
- Set and retrieve the size, image, and extension state of the information view
- Set and clear an image texture on the object's down, front, back icons and information view

## The ARIconObject Class

Currently, the single concrete ARObject is the ARIconObject. ARIconObject represents the object model described in *The LiveSight Object Model* on page 183. Because it is the only concrete ARObject, all of its functions reside in the ARObject.

## Adding and Interacting with ARObjects

Adding an ARObject to LiveSight is accomplished with the ARController.addARObject(ARObject) method:

```
arIconObject = new ARIconObject(
    new GeoCoordinate(49.276744, -123.112049, 2.0), view, image);
arController.addARObject(arIconObject);
```

Similarly, ARObjects can be removed using the ARController.removeObject(ARObject) method:

```
boolean success = arController.removeARObject(arIconObject);
```

To facilitate interactivity with ARObjects, an ARController.OnTapListener can be registered with the ARController.addOnTapListener(OnTapListener) method. When a tap event occurs, the ARObject at the tap point can be found through the press(PointF) method. Calling press(PointF) also causes an animation on the ARObject. Additionally, the ARObject can be put into focus with the ARController.focus(ARObject) method. While in focus, an ARObject that is in the back plane displays its info pane. Only one ARObject may have focus at a time.

```
arController.addOnTapListener(new ARController.OnTapListener() {
    @Override
    public boolean onTap(PointF point) {
        // retrieve ARObject at point (if one exists)
        // and trigger press animation
        ARObject arObject = arController.press(point);

        if (arObject != null) {
            // focus object
            arController.focus(arObject);
        }

        return false;
    }
});
```

To defocus an ARObject, call focus() on another ARObject. You can also call the ARController.defocus() method to defocus from the currently focused ARObject.

In addition to event driven ARObject retrieval, the ARController.getObjects(PointF) and ARController.getObjects(ViewRect) methods can be used to programmatically get ARObject at a screen location:

```
PointF point = new PointF(50, 50);
List<ARObject> objectsAtPoint = arController.getObjects(point);
```

```
ViewRect viewRect = new ViewRect(50, 50, 25, 25);
```

```
List<ARObject> objectsInViewRect = arController.getObjects(viewRect);
```

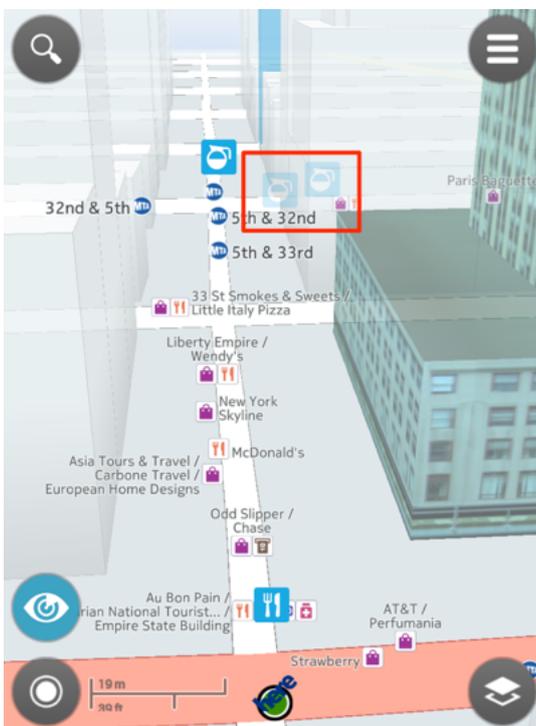
## Selecting ARObjects

After retrieving an ARObject, you can choose to select and unselect it by calling the `select()` and `unselect()` methods. Selecting an object causes objects to change their properties (such as size and opacity) according to `ARObject.SelectedItemParams`. Only one ARObject may be selected at a time.

- Note:** A single ARObject cannot be focused and selected simultaneously. However, it is possible to have one ARObject focused and another ARObject selected at the same time.

## ARObject Occlusion

Figure 73: Occluded Objects in the Map View



Occlusion refers to whether a certain ARObject is behind a building, with respect to the user's point of view. If the point represented by the ARObject is not visible in real life because it is blocked by a building, then that point is considered occluded. Because occlusion is dependent of the user's point of view, this feature is dependant on having accurate building data for the user's location.

With the ARController, you can check for occluded LiveSight objects and change their opacity by using the following methods:

- `ARController.isOccluded(ARObject arObject)`
- `ARController.setOcclusionOpacity(float opacity)`
- `ARController.setOcclusionEnabled(boolean enable)`

## 3D Objects

LiveSight also supports two types of 3D objects: `ARBillboardObject` and `ARMeshObject`. Both of these classes are the derivatives of `ARModelObject`, which provides the

ability to control basic properties such as object opacity, scale, and rotation. Because `ARModelObject` classes do not derive from the `ARObject` class, you cannot use them with some `ARController` methods such as `focus(ARObject)` or `press(ARObject)`. To add or remove an `ARModelObject`, use the `ARController.addARObject(ARModelObject)` and `ARController.removeARObject(ARModelObject)` methods.

An `ARBillboardObject` can be oriented in the Up state in two ways. In the `FIXED` orientation mode, it may be "attached" to a surface by specifying the up and normal vectors using the `setUpDirection(Vector3f)` and `setSurfaceNormal(Vector3f)` methods. In the `BILLBOARD` orientation mode, a billboard is set to be always upright and facing the camera. An `ARBillboardObject` can be positioned in one of the following ways:

- Anchored to a specific geo-location using constructors `ARBillboardObject(GeoCoordinate)` and `ARBillboardObject(GeoCoordinate, Image)`, as well as the `setGeoPosition(GeoCoordinate)` method.
- Anchored relative to the camera using constructors `ARBillboardObject(Vector3f)` and `ARBillboardObject(Vector3f, Image)`, as well as the `setLocalPosition(Vector3f)` method. The `Vector3f` represents the location of the center of the billboard in meters away from the camera.

An `ARMeshObject` represents a 3D object mesh. As with an `ARBillboardObject`, a mesh object may be anchored to a geo location or relative to the screen. You can control the orientation of the `ARMeshObject` by providing a `GeoCoordinate` that the object can point towards.

## Customizing LiveSight

LiveSight is highly configurable, allowing developers and designers to create many different and immersive experiences. The `ARController` class serves as a facade for overall LiveSight functionality, containing all of the methods and callbacks available for controlling and customizing LiveSight behavior.

The methods used to customize LiveSight reside in the `ARController` and also the following inner classes:

- `ARController.UpViewParams`
- `ARController.UpViewTransitionParams`
- `ARController.DownViewParams`
- `ARController.IntroAnimationParams`
- `ARController.IconParams`
- `ARController.InfoParams`
- `ARController.CameraParams`
- `ARController.FilterParams`
- `ARController.SelectedItemParams`

### UpViewParams, UpViewTransitionParams, and DownViewParams

`UpViewParams` and `DownViewParams` encapsulate the customizable parameters that are applicable for the Up and Down views. `UpViewTransitionParams` encapsulates customizable parameters that are applicable when you move up from the down view and enter the camera view.

## IntroAnimationParams

`IntroAnimationParams` encapsulates parameters about various intro animations. Intro animation refers to the animation that is used while the app is entering LiveSight. During LiveSight entry, a few transition operations happen simultaneously, and each of these can be assigned a different animation style. These customizable transition operations are: map zoom (the map zooms in towards the ground level), heading change (the current heading changes to the current device heading), position change (the current position changes to the current device position or a LiveSight-specific position), and pitch change (the pitch changes according to the 3D orientation of the device).

## IconParams and InfoParams

`IconParams` encapsulates customizable parameters for the front, back, and down icons. In addition to setting icon sizes, you can also set how icons animate when they first appear ("pop-up"), receive a tap, or appear while transitioning from the Down to Up view ("fly"). For more information on down, front, and back icons, consult the section [Adding and Interacting with LiveSight Content](#) on page 183.

`InfoParams` allow you to customize how Info Views animate when they first appear ("pop-up"), receive a tap, or appear while transitioning from the Down to Up view ("fly").

## CameraParams

`CameraParams` encapsulates parameters that are related to the camera-enabled Up view. The `CameraParams.setSize(Size)` method allows you to set the camera resolution to be used for the LiveSight camera view. Note that using a high camera resolution may cause performance degradation. The default camera resolution is 680x480.

## HeadingFilterParams, PitchFilterParams, and ZoomFilterParams

`HeadingFilterParams`, `PitchFilterParams`, and `ZoomFilterParams` are all instances of the `ARController.FilterParams` class. These objects encapsulate the customizable parameters for the heading, pitch, and zoom data sampling. Methods in `Filter` allow you to customize how data samples are read from the device sensors.

## SelectedItemParams

`SelectedItemParams` encapsulates parameters that control behavior when an `ARObject` is in the selected or unselected state. For example, you can increase the size of a selected icon. By default, objects are neither in the selected or unselected state. When an `ARObject` is selected, all other `ARObjects` are changed to the unselected state. When selection is canceled, all objects are returned to the neutral state.

## Other ARController Settings

In addition to the previous parameter classes, you can use methods in `ARController` to customize the following areas in LiveSight:

- **Alternative Center Location** — LiveSight is not only limited to the current device location. It is possible to use the `ARController` to set an alternative location ("space shift") for your LiveSight experience.

- Icon Display Behavior — Adjust settings related to the icon display, such as as only showing Front items, or using Down icons in the map.
- Device Orientation Behavior — Set whether the Down view is updated with the device sensor's orientation data.
- Layout Updates — By default, LiveSight icons are set to update dynamically according to the current device position. However, you can set `ARController` so that the Layout (containing the front and back icons) does not update until the device position has changed significantly past a threshold.

## External Sensor Data

LiveSight also provides the ability to switch from using integrated device sensor data to one or more data feeds provided by external sources. You may need to do this when more accuracy is required for object projection results in the Up state, or when you require a distributed LiveSight solution where data from multiple sensors are provided over TCP/IP.

`ARController.ExternalSensors` is the entry point for using external sensor data. You can enable or disable input from one or more external sensors by using this class with the values defined in the `ARController.SensorType` enum, with the exception of `CAMERA`. For example:

```
arController.ExternalSensors.utilize(SensorType.GPS, true);
```

**Note:** This call should only be made when `ARController` is stopped or paused.

After the external sensor is enabled, the integrated device sensor data is no longer used, and you must start providing sensor data into the LiveSight engine using the `pushData(SensorType, double, double, double, long)` method. Note that the parameters are treated differently if a different `SensorType` is used. For more information on providing data using this method, see the API reference.

## Animation Interpolators

The visual appearance of many of the LiveSight animations can be changed by using different animation interpolators. The available interpolator types include:

- `LINEAR` - Linear interpolation
- `ACCELERATE` - Starts slow, and then accelerates
- `DECELERATE` - Starts quick, and then decelerates
- `ACCELERATE_DECELERATE` - Starts and ends slowly, but accelerates through the middle
- `OVERSHOOT` - Flings forward and overshoots the last value, then comes back
- `ANTICIPATE` - Starts backward, then flings forward
- `ANTICIPATE_OVERSHOOT` - Starts forward, then flings forward and overshoots the target value, and finally goes back to the final value
- `BOUNCE` - Rate of change 'bounces' at the end

## Listeners provided by ARController

The `ARController` class provides a variety of listener classes that can be used to trigger event-driven code in your application. The listeners provided are:

Listener Name	Purpose
<code>OnCameraEnteredListener</code>	Listener for the Camera view-entered event. This event is triggered just before the camera frame is displayed.
<code>OnCameraExitedListener</code>	Listener for the Camera view-exited event. This event is triggered just after the camera frame is exited.
<code>OnCompassCalibrationChangedListener</code>	Listener for compass calibration changed event. This event is triggered by the system when the compass calibration status changes.
<code>OnMapEnteredListener</code>	Listener for the "Map view entered" event. This event is triggered just before the Map view is displayed.
<code>OnMapExitedListener</code>	Listener for the "Map view exited" event. This event is triggered just after the Map view is exited.
<code>OnObjectTappedListener</code>	Listener for object selection events.
<code>OnPanListener</code>	Listener for pan events.
<code>OnPoseListener</code>	Listener for pose update events.
<code>OnPreDrawListener</code>	Listener for pre-draw event. This event is triggered just before a draw is performed. This listener is useful in case a client wants to update things while in LiveSight Mode and serialize the update action with the LiveSight draw cycle. This callback is performed in both Map view and Camera view.
<code>OnPreDrawMapListener</code>	Listener for the map pre-draw event. This event is triggered just before the map is being drawn. This listener is useful in the case where the client wants to update things on the map and serialize the update action with the draw cycle.
<code>OnPrePresentListener</code>	Listener for the event that occurs before the frame is composited. This event occurs after the draw event.
<code>OnPostPresentListener</code>	Listener for the event that occurs after the frame is composited.
<code>OnLivesightStatusListener</code>	Listener for hardware and component errors related to LiveSight.
<code>OnPitchFunction</code>	Listener for pitch changes. Allows you to override the default LiveSight pitch/zoom curve.
<code>OnRadarUpdateListener</code>	Listener for radar update events.
<code>OnSensorCalibrationChangedListener</code>	Listener for sensor calibration events.
<code>OnTapListener</code>	Listener for tap events.
<code>OnTouchDownListener</code>	Listener for touch "down" events.
<code>OnTouchUpListener</code>	Listener for touch "up" events.

📌 **Note:** `OnPreDrawMapListener` is a replacement for the `OnMapRenderListener.onPreDraw()` callback, which is not triggered while in LiveSight Mode.

All of these Listeners are added and removed by way of their respective `addOnXYZListener` and `removeOnXYZListener` methods provided by the `ARController`.

## Draw and Present Phases

To understand how to use `OnPreDrawMapListener`, `OnPrePresentListener`, and `OnPostPresentListener`, it is important to understand the order and differences between Present and Draw. The order of LiveSight phases and events are as follows:

1. Pre-Draw event

2. Draw phase
3. Pre-Present event
4. Present phase
5. Post-Present event

The Draw phase is the action of filling graphics buffers with the various components of the scene, which are applicable for the current LiveSight View. In the Draw phase, the LiveSight engine is composing different layers in a frame, such as a map and icons for the Down view, and the camera feed and icons for the Up view. This phase occurs before the Present phase, and since the Pre-Draw event is triggered before this phase, you should use the Pre-Draw event if you want, for example, for an icon to change for the next frame.

Note the absence of the Post-Draw event. If you want to do something just before presenting, use the Pre-Present event, which is the same as Post-Draw, since the Pre-Present event occurs after "Draw" but before the "Present" phase.

The Present phase refers to the composition of the buffers filled in the draw phase into the frame. In other words, this phase takes buffers and blends their contents into one buffer to be displayed. For example, this is how icons are placed on top of the camera frame. After the "Present" phase, the Post-Present event is triggered.

## Platform Data Extension

---

Platform Data Extension (PDE) provides the ability to easily access the Platform Data Extension API from the HERE Android SDK. You can use this extension to access a wide range of data that can be later used for different use cases. Some examples include displaying road elevation, slopes, and traffic signs. For more information about use cases and the types of data that can be accessed through PDE, check the [Platform Data Extension API Developer's Guide](#).

### PDE Thematic Layers

PDE divides map content across many thematic layers. Each thematic data layer serves a specific use case and only contains the data required for it, such as road elevation. To use PDE, you need to first decide on the required data for your app and select the PDE thematic layers accordingly. The available thematic layers can be found via the PDE [Layers API](#). You can then check the targeted thematic layers via the individual [Layer API](#). Before starting to use PDE in your app, you need to select the correct thematic layers, and then decide on what data to use and how to use it. This is a crucial step.

- **Note:** It is common for routes to start on smaller roads, climb to bigger roads, stay on motorways for the main part, and finally steps down to smaller roads again when approaching the destination. Since retrieving all information about smaller roads along the entire route requires a large amount of data, *road link*-related thematic layers are actually split into five layers each, corresponding to the functional road classes in the HERE map. Functional Class 1 roads are generally motorways, while Functional Class 5 roads are small roads that are only used near a destination. To use these layers, you need to specify the tile layer by appending the functional class suffix "\_FCx", where x is a number from 1 to 5. For example, ROAD\_GEOM\_FC1. If a layer isn't related to road links, such as the PSTLCB\_GEN layer, you don't need to append the "\_FCx" suffix and specify the tile layer.

## PDE Classes

Class	Description
<code>PlatformDataRequest</code>	Used to create and execute a PDE data request with the specified layers and <code>GeoBoundingBox</code> object.
<code>PlatformDataResult</code>	The result of running a PDE data request. Contains data for requested layers, which are accessible by the layer name. This implements the <code>java.util.Map</code> interface for ease of use and interoperability, although objects of this class are unmodifiable. Provides <code>extract</code> method to convert the result into an <code>Map&lt;String, List&lt;Map&lt;String, String&gt;&gt;&gt;</code> which is a raw representation of the underlying data.
<code>PlatformDataItemCollection</code>	Represents layer data in the form of an array of <code>PlatformDataItem</code> objects. This is what you get by asking <code>PlatformDataResult</code> for a specific layer—for example, by calling <code>platformDataResult.get("ROAD_GEOM_FC1")</code> . <code>PlatformDataItemCollection</code> implements the <code>java.util.List</code> interface for ease of use and interoperability, although objects of this class are unmodifiable. It also provides an <code>extract()</code> method to convert the collection into an <code>List&lt;Map&lt;String, String&gt;&gt;</code> object.
<code>PlatformDataItem</code>	Represents actual data records in a layer as a map of attribute names and values. This is what you get from <code>PlatformDataItemCollection</code> by iterating over its contents or asking for an item at a specific index. Note that for several attributes, shortcut methods are provided, such as <code>item.getLinkId()</code> , which can be used instead of <code>item.get("LINK_ID")</code> . This implements the <code>java.util.Map</code> interface for ease of use and interoperability, although objects of this class are unmodifiable. Provides <code>extract()</code> method to convert it into an <code>Map&lt;String, String&gt;</code> object.

In summary, `PlatformDataRequest` produces `PlatformDataResult`, a `Map` of layer names to `PlatformDataItemCollection` objects, which in turn are `List` of `PlatformDataItem` objects, with each containing attribute names and their values in the form of a `Map`.

### Example: Requesting the PDE Data

The example below shows how a feature is implemented using the PDE data. The goal is to colorize each road segment according to its average height. For this feature, you need the PDE data from the `ROAD_GEOM_FC1` and `BASIC_HEIGHT_FC1` layers. As of now, the only way to request the PDE data requires the layers specified with an `GeoBoundingBox`.

- 📌 **Note:** The `ROAD_GEOM_FC[number]` and `BASIC_HEIGHT_FC[number]` layers are also referred to as "tile" layers, since their data is split into multiple tiles. Due to server limitations, up to 15 tiles can be requested at a time. PDE also supports non-tile layers.

To use the data from both layers, you need to join the two layers by using the `LINK_ID` property. This is demonstrated in the next section.



The following are sample results from the Layer request.

ROAD\_GEOM\_FC1 Layer API result:

```
{
  "description": "Ungeneralized road, ferry and rail ferry geometry (polylines).<br/>If a road link crosses a tile boundary, it will be written into each of the tiles, each including the full link geometry. This simplifies use cases other than pure display of all geometry within a rectangle.",
  "attributes": {
    "LINK_ID": "Permanent link ID. Positive 64 bit Integer that globally identifies the road, carto or buildin footprint link, also across map releases. Link IDs are never reused.",
    "LONG_HAUL": "This link or polygon or POI is of major importance. It should be displayed at high zoom levels, and it should be included for routing in/through regions where no detailed routing is supported.",
    "NAME": "A name of this road line. Roads can have multiple names, in the same or multiple languages. This field contains any of those.",
    "NAMES": "List of all names for this object, in all languages [...]",
    "TUNNEL": "Is this navigable link or railroad a tunnel?",
    "BRIDGE": "Is this navigable link or railroad a bridge?",
    "LAT": "Latitude coordinates [10^-5 degree WGS84] along the polyline. ",
    "LON": "Longitude coordinates [10^-5 degree WGS84] along the polyline. ",
    "ZLEVEL": "(-4 ... 11) indicates the height of the point relative to another point on a grade separated crossing with any other line. Comma separated. If z-level is null then the value '0' is left out."
  },
  "referencedStaticContents": [],
  "tileRequestsLevel": 9,
  "tileX": 499,
  "tileY": 403,
  "isStaticContent": false
}
```

BASIC\_HEIGHT\_FC1 Layer API result:

```
{
```

```
"description": "Link height values computed from a Digital Terrain Model, cleaned up for continuity
along links, bridges and tunnels. Less accurate than ADAS link height values, but full coverage and
sufficient for certain use cases.",
"attributes": {
  "LINK_ID": "Permanent link ID. Positive 64 bit Integer that globally identifies the road, carto or
buildin footprint link, also across map releases. Link IDs are never reused.",
  "DTM_MIN_HEIGHT": "The minimum height [cm above WGS84 ellipsoid] encountered along the link.",
  "DTM_MAX_HEIGHT": "The maximum height [cm above WGS84 ellipsoid] encountered along the link.",
  "DTM_AVG_HEIGHT": "The average height [cm above WGS84 ellipsoid] along the link.",
  "DTM_REF_ZCOORD": "Height [cm above WGS84 ellipsoid] at the reference node of the link.",
  "DTM_NONREF_ZCOORD": "Height [cm above WGS84 ellipsoid] at the non-reference node of the link."
},
"referencedStaticContents": [],
"tileRequestsLevel": 9,
"tileX": 496,
"tileY": 358,
"isStaticContent": false
}
```

To begin using the PDE layers, create a `PlatformDataRequest` object:

```
Set<String> layers = new HashSet<String>(Arrays.asList("LINK_FC1", "BASIC_HEIGHT_FC1"));
GeoBoundingBox box = mapView.getBoundingBox();
PlatformDataRequest request =
  PlatformDataRequest.createBoundingBoxRequest(RoadElevationProcessor.LAYERS, box);
```

Note that trying to create a request with invalid parameters causes a `java.lang.IllegalArgumentException`.

Next, you need to supply a `Listener<PlatformDataResult>` object to get the results of the request.

```
request.execute(new PlatformDataRequest.Listener<PlatformDataResult>() {
  @Override
  public void onCompleted(PlatformDataResult data, PlatformDataRequest.Error error) {
    if (error != null) {
      Log.w(TAG, "PlatformDataRequest failed with error: " + error);
    } else {
      // process received data
      RoadElevationProcessor processor = new RoadElevationProcessor(data);
      processor.process(new Listener<List<MapObject>>() {
        @Override
        public void onResult(List<MapObject> result) {
          m_elevationPolylines = result;
          m_elevationLegend.setVisibility(View.VISIBLE);
          m_map.addMapObjects(m_elevationPolylines);
          onRequestEnd(null);
        }
      });
    }
  }
});
```

### Example: Processing the PDE Data

After the data result is successfully retrieved, you need to process the data. In the example above, you have asked for `ROAD_GEOM_FC1` and `BASIC_HEIGHT_FC1` data, restricted with the map view's bounding box. For tutorial purposes, we then implemented a sample data processor class, `PlatformDataProcessor`, which provides methods to join the layers and can be extended to consume the joined data. We use these classes to implement the colorize feature.

```
public abstract class PlatformDataProcessor<T> {
```

```

protected final PlatformDataResult m_data;
private Handler m_handler = new Handler(Looper.getMainLooper());

public PlatformDataProcessor(PlatformDataResult data) {
    m_data = data;
}

public void process(final Listener<T> listener) {
    new Thread(new Runnable() {
        @Override
        public void run() {
            final T result = doProcess();
            m_handler.post(new Runnable() {
                @Override
                public void run() {
                    listener.onResult(result);
                }
            });
        }
    }).start();
}

protected abstract T doProcess();

protected Map<String, PlatformDataItem> map(Indexer indexer, PlatformDataItemCollection items) {
    Map<String, PlatformDataItem> ret = new HashMap<String, PlatformDataItem>();
    map(indexer, items, ret);
    return ret;
}

protected void map(Indexer indexer, PlatformDataItemCollection items,
    Map<String, PlatformDataItem> output) {
    for (PlatformDataItem item : items) {
        output.put(indexer.getIndexValue(item), item);
    }
}

protected Map<String, List<PlatformDataItem>> multimap(MultiIndexer indexer,
    PlatformDataItemCollection items) {
    Map<String, List<PlatformDataItem>> ret = new HashMap<String, List<PlatformDataItem>>();
    multimap(indexer, items, ret);
    return ret;
}

protected void multimap(MultiIndexer indexer, PlatformDataItemCollection items,
    Map<String, List<PlatformDataItem>> output) {
    for (PlatformDataItem item : items) {
        for (String value : indexer.getIndexValue(item)) {
            List<PlatformDataItem> entry = output.get(value);
            if (entry == null) {
                entry = new ArrayList<PlatformDataItem>();
                output.put(value, entry);
            }
            entry.add(item);
        }
    }
}

protected Map<PlatformDataItem, PlatformDataItem> join(Indexer commonIndexer,
    PlatformDataItemCollection mainLayer, PlatformDataItemCollection otherLayer) {
    return join(commonIndexer, mainLayer, commonIndexer, otherLayer);
}

protected Map<PlatformDataItem, PlatformDataItem> join(Indexer mainIndexer,
    PlatformDataItemCollection mainLayer, Indexer otherIndexer,
    PlatformDataItemCollection otherLayer) {
    Map<PlatformDataItem, PlatformDataItem> ret =

```

```

    new HashMap<PlatformDataItem, PlatformDataItem>();
    Map<String, PlatformDataItem> mappedItems = map(otherIndexer, otherLayer);

    for (PlatformDataItem item : mainLayer) {
        String value = mainIndexer.getIndexValue(item);
        PlatformDataItem matchedItem = mappedItems.get(value);
        ret.put(item, matchedItem);
    }
    return ret;
}

protected Map<PlatformDataItem, List<PlatformDataItem>> join(MultiIndexer mainIndexer,
    PlatformDataItemCollection mainLayer, PlatformDataItemCollection otherLayer) {
    return join(mainIndexer, mainLayer, mainIndexer, otherLayer);
}

protected Map<PlatformDataItem, List<PlatformDataItem>> join(MultiIndexer mainIndexer,
    PlatformDataItemCollection mainLayer, MultiIndexer otherIndexer,
    PlatformDataItemCollection otherLayer) {
    Map<String, List<PlatformDataItem>> mappedItems = multimap(otherIndexer, otherLayer);
    Map<PlatformDataItem, List<PlatformDataItem>> ret =
        new HashMap<PlatformDataItem, List<PlatformDataItem>>();
    for (PlatformDataItem item : mainLayer) {
        for (String value : mainIndexer.getIndexValue(item)) {
            List<PlatformDataItem> matchedItems = mappedItems.get(value);
            List<PlatformDataItem> entry = ret.get(item);
            if (entry == null) {
                entry = new ArrayList<PlatformDataItem>();
                ret.put(item, entry);
            }
            if (matchedItems != null) {
                entry.addAll(matchedItems);
            }
        }
    }
    return ret;
}

interface Indexer {
    String getIndexValue(PlatformDataItem item);
}

interface MultiIndexer {
    String[] getIndexValue(PlatformDataItem item);
}

interface Listener<T> {
    void onResult(T result);
}
}

```

Note that the `PlatformDataProcessor.join()` method is for inner joining the thematic layers with properties where more than one data item is possible. For example, the `TRAFFIC_SIGN_FCx` thematic layer has the `LINK_IDS` property where as much as two `LINK_IDS` are contained.

Next, create `RoadElevationProcessor`. The `RoadElevationProcessor` class extends the `PlatformDataProcessor` for coloring the road segments according to their average height. This class needs the result and a dedicated map container intended for the `MapPolyline` objects. Note that the base class `PlatformDataProcessor` performs the inner joining of the thematic layer data depending on the indexer blocks provided. The `RoadElevationProcessor` class utilizes the joined data to implement the intended feature.

```
public class RoadElevationProcessor extends PlatformDataProcessor<List<MapObject>> {
```

```

public static final String ROAD_GEOM_LAYER = "ROAD_GEOM_FC1";
public static final String BASIC_HEIGHT_LAYER = "BASIC_HEIGHT_FC1";
public static final Set<String> LAYERS = new HashSet<String>(Arrays.asList(ROAD_GEOM_LAYER,
    BASIC_HEIGHT_LAYER));

public RoadElevationProcessor(PlatformDataResult data) {
    super(data);
}

protected List<MapObject> doProcess() {
    List<MapObject> polyLines = new ArrayList<MapObject>();
    PlatformDataItemCollection roadGeomLayer = m_data.get(ROAD_GEOM_LAYER);
    PlatformDataItemCollection basicHeightLayer = m_data.get(BASIC_HEIGHT_LAYER);

    Map<PlatformDataItem, PlatformDataItem> combinedData =
        join(LINK_ID_INDEXER, roadGeomLayer, basicHeightLayer);

    for (Map.Entry<PlatformDataItem, PlatformDataItem> entry : combinedData.entrySet()) {
        PlatformDataItem roadGeomItem = entry.getKey();
        PlatformDataItem basicHeightItem = entry.getValue();
        List<GeoCoordinate> linkGeometry = roadGeomItem.getCoordinates();
        if (linkGeometry.size() > 1) {
            GeoPolyline geoPolyline = new GeoPolyline(linkGeometry);
            MapPolyline mapPolyline = new MapPolyline(geoPolyline);
            mapPolyline.setLineColor(calculateColor(basicHeightItem.getAverageHeight()));
            mapPolyline.setLineWidth(10);
            polyLines.add(mapPolyline);
        }
    }

    return polyLines;
}

private int calculateColor(int height) {
    if (height > 75000) {
        return 0xff00695c;
    } else if (height > 25000) {
        return 0xff009688;
    } else if (height > 0) {
        return 0xff4db6ac;
    } else if (height > -25000) {
        return 0xff7986cb;
    } else if (height > -75000) {
        return 0xff5c6bc0;
    } else {
        return 0xff3f51b5;
    }
}

private Indexer LINK_ID_INDEXER = new Indexer() {
    @Override
    public String getIndexValue(PlatformDataItem item) {
        return item.getLinkId();
    }
};
}

```

The main method for the `RoadElevationProcessor` class is the `doProcess()` method.

The first thing this method does is joining the data coming from two different thematic layers with the "indexer" blocks. Here, the data is joined via the `LINK_ID`'s. Note that the `LinkId` property is available as a shortcut property in the `PlatformDataItem` class. After joining the data, each `ROAD_GEOM_FC1` data item is inner joined with the relevant `BASIC_HEIGHT_FC1` data item, and the joined data is returned as a dictionary where the actual type is `Map<PlatformDataItem, PlatformDataItem>`. Each key-

value pairs provides the necessary data for the feature: the key of `PlatformDataItem` type representing the `ROAD_GEOM_FC1` thematic layer data provides the road geometry, such as coordinates of the road segment, and the value of `PlatformDataItem` type, representing the `BASIC_HEIGHT_FC1` thematic layer data, provides the average height of that road segment. The joined data provides all the data required for implementing the intended feature.

```
{
  BRIDGE = N;
  LAT = "5246124,2";
  "LINK_ID" = 936938339;
  LON = "1342560,24";
  "LONG_HAUL" = Y;
  NAME = A100;
  NAMES = "GERBNTunnel BritzGERY\"tU|n@l \"brItsGERBNA100GERN\"?a: \"hUn|d6t;GERN\"?aU|to:|ba:n ?aIn|
  \"hUn|d6t;GERY\"?a: ?aIn|\"hUn|d6t;GERN\"?aU|to:|ba:n \"hUn|d6tGERBNStadtring BerlinGERY\"Stat|rIN
  bEr|\"li:n";
  TUNNEL = Y;
  ZLEVEL = ", ";
} = {
  "DTM_AVG_HEIGHT" = 8500;
  "DTM_MAX_HEIGHT" = 8693;
  "DTM_MIN_HEIGHT" = 8099;
  "DTM_NONREF_ZCOORD" = 8500;
  "DTM_REF_ZCOORD" = 8500;
  "LINK_ID" = 936938339;
}
```

Note that the key-value pair has the same `LINK_ID`.

## Natural Language Processing (NLP)

The Natural Language Processing (NLP) feature adds a "natural language" interface to the HERE Android SDK. For example, the end user says "find me a gas station". This prompts the NLP interface to detect that the user wants to search for gas stations, trigger a search via the HERE SDK, use [Places](#) to find gas stations, and speak the results to the user.

**Important:** NLP is currently offered as a beta feature, and it is only available for use in the English language. APIs may change without notice. Do not use this feature in a commercial application.

NLP covers the main features offered by the HERE Android SDK: search, routing, navigation, and traffic. NLP also saves and handles context for the user's request. For example, it can handle the command "find 3 gas stations", followed by "take me to the third one".

### Initialization

You can start using the NLP feature by initializing the `Nlp` class after you have successfully initialized the `MapFragment` in your application.

`Nlp` is a singleton, so you first need to retrieve the instance of it and then call `init()` to initialize the whole engine. The `Nlp.init(Context, MapFragment, CollectionProvider, SpeechToTextProvider, OnInitializationListener)` method takes the following input parameters, as demonstrated in the next example:

- The application context

- The `MapFragment` object
- A `CollectionProvider` (Or null if you don't want to implement a collection feature)
- A `SpeechToTextProvider` to enable the Speech Recognition functionality
- An `OnInitializationListener`

```
// Create Map NLP object to control voice operations
// Pass Activity as a Context
m_nlp = Nlp.getInstance();
m_speechToTextProvider = new MyASR(getApplicationContext());

m_nlp.init(AppActivity.this, mapFragment,
    m_nlpCollectionProvider, m_speechToTextProvider, m_nlpListener);

private OnInitializationListener m_nlpListener = new OnInitializationListener() {
    @Override
    public void onComplete(Error error) {

        if (error == Error.NONE) {

            m_speechToTextProvider.setNlp(m_nlp);

            // Enable talk-back
            m_nlp.setTalkBackEnabled(true);

            // Set speech volume percentage
            m_nlp.setSpeechVolume(25);
        }
    }
};
```

**Note:** Nlp can only be used after it is successfully initialized.

**Note:** If you want to support a collection feature in your application via NLP, implement a `CollectionProvider`. If the `CollectionProvider` interface is not implemented, all collection-related utterances result in "feature not supported" announcements to the user. Collection-handling use cases include: saving a found place in a collection, creating a collection, renaming a favorite place, and deleting a collection.

## Speech Recognition

You need to create your own Speech Recognition class, by implementing the `SpeechToTextProvider` interface, to listen to the user's voice commands. The example below uses the Android `SpeechRecognizer` API, but your application can use any available Automatic Speech Recognition (ASR). Once the ASR results are received, the recognized text is processed through NLP to be analyzed and understood using the `Nlp understand(String)` API.

If the `SpeechRecognizer` interface is not implemented, NLP will not be able to automatically start listening when asking a question to the user for clarification or confirmation.

It is also recommended to use `Nlp.startListening()` API instead of calling your speech recognizer's `start()` directly. This will allow NLP to automatically stop navigation instructions from speaking when the application wants to start listening to user's speech.

```
public class MyASR implements SpeechToTextProvider {

    private Context m_context = null;
    private volatile SpeechRecognizer m_stt = null;
    private Nlp m_nlp = null;
```

```

/**
 * Create Speech recognizer
 */
MyASR(Context context, int resStartEarcon, int resStopEarcon, int resErrorEarcon) {
    m_context = context;

    if (m_stt == null) {
        // Creating an instance of Google SpeechRecognizer to listen to user's utterances
        m_stt = SpeechRecognizer.createSpeechRecognizer(m_context);
        m_stt.setRecognitionListener(m_sttListener);
    }
}

/**
 * Schedule to start listening
 */
@Override
public synchronized void start() {

    final Intent intent = new Intent(RecognizerIntent.ACTION_RECOGNIZE_SPEECH);
    intent.putExtra(RecognizerIntent.EXTRA_LANGUAGE, Locale.US.toString());
    intent.putExtra(RecognizerIntent.EXTRA_LANGUAGE_PREFERENCE, Locale.US.toString());
    intent.putExtra(RecognizerIntent.EXTRA_MAX_RESULTS, 4);

    try {
        m_stt.startListening(intent);
    } catch (Exception e) {
        destroy();
    }
}

/**
 * Google Speech Recognizer listener
 */
private final RecognitionListener m_sttListener = new RecognitionListener() {
    @Override
    public void onResults(final Bundle results) {
        synchronized (GoogleASR.this) {

            final ArrayList<String> data =
                results.getStringArrayList(SpeechRecognizer.RESULTS_RECOGNITION);

            if (data != null && !data.isEmpty() && m_nlp.isInitialized()) {
                m_nlp.understand(data.get(0)); // Pass the utterance to NLP for analysis
            }
        }
    }
};
}

```

## Using the Nlp Class

To receive callbacks when different utterances are said by the users, set listeners after the Nlp has successfully initialized. For example, if you want to know when the user says "search for restaurants", you need to override the `OnSearchListener` callback. All available listeners are listed in the Nlp class definition.

The following is an example of how to set an `OnSearchListener`:

```

private OnInitializationListener m_nlpListener = new OnInitializationListener() {
    @Override
    public void onComplete(Error error) {

```

```
if (error == Error.NONE) {

    // Create handlers
    m_nlp.addListener(m_searchListener);
}
};

private OnSearchListener m_searchListener = new OnSearchListener() {
    @Override
    public void onStart(final String subject, final GeoBoundingBox box) {
        android.util.Log.d(TAG, "onStart: Search STRING start event");
    }

    @Override
    public void onStart(final CategoryFilter filter, final GeoBoundingBox box) {
        android.util.Log.d(TAG, "onStart: Search CATEGORY start event");
    }

    @Override
    public void onStart(final GeoCoordinate center) {
        android.util.Log.d(TAG, "onStart: Search REVERSE start event");
    }

    @Override
    public void onComplete(final Error error,
        final String searchString,
        final String whereString,
        final String nearString,
        List<Placelink> placeLinks) {
        android.util.Log.d(TAG, "onComplete: Search results are available");
        if (error == Error.NONE) {
            // Show all found places on the map.
        }
    }
};
```

## Chapter 4

# Supplemental Information

---

### Topics:

- [Create a Simple App Using ...](#)
- [Requesting Android Permiss...](#)
- [Android Emulator Support](#)
- [Adding a MapFragment at Ru...](#)
- [3D Venues FAQ](#)
- [Size Management](#)
- [Map Rendering Order](#)
- [Development Tips](#)
- [Signpost Parsing](#)

This section provides supplemental information for using the HERE Android SDK.

## Create a Simple App Using the HERE SDK

---

This tutorial provides instructions on how to create a simple application that uses the HERE Android SDK to render a map on an Android device.

This tutorial assumes that you are using the *Android Studio* development environment. Development tasks for this basic application include:

- Acquire HERE credentials for accessing map services.
- Create a new Android Studio project.
- Add necessary resources, permissions, and a map fragment to the project.
- Modify `AndroidManifest.xml`
- Initialize the map fragment to create a map instance and associate this map with the map fragment for rendering on the client device.

■ **Note:** The HERE Map Service must be embedded with the application. For more information on this requirement, see *Embedding the Map Service* on page 20.

■ **Note:** The HERE Android SDK is now distributed as an .AAR instead of a .JAR. Please review your project configuration if you are upgrading from an older versions of the HERE SDK. Also, be sure to first remove the old `HERE-sdk.jar` and native libraries from your Android project before you import the new .AAR file.

### Acquire HERE SDK Credentials

Typically, before developing a new HERE SDK application, you need to acquire a set of credentials by registering your application on <http://developer.here.com>. Each application requires a unique set of credentials. When you register your app, the registered bundle identifier must match the package name in your project.

### Create a New Android Studio Project

The second stage of developing an application using the HERE SDK is to create a new project in Android Studio as follows:

1. From the Welcome to Android Studio dialogue box, select **New Project...** to open the Create New Project dialog.
2. In the New Android Application dialog, under Application name, specify an appropriate application name. The remainder of this tutorial uses `BasicMapSolution` as the application name.
3. Under Company Domain, specify an appropriate domain.
4. Edit the package name by clicking the **Edit** link. The remainder of this tutorial uses `com.here.android.tutorial` as the package name.

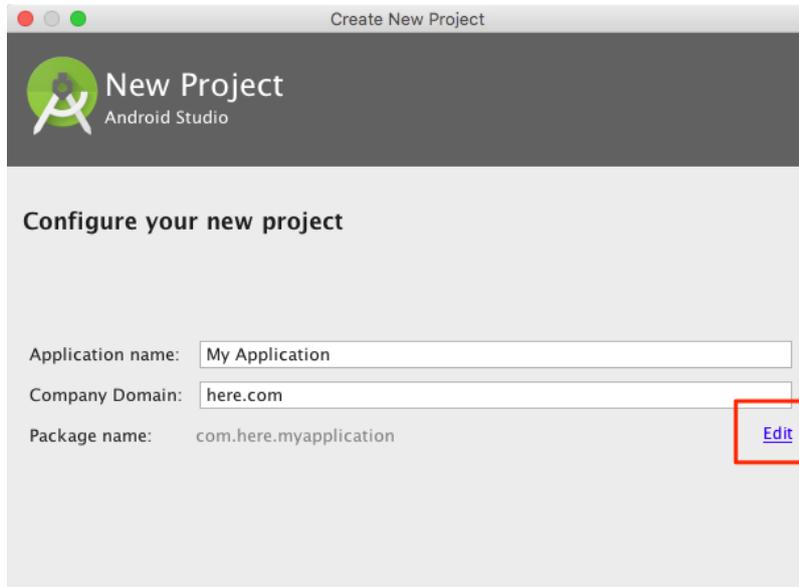
■ **Important:** You must use the same package name as you have registered on [developer.here.com](http://developer.here.com). Failure to do so leads to a blank map to appear in your application.

You can also edit this package name later in your `AndroidManifest.xml`:

```
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
  package="com.your.package.name.here"
  android:versionCode="1"
```

```
android:versionName="1.0" >
```

**Figure 74: Edit the Package Name**



5. Under Project Location, specify an appropriate project location in the file system.
6. Click **Next**.
7. Select the form factors supported by your application. For the purpose of this tutorial, check Phone and Tablet.
8. Under Minimum SDK, select the lowest version of the Android SDK you wish to support. For this sample application, use Android 4.1.x "Jelly Bean".
9. Click **Next**.
10. You may be prompted to agree to a License Agreement. Click Accept, and then **Next** to install SDK components. After the installation is complete, click **Next** again.
11. In the "Add an activity to Mobile" dialog box, select Empty Activity and click **Next**.
12. In the "Customize Activity" dialog box, specify an appropriate activity name in Activity Name. This tutorial uses the name `BasicMapActivity`.
13. Under Layout Name, specify an appropriate layout name. (This tutorial uses `activity_main`.)
14. Click **Finish**.

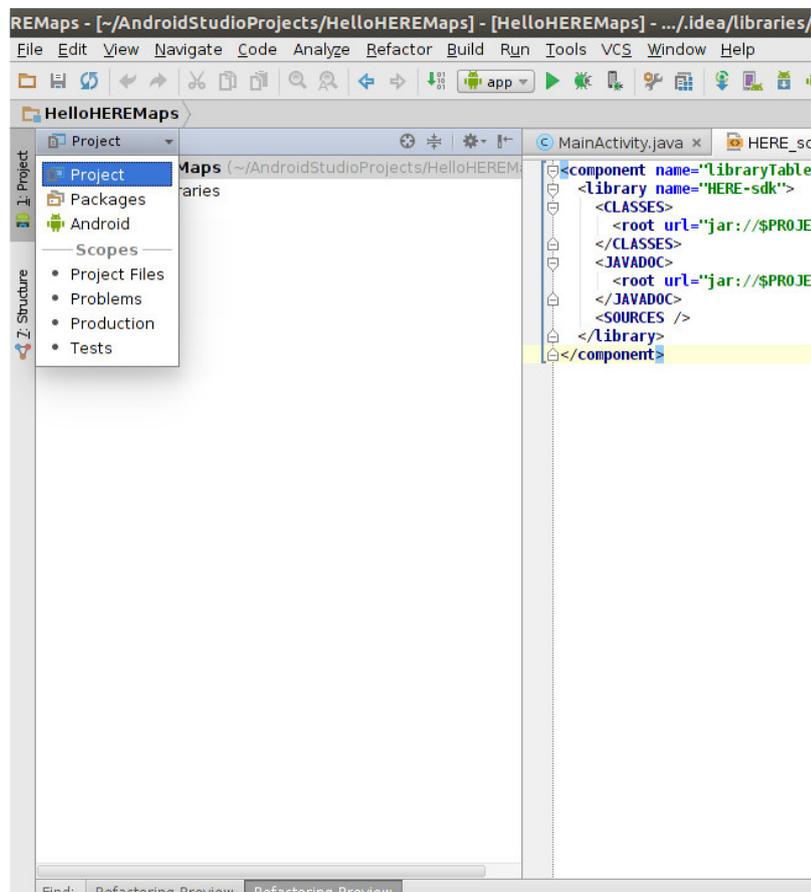
Result: Android Studio creates the structure for your project and opens the development environment.

A few views are available in the Android Studio development environment. The Android view shows a flattened view of the application's structure, and the Project view shows a flattened view of the project's structure, including Gradle-related files.

The Android view provides quick access to key source files of your Android application. Selecting the `activity_main.xml` file in Android view opens the file in the Layout Editor and allows you to drag-and-drop widgets into your layout.

The following image shows how to switch between Android and Project view.

**Figure 75: Switching Views in Android Studio**



## Import the HERE SDK Android Archive

The HERE Android SDK library is shipped as an Android Archive (.AAR) file. You can import this library by doing the following:

1. On the **View** menu, click **Tool Windows > Project**.
2. A few tabs are available in this tool window. Select the **Project** tab to show a file system view of the application structure.
3. Right-click on the **app** folder and select **New > Directory** to create a new folder. Use **libs** as the new folder name.
4. In your operating system's file system, navigate to the extracted HERE SDK directory. Copy the **HERE-sdk.aar** file and paste it into the newly created **libs** directory.
5. Optional: To enable quick Javadoc reference within your Android Studio environment, scroll down to the **External Libraries** section, right-click on **HERE-sdk**, and then select **Library Properties**. Click the **+** button and locate **HERE-sdk-javadoc.jar** from the HERE SDK package.

## Modify build.gradle

After importing the .AAR file, modify **build.gradle** to add the file to your list of dependencies.

1. From the Project view pane, locate the **build.gradle** file under the **app** folder and open it for editing.

- In `build.gradle`, add the following line into the `android { ... }` section:

```
repositories {
    flatDir {
        dirs 'libs'
    }
}
```

- Next, add the following into the `dependencies { ... }` section:

```
compile project(':HERE-sdk')
```

- Optional: If you plan on extending this application with HERE Places, Custom Locations, 3D Venues, or Transit Routing, functionality, add the GSON library to your project. You can add this library by adding the following line into the `dependencies { ... }` section:

```
compile 'com.google.code.gson:gson:2.8.0'
```

## Modify AndroidManifest.xml and Add HERE Credentials

- Add the HERE credentials to `AndroidManifest.xml`. For instructions on how to edit this file, see [Authenticating Applications](#) on page 17.
- Modify the opening `<application>` by adding the `android:hardwareAccelerated="true"` attribute.

```
<application android:icon="@drawable/icon"
    android:label="@string/app_name" android:hardwareAccelerated="true">
```

- Add the following markup before the `<application></application>` tags:

```
<uses-permission android:name="android.permission.WRITE_EXTERNAL_STORAGE"/>
<uses-permission android:name="android.permission.ACCESS_NETWORK_STATE"/>
<uses-permission android:name="android.permission.INTERNET"/>
<uses-permission android:name="android.permission.ACCESS_WIFI_STATE"/>
```

**Note:** If your app uses Android API level 23 (Android 6.0) or above, you must also add code to request for permissions during runtime. You can find more information in the [Request for Permissions](#) section.

- Within the same `<application></application>` section in your `AndroidManifest.xml` file, add the following lines:

```
<service
    android:name="com.here.android.mpa.service.MapService"
    android:label="HereMapService"
    android:process="global.Here.Map.Service.v3"
    android:exported="true" >
    <intent-filter>
        <action android:name="com.here.android.mpa.service.MapService.v3" >
        </action>
    </intent-filter>
</service>
```

Result: Your project is able to make use of APIs from the HERE SDK.

## Edit activity\_main.xml

Along with permissions and credentials, you must add an Android `<fragment />` tag to set up the map fragment that your application activity is associated with. In this section, we add a text label (generated as part of the default new application) and a map as follows:

1. From the Android View, under the `res/layout/` folder of your project, double-click the `activity_main.xml` file to open it for editing.
2. Ensure that the XML file has `<LinearLayout></LinearLayout>` as its root element. Depending on your version of Android Studio, this may be a `RelativeLayout` instead. If that is the case, replace the contents of the file with the following:

```
<LinearLayout
  xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:tools="http://schemas.android.com/tools"
  android:layout_width="fill_parent"
  android:layout_height="fill_parent"
  android:orientation="vertical" >

  <TextView
    android:id="@+id/title"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Hello World"
    tools:context=".BasicMapActivity" />

</LinearLayout>
```

3. Add the following markup beneath the `<TextView/>` tag:

```
<!-- Map Fragment embedded with the map object -->
<fragment
  class="com.here.android.mpa.mapping.MapFragment"
  android:id="@+id/mapfragment"
  android:layout_width="match_parent"
  android:layout_height="match_parent"/>
```

Result: When `MapFragment` is initialized, your application's `BasicMapActivity` contains a `MapFragment` UI element (with the ID `mapfragment`) that owns a `Map` object.

## Initializing the Map Fragment

When you have defined the basic layout of the application and acquired necessary permissions, the final step is to initialize the instance of the `MapFragment` class, thus creating and associating a `Map` with the `MapFragment` declared in the `activity_main.xml` file:

- From the Android View, double-click the `BasicMapActivity.java` file under the `java` folder to open it for editing.
- Revise the `import` statements and functional logic of `BasicMapActivity` to look like the following:

```
package com.here.android.tutorial;

import android.app.Activity;
import android.os.Bundle;

import com.here.android.mpa.common.GeoCoordinate;
import com.here.android.mpa.common.OnEngineInitListener;
import com.here.android.mpa.mapping.Map;
import com.here.android.mpa.mapping.MapFragment;

public class BasicMapActivity extends Activity {

  // map embedded in the map fragment
  private Map map = null;

  // map fragment embedded in this activity
  private MapFragment mapFragment = null;
```

```
@Override
public void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    initialize();
}

private void initialize() {
    setContentView(R.layout.activity_main);

    // Search for the map fragment to finish setup by calling init().
    mapFragment = (MapFragment)getFragmentManager().findFragmentById(
        R.id.mapfragment);
    mapFragment.init(new OnEngineInitListener() {
        @Override
        public void onEngineInitializationCompleted(
            OnEngineInitListener.Error error)
        {
            if (error == OnEngineInitListener.Error.NONE) {
                // retrieve a reference of the map from the map fragment
                map = mapFragment.getMap();
                // Set the map center to the Vancouver region (no animation)
                map.setCenter(new GeoCoordinate(49.196261, -123.004773, 0.0),
                    Map.Animation.NONE);
                // Set the zoom level to the average between min and max
                map.setZoomLevel(
                    (map.getMaxZoomLevel() + map.getMinZoomLevel()) / 2);
            } else {
                System.out.println("ERROR: Cannot initialize Map Fragment");
            }
        }
    });
}
```

## Request for Permissions

If your app supports Android 6.0 or above, your app needs to ask users to grant certain permissions at runtime. For more information about this requirement, see [Requesting Android Permissions](#) on page 210.

## Run the Application

You can run your simple application by pressing the key combination **Shift + F10** (or **Ctrl + R** on Macs) from within Android Studio. The application renders a map retrieved from the HERE servers. When you are running your application on a device, make sure a data connection is enabled.

See the `BasicMapSolution` folder for a completed example. You need to add your own `App_Id` and `App_Code` for this completed example to work.

## Requesting Android Permissions

If your application supports Android 6.0 or above, add the following code in your activity file to ask the application users to grant Android permissions at runtime. For more information about this requirement, see the [Android Developer documentation](#).

Figure 76: Request Location Permission

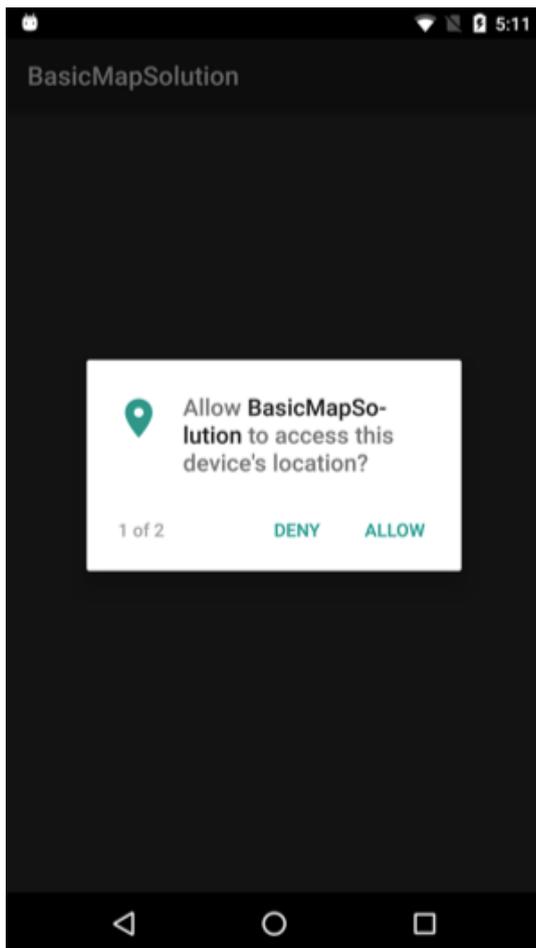
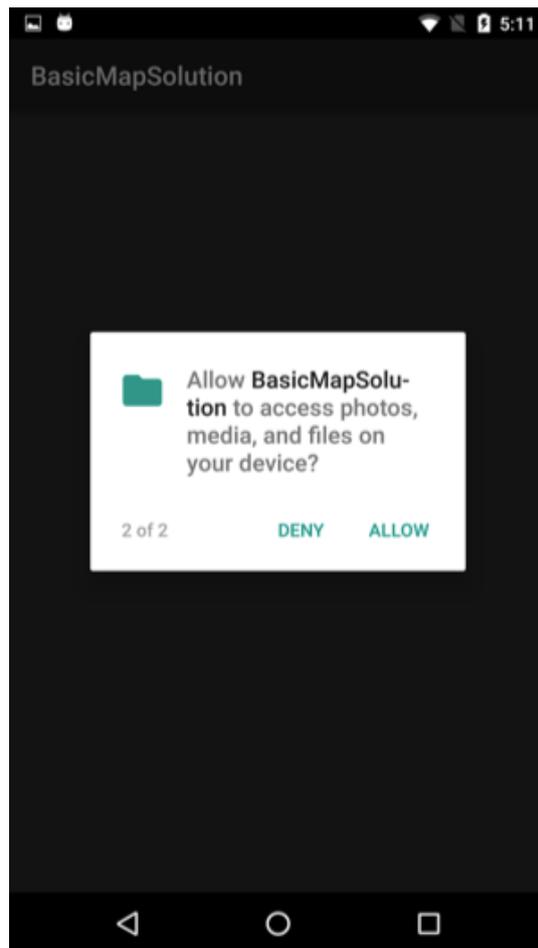


Figure 77: Request File Access Permission



1. Add the following `import` statements to the beginning of the file:

```
import android.content.pm.PackageManager;
import android.support.annotation.NonNull;
import android.support.v4.app.ActivityCompat;
import android.support.v4.content.ContextCompat;
import android.Manifest;
import android.widget.Toast;
import java.util.ArrayList;
import java.util.Arrays;
import java.util.List;
```

2. Add these static variables to the `BasicMapActivity` class:

```
/**
 * permissions request code
```

```

*/
private final static int REQUEST_CODE_ASK_PERMISSIONS = 1;

/**
 * Permissions that need to be explicitly requested from end user.
 */
private static final String[] REQUIRED_SDK_PERMISSIONS = new String[] {
    Manifest.permission.ACCESS_FINE_LOCATION, Manifest.permission.WRITE_EXTERNAL_STORAGE };

```

**Note:** The Android permission `android.permission.ACCESS_FINE_LOCATION` is not required to initialize or use the SDK. However, it is required if you use the following components:

- `PositioningManager`
- `NavigationManager`
- `PositionSimulator`
- `LiveSight`

### 3. Add the following methods to the `BasicMapActivity` class:

```

/**
 * Checks the dynamically-controlled permissions and requests missing permissions from end user.
 */
protected void checkPermissions() {
    final List<String> missingPermissions = new ArrayList<String>();
    // check all required dynamic permissions
    for (final String permission : REQUIRED_SDK_PERMISSIONS) {
        final int result = ContextCompat.checkSelfPermission(this, permission);
        if (result != PackageManager.PERMISSION_GRANTED) {
            missingPermissions.add(permission);
        }
    }
    if (!missingPermissions.isEmpty()) {
        // request all missing permissions
        final String[] permissions = missingPermissions
            .toArray(new String[missingPermissions.size()]);
        ActivityCompat.requestPermissions(this, permissions, REQUEST_CODE_ASK_PERMISSIONS);
    } else {
        final int[] grantResults = new int[REQUIRED_SDK_PERMISSIONS.length];
        Arrays.fill(grantResults, PackageManager.PERMISSION_GRANTED);
        onRequestPermissionsResult(REQUEST_CODE_ASK_PERMISSIONS, REQUIRED_SDK_PERMISSIONS,
            grantResults);
    }
}

@Override
public void onRequestPermissionsResult(int requestCode, @NonNull String permissions[],
    @NonNull int[] grantResults) {
    switch (requestCode) {
        case REQUEST_CODE_ASK_PERMISSIONS:
            for (int index = permissions.length - 1; index >= 0; --index) {
                if (grantResults[index] != PackageManager.PERMISSION_GRANTED) {
                    // exit the app if one permission is not granted
                    Toast.makeText(this, "Required permission '" + permissions[index]
                        + "' not granted, exiting", Toast.LENGTH_LONG).show();
                    finish();
                    return;
                }
            }
            // all permissions were granted
            initialize();
            break;
    }
}
}

```

4. Finally, change the method call in `onCreate(Bundle)` from `initialize()` to `checkPermissions()` instead:

```
@Override
public void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    checkPermissions();
}
```

## Android Emulator Support

---

Starting from v3.6, HERE Android SDK includes support for the x86 Application Binary Interface (ABI). The x86 ABI enables you to run apps with x86 Android Virtual Devices (AVD). Due to this change, the `.aar` file size available in the HERE SDK from <http://developer.here.com> is larger and contains the libraries for the newly supported ABIs.

For more information on ABIs, see <https://developer.android.com/ndk/guides/abis.html>.

For more information on how to create x86 AVDs, see <https://developer.android.com/studio/run/managing-avds.html>.

**Note:** To get the best possible performance on an x86 AVD, install and enable Intel HAXM by following these instructions: <https://developer.android.com/studio/run/emulator-acceleration.html>.

By default, you do not need to make any changes to your development environment to include x86 native libraries. However, any `.apk` file that you build with the HERE SDK will be larger, since it contains twice as many native libraries. Optionally, you can follow [this guide](#) to create multiple `.apk` files, with each containing native libraries for a specific ABI, and thus reducing application sizes.

## Adding a MapFragment at Runtime

---

Earlier tutorials in this document featured adding a `MapFragment` to an activity by editing the layout XML file. You can also add a `MapFragment` to an activity dynamically, during runtime, by performing the following steps in the Activity class:

1. Create a layout container:

```
final int CONTAINER_ID = 1234567;
LinearLayout layoutContainer = new LinearLayout(this);
layoutContainer.setOrientation(LinearLayout.HORIZONTAL);
layoutContainer.setId(CONTAINER_ID);
```

2. Define a map tag:

```
final String MAP_TAG = "map_tag";
```

3. Create a map fragment and add it using the fragment manager:

```
mapFragment = new MapFragment();
getFragmentManager().beginTransaction().add(layoutContainer.getId(), mapFragment,
MAP_TAG).commit();
```

4. Initialize the map fragment by implementing `OnEngineInitListener`:

```
MyOnEngineInitListener onEngineInitListener = new MyOnEngineInitListener();
ApplicationContext context = new ApplicationContext(this);
mapFragment.init(context, onEngineInitListener);
```

5. Finally, show the content view:

```
setContentView(layoutContainer);
```

For more information on adding a fragment at runtime, see this article: <https://developer.android.com/training/basics/fragments/fragment-ui.html#AddAtRuntime>.

## 3D Venues FAQ

---

### Can I customize the venue color scheme and venue icon?

Yes. Venue attributes can be customized using the `StyleSettings` object.

There are two types of icons:

- Icons displayed on the map for a space, point-space, or facility (SVG file format)
- Icons displayed in native controls, such as a search filter list (PNG file format)

Map icons can be customized in two ways, either by replacing the respective SVG asset files with customized ones, or by dynamically replacing it at runtime using the `StyleSettings` object. See the following code snippet as an example on how to customize icon for a space.

```
@Override
public void onVenueSelected(Venue venue) {
    if (venue.getId().equals("DM_12468")) {
        Space t1Space = venue.getSpace("Lv26051Ds3186063");
        if (t1Space != null) {
            VenueController venueCtrl = m_venueLayer.getVenueController(venue);
            Bitmap bitmap = BitmapFactory.decodeResource(m_venueLayer.getActivity().getResources(),
                R.drawable.ic_terminal_c);
            Image image = new Image();
            image.setImageBitmap(bitmap);
            StyleSettings settings = new StyleSettings();
            settings.setLabelImage(image);
            venueCtrl.setStyleSettings(settings, t1Space);
        }
    }
}
```

- **Note:** Using a private HERE account, PNG icons that are displayed in native controls can also be customized by replacing the respective PNG icon files with customized ones. Note that there are 4 different sizes for each Android resolution type. To make these customizations, contact a HERE representative.

### Can logos be added for individual spaces, such as for a restaurant?

Yes. You can modify the icon for an individual *space* dynamically using the `StyleSettings` object. For details, see the `StyleSettings` API Reference.

## Is it possible to expose venue data, in a classified manner, for a single user?

Yes, you can create a private HERE account and expose a "customized" version of the venue to it. Please contact a HERE representative for more information.

## What fonts are supported by the Venues feature?

There is currently no support for fonts. Only the default font is supported.

## Are there venue routing penalties for different types of connectors, such as elevators?

Penalties are applied when the route is calculated in "fastest" mode. For "shortest" mode, connectors are considered only if the geometry has a significant distance.

## How can I create a colored MapMarker?

See the following code snippet or the [MapMarker API Reference](#) .

```
MapMarker m_marker;

@Override
public void onSpaceSelected(Venue venue, Space space) {
    removeMarker();
    Bitmap bitmap = BitmapFactory.decodeResource(getResources(), R.drawable.pin_start);
    Image image = new Image();
    image.setBitmap(bitmap);
    m_marker = new MapMarker(space.getCenter(), image);
    m_marker.setAnchorPoint(new PointF(image.getWidth() / 2f, 0.9f * image.getHeight()));
    m_marker.setOverlayType(MapOverlayType.FOREGROUND_OVERLAY);
    m_marker.setZIndex(100);
    getMap().addMapObject(m_marker);
}

@Override
public void onSpaceDeselected(Venue venue, Space space) {
    removeMarker();
}

private void removeMarker() {
    if (m_marker != null) {
        getMap().removeMapObject(m_marker);
        m_marker = null;
    }
}
```

## How do I select point-spaces (spaces without geometry) and calculate a route to such a position?

Take the tapped position and calculate the route from those coordinates. The following is an example of how to handle the map tap events to get a location for a route.

```
public boolean onMapTapped(PointF point) {
    Map map = m_venueLayer.getMap();
    GeoCoordinate tapPoint = map.pixelToGeo(point);
    if (tapPoint == null || !tapPoint.isValid()) {
        return false;
    }

    Venue venue = m_venueLayer.getSelectedVenue();
```

```

VenueController venueController = null;
if (venue != null) {
    venueController = m_venueLayer.getVenueController(venue);
}

if (venueController == null) {
    // null controller means that there is no venue open in 3d mode,
    // so use the tap point as outdoor location
    BaseLocation location = new OutdoorLocation(tapPoint);
    addRoutePoint(location);
    return false;
}

// if the controller is not null, get the tapped point as a location inside venue
BaseLocation location = venueController.getLocation(point, m_preferSpaceSelection);
addRoutePoint(location);

return false;
}

private void addRoutePoint(BaseLocation location) {
    //Logic for saving route points.
}

```

## How do I calculate the length of a route?

1. From the CombinedRoute result object, get all the route sections. Route sections can be of three types: VENUE, LINK, or OUTDOOR.
2. For each route type, you need to calculate its distance individually. See the following example on how to calculate length of different route types.

```

private void calculateLength(CombinedRoute combinedRoute) {

    List<IRouteSection> sections = combinedRoute.getRouteSections();
    double distance = 0.0;
    for (IRouteSection section : sections) {
        if (section instanceof VenueRoute) {
            // get length of indoor sections
            List<VenueManeuver> maneuvers = ((VenueRoute)section).getVenueManeuvers();
            distance += (double)maneuvers.get(maneuvers.size() - 1).getDistanceFromStart();
        } else if (section instanceof LinkingRoute) {
            // get length of link sections
            distance +=
                ((LinkingRoute)section).getFrom().distanceTo(((LinkingRoute) section).getTo());
        } else if (section instanceof OutdoorRoute) {
            // get length of outdoor sections
            com.here.android.mpa.routing.Route route = ((OutdoorRoute)section).getRoute();
            distance += (double)route.getLength();
        }
    }
}

```

## How can my app automatically open a venue right after the app starts?

At app start, make sure the VenueService is initialized and then select the desired venue using VenueMapFragment, as shown in the following example:

```

//1. make sure VenueService is initialized
if (VenueMapFragment.getVenueService().getInitStatus() == ONLINE_SUCCESS ||
    VenueMapFragment.getVenueService().getInitStatus() == OFFLINE_SUCCESS) {
//2. Then, use the method to get the desired venue

```

```
VenueMapFragment.selectVenueAsync(String id);  
}
```

## How can my app detect whether a route passes a specific type of space, such as a security gate?

To identify if a route passes a certain type or category of space, loop through the route sections and inspect if a maneuver contains a space in the expected category. For example, the following code snippet shows how to find the first venue maneuver with category 4, which represents a security gate.

```
private void findSecurityGate(CombinedRoute route) {  
    for (IRouteSection section: route.getRouteSections()) {  
        if (section.getRouteSectionType() == IRouteSection.RouteSectionType.VENUE) {  
            VenueRoute venueRoute = (VenueRoute) section;  
            List<VenueManeuver> maneuvers = venueRoute.getVenueManeuvers();  
            for (VenueManeuver maneuver: maneuvers) {  
                if (maneuver.getSpace() != null && maneuver.getSpace().getContent() != null) {  
                    Content content = maneuver.getSpace().getContent();  
                    if (content.getCategoryId().equals("4")) {  
                        // create alert;  
                        return;  
                    }  
                }  
            }  
        }  
    }  
}
```

## We get the spaces and facilities by iterating through all the levels and calling the `getSortedSpacesWithFacilities()` method. Is it possible to also get the entrances?

This is the correct way to get a list with all the spaces and facilities. However, entrances (accessors) are not exposed as POIs at the moment.

## Is there a way to only show the venue model without showing the map tiles beneath it?

At the moment, a venue can only be shown on top of the map.

## Is there a way to integrate 3D Venues with Apache Cordova?

We do not support a Cordova plug-in. Only native Android and iOS SDKs are supported.

## Can airport venues be identified by their IATA airport codes?

This can only be done by searching through the core map POI database (for example, using HERE WeGo app) for the IATA code. For example, you may search for "fra", "Fra", or "FRA" and get the POI result "Frankfurt Airport (FRA)". By doing this, the venue map model's footprint (DM\_9964 - "Frankfurt International Airport") becomes exposed on the map as an unopened model within the map bounding box.

## How can I get a nearby space based on a location and a radius?

This is not currently supported.

## How can I get a nearby space based on an indoor routing line?

This is not possible at the moment. This is planned for a future release.

## How can I get a certain area around a venue model for offline mode?

Once a venue has been downloaded, it is cached and be available later in offline mode. However, you need to be online and request the venue prior to this.

## Can venue entrance markers be customized ?

HERE SDK already marks entrances on the map and on the route with entrance icons. For private venues, these icons can be customized by contacting HERE representatives.

## How do I pre-cache known airports without user interaction?

You need to download venues using `VenueService`.

- `v.getVenueAsync()`
- `v.getVenueAt()`
- `v.getVenueById()`
- `v.getVenuesIn()`

For more information, see the [VenueService API Reference](#) .

## How do I translate geo-locations into indoor locations, expressed as latitude, longitude, and level, for a given functional call within the HERE SDK?

You need to have the geo-location which you want to map inside the venue, as well as the level on which you intend to place those coordinates. Thus, you can use `LevelLocation` to construct the indoor location.

```
GeoCoordinate m_currentPosition;
String m_buildingId;
Integer m_levelId;
Level m_currentLevel;
LevelLocation m_levelLocation;
OutdoorLocation m_outdoorLocation;

@Override
public void onPositionUpdated(LocationMethod locationMethod, GeoPosition currentPosition,
    boolean isMapMatched) {

    // Get position in GeoCoordinates
    m_currentPosition = currentPosition.getCoordinate();
    m_map.setZoomLevel(17.0);
    m_map.setCenter(m_currentPosition, Animation.NONE);
    if (currentPosition.getBuildingId() != null) {
        // If inside a venue get building information and initiate venue opening
        // Get buidling id (venue id)
        m_buildingId = currentPosition.getBuildingId();
        // Get level number
        m_levelId = currentPosition.getFloorId();
        // Get 3d venue based on venue id.
        // Venue object is available as parameter of onVenueSelected callback of VenueListener.
        // In order to get that callback, register your application to receive this
        // callback with VenueService.addVenueLoadListener method.
        if (m_venueLayer.getSelectedVenue() == null ||
```

```
(!m_venueLayer.getSelectedVenue().getId().equals(m_buildingId))
{
    m_venueLayer.selectVenueAsync(m_buildingId);
}
} else {
    // In not inside a venue create an outdoor location
    m_outdoorLocation = new OutdoorLocation(m_currentPosition);
}
}

@Override
public void onVenueSelected(Venue venue) {
    // Get Level object based on level id.
    // Java 8 offers more elegant way to iterate using filter but assume we need to stick on Java 7
    List<Level> levels = venue.getLevels();
    boolean found = false;
    for (int i = 0; i < levels.size() && !found; ++i) {
        if (levels.get(i).getFloorNumber() == m_levelId) {
            m_currentLevel = levels.get(i);
            found = true;
        }
    }
    // Create LevelLocation object
    m_levelLocation =
        new LevelLocation(m_currentLevel, m_currentPosition, m_venueLayer.getVenueController(venue));
}
```

## Size Management

---

This section provides tips on reducing the size of the HERE SDK so your application uses less storage on consumer devices.

### Remove Unused Font Files

By default, the HERE Android SDK includes a number of font files to support different languages. These files may range from a few hundred kilobytes to a few megabytes in size. You can exclude unused font files to reduce the size of your HERE SDK-enabled application.

To exclude HERE SDK font files, perform these steps:

1. From the Android Studio "Project" Tool Window (Alt+1 on Windows or Linux, Command+1 on Mac), select the "Project Files" view and navigate to the `app` folder to reveal its contents.
2. Double-click on the `build.gradle` file to open it for editing.
3. In the `android { ... }` section, add `packagingOptions` so that it looks like the following:

```
android {
    ...
    packagingOptions {
        exclude '/lib/armeabi-v7a/libNanumGothicFontPkg.so'
        exclude '/lib/armeabi-v7a/libLohitIndicFontPkg.so'
        exclude '/lib/armeabi-v7a/libChineseFontPkg.so'
    }
    ...
}
```

**Note:**

- The "Chinese" font package supports Chinese characters.
- "Nanum Gothic" supports Korean characters.
- "Lohit Indic" supports Indic scripts.

After completing these steps, your application consumes less space when it is installed on a device. The maximum amount that you can save with these steps is approximately 5MB.

## Map Rendering Order

The HERE SDK renders map elements in a pre-defined order through a set of overlays, so that when an overlay is rendered, elements that should appear in the foreground are not obscured by background items. As a developer, you cannot modify this rendering order or overlay grouping, but you can assign new *map objects* and *raster tiles* to a specific map overlay.

The following is a reference of the map overlays that you can set to an object or raster tile, as defined in the `MapOverlayType` enum. This reference also includes a listing of the map elements that are rendered on each overlay. You can use this reference to ensure that your object and tiles are rendered correctly and unobscured.

MapOverlayType	Represents
BACKGROUND_REPLACEMENT	<p>Objects on this overlay replace the background. The elements that are rendered on this overlay by default include:</p> <ul style="list-style-type: none"> <li>• the background</li> <li>• simple map terrains</li> <li>• a high-level abstract view of the world map</li> </ul>
BACKGROUND_OVERLAY	<p>Objects on this overlay are directly placed over (on top of) the background map. No other elements are rendered on this overlay by default.</p>
AREA_OVERLAY	<p>Objects on this overlay contain area information. The elements that are rendered on this overlay by default include:</p> <ul style="list-style-type: none"> <li>• deserts</li> <li>• glaciers</li> <li>• woodlands</li> <li>• parks</li> <li>• national parks</li> <li>• urban built-up areas</li> <li>• industrial zones</li> <li>• parks</li> <li>• beaches</li> <li>• runways</li> <li>• bodies of water</li> <li>• outlines of large areas</li> <li>• outlines of buildings</li> </ul>

MapOverlayType	Represents
ROAD_OVERLAY	<p>Objects on this overlay contain information about the road network. The elements that are rendered on this overlay by default include:</p> <ul style="list-style-type: none"> <li>• ferry paths</li> <li>• railroads</li> <li>• streets</li> <li>• country boundaries</li> <li>• street-level imagery coverage</li> <li>• transit paths</li> <li>• traffic flow</li> <li>• traffic incidents</li> </ul>
TRANSIT_STOP_OVERLAY	<p>Objects on this overlay contain information about transit stops. The elements that are rendered on this overlay by default include:</p> <ul style="list-style-type: none"> <li>• extruded buildings</li> <li>• 3D landmarks</li> <li>• points of interest (POIs)</li> <li>• transit accesses</li> <li>• transit stops</li> <li>• city centers</li> <li>• user transit routes</li> </ul>
POI_OVERLAY	<p>Objects on this overlay contain information that are related to points of interest. The elements that are rendered on this overlay by default include:</p> <ul style="list-style-type: none"> <li>• certain transit paths</li> <li>• neighborhood labels</li> <li>• park information</li> <li>• highway labels</li> <li>• safety spots</li> <li>• 3D venue objects</li> </ul>
FOREGROUND_OVERLAY	<p>Objects on this overlay are placed on top of other objects. The elements that are rendered on this overlay by default include:</p> <ul style="list-style-type: none"> <li>• labels for bodies of water</li> <li>• labels for islands</li> <li>• labels for mountains</li> <li>• labels for national parks</li> <li>• labels for desert</li> <li>• labels for glaciers</li> <li>• labels for woodlands</li> <li>• labels for beaches</li> <li>• labels for industrial areas</li> <li>• labels for buildings</li> <li>• labels for addresses</li> <li>• labels and icons for venue POIs</li> <li>• arrow indicating user location</li> </ul>

## Development Tips

---

This section provides tips on building your application using the HERE Android SDK.

### Logging the HERE SDK Version

For troubleshooting purposes, we recommend that you add the HERE SDK version number in your application logs. You can get the SDK version by calling `com.here.android.mpa.common.Version.getSdkVersion()`.

### Upgrading from Older Versions of HERE SDK

The HERE Android SDK is now packaged as an Android archive (AAR) file instead of separate JAR, native library and proguard components. If you are upgrading from an older HERE SDK release, the old components should be cleaned up before integrating the AAR version of the HERE SDK. To do so, follow these steps:

1. Ensure the `HERE-sdk.jar` file is removed from your project and the compile entry is removed from your `build.gradle` file. The JAR may be located at `app/libs/HERE-sdk.jar` and included in your `build.gradle` file one of the following:

```
compile files('libs/HERE-sdk.jar')
```

```
compile fileTree(dir: 'libs', include: ['*.jar'])
```

Note that if you were previously using the Google GSON library with the HERE SDK, it is still required to be included separately.

2. Remove the HERE SDK proguard file and the proguard entry specific to the HERE SDK from the `build.gradle` file. The file to remove is named `proguard-here-sdk.txt`, and the entry of the same name should also be removed from the `proguardFiles` property in your `build.gradle` file. The proguard instructions for newer versions of the HERE SDK are now applied automatically and are included in the AAR.
3. Ensure all HERE SDK related native libraries are removed from your project. These files are now a part of the AAR file and do not need to be included separately. To locate these native libraries, check the `app/src/main/jniLibs/armeabi-v7a` folder in your project. If you are not using other standalone native libraries in your project, you can delete the entire `armeabi-v7a` folder. A list of the HERE SDK native libraries, as of SDK release 3.2.2, is:
  - `libCertResourcesPkg.so`
  - `libcrypto_here.so`
  - `libgnustl_shared.so`
  - `libLohitIndicFontPkg.so`
  - `libMapsEngineResourcePkg.so`
  - `libMAPSJNI.so`
  - `libNanumGothicFontPkg.so`
  - `libNlpResourcePkg.so`
  - `libos_adaptation.context.so`
  - `libos_adaptation.network.so`
  - `libposclient.so`
  - `libPositioningResourcePkg.so`

- `libPureArabicFontPkg.so`
- `libPureChineseFontPkg.so`
- `libPureIndicSouthFontPkg.so`
- `libPureThaiFontPkg.so`
- `libSdkResourcePkg.so`
- `libssl_here.so`

You can find further info on integrating the AAR version of the HERE SDK into your app in the [Run the Sample Application](#) on page 13 section of the User Guide and the associated `HERE-sdk/tutorial/BasicMapSolution/app/build.gradle` file.

## Troubleshooting SDK Initialization Errors

If you receive `OnEngineInitListener.FILE_RW_ERROR` or `OnEngineInitListener.UNKNOWN` when trying to initialize the SDK, it can be due to file system corruption or resource locking on the device. You can usually resolve this issue by restarting the device. If this is not practical, another option is to set a new isolated disk cache location using the method outlined in [Using an Isolated Map Disk Cache with the Map Service](#).

If your app users are encountering this issue frequently, check whether your intended disk cache location is writable using standard Java APIs before setting it for the HERE SDK. If the location is not writable, set it to a different location which is writable.

## Updating Map Data Without Using MapLoader

You can use the [MapLoader](#) to check and perform map data updates. However, if your application does not use `MapLoader`, you can periodically update map data by deleting the application map data cache located at the following location:

```
/sdcard/.here-maps/diskcache-v5/BundleStore
```

Deleting this cache forces the HERE SDK to download the latest map data.

## "Disk Cleaner" Applications

Third-party memory cleaner apps may randomly delete files that are required by the HERE SDK. These apps may cause problems such as:

- Deletion of the SSL certificates, causing network connections and map data downloads to fail
- Unintended deletion of the map data cache

It is recommended for users to disable these types of apps while using an app that uses the HERE SDK.

## Lapsed Listeners and Garbage Collection

The HERE SDK provides a number of listener interfaces, such as `Map.OnSchemeChangeListener`, `Map.OnTransformListener`, and `MapGesture.OnGestureListener`. To use these listeners, you are required to implement and create a listener instance, then register it with another object (using a method such as `addSchemeChangeListener()`) to receive event notifications. Unfortunately, this coding pattern can also lead to the [lapsed listener problem](#), where available memory is consumed by listener objects that are not explicitly unregistered and not garbage collected.

To mitigate this problem, the HERE SDK, in some cases, accepts listener objects in `WeakReference` containers. This has the advantage of avoiding lapsed listeners, but it also means that you must be aware of registered listeners becoming garbage collected. To avoid any unintended issues with this coding pattern, be sure to retain a strong reference to your listener instances (for example, by assigning it to a class variable) if you would like to manage its garbage collection lifecycle. Listener objects are not garbage collected as long as a strong reference exists.

## Working with Getters

Classes in the HERE SDK return copies of objects in its getters. For example, `MapPolyline.getPolyline()` does not return the same `GeoPolyline` instance that was used to construct the `MapPolyline` object; instead, a copy of the `GeoPolyline` is returned. Since this returned object is a copy, you cannot dynamically modify the `MapPolyline` instance by modifying this object. If you would like to make changes to `MapPolyline`, you must call `setGeoPolyline(GeoPolyline)` instead.

## Map Object Limitations

The HERE SDK does not limit the number of map markers, polygons, and polylines that can be added to a map. However, rendering a large number of map objects can cause performance degradation in your application. It is recommended that you use techniques such as viewport clipping and [marker clustering](#) to avoid these issues.

## Rendering Issue with Extruded Buildings

Devices using the MediaTek MT65XX or PowerVR SGX 5\*MP\* chipset family have a known GPU shader error where the rendering of extruded buildings causes flickers of random colors. It is advised to turn off extruded building rendering on these devices. For example:

```
private OnMapRenderListener m_renderListener = new OnMapRenderListener() {
    @Override
    public void onPreDraw() {
        String renderer = GLES20.glGetString(GLES20.GL_RENDERER);

        if(renderer.contains("PowerVR SGX 544MP"))
        {
            map.setExtrudedBuildingsVisible(false);
        }
    }
    @Override
    public void onPostDraw(boolean invalidated, long renderTime) {
    }
    @Override
    public void onSizeChanged(int width, int height) {
    }
    @Override
    public void onGraphicsDetached() {
    }
};
```

For more information, see the `Map.setExtrudedBuildingsVisible(boolean)` API Reference.

## Doze and App Standby

If you are using Android 6.0 (API level 23) or above, be aware that the *Doze* and *App Standby* features may impact your HERE SDK app by disabling network access when the device is unplugged, stationary, and has the screen off for a period of time. While the HERE Android SDK has the ability to work offline, you should design your app with these operating system features in mind.

For more information about Doze and App Standby, including how to use notifications and whitelisting to ensure your app functions properly, see the Android article, "[Optimizing for Doze and App Standby](#)".

## Native Libraries and ABI Splits

Your app may encounter an error if it also *includes other dependencies that have unsupported ABIs*. To get around this issue, enable ABI splits to only build for the `armeabi-v7a` architecture explicitly by modifying your app's `build.gradle` file:

```
android {
    (...)
    splits {
        abi {
            enable true
            reset()
            include 'armeabi-v7a'
            universalApk false
        }
    }
    (...)
}
```

For more information about the `splits` Gradle block, see [Configure multiple APKs for ABIs](#) in the Android Studio User Guide.

## Signpost Parsing

---

This section provides guidelines on how to use the HERE Mobile SDK Signpost object to present visual maneuver instructions which match with the audible voice instruction during turn-by-turn guidance. While the high-level guidelines in this section are applicable to both the HERE Android and iOS SDKs, the detailed descriptions are generic and do refer to the specific APIs available on either platform.

Signs represent textual and graphic information posted along roads. The information is always represented as text, but may originate from a graphical icon. Signpost information may be used for route guidance (both audible and visual guidance) and map display. A navigation system may prefer using the signpost text rather than the street/ramp name as the latter may not always match what is on the sign in reality and may confuse a user. The signpost feature supports the user navigating through complex situations and provides a conformation for a maneuver by presenting the same direction information as shown on the street signs in reality.

### Signpost Content

The Signpost representation is an association between two links, the "From link" and the "To link". They are not necessarily contiguous. The "From link" is the link prior to a maneuver decision point. A maneuver

decision is a point where the road splits and the driver is unable to determine the direction to traverse. The “To link” is the link traversed after the decision point.

**Note:** Not all maneuvers contain Signpost information.

Based on the map attributes, the HERE Mobile SDKs aggregate the following information into a Signpost object:

- Exit number
- Exit text
- Exit icon
- Exit directions
- Foreground / Background color

Exit directions is an array of information shown on the sign and can contain the following information:

- Language i.e. the three letter MARC code for the label language
- Route direction
- Route name
- Text representing auxiliary information. Typically the auxiliary information contains a destination name such as a city or a characteristic place (such as "airport").

Each index in the exit directions array will typically contain only one of Route direction, Route name and Text. Since the origin data is not always consistent it is advisable to concatenate the route name and route direction fields.

## Parsing Basic Signpost Information

To present an audible or visual maneuver instruction, information from the Maneuver and Signpost objects can be combined as shown in the figure below:

Figure 78: Parsing for audible instructions for a basic sign

The screenshot shows a debugger window for a 'Route' object. The 'get\_signpost()' method is expanded, showing the following JSON data:

```

{
  "get_exit_number": 10,
  "get_exit_text": "Funkturn",
  "get_exit_icon": "Image",
  "get_exit_directions": [
    {
      "value (deprecated)": "Magdeburg",
      "language": "GER",
      "text": "Magdeburg",
      "route_name": "",
      "route_direction": ""
    },
    {
      "value (deprecated)": "Leipzig",
      "language": "GER",
      "text": "Leipzig",
      "route_name": "",
      "route_direction": ""
    }
  ],
  "get_background_color": "blue",
  "get_traffic_direction": "TRAFFIC_DIR_RIGHT",
  "get_angle": 194,
  "starts_from_signpost": true,
  "next_is_signpost": true,
  "is_counter_roundabout": false,
  "get_start_position": "(13.280628, 52.499574)",
  "get_start_angle": 333,
  "get_start_time": "<invalid>"
}

```

Next to the JSON data, there are two visual representations:

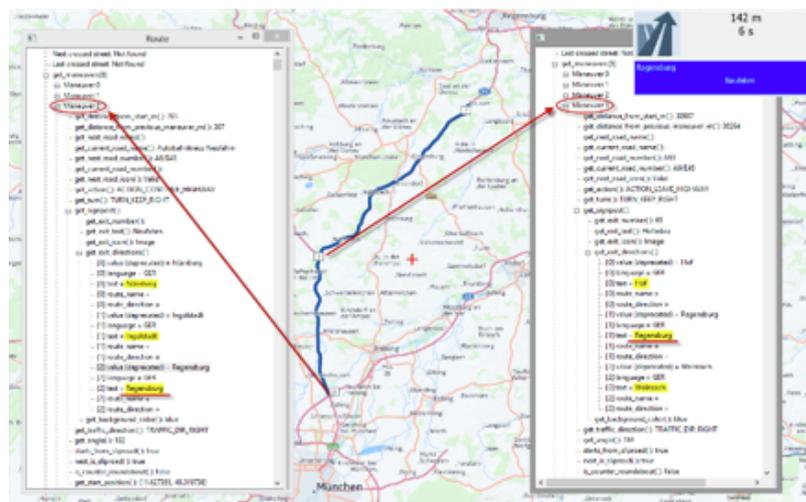
**Visual representation:** A blue rectangular sign with a white circle containing the number '10' on the left, the text 'Funkturn' in the middle, and 'Magdeburg, Leipzig' at the top.

**Voice Command:** "After 400 meters keep right, take exit 10 Funkturn towards A115 E51 Magdeburg, Leipzig."

Not all exit direction information presented on the real signpost might be relevant to the user's route. In order to avoid a flood of information, which easily could lead to confusion, especially for the voice output, exit directions information which is irrelevant for a driver's route may be suppressed.

To achieve this, the signpost information of the next maneuver and the next-next maneuver can be compared and only the exit direction information valid for both maneuvers may be presented for the next maneuver. An example of this is shown in the figure below.

**Figure 79: Filtering out exit directions information**



There may be some cases where there is no matching exit direction information in the next maneuver and the next-next maneuver. In this case the recommendation is to present the first index in the exit directions array of the next maneuver.

# Chapter 5

## Coverage Information

---

**Topics:**

- [Downloadable Maps by Count...](#)
- [Map Label Languages](#)
- [Navigation Voices](#)
- [Safety Camera Coverage](#)

The following list provides coverage information for HERE Android SDK features. Feature support in the HERE SDK may differ depending on the language and locale.

- [Street level](#)
- [Public Transit](#)
- [Traffic](#)
- [Routing](#)
- [Venue Maps](#)
- [Guidance](#)
- [Point Address](#) (such as house numbers)
- [Online Geocoding / Reverse Geocoding](#)
- [Online Places and Search](#)
- [Satellite Imagery: Worldwide](#)

## Downloadable Maps by Country/Region

---

The following countries and regions have downloadable maps:

- Africa
- Albania
- Algeria
- Andorra
- Angola
- Argentina
- Aruba
- Asia
- Australia
- Australia/Oceania
- Austria
- Azerbaijan
- Bahamas
- Bahrain
- Bangladesh
- Belarus
- Belgium
- Belize
- Benin
- Bermuda
- Bolivia
- Bosnia and Herzegovina
- Botswana
- Brazil
- Brunei
- Bulgaria
- Burkina Faso
- Burundi
- Cameroon
- Canada
- Cape Verde
- Cayman Islands
- Central African Republic
- Chad

- Chile
- Colombia
- Comoros
- Congo (Republic),
- Congo (Zaire),
- Costa Rica
- Cote d'Ivoire
- Croatia
- Cuba
- Cyprus
- Czech Republic
- Denmark
- Djibouti
- Dominican Republic
- Ecuador
- Egypt
- El Salvador
- Equatorial Guinea
- Eritrea
- Estonia
- Ethiopia
- Europe
- Fiji
- Finland
- France
- Gabon
- Gambia
- Georgia
- Germany
- Ghana
- Gibraltar
- Greece
- Guatemala
- Guinea
- Guinea-Bissau
- Guyana
- Honduras
- Hong Kong and Macau
- Hungary

- Iceland
- India
- Indonesia
- Iran
- Iraq
- Israel
- Italy
- Jamaica
- Jordan
- Kazakhstan
- Kenya
- Kuwait
- Latvia
- Lebanon
- Lesotho
- Liberia
- Libya
- Liechtenstein
- Lithuania
- Luxembourg
- Madagascar
- Malawi
- Malaysia
- Maldives
- Mali
- Malta
- Mauritania
- Mauritius
- Mayotte
- Mexico
- Monaco
- Montenegro
- Morocco
- Mozambique
- Namibia
- Nepal
- Netherlands
- New Zealand
- Nicaragua

- Niger
- Nigeria
- North and Central America
- Norway
- Oman
- Panama
- Paraguay
- Peru
- Philippines
- Poland
- Portugal
- Qatar
- Republic of Ireland
- Republic of Moldova
- Romania
- Russia
- Rwanda
- Saint Helena
- Saint Kitts and Nevis
- Saint Vincent and the Grenadines
- San Marino
- Sao Tome and Principe
- Saudi Arabia
- Senegal
- Serbia
- Seychelles
- Sierra Leone
- Singapore
- Slovakia
- Slovenia
- Somalia
- South Africa
- South America
- Spain
- Sri Lanka
- Suriname
- Swaziland
- Sweden
- Switzerland

- Taiwan
- Tanzania
- Thailand
- The Former Yugoslav Republic of Macedonia
- Togo
- Trinidad and Tobago
- Tunisia
- Turkey
- Uganda
- Ukraine
- United Arab Emirates
- United Kingdom
- Uruguay
- USA
- Vatican City
- Venezuela
- Vietnam
- Virgin Islands
- World
- Yemen
- Zambia
- Zimbabwe

## Map Label Languages

---

The HERE Android SDK is a globally-available product with support for many languages. The HERE SDK does not require any actions from developers to set the appropriate language, as it automatically detects the current device language setting and applies the same language within the SDK, if it is supported. If the HERE SDK does not support the device language, a fallback language, which is typically English, is used.

Map labels at the street level are always displayed in the local language. For example, Central Park in Manhattan, New York is always displayed as "Central Park" irrespective of the device language setting. Names for states, provinces, regions, cities, mountains, lakes, and rivers, may be localized to the language corresponding to the device language setting. For example, where the device language is set to French, the label for South Carolina reads "Caroline du Sud"; if the device language is set to Spanish, the label for New York reads "Neuva York".

Language	Language code	Marc code mapping	Note
English (UK)	EN	ENG	
French	FR	FRE	
German	GE	GER	

Language	Language code	Marc code mapping	Note
Spanish	SP	SPA	
Italian	IT	ITA	
Swedish	SW	SWA	
Danish	DA	DAN	
Norwegian	NO	NOR	
Finnish	FI	FIN	
English American	AM	ENG	Mapped to ENG
Swiss French	SF	FRE	Mapped to FRE
Swiss German	SG	GSW	Mapped to GER
Portuguese	PO	POR	
Turkish	TU	TUR	
Icelandic	IC	ICE	
Russian	RU	RUS	
Hungarian	HU	HUN	
Dutch	DU	DUT	
Flemish Belgian	BL	DUT	Mapped to DUT
Australian	AU	ENG	Mapped to ENG
Belgian French	BF	FRE	Mapped to FRE
Austrian	AS	GER	Mapped to GER
New Zealand	NZ	ENG	Mapped to ENG
French International	IF	FRE	Mapped to FRE
Czech	CS	CZE	
Slovak	SK	SLO	
Polish	PL	POL	
Slovenian	SL	SLV	
Chinese Taiwan	TC	CHT	
Hong Kong Chinese	HK	CHT	
Chinese PRC	ZH	CHI	
Japanese	JA	JPN	
Thai	TH	THA	
Afrikaans	AF	AFR	
Arabic	AR	ARA	
Bulgarian	BG	BUL	
Catalan	CA	CAT	
Croatian	HR	SCR	
Canadian English	CE	ENG	Mapped to ENG

Language	Language code	Marc code mapping	Note
English International	IE	ENG	Mapped to ENG
South African English	SA	ENG	Mapped to ENG
Estonian	ET	EST	
French Canadian	CF	FRE	Mapped to FRE
Greek	EL	GRE	
Greek (Cyprus)	CG	GRE	Mapped to GRE
Hebrew	HE	HEB	
Hindi	HI	HIN	
Indonesian	IN	IND	
Swiss Italian	SZ	ITA	Mapped to ITA
Latvian	LV	LAV	
Lithuanian	LT	LIT	
Malay	MS	MAY	
Marathi	MR	MAR	
Norwegian Nynorsk	NN	NOR	
Brazilian Portuguese	BP	POR	Mapped to POR
Romanian	RO	RUM	
Serbian	SR	SRP	
International Spanish	OS	SPA	Mapped to SPA
Latin American Spanish	LS	SPA	Mapped to SPA
Finland Swedish	FS	SWE	Mapped to SWE
Cyprus Turkish	CT	TUR	Mapped to TUR
Ukrainian	UK	UKR	
Urdu	UR	URD	
Vietnamese	VI	VIE	
Basque	BA	BAQ	
Malay as appropriate for use in Asia-Pacific regions.	MA	MAY	Mapped to ENG

## Navigation Voices

The HERE Android SDK supports navigation voices in the following languages, in either text-to-speech or pre-recorded format.

- Pre-recorded voices support spoken maneuver instructions.
- Text-to-speech voices, which are also known as speech synthesis voices, support spoken maneuver instructions and street names.

**Table 12: Supported Navigation Voices**

## Text-to-Speech

- English (US)
- English (UK)
- French (France)
- French (Canada)
- German
- Spanish (Spain)
- Spanish (Mexico)
- Indonesian
- Italian
- Japanese
- Norwegian
- Portugese (Portugal)
- Portugese (Brazil)
- Russian
- Swedish
- Finnish
- Danish
- Korean
- Chinese (Taiwanese Mandarin)
- Turkish
- Czech
- Polish

 **Note:** This is a list of the potential languages that are supported. Actual audio playback depends on the TTS engine that is installed on the user's device.

## Pre-recorded

- English (UK) - Female
- English (US) - Male
- English (UK) - Male
- Portuguese (Portugal) - Female
- Turkish - Female
- Icelandic - Female
- Indonesian
- Russian - Female
- Hungarian - Female
- Hungarian - Male
- Dutch - Female
- Dutch - Male
- French - Female
- Czech - Female
- Slovak - Female
- Polish - Female
- Slovenian - Female
- Mandarin (Taiwan) - Female
- German - Female
- Cantonese - Female
- Mandarin (China) - Female
- German - Male
- Thai - Male
- Afrikaans - Female
- Arabic (North African) - Female
- Arabic (Saudi Arabia) - Male
- Tagalog - Female
- Spanish (Spain) - Female
- Basque - Female
- Galician - Female
- Spanish (Latin America) - Female
- Bulgarian - Female
- Catalan - Female
- Croatian - Female
- Estonian - Female
- Italian - Female
- Farsi - Female
- French (Canada) - Female
- Greek - Female
- Hindi - Female
- Indonesian - Male
- Swedish - Female
- Korean (South Korea) -Female
- Latvian - Female
- Lithuanian - Female
- Danish - Female
- Malay - Female
- Portuguese (Brazil) - Female
- Romanian - Female
- Serbian - Male
- Norwegian - Female
- Spanish (Mexico) - Male
- Swahili - Male
- Tamil - Male
- Finnish - Female
- Finnish - Male
- Ukrainian - Female
- Urdu - Female
- Vietnamese - Female

## Safety Camera Coverage

The following table indicates the safety camera coverage in the indicated countries.

**Table 13: Safety Camera Coverage**

Country or Region	2017 Q2
Andorra	13
Argentina	549

Country or Region	2017 Q2
Australia	1397
Austria	660
Belgium	1675
Bosnia and Herzegovina	14
Brazil	15953
Bulgaria	44
Canada	639
Chile	75
Czech Republic	220
Estonia	61
Finland	799
Hungary	26
Iceland	17
Italy	3766
Kazakhstan	937
Kuwait	353
Latvia	21
Lithuania	169
Malaysia	405
Netherlands	1220
New Zealand	126
Norway	328
Poland	555
Portugal	46
Qatar	389
Romania	96
Russia	9632
Saudi Arabia	3510
Singapore	224

Country or Region	2017 Q2
Slovakia	13
Slovenia	41
South Africa	554
Spain	1144
Sweden	1465
Taiwan	2716
Thailand	87
United Arab Emirates	1044
United Kingdom	5408
United States	4949

# Chapter 6

## API Reference

---

### Topics:

- [ar](#)
- [cluster](#)
- [common](#)
- [customlocation2](#)
- [electronic\\_horizon](#)
- [fce](#)
- [guidance](#)
- [mapping](#)
- [nlp](#)
- [odml](#)
- [pde](#)
- [routing](#)
- [search](#)
- [service](#)
- [streetlevel](#)
- [tce](#)
- [urbanmobility](#)
- [venues3d](#)

The HERE SDK for Android allows you to add HERE Maps, Routing and Search functionality to your Android applications. The following pages provide a detailed reference to the packages and classes that make up the SDK.

### Open Source Software Notices

If you use the HERE Android SDK in your application, you must embed or link to the HERE copyright and various open source software licenses. You can find a copy of these licenses in the SDK Release Notes, or in the [SDK package]/copyright.txt file.

## ar

---

The package *ar* is a member of *com.here.android.mpa*.

### Package Summary

#### ar

The AR package provides classes, interfaces and enumerations for displaying LiveSight and customizing the experience.

### Package Details

The AR package provides classes, interfaces and enumerations for displaying LiveSight and customizing the experience.

Some key classes and interfaces in this package are:

- [CompositeFragment](#)
- [ARController](#)
- [ARIconObject](#)

#### CompositeFragment

The [CompositeFragment](#) class is a UI fragment that can be embedded into an activity to render both the Map and LiveSight. It is composite because it provides Map functionality (such as that provided by [MapFragment](#)) as well as LiveSight functionality. The fragment can be embedded as follows:

```
<fragment
    class="com.here.android.mpa.ar.CompositeFragment"
    android:id="@+id/compositefragment"
    android:layout_width="fill_parent"
    android:layout_height="fill_parent" />
```

The [ARController](#) can be retrieved from the [CompositeFragment](#) by way of the [getARController\(\)](#) API.

#### ARController

The [ARController](#) serves as a facade for LiveSight functionality. It contains methods and callbacks for controlling and customizing LiveSight behavior. Some key APIs are:

- [start\(\)](#) - Start LiveSight, transition from Map mode to LiveSight mode
- [stop\(\)](#) - Stop LiveSight, transition from LiveSight mode to Map mode
- [addARObject\(ARObject\)](#) - Add content to LiveSight
- [press\(PointF\)](#) - Return [ARObject](#) at [PointF](#) and render to simulate pressing

#### ARIconObject

The [ARIconObject](#) is a concrete [ARObject](#) which represents the LiveSight object model. It is composed of Front, Down and Back icons, an info icon and a [GeoCoordinate](#) representing the objects position.

For more information on using this feature, please consult the "LiveSight" section in the HERE SDK for Android Developer's Guide.

## ARBillboardObject

The class `ARBillboardObject` is a member of `com.here.android.mpa.ar`.

### Class Summary

public class **ARBillboardObject**

extends `com.here.android.mpa.ar.ARModelObject`, `java.lang.Object`

Represents a 3D AR billboard objects that users can add to a `ARController`.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 14: Nested Classes in ARBillboardObject

Nested Classes
public static final enumeration <code>ARBillboardObject.Orientation</code> Represents billboard's orientation mode

### Constructor Summary

Table 15: Constructors in ARBillboardObject

Constructors
<code>ARBillboardObject (Vector3f position)</code> Construct AR billboard object
<code>ARBillboardObject (GeoCoordinate position)</code> Construct AR billboard object
<code>ARBillboardObject (Vector3f position, Image texture)</code> Construct AR billboard object
<code>ARBillboardObject (GeoCoordinate position, Image texture)</code> Creates a geo positioned ARBillboardObject

### Method Summary

Table 16: Methods in ARBillboardObject

Methods
public <code>GeoCoordinate</code> <code>getGeoPosition ()</code> Get the position of the billboard

## Methods

```
public Vector3f getLocalPosition ()
```

Get the position of the billboard

```
public Orientation getOrientation ()
```

Get the orientation mode of the billboard

```
public PointF getSize ()
```

Get the size of the billboard in meters

```
public Vector3f getSurfaceNormal ()
```

Get the surface normal

```
public Vector3f setUpDirection ()
```

Get the up direction

```
public void setGeoPosition (GeoCoordinate position)
```

Set the position of the billboard

```
public void setLocalPosition (Vector3f position)
```

Set the position of the billboard

```
public void setOrientation (Orientation orientation)
```

Set the orientation mode of the billboard

```
public void setSize (PointF size)
```

Set the size of the billboard in meters

```
public void setSurfaceNormal (Vector3f surfaceNormal)
```

Set the surface normal

```
public void setUpDirection (Vector3f upDirection)
```

Set the up direction

## Class Details

Represents a 3D AR billboard objects that users can add to a *ARController*. There are two types of AR billboard objects supported: - Geo positioned billboard - Locally positioned billboard

## Constructor Details

**ARBillboardObject** (*Vector3f* position)

Construct AR billboard object

### Parameters:

- **position**  
Position of the center of the billboard relative to the camera. Unit is meters

**ARBillboardObject** (*GeoCoordinate* position)

Construct AR billboard object

**Parameters:**

- **position**  
Geo position of the center of the billboard

## ARBillboardObject (*Vector3f* position, *Image* texture)

Construct AR billboard object

**Parameters:**

- **position**  
Position of the center of the billboard relative to the camera. Unit is meters
- **texture**  
Billboard's texture

## ARBillboardObject (*GeoCoordinate* position, *Image* texture)

Creates a geo positioned ARBillboardObject

**Parameters:**

- **position**  
Position on earth of the center of the billboard
- **texture**  
Billboard's texture

### Method Details

```
public GeoCoordinate getGeoPosition ()
```

Get the position of the billboard

**Returns:**

Position on earth of the center of the billboard

```
public Vector3f getLocalPosition ()
```

Get the position of the billboard

**Returns:**

Position of the center of the billboard relative to the camera. Unit is meters

```
public Orientation getOrientation ()
```

Get the orientation mode of the billboard

**Returns:**

Orientation mode

```
public PointF getSize ()
```

Get the size of the billboard in meters

**Returns:**

Size in meters (width, height)

```
public Vector3f getSurfaceNormal ()
```

Get the surface normal

**Returns:**

Surface normal

```
public Vector3f getUpDirection ()
```

Get the up direction

**Returns:**

Up direction

```
public void setGeoPosition (GeoCoordinate position)
```

Set the position of the billboard

**Parameters:**

- **position**  
Position on earth of the center of the billboard

```
public void setLocalPosition (Vector3f position)
```

Set the position of the billboard

**Parameters:**

- **position**  
Position of the center of the billboard relative to the camera. Unit is meters

```
public void setOrientation (Orientation orientation)
```

Set the orientation mode of the billboard

## Parameters:

- **orientation**  
Orientation mode

```
public void setSize (PointF size)
```

Set the size of the billboard in meters

## Parameters:

- **size**  
Size in meters (width, height)

```
public void setSurfaceNormal (Vector3f surfaceNormal)
```

Set the surface normal

## Parameters:

- **surfaceNormal**  
Surface normal

```
public void setUpDirection (Vector3f upDirection)
```

Set the up direction

## Parameters:

- **upDirection**  
Up direction

## Orientation

The enumeration *Orientation* is a member of *com.here.android.mpa.ar.ARBillboardObject*.

### Enumeration Summary

```
public static final enumeration ARBillboardObject.Orientation
```

```
extends java.lang.Enum, java.lang.Object
```

Represents billboard's orientation mode

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 17: Enum Constants in Orientation

Fields
<pre>public static final Orientation <b>FIXED</b></pre> <p>Orientation is fixed, set explicitly using normal and up vectors</p>
<pre>public static final Orientation <b>BILLBOARD</b></pre> <p>Billboard is oriented towards camera</p>

## Method Summary

Table 18: Methods in Orientation

Methods
<pre>public static Orientation <b>valueOf</b> (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static ARBillboardObject.Orientation[] <b>values</b> ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Represents billboard's orientation mode

### Enum Constant Details

```
public static final Orientation FIXED
```

Orientation is fixed, set explicitly using normal and up vectors

```
public static final Orientation BILLBOARD
```

Billboard is oriented towards camera

### Method Details

```
public static Orientation valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static ARBillboardObject.Orientation[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## ARBuildingInfo

The class *ARBuildingInfo* is a member of *com.here.android.mpa.ar*.

### Class Summary

```
public class ARBuildingInfo
```

```
extends java.lang.Object
```

This class encapsulates information about a building on the map.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 19: Methods in *ARBuildingInfo*

Methods
<pre>public boolean <i>equals</i> (<i>Object</i> obj)</pre> <p>For documentation, see <i>java.lang.Object</i></p>
<pre>public float <i>getHeight</i> ()</pre> <p>Gets building height.</p>
<pre>public <i>Identifier</i> <i>getIdentifier</i> ()</pre> <p>Gets the <i>Identifier</i> of the building.</p>
<pre>public <i>Location</i> <i>getLocation</i> ()</pre> <p>Returns the object's location.</p>
<pre>public String <i>getPlaceName</i> ()</pre> <p>Gets the name of the <i>MapBuildingObject</i>.</p>
<pre>public <i>GeoCoordinate</i> <i>getPosition</i> ()</pre> <p>Gets the position of the <i>MapBuildingObject</i></p>
<pre>public <i>Vector3f</i> <i>getSelectedFacadeNormal</i> ()</pre> <p>Gets selected facade's normal.</p>
<pre>public <i>GeoCoordinate</i> <i>getSelectedFacadeNormalOrigin</i> ()</pre> <p>Gets origin of the selected facade's normal.</p>
<pre>public int <i>hashCode</i> ()</pre> <p>For documentation, see <i>java.lang.Object</i></p>

## Class Details

This class encapsulates information about a building on the map.

## Method Details

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

### Parameters:

- `obj`

```
public float getHeight ()
```

Gets building height.

### Returns:

Building height in meters.

```
public Identifier getIdentifier ()
```

Gets the *Identifier* of the building. The identifier can be matched against results in *PlaceLink*

### Returns:

Identifier id of the building

```
public Location getLocation ()
```

Returns the object's location.

### Returns:

Building *Location*

```
public String getPlaceName ()
```

Gets the name of the *MapBuildingObject*. This information is only available in 3D Landmarks.

### Returns:

Name of the landmark

```
public GeoCoordinate getPosition ()
```

Gets the position of the *MapBuildingObject*

**Returns:**

*GeoCoordinate* position of the building

```
public Vector3f getSelectedFacadeNormal ()
```

Gets selected facade's normal.

**Returns:**

Normal of the selected facade.

```
public GeoCoordinate getSelectedFacadeNormalOrigin ()
```

Gets origin of the selected facade's normal.

**Returns:**

Geo-coordinate of the facade's origin.

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## ARController

The class *ARController* is a member of *com.here.android.mpa.ar* .

### Class Summary

```
public final class ARController
```

*extends java.lang.Object*

The *ARController* class serves as a facade for LiveSight functionality.

[For complete information, see the section *Class Details*]

### Nested Class Summary

Table 20: Nested Classes in *ARController*

#### Nested Classes

```
public static final class ARController.CameraParams
```

Encapsulates parameters which affect the device camera.

```
public final class ARController.DownViewParams
```

Encapsulates parameters which affect the Down view.

**Nested Classes**

public static final enumeration [ARController.Error](#)

AR Error codes

public final class [ARController.ExternalSensors](#)

Encapsulates functionality to replace integrated sensors(all or selected) data feeds with external ones.

public final class [ARController.FilterParams](#)

Encapsulates parameters which affect data filtering.

public final class [ARController.IconParams](#)

Encapsulates parameters which affect the icons of an [ARObject](#).

public final class [ARController.InfoParams](#)

Encapsulates parameters which affect the info of an [ARObject](#).

public static final enumeration [ARController.IntroAnimationMode](#)

Intro animation mode.

public final class [ARController.IntroAnimationParams](#)

Encapsulates parameters which affect the Intro Animation.

public static abstract interface [ARController.OnCameraEnteredListener](#)

Listener for Camera view entered event.

public static abstract interface [ARController.OnCameraExitedListener](#)

Listener for Camera view exited event.

public static abstract interface [ARController.OnCompassCalibrationChangedListener](#)

Listener for compass calibration changed event.

public static abstract interface [ARController.OnLivesightStatusListener](#)

Monitor overall livesight status.

public static abstract interface [ARController.OnMapEnteredListener](#)

Listener for Map view entered event.

public static abstract interface [ARController.OnMapExitedListener](#)

Listener for Map view exited event.

public static abstract interface [ARController.OnObjectTappedListener](#)

Listener for object tap events.

public static abstract interface [ARController.OnPanListener](#)

Listener for pan events.

public static abstract interface [ARController.OnPitchFunction](#)

Pitch function interface.

public static abstract interface [ARController.OnPoseListener](#)

Listener for pose update events.

## Nested Classes

public static abstract interface [ARController.OnPostPresentListener](#)

Listener for the post draw event.

public static abstract interface [ARController.OnPreDrawListener](#)

Listener for the livesight frame pre draw event.

public static abstract interface [ARController.OnPreDrawMapListener](#)

Listener for the map pre draw event.

public static abstract interface [ARController.OnPrePresentListener](#)

Listener for the pre present event.

public static abstract interface [ARController.OnProjectionCameraUpdatedListener](#)

Monitor livesight projection camera.

public static abstract interface [ARController.OnRadarUpdateListener](#)

Listener for radar update events.

public static abstract interface [ARController.OnSensorCalibrationChangedListener](#)

Listener for sensor calibration events.

public static abstract interface [ARController.OnTapListener](#)

Listener for tap events.

public static abstract interface [ARController.OnTouchDownListener](#)

Listener for touch down events.

public static abstract interface [ARController.OnTouchUpListener](#)

Listener for touch up events.

public static final enumeration [ARController.ProjectionType](#)

Type of the projection used by the LiveSight engine while displaying *ARObjects* in the camera/UP view.

public final class [ARController.SelectedItemParams](#)

Encapsulates parameters which affect *ARObjects* which are in the selected or non selected states.

public static final enumeration [ARController.SensorType](#)

Type of sensors used by the LiveSight engine.

public final class [ARController.UpViewParams](#)

Encapsulates parameters which affect the Up view.

public final class [ARController.UpViewTransitionParams](#)

Encapsulates parameters which affect the Up view transition.

public static final enumeration [ARController.ViewType](#)

List of all views available in LiveSight

## Field Summary

Table 21: Fields in ARController

Fields
<p><code>public static final <i>CameraParams</i> <b>CameraParams</b></code>                      Accessor for <code>ARController.CameraParams</code> instance.</p>
<p><code>public final <i>DownViewParams</i> <b>DownViewParams</b></code>                      Accessor for <code>ARController.DownViewParams</code> instance.</p>
<p><code>public final <i>ExternalSensors</i> <b>ExternalSensors</b></code>                      ARController external sensors interface</p>
<p><code>public final <i>FilterParams</i> <b>HeadingFilterParams</b></code>                      Accessor for <code>ARController.FilterParams</code> instance which affects Heading.</p>
<p><code>public final <i>IconParams</i> <b>IconParams</b></code>                      Accessor for <code>ARController.IconParams</code> instance.</p>
<p><code>public final <i>InfoParams</i> <b>InfoParams</b></code>                      Accessor for <code>ARController.InfoParams</code> instance.</p>
<p><code>public final <i>IntroAnimationParams</i> <b>IntroParams</b></code>                      Accessor for <code>ARController.IntroAnimationParams</code> instance.</p>
<p><code>public final <i>FilterParams</i> <b>PitchFilterParams</b></code>                      Accessor for <code>ARController.FilterParams</code> instance which affects Pitch.</p>
<p><code>public final <i>SelectedItemParams</i> <b>SelectedItemParams</b></code>                      Accessor for <code>ARController.SelectedItemParams</code> instance.</p>
<p><code>public final <i>UpViewParams</i> <b>UpViewParams</b></code>                      Accessor for <code>ARController.UpViewParams</code> instance.</p>
<p><code>public final <i>UpViewTransitionParams</i> <b>UpViewTransitionParams</b></code>                      Accessor for <code>ARController.UpViewTransitionParams</code> instance.</p>
<p><code>public final <i>FilterParams</i> <b>ZoomFilterParams</b></code>                      Accessor for <code>ARController.FilterParams</code> instance which affects Zoom.</p>

## Method Summary

Table 22: Methods in ARController

Methods
<p><code>public void <b>addARObject</b> (<i>ARObject</i> arObject)</code>                      Add an <code>ARObject</code> that will be displayed in the Camera and Map view.</p>
<p><code>public void <b>addARObject</b> (<i>ARPolylineObject</i> arPolyObject)</code>                      Add an <code>ARPolylineObject</code> that will be displayed in the Camera view.</p>

**Methods**

```
public void addARObject (ARModelObject arViewObject)
```

Add an *ARModelObject* that will be displayed in the Camera view.

```
public void addOnCameraEnteredListener (OnCameraEnteredListener listener)
```

Adds a *ARController.OnCameraEnteredListener* to this *ARController* to listen for the event triggered when Camera view is entered.

```
public void addOnCameraExitedListener (OnCameraExitedListener listener)
```

Adds a *ARController.OnCameraExitedListener* to this *ARController* to listen for the event triggered when Camera view is exited.

```
public void addOnCompassCalibrationChangedListener (OnCompassCalibrationChangedListener listener)
```

Adds a *ARController.OnCompassCalibrationChangedListener* to this *ARController* to listen for compass calibration changed events.

```
public void addOnLivesightStatusListener (OnLivesightStatusListener listener)
```

Adds a *ARController.OnLivesightStatusListener* to this *ARController* to listen for livesight status notification.

```
public void addOnMapEnteredListener (OnMapEnteredListener listener)
```

Adds a *ARController.OnMapEnteredListener* to this *ARController* to listen for the event triggered when Map view is entered.

```
public void addOnMapExitedListener (OnMapExitedListener listener)
```

Adds a *ARController.OnMapEnteredListener* to this *ARController* to listen for the event triggered when Map view is exited.

```
public void addOnObjectTappedListener (OnObjectTappedListener listener)
```

Adds a *ARController.OnObjectTappedListener* to this *ARController* to listen for object tap events.

```
public void addOnPanListener (OnPanListener listener)
```

Adds a *ARController.OnPanListener* to this *ARController* to listen for pan events.

```
public void addOnPoseListener (OnPoseListener listener)
```

Adds a *ARController.OnPoseListener* to this *ARController* to listen for pose update events.

```
public void addOnPostPresentListener (OnPostPresentListener listener)
```

Adds a *ARController.OnPostPresentListener* to this *ARController* to listen for the event triggered after a draw is being performed.

```
public void addOnPreDrawListener (OnPreDrawListener listener)
```

Adds a *ARController.OnPreDrawListener* to this *ARController* to listen for the event triggered before the livesight frame is being drawn.

```
public void addOnPreDrawMapListener (OnPreDrawMapListener listener)
```

Adds a *ARController.OnPreDrawMapListener* to this *ARController* to listen for the event triggered before the map is being drawn.

```
public void addOnPrePresentListener (OnPrePresentListener listener)
```

Adds a *ARController.OnPrePresentListener* to this *ARController* to listen for the event triggered before a draw is being performed.

## Methods

```
public void addOnProjectionCameraUpdatedListener (OnProjectionCameraUpdatedListener listener)
```

Adds a *ARController.OnProjectionCameraUpdatedListener* to this *ARController* to listen for livesight projection camera change notification.

```
public void addOnRadarUpdateListener (OnRadarUpdateListener listener)
```

Adds a *ARController.OnRadarUpdateListener* to this *ARController* to listen for radar update events.

```
public void addOnSensorCalibrationChangedListener (OnSensorCalibrationChangedListener listener)
```

Adds a *ARController.OnSensorCalibrationChangedListener* to this *ARController* to listen for sensor calibration changed events.

```
public void addOnTapListener (OnTapListener listener)
```

Adds a *ARController.OnTapListener* to this *ARController* to listen for tap events.

```
public void addOnTouchDownListener (OnTouchDownListener listener)
```

Adds a *ARController.OnTouchDownListener* to this *ARController* to listen for touch down events.

```
public void addOnTouchUpListener (OnTouchUpListener listener)
```

Adds a *ARController.OnTouchUpListener* to this *ARController* to listen for touch up events.

```
public void defocus ()
```

Defocus previously focused *ARObject*.

```
public void depress (ARObject arObject)
```

Depress previously pressed *ARObject*.

```
public void focus (ARObject arObject)
```

Focus an *ARObject*.

```
public boolean geoTo3dPosition (GeoCoordinate geoPosition, Vector3f position)
```

Convert a geo position into a 3d space position

```
public int getAccelerometerCalibrationStatus ()
```

Get the accelerometer calibration status.

```
public float getCompassAccuracy ()
```

Get compass accuracy in degrees.

```
public int getCompassCalibrationStatus ()
```

Get the compass calibration status.

```
public float getFixedAltitude ()
```

Get fixed altitude of the livesight's view point.

```
public int getGyroscopeCalibrationStatus ()
```

Get the gyroscope calibration status.

```
public long getObjectId (ARObject arObject)
```

Get *ARObjects* unique identifier.

```
public java.util.List <ARObject> getObjects (PointF point)
```

Get a list of *ARObjects* at the specified screen point.

## Methods

```
public java.util.List <ARObject> getObjects (ViewRect rect)
```

Get a list of *ARObjects* which intersect the given *ViewRect*

```
public float getOcclusionOpacity ()
```

Get opacity of the occlusion items.

```
public ARPoseReading getPose ()
```

Get latest pose

```
public GeoCoordinate getPosition ()
```

Get the last known position.

```
public GeoCoordinate getPosition (AtomicBoolean mapMached)
```

Get the last known position with map matching indicator.

```
public ProjectionType getProjectionType ()
```

Get Camera view *ARController.ProjectionType*

```
public PointF getScreenViewPoint ()
```

Get target screen view point.

```
public long getSensorsWaitTimeout ()
```

Get sensors wait timeout in ms.

```
public int getUpdateDistanceDelta ()
```

Get the update distance delta.

```
public ViewType getViewType ()
```

Get enforced *ARController.ViewType*.

```
public boolean isOccluded (ARObject arObject)
```

Check if an *ARObject* is occluded by a building

```
public boolean isOcclusionEnabled ()
```

Check if occlusion is enabled.

```
public boolean isUsingAlternativeCenter ()
```

Checks to see if an alternative center is currently being used

```
public boolean isVisible (ARObject arObject)
```

Check if an *ARObject* is visible in the camera view.

```
public void pan (PointF from, PointF to)
```

Pans the Camera view from one specified on-screen android.graphics.PointF to another.

```
public void panTo (GeoCoordinate coordinate)
```

Pan the Camera view such that the *GeoCoordinate* passed as a parameter will be in the last location in the Front plane (i.e.

```
public boolean pixelTo3dPosition (float z, PointF screenPoint, Vector3f position)
```

Convert a screen point into a 3d space position

## Methods

```
public ARObject press (PointF point)
```

Press an *ARObject*.

```
public void press (ARObject arObject)
```

Press an *ARObject*.

```
public boolean removeARObject (ARObject arObject)
```

Remove an *ARObject* from the Camera and Map view.

```
public boolean removeARObject (ARPolylineObject arPolyObject)
```

Remove an *ARPolylineObject* from the Camera view.

```
public boolean removeARObject (ARModelObject arViewObject)
```

Remove an *ARModelObject* from the Camera view.

```
public void removeOnCameraEnteredListener (OnCameraEnteredListener listener)
```

Removes an existing *ARController.OnCameraEnteredListener* from this *ARController* .

```
public void removeOnCameraExitedListener (OnCameraExitedListener listener)
```

Removes an existing *ARController.OnCameraExitedListener* from this *ARController* .

```
public void removeOnCompassCalibrationChangedListener (OnCompassCalibrationChangedListener listener)
```

Removes an existing *ARController.OnCompassCalibrationChangedListener* from this *ARController* .

```
public void removeOnLivesightStatusListener (OnLivesightStatusListener listener)
```

Removes an existing *ARController.OnLivesightStatusListener* from this *ARController*.

```
public void removeOnMapEnteredListener (OnMapEnteredListener listener)
```

Removes an existing *ARController.OnMapEnteredListener* from this *ARController* .

```
public void removeOnMapExitedListener (OnMapExitedListener listener)
```

Removes an existing *ARController.OnMapExitedListener* from this *ARController* .

```
public void removeOnObjectTappedListener (OnObjectTappedListener listener)
```

Removes an existing *ARController.OnObjectTappedListener* from this *ARController* .

```
public void removeOnPanListener (OnPanListener listener)
```

Removes an existing *ARController.OnPanListener* from this *ARController* .

```
public void removeOnPoseListener (OnPoseListener listener)
```

Removes an existing *ARController.OnPoseListener* from this *ARController* .

```
public void removeOnPostPresentListener (OnPostPresentListener listener)
```

Removes an existing *ARController.OnPostPresentListener* from this *ARController* .

```
public void removeOnPreDrawListener (OnPreDrawListener listener)
```

Removes an existing *ARController.OnPreDrawListener* from this *ARController* .

```
public void removeOnPreDrawMapListener (OnPreDrawMapListener listener)
```

Removes an existing *ARController.OnPreDrawMapListener* from this *ARController* .

**Methods**

```
public void removeOnPrePresentListener (OnPrePresentListener listener)
```

Removes an existing *ARController.OnPrePresentListener* from this *ARController* .

```
public void removeOnProjectionCameraUpdatedListener (OnProjectionCameraUpdatedListener listener)
```

Removes an existing *ARController.OnProjectionCameraUpdatedListener* from this *ARController* .

```
public void removeOnRadarUpdateListener (OnRadarUpdateListener listener)
```

Removes an existing *ARController.OnRadarUpdateListener* from this *ARController* .

```
public void removeOnSensorCalibrationChangedListener (OnSensorCalibrationChangedListener listener)
```

Removes an existing *ARController.OnSensorCalibrationChangedListener* from this *ARController* .

```
public void removeOnTapListener (OnTapListener listener)
```

Removes an existing *ARController.OnTapListener* from this *ARController* .

```
public void removeOnTouchDownListener (OnTouchDownListener listener)
```

Removes an existing *ARController.OnTouchDownListener* from this *ARController* .

```
public void removeOnTouchUpListener (OnTouchUpListener listener)
```

Removes an existing *ARController.OnTouchUpListener* from this *ARController* .

```
public void removePitchFunction ()
```

Removes an existing *ARController.OnPitchFunction* from this *ARController* .

```
public void select (ARObject arObject)
```

Select an *ARObject* .

```
public void select (ARObject arObject, boolean allowInfo, float scale)
```

Select an *ARObject* .

```
public void setAlternativeCenter (GeoCoordinate coordinate)
```

Set alternative to current GPS position to use for LiveSight.

```
public void setCompassAccuracy (float degrees)
```

Set compass accuracy in degrees.

```
public void setFixedAltitude (float altitude_m, boolean animate)
```

Set fixed altitude of the livesight's view point.

```
public void setInfoAnimationInUpViewOnly (boolean enable)
```

Choose the moment when INFO animation starts.

```
public void setMap (Map map)
```

Set *Map* to the *ARController* .

```
public void setOcclusionEnabled (boolean enable)
```

Enables or disables occlusion fading.

```
public void setOcclusionOpacity (float opacity)
```

Set opacity of the occlusion items.

## Methods

public void **setOrientationAnimation** (boolean enabled)

Enable/disable animation during orientation change.

public void **setPitchFunction** (*OnPitchFunction* function)

Adds a *ARController.OnPitchFunction* to this *ARController* to be able to override current device pitch.

public void **setPlanesParameters** (float frontNear, float frontFar, float backNear, float backFar)

Set front and back planes parameters - screen height ratios (0..1f).

public void **setProjectionType** (*ProjectionType* type)

Set Camera view *ARController.ProjectionType*

public void **setSensorsWaitTimeout** (long timeout)

Set sensors wait timeout in ms.

public void **setTapArea** (int width, int height)

Sets the tap area width and height.

public void **setUpdateDistanceDelta** (int delta)

Sets the update distance delta for the items in the camera view.

public void **setUseDownIconsOnMap** (boolean useDownIcons)

Use Down icons in Map view in LiveSight

public void **showFrontItemsOnly** (boolean show)

Show only icons in the Front plane in Camera view.

public void **showView** (*ViewType* viewType)

Show(enforce) specified *ARController.ViewType*.

public *Error* **start** ()

Start AR

public *Error* **stop** (boolean withExitAnimation)

Stop AR

public void **unselect** ()

Unselect previously selected object.

## Class Details

The *ARController* class serves as a facade for LiveSight functionality. It contains methods and callbacks for controlling and customizing LiveSight behavior.

## Field Details

public static final *CameraParams* **CameraParams**

Accessor for *ARController.CameraParams* instance.

```
public final DownViewParams DownViewParams
```

Accessor for *ARController.DownViewParams* instance.

```
public final ExternalSensors ExternalSensors
```

ARController external sensors interface

```
public final FilterParams HeadingFilterParams
```

Accessor for *ARController.FilterParams* instance which affects Heading. A Low-bypass filter is used.

```
public final IconParams IconParams
```

Accessor for *ARController.IconParams* instance.

```
public final InfoParams InfoParams
```

Accessor for *ARController.InfoParams* instance.

```
public final IntroAnimationParams IntroParams
```

Accessor for *ARController.IntroAnimationParams* instance.

```
public final FilterParams PitchFilterParams
```

Accessor for *ARController.FilterParams* instance which affects Pitch. A Low-bypass filter is used.

```
public final SelectedItemParams SelectedItemParams
```

Accessor for *ARController.SelectedItemParams* instance.

```
public final UpViewParams UpViewParams
```

Accessor for *ARController.UpViewParams* instance.

```
public final UpViewTransitionParams UpViewTransitionParams
```

Accessor for *ARController.UpViewTransitionParams* instance.

```
public final FilterParams ZoomFilterParams
```

Accessor for *ARController.FilterParams* instance which affects Zoom. A Low-bypass filter is used.

## Method Details

```
public void addARObject (ARObject arObject)
```

Add an *ARObject* that will be displayed in the Camera and Map view.

### Parameters:

- **arObject**  
ARObject to add to the ARController

```
public void addARObject (ARPolylineObject arPolyObject)
```

Add an *ARPolylineObject* that will be displayed in the Camera view.

### Parameters:

- **arPolyObject**  
ARPolylineObject to add to the ARController

```
public void addARObject (ARModelObject arViewObject)
```

Add an *ARModelObject* that will be displayed in the Camera view.

### Parameters:

- **arViewObject**  
ARModelObject to add to the ARController

```
public void addOnCameraEnteredListener (OnCameraEnteredListener listener)
```

Adds a *ARController.OnCameraEnteredListener* to this ARController to listen for the event triggered when Camera view is entered. This event is triggered just before the Camera view is entered.

### Parameters:

- **listener**  
A *ARController.OnCameraEnteredListener* to add to the *ARController*

### See also:

*removeOnCameraEnteredListener(OnCameraEnteredListener)*

```
public void addOnCameraExitedListener (OnCameraExitedListener listener)
```

Adds a *ARController.OnCameraExitedListener* to this *ARController* to listen for the event triggered when Camera view is exited. This event is triggered just after the Camera view is exited.

**Parameters:**

- **listener**

A *ARController.OnCameraExitedListener* to add to the *ARController*

**See also:**

[removeOnCameraExitedListener\(OnCameraExitedListener\)](#)

```
public void addOnCompassCalibrationChangedListener  
(OnCompassCalibrationChangedListener listener)
```

Adds a *ARController.OnCompassCalibrationChangedListener* to this *ARController* to listen for compass calibration changed events.

**Parameters:**

- **listener**

A *ARController.OnCompassCalibrationChangedListener* to add to the *ARController*

**See also:**

[removeOnCompassCalibrationChangedListener\(OnCompassCalibrationChangedListener\)](#)

```
public void addOnLivesightStatusListener (OnLivesightStatusListener listener)
```

Adds a *ARController.OnLivesightStatusListener* to this *ARController* to listen for livesight status notification.

**Parameters:**

- **listener**

A *ARController.OnLivesightStatusListener* to add to the *ARController*

**See also:**

[removeOnLivesightStatusListener\(OnLivesightStatusListener\)](#)

```
public void addOnMapEnteredListener (OnMapEnteredListener listener)
```

Adds a *ARController.OnMapEnteredListener* to this *ARController* to listen for the event triggered when Map view is entered. This event is triggered just before the Map view is entered.

**Parameters:**

- **listener**

A *ARController.OnMapEnteredListener* to add to the *ARController*

**See also:**

[removeOnMapEnteredListener\(OnMapEnteredListener\)](#)

```
public void addOnMapExitedListener (OnMapExitedListener listener)
```

Adds a *ARController.OnMapEnteredListener* to this *ARController* to listen for the event triggered when Map view is exited. This event is triggered just after the Map view is exited.

**Parameters:**

- **listener**  
A *ARController.OnMapEnteredListener* to add to the *ARController*

**See also:**

[removeOnMapExitedListener\(OnMapExitedListener\)](#)

```
public void addOnObjectTappedListener (OnObjectTappedListener listener)
```

Adds a *ARController.OnObjectTappedListener* to this *ARController* to listen for object tap events.

**Parameters:**

- **listener**  
A *ARController.OnObjectTappedListener* to add to the *ARController*

**See also:**

[removeOnObjectTappedListener\(OnObjectTappedListener\)](#)

```
public void addOnPanListener (OnPanListener listener)
```

Adds a *ARController.OnPanListener* to this *ARController* to listen for pan events.

**Parameters:**

- **listener**  
A *ARController.OnPanListener* to add to the *ARController*

**See also:**

[removeOnPanListener\(OnPanListener\)](#)

```
public void addOnPoseListener (OnPoseListener listener)
```

Adds a *ARController.OnPoseListener* to this *ARController* to listen for pose update events.

**Parameters:**

- **listener**  
A *ARController.OnPoseListener* to add to the *ARController*

**See also:**

[removeOnPoseListener\(OnPoseListener\)](#)

```
public void addOnPostPresentListener (OnPostPresentListener listener)
```

Adds a *ARController.OnPostPresentListener* to this *ARController* to listen for the event triggered after a draw is being performed.

**Parameters:**

- **listener**  
A *ARController.OnPostPresentListener* to add to the *ARController*

**See also:**

[removeOnPostPresentListener\(OnPostPresentListener\)](#)

```
public void addOnPreDrawListener (OnPreDrawListener listener)
```

Adds a *ARController.OnPreDrawListener* to this *ARController* to listen for the event triggered before the livesight frame is being drawn.

**Parameters:**

- **listener**  
A *ARController.OnPreDrawListener* to add to the *ARController*

**See also:**

[removeOnPreDrawListener\(OnPreDrawListener\)](#)

```
public void addOnPreDrawMapListener (OnPreDrawMapListener listener)
```

Adds a *ARController.OnPreDrawMapListener* to this *ARController* to listen for the event triggered before the map is being drawn.

**Parameters:**

- **listener**  
A *ARController.OnPreDrawMapListener* to add to the *ARController*

**See also:**

[removeOnPreDrawMapListener\(OnPreDrawMapListener\)](#)

```
public void addOnPrePresentListener (OnPrePresentListener listener)
```

Adds a *ARController.OnPrePresentListener* to this *ARController* to listen for the event triggered before a draw is being performed.

**Parameters:**

- **listener**  
A *ARController.OnPrePresentListener* to add to the *ARController*

See also:

[removeOnPrePresentListener\(OnPrePresentListener\)](#)

```
public void addOnProjectionCameraUpdatedListener  
(OnProjectionCameraUpdatedListener listener)
```

Adds a [ARController.OnProjectionCameraUpdatedListener](#) to this [ARController](#) to listen for livesight projection camera change notification.

Parameters:

- **listener**  
A [ARController.OnProjectionCameraUpdatedListener](#) to add to the [ARController](#)

See also:

[removeOnProjectionCameraUpdatedListener\(OnProjectionCameraUpdatedListener\)](#)

```
public void addOnRadarUpdateListener (OnRadarUpdateListener listener)
```

Adds a [ARController.OnRadarUpdateListener](#) to this [ARController](#) to listen for radar update events.

Parameters:

- **listener**  
A [ARController.OnRadarUpdateListener](#) to add to the [ARController](#)

See also:

[removeOnRadarUpdateListener\(OnRadarUpdateListener\)](#)

```
public void addOnSensorCalibrationChangedListener  
(OnSensorCalibrationChangedListener listener)
```

Adds a [ARController.OnSensorCalibrationChangedListener](#) to this [ARController](#) to listen for sensor calibration changed events.

Parameters:

- **listener**  
A [ARController.OnSensorCalibrationChangedListener](#) to add to the [ARController](#)

See also:

[removeOnSensorCalibrationChangedListener\(OnSensorCalibrationChangedListener\)](#)

```
public void addOnTapListener (OnTapListener listener)
```

Adds a *ARController.OnTapListener* to this *ARController* to listen for tap events.

**Parameters:**

- **listener**  
A *ARController.OnTapListener* to add to the *ARController*

**See also:**

*removeOnTapListener(OnTapListener)*

```
public void addOnTouchDownListener (OnTouchDownListener listener)
```

Adds a *ARController.OnTouchDownListener* to this *ARController* to listen for touch down events.

**Parameters:**

- **listener**  
A *ARController.OnTouchDownListener* to add to the *ARController*

**See also:**

*removeOnTouchDownListener(OnTouchDownListener)*

```
public void addOnTouchUpListener (OnTouchUpListener listener)
```

Adds a *ARController.OnTouchUpListener* to this *ARController* to listen for touch up events.

**Parameters:**

- **listener**  
A *ARController.OnTouchUpListener* to add to the *ARController*

**See also:**

*removeOnTouchUpListener(OnTouchUpListener)*

```
public void defocus ()
```

Defocus previously focused *ARObject*. Bring the object back to its position among all objects in Camera view.

```
public void depress (ARObject arObject)
```

Depress previously pressed *ARObject*. Render the item to simulate depressing.

**Parameters:**

- **arObject**  
The *ARObject* to be marked as no longer pressed

```
public void focus (ARObject arObject)
```

Focus an *ARObject*. Bring the object in front of other items and expand Info. The object becomes defocused automatically if other object is chosen to be focused. Only one object can be focused.

Focus only has a visible affect on ARObject s which are in the Back plane.

**Parameters:**

- **arObject**  
ARObject to focus

```
public boolean geoTo3dPosition (GeoCoordinate geoPosition, Vector3f position)
```

Convert a geo position into a 3d space position

**Parameters:**

- **geoPosition**  
Geo position to convert
- **position**  
Filled on return with the corresponding 3d space position

**Returns:**

true on success

```
public int getAccelerometerCalibrationStatus ()
```

Get the accelerometer calibration status.

Status can be one of the following values:

- -1
- `SensorManager.SENSOR_STATUS_UNRELIABLE`
- `SensorManager.SENSOR_STATUS_ACCURACY_LOW`
- `SensorManager.SENSOR_STATUS_ACCURACY_MEDIUM`
- `SensorManager.SENSOR_STATUS_ACCURACY_HIGH`

**Returns:**

the accelerometer calibration status. -1 indicates the status has not been retrieved yet.

```
public float getCompassAccuracy ()
```

Get compass accuracy in degrees.

**Returns:**

Accuracy in degrees.

```
public int getCompassCalibrationStatus ()
```

Get the compass calibration status.

Status can be one of the following values:

- -1
- `SensorManager.SENSOR_STATUS_UNRELIABLE`
- `SensorManager.SENSOR_STATUS_ACCURACY_LOW`
- `SensorManager.SENSOR_STATUS_ACCURACY_MEDIUM`
- `SensorManager.SENSOR_STATUS_ACCURACY_HIGH`

**Returns:**

the compass calibration status. -1 indicates the status has not been retrieved yet.

```
public float getFixedAltitude ()
```

Get fixed altitude of the livesight's view point.

**Returns:**

Altitude in meters of the view point above the ground

```
public int getGyroscopeCalibrationStatus ()
```

Get the gyroscope calibration status.

Status can be one of the following values:

- -1
- `SensorManager.SENSOR_STATUS_UNRELIABLE`
- `SensorManager.SENSOR_STATUS_ACCURACY_LOW`
- `SensorManager.SENSOR_STATUS_ACCURACY_MEDIUM`
- `SensorManager.SENSOR_STATUS_ACCURACY_HIGH`

**Returns:**

the gyroscope calibration status. -1 indicates the status has not been retrieved yet.

```
public long getObjectId (ARObject arObject)
```

Get *ARObjects* unique identifier.

**Parameters:**

- **arObject**  
ARObject to retrieve unique identifier for

**Returns:**

ARObjects unique identifier. -1 returned if object has not been found

```
public java.util.List <ARObject> getObjects (PointF point)
```

Get a list of *ARObjects* at the specified screen point.

**Parameters:**

- **point**  
Screen point to check for ARObjects

**Returns:**

List of ARObjects. null if no objects are located at point.

```
public java.util.List <ARObject> getObjects (ViewRect rect)
```

Get a list of *ARObjects* which intersect the given *ViewRect*

**Parameters:**

- **rect**  
*ViewRect* to check for ARObjects

**Returns:**

List of ARObjects. null if no objects are located in rect.

```
public float getOcclusionOpacity ()
```

Get opacity of the occlusion items.

**Returns:**

A value of opacity.

```
public ARPoseReading getPose ()
```

Get latest pose

**Returns:**

An *ARPoseReading* object representing the latest available pose

```
public GeoCoordinate getPosition ()
```

Get the last known position.

**Returns:**

*GeoCoordinate* representing the last known position or null if no position fix is available

```
public GeoCoordinate getPosition (AtomicBoolean mapMached)
```

Get the last known position with map matching indicator. See *NavigationManager*, *PositioningManager*.

**Parameters:**

- **mapMached**

Set to `true` on return if the position was changed such that it matches the closest road. Usually enabled during navigation.

**Returns:**

*GeoCoordinate* representing the last known position or `null` if no position fix is available

`public ProjectionType getProjectionType ()`

Get Camera view *ARController.ProjectionType*

**Returns:**

A value of *ProjectionType*

`public PointF getScreenViewPoint ()`

Get target screen view point. This point is a final first person view on the screen.

**Returns:**

A value of the timeout in ms.

`public long getSensorsWaitTimeout ()`

Get sensors wait timeout in ms.

**Returns:**

A value of the timeout in ms.

`public int getUpdateDistanceDelta ()`

Get the update distance delta.

**Returns:**

Distance delta in meters.

**See also:**

*setUpdateDistanceDelta(int)*

`public ViewType getViewType ()`

Get enforced *ARController.ViewType*. If view type is `AUTO` the value depends on the device tilt and high and low pitch thresholds.

**Returns:**

A *ViewType*.

```
public boolean isOccluded (ARObject arObject)
```

Check if an *ARObject* is occluded by a building

**Parameters:**

- **arObject**  
*ARObject*

**Returns:**

true if object is occluded by a building, false otherwise.

**See also:**

[ARIconObject](#)

```
public boolean isOcclusionEnabled ()
```

Check if occlusion is enabled.

**Returns:**

true if occlusion is enabled, false otherwise.

```
public boolean isUsingAlternativeCenter ()
```

Checks to see if an alternative center is currently being used

**Returns:**

true if alternative center is used, false otherwise

**See also:**

[setAlternativeCenter\(GeoCoordinate\)](#)

```
public boolean isVisible (ARObject arObject)
```

Check if an *ARObject* is visible in the camera view.

**Parameters:**

- **arObject**  
*ARObject*

**Returns:**

true if object is visible in camera view, false otherwise.

**See also:**

[ARIconObject](#)

```
public void pan (PointF from, PointF to)
```

Pans the Camera view from one specified on-screen `android.graphics.PointF` to another.

**Parameters:**

- **from**  
An originating on-screen `PointF` (pre-pan)
- **to**  
An on-screen `PointF` representing the end of the pan

```
public void panTo (GeoCoordinate coordinate)
```

Pan the Camera view such that the *GeoCoordinate* passed as a parameter will be in the last location in the Front plane (i.e. on the boundary between Front and Back plane).

This can be used in conjunction with *getCoordinate()* to pan so that a given `ARObject` will be in the last position in the Front plane.

**Parameters:**

- **coordinate**  
`GeoCoordinate` to be the last location in Front plane.

```
public boolean pixelTo3dPosition (float z, PointF screenPoint, Vector3f  
position)
```

Convert a screen point into a 3d space position

**Parameters:**

- **z**  
Position depth relative to which the conversion is made
- **screenPoint**  
Screen point to convert. It is relative to the AR view
- **position**  
Filled on return with the corresponding 3d space position

**Returns:**

true on success, false otherwise.

```
public ARObject press (PointF point)
```

Press an *ARObject*. Render the item to simulate pressing.

**Parameters:**

- **point**

`android.graphics.PointF` on the screen to press.

**Returns:**

Pressed [ARObject](#). null if no object is located at point.

```
public void press (ARObject arObject)
```

Press an [ARObject](#). Render the item to simulate pressing.

**Parameters:**

- `arObject`  
The [ARObject](#) to be marked as pressed

```
public boolean removeARObject (ARObject arObject)
```

Remove an [ARObject](#) from the Camera and Map view.

**Parameters:**

- `arObject`  
[ARObject](#) to remove

**Returns:**

true if object is successfully removed from [ARController](#), false otherwise.

**See also:**

[ARIconObject](#)

```
public boolean removeARObject (ARPolylineObject arPolyObject)
```

Remove an [ARPolylineObject](#) from the Camera view.

**Parameters:**

- `arPolyObject`  
[ARPolylineObject](#) to remove

**Returns:**

true if object is successfully removed from [ARController](#), false otherwise.

```
public boolean removeARObject (ARModelObject arViewObject)
```

Remove an [ARModelObject](#) from the Camera view.

**Parameters:**

- `arViewObject`  
[ARModelObject](#) to remove

## Returns:

true if object is successfully removed from `ARController`, false otherwise.

```
public void removeOnCameraEnteredListener (OnCameraEnteredListener listener)
```

Removes an existing `ARController.OnCameraEnteredListener` from this `ARController`.

## Parameters:

- `listener`  
A `ARController.OnCameraEnteredListener` to remove from the `ARController`

```
public void removeOnCameraExitedListener (OnCameraExitedListener listener)
```

Removes an existing `ARController.OnCameraExitedListener` from this `ARController`.

## Parameters:

- `listener`  
A `ARController.OnCameraExitedListener` to remove from the `ARController`

```
public void removeOnCompassCalibrationChangedListener  
(OnCompassCalibrationChangedListener listener)
```

Removes an existing `ARController.OnCompassCalibrationChangedListener` from this `ARController`.

## Parameters:

- `listener`  
A `ARController.OnCompassCalibrationChangedListener` to remove from the `ARController`

```
public void removeOnLivesightStatusListener (OnLivesightStatusListener listener)
```

Removes an existing `ARController.OnLivesightStatusListener` from this `ARController`.

## Parameters:

- `listener`  
A `ARController.OnLivesightStatusListener` to remove from the `ARController`

```
public void removeOnMapEnteredListener (OnMapEnteredListener listener)
```

Removes an existing `ARController.OnMapEnteredListener` from this `ARController`.

## Parameters:

- `listener`  
A `ARController.OnMapEnteredListener` to remove from the `ARController`

```
public void removeOnMapExitedListener (OnMapExitedListener listener)
```

Removes an existing *ARController.OnMapExitedListener* from this *ARController* .

**Parameters:**

- **listener**  
A *ARController.OnMapExitedListener* to remove from the *ARController*

```
public void removeOnObjectTappedListener (OnObjectTappedListener listener)
```

Removes an existing *ARController.OnObjectTappedListener* from this *ARController* .

**Parameters:**

- **listener**  
A *ARController.OnObjectTappedListener* to remove from the *ARController*

```
public void removeOnPanListener (OnPanListener listener)
```

Removes an existing *ARController.OnPanListener* from this *ARController* .

**Parameters:**

- **listener**  
A *ARController.OnPanListener* to remove from the *ARController*

```
public void removeOnPoseListener (OnPoseListener listener)
```

Removes an existing *ARController.OnPoseListener* from this *ARController* .

**Parameters:**

- **listener**  
A *ARController.OnPoseListener* to remove from the *ARController*

```
public void removeOnPostPresentListener (OnPostPresentListener listener)
```

Removes an existing *ARController.OnPostPresentListener* from this *ARController* .

**Parameters:**

- **listener**  
A *ARController.OnPostPresentListener* to remove from the *ARController*

```
public void removeOnPreDrawListener (OnPreDrawListener listener)
```

Removes an existing *ARController.OnPreDrawListener* from this *ARController* .

**Parameters:**

- **listener**

A *ARController.OnPreDrawListener* to remove from the *ARController*

```
public void removeOnPreDrawMapListener (OnPreDrawMapListener listener)
```

Removes an existing *ARController.OnPreDrawMapListener* from this *ARController*.

**Parameters:**

- **listener**

A *ARController.OnPreDrawMapListener* to remove from the *ARController*

```
public void removeOnPrePresentListener (OnPrePresentListener listener)
```

Removes an existing *ARController.OnPrePresentListener* from this *ARController*.

**Parameters:**

- **listener**

A *ARController.OnPrePresentListener* to remove from the *ARController*

```
public void removeOnProjectionCameraUpdatedListener  
(OnProjectionCameraUpdatedListener listener)
```

Removes an existing *ARController.OnProjectionCameraUpdatedListener* from this *ARController*.

**Parameters:**

- **listener**

A *ARController.OnProjectionCameraUpdatedListener* to remove from the *ARController*

```
public void removeOnRadarUpdateListener (OnRadarUpdateListener listener)
```

Removes an existing *ARController.OnRadarUpdateListener* from this *ARController*.

**Parameters:**

- **listener**

A *ARController.OnRadarUpdateListener* to remove from the *ARController*

```
public void removeOnSensorCalibrationChangedListener  
(OnSensorCalibrationChangedListener listener)
```

Removes an existing *ARController.OnSensorCalibrationChangedListener* from this *ARController*.

**Parameters:**

- **listener**

A *ARController.OnSensorCalibrationChangedListener* to remove from the *ARController*

```
public void removeOnTapListener (OnTapListener listener)
```

Removes an existing *ARController.OnTapListener* from this *ARController* .

**Parameters:**

- **listener**

A *ARController.OnTapListener* to remove from the *ARController*

```
public void removeOnTouchDownListener (OnTouchDownListener listener)
```

Removes an existing *ARController.OnTouchDownListener* from this *ARController* .

**Parameters:**

- **listener**

A *ARController.OnTouchDownListener* to remove from the *ARController*

```
public void removeOnTouchUpListener (OnTouchUpListener listener)
```

Removes an existing *ARController.OnTouchUpListener* from this *ARController* .

**Parameters:**

- **listener**

A *ARController.OnTouchUpListener* to remove from the *ARController*

```
public void removePitchFunction ()
```

Removes an existing *ARController.OnPitchFunction* from this *ARController* .

```
public void select (ARObject arObject)
```

Select an *ARObject*. Any item in Camera view can be in selected state. This implies that the item is rendered differently. The *ARObject* becomes unselected automatically if another *ARObject* is selected. Only one *ARObject* can be selected at a time.

When selected: Details portion, (if present), of the item collapses, background image replaces foreground image, (if item is on foreground), item's image is scaled, (if specified), item's opacity is changed, (if specified), all non-selected items opacity, (if specified), are changed as well.

**Parameters:**

- **arObject**

The `ARObject` to be marked as selected

**See also:**

[setOpacity\(float\)](#)

[setNonSelectedItemsOpacity\(float\)](#)

```
public void select (ARObject arObject, boolean allowInfo, float scale)
```

Select an `ARObject`. Any item in Camera view can be in selected state. This implies that the item is rendered differently. The `ARObject` becomes unselected automatically if another `ARObject` is selected. Only one `ARObject` can be selected at a time.

**Parameters:**

- **arObject**

The `ARObject` to be marked as selected

- **allowInfo**

If true and info is visible, it will continue to be visible. If false, BACK icon replaces FRONT icon and info portion will collapse.

- **scale**

The size multiplier to be applied while the item is in selected state. If scale is x1, `SelectedItemParams#setSize` is used for width and height. Otherwise scale is applied to the current projected size.

When selected: If `allowInfo` is set to false - details portion(if present) collapses and background image replaces foreground image(if item is on foreground), item's image is scaled by the factor of scale, item's opacity is changed(if specified), all non-selected items opacity(if specified) are changed as well.

**See also:**

[setOpacity\(float\)](#)

[setNonSelectedItemsOpacity\(float\)](#)

```
public void setAlternativeCenter (GeoCoordinate coordinate)
```

Set alternative to current GPS position to use for LiveSight. Passing null will cause LiveSight to resume using GPS position.

**Parameters:**

- **coordinate**

`GeoCoordinate` representing alternative center to use

**See also:**

[isUsingAlternativeCenter\(\)](#)

```
public void setCompassAccuracy (float degrees)
```

Set compass accuracy in degrees.

**Parameters:**

- **degrees**  
Accuracy in degrees.

**public void setFixedAltitude (float altitude\_m, boolean animate)**

Set fixed altitude of the livesight's view point. Default value is 2 meters in order to see closest to the viewer surrounding area. If the value is negative, the positioning service altitude will be used. Example: Setting altitude to 1000 meters would allow to create binocular magnification effect looking at the distance from 1000 meters above the ground.

**Parameters:**

- **altitude\_m**  
Altitude in meters of the view point above the ground
- **animate**  
To control transition from current altitude to new one

**public void setInfoAnimationInUpViewOnly (boolean enable)**

Choose the moment when INFO animation starts.

**Parameters:**

- **enable**  
If **true**, INFO open and close occurs in UP view only, that is after flying in and before flying out from UP view.

**public void setMap (*Map* map)**

Set *Map* to the ARController . ARController will handle transitions between views.

**Parameters:**

- **map**  
Existing *Map* object

**public void setOcclusionEnabled (boolean enable)**

Enables or disables occlusion fading. If an item gets obstructed by a building its opacity will be reduced.

**Parameters:**

- **enable**  
Enables if true or disables if false. By default, occlusion is disabled.

```
public void setOcclusionOpacity (float opacity)
```

Set opacity of the occlusion items.

**Parameters:**

- **opacity**  
Opacity value to use when item is obstructed by a building.

```
public void setOrientationAnimation (boolean enabled)
```

Enable/disable animation during orientation change. It has effect on the camera scene only. This call should be made when livesight is stopped.

**Parameters:**

- **enabled**  
If true, orientation animation is used

```
public void setPitchFunction (OnPitchFunction function)
```

Adds a [ARController.OnPitchFunction](#) to this [ARController](#) to be able to override current device pitch.

**Parameters:**

- **function**  
A [OnPitchFunction](#) to add to the [ARController](#)

**See also:**

[removePitchFunction\(\)](#)

```
public void setPlanesParameters (float frontNear, float frontFar, float backNear, float backFar)
```

Set front and back planes parameters - screen height ratios (0..1f). The livesight by default is using two plane scheme. The first one is the front plane where icons are shown in close proximity as a composition of two parts: front icon image and info icon image attached on the right. The back plane is for "far" icons. They are displayed with back icon images only. The front plane takes lower portion of the view. The back plane takes higher portion of the view. Both planes are limited by two horizontal lines described as a proportion of the height of the view. Using push/pull gesture allows to move icons closer or farther from the viewer in each plane.

**Parameters:**

- **frontNear**  
Front plane near screen height ratio. Example: 0.95
- **frontFar**  
Front plane far screen height ratio. Example: 0.6

- **backNear**  
Back plane near screen height ratio. Example: 0.2
- **backFar**  
Back plane far screen height ratio. Example: 0.5

```
public void setProjectionType (ProjectionType type)
```

Set Camera view *ARController.ProjectionType*

**Parameters:**

- **type**  
A value of *ProjectionType*.

```
public void setSensorsWaitTimeout (long timeout)
```

Set sensors wait timeout in ms. In exceptional situations sensors may not produce valid data due to system level malfunction. To handle the situation, provided timeout is used to wait until the sensors data is available. This call should be made before *livesight start()* command for the value to take effect, otherwise it will be used on next sensors verification. See *ARController.OnLivesightStatusListener* and *ARController.Error* codes.

**Parameters:**

- **timeout**  
A value of the timeout in ms.

```
public void setTapArea (int width, int height)
```

Sets the tap area width and height. Whenever user touches the screen, a tap event is triggered. Whenever the user starts moving the finger on the screen, a pan event is triggered. The tap area is a rectangle having the initial touch point as the center. As long as the user moves the finger on the screen and the touch point is inside the tap area, no pan event will be triggered. The default tap area has a width and height of 51 pixels.

**Parameters:**

- **width**  
The tap area width in pixels
- **height**  
The tap area height in pixels

```
public void setUpdateDistanceDelta (int delta)
```

Sets the update distance delta for the items in the camera view.

When the distance between the current geo position and a new one is bigger than specified value the AR layout items projection is updated.

**Parameters:**

- **delta**  
Distance delta in meters. Default: 3 meters.

```
public void setUseDownIconsOnMap (boolean useDownIcons)
```

Use Down icons in Map view in LiveSight

**Parameters:**

- **useDownIcons**  
Enable using Down icons in Map view of LiveSight. By default, down icons are being used.

```
public void showFrontItemsOnly (boolean show)
```

Show only icons in the Front plane in Camera view.

**Parameters:**

- **show**  
If true, only front items will be displayed in Camera view

```
public void showView (ViewType viewType)
```

Show(enforce) specified [ARController.ViewType](#).

**Parameters:**

- **viewType**  
ViewType to show

```
public Error start ()
```

Start AR

**Returns:**

[NONE](#) on success. Otherwise, one of the error codes in [Error](#).

```
public Error stop (boolean withExitAnimation)
```

Stop AR

**Parameters:**

- **withExitAnimation**  
If true, exit animation is used before stopping LiveSight.

**Returns:**

*NONE* on success. Otherwise, one of the error codes in `Error`.

```
public void unselect ()
```

Unselect previously selected object.

When unselected: Details portion(if present) expands, front image is used instead of background(if item is on foreground), item is scaled to normal size, all opacities change to default values.

**See also:**

[setOpacity\(float\)](#)

[setNonSelectedItemsOpacity\(float\)](#)

## CameraParams

The class `CameraParams` is a member of `com.here.android.mpa.ar.ARController`.

### Class Summary

```
public static final class ARController.CameraParams
```

```
extends java.lang.Object
```

Encapsulates parameters which affect the device camera.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 23: Methods in `CameraParams`

Methods
<pre>public int getFps ()</pre> <p>Get camera FPS.</p>
<pre>public float getHorizontalFov ()</pre> <p>Get horizontal field of view of Camera view in the <code>CompositeFragment</code>.</p>
<pre>public Size[] getPreviewSizes ()</pre> <p>Get the array of supported camera resolutions for Camera view.</p>
<pre>public Size getSize ()</pre> <p>Get camera resolution for Camera view.</p>
<pre>public float getVerticalFov ()</pre> <p>Get vertical field of view of Camera view in the <code>CompositeFragment</code>.</p>
<pre>public CameraParams setFps (int fps)</pre> <p>Set camera FPS.</p>

## Methods

```
public CameraParams setSize (Size size)
```

Set camera resolution for Camera view.

## Class Details

Encapsulates parameters which affect the device camera. The device camera is used when in *CAMERA* view.

## Method Details

```
public int getFps ()
```

Get camera FPS.

### Returns:

Camera FPS. If not available -1.

```
public float getHorizontalFov ()
```

Get horizontal field of view of Camera view in the *CompositeFragment*. This is not camera hardware field of view. IMPORTANT! View has to exist in the *CompositeFragment* in order to retrieve the value, otherwise invalid value is returned.

### Returns:

horizontal field of view, in degrees

```
public Size[] getPreviewSizes ()
```

Get the array of supported camera resolutions for Camera view.

### Returns:

The array of supported camera resolutions. null if camera not found. See *Size*

```
public Size getSize ()
```

Get camera resolution for Camera view.

### Returns:

size Camera resolution. See *Size*

```
public float getVerticalFov ()
```

Get vertical field of view of Camera view in the *CompositeFragment*. This is not camera hardware field of view. IMPORTANT! View has to exist in the *CompositeFragment* in order to retrieve the value, otherwise invalid value is returned.

## Returns:

vertical field of view, in degrees

```
public CameraParams setFps (int fps)
```

Set camera FPS. This call should be made prior to creating *CompositeFragment* object.

## Parameters:

- **fps**  
Camera FPS.

## Returns:

*CameraParams* object.

```
public CameraParams setSize (Size size)
```

Set camera resolution for Camera view. Currently, any size equal to or greater than 640X480 is supported. This call should be made prior to creating *CompositeFragment* object.

When a custom size is set, it will be matched to the closest supported size for a given device, as reported by *getPreviewSizes()*.

Setting the camera size to high resolutions has a significant performance impact.

## Parameters:

- **size**  
Camera resolution. See *Size*

## Returns:

*CameraParams* object.

## DownViewParams

The class *DownViewParams* is a member of *com.here.android.mpa.ar.ARController*.

### Class Summary

```
public final class ARController.DownViewParams
```

```
extends java.lang.Object
```

Encapsulates parameters which affect the Down view.

[For complete information, see the section *Class Details*]

## Method Summary

Table 24: Methods in DownViewParams

Methods
<pre>public AnimationInterpolator <b>getCenterInterpolator</b> ()</pre> <p>Get auto TFC interpolation algorithm.</p>
<pre>public long <b>getFadeInAnimationDelay</b> ()</pre> <p>Get delay of Down view fade-in animation.</p>
<pre>public long <b>getFadeInAnimationTime</b> ()</pre> <p>Get duration of Down view fade-in animation.</p>
<pre>public AnimationInterpolator <b>getFadeInInterpolator</b> ()</pre> <p>Get the interpolator for Down view fade-in animation.</p>
<pre>public long <b>getFadeOutAnimationDelay</b> ()</pre> <p>Get delay of Down view fade-out animation.</p>
<pre>public long <b>getFadeOutAnimationTime</b> ()</pre> <p>Get duration of Down view fade-out animation.</p>
<pre>public AnimationInterpolator <b>getFadeOutInterpolator</b> ()</pre> <p>Get the interpolator for Down view fade-out animation.</p>
<pre>public AnimationInterpolator <b>getGeoCenterInterpolator</b> ()</pre> <p>Get auto GPS interpolation algorithm.</p>
<pre>public AnimationInterpolator <b>getHeadingInterpolator</b> ()</pre> <p>Get auto heading interpolation algorithm.</p>
<pre>public float <b>getMaxAlpha</b> ()</pre> <p>Get maximum alpha value for DOWN view.</p>
<pre>public float <b>getMaxZoomOutScale</b> ()</pre> <p>Get max zoom out level for Down view.</p>
<pre>public float <b>getMinAlpha</b> ()</pre> <p>Get minimum alpha value for DOWN view.</p>
<pre>public float <b>getMinPitch</b> ()</pre> <p>Get minimum Down view pitch.</p>
<pre>public AnimationInterpolator <b>getPitchInterpolator</b> ()</pre> <p>Get auto pitch interpolation algorithm.</p>
<pre>public float <b>getPitchThreshold</b> ()</pre> <p>Get pitch threshold when Up view transitions to Down view</p>
<pre>public AnimationInterpolator <b>getZoomInterpolator</b> ()</pre> <p>Get auto zoom interpolation algorithm.</p>

## Methods

```
public boolean isAutoGeoCenterEnabled ()
```

Get Down view auto geo center setting.

```
public boolean isAutoHeadingEnabled ()
```

Get Down view auto heading setting.

```
public boolean isAutoPitchEnabled ()
```

Get Down view auto pitch setting.

```
public boolean isAutoTFCEnabled ()
```

Get Down view auto tfc setting.

```
public boolean isAutoZoomEnabled ()
```

Get Down view auto zoom setting.

```
public DownViewParams setAutoControlOnEntryExit (boolean enabled)
```

Enable/disable map auto control during Entry and Exit animations.

```
public DownViewParams setAutoGeoCenterEnabled (boolean enabled, boolean animate)
```

Enable/disable auto geo center control.

```
public DownViewParams setAutoHeadingEnabled (boolean enabled, boolean animate)
```

Enable/disable auto heading control.

```
public DownViewParams setAutoPitchEnabled (boolean enabled, boolean animate)
```

Enable/disable auto pitch control.

```
public DownViewParams setAutoTFCEnabled (boolean enabled, boolean animate)
```

Enable/disable auto transform center control.

```
public DownViewParams setAutoZoomEnabled (boolean enabled, boolean animate)
```

Enable/disable auto zoom control.

```
public DownViewParams setCenterInterpolator (AnimationInterpolator value)
```

Set auto TFC interpolation algorithm.

```
public DownViewParams setFadeInAnimationDelay (long value)
```

Set Down view fade-in animation delay.

```
public DownViewParams setFadeInAnimationTime (long value)
```

Set Down view fade-in animation duration.

```
public DownViewParams setFadeInInterpolator (AnimationInterpolator value)
```

Set the interpolator for Down view fade-in animation.

```
public DownViewParams setFadeOutAnimationDelay (long value)
```

Set Down view fade-out animation delay.

```
public DownViewParams setFadeOutAnimationTime (long value)
```

Set Down view fade-out animation duration.

## Methods

```
public DownViewParams setFadeOutInterpolator (AnimationInterpolator value)
```

Set the interpolator for Down view fade-out animation.

```
public DownViewParams setGeoCenterInterpolator (AnimationInterpolator value)
```

Set auto GPS interpolation algorithm.

```
public DownViewParams setHeadingInterpolator (AnimationInterpolator value)
```

Set auto heading interpolation algorithm

```
public DownViewParams setMaxAlpha (float value)
```

Set maximum alpha value for DOWN view.

```
public DownViewParams setMaxZoomOutScale (float value, boolean animate, boolean pitchCorrection)
```

Set max zoom out level for Down view.

```
public DownViewParams setMinAlpha (float value)
```

Set minimum alpha value for DOWN view.

```
public DownViewParams setMinPitch (float value)
```

Sets minimum Down view pitch.

```
public DownViewParams setPitchInterpolator (AnimationInterpolator value)
```

Set auto pitch interpolation algorithm

```
public DownViewParams setPitchThreshold (float value)
```

Set Pitch threshold when Up view transitions to Down view

```
public DownViewParams setTransformCenter (PointF center, boolean animate)
```

Set down view transform center in the livesight.

```
public DownViewParams setZoomInterpolator (AnimationInterpolator value)
```

Set auto zoom interpolation algorithm.

## Class Details

Encapsulates parameters which affect the Down view.

## Method Details

```
public AnimationInterpolator getCenterInterpolator ()
```

Get auto TFC interpolation algorithm.

### Returns:

auto TFC interpolation algorithm enumerator.

```
public long getFadeInAnimationDelay ()
```

Get delay of Down view fade-in animation.

**Returns:**

delay of Down view fade-in animation in ms.

```
public long getFadeInAnimationTime ()
```

Get duration of Down view fade-in animation.

**Returns:**

duration of Down view fade-in animation in ms.

```
public AnimationInterpolator getFadeInInterpolator ()
```

Get the interpolator for Down view fade-in animation.

**Returns:**

The *AnimationInterpolator* for Down view fade-in animation

```
public long getFadeOutAnimationDelay ()
```

Get delay of Down view fade-out animation.

**Returns:**

delay of Down view fade-out animation in ms.

```
public long getFadeOutAnimationTime ()
```

Get duration of Down view fade-out animation.

**Returns:**

duration of Down view fade-out animation in ms.

```
public AnimationInterpolator getFadeOutInterpolator ()
```

Get the interpolator for Down view fade-out animation.

**Returns:**

The *AnimationInterpolator* for Down view fade-out animation

```
public AnimationInterpolator getGeoCenterInterpolator ()
```

Get auto GPS interpolation algorithm.

**Returns:**

auto GPS interpolation algorithm enumerator.

```
public AnimationInterpolator getHeadingInterpolator ()
```

Get auto heading interpolation algorithm.

**Returns:**

auto heading interpolation algorithm enumerator.

```
public float getMaxAlpha ()
```

Get maximum alpha value for DOWN view. Range 0..1f.

**Returns:**

max alpha channel value of DOWN view.

```
public float getMaxZoomOutScale ()
```

Get max zoom out level for Down view. Zoom value in down view changes dynamically as a function of pitch. Full zoom range is from 0(most farthest) to 1.0(most closest).

**Returns:**

max zoom out level

```
public float getMinAlpha ()
```

Get minimum alpha value for DOWN view. Range 0..1f.

**Returns:**

min alpha channel value of DOWN view

```
public float getMinPitch ()
```

Get minimum Down view pitch. Default value is *Map's* min pitch.

**Returns:**

minimum map pitch.

**See also:**

[\*setTilt\(float, Animation\)\*](#)

[\*getMinTilt\(\)\*](#)

[\*getMaxTilt\(\)\*](#)

```
public AnimationInterpolator getPitchInterpolator ()
```

Get auto pitch interpolation algorithm.

**Returns:**

auto pitch interpolation algorithm enumerator.

```
public float getPitchThreshold ()
```

Get pitch threshold when Up view transitions to Down view

**Returns:**

pitch value which triggers transition from Up view to Down view

```
public AnimationInterpolator getZoomInterpolator ()
```

Get auto zoom interpolation algorithm.

**Returns:**

auto zoom interpolation algorithm enumerator.

```
public boolean isAutoGeoCenterEnabled ()
```

Get Down view auto geo center setting.

**Returns:**

Auto geo center setting

```
public boolean isAutoHeadingEnabled ()
```

Get Down view auto heading setting.

**Returns:**

Auto heading setting

```
public boolean isAutoPitchEnabled ()
```

Get Down view auto pitch setting.

**Returns:**

Auto pitch setting

```
public boolean isAutoTFCEnabled ()
```

Get Down view auto tfc setting.

**Returns:**

Auto tfc setting

```
public boolean isAutoZoomEnabled ()
```

Get Down view auto zoom setting.

**Returns:**

Auto zoom setting

```
public DownViewParams setAutoControlOnEntryExit (boolean enabled)
```

Enable/disable map auto control during Entry and Exit animations. If certain map parameters such as auto pitch, auto heading are disabled, they are treated enabled during Entry and Exit animations only.

**Parameters:**

- **enabled**  
If `true`, map auto control is enabled during Entry and Exit animations.

**Returns:**

The updated *DownViewParams* object itself

```
public DownViewParams setAutoGeoCenterEnabled (boolean enabled, boolean animate)
```

Enable/disable auto geo center control. When enabled, *ARController* sets geo center automatically

**Parameters:**

- **enabled**  
If `true`, geo center is set automatically
- **animate**  
If `true`, start animation from current value to the calculated by liveisght

**Returns:**

The updated *DownViewParams* object itself

```
public DownViewParams setAutoHeadingEnabled (boolean enabled, boolean animate)
```

Enable/disable auto heading control. When enabled, *ARController* adjusts the heading automatically

**Parameters:**

- **enabled**  
If `true`, heading is adjusted automatically
- **animate**  
If `true`, start animation from current value to the calculated by liveisght

## Returns:

The updated `DownViewParams` object itself

```
public DownViewParams setAutoPitchEnabled (boolean enabled, boolean animate)
```

Enable/disable auto pitch control. When enabled, *ARController* adjusts the pitch automatically

## Parameters:

- **enabled**  
If `true`, pitch is adjusted automatically
- **animate**  
If `true`, start animation from current value to the calculated by liveisght

## Returns:

The updated `DownViewParams` object itself

```
public DownViewParams setAutoTFCEnabled (boolean enabled, boolean animate)
```

Enable/disable auto transform center control. When enabled, *ARController* adjusts the transform center automatically

## Parameters:

- **enabled**  
If `true`, transform center is adjusted automatically
- **animate**  
If `true`, start animation from current value to the calculated by liveisght

## Returns:

The updated `DownViewParams` object itself

```
public DownViewParams setAutoZoomEnabled (boolean enabled, boolean animate)
```

Enable/disable auto zoom control. When enabled, *ARController* adjusts the zoom level automatically

## Parameters:

- **enabled**  
If `true`, zoom is adjusted automatically
- **animate**  
If `true`, start animation from current value to the calculated by liveisght

## Returns:

The updated `DownViewParams` object itself

```
public DownViewParams setCenterInterpolator (AnimationInterpolator value)
```

Set auto TFC interpolation algorithm.

**Parameters:**

- **value**  
auto TFC interpolation algorithm.

**Returns:**

The updated *DownViewParams* object itself

```
public DownViewParams setFadeInAnimationDelay (long value)
```

Set Down view fade-in animation delay.

**Parameters:**

- **value**  
Down view fade-in animation delay in ms

**Returns:**

The updated *DownViewParams* object itself

```
public DownViewParams setFadeInAnimationTime (long value)
```

Set Down view fade-in animation duration.

**Parameters:**

- **value**  
Down view fade-in animation duration in ms

**Returns:**

The updated *DownViewParams* object itself

```
public DownViewParams setFadeInInterpolator (AnimationInterpolator value)
```

Set the interpolator for Down view fade-in animation.

**Parameters:**

- **value**  
The *AnimationInterpolator* for Down view fade-in animation

**Returns:**

The updated *DownViewParams* object itself

```
public DownViewParams setFadeOutAnimationDelay (long value)
```

Set Down view fade-out animation delay.

**Parameters:**

- **value**  
Down view fade-out animation delay in ms

**Returns:**

The updated *DownViewParams* object itself

```
public DownViewParams setFadeOutAnimationTime (long value)
```

Set Down view fade-out animation duration.

**Parameters:**

- **value**  
Down view fade-out animation duration in ms

**Returns:**

The updated *DownViewParams* object itself

```
public DownViewParams setFadeOutInterpolator (AnimationInterpolator value)
```

Set the interpolator for Down view fade-out animation.

**Parameters:**

- **value**  
The *AnimationInterpolator* for Down view fade-out animation

**Returns:**

The updated *DownViewParams* object itself

```
public DownViewParams setGeoCenterInterpolator (AnimationInterpolator value)
```

Set auto GPS interpolation algorithm.

**Parameters:**

- **value**  
auto GPS interpolation algorithm.

**Returns:**

The updated *DownViewParams* object itself

```
public DownViewParams setHeadingInterpolator (AnimationInterpolator value)
```

Set auto heading interpolation algorithm

**Parameters:**

- **value**  
auto heading interpolation algorithm.

**Returns:**

The updated `DownViewParams` object itself

```
public DownViewParams setMaxAlpha (float value)
```

Set maximum alpha value for DOWN view. Range 0..1f.

**Parameters:**

- **value**  
The DOWN view alpha channel.

**Returns:**

The updated `DownViewParams` object itself

```
public DownViewParams setMaxZoomOutScale (float value, boolean animate,  
boolean pitchCorrection)
```

Set max zoom out level for Down view. Zoom value in down view changes dynamically as a function of pitch. Full map's zoom scale range is from 0(most zoomed out) to 1.0(most zoomed in). Example: Setting value of 0.8 would limit livesight zoom to 0.8(most zoomed out) to 1.0(most zoomed in).

**Parameters:**

- **value**  
max zoom out level.
- **animate**  
true to animate change from previous value to new one.
- **pitchCorrection**  
true to consider current pitch when zoom scale was applied. The final max zoom out value will be equal or greater then specified.

**Returns:**

The updated `DownViewParams` object itself

```
public DownViewParams setMinAlpha (float value)
```

Set minimum alpha value for DOWN view. Range 0..1f.

**Parameters:**

- **value**

The DOWN view alpha channel

**Returns:**

The updated DownViewParams object itself

```
public DownViewParams setMinPitch (float value)
```

Sets minimum Down view pitch. Value's range should be [min map tilt, max map tilt]. *Map*.

**Parameters:**

- **value**  
minimum map pitch.

**Returns:**

The updated DownViewParams object itself

**See also:**

[setTilt\(float, Animation\)](#)

[getMinTilt\(\)](#)

[getMaxTilt\(\)](#)

```
public DownViewParams setPitchInterpolator (AnimationInterpolator value)
```

Set auto pitch interpolation algorithm

**Parameters:**

- **value**  
auto pitch interpolation algorithm.

**Returns:**

The updated DownViewParams object itself

```
public DownViewParams setPitchThreshold (float value)
```

Set Pitch threshold when Up view transitions to Down view

**Parameters:**

- **value**  
Pitch value ranges from 0...180

**Returns:**

The updated DownViewParams object itself

```
public DownViewParams setTransformCenter (PointF center, boolean animate)
```

Set down view transform center in the livesight. By default map transform center and first person view are coincide. The API enables separation of these points and creating "fly around" effect, where viewer is "flying around" specified map transform center.

**Parameters:**

- **center**  
Normalized screen coordinates. Example {0.5, 1} corresponds to {width/2, height}
- **animate**  
A flag to enable/disable animation from current view point to new one.

**Returns:**

The updated `DownViewParams` object itself

```
public DownViewParams setZoomInterpolator (AnimationInterpolator value)
```

Set auto zoom interpolation algorithm.

**Parameters:**

- **value**  
auto zoom interpolation algorithm.

**Returns:**

The updated `DownViewParams` object itself

## Error

The enumeration *Error* is a member of *com.here.android.mpa.ar.ARController*.

### Enumeration Summary

public static final enumeration **ARController.Error**

*extends java.lang.Enum, java.lang.Object*

AR Error codes

[For complete information, see the section *Enumeration Details*]

### Enum Constant Summary

Table 25: Enum Constants in Error

Fields
public static final <i>Error</i> <b>NONE</b> There is no error

## Fields

```
public static final Error INVALID_OPERATION
```

Operation not allowed at the time of the call.

```
public static final Error INVALID_PARAMETERS
```

Parameters passed to API are not valid.

```
public static final Error OPERATION_NOT_ALLOWED
```

Access to this operation is denied.

```
public static final Error CAMERA_UNAVAILABLE
```

Camera cannot be opened

```
public static final Error SENSORS_UNAVAILABLE
```

Sensors unavailable

```
public static final Error STOPPED
```

Livesight stopped

## Method Summary

Table 26: Methods in Error

### Methods

```
public static Error valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static ARController.Error[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

AR Error codes

### Enum Constant Details

```
public static final Error NONE
```

There is no error

```
public static final Error INVALID_OPERATION
```

Operation not allowed at the time of the call. For example, calling `start()` a second time before calling `stop`

```
public static final Error INVALID_PARAMETERS
```

Parameters passed to API are not valid.

```
public static final Error OPERATION_NOT_ALLOWED
```

Access to this operation is denied. Contact your HERE representative for more information.

```
public static final Error CAMERA_UNAVAILABLE
```

Camera cannot be opened

```
public static final Error SENSORS_UNAVAILABLE
```

Sensors unavailable

```
public static final Error STOPPED
```

Livesight stopped

## Method Details

```
public static Error valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static ARController.Error[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## ExternalSensors

The class *ExternalSensors* is a member of *com.here.android.mpa.ar.ARController*.

### Class Summary

```
public final class ARController.ExternalSensors
```

```
extends java.lang.Object
```

Encapsulates functionality to replace integrated sensors(all or selected) data feeds with external ones.

[For complete information, see the section [Class Details](#)]

## Method Summary

Table 27: Methods in ExternalSensors

Methods
<pre>public void <i>pushData</i> (<i>SensorType</i> sensorType, double x, double y, double z, long timeStamp)</pre> <p>Push sensors readings into the LiveSight engine.</p> <pre>public <i>ExternalSensors</i> <i>utilize</i> (<i>SensorType</i> sensorType, boolean onOff)</pre> <p>IMPORTANT! This call should be made when ARController is stopped or paused.</p>

## Class Details

Encapsulates functionality to replace integrated sensors(all or selected) data feeds with external ones. The interface is used to allow utilization of higher precision sensors to produce more accurate 3D projection results instead of using internal sensors on the device. [ARController.FilterParams](#) are also applicabe to the external sensors data.

## Method Details

```
public void pushData (SensorType sensorType, double x, double y, double z, long timeStamp)
```

Push sensors readings into the LiveSight engine.

### Parameters:

- **sensorType**  
Sensor type. [ARController.SensorType](#).
- **x**  
Accelerometer: Acceleration force along the x axis (m/s<sup>2</sup>). Gyroscope: Rate of rotation around the x axis (rad/s). Compass: The X (northward) component of the magnetic field in nanoteslas Location: Latitude in degrees.
- **y**  
Accelerometer: Acceleration force along the y axis (m/s<sup>2</sup>). Gyroscope: Rate of rotation around the y axis (rad/s). Compass: The Y (eastward) component of the magnetic field in nanoteslas. Location: Longitude in degrees.
- **z**  
Accelerometer: Acceleration force along the z axis (m/s<sup>2</sup>). Gyroscope: Rate of rotation around the z axis (rad/s). Compass: The Z (downward) component of the magnetic field in nanoteslas. Location: Altitude in meters.
- **timeStamp**  
Timestamp of the sensor's reading.

```
public ExternalSensors utilize (SensorType sensorType, boolean onOff)
```

IMPORTANT! This call should be made when *ARController* is stopped or paused. Enable/disable the external sensor(s) to feed data into the LiveSight. Once the external sensor is turned on, integrated sensor's data feed is stopped and from this moment on the client has to start feeding the sensor's data into LiveSight engine. See `pushData()`.

#### Parameters:

- **sensorType**  
Sensor type. *ARController.SensorType*.
- **onOff**  
If true, the integrated sensor's data feed is stopped and switched to external sensor data feed provided by the client. If false, integrated sensor's feed is turned back on and external sensor's data feed is ignored, if continued.

#### Returns:

The updated `ExternalSensors` object itself.

## FilterParams

The class *FilterParams* is a member of *com.here.android.mpa.ar.ARController*.

### Class Summary

```
public final class ARController.FilterParams
```

```
extends java.lang.Object
```

Encapsulates parameters which affect data filtering.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 28: Methods in *FilterParams*

Methods
<pre>public float <i>getCoeff</i> ()</pre> <p>Get filter coefficient</p>
<pre>public int <i>getSize</i> ()</pre> <p>Get number of collected samples for filter.</p>
<pre>public <i>FilterParams</i> <i>setCoeff</i> (float coeff)</pre> <p>Set filter coefficient.</p>
<pre>public <i>FilterParams</i> <i>setSize</i> (int size)</pre> <p>Set number of collected samples for filter.</p>

## Class Details

Encapsulates parameters which affect data filtering.

## Method Details

```
public float getCoeff ()
```

Get filter coefficient

**Returns:**

filter coefficient

```
public int getSize ()
```

Get number of collected samples for filter.

**Returns:**

filter size

```
public FilterParams setCoeff (float coeff)
```

Set filter coefficient.

Changing this value affects smoothing of filtered data. Increasing smoothing may increase the time before raw data changes influence filtered output (i.e. latency).

**Parameters:**

- **coeff**  
filter coefficient

**Returns:**

The updated `FilterParams` object itself.

```
public FilterParams setSize (int size)
```

Set number of collected samples for filter.

Changing this value affects smoothing of filtered data. Increasing smoothing may increase the time before raw data changes influence filtered output (i.e. latency).

**Parameters:**

- **size**  
filter size

**Returns:**

The updated `FilterParams` object itself.

## IconParams

The class *IconParams* is a member of *com.here.android.mpa.ar.ARController*.

### Class Summary

public final class **ARController.IconParams**

*extends java.lang.Object*

Encapsulates parameters which affect the icons of an *ARObject*.

[For complete information, see the section *Class Details*]

### Method Summary

Table 29: Methods in IconParams

Methods
public long <i>getDepressAnimationDelay</i> () Get delay of icon's depress animation.
public long <i>getDepressAnimationTime</i> () Get duration of icon's depress animation.
public float <i>getDownIconOpacity</i> () Get down icon's opacity.
public long <i>getFlyAnimationDelay</i> () Get delay of icon's fly animation.
public long <i>getFlyAnimationTime</i> () Get duration of icon's fly animation.
public <i>AnimationInterpolator</i> <i>getFlyInterpolator</i> () Get the interpolator for icon flying animation.
public <i>Vector3f</i> <i>getFlyRotateAngles</i> () Get icon's fly rotation angles.
public long <i>getFlyRotateAnimationDelay</i> () Get delay of icon's fly rotation animation.
public long <i>getFlyRotateAnimationTime</i> () Get duration of icon's fly rotation animation.
public long <i>getPopUpAnimationDelay</i> () Get delay of icon's first appearance animation(pop-up).
public long <i>getPopUpAnimationTime</i> () Get duration of icon's first appearance animation(pop-up).

## Methods

```
public AnimationInterpolator getPopUpInterpolator ()
```

Get the interpolator for icon pop up animation.

```
public long getPressAnimationDelay ()
```

Get delay of icon's tap animation.

```
public long getPressAnimationTime ()
```

Get duration of icon's press animation.

```
public AnimationInterpolator getTurnInterpolator ()
```

Get the interpolator for icon rotation animation.

```
public boolean getUseDownIconOpacity ()
```

Get enabled status of down icon's opacity.

```
public IconParams setBackIconMaxSize (int width, int height)
```

Set back icon maximum size

```
public IconParams setBackToFrontIconSizeRatio (float ratio)
```

Set back to front icon size ratio.

```
public IconParams setDefaultIcons (int frontIconId, int backIconId, int downIconId)
```

Set default icons resource ids.

```
public IconParams setDepressAnimationDelay (long time)
```

Set delay of icon's depress animation.

```
public IconParams setDepressAnimationTime (long time)
```

Set duration of icon's depress animation.

```
public IconParams setDownIconOpacity (float opacity)
```

Set down icon's opacity.

```
public IconParams setFlyAnimationDelay (long value)
```

Set icon's fly animation delay.

```
public IconParams setFlyAnimationTime (long value)
```

Set icon's fly animation duration.

```
public IconParams setFlyIconSizeOnMap (AObject object, int width, int height)
```

Set fly animation initial icon size while transitioning from MAP to CAMERA view and final icon size while transitioning from CAMERA to MAP view

```
public IconParams setFlyInterpolator (AnimationInterpolator value)
```

Set the interpolator for icon flying animation.

```
public IconParams setFlyRotateAngles (Vector3f value)
```

Set icon's fly rotation angles.

```
public IconParams setFlyRotateAnimationDelay (long value)
```

Set icon's fly rotation animation delay.

## Methods

```
public IconParams setFlyRotateAnimationTime (long value)
```

Set icon's fly rotation animation duration.

```
public IconParams setFrontIconMaxSize (int width, int height)
```

Set front icon maximum size

```
public IconParams setPopUpAnimationDelay (long value)
```

Set icon's first appearance animation(pop-up) delay.

```
public IconParams setPopUpAnimationTime (long value)
```

Set icon's first appearance animation(pop-up) duration.

```
public IconParams setPopUpInterpolator (AnimationInterpolator value)
```

Set the interpolator for icon pop up animation.

```
public IconParams setPressAnimationDelay (long time)
```

Set delay of icon's press animation.

```
public IconParams setPressAnimationTime (long time)
```

Set duration of icon's press animation.

```
public IconParams setTurnInterpolator (AnimationInterpolator value)
```

Set the interpolator for icon rotation animation.

```
public IconParams setUseDownIconOpacity (boolean enabled)
```

Enables/disables usage of down icon opacity, by default, it is enabled.

## Class Details

Encapsulates parameters which affect the icons of an *ARObject*.

## Method Details

```
public long getDepressAnimationDelay ()
```

Get delay of icon's depress animation.

### Returns:

delay of icon's depress animation in ms.

```
public long getDepressAnimationTime ()
```

Get duration of icon's depress animation.

### Returns:

duration of icon's depress animation in ms.

```
public float getDownIconOpacity ()
```

Get down icon's opacity.

**Returns:**

down icon's opacity.

```
public long getFlyAnimationDelay ()
```

Get delay of icon's fly animation.

**Returns:**

delay of icon's fly animation in ms.

```
public long getFlyAnimationTime ()
```

Get duration of icon's fly animation.

**Returns:**

duration of icon's fly animation in Ms.

```
public AnimationInterpolator getFlyInterpolator ()
```

Get the interpolator for icon flying animation.

**Returns:**

*AnimationInterpolator*.

```
public Vector3f getFlyRotateAngles ()
```

Get icon's fly rotation angles.

**Returns:**

angles of rotation in degrees.

```
public long getFlyRotateAnimationDelay ()
```

Get delay of icon's fly rotation animation.

**Returns:**

delay of icon's fly rotation animation in ms.

```
public long getFlyRotateAnimationTime ()
```

Get duration of icon's fly rotation animation.

**Returns:**

duration of icon's fly rotation animation in ms.

```
public long getPopUpAnimationDelay ()
```

Get delay of icon's first appearance animation(pop-up).

**Returns:**

delay of icon's first appearance animation(pop-up) in ms.

```
public long getPopUpAnimationTime ()
```

Get duration of icon's first appearance animation(pop-up).

**Returns:**

duration of icon's first appearance animation(pop-up) in ms.

```
public AnimationInterpolator getPopUpInterpolator ()
```

Get the interpolator for icon pop up animation.

**Returns:**

*AnimationInterpolator*.

```
public long getPressAnimationDelay ()
```

Get delay of icon's tap animation.

**Returns:**

delay of icon's tap animation in ms.

```
public long getPressAnimationTime ()
```

Get duration of icon's press animation.

**Returns:**

duration of icon's press animation in ms.

```
public AnimationInterpolator getTurnInterpolator ()
```

Get the interpolator for icon rotation animation.

**Returns:**

*AnimationInterpolator*.

```
public boolean getUseDownIconOpacity ()
```

Get enabled status of down icon's opacity.

**Returns:**

down icon's opacity status.

```
public IconParams setBackIconMaxSize (int width, int height)
```

Set back icon maximum size

**Parameters:**

- **width**  
Maximum width of back icon in pixels
- **height**  
Maximum height of back icon in pixels

**Returns:**

The updated *IconParams* object itself.

```
public IconParams setBackToFrontIconSizeRatio (float ratio)
```

Set back to front icon size ratio. The ratio is taken into account ONLY if icon and info sizes are NOT set explicitly. For example, a ratio of 0.5 means the back icon has half the width and height of the front icon.

**Parameters:**

- **ratio**  
back to front icon size ratio

**Returns:**

The updated *IconParams* object itself.

```
public IconParams setDefaultIcons (int frontIconId, int backIconId, int downIconId)
```

Set default icons resource ids.

**Parameters:**

- **frontIconId**  
Front fallback icon resource Id
- **backIconId**  
Back fallback icon resource Id
- **downIconId**  
Down fallback icon resource Id

**Returns:**

The updated `IconParams` object itself.

```
public IconParams setDepressAnimationDelay (long time)
```

Set delay of icon's depress animation.

**Parameters:**

- **time**  
delay of icon's depress animation in ms.

**Returns:**

The updated `IconParams` object itself.

```
public IconParams setDepressAnimationTime (long time)
```

Set duration of icon's depress animation.

**Parameters:**

- **time**  
duration of icon's depress animation in ms.

**Returns:**

The updated `IconParams` object itself.

```
public IconParams setDownIconOpacity (float opacity)
```

Set down icon's opacity.

**Parameters:**

- **opacity**  
Down icon's opacity.

**Returns:**

The updated `IconParams` object itself.

```
public IconParams setFlyAnimationDelay (long value)
```

Set icon's fly animation delay.

**Parameters:**

- **value**  
fly animation delay in ms

**Returns:**

The updated `IconParams` object itself.

```
public IconParams setFlyAnimationTime (long value)
```

Set icon's fly animation duration.

**Parameters:**

- **value**  
fly animation duration in ms

**Returns:**

The updated `IconParams` object itself.

```
public IconParams setFlyIconSizeOnMap (ARObject object, int width, int height)
```

Set fly animation initial icon size while transitioning from MAP to CAMERA view and final icon size while transitioning from CAMERA to MAP view

**Parameters:**

- **object**  
An *ARObject* to set the size to
- **width**  
An icon width at the start/end of animation
- **height**  
An icon height at the start/end of animation

**Returns:**

The updated `IconParams` object itself.

```
public IconParams setFlyInterpolator (AnimationInterpolator value)
```

Set the interpolator for icon flying animation.

**Parameters:**

- **value**  
of *AnimationInterpolator*

**Returns:**

The updated `IconParams` object itself.

```
public IconParams setFlyRotateAngles (Vector3f value)
```

Set icon's fly rotation angles.

**Parameters:**

- **value**  
icon's fly rotation angles in degrees.

**Returns:**

The updated `IconParams` object itself.

```
public IconParams setFlyRotateAnimationDelay (long value)
```

Set icon's fly rotation animation delay.

**Parameters:**

- **value**  
fly rotation animation delay in ms

**Returns:**

The updated `IconParams` object itself.

```
public IconParams setFlyRotateAnimationTime (long value)
```

Set icon's fly rotation animation duration.

**Parameters:**

- **value**  
fly rotation animation duration in ms

**Returns:**

The updated `IconParams` object itself.

```
public IconParams setFrontIconMaxSize (int width, int height)
```

Set front icon maximum size

**Parameters:**

- **width**  
Maximum width of front icon in pixels
- **height**  
Maximum height of front icon in pixels

**Returns:**

The updated `IconParams` object itself.

```
public IconParams setPopUpAnimationDelay (long value)
```

Set icon's first appearance animation(pop-up) delay.

**Parameters:**

- **value**  
pop-up animation delay in ms

**Returns:**

The updated IconParams object itself.

```
public IconParams setPopUpAnimationTime (long value)
```

Set icon's first appearance animation(pop-up) duration.

**Parameters:**

- **value**  
pop-up animation duration in ms

**Returns:**

The updated IconParams object itself.

```
public IconParams setPopUpInterpolator (AnimationInterpolator value)
```

Set the interpolator for icon pop up animation.

**Parameters:**

- **value**  
of *AnimationInterpolator*

**Returns:**

The updated IconParams object itself.

```
public IconParams setPressAnimationDelay (long time)
```

Set delay of icon's press animation.

**Parameters:**

- **time**  
delay of icon's tap animation in ms.

**Returns:**

The updated IconParams object itself.

```
public IconParams setPressAnimationTime (long time)
```

Set duration of icon's press animation.

**Parameters:**

- **time**  
duration of icon's press animation in ms.

**Returns:**

The updated `IconParams` object itself.

```
public IconParams setTurnInterpolator (AnimationInterpolator value)
```

Set the interpolator for icon rotation animation.

**Parameters:**

- **value**  
The *AnimationInterpolator* for the icon rotation animation

**Returns:**

The updated `IconParams` object itself.

```
public IconParams setUseDownIconOpacity (boolean enabled)
```

Enables/disables usage of down icon opacity, by default, it is enabled. When enabled, down icons will use the opacity specified through *setDownIconOpacity(float)*, instead of the opacity computed for up icons.

**Parameters:**

- **enabled**  
Enabled status

**Returns:**

The updated `IconParams` object itself.

## InfoParams

The class *InfoParams* is a member of *com.here.android.mpa.ar.ARController*.

### Class Summary

```
public final class ARController.InfoParams
```

```
extends java.lang.Object
```

Encapsulates parameters which affect the info of an *ARObject*.

[For complete information, see the section *Class Details*]

## Method Summary

Table 30: Methods in InfoParams

Methods
<pre>public float <a href="#">getAnimationMinWidthFactor</a> ()</pre> <p>Get info's animation minimum width factor.</p>
<pre>public long <a href="#">getCloseAnimationDelay</a> ()</pre> <p>Get delay of Info's close animation.</p>
<pre>public long <a href="#">getCloseAnimationTime</a> ()</pre> <p>Get duration of Info's close animation.</p>
<pre>public <a href="#">AnimationInterpolator</a> <a href="#">getCloseInterpolator</a> ()</pre> <p>Get the interpolator for info icon close animation.</p>
<pre>public long <a href="#">getOpenAnimationDelay</a> ()</pre> <p>Get delay of Info's open animation.</p>
<pre>public long <a href="#">getOpenAnimationTime</a> ()</pre> <p>Get duration of Info's open animation.</p>
<pre>public <a href="#">AnimationInterpolator</a> <a href="#">getOpenInterpolator</a> ()</pre> <p>Get the interpolator for info icon open animation.</p>
<pre>public <a href="#">InfoParams</a> <a href="#">setAnimationMinWidthFactor</a> (float value)</pre> <p>Set info's minimum width factor during animation.</p>
<pre>public <a href="#">InfoParams</a> <a href="#">setCloseAnimationDelay</a> (long value)</pre> <p>Set Info's close animation delay.</p>
<pre>public <a href="#">InfoParams</a> <a href="#">setCloseAnimationTime</a> (long value)</pre> <p>Set Info's close animation duration.</p>
<pre>public <a href="#">InfoParams</a> <a href="#">setCloseInterpolator</a> (<a href="#">AnimationInterpolator</a> value)</pre> <p>Set the interpolator for info close animation.</p>
<pre>public <a href="#">InfoParams</a> <a href="#">setOpenAnimationDelay</a> (long value)</pre> <p>Set Info's open animation delay.</p>
<pre>public <a href="#">InfoParams</a> <a href="#">setOpenAnimationTime</a> (long value)</pre> <p>Set Info's open animation duration.</p>
<pre>public <a href="#">InfoParams</a> <a href="#">setOpenInterpolator</a> (<a href="#">AnimationInterpolator</a> value)</pre> <p>Set the interpolator for info open animation.</p>

## Class Details

Encapsulates parameters which affect the info of an [ARObject](#).

## Method Details

```
public float getAnimationMinWidthFactor ()
```

Get info's animation minimum width factor.

**Returns:**

info animation's minimum width factor.

```
public long getCloseAnimationDelay ()
```

Get delay of Info's close animation.

**Returns:**

delay of Info's close animation in ms.

```
public long getCloseAnimationTime ()
```

Get duration of Info's close animation.

**Returns:**

duration of Info's close animation in ms.

```
public AnimationInterpolator getCloseInterpolator ()
```

Get the interpolator for info icon close animation.

**Returns:**

*AnimationInterpolator*.

```
public long getOpenAnimationDelay ()
```

Get delay of Info's open animation.

**Returns:**

delay of open animation in ms.

```
public long getOpenAnimationTime ()
```

Get duration of Info's open animation.

**Returns:**

duration of Info's open animation in ms.

```
public AnimationInterpolator getOpenInterpolator ()
```

Get the interpolator for info icon open animation.

**Returns:**

*AnimationInterpolator*.

```
public InfoParams setAnimationMinWidthFactor (float value)
```

Set info's minimum width factor during animation.

**Parameters:**

- **value**  
minimum width factor.

**Returns:**

The updated *InfoParams* object itself.

```
public InfoParams setCloseAnimationDelay (long value)
```

Set Info's close animation delay.

**Parameters:**

- **value**  
pop-up animation delay in ms.

**Returns:**

The updated *InfoParams* object itself.

```
public InfoParams setCloseAnimationTime (long value)
```

Set Info's close animation duration.

**Parameters:**

- **value**  
pop-up animation duration in ms.

**Returns:**

The updated *InfoParams* object itself.

```
public InfoParams setCloseInterpolator (AnimationInterpolator value)
```

Set the interpolator for info close animation.

**Parameters:**

- **value**  
The *AnimationInterpolator* for info close animation.

## Returns:

The updated `InfoParams` object itself.

```
public InfoParams setOpenAnimationDelay (long value)
```

Set Info's open animation delay.

## Parameters:

- `value`  
pop-up animation delay in ms.

## Returns:

The updated `InfoParams` object itself.

```
public InfoParams setOpenAnimationTime (long value)
```

Set Info's open animation duration.

## Parameters:

- `value`  
pop-up animation duration in ms.

## Returns:

The updated `InfoParams` object itself.

```
public InfoParams setOpenInterpolator (AnimationInterpolator value)
```

Set the interpolator for info open animation.

## Parameters:

- `value`  
The *AnimationInterpolator* for info open animation.

## Returns:

The updated `InfoParams` object itself.

## IntroAnimationMode

The enumeration *IntroAnimationMode* is a member of *com.here.android.mpa.ar.ARController*.

### Enumeration Summary

```
public static final enumeration ARController.IntroAnimationMode
```

extends *java.lang.Enum*, *java.lang.Object*

Intro animation mode.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 31: Enum Constants in IntroAnimationMode

Fields
<pre>public static final IntroAnimationMode DEFAULT</pre> <p>All properties of the <i>Map</i> pitch, heading, zoom, pixel and geo transform centers are animated at once.</p>
<pre>public static final IntroAnimationMode FLY_TO_LOCATION</pre> <p>Animate flying to current or alternative(See <code>setAlternativeCenter()</code>) geo location and afterwards animate other <i>Map</i>'s properties.</p>

## Method Summary

Table 32: Methods in IntroAnimationMode

Methods
<pre>public static IntroAnimationMode valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static ARController.IntroAnimationMode[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Intro animation mode. See *ARController.IntroAnimationParams*.

## Enum Constant Details

```
public static final IntroAnimationMode DEFAULT
```

All properties of the *Map* pitch, heading, zoom, pixel and geo transform centers are animated at once. Default mode.

```
public static final IntroAnimationMode FLY_TO_LOCATION
```

Animate flying to current or alternative(See `setAlternativeCenter()`) geo location and afterwards animate other *Map*'s properties.

## Method Details

```
public static IntroAnimationMode valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static ARController.IntroAnimationMode[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## IntroAnimationParams

The class *IntroAnimationParams* is a member of *com.here.android.mpa.ar.ARController*.

### Class Summary

```
public final class ARController.IntroAnimationParams
```

```
extends java.lang.Object
```

Encapsulates parameters which affect the Intro Animation.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 33: Methods in IntroAnimationParams

Methods
<pre>public long <i>getAnimationTime</i> ()</pre> <p>Get duration of intro transition animation.</p>
<pre>public <i>AnimationInterpolator</i> <i>getCenterInterpolator</i> ()</pre> <p>Get the interpolator for intro(LiveSight entry) first person's location animation.</p>
<pre>public <i>AnimationInterpolator</i> <i>getHeadingInterpolator</i> ()</pre> <p>Get the interpolator for intro(LiveSight entry) heading animation.</p>
<pre>public <i>IntroAnimationMode</i> <i>getIntroAnimationMode</i> ()</pre> <p>Get intro animation mode.</p>
<pre>public <i>AnimationInterpolator</i> <i>getPitchInterpolator</i> ()</pre> <p>Get the interpolator for intro(LiveSight entry) pitch animation.</p>
<pre>public <i>AnimationInterpolator</i> <i>getPositionInterpolator</i> ()</pre> <p>Get the interpolator for intro(LiveSight entry) position change animation.</p>
<pre>public <i>AnimationInterpolator</i> <i>getZoomInterpolator</i> ()</pre> <p>Get the interpolator for intro(LiveSight entry) zoom animation.</p>

## Methods

```
public IntroAnimationParams setAnimationTime (long value)
```

Set the value of intro transition animation duration.

```
public IntroAnimationParams setCenterInterpolator (AnimationInterpolator value)
```

Set the interpolator for intro(LiveSight entry) first person's location animation.

```
public IntroAnimationParams setHeadingInterpolator (AnimationInterpolator value)
```

Set the interpolator for intro(LiveSight entry) heading animation.

```
public IntroAnimationParams setIntroAnimationMode (IntroAnimationMode mode)
```

Set intro animation mode.

```
public IntroAnimationParams setPitchInterpolator (AnimationInterpolator value)
```

Set the interpolator for intro(LiveSight entry) pitch animation.

```
public IntroAnimationParams setPositionInterpolator (AnimationInterpolator value)
```

Set the interpolator for intro(LiveSight entry) position change animation.

```
public IntroAnimationParams setZoomInterpolator (AnimationInterpolator value)
```

Set the interpolator for intro(LiveSight entry) zoom animation.

## Class Details

Encapsulates parameters which affect the Intro Animation. The Intro Animation refers to the animation that is performed right after calling [start\(\)](#).

### Method Details

```
public long getAnimationTime ()
```

Get duration of intro transition animation.

**Returns:**

duration of intro transition animation in ms.

```
public AnimationInterpolator getCenterInterpolator ()
```

Get the interpolator for intro(LiveSight entry) first person's location animation.

**Returns:**

*AnimationInterpolator*.

```
public AnimationInterpolator getHeadingInterpolator ()
```

Get the interpolator for intro(LiveSight entry) heading animation.

**Returns:**

*AnimationInterpolator*.

```
public IntroAnimationMode getIntroAnimationMode ()
```

Get intro animation mode.

**Returns:**

*ARController.IntroAnimationMode*.

```
public AnimationInterpolator getPitchInterpolator ()
```

Get the interpolator for intro(LiveSight entry) pitch animation.

**Returns:**

*AnimationInterpolator*.

```
public AnimationInterpolator getPositionInterpolator ()
```

Get the interpolator for intro(LiveSight entry) position change animation.

**Returns:**

*AnimationInterpolator*.

```
public AnimationInterpolator getZoomInterpolator ()
```

Get the interpolator for intro(LiveSight entry) zoom animation.

**Returns:**

*AnimationInterpolator*.

```
public IntroAnimationParams setAnimationTime (long value)
```

Set the value of intro transition animation duration.

**Parameters:**

- **value**  
intro transition animation duration in ms

**Returns:**

The updated *IntroAnimationParams* object itself.

```
public IntroAnimationParams setCenterInterpolator (AnimationInterpolator value)
```

Set the interpolator for intro(LiveSight entry) first person's location animation.

**Parameters:**

- **value**

The *AnimationInterpolator* for intro first person's location animation

**Returns:**

The updated *IntroAnimationParams* object itself.

```
public IntroAnimationParams setHeadingInterpolator (AnimationInterpolator value)
```

Set the interpolator for intro(LiveSight entry) heading animation.

**Parameters:**

- **value**  
The *AnimationInterpolator* for intro heading animation

**Returns:**

The updated *IntroAnimationParams* object itself.

```
public IntroAnimationParams setIntroAnimationMode (IntroAnimationMode mode)
```

Set intro animation mode.

**Parameters:**

- **mode**  
The *ARController.IntroAnimationMode* for intro animation

**Returns:**

The updated *IntroAnimationParams* object itself.

```
public IntroAnimationParams setPitchInterpolator (AnimationInterpolator value)
```

Set the interpolator for intro(LiveSight entry) pitch animation.

**Parameters:**

- **value**  
The *AnimationInterpolator* for intro pitch animation

**Returns:**

The updated *IntroAnimationParams* object itself.

```
public IntroAnimationParams setPositionInterpolator (AnimationInterpolator value)
```

Set the interpolator for intro(LiveSight entry) position change animation.

**Parameters:**

- **value**  
The *AnimationInterpolator* for intro position change animation

**Returns:**

The updated `IntroAnimationParams` object itself.

```
public IntroAnimationParams setZoomInterpolator (AnimationInterpolator value)
```

Set the interpolator for intro(LiveSight entry) zoom animation.

**Parameters:**

- `value`  
The *AnimationInterpolator* for intro zoom animation.

**Returns:**

The updated `IntroAnimationParams` object itself.

## OnCameraEnteredListener

The interface *OnCameraEnteredListener* is a member of *com.here.android.mpa.ar.ARController*.

### Interface Summary

```
public static abstract interface ARController.OnCameraEnteredListener
```

Listener for Camera view entered event.

[For complete information, see the section [Interface Details](#)]

### Method Summary

Table 34: Methods in OnCameraEnteredListener

Methods
<pre>public abstract void onCameraEntered ()</pre> <p>A callback indicating that Camera view is entered</p>

### Interface Details

Listener for Camera view entered event. This event is triggered just before the Camera view (containing the camera frame and AR Objects) is displayed.

### Method Details

```
public abstract void onCameraEntered ()
```

A callback indicating that Camera view is entered

## OnCameraExitedListener

The interface *OnCameraExitedListener* is a member of *com.here.android.mpa.ar.ARController*.

### Interface Summary

public static abstract interface **ARController.OnCameraExitedListener**

Listener for Camera view exited event.

[For complete information, see the section [Interface Details](#)]

### Method Summary

Table 35: Methods in OnCameraExitedListener

Methods
<pre>public abstract void <i>onCameraExited</i> ()</pre>
A callback indicating that Camera view is exited

### Interface Details

Listener for Camera view exited event. This event is triggered just after the Camera view (containing the camera frame and AR Objects) is exited.

### Method Details

```
public abstract void onCameraExited ()
```

A callback indicating that Camera view is exited

## OnCompassCalibrationChangedListener

The interface *OnCompassCalibrationChangedListener* is a member of *com.here.android.mpa.ar.ARController*.

### Interface Summary

public static abstract interface **ARController.OnCompassCalibrationChangedListener**

Listener for compass calibration changed event.

[For complete information, see the section [Interface Details](#)]

## Method Summary

Table 36: Methods in OnCompassCalibrationChangedListener

Methods
<pre>public abstract void <a href="#">onCompassCalibrationChange</a> ()</pre> <p>A callback indicating that compass calibration changed</p>

## Interface Details

Listener for compass calibration changed event. This event is triggered by the system when the compass calibration status changes.

## Method Details

```
public abstract void onCompassCalibrationChange ()
```

A callback indicating that compass calibration changed

## OnLivesightStatusListener

The interface *OnLivesightStatusListener* is a member of *com.here.android.mpa.ar.ARController*.

## Interface Summary

```
public static abstract interface ARController.OnLivesightStatusListener
```

Monitor overall livesight status.

[For complete information, see the section [Interface Details](#)]

## Method Summary

Table 37: Methods in OnLivesightStatusListener

Methods
<pre>public abstract void <a href="#">onLivesightStatus</a> (<i>Error code</i>)</pre> <p>Notification for overall livesight status</p>

## Interface Details

Monitor overall livesight status.

There may be the situations where hardware or other system componets are not behave as expected. This notification allows application to handle such situations in the most suitable way. The same status may be reported more then once depending on the internal state of the livesight.

## Method Details

```
public abstract void onLivesightStatus (Error code)
```

Notification for overall livesight status

### Parameters:

- **code**  
Error code

## OnMapEnteredListener

The interface *OnMapEnteredListener* is a member of *com.here.android.mpa.ar.ARController*.

### Interface Summary

```
public static abstract interface ARController.OnMapEnteredListener
```

Listener for Map view entered event.

[For complete information, see the section [Interface Details](#)]

### Method Summary

**Table 38: Methods in OnMapEnteredListener**

Methods
<pre>public abstract void <i>onMapEntered</i> ()</pre> <p>A callback indicating that Map view is entered</p>

### Interface Details

Listener for Map view entered event. This event is triggered just before the Map view is displayed.

### Method Details

```
public abstract void onMapEntered ()
```

A callback indicating that Map view is entered

## OnMapExitedListener

The interface *OnMapExitedListener* is a member of *com.here.android.mpa.ar.ARController*.

### Interface Summary

```
public static abstract interface ARController.OnMapExitedListener
```

Listener for Map view exited event.

[For complete information, see the section [Interface Details](#)]

## Method Summary

Table 39: Methods in OnMapExitedListener

Methods
<pre>public abstract void <a href="#">onMapExited</a> ()</pre> <p>A callback indicating that Map view is exited</p>

## Interface Details

Listener for Map view exited event. This event is triggered just after the Map view is exited.

## Method Details

```
public abstract void onMapExited ()
```

A callback indicating that Map view is exited

## OnObjectTappedListener

The interface *OnObjectTappedListener* is a member of *com.here.android.mpa.ar.ARController*.

## Interface Summary

```
public static abstract interface ARController.OnObjectTappedListener
```

Listener for object tap events.

[For complete information, see the section [Interface Details](#)]

## Method Summary

Table 40: Methods in OnObjectTappedListener

Methods
<pre>public abstract boolean <a href="#">onObjectTapped</a> (java.util.List &lt;ARObject&gt; objects)</pre> <p>A callback indicating that at least one <i>ARObject</i> is located at the users tap point.</p>

## Interface Details

Listener for object tap events.

## Method Details

```
public abstract boolean onObjectTapped (java.util.List <ARObject> objects)
```

A callback indicating that at least one *ARObject* is located at the users tap point.

If there are *ARObject*s located at the users tap point, this callback will be made before *onTap(PointF)*. If `true` is returned from this callback, *onTap(PointF)* on the tap listener will not be called.

### Parameters:

- **objects**  
A list of selected *ARObject* objects

### Returns:

`true` if consumed (which prevents calling of *onTap(PointF)*), `false` otherwise.

## OnPanListener

The interface *OnPanListener* is a member of *com.here.android.mpa.ar.ARController*.

## Interface Summary

```
public static abstract interface ARController.OnPanListener
```

Listener for pan events.

[For complete information, see the section [Interface Details](#)]

## Method Summary

Table 41: Methods in OnPanListener

Methods
<pre>public abstract boolean onPan (PointF from, PointF to)</pre> <p>A callback indicating that a pan operation occurred.</p>

## Interface Details

Listener for pan events. Use of *panTo(GeoCoordinate)* API does not trigger this callback.

## Method Details

```
public abstract boolean onPan (PointF from, PointF to)
```

A callback indicating that a pan operation occurred.

### Parameters:

- **from**  
A *PointF* representing the start point

- **to**

A `PointF` representing the end point

**Returns:**

If true, event is consumed, false otherwise. If true is returned, panning will no longer be performed by the controller.

## OnPitchFunction

The interface `OnPitchFunction` is a member of `com.here.android.mpa.ar.ARController`.

### Interface Summary

public static abstract interface **ARController.OnPitchFunction**

Pitch function interface.

[For complete information, see the section [Interface Details](#)]

### Method Summary

Table 42: Methods in OnPitchFunction

Methods
public abstract float <code>onPitchFunction</code> (float pitch) Function applied to the current pitch

### Interface Details

Pitch function interface.

It gives ability to apply a function to the current device's pitch/tilt value to change the resulting pitch curve.

Special consideration should be used when `setAutoPitchEnabled(boolean, boolean)` API is called. This method uses the current `Map`'s value, which *may* be altered by the pitch function, thus effecting the animation.

### Method Details

public abstract float **onPitchFunction** (float pitch)

Function applied to the current pitch

**Parameters:**

- **pitch**

An argument to the function of pitch representing default pitch value

**Returns:**

Result of client pitch function, a custom pitch value for LiveSight to use.

## OnPoseListener

The interface *OnPoseListener* is a member of *com.here.android.mpa.ar.ARController*.

### Interface Summary

public static abstract interface **ARController.OnPoseListener**

Listener for pose update events.

[For complete information, see the section [Interface Details](#)]

### Method Summary

Table 43: Methods in OnPoseListener

Methods
<p>public abstract void <b>onPose</b> (<i>ARPoseReading</i> pose)</p> <p>A callback indicating that the pose has been updated.</p>

### Interface Details

Listener for pose update events.

### Method Details

public abstract void **onPose** (*ARPoseReading* pose)

A callback indicating that the pose has been updated. This can be triggered by the user moving the device (tilting, rotating or changing position).

#### Parameters:

- **pose**  
An *ARPoseReading* representing the new pose

## OnPostPresentListener

The interface *OnPostPresentListener* is a member of *com.here.android.mpa.ar.ARController*.

### Interface Summary

public static abstract interface **ARController.OnPostPresentListener**

Listener for the post draw event.

[For complete information, see the section [Interface Details](#)]

## Method Summary

Table 44: Methods in OnPostPresentListener

Methods
<pre>public abstract void <a href="#">onPostPresent</a> ()</pre> <p>A callback indicating that a draw has just been performed</p>

## Interface Details

Listener for the post draw event. This event is triggered just after a present is performed.  
Called on the Render thread.

## Method Details

```
public abstract void onPostPresent ()
```

A callback indicating that a draw has just been performed  
Called on the Render thread.

## OnPreDrawListener

The interface *OnPreDrawListener* is a member of *com.here.android.mpa.ar.ARController*.

## Interface Summary

```
public static abstract interface ARController.OnPreDrawListener
```

Listener for the livesight frame pre draw event.  
[For complete information, see the section [Interface Details](#)]

## Method Summary

Table 45: Methods in OnPreDrawListener

Methods
<pre>public abstract void <a href="#">onPreDraw</a> ()</pre> <p>Livesight frame pre draw callback</p>

## Interface Details

Listener for the livesight frame pre draw event. This event is triggered just before the livesight frame is being composited. This listener is useful in case client wants to update items before they are drawn and synchronize the update action with the draw cycle.

Called on the Render thread.

## Method Details

```
public abstract void onPreDraw ()
```

Livesight frame pre draw callback

Called on the Render thread.

## OnPreDrawMapListener

The interface *OnPreDrawMapListener* is a member of *com.here.android.mpa.ar.ARController*.

## Interface Summary

```
public static abstract interface ARController.OnPreDrawMapListener
```

Listener for the map pre draw event.

[For complete information, see the section [Interface Details](#)]

## Method Summary

Table 46: Methods in OnPreDrawMapListener

Methods
<pre>public abstract void onPreDrawMap (float orientationDeg, float tiltDeg, <i>GeoCoordinate</i> center)</pre> <p>Map pre draw callback</p>

## Interface Details

Listener for the map pre draw event. This event is triggered just before the map is being drawn. This listener is useful in case client wants to update things on the map and synchronize the update action with the draw cycle.

Called on the Render thread.

## Method Details

```
public abstract void onPreDrawMap (float orientationDeg, float tiltDeg, GeoCoordinate center)
```

Map pre draw callback

Called on the Render thread.

#### Parameters:

- **orientationDeg**  
Current *Map* orientation in degrees
- **tiltDeg**  
Current *Map* tilt in degrees
- **center**  
Current *Map* center

## OnPrePresentListener

The interface *OnPrePresentListener* is a member of *com.here.android.mpa.ar.ARController*.

### Interface Summary

public static abstract interface **ARController.OnPrePresentListener**

Listener for the pre present event.

[For complete information, see the section [Interface Details](#)]

### Method Summary

Table 47: Methods in OnPrePresentListener

Methods
<pre>public abstract void <b>onPrePresent</b> ()</pre> <p>A callback indicating that a draw is going to be performed</p>

### Interface Details

Listener for the pre present event. This event is triggered just before a present is performed. This listener is useful in case client wants to update items in AR just before they are presented to the screen and synchronize the update action with the AR draw cycle.

Called on the Render thread.

### Method Details

```
public abstract void onPrePresent ()
```

A callback indicating that a draw is going to be performed

Called on the Render thread.

## OnProjectionCameraUpdatedListener

The interface *OnProjectionCameraUpdatedListener* is a member of *com.here.android.mpa.ar.ARController*.

### Interface Summary

public static abstract interface **ARController.OnProjectionCameraUpdatedListener**

Monitor livesight projection camera.

[For complete information, see the section [Interface Details](#)]

### Method Summary

Table 48: Methods in OnProjectionCameraUpdatedListener

Methods
<pre>public abstract void <b>onProjectionCameraUpdated</b> ()</pre>
Notification of projection camera changes

### Interface Details

Monitor livesight projection camera.

It gives the ability to react to changes in projection camera. Can be used for updating pixel to local position associations.

### Method Details

```
public abstract void onProjectionCameraUpdated ()
```

Notification of projection camera changes

## OnRadarUpdateListener

The interface *OnRadarUpdateListener* is a member of *com.here.android.mpa.ar.ARController*.

### Interface Summary

public static abstract interface **ARController.OnRadarUpdateListener**

Listener for radar update events.

[For complete information, see the section [Interface Details](#)]

## Method Summary

Table 49: Methods in OnRadarUpdateListener

Methods
<pre>public abstract void <i>onRadarUpdate</i> (<i>ARRadarProperties</i> radar)</pre> <p>A callback indicating that <i>ARRadarProperties</i> have been updated.</p>

## Interface Details

Listener for radar update events.

## Method Details

```
public abstract void onRadarUpdate (ARRadarProperties radar)
```

A callback indicating that *ARRadarProperties* have been updated.

### Parameters:

- **radar**  
An *ARRadarProperties* object representing the updated properties.

## OnSensorCalibrationChangedListener

The interface *OnSensorCalibrationChangedListener* is a member of *com.here.android.mpa.ar.ARController*.

## Interface Summary

```
public static abstract interface ARController.OnSensorCalibrationChangedListener
```

Listener for sensor calibration events.

[For complete information, see the section [Interface Details](#)]

## Method Summary

Table 50: Methods in OnSensorCalibrationChangedListener

Methods
<pre>public abstract void <i>onSensorCalibrationChanged</i> (int type, int status)</pre> <p>Notification for sensor status changed</p>

## Interface Details

Listener for sensor calibration events.

## Method Details

```
public abstract void onSensorCalibrationChanged (int type, int status)
```

Notification for sensor status changed

### Parameters:

- **type**  
can be one of the following values:
  - Sensor.TYPE\_ACCELEROMETER
  - Sensor.TYPE\_MAGNETIC\_FIELD
  - Sensor.TYPE\_GYROSCOP
- **status**  
can be one of the following values:
  - SensorManager.SENSOR\_STATUS\_UNRELIABLE
  - SensorManager.SENSOR\_STATUS\_ACCURACY\_LOW
  - SensorManager.SENSOR\_STATUS\_ACCURACY\_MEDIUM
  - SensorManager.SENSOR\_STATUS\_ACCURACY\_HIGH

## OnTapListener

The interface *OnTapListener* is a member of *com.here.android.mpa.ar.ARController*.

### Interface Summary

```
public static abstract interface ARController.OnTapListener
```

Listener for tap events.

[For complete information, see the section [Interface Details](#)]

### Method Summary

Table 51: Methods in OnTapListener

Methods
<pre>public abstract boolean onTap (PointF point)</pre> <p>A callback indicating a tap has occurred</p>

### Interface Details

Listener for tap events.

### Method Details

```
public abstract boolean onTap (PointF point)
```

A callback indicating a tap has occurred

**Parameters:**

- **point**  
A `PointF` representing the touch point

**Returns:**

If true, event is consumed, false otherwise. If true is returned, touch action will no longer be performed by the controller.

## OnTouchDownListener

The interface `OnTouchDownListener` is a member of `com.here.android.mpa.ar.ARController`.

### Interface Summary

public static abstract interface `ARController.OnTouchDownListener`

Listener for touch down events.

[For complete information, see the section [Interface Details](#)]

### Method Summary

Table 52: Methods in `OnTouchDownListener`

Methods
public abstract boolean <code>onTouchDown</code> ( <code>PointF point</code> ) A callback indicating a touch has been initiated

### Interface Details

Listener for touch down events.

### Method Details

public abstract boolean `onTouchDown` (`PointF point`)

A callback indicating a touch has been initiated

**Parameters:**

- **point**  
A `PointF` representing the touch point

**Returns:**

If true, event is consumed, false otherwise. If true is returned, touch action will no longer be performed by the controller.

## OnTouchListener

The interface *OnTouchListener* is a member of *com.here.android.mpa.ar.ARController*.

### Interface Summary

public static abstract interface **ARController.OnTouchListener**

Listener for touch up events.

[For complete information, see the section *Interface Details*]

### Method Summary

Table 53: Methods in OnTouchListener

Methods
public abstract boolean <i>onTouchUp</i> (PointF point) A callback indicating a touch has been released

### Interface Details

Listener for touch up events.

### Method Details

public abstract boolean **onTouchUp** (PointF point)

A callback indicating a touch has been released

#### Parameters:

- **point**  
A PointF representing the touch point

#### Returns:

If true, event is consumed, false otherwise. If true is returned, touch action will no longer be performed by the controller.

## ProjectionType

The enumeration *ProjectionType* is a member of *com.here.android.mpa.ar.ARController*.

### Enumeration Summary

public static final enumeration **ARController.ProjectionType**

extends *java.lang.Enum*, *java.lang.Object*

Type of the projection used by the LiveSight engine while displaying *ARObjects* in the camera/UP view.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 54: Enum Constants in ProjectionType

Fields
<pre>public static final ProjectionType NEAR_FAR</pre> <p>Near-far projection.</p>
<pre>public static final ProjectionType DIRECT_3D</pre> <p>Direct 3D projection.</p>
<pre>public static final ProjectionType HORIZONTAL</pre> <p>HORIZONTAL projection.</p>
<pre>public static final ProjectionType MAP</pre> <p>Map projection.</p>
<pre>public static final ProjectionType USE_GLOBAL_PROJECTION_TYPE</pre> <p>USE_GLOBAL_PROJECTION_TYPE projection.</p>

## Method Summary

Table 55: Methods in ProjectionType

Methods
<pre>public static ProjectionType valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static ARController.ProjectionType[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Type of the projection used by the LiveSight engine while displaying *ARObjects* in the camera/UP view.

### Enum Constant Details

```
public static final ProjectionType NEAR_FAR
```

Near-far projection. *ARObject* s appear in one of two planes defined by *setPlanesParameters(float, float, float, float)*. In FAR plane items are displayed without details portion with reduced opacity as function of distance to the view point. In NEAR plane items are displayed with details portion. Default value.

```
public static final ProjectionType DIRECT_3D
```

Direct 3D projection. ARObject s appear in 3D space as a result of direct projection of Geolocation.

```
public static final ProjectionType HORIZONTAL
```

HORIZONTAL projection. ARObject s appear in one horizontal line.

```
public static final ProjectionType MAP
```

Map projection. ARObject s appear in the positions retrieved by *projectToPixel(GeoCoordinate)* API.

```
public static final ProjectionType USE_GLOBAL_PROJECTION_TYPE
```

USE\_GLOBAL\_PROJECTION\_TYPE projection. ARObject s appear in the projection set for *ARController* globally.

### Method Details

```
public static ProjectionType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static ARController.ProjectionType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## SelectedItemParams

The class *SelectedItemParams* is a member of *com.here.android.mpa.ar.ARController*.

### Class Summary

```
public final class ARController.SelectedItemParams
```

```
extends java.lang.Object
```

Encapsulates parameters which affect *ARObjects* which are in the selected or non selected states.

[For complete information, see the section *Class Details*]

## Method Summary

Table 56: Methods in SelectedItemParams

Methods
<p><code>public long <a href="#">getBoundingBoxAnimationDelay</a> ()</code> Get delay of selected item bounding box animation.</p>
<p><code>public long <a href="#">getBoundingBoxAnimationTime</a> ()</code> Get delay of selected item bounding box animation.</p>
<p><code>public <a href="#">AnimationInterpolator</a> <a href="#">getBoundingBoxInterpolator</a> ()</code> Get the interpolator for selected object bounding box animation.</p>
<p><code>public float <a href="#">getMaxViewAngle</a> ()</code> Get selected item max view angle when the item is on the right or left from line of sight.</p>
<p><code>public float <a href="#">getNonSelectedItemsOpacity</a> ()</code> Get others icons opacity while one icon is in selected state.</p>
<p><code>public float <a href="#">getOpacity</a> ()</code> Get selected item's opacity when icon in camera view is selected.</p>
<p><code>public <a href="#">Size</a> <a href="#">getSize</a> ()</code> Get selected item size.</p>
<p><code>public long <a href="#">getSizeAnimationDelay</a> ()</code> Get delay of selected item size animation.</p>
<p><code>public long <a href="#">getSizeAnimationTime</a> ()</code> Get delay of selected item size animation.</p>
<p><code>public <a href="#">AnimationInterpolator</a> <a href="#">getSizeInterpolator</a> ()</code> Get the interpolator for selected object size animation.</p>
<p><code>public <a href="#">SelectedItemParams</a> <a href="#">setBoundingBox</a> (<a href="#">RectF</a> box)</code> Set bounding box for a selected item.</p>
<p><code>public <a href="#">SelectedItemParams</a> <a href="#">setBoundingBoxAnimationDelay</a> (long value)</code> Set selected item bounding box animation delay.</p>
<p><code>public <a href="#">SelectedItemParams</a> <a href="#">setBoundingBoxAnimationTime</a> (long value)</code> Set selected item bounding box animation time.</p>
<p><code>public <a href="#">SelectedItemParams</a> <a href="#">setBoundingBoxInterpolator</a> (<a href="#">AnimationInterpolator</a> value)</code> Set the interpolator for selected object bounding box animation.</p>
<p><code>public <a href="#">SelectedItemParams</a> <a href="#">setMaxViewAngle</a> (float angleDeg)</code> Set selected item max view angle when the item is on the right or left from line of sight.</p>
<p><code>public <a href="#">SelectedItemParams</a> <a href="#">setNonSelectedItemsOpacity</a> (float value)</code> Set others icons opacity while one icon is in selected state.</p>

## Methods

```
public SelectedItemParams setOpacity (float value)
```

Set selected item's opacity when icon in camera view is selected.

```
public SelectedItemParams setSize (int width, int height)
```

Set selected item size.

```
public SelectedItemParams setSizeAnimationDelay (long value)
```

Set selected item size animation delay.

```
public SelectedItemParams setSizeAnimationTime (long value)
```

Set selected item size animation time.

```
public SelectedItemParams setSizeInterpolator (AnimationInterpolator value)
```

Set the interpolator for selected object size animation.

## Class Details

Encapsulates parameters which affect *ARObjects* which are in the selected or non selected states.

An *ARObject* is selected by way of the *select(ARObject)* method. When an *ARObject* is selected, all other *ARObject*s are considered non selected. When no *ARObject* is selected, *ARObject*s are neither selected nor non selected.

## Method Details

```
public long getBoundingBoxAnimationDelay ()
```

Get delay of selected item bounding box animation.

### Returns:

delay in ms

```
public long getBoundingBoxAnimationTime ()
```

Get delay of selected item bounding box animation.

### Returns:

delay in ms

```
public AnimationInterpolator getBoundingBoxInterpolator ()
```

Get the interpolator for selected object bounding box animation.

### Returns:

*AnimationInterpolator*.

```
public float getMaxViewAngle ()
```

Get selected item max view angle when the item is on the right or left from line of sight.

**Returns:**

The view angle at the selected item. The range is: -angleDeg +angleDeg.

```
public float getNonSelectedItemsOpacity ()
```

Get others icons opacity while one icon is in selected state.

**Returns:**

non-selected icon opacity.

```
public float getOpacity ()
```

Get selected item's opacity when icon in camera view is selected.

**Returns:**

selected icon opacity.

```
public Size getSize ()
```

Get selected item size. This size is used when *ARObject* is in selected state.

**Returns:**

icon size when selected.

**See also:**

[\*select\(ARObject\)\*](#)

[\*unselect\(\)\*](#)

```
public long getSizeAnimationDelay ()
```

Get delay of selected item size animation.

**Returns:**

delay in ms

```
public long getSizeAnimationTime ()
```

Get delay of selected item size animation.

**Returns:**

delay in ms

```
public AnimationInterpolator getSizeInterpolator ()
```

Get the interpolator for selected object size animation.

**Returns:**

*AnimationInterpolator*.

```
public SelectedItemParams setBoundingBox (RectF box)
```

Set bounding box for a selected item. All values(left, top, right and bottom) are the ratios of the view's height and width. Value of 0 for left and top and 1 for right and bottom indicate that there are no boundaries are actually used. Values > 0 and < 1 are used to set absolute boundaries considering selected icon half size, so that icon is shown on the screen fully.

**Parameters:**

- **box**  
android.graphics.RectF selected item's bounding box. If null, bounding box for the selected item is not used.

**Returns:**

The updated SelectedItemParams object itself.

```
public SelectedItemParams setBoundingBoxAnimationDelay (long value)
```

Set selected item bounding box animation delay.

**Parameters:**

- **value**  
Delay in ms

**Returns:**

The updated SelectedItemParams object itself.

```
public SelectedItemParams setBoundingBoxAnimationTime (long value)
```

Set selected item bounding box animation time.

**Parameters:**

- **value**  
Delay in ms

**Returns:**

The updated SelectedItemParams object itself.

```
public SelectedItemParams setBoundingBoxInterpolator (AnimationInterpolator value)
```

Set the interpolator for selected object bounding box animation.

**Parameters:**

- **value**

The *AnimationInterpolator* for selected object bounding box animation.

**Returns:**

The updated SelectedItemParams object itself.

```
public SelectedItemParams setMaxViewAngle (float angleDeg)
```

Set selected item max view angle when the item is on the right or left from line of sight.

**Parameters:**

- **angleDeg**

The view angle at the selected item. The range is: -angleDeg +angleDeg.

**Returns:**

The updated SelectedItemParams object itself.

```
public SelectedItemParams setNonSelectedItemsOpacity (float value)
```

Set others icons opacity while one icon is in selected state.

**Parameters:**

- **value**

non-selected icons opacity.

**Returns:**

The updated SelectedItemParams object itself.

```
public SelectedItemParams setOpacity (float value)
```

Set selected item's opacity when icon in camera view is selected.

**Parameters:**

- **value**

selected icon opacity.

**Returns:**

The updated SelectedItemParams object itself.

```
public SelectedItemParams setSize (int width, int height)
```

Set selected item size. This size is used when *ARObject* is in selected state.

## Parameters:

- **width**  
Maximum width of selected icon in pixels
- **height**  
Maximum height of selected icon in pixels

## Returns:

The updated `SelectedItemParams` object itself.

## See also:

[select\(AObject\)](#)

[unselect\(\)](#)

```
public SelectedItemParams setSizeAnimationDelay (long value)
```

Set selected item size animation delay.

## Parameters:

- **value**  
Delay in ms

## Returns:

The updated `SelectedItemParams` object itself.

```
public SelectedItemParams setSizeAnimationTime (long value)
```

Set selected item size animation time.

## Parameters:

- **value**  
Delay in ms

## Returns:

The updated `SelectedItemParams` object itself.

```
public SelectedItemParams setSizeInterpolator (AnimationInterpolator value)
```

Set the interpolator for selected object size animation.

## Parameters:

- **value**  
The [AnimationInterpolator](#) for selected object size animation.

## Returns:

The updated `SelectedItemParams` object itself.

## SensorType

The enumeration `SensorType` is a member of `com.here.android.mpa.ar.ARController`.

### Enumeration Summary

public static final enumeration **ARController.SensorType**

extends `java.lang.Enum`, `java.lang.Object`

Type of sensors used by the LiveSight engine.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 57: Enum Constants in `SensorType`

Fields
<pre>public static final SensorType GPS</pre> <p>GPS coordinates sensor.</p>
<pre>public static final SensorType COMPASS</pre> <p>Compass or magnetometer sensor.</p>
<pre>public static final SensorType ACCELEROMETER</pre> <p>Accelerometer sensor.</p>
<pre>public static final SensorType GYROSCOPE</pre> <p>Gyroscope sensor.</p>
<pre>public static final SensorType CAMERA</pre> <p>Camera unit (video sensor).</p>

### Method Summary

Table 58: Methods in `SensorType`

Methods
<pre>public static SensorType valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static ARController.SensorType[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Type of sensors used by the LiveSight engine. See [ARController.ExternalSensors](#).

### Enum Constant Details

```
public static final SensorType GPS
```

GPS coordinates sensor.

```
public static final SensorType COMPASS
```

Compass or magnetometer sensor.

```
public static final SensorType ACCELEROMETER
```

Accelerometer sensor.

```
public static final SensorType GYROSCOPE
```

Gyroscope sensor.

```
public static final SensorType CAMERA
```

Camera unit (video sensor).

## Method Details

```
public static SensorType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static ARController.SensorType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## UpViewParams

The class *UpViewParams* is a member of *com.here.android.mpa.ar.ARController*.

## Class Summary

public final class **ARController.UpViewParams**

extends *java.lang.Object*

Encapsulates parameters which affect the Up view.

[For complete information, see the section [Class Details](#)]

## Method Summary

Table 59: Methods in UpViewParams

Methods
<p>public float <b>getCameraFrameMaxZoomScale</b> ()</p> <p>Gets current Max zoom scale as increase from the original</p>
<p>public float <b>getPitchThreshold</b> ()</p> <p>Get pitch threshold when Down view transitions to Up view</p>
<p>public boolean <b>isCameraFrameZoomEnabled</b> ()</p> <p>Check if camera frame zoom is enabled in UP view</p>
<p>public boolean <b>isEdgeDetectionEnabled</b> ()</p> <p>Check if edge detection mode is enabled.</p>
<p>public boolean <b>isPanEnabled</b> ()</p> <p>Check if pan is enabled in UP view</p>
<p>public boolean <b>isPinchEnabled</b> ()</p> <p>Check if pinch is enabled in UP view</p>
<p>public boolean <b>isPitchLocked</b> ()</p> <p>Check if pitch is locked in UP view</p>
<p>public boolean <b>isShowGridEnabled</b> ()</p> <p>Check if showing the bottom plane grid is enabled in UP view</p>
<p>public <i>UpViewParams</i> <b>setCameraFrameMaxZoomScale</b> (float value)</p> <p>Sets Max zoom scale as increase from the original to be used when pulled in UP view</p>
<p>public <i>UpViewParams</i> <b>setCameraFrameZoomEnabled</b> (boolean enable)</p> <p>Enables or disables camera frame zoom, when pushed or pulled in LiveSight</p>
<p>public void <b>setEdgeDetectionEnabled</b> (boolean enabled)</p> <p>Enable/disable mode where the camera frame gets processed for accurate placement of the LiveSight objects in the camera scene.</p>
<p>public <i>UpViewParams</i> <b>setPanEnabled</b> (boolean enable)</p> <p>Enables or disables pan gesture in UP view</p>
<p>public <i>UpViewParams</i> <b>setPinchEnabled</b> (boolean enable)</p> <p>Enables or disables pinch gesture in UP view</p>

## Methods

```
public UpViewParams setPitchLocked (boolean locked)
```

Enable/disable locked pitch in UP view

```
public UpViewParams setPitchThreshold (float value)
```

Set Pitch threshold when Down view transitions to Up View

```
public UpViewParams setShowGridEnabled (boolean enabled)
```

Enable/disable showing the bottom plane grid in UP view

---

## Class Details

Encapsulates parameters which affect the Up view.

## Method Details

```
public float getCameraFrameMaxZoomScale ()
```

Gets current Max zoom scale as increase from the original

### Returns:

Max camera zoom scale

```
public float getPitchThreshold ()
```

Get pitch threshold when Down view transitions to Up view

### Returns:

pitch value which triggers transition to Up view

```
public boolean isCameraFrameZoomEnabled ()
```

Check if camera frame zoom is enabled in UP view

### Returns:

Camera zoom enable setting

```
public boolean isEdgeDetectionEnabled ()
```

Check if edge detection mode is enabled.

### Returns:

true if edge detection is enabled.

### See also:

[\*setEdgeDetectionEnabled\(boolean\)\*](#)

```
public boolean isPanEnabled ()
```

Check if pan is enabled in UP view

**Returns:**

Pan enable setting

```
public boolean isPinchEnabled ()
```

Check if pinch is enabled in UP view

**Returns:**

Pinch enable setting

```
public boolean isPitchLocked ()
```

Check if pitch is locked in UP view

**Returns:**

Pitch lock setting

```
public boolean isShowGridEnabled ()
```

Check if showing the bottom plane grid is enabled in UP view

**Returns:**

flag indicating if this feature is enabled

```
public UpViewParams setCameraFrameMaxZoomScale (float value)
```

Sets Max zoom scale as increase from the original to be used when pulled in UP view

**Parameters:**

- **value**  
max frame zoom when pulled

**Returns:**

The updated *UpViewParams* object itself.

```
public UpViewParams setCameraFrameZoomEnabled (boolean enable)
```

Enables or disables camera frame zoom, when pushed or pulled in LiveSight

**Parameters:**

- **enable**

Enables if true or disables if false. This is disabled by default.

**Returns:**

The updated `UpViewParams` object itself.

**public void `setEdgeDetectionEnabled` (boolean `enabled`)**

Enable/disable mode where the camera frame gets processed for accurate placement of the LiveSight objects in the camera scene. Enabled by default. It is recommended to disable the edge detection in low light conditions.

**Parameters:**

- **`enabled`**

If true, edge detection mode is enabled.

**public `UpViewParams` `setPanEnabled` (boolean `enable`)**

Enables or disables pan gesture in UP view

**Parameters:**

- **`enable`**

Enables if true or disables if false. Default: enabled.

**Returns:**

The updated `UpViewParams` object itself.

**public `UpViewParams` `setPinchEnabled` (boolean `enable`)**

Enables or disables pinch gesture in UP view

**Parameters:**

- **`enable`**

Enables if true or disables if false. By default, pinch gesture is enabled.

**Returns:**

The updated `UpViewParams` object itself.

**public `UpViewParams` `setPitchLocked` (boolean `locked`)**

Enable/disable locked pitch in UP view

**Parameters:**

- **`locked`**

Lock value

**Returns:**

The updated `UpViewParams` object itself.

```
public UpViewParams setPitchThreshold (float value)
```

Set Pitch threshold when Down view transitions to Up View

**Parameters:**

- **value**  
Pitch value ranges from 0...180

**Returns:**

The updated `UpViewParams` object itself.

```
public UpViewParams setShowGridEnabled (boolean enabled)
```

Enable/disable showing the bottom plane grid in UP view

**Parameters:**

- **enabled**  
Flag indicating if this feature is enabled

**Returns:**

The updated `UpViewParams` object itself.

## UpViewTransitionParams

The class `UpViewTransitionParams` is a member of `com.here.android.mpa.ar.ARController`.

### Class Summary

```
public final class ARController.UpViewTransitionParams
```

```
extends java.lang.Object
```

Encapsulates parameters which affect the Up view transition.

[For complete information, see the section [Class Details](#)]

## Method Summary

Table 60: Methods in UpViewTransitionParams

Methods
<pre>public long <b>getMaxAnimationTime</b> ()</pre> <p>Get maximum duration of up view transition animation.</p>
<pre>public long <b>getMinAnimationTime</b> ()</pre> <p>Get minimum duration of up view transition animation.</p>
<pre>public <i>AnimationInterpolator</i> <b>getPitchInterpolator</b> ()</pre> <p>Get the interpolator for pitch change after crossing threshold of up view.</p>
<pre>public <i>UpViewTransitionParams</i> <b>setMaxAnimationTime</b> (long value)</pre> <p>Set the maximum value of up view transition animation duration.</p>
<pre>public <i>UpViewTransitionParams</i> <b>setMinAnimationTime</b> (long value)</pre> <p>Set the minimum value of up view transition animation duration.</p>
<pre>public <i>UpViewTransitionParams</i> <b>setPitchInterpolator</b> (<i>AnimationInterpolator</i> value)</pre> <p>Set the interpolator for pitch change after crossing threshold of up view.</p>

## Class Details

Encapsulates parameters which affect the Up view transition. The Up view transition is the action that occurs when transitioning from the Down view to the Up view.

## Method Details

```
public long getMaxAnimationTime ()
```

Get maximum duration of up view transition animation.

**Returns:**

maximum duration of up view transition animation in ms.

```
public long getMinAnimationTime ()
```

Get minimum duration of up view transition animation.

**Returns:**

minimum duration of up view transition animation in ms.

```
public AnimationInterpolator getPitchInterpolator ()
```

Get the interpolator for pitch change after crossing threshold of up view.

**Returns:**

*AnimationInterpolator*.

```
public UpViewTransitionParams setMaxAnimationTime (long value)
```

Set the maximum value of up view transition animation duration.

**Parameters:**

- **value**  
up view transition animation maximum duration in ms

**Returns:**

The updated *UpViewTransitionParams* object itself.

```
public UpViewTransitionParams setMinAnimationTime (long value)
```

Set the minimum value of up view transition animation duration.

**Parameters:**

- **value**  
up view transition animation minimum duration in ms

**Returns:**

The updated *UpViewTransitionParams* object itself.

```
public UpViewTransitionParams setPitchInterpolator (AnimationInterpolator value)
```

Set the interpolator for pitch change after crossing threshold of up view.

**Parameters:**

- **value**  
The *AnimationInterpolator* for pitch change

**Returns:**

The updated *UpViewTransitionParams* object itself.

## ViewType

The enumeration *ViewType* is a member of *com.here.android.mpa.ar.ARController*.

### Enumeration Summary

```
public static final enumeration ARController.ViewType
```

```
extends java.lang.Enum, java.lang.Object
```

List of all views available in LiveSight

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 61: Enum Constants in ViewType

Fields
<pre>public static final ViewType AUTO</pre> <p>Default behavior.</p>
<pre>public static final ViewType MAP</pre> <p>MAP view with POIs.</p>
<pre>public static final ViewType CAMERA</pre> <p>Camera view.</p>

## Method Summary

Table 62: Methods in ViewType

Methods
<pre>public static ViewType valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static ARController.ViewType[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

List of all views available in LiveSight

### Enum Constant Details

```
public static final ViewType AUTO
```

Default behavior. Switching between views is performed automatically based on the current pitch value and the up and down view pitch thresholds

```
public static final ViewType MAP
```

MAP view with POIs. Down view.

```
public static final ViewType CAMERA
```

Camera view. UP view.

## Method Details

```
public static ViewType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static ARController.ViewType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## ARIconObject

The class *ARIconObject* is a member of *com.here.android.mpa.ar* .

### Class Summary

```
public final class ARIconObject
```

```
extends com.here.android.mpa.ar.ARObject, java.lang.Object
```

Concrete *ARObject* which represents the LiveSight object model.

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 63: Constructors in ARIconObject

Constructors
<pre><i>ARIconObject</i> (<i>GeoCoordinate</i> coordinate, <i>Bitmap</i> info)</pre> <p>Construct the object using specified <i>Image</i></p>
<pre><i>ARIconObject</i> (<i>GeoCoordinate</i> coordinate, <i>Bitmap</i> info, <i>Image</i> icon)</pre> <p>Construct the object using specified <i>Image</i></p>
<pre><i>ARIconObject</i> (<i>GeoCoordinate</i> coordinate, <i>Bitmap</i> info, int iconResourceId)</pre> <p>Construct the object using provided image resource id.</p>
<pre><i>ARIconObject</i> (<i>GeoCoordinate</i> coordinate, <i>Bitmap</i> info, <i>Image</i> frontIcon, <i>Image</i> downIcon, <i>Image</i> backIcon)</pre> <p>Construct the object using specified FRONT, DOWN and BACK <i>Images</i></p>
<pre><i>ARIconObject</i> (<i>GeoCoordinate</i> coordinate, <i>Bitmap</i> info, int frontIconResourceId, int downIconResourceId, int backIconResourceId)</pre> <p>Construct the object using provided image resource ids for FRONT, DOWN and BACK icons.</p>

## Constructors

***ARIconObject*** (*GeoCoordinate* coordinate, *Bitmap* info, *String* frontIconUrl, *String* downIconUrl, *String* backIconUrl)

Construct the object using FRONT, DOWN and BACK icons URLs.

***ARIconObject*** (*GeoCoordinate* coordinate, *View* info)

Construct the object using specified *Image*

***ARIconObject*** (*GeoCoordinate* coordinate, *View* info, *Image* icon)

Construct the object using specified *Image*

***ARIconObject*** (*GeoCoordinate* coordinate, *View* info, *int* iconResourceId)

Construct the object using provided image resource id.

***ARIconObject*** (*GeoCoordinate* coordinate, *View* info, *Image* frontIcon, *Image* downIcon, *Image* backIcon)

Construct the object using specified FRONT, DOWN and BACK images *Image*

***ARIconObject*** (*GeoCoordinate* coordinate, *View* info, *int* frontIconResourceId, *int* downIconResourceId, *int* backIconResourceId)

Construct the object using provided image resource ids for FRONT, DOWN and BACK icons.

***ARIconObject*** (*GeoCoordinate* coordinate, *View* info, *String* frontIconUrl, *String* downIconUrl, *String* backIconUrl)

Construct the object using FRONT, DOWN and BACK icon URLs.

## Class Details

Concrete *ARObject* which represents the LiveSight object model. Composed of FRONT, DOWN and BACK icons, an info icon and a *GeoCoordinate* representing the objects position.

## Constructor Details

***ARIconObject*** (*GeoCoordinate* coordinate, *Bitmap* info)

Construct the object using specified *Image*

### Parameters:

- **coordinate**  
A *GeoCoordinate* representing coordinates of the AR icon
- **info**  
A *android.graphics.Bitmap* of info in AR view

***ARIconObject*** (*GeoCoordinate* coordinate, *Bitmap* info, *Image* icon)

Construct the object using specified *Image*

### Parameters:

- **coordinate**

A *GeoCoordinate* representing coordinates of the AR icon

- **info**

A `android.graphics.Bitmap` of info in AR view

- **icon**

*Image* representing image to be used for FRONT, DOWN and BACK icons

## **ARIconObject** (*GeoCoordinate* coordinate, `Bitmap` info, `int` iconResourceId)

Construct the object using provided image resource id. Falls back to default images if resource id is invalid.

### Parameters:

- **coordinate**

A *GeoCoordinate* representing coordinates of the AR icon

- **info**

A `android.graphics.Bitmap` of info in AR view

- **iconResourceId**

Representing image resource id to be used for FRONT, DOWN and BACK icons

## **ARIconObject** (*GeoCoordinate* coordinate, `Bitmap` info, *Image* frontIcon, *Image* downIcon, *Image* backIcon)

Construct the object using specified FRONT, DOWN and BACK *Images*

### Parameters:

- **coordinate**

A *GeoCoordinate* representing coordinates of the AR icon

- **info**

A `android.graphics.Bitmap` of info in AR view

- **frontIcon**

*Image* representing image to be used for both FRONT icon

- **downIcon**

*Image* representing image to be used for both DOWN icon

- **backIcon**

*Image* representing image to be used for both BACK icon

## **ARIconObject** (*GeoCoordinate* coordinate, `Bitmap` info, `int` frontIconResourceId, `int` downIconResourceId, `int` backIconResourceId)

Construct the object using provided image resource ids for FRONT, DOWN and BACK icons. Falls back to default images if either of the icons resources are not valid.

### Parameters:

- **coordinate**  
A *GeoCoordinate* representing coordinates of the AR icon
- **info**  
A `android.graphics.Bitmap` of info in AR view
- **frontIconResourceId**  
Representing FRONT image resource id to be used for FRONT icon
- **downIconResourceId**  
Representing DOWN image resource id to be used for DOWN icon
- **backIconResourceId**  
Representing BACK image resource id to be used for BACK icon

## **ARIconObject** (*GeoCoordinate* coordinate, `Bitmap` info, `String` frontIconUrl, `String` downIconUrl, `String` backIconUrl)

Construct the object using FRONT, DOWN and BACK icons URLs. If either of the URLs are invalid default icons will be used.

### Parameters:

- **coordinate**  
A *GeoCoordinate* representing coordinates of the AR icon
- **info**  
A `android.graphics.Bitmap` of info in AR view
- **frontIconUrl**  
`java.lang.String` representing URL of the FRONT icon
- **downIconUrl**  
`java.lang.String` representing URL of the DOWN icon
- **backIconUrl**  
`java.lang.String` representing URL of the BACK icon

## **ARIconObject** (*GeoCoordinate* coordinate, `View` info)

Construct the object using specified *Image*

### Parameters:

- **coordinate**  
A *GeoCoordinate* representing coordinates of the AR icon
- **info**  
A UI `android.view.View` of info in AR view

## **ARIconObject** (*GeoCoordinate* coordinate, `View` info, *Image* icon)

Construct the object using specified *Image*

**Parameters:**

- **coordinate**  
A *GeoCoordinate* representing coordinates of the AR icon
- **info**  
A UI `android.view.View` of info in AR view
- **icon**  
*Image* representing image to be used for FRONT, DOWN and BACK icons

**ARIconObject (GeoCoordinate coordinate, View info, int iconResourceId)**

Construct the object using provided image resource id. Falls back to default images if resource id is invalid.

**Parameters:**

- **coordinate**  
A *GeoCoordinate* representing coordinates of the AR icon
- **info**  
A UI `android.view.View` of info in AR view
- **iconResourceId**  
Representing image resource id to be used for FRONT, DOWN and BACK icons

**ARIconObject (GeoCoordinate coordinate, View info, Image frontIcon, Image downIcon, Image backIcon)**

Construct the object using specified FRONT, DOWN and BACK images *Image*

**Parameters:**

- **coordinate**  
A *GeoCoordinate* representing coordinates of the AR icon
- **info**  
A UI `android.view.View` of info in AR view
- **frontIcon**  
*Image* representing image to be used for both FRONT icon
- **downIcon**  
*Image* representing image to be used for both DOWN icon
- **backIcon**  
*Image* representing image to be used for both BACK icon

**ARIconObject (GeoCoordinate coordinate, View info, int frontIconResourceId, int downIconResourceId, int backIconResourceId)**

Construct the object using provided image resource ids for FRONT, DOWN and BACK icons. Falls back to default images if either of the icons resources are not valid.

#### Parameters:

- **coordinate**  
A *GeoCoordinate* representing coordinates of the AR icon
- **info**  
A UI `android.view.View` of info in AR view
- **frontIconResourceId**  
Representing FRONT image resource id to be used for FRONT icon
- **downIconResourceId**  
Representing DOWN image resource id to be used for DOWN icon
- **backIconResourceId**  
Representing DOWN image resource id to be used for BACK icon

**ARIconObject** (*GeoCoordinate* coordinate, `View` info, `String` frontIconUrl, `String` downIconUrl, `String` backIconUrl)

Construct the object using FRONT, DOWN and BACK icon URLs. If either of the URLs are invalid default icons will be used.

#### Parameters:

- **coordinate**  
A *GeoCoordinate* representing coordinates of the AR icon
- **info**  
A UI `android.view.View` of info in AR view
- **frontIconUrl**  
`java.lang.String` representing URL of the FRONT icon
- **downIconUrl**  
`java.lang.String` representing URL of the DOWN icon
- **backIconUrl**  
`java.lang.String` representing URL of the BACK icon

## ARMeshObject

The class *ARMeshObject* is a member of `com.here.android.mpa.ar`.

### Class Summary

public class **ARMeshObject**

extends `com.here.android.mpa.ar.ARModelObject`, `java.lang.Object`

Concrete 3D AR model objects with mesh.

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 64: Constructors in ARMeshObject

Constructors
<p><b>ARMeshObject</b> (<i>GeoCoordinate</i> position)</p> <p>Construct AR mesh object</p>
<p><b>ARMeshObject</b> (<i>Vector3f</i> position)</p> <p>Construct AR mesh object</p>
<p><b>ARMeshObject</b> (<i>Vector3f</i> position, <i>GeoCoordinate</i> direction)</p> <p>Construct AR mesh object</p>
<p><b>ARMeshObject</b> (<i>GeoCoordinate</i> position, <i>LocalMesh</i> mesh, <i>Image</i> texture)</p> <p>Construct AR mesh object</p>
<p><b>ARMeshObject</b> (<i>Vector3f</i> position, <i>LocalMesh</i> mesh, <i>Image</i> texture)</p> <p>Construct AR mesh object</p>
<p><b>ARMeshObject</b> (<i>Vector3f</i> position, <i>GeoCoordinate</i> direction, <i>LocalMesh</i> mesh, <i>Image</i> texture)</p> <p>Construct AR mesh object</p>

## Method Summary

Table 65: Methods in ARMeshObject

Methods
<p>public <i>GeoCoordinate</i> <b>getGeoDirection</b> ()</p> <p>Get the geo direction of the mesh</p>
<p>public <i>GeoCoordinate</i> <b>getGeoPosition</b> ()</p> <p>Get geo position of the mesh</p>
<p>public <i>Vector3f</i> <b>getLocalPosition</b> ()</p> <p>Get local position of the mesh</p>
<p>public <i>LocalMesh</i> <b>getMesh</b> ()</p> <p>Get the mesh associated with the object</p>
<p>public void <b>setGeoDirection</b> (<i>GeoCoordinate</i> direction)</p> <p>Set the geo direction of the mesh</p>
<p>public void <b>setGeoPosition</b> (<i>GeoCoordinate</i> position)</p> <p>Set the geo position of the mesh</p>

### Methods

```
public void setLocalPosition (Vector3f position)
```

Set local position of the mesh

```
public void setMesh (LocalMesh mesh)
```

Set the mesh associated with the object.

## Class Details

Concrete 3D AR model objects with mesh. There are three types of AR mesh objects supported: - Geo positioned mesh object - Locally positioned mesh object - Locally positioned mesh object with additional geo direction

## Constructor Details

### *ARMeshObject* (*GeoCoordinate* position)

Construct AR mesh object

#### Parameters:

- **position**  
Mesh geo position

### *ARMeshObject* (*Vector3f* position)

Construct AR mesh object

#### Parameters:

- **position**  
Position of the center of the mesh relative to the camera. Unit is meters

### *ARMeshObject* (*Vector3f* position, *GeoCoordinate* direction)

Construct AR mesh object

#### Parameters:

- **position**  
Position of the center of the mesh relative to the camera. Unit is meters
- **direction**  
Geo direction of the mesh (where to point to)

### *ARMeshObject* (*GeoCoordinate* position, *LocalMesh* mesh, *Image* texture)

Construct AR mesh object

#### Parameters:

- **position**  
Mesh's geo position
- **mesh**  
Object's mesh
- **texture**  
Object's texture

## ARMeshObject (*Vector3f* position, *LocalMesh* mesh, *Image* texture)

Construct AR mesh object

### Parameters:

- **position**  
Position of the center of the mesh relative to the camera. Unit is meters
- **mesh**  
Object's mesh
- **texture**  
Object's texture

## ARMeshObject (*Vector3f* position, *GeoCoordinate* direction, *LocalMesh* mesh, *Image texture*)

Construct AR mesh object

### Parameters:

- **position**  
Position of the center of the mesh relative to the camera. Unit is meters
- **direction**  
Waypoint geo position (where to point to)
- **mesh**  
Object's mesh
- **texture**  
Object's texture

## Method Details

```
public GeoCoordinate getGeoDirection ()
```

Get the geo direction of the mesh

### Returns:

geo direction of the mesh

```
public GeoCoordinate getGeoPosition ()
```

Get geo position of the mesh

**Returns:**

Geo position of the center of the mesh

```
public Vector3f getLocalPosition ()
```

Get local position of the mesh

**Returns:**

Position of the center of the mesh relative to the camera. Unit is meters

```
public LocalMesh getMesh ()
```

Get the mesh associated with the object

**Returns:**

*LocalMesh* object

```
public void setGeoDirection (GeoCoordinate direction)
```

Set the geo direction of the mesh

**Parameters:**

- **direction**  
Geo direction of the mesh

```
public void setGeoPosition (GeoCoordinate position)
```

Set the geo position of the mesh

**Parameters:**

- **position**  
Geo position of the center of the mesh

```
public void setLocalPosition (Vector3f position)
```

Set local position of the mesh

**Parameters:**

- **position**  
Position of the center of the mesh relative to the camera. Unit is meters

```
public void setMesh (LocalMesh mesh)
```

Set the mesh associated with the object.

**Parameters:**

- **mesh**  
An object representing the mesh to set.

## ARModelObject

The class *ARModelObject* is a member of *com.here.android.mpa.ar*.

### Class Summary

```
public abstract class ARModelObject
```

```
extends java.lang.Object
```

Represents a base class for all 3D AR objects that users can add to a *ARController*.

[For complete information, see the section *Class Details*]

### Nested Class Summary

Table 66: Nested Classes in ARModelObject

Nested Classes
<pre>public static final enumeration <i>ARModelObject.ShadingMode</i></pre> <p>Represents object's shading mode</p>

### Method Summary

Table 67: Methods in ARModelObject

Methods
<pre>public void <i>clearTransformation</i> ()</pre> <p>Set the model transformation to the identity matrix</p>
<pre>public boolean <i>equals</i> (Object obj)</pre> <p>For documentation, see <i>java.lang.Object</i></p>
<pre>public void <i>getDynamicScale</i> (PointF interval, PointF factors)</pre> <p>Get the parameters for dynamic scaling of this object.</p>
<pre>public float <i>getOpacity</i> ()</pre> <p>Get opacity</p>

## Methods

```
public ShadingMode getShadingMode ()
```

Get object shading mode

```
public Image getTexture ()
```

Get the texture for this object

```
public float[] getTransformation ()
```

Get the model transformation

```
public PointF getVisibilityRange ()
```

Get the distance range in meters around the camera over which this model is visible

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public void rotate (Vector3f rotationAxis, float rotationAngleDeg)
```

Apply a rotation to the model (model matrix is post-multiplied)

```
public void rotate (float xRotationDeg, float yRotationDeg, float zRotationDeg)
```

Apply a rotation to the model (model matrix is post-multiplied).

```
public void scale (float xScale, float yScale, float zScale)
```

Apply scaling to the model (model matrix is post-multiplied)

```
public void setDynamicScale (PointF interval, PointF factors)
```

Set the parameters for dynamic scaling of this object.

```
public void setOpacity (float opacity)
```

Set opacity

```
public void setShadingMode (ShadingMode mode)
```

Set object shading mode

```
public void setTexture (Image texture)
```

Set the texture for this object

```
public void setTransformation (float[] matrix)
```

Set the model transformation

```
public void setVisibilityRange (PointF range)
```

Set the distance range in meters around the camera over which this model is visible

```
public void translate (float xTranslation, float yTranslation, float zTranslation)
```

Apply a translation to the model (model matrix is post-multiplied)

## Class Details

Represents a base class for all 3D AR objects that users can add to a *ARController*.

This class serves as a generalization (or abstract base) for more specified object types (such as *ARBillboardObject* and *ARMeshObject*), bundling their common properties.

## Method Details

```
public void clearTransformation ()
```

Set the model transformation to the identity matrix

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

### Parameters:

- **obj**

```
public void getDynamicScale (PointF interval, PointF factors)
```

Get the parameters for dynamic scaling of this object.

### Parameters:

- **interval**  
in meters over which scaling is linearly interpolated
- **factors**  
x and y are min and max scale factors

```
public float getOpacity ()
```

Get opacity

### Returns:

Opacity used for this ARModelObject.

```
public ShadingMode getShadingMode ()
```

Get object shading mode

### Returns:

The current object shading mode.

```
public Image getTexture ()
```

Get the texture for this object

### Returns:

*Image* object

```
public float[] getTransformation ()
```

Get the model transformation

**Returns:**

array of 16 floats storing the model transformation (4x4 matrix) in column major order

```
public PointF getVisibilityRange ()
```

Get the distance range in meters around the camera over which this model is visible

**Returns:**

x and y are min and max visible distances, respectively

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public void rotate (Vector3f rotationAxis, float rotationAngleDeg)
```

Apply a rotation to the model (model matrix is post-multiplied)

**Parameters:**

- **rotationAxis**  
Axis of rotation
- **rotationAngleDeg**  
Rotation angle in degrees (right-hand convention)

```
public void rotate (float xRotationDeg, float yRotationDeg, float zRotationDeg)
```

Apply a rotation to the model (model matrix is post-multiplied). The rotation is specified as Euler angles:  $R_x(rx) * R_y(ry) * R_z(rz)$

**Parameters:**

- **xRotationDeg**  
rotation in degrees around X-axis (right-hand convention)
- **yRotationDeg**  
rotation in degrees around Y-axis (right-hand convention)
- **zRotationDeg**  
rotation in degrees around Z-axis (right-hand convention)

```
public void scale (float xScale, float yScale, float zScale)
```

Apply scaling to the model (model matrix is post-multiplied)

**Parameters:**

- **xScale**  
Scaling factor in the X-axis direction
- **yScale**  
Scaling factor in the Y-axis direction
- **zScale**  
Scaling factor in the Z-axis direction

**public void setDynamicScale (PointF interval, PointF factors)**

Set the parameters for dynamic scaling of this object. After applying the model transformation the object is scaled as a linear function of its distance to the camera. The scaling is defined as follows:  $\text{scaling}(\text{distance}) = s_{\text{min}}$  if  $\text{distance} < d_{\text{min}}$ ,  $= s_{\text{max}}$  if  $\text{distance} > d_{\text{max}}$ ,  $= s_{\text{min}} + (\text{distance} - d_{\text{min}}) / (d_{\text{max}} - d_{\text{min}}) * (s_{\text{max}} - s_{\text{min}})$ , otherwise

**Parameters:**

- **interval**  
in meters over which scaling is linearly interpolated
- **factors**  
x and y are min and max scale factors

**public void setOpacity (float opacity)**

Set opacity

**Parameters:**

- **opacity**  
to be used for this ARModelObject

**public void setShadingMode (*ShadingMode* mode)**

Set object shading mode

**Parameters:**

- **mode**  
Shading mode to be used.

**public void setTexture (*Image* texture)**

Set the texture for this object

**Parameters:**

- **texture**

Object *Image* texture

```
public void setTransformation (float[] matrix)
```

Set the model transformation

**Parameters:**

- **matrix**  
array of 16 floats storing the new model transformation (4x4 matrix) in column major order

```
public void setVisibilityRange (PointF range)
```

Set the distance range in meters around the camera over which this model is visible

**Parameters:**

- **range**  
- x and y are min and max visible distances, respectively

```
public void translate (float xTranslation, float yTranslation, float zTranslation)
```

Apply a translation to the model (model matrix is post-multiplied)

**Parameters:**

- **xTranslation**  
Translation in meters the X-axis direction
- **yTranslation**  
Translation in meters the Y-axis direction
- **zTranslation**  
Translation in meters the Z-axis direction

## ShadingMode

The enumeration *ShadingMode* is a member of *com.here.android.mpa.ar.ARModelObject*.

### Enumeration Summary

```
public static final enumeration ARModelObject.ShadingMode
```

```
extends java.lang.Enum, java.lang.Object
```

Represents object's shading mode

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 68: Enum Constants in ShadingMode

Fields
<pre>public static final ShadingMode FLAT_TEXTURED</pre> <p>Textured no lighting</p>
<pre>public static final ShadingMode DIFFUSE_TEXTURED</pre> <p>Textured with diffuse lighting</p>

## Method Summary

Table 69: Methods in ShadingMode

Methods
<pre>public static ShadingMode valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static ARModelObject.ShadingMode[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Represents object's shading mode

### Enum Constant Details

```
public static final ShadingMode FLAT_TEXTURED
```

Textured no lighting

```
public static final ShadingMode DIFFUSE_TEXTURED
```

Textured with diffuse lighting

### Method Details

```
public static ShadingMode valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- name**  
 A string containing the name of the enumeration member whose value is to be retrieved.

```
public static ARModelObject.ShadingMode[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## ARObject

The class *ARObject* is a member of *com.here.android.mpa.ar*.

### Class Summary

```
public abstract class ARObject
```

```
extends java.lang.Object
```

Represents a base class for all AR related objects that users can add to a *ARController*.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 70: Nested Classes in ARObject

Nested Classes
<pre>public static final enumeration <i>ARObject.IconType</i></pre> <p>Icon types used by ARObject</p>

### Method Summary

Table 71: Methods in ARObject

Methods
<pre>public boolean <i>equals</i> (Object obj)</pre> <p>For documentation, see <i>java.lang.Object</i></p>
<pre>public RectF <i>getBoundingBox</i> ()</pre> <p>Get bounding box limiting where the ARObject can travel on screen.</p>
<pre>public <i>GeoCoordinate</i> <i>getCoordinate</i> ()</pre> <p>Gets the current <i>GeoCoordinate</i> for the ARObject.</p>
<pre>public <i>Image</i> <i>getIcon</i> (<i>IconType</i> type)</pre> <p>Gets the icon image for the ARObject</p>
<pre>public PointF <i>getIconAnchor</i> (<i>IconType</i> type)</pre> <p>Get down icon's anchor point represented as halves of width and height of the icon.</p>
<pre>public float <i>getIconSizeScale</i> (<i>IconType</i> type)</pre> <p>Gets icon's size scaling factor</p>

**Methods**

```
public float getMaxViewAngle ()
```

Get item's max view angle when the item is on the right or left from line of sight.

```
public float getOpacity ()
```

Get item's opacity.

```
public ProjectionType getProjectionType ()
```

Get Camera view *ARController.ProjectionType*

```
public long getUid ()
```

Get unique identifier.

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public boolean isInfoExtended ()
```

Checks if info portion of the *ARObject* is extended

```
public void setBoundingBox (RectF box)
```

Set bounding box to limit travel on the screen.

```
public void setCoordinate (GeoCoordinate coordinate)
```

Sets a *GeoCoordinate* for the *ARObject*.

```
public void setIcon (IconType type, Image icon)
```

Sets an icon image for the *ARObject*.

```
public void setIcon (IconType type, View icon)
```

Sets an icon image for the *ARObject*.

```
public void setIcon (IconType type, Bitmap icon)
```

Sets an icon image for the *ARObject*.

```
public void setIconAnchor (IconType type, PointF anchor)
```

Set icon's anchor point represented as halves of width and height of the icon.

```
public void setIconSizeScale (IconType type, float scale)
```

Sets icon's size scaling factor

```
public void setIconTexture (IconType type, int texture, int width, int height)
```

Sets an OpenGL texture name for the specified icon in the *ARObject*.

```
public void setInfoMaxHeight (int height)
```

Sets maximum height for the *ARObject*'s info portion of the icon

```
public void setInfoMaxWidth (int width)
```

Sets maximum width for the *ARObject*'s info portion of the icon

```
public void setMaxViewAngle (float angleDeg)
```

Set item max view angle when the item is on the right or left from line of sight.

## Methods

```
public void setOpacity (float value)
```

Set item's opacity.

```
public void setProjectionType (ProjectionType type)
```

Set Camera view *ARController.ProjectionType*

## Class Details

Represents a base class for all AR related objects that users can add to a *ARController*.

This class serves as a generalization (or abstract base) for more specified object types (such as *ARIconObject*), bundling their common properties.

## Method Details

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

### Parameters:

- **obj**

```
public RectF getBoundingBox ()
```

Get bounding box limiting where the *ARObject* can travel on screen.

### Returns:

The *android.graphics.RectF* representing the bounding box.

```
public GeoCoordinate getCoordinate ()
```

Gets the current *GeoCoordinate* for the *ARObject*.

### Returns:

The current *GeoCoordinate*

```
public Image getIcon (IconType type)
```

Gets the icon image for the *ARObject*

### Parameters:

- **type**  
An *ARObject.IconType*.

### Returns:

An *Image* representing the front icon

```
public PointF getIconAnchor (IconType type)
```

Get down icon's anchor point represented as halves of width and height of the icon.

**Parameters:**

- **type**  
An *ARObject.IconType*.

**Returns:**

down icon's opacity.

```
public float getIconSizeScale (IconType type)
```

Gets icon's size scaling factor

**Parameters:**

- **type**  
*ARObject.IconType*

**Returns:**

scale A size scaling factor

```
public float getMaxViewAngle ()
```

Get item's max view angle when the item is on the right or left from line of sight.

**Returns:**

The view angle of the item. The range is: - angleDeg to + angleDeg.

```
public float getOpacity ()
```

Get item's opacity. NOTE: Setting item's opacity overrides calculated value.

**Returns:**

A value of the opacity.

```
public ProjectionType getProjectionType ()
```

Get Camera view *ARController.ProjectionType*

**Returns:**

A value of ProjectionType

```
public long getUid ()
```

Get unique identifier. Helper method to accommodate faster mapping of the *ARObject* and application specific objects (Example: items "radar" implementation)

**Returns:**

Unique object identifier

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public boolean isInfoExtended ()
```

Checks if info portion of the *ARObject* is extended

**Returns:**

True, if object has expended info portion of the icon.

```
public void setBoundingBox (RectF box)
```

Set bounding box to limit travel on the screen. Left, top, right and bottom values are the ratios of the view's height and width. Value of 0 for left an top and 1 for right and bottom indicate that there are no boundaries are actually used. Values > 0 and < 1 are used to set absolute screen boundaries.

**Parameters:**

- **box**  
android.graphics.RectF Item's bounding box. If null, bounding box is set to {0, 0, 1, 1}.

```
public void setCoordinate (GeoCoordinate coordinate)
```

Sets a *GeoCoordinate* for the *ARObject*.

**Parameters:**

- **coordinate**  
Desired *GeoCoordinate* for ARObject

```
public void setIcon (IconType type, Image icon)
```

Sets an icon image for the *ARObject*.

**Parameters:**

- **type**  
An *ARObject.IconType*.
- **icon**  
An *Image* representing the icon type.

```
public void setIcon (IconType type, View icon)
```

Sets an icon image for the *ARObject*.

**Parameters:**

- **type**  
An *ARObject.IconType*.
- **icon**  
An `android.view.View` representing the icon type.

```
public void setIcon (IconType type, Bitmap icon)
```

Sets an icon image for the *ARObject*.

**Parameters:**

- **type**  
An *ARObject.IconType*.
- **icon**  
An `android.graphics.Bitmap` representing the icon type.

```
public void setIconAnchor (IconType type, PointF anchor)
```

Set icon's anchor point represented as halves of width and height of the icon. Example: value of (1, 1) means that the center of the icon corresponds to the actual geo position. Value (1,2) means that half width and bottom of the icon corresponds to the actual geo position. Default value is (1, 1).

**Parameters:**

- **type**  
An *ARObject.IconType*.
- **anchor**  
X and Y offset coefficients represented as halves of the icon width and height. Range is 0 to 2.0f. 0 --- 1 --- 2 | | | 1 --- x --- x | | | 2 --- x --- x

```
public void setIconSizeScale (IconType type, float scale)
```

Sets icon's size scaling factor

**Parameters:**

- **type**  
*ARObject.IconType*
- **scale**  
A size scaling factor

```
public void setIconTexture (IconType type, int texture, int width, int height)
```

Sets an OpenGL texture name for the specified icon in the *ARObject*. Previously set image (using *setIcon(ARObject.IconType, Image)* for example) is not disposed and can be used when texture is cleaned. Texture can be cleaned by passing -1 for texture parameter (i.e. *setIconTexture(IconType.FRONT, -1, 0, 0)*).

**Parameters:**

- **type**  
An *ARObject.IconType*
- **texture**  
An OpenGL texture name corresponding to the icon type specified.
- **width**  
An OpenGL texture width
- **height**  
An OpenGL texture height

```
public void setInfoMaxHeight (int height)
```

Sets maximum height for the *ARObject*'s info portion of the icon

**Parameters:**

- **height**  
A maximum height of the *ARObject* info portion on the screen

```
public void setInfoMaxWidth (int width)
```

Sets maximum width for the *ARObject*'s info portion of the icon

**Parameters:**

- **width**  
A maximum width of the *ARObject* info portion on the screen

```
public void setMaxViewAngle (float angleDeg)
```

Set item max view angle when the item is on the right or left from line of sight.

**Parameters:**

- **angleDeg**  
The view angle of the item. The range is: - angleDeg to + angleDeg.

```
public void setOpacity (float value)
```

Set item's opacity. Setting item's opacity overrides the calculated value. Setting negative value resets previous setting to the default - calculated one.

**Parameters:**

- **value**  
A value of the opacity.

```
public void setProjectionType (ProjectionType type)
```

Set Camera view *ARController.ProjectionType*

**Parameters:**

- **type**  
A value of *ProjectionType*.

## IconType

The enumeration *IconType* is a member of *com.here.android.mpa.ar.ARObject*.

### Enumeration Summary

```
public static final enumeration ARObject.IconType
```

```
extends java.lang.Enum, java.lang.Object
```

Icon types used by *ARObject*

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 72: Enum Constants in *IconType*

Fields
<pre>public static final <i>IconType</i> <b>DOWN</b></pre> <p>Icon representing <i>ARObject</i> in <i>DOWN</i> scene when device is tilted down.</p>
<pre>public static final <i>IconType</i> <b>FRONT</b></pre> <p>Icon representing <i>ARObject</i> in <i>UP</i> scene when device is tilted up and the item appears in foreground.</p>
<pre>public static final <i>IconType</i> <b>BACK</b></pre> <p>Icon representing <i>ARObject</i> in <i>UP</i> scene when device is tilted up and the item appears in background.</p>
<pre>public static final <i>IconType</i> <b>INFO</b></pre> <p>Icon representing <i>ARObject</i> in <i>UP</i> scene adjacent to the <i>FRONT</i> icon on the right when device is tilted up and the item appears in foreground.</p>

## Method Summary

Table 73: Methods in `IconType`

Methods
<pre>public static <i>IconType</i> valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>ARObject.IconType</i>[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Icon types used by `ARObject`

### Enum Constant Details

```
public static final IconType DOWN
```

Icon representing `ARObject` in DOWN scene when device is tilted down. Actual switch to down scene happens based on the down pitch threshold. See [setPitchThreshold\(float\)](#).

```
public static final IconType FRONT
```

Icon representing `ARObject` in UP scene when device is tilted up and the item appears in foreground. Actual switch to up scene happens based on the pitch threshold. See [setPitchThreshold\(float\)](#).

```
public static final IconType BACK
```

Icon representing `ARObject` in UP scene when device is tilted up and the item appears in background. Actual switch to up scene happens based on the pitch threshold. See [setPitchThreshold\(float\)](#).

```
public static final IconType INFO
```

Icon representing `ARObject` in UP scene adjacent to the FRONT icon on the right when device is tilted up and the item appears in foreground. Actual switch to up scene happens based on the pitch threshold. See [setPitchThreshold\(float\)](#).

## Method Details

```
public static IconType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- `name`

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static ARObject.IconType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## ARPolylineObject

The class *ARPolylineObject* is a member of *com.here.android.mpa.ar*.

### Class Summary

```
public final class ARPolylineObject
```

```
extends java.lang.Object
```

Represent a ARPolyline that users can add to a *ARController*.

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 74: Constructors in ARPolylineObject

Constructors
<pre><i>ARPolylineObject</i> (<i>GeoPolyline</i> polyline)</pre> <p>Create ARPolylineObject with GeoPolyline.</p>
<pre><i>ARPolylineObject</i> (<i>GeoPolyline</i> polyline, <i>LineAttributes</i> lineAttributes)</pre> <p>Create ARPolylineObject with a GeoPolyline and a line attribute.</p>

### Method Summary

Table 75: Methods in ARPolylineObject

Methods
<pre>public <i>GeoPolyline</i> <i>getGeoPolyLine</i> ()</pre> <p>Get the GeoPolyline used for this ARPolyline.</p>
<pre>public <i>LineAttributes</i> <i>getLineAttributes</i> ()</pre> <p>Get the LineAttributes used for this ARPolyline.</p>
<pre>public void <i>setGeoPolyline</i> (<i>GeoPolyline</i> polyline)</pre> <p>Changes the GeoPolyline rendered by this ARPolylineObject</p>
<pre>public void <i>setLineAttributes</i> (<i>LineAttributes</i> lineAttributes)</pre> <p>Changes the <i>LineAttributes</i> rendered by this ARPolylineObject</p>

## Class Details

Represent a `ARPolyline` that users can add to a `ARController`. This class also provide features to customize polyline attributes such as width of line, color and so on.

## Constructor Details

### `ARPolylineObject (GeoPolyline polyline)`

Create `ARPolylineObject` with `GeoPolyline`. In this case, a default line attributes `LineAttributes` will be used.

#### Parameters:

- `polyline`  
a `GeoPolyline`.

#### Throws:

- `NullPointerException`  
if `GeoPolyline` is `null`.

### `ARPolylineObject (GeoPolyline polyline, LineAttributes lineAttributes)`

Create `ARPolylineObject` with a `GeoPolyline` and a line attribute.

#### Parameters:

- `polyline`  
a `GeoPolyline`
- `lineAttributes`  
attributes to customize line features such as width, color, line end cap style.

#### Throws:

- `NullPointerException`  
if `GeoPolyline` is `null` OR `lineAttributes` is `null`.

## Method Details

```
public GeoPolyline getGeoPolyLine ()
```

Get the `GeoPolyline` used for this `ARPolyline`.

#### Returns:

`GeoPolyline` used for this `ARPolyline`.

```
public LineAttributes getLineAttributes ()
```

Get the `LineAttributes` used for this `ARPolyline`.

**Returns:**

[LineAttributes](#) used for this ARPolyline.

```
public void setGeoPolyline (GeoPolyline polyline)
```

Changes the GeoPolyline rendered by this ARPolylineObject

**Parameters:**

- **polyline**  
GeoPolyline to be rendered

```
public void setLineAttributes (LineAttributes lineAttributes)
```

Changes the [LineAttributes](#) rendered by this ARPolylineObject

**Parameters:**

- **lineAttributes**  
GeoPolyline to be rendered

## ARPoseReading

The class *ARPoseReading* is a member of [com.here.android.mpa.ar](#) .

### Class Summary

```
public final class ARPoseReading
```

```
extends java.lang.Object
```

Represents a model class comprising the latitude, longitude, altitude, pitch, heading, roll and time stamp for the current AR pose.

[For complete information, see the section [Class Details](#)]

### Method Summary

**Table 76: Methods in ARPoseReading**

#### Methods

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

```
public float getAltitude ()
```

Get the altitude in meters as height above the WGS84 ellipsoid.

## Methods

```
public float getHeading ()
```

Get the y-axis rotation in radians.

```
public double getLatitude ()
```

Get the latitude in WGS84 degrees.

```
public double getLongitude ()
```

Get the longitude in WGS84 degrees.

```
public float getPitch ()
```

Get the x-axis rotation (pitch) in radians.

```
public float getRoll ()
```

Get the z-axis rotation (roll) in radians.

```
public long getTimestamp ()
```

Get a timestamp indicating the time at which the pose reading was taken.

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## Class Details

Represents a model class comprising the latitude, longitude, altitude, pitch, heading, roll and time stamp for the current AR pose. This object can be retrieved by calling *getPose()*.

## Method Details

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

### Parameters:

- **obj**

```
public float getAltitude ()
```

Get the altitude in meters as height above the WGS84 ellipsoid.

### Returns:

The altitude in meters as height above the WGS84 ellipsoid.

```
public float getHeading ()
```

Get the y-axis rotation in radians.

### Returns:

The y-axis rotation in radians.

```
public double getLatitude ()
```

Get the latitude in WGS84 degrees.

**Returns:**

The latitude in WGS84 degrees.

```
public double getLongitude ()
```

Get the longitude in WGS84 degrees.

**Returns:**

The longitude in WGS84 degrees.

```
public float getPitch ()
```

Get the x-axis rotation (pitch) in radians.

**Returns:**

The x-axis rotation (pitch) in radians.

```
public float getRoll ()
```

Get the z-axis rotation (roll) in radians.

**Returns:**

The z-axis rotation (roll) in radians.

```
public long getTimestamp ()
```

Get a timestamp indicating the time at which the pose reading was taken.

**Returns:**

A timestamp indicating the time at which the pose reading was taken.

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## ARRadarItem

The class *ARRadarItem* is a member of [com.here.android.mpa.ar](http://com.here.android.mpa.ar) .

## Class Summary

public final class **ARRadarItem**

extends *java.lang.Object*

Represents a model class comprising the `Uid`, bearing, distance, spread distance, pan distance for an AR item that will be displayed on the radar.

[For complete information, see the section [Class Details](#)]

## Method Summary

Table 77: Methods in **ARRadarItem**

Methods
<p>public boolean <b><i>equals</i></b> (<code>Object obj</code>)</p> <p>For documentation, see <i>java.lang.Object</i></p>
<p>public <i>ARObject</i> <b><i>getARObject</i></b> ()</p> <p>Returns <i>ARObject</i> associated with the <b>ARRadarItem</b></p>
<p>public float <b><i>getBearing</i></b> ()</p> <p>Returns the bearing in degrees of the item relative to the current position.</p>
<p>public float <b><i>getDistance</i></b> ()</p> <p>Returns the distance in meters to the item from the current position.</p>
<p>public float <b><i>getPanDistance</i></b> ()</p> <p>Returns the pan distance in meters of the item.</p>
<p>public <code>RectF</code> <b><i>getScreenRect</i></b> ()</p> <p>Returns the screen rectangle occupied by the <i>ARObject</i> associated with this item, when visible.</p>
<p>public float <b><i>getSpreadDistance</i></b> ()</p> <p>Returns the spread distance in meters of the item.</p>
<p>public int <b><i>getUid</i></b> ()</p> <p>Returns the unique identifier of the item associated with the <i>ARObject</i>.</p>
<p>public int <b><i>hashCode</i></b> ()</p> <p>For documentation, see <i>java.lang.Object</i></p>
<p>public boolean <b><i>isOccluded</i></b> ()</p> <p>Checks if <i>ARObject</i> is occluded by buildings</p>
<p>public boolean <b><i>isVisible</i></b> ()</p> <p>Checks if <i>ARObject</i> is visible in the UP view</p>

## Class Details

Represents a model class comprising the `Uid`, bearing, distance, spread distance, pan distance for an AR item that will be displayed on the radar. The list of **ARRadarItems** can be retrieved by calling [getItems\(\)](#).

## Method Details

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

### Parameters:

- `obj`

```
public ARObject getARObject ()
```

Returns *ARObject* associated with the `ARRadarItem`

### Returns:

*ARObject* object.

```
public float getBearing ()
```

Returns the bearing in degrees of the item relative to the current position.

### Returns:

The bearing in degrees of the item relative to the current position.

```
public float getDistance ()
```

Returns the distance in meters to the item from the current position.

### Returns:

The distance in meters to the item from the current position.

```
public float getPanDistance ()
```

Returns the pan distance in meters of the item. If this is smaller than the dimming limit then items is not visible. Item should be grayed out or not displayed on the radar.

### Returns:

The pan distance in meters of the item.

```
public RectF getScreenRect ()
```

Returns the screen rectangle occupied by the *ARObject* associated with this item, when visible. If any of the value is outside of the view, then the item is partially visible.

### Returns:

The screen rectangle.

### See also:

*getARObject()*

```
public float getSpreadDistance ()
```

Returns the spread distance in meters of the item.

**Returns:**

The spread distance in meters of the item.

```
public int getUid ()
```

Returns the unique identifier of the item associated with the *ARObject*.

**Returns:**

The unique identifier.

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public boolean isOccluded ()
```

Checks if *ARObject* is occluded by buildings

**Returns:**

True, if object is occluded by buildings.

```
public boolean isVisible ()
```

Checks if *ARObject* is visible in the UP view

**Returns:**

True, if object is visible on the screen.

## ARRadarProperties

The class *ARRadarProperties* is a member of *com.here.android.mpa.ar* .

### Class Summary

```
public final class ARRadarProperties
```

```
extends java.lang.Object
```

Represents a model class comprising the radar properties such as the visible area details and radar items.

[For complete information, see the section [Class Details](#)]

## Method Summary

Table 78: Methods in ARRadarProperties

Methods
<pre>public boolean equals (Object obj)</pre> <p>For documentation, see <i>java.lang.Object</i></p>
<pre>public double getAngle ()</pre> <p>Get the heading (rotation on Y axis) in degrees.</p>
<pre>public float getBackPlaneStart ()</pre> <p>Return the z in meters at which the back plane starts.</p>
<pre>public float getDimmingLimit ()</pre> <p>Return the z limit in meters.</p>
<pre>public float getFrontPlaneEnd ()</pre> <p>Return the z in meters at which the front plane ends.</p>
<pre>public float getFrontPlaneStart ()</pre> <p>Return the z in meters at which the front plane starts.</p>
<pre>public java.util.List &lt;ARRadarItem&gt; getItems ()</pre> <p>Returns the list of radar items.</p>
<pre>public int hashCode ()</pre> <p>For documentation, see <i>java.lang.Object</i></p>

## Class Details

Represents a model class comprising the radar properties such as the visible area details and radar items. Each radar item corresponds to one of the *ARObjects* added to the ARController. In order to get the radar properties, the client must register a listener using *addOnRadarUpdateListener(ARController.OnRadarUpdateListener)*.

## Method Details

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

### Parameters:

- `obj`

```
public double getAngle ()
```

Get the heading (rotation on Y axis) in degrees.

**Returns:**

The heading (rotation on Y axis) in degrees.

```
public float getBackPlaneStart ()
```

Return the z in meters at which the back plane starts.

**Returns:**

The z in meters at which the back plane starts.

```
public float getDimmingLimit ()
```

Return the z limit in meters. AR Objects that have smaller z value will not be visible on the screen.

**Returns:**

The z limit in meters.

```
public float getFrontPlaneEnd ()
```

Return the z in meters at which the front plane ends.

**Returns:**

The z in meters at which the front plane ends.

```
public float getFrontPlaneStart ()
```

Return the z in meters at which the front plane starts.

**Returns:**

The z in meters at which the front plane starts.

```
public java.util.List <ARRadarItem> getItems ()
```

Returns the list of radar items.

**Returns:**

The list of radar items.

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## AnimationInterpolator

The enumeration *AnimationInterpolator* is a member of *com.here.android.mpa.ar* .

### Enumeration Summary

public final enumeration **AnimationInterpolator**

*extends java.lang.Enum, java.lang.Object*

Animation Interpolator types.

[For complete information, see the section *Enumeration Details*]

### Enum Constant Summary

Table 79: Enum Constants in AnimationInterpolator

Fields
public static final <i>AnimationInterpolator</i> <b>LINEAR</b> Linear interpolation
public static final <i>AnimationInterpolator</i> <b>ACCELERATE</b> Accelerate.
public static final <i>AnimationInterpolator</i> <b>DECELERATE</b> Decelerate.
public static final <i>AnimationInterpolator</i> <b>ACCELERATE_DECELERATE</b> Accelerate - Decelerate.
public static final <i>AnimationInterpolator</i> <b>OVERSHOOT</b> Overshoot.
public static final <i>AnimationInterpolator</i> <b>ANTICIPATE</b> Anticipate.
public static final <i>AnimationInterpolator</i> <b>ANTICIPATE_OVERSHOOT</b> Anticipate - Overshoot.
public static final <i>AnimationInterpolator</i> <b>BOUNCE</b> Bounce.
public static final <i>AnimationInterpolator</i> <b>CYCLE</b> Cycle.

## Method Summary

Table 80: Methods in AnimationInterpolator

Methods
<pre>public static <i>AnimationInterpolator</i> <i>valueOf</i> (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>AnimationInterpolator</i>[] <i>values</i> ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Animation Interpolator types. Function of time. Returned value is determined by the type of the interpolation.

### Enum Constant Details

```
public static final AnimationInterpolator LINEAR
```

Linear interpolation

```
public static final AnimationInterpolator ACCELERATE
```

Accelerate. An interpolator where the rate of change starts out slowly and then accelerates

```
public static final AnimationInterpolator DECELERATE
```

Decelerate. An interpolator where the rate of change starts out quickly and then decelerates

```
public static final AnimationInterpolator ACCELERATE_DECELERATE
```

Accelerate - Decelerate. An interpolator where the rate of change starts and ends slowly but accelerates through the middle

```
public static final AnimationInterpolator OVERSHOOT
```

Overshoot. An interpolator where the change flings forward and overshoots the last value then comes back.

```
public static final AnimationInterpolator ANTICIPATE
```

Anticipate. An interpolator where the change starts backward then flings forward.

```
public static final AnimationInterpolator ANTICIPATE_OVERSHOOT
```

Anticipate - Overshoot. An interpolator where the change starts backward then flings forward and overshoots the target value and finally goes back to the final value.

```
public static final AnimationInterpolator BOUNCE
```

Bounce. An interpolator where the change bounces at the end.

```
public static final AnimationInterpolator CYCLE
```

Cycle. Repeats the animation for a specified number of cycles. The rate of change follows a sinusoidal pattern.

## Method Details

```
public static AnimationInterpolator valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static AnimationInterpolator[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## CompositeFragment

The class *CompositeFragment* is a member of [com.here.android.mpa.ar](http://com.here.android.mpa.ar).

### Class Summary

```
public class CompositeFragment
```

```
extends java.lang.Object
```

Composite fragment which enables usage of AR and Map functionality within the same view context.

[For complete information, see the section [Class Details](#)]

### See also:

[MapFragment](#)

## Constructor Summary

Table 81: Constructors in CompositeFragment

Constructors
<p><i>CompositeFragment</i> ()</p> <p>Constructor</p>

## Method Summary

Table 82: Methods in CompositeFragment

Methods
<p>public void <i>addOnMapRenderListener</i> (<i>OnMapRenderListener</i> listener)</p> <p>Adds a <i>OnMapRenderListener</i> to listen for map render events.</p>
<p>public <i>ARController</i> <i>getARController</i> ()</p> <p>Get <i>ARController</i></p>
<p>public <i>ViewRect</i> <i>getClipRect</i> ()</p> <p>Returns the <i>ViewRect</i> representing the clip rectangle for this <i>CompositeFragment</i>.</p>
<p>public <i>Rect</i> <i>getCopyrightBoundaryRect</i> ()</p> <p>Gets the current HERE copyright logo's boundary rectangle.</p>
<p>public int <i>getCopyrightLogoHeight</i> ()</p> <p>Returns the height of the copyright logo.</p>
<p>public <i>CopyrightLogoPosition</i> <i>getCopyrightLogoPosition</i> ()</p> <p>Returns the on-screen position of the HERE copyright logo as a <i>CopyrightLogoPosition</i> value.</p>
<p>public int <i>getCopyrightLogoWidth</i> ()</p> <p>Returns the width of the copyright logo.</p>
<p>public int <i>getCopyrightMargin</i> ()</p> <p>Returns the current margin for the HERE copyright logo, in number of pixels, as an offset from the edge of the visible map area to the edge of the logo.</p>
<p>public int <i>getHeight</i> ()</p> <p>Gets the current height of the fragment, in pixels.</p>
<p>public <i>Map</i> <i>getMap</i> ()</p> <p>Returns the instance of <i>Map</i> associated with this fragment</p>
<p>public <i>MapGesture</i> <i>getMapGesture</i> ()</p> <p>Returns the <i>MapGesture</i> object representing the current gesture handler for the <i>CompositeFragment</i>.</p>
<p>public void <i>getScreenCapture</i> (<i>OnScreenCaptureListener</i> listener)</p> <p>Returns the full screen bitmap for the <i>CompositeFragment</i>.</p>

## Methods

```
public int getWidth ()
```

Gets the current width of the fragment, in pixels.

```
public void init (OnEngineInitListener listener)
```

Users of [CompositeFragment](#) must call this function after the fragment is first attached to its activity.

```
public void init (Context context, OnEngineInitListener listener)
```

**Deprecated:** As of SDK 3.4.

User of [CompositeFragment](#) must call this function after the fragment is created.

```
public void init (Context context, MapVariant variant, OnEngineInitListener listener)
```

**Deprecated:** As of SDK 3.4.

User of [CompositeFragment](#) must call this function after the fragment is created.

```
public void init (ApplicationContext context, OnEngineInitListener listener)
```

Users of [CompositeFragment](#) must call this function after the fragment is first attached to its activity.

```
public View onCreateView (LayoutInflater inflater, ViewGroup container, Bundle savedInstanceState)
```

For documentation, see [android.app.Fragment.onCreateView\(LayoutInflater, ViewGroup, Bundle\)](#)

```
public void onDestroyView ()
```

For documentation, see [android.app.Fragment.onDestroyView\(\)](#)

```
public void onInflate (Activity activity, AttributeSet attrs, Bundle savedInstanceState)
```

**Deprecated:** Deprecated as of release 3.5.

For documentation, see [android.app.Fragment.onInflate\(Activity, AttributeSet, Bundle\)](#)

```
public void onInflate (Context context, AttributeSet attrs, Bundle savedInstanceState)
```

For documentation, see [android.app.Fragment.onInflate\(Context, AttributeSet, Bundle\)](#)

```
public void onPause ()
```

Called when this fragment is no longer resumed.

```
public void onResume ()
```

Called when this fragment is visible to the user and actively running.

```
public void onSaveInstanceState (Bundle outState)
```

```
public void removeOnMapRenderListener (OnMapRenderListener listener)
```

Removes an existing [OnMapRenderListener](#).

```
public void setClipRect (ViewRect rect, PointF transformCenter)
```

Sets a clipping rectangle to the [CompositeFragment](#).

```
public void setClipRect (ViewRect rect)
```

Sets a clipping rectangle to this [CompositeFragment](#).

```
public void setCopyrightBoundaryRect (Rect rect)
```

Sets a rectangle, in pixels, relative to the top left corner of the [CompositeFragment](#)'s boundary, for the placement of the HERE copyright logo.

## Methods

```
public void setCopyrightLogoPosition (CopyrightLogoPosition position)
```

Sets a position for the HERE copyright logo.

```
public void setCopyrightMargin (int margin)
```

Sets a margin for the HERE copyright logo, in number of pixels, as an offset from the edge of the visible map area to the edge of the logo (depending on the placement).

```
public void setMapMarkerDragListener (OnDragListener listener)
```

Sets a [OnDragListener](#) to be invoked whenever any [MapMarker](#) on a [Map](#) that is attached to this fragment is dragged.

```
public void setOnTouchListener (View.OnTouchListener listener)
```

Sets an `android.view.OnTouchListener` to be invoked whenever a touch event is sent to the [CompositeFragment](#).

## Class Details

Composite fragment which enables usage of AR and Map functionality within the same view context. This class contains methods which are specific to Map as well as methods specific to AR. Concretely, provides the same functionality as [MapFragment](#) in addition to AR functionality.

**See also:**

[MapFragment](#)

## Constructor Details

### `CompositeFragment ()`

Constructor

## Method Details

```
public void addOnMapRenderListener (OnMapRenderListener listener)
```

Adds a [OnMapRenderListener](#) to listen for map render events.

**Parameters:**

- `listener`  
A [OnMapRenderListener](#) to add to the [CompositeFragment](#)

**See also:**

[removeOnMapRenderListener\(OnMapRenderListener\)](#)

```
public ARController getARController ()
```

Get [ARController](#)

**Returns:**

ARController object

```
public ViewRect getClipRect ()
```

Returns the *ViewRect* representing the clip rectangle for this *CompositeFragment*.

**Returns:**

The clip rectangle for rendering *MapObjects* and similar map-related screen elements. null if the view's layout process has yet to be completed. If the process is not yet complete, users can either retry later or subscribe as a *OnMapRenderListener* and call this method upon the callback *OnMapRenderListener.onSizeChanged(int,int)*.

```
public Rect getCopyrightBoundaryRect ()
```

Gets the current HERE copyright logo's boundary rectangle. Returns null if a boundary rect has not been set previously.

**Returns:**

The copyright logo's boundary rect. null if a boundary rect has not been set previously.

**See also:**

[setCopyrightBoundaryRect\(Rect\)](#)

```
public int getCopyrightLogoHeight ()
```

Returns the height of the copyright logo.

This method only returns a valid value once fragment initialization has taken completed.

**Returns:**

The height of the copyright logo, in number of pixels

```
public CopyrightLogoPosition getCopyrightLogoPosition ()
```

Returns the on-screen position of the HERE copyright logo as a *CopyrightLogoPosition* value.

**Returns:**

The position of the logo.

```
public int getCopyrightLogoWidth ()
```

Returns the width of the copyright logo.

This method only returns a valid value once fragment initialization has completed.

**Returns:**

The width of the copyright logo, in number of pixels

```
public int getCopyrightMargin ()
```

Returns the current margin for the HERE copyright logo, in number of pixels, as an offset from the edge of the visible map area to the edge of the logo.

This method only returns a valid value once fragment initialization has taken place.

**Returns:**

The current offset from the edge of the *CompositeFragment*, in number of pixels

```
public int getHeight ()
```

Gets the current height of the fragment, in pixels.

**Returns:**

The current height

```
public Map getMap ()
```

Returns the instance of *Map* associated with this fragment

**Returns:**

The Map object currently displayed in this fragment.

```
public MapGesture getMapGesture ()
```

Returns the *MapGesture* object representing the current gesture handler for the *CompositeFragment*. Applications can intercept this object and override the default event behaviors.

**Returns:**

The *MapGesture*

```
public void getScreenCapture (OnScreenCaptureListener listener)
```

Returns the full screen bitmap for the *CompositeFragment*. This method is asynchronous and will invoke a callback once the operation is completed through the operation is completed through the *OnScreenCaptureListener* the *CompositeFragment* must be visible to create the screen capture. Note that the current functionality of this API is limited to getting a screen capture of the Map. Future releases maybe enhanced to support getting screen capture of the AR and Map composite.

**Parameters:**

- **listener**

A *OnScreenCaptureListener* to listen for the callback when screen capture is complete.

```
public int getWidth ()
```

Gets the current width of the fragment, in pixels.

**Returns:**

The current width

```
public void init (OnEngineInitListener listener)
```

Users of *CompositeFragment* must call this function after the fragment is first attached to its activity. This automatically initializes the *MapEngine* and creates an *ARController* for use. This method is a convenience method that can be used for fragments embedded in a layout XML. This method should not be used when programmatically creating an *CompositeFragment*.

This method will initialize *MapEngine* with *GLOBAL* map variant on first SDK usage and with stored map variant on sub-sequent usages.

**Parameters:**

- **listener**

A *OnEngineInitListener* object that will be called when *CompositeFragment* and *MapEngine* initialization is finished. A null object can be supplied if callers do not expect any notification when initialization completes.

**See also:**

*OnEngineInitListener*

*init(ApplicationContext, OnEngineInitListener)*

*init(Context, OnEngineInitListener)*

```
public void init (Context context, OnEngineInitListener listener)
```

Deprecated: As of SDK 3.4.

Use *init(ApplicationContext, OnEngineInitListener)* instead.

User of *CompositeFragment* must call this function after the fragment is created. This automatically initialises the *MapEngine* and creates an *ARController* for use. This method can be used when programmatically creating an *CompositeFragment*.

This method will initialize *MapEngine* with *GLOBAL* map variant on first SDK usage and with stored map variant on sub-sequent usages.

**Parameters:**

- **context**

Application context.

- **listener**

A *OnEngineInitListener* object that will be called when *CompositeFragment* and *MapEngine* initialization is finished. A null object can be supplied if callers do not expect any notification when initialization completes.

**See also:**[OnEngineInitListener](#)[init\(Context, OnEngineInitListener\)](#)[init\(OnEngineInitListener\)](#)

```
public void init (Context context, MapVariant variant, OnEngineInitListener listener)
```

Deprecated: As of SDK 3.4.

Use [init\(ApplicationContext, OnEngineInitListener\)](#) instead.

User of [CompositeFragment](#) must call this function after the fragment is created. This automatically initialises the [MapEngine](#) and creates an [ARController](#) for use. This method can be used when programmatically creating an [CompositeFragment](#) .

This method can configure map variant which will be used by MapEngine. If initialization fails - `OPERATION_NOT_ALLOWED` will be reported. Currently following variants are supported: - [GLOBAL](#) - initialize MapEngine to use international map variant; - [KOREA](#) - initialize MapEngine to use Korean map variant; - null - initialize MapEngine to use stored map variant or international map variant for first run. This method is used to configure MapEngine to use certain map variant. If MapEngine was already configured and passed `variant` differs - error will be reported and initialization fails.

**Parameters:**

- **context**  
Application context.
- **variant**  
Map variant to use.
- **listener**  
A [OnEngineInitListener](#) object that will be called when [CompositeFragment](#) and [MapEngine](#) initialization is finished. A null object can be supplied if callers do not expect any notification when initialization completes.

**See also:**[OnEngineInitListener](#)[init\(Context, OnEngineInitListener\)](#)[init\(OnEngineInitListener\)](#)

```
public void init (ApplicationContext context, OnEngineInitListener listener)
```

Users of [CompositeFragment](#) must call this function after the fragment is first attached to its activity. This automatically initializes the [MapEngine](#) and creates an [ARController](#) for use. This method is a convenience method that can be used for fragments embedded in a layout XML. This method should not be used when programmatically creating an [CompositeFragment](#) .

## Parameters:

- **context**

ApplicationContext to be used during initialization.

- **listener**

A *OnEngineInitListener* object that will be called when CompositeFragment and MapEngine initialization is finished. A null object can be supplied if callers do not expect any notification when initialization completes.

## See also:

[OnEngineInitListener](#)

[init\(ApplicationContext, OnEngineInitListener\)](#)

[init\(ApplicationContext, OnEngineInitListener\)](#)

```
public View onCreateView (LayoutInflater inflater, ViewGroup container, Bundle savedInstanceState)
```

For documentation, see [android.app.Fragment.onCreateView\(LayoutInflater, ViewGroup, Bundle\)](#)

## Parameters:

- **inflater**
- **container**
- **savedInstanceState**

```
public void onDestroyView ()
```

For documentation, see [android.app.Fragment.onDestroyView\(\)](#)

```
public void onInflate (Activity activity, AttributeSet attrs, Bundle savedInstanceState)
```

**Deprecated:** Deprecated as of release 3.5.

Use `onInflate(Context, AttributeSet, Bundle)` instead.

For documentation, see [android.app.Fragment.onInflate\(Activity, AttributeSet, Bundle\)](#)

## Parameters:

- **activity**
- **attrs**
- **savedInstanceState**

```
public void onInflate (Context context, AttributeSet attrs, Bundle savedInstanceState)
```

For documentation, see [android.app.Fragment.onInflate\(Context, AttributeSet, Bundle\)](#)

**Parameters:**

- `context`
- `attrs`
- `savedInstanceState`

```
public void onPause ()
```

Called when this fragment is no longer resumed. All *MapEngine* activities will be paused automatically.

**See also:**

`android.app.Fragment#onPause()`

```
public void onResume ()
```

Called when this fragment is visible to the user and actively running. All *MapEngine* activities will be resumed automatically.

**See also:**

`android.app.Fragment#onResume()`

```
public void onSaveInstanceState (Bundle outState)
```

**Parameters:**

- `outState`

```
public void removeOnMapRenderListener (OnMapRenderListener listener)
```

Removes an existing *OnMapRenderListener*.

**Parameters:**

- `listener`

A *OnMapRenderListener* to remove from the *CompositeFragment*

```
public void setClipRect (ViewRect rect, PointF transformCenter)
```

Sets a clipping rectangle to the *CompositeFragment*. Only the area specified by the *ViewRect* will be used for rendering, while the rest of the view will be masked in black. This rectangle will be reset to the full size of the *CompositeFragment* upon screen rotation or upon recreating the screen.

Note that setting a clipping rectangle will also reset the *CompositeFragment*'s viewing rectangle to its full default size.

If the *ViewRect* is not valid, this method does nothing.

**Parameters:**

- `rect`

A `ViewRect` for rendering *MapObjects* and similar map-related screen elements

- **transformCenter**

A `android.graphics.PointF` representing the center coordinate for map transformations such as zooming and rotation

**See also:**

[setClipRect\(ViewRect\)](#)

```
public void setClipRect (ViewRect rect)
```

Sets a clipping rectangle to this *CompositeFragment*. Only the area specified by the *ViewRect* will be used for rendering, while the rest of the view will be masked in black. This rectangle will be reset to the full size of the *CompositeFragment* upon screen rotation or upon recreating the screen.

If the *ViewRect* is not valid, this method does nothing.

**Parameters:**

- **rect**

A *ViewRect* for rendering *MapObjects* and similar map-related screen elements

**See also:**

[setClipRect\(ViewRect, PointF\)](#)

```
public void setCopyrightBoundaryRect (Rect rect)
```

Sets a rectangle, in pixels, relative to the top left corner of the *CompositeFragment*'s boundary, for the placement of the HERE copyright logo.

If the specified rectangle is not contained completely within the current visible map area, their area of intersection will be used instead of the specified rectangle's area. The copyright logo and copyright margin must fit into the rectangle, otherwise specified rectangle will be ignored.

The rectangle is reset upon screen rotation or upon screen re-creation, or it can be done by setting a `null` - `android.graphics.Rect`.

**Parameters:**

- **rect**

A `android.graphics.Rect` representing the desired rectangular container to be used for positioning the copyright logo. Use `null` `android.graphics.Rect` to reset the boundary container.

**Throws:**

- **IllegalArgumentException**

if `android.graphics.Rect` supplied is invalid

```
public void setCopyrightLogoPosition (CopyrightLogoPosition position)
```

Sets a position for the HERE copyright logo. The current default is to place the logo at the center-bottom of the visible map view area.

After the logo's position is set, the position stays effective even when the screen is rotated or re-created.

**Parameters:**

- **position**  
A *CopyrightLogoPosition* value representing the desired placement of the HERE copyright logo with respect to the visible map view area

**public void setCopyrightMargin (int margin)**

Sets a margin for the HERE copyright logo, in number of pixels, as an offset from the edge of the visible map area to the edge of the logo (depending on the placement).

**Parameters:**

- **margin**  
Desired offset from the edge of the *CompositeFragment*

**public void setMapMarkerDragListener (OnDragListener listener)**

Sets a *OnDragListener* to be invoked whenever any *MapMarker* on a *Map* that is attached to this fragment is dragged.

**Parameters:**

- **listener**  
An *MapMarker.OnDragListener* to set for this *CompositeFragment*

**public void setOnTouchListener (View.OnTouchListener listener)**

Sets an *android.view.OnTouchListener* to be invoked whenever a touch event is sent to the *CompositeFragment*.

**Parameters:**

- **listener**  
An *android.view.OnTouchListener* to set for the *CompositeFragment*

**See also:**

[android.view.View.OnTouchListener](#)

## LineAttributes

The class *LineAttributes* is a member of *com.here.android.mpa.ar*.

## Class Summary

public class **LineAttributes**

extends *java.lang.Object*

Line/Shape outline attributes.

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 83: Constructors in LineAttributes

Constructors
<p><b>LineAttributes</b> ()</p> <p>Constructs a LineAttributes object from default parameters.</p>
<p><b>LineAttributes</b> (int widthInPixel, int color, <b>CapStyle</b> capStyle, boolean perspective)</p> <p>Constructs a LineAttributes object from passed parameters.</p>

## Field Summary

Table 84: Fields in LineAttributes

Fields
protected LineAttributesImpl <b>m_basePimpl</b>

## Method Summary

Table 85: Methods in LineAttributes

Methods
<p>public <b>LineAttributes</b> <b>enablePerspective</b> (boolean enable)</p> <p>Enable perspective.</p>
<p>public <b>CapStyle</b> <b>getCapStyle</b> ()</p> <p>Get the line end rendering cap style</p>
<p>public int <b>getDashPrimaryLength</b> ()</p> <p>Returns the current length of the primary dash segment of a dashed line, in pixels.</p>
<p>public int <b>getDashSecondaryLength</b> ()</p> <p>Returns the current length of the secondary (empty) dash segments of a dashed line, in pixels.</p>
<p>public int <b>getLineColor</b> ()</p> <p>Gets the current line color, returning an ARGB (Alpha/Red/Green/Blue) integer color value.</p>
<p>public int <b>getLineWidth</b> ()</p> <p>Returns the current line width, in pixels.</p>

## Methods

```
public boolean isDashEnabled ()
```

Returns a boolean indicating whether the `LineAttributes` appears as a dashed line.

```
public boolean isPerspectiveEnable ()
```

Queries if perspective is enabled.

```
public LineAttributes setCapStyle (CapStyle style)
```

Set the line end rendering cap style.

```
public LineAttributes setDashEnabled (boolean enabled)
```

Sets the appearance as either a dashed or solid line.

```
public LineAttributes setDashPrimaryLength (int length)
```

Sets a length, in pixels, for the primary dash segment of a dashed line.

```
public LineAttributes setDashSecondaryLength (int length)
```

Sets a length, in pixels, for the secondary (empty) dash segments of a dashed line.

```
public LineAttributes setLineColor (int color)
```

Sets line color, using an ARGB (Alpha/Red/Green/Blue) integer color value.

```
public LineAttributes setLineWidth (int width)
```

Sets a line width, in pixels, an int value within the [0..100] range.

## Class Details

Line/Shape outline attributes. specify the drawing attributes of a line or the outline of a shape. This class can be used together with [GeoPolyline](#) to form a [ARPolylineObject](#).

## Constructor Details

### `LineAttributes ()`

Constructs a `LineAttributes` object from default parameters.

Default parameters are:

- Width of Line - 1 px
- Color of the line - `android.graphics.Color#BLUE`
- The line ending styles - [ROUND](#)
- Perspective - `false`

### `LineAttributes (int widthInPixel, int color, CapStyle capStyle, boolean perspective)`

Constructs a `LineAttributes` object from passed parameters.

Parameters:

- `widthInPixel`

Width in pixels of the line. The value will be clipped to the valid range [0, 100].

- **color**

Color of the line using an ARGB (Alpha/Red/Green/Blue) integer color value.

- **capStyle**

The line ending styles.

- **perspective**

if `true`, the line looks thinner further away when the map is tilted.

## Field Details

```
protected LineAttributesImpl m_basePimpl
```

## Method Details

```
public LineAttributes enablePerspective (boolean enable)
```

Enable perspective. The line looks thinner further away when the map is tilted.

**Parameters:**

- **enable**

Value to set.

**Returns:**

The updated `LineAttributes` itself.

```
public CapStyle getCapStyle ()
```

Get the line end rendering cap style

**Returns:**

`CapStyle` cap style.

```
public int getDashPrimaryLength ()
```

Returns the current length of the primary dash segment of a dashed line, in pixels.

**Returns:**

The current length of the primary dash

**See also:**

[getDashSecondaryLength\(\)](#)

```
public int getDashSecondaryLength ()
```

Returns the current length of the secondary (empty) dash segments of a dashed line, in pixels.

**Returns:**

The current length of the empty dash

**See also:**

[getDashPrimaryLength\(\)](#)

```
public int getLineColor ()
```

Gets the current line color, returning an ARGB (Alpha/Red/Green/Blue) integer color value.

**Returns:**

The current ARGB integer color value. The packed integer is made up of 4 bytes: alpha, red, green, blue. Each color component has a value range from [0..255], with 0 meaning no contribution for that component and 255 meaning 100% contribution

**See also:**

[android.graphics.Color](#)

```
public int getLineWidth ()
```

Returns the current line width, in pixels.

**Returns:**

The current line width.

```
public boolean isDashEnabled ()
```

Returns a boolean indicating whether the `LineAttributes` appears as a dashed line. By default, dash is disabled.

**Returns:**

True if the `LineAttributes` is dashed, false otherwise

```
public boolean isPerspectiveEnable ()
```

Queries if perspective is enabled.

**Returns:**

perspective state.

```
public LineAttributes setCapStyle (CapStyle style)
```

Set the line end rendering cap style.

**Parameters:**

- **style**  
CapStyle

**Returns:**

The updated `LineAttributes` itself.

```
public LineAttributes setDashEnabled (boolean enabled)
```

Sets the appearance as either a dashed or solid line.

**Parameters:**

- **enabled**  
A boolean specifying whether line should be dashed.

**Returns:**

The updated `LineAttributes` itself.

```
public LineAttributes setDashPrimaryLength (int length)
```

Sets a length, in pixels, for the primary dash segment of a dashed line. By default, the primary dash length is 1.

**Parameters:**

- **length**  
Desired length of the primary dash

**Returns:**

The updated `LineAttributes` itself.

**Throws:**

- **IllegalArgumentException**  
if `length` is smaller or equal to 0.

**See also:**

[\*setDashSecondaryLength\(int\)\*](#)

```
public LineAttributes setDashSecondaryLength (int length)
```

Sets a length, in pixels, for the secondary (empty) dash segments of a dashed line. By default, the secondary dash length is 1.

**Parameters:**

- **length**

Desired length of the empty dash

**Returns:**

The updated `LineAttributes` itself.

**Throws:**

- `IllegalArgumentException`  
if `length` is smaller or equal to 0.

**See also:**

[setDashPrimaryLength\(int\)](#)

## `public LineAttributes setLineColor (int color)`

Sets line color, using an ARGB (Alpha/Red/Green/Blue) integer color value. The default line color is `Color.BLUE`.

**Parameters:**

- `color`  
The ARGB integer color value. The packed integer is made up of 4 bytes: alpha, red, green, blue. Each color component has a value range from [0..255] with 0 meaning no contribution for that component, and 255 meaning 100% contribution

**Returns:**

The updated `LineAttributes` itself.

**See also:**

[android.graphics.Color](#)

## `public LineAttributes setLineWidth (int width)`

Sets a line width, in pixels, an `int` value within the [0..100] range. By default, the line width is 1.

**Parameters:**

- `width`  
Desired width of the line. Must be within the [0..100] range.

**Returns:**

The updated `LineAttributes` itself.

**Throws:**

- `IllegalArgumentException`  
if `width` is out of range.

## cluster

---

The package *cluster* is a member of *com.here.android.mpa*.

### Package Summary

#### cluster

This package provides classes, interfaces, and enumerations for Marker clustering.

### Package Details

This package provides classes, interfaces, and enumerations for Marker clustering. With this feature, markers that are close together are automatically replaced by numbered cluster markers to indicate that multiple map markers are represented.

Some key classes and interfaces in this package are:

- [ClusterLayer](#)
- [ClusterTheme](#)
- [ClusterStyle](#)

For more information for using this feature, please consult the "Marker Clustering" section in the HERE SDK for Android Developer's Guide.

## BasicClusterStyle

The class *BasicClusterStyle* is a member of *com.here.android.mpa.cluster*.

### Class Summary

public class **BasicClusterStyle**

extends *com.here.android.mpa.cluster.ClusterStyle*, *java.lang.Object*

Basic implementation of *ClusterStyle*.

[For complete information, see the section [Class Details](#)]

**See also:**

[ClusterTheme](#)

[ClusterStyle](#)

## Constructor Summary

Table 86: Constructors in BasicClusterStyle

Constructors
<p><b>BasicClusterStyle</b> ()</p> <p>Creates new style with default icon stroke, fill and font colors.</p>
<p><b>BasicClusterStyle</b> (int strokeColor, int fillColor, int fontColor)</p> <p>Creates new style with specific stroke, fill and font colors.</p>

## Method Summary

Table 87: Methods in BasicClusterStyle

Methods
<p>public int <b>getFillColor</b> ()</p> <p>Returns the current color for filling the cluster icon.</p>
<p>public int <b>getFontColor</b> ()</p> <p>Returns color of the font which is used to display the density in the cluster icon.</p>
<p>public int <b>getStrokeColor</b> ()</p> <p>Return the color of the cluster icon outline.</p>
<p>public <b>BasicClusterStyle</b> <b>setFillColor</b> (int fillColor)</p> <p>Set the color for filling the cluster icon.</p>
<p>public <b>BasicClusterStyle</b> <b>setFontColor</b> (int fontColor)</p> <p>Sets color of the font, which is used to display the density in the cluster icon.</p>
<p>public <b>BasicClusterStyle</b> <b>setStrokeColor</b> (int strokeColor)</p> <p>Set the color of the cluster icon outline.</p>
<p>public String <b>toString</b> ()</p> <p>For documentation, see <i>java.lang.Object</i></p>

## Class Details

Basic implementation of [ClusterStyle](#). This cluster style can be used if you need to apply some basic customizations to the default cluster style.

Note that in the default and basic cluster styles, the size of the circle grows as the density grows.

The colors in this class need to be specified in an ARGB packed integer format. This packed integer is made up of 4 bytes: alpha, red, green, blue. Each color component has a value range from [0..255] with 0 meaning no contribution for that component, and 255 meaning 100% contribution.

**See also:**

[ClusterTheme](#)

## ClusterStyle

### Constructor Details

#### **BasicClusterStyle ()**

Creates new style with default icon stroke, fill and font colors.

#### **BasicClusterStyle (int strokeColor, int fillColor, int fontColor)**

Creates new style with specific stroke, fill and font colors.

##### Parameters:

- **strokeColor**  
Color of the icon's outline, as a 4-byte ARGB value.
- **fillColor**  
Fill color of the icon, as a 4-byte ARGB value.
- **fontColor**  
Color of the font inside the icon, as a 4-byte ARGB value.

### Method Details

#### **public int getFillColor ()**

Returns the current color for filling the cluster icon.

##### Returns:

Fill color of the icon, as a 4-byte ARGB value.

#### **public int getFontColor ()**

Returns color of the font which is used to display the density in the cluster icon.

##### Returns:

Color of the font inside the icon, in a 4-byte ARGB value.

#### **public int getStrokeColor ()**

Return the color of the cluster icon outline.

##### Returns:

Stroke color of the icon, as a 4-byte ARGB value.

#### **public *BasicClusterStyle* setFillColor (int fillColor)**

Set the color for filling the cluster icon.

**Parameters:**

- **fillColor**  
Fill color of the icon, as a 4-byte ARGB value.

**Returns:**

The updated `BasicClusterStyle` object itself.

```
public BasicClusterStyle setFontColor (int fontColor)
```

Sets color of the font, which is used to display the density in the cluster icon.

**Parameters:**

- **fontColor**  
Color of the font inside the icon as a 4-byte ARGB value.

**Returns:**

The updated `BasicClusterStyle` object itself.

```
public BasicClusterStyle setStrokeColor (int strokeColor)
```

Set the color of the cluster icon outline.

**Parameters:**

- **strokeColor**  
Stroke color of the icon, as a 4-byte ARGB value.

**Returns:**

The updated `BasicClusterStyle` object itself.

```
public String toString ()
```

For documentation, see *java.lang.Object*

## ClusterDensityRange

The class *ClusterDensityRange* is a member of *com.here.android.mpa.cluster*.

### Class Summary

```
public class ClusterDensityRange
```

```
extends java.lang.Object
```

Represents a range of cluster densities that can be represented, such as '5 to 10 markers'.

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 88: Constructors in ClusterDensityRange

Constructors
<p><code>ClusterDensityRange</code> (int from, int to) Creates a new density range.</p>

## Field Summary

Table 89: Fields in ClusterDensityRange

Fields
<p>public static final int <code>MINIMUM_CLUSTER_DENSITY</code> The lowest allowable density for any map cluster.</p>
<p>public final int <code>from</code> The lower density limit for this range.</p>
<p>public final int <code>to</code> The upper density limit for this range.</p>

## Method Summary

Table 90: Methods in ClusterDensityRange

Methods
<p>public static boolean <code>isValidDensityRange</code> (int from, int to) Checks if the provided values comprise a valid range.</p>
<p>public String <code>toString</code> () For documentation, see <code>java.lang.Object</code></p>

## Class Details

Represents a range of cluster densities that can be represented, such as '5 to 10 markers'. Cluster density is the number of map markers that are inside a single cluster.

Cluster density ranges are inclusive of the upper and lower bounds.

## Constructor Details

### `ClusterDensityRange` (int from, int to)

Creates a new density range.

**Parameters:**

- **from**  
Lower density range limit (inclusive), must be greater or equal to [MINIMUM\\_CLUSTER\\_DENSITY](#).
- **to**  
Upper density range limit (inclusive), must be smaller or equal lower limit

**Throws:**

- **IllegalArgumentException**  
If lower limit smaller than [MINIMUM\\_CLUSTER\\_DENSITY](#) or if lower limit greater than upper limit

### Field Details

```
public static final int MINIMUM_CLUSTER_DENSITY
```

The lowest allowable density for any map cluster. Clusters will only form if there are more than this amount of map markers.

```
public final int from
```

The lower density limit for this range.

```
public final int to
```

The upper density limit for this range.

### Method Details

```
public static boolean isValidDensityRange (int from, int to)
```

Checks if the provided values comprise a valid range. A range is valid if ( `from` is smaller or equal to `to` ) and ( `from` greater or equal to [MINIMUM\\_CLUSTER\\_DENSITY](#) ).

**Parameters:**

- **from**  
lower density range limit
- **to**  
upper density range limit

**Returns:**

true if the range is valid, false otherwise

```
public String toString ()
```

For documentation, see [java.lang.Object](#)

## ClusterLayer

The class *ClusterLayer* is a member of [com.here.android.mpa.cluster](#).

### Class Summary

```
public class ClusterLayer
```

```
extends java.lang.Object
```

*ClusterLayer* is a container of *MapMarker* instances.

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 91: Constructors in ClusterLayer

Constructors
<pre><i>ClusterLayer</i> ()</pre> <p>Creates new cluster layer with a default theme.</p>

### Method Summary

Table 92: Methods in ClusterLayer

Methods
<pre>public void <i>addMarker</i> (<i>MapMarker</i> marker)</pre> <p>Adds a <i>MapMarker</i> to this layer.</p>
<pre>public void <i>addMarkers</i> (java.util.Collection &lt;<i>MapMarker</i>&gt; markers)</pre> <p>Adds a collection of <i>MapMarker</i> to this layer.</p>
<pre>public java.util.Collection &lt;<i>MapMarker</i>&gt; <i>getMarkers</i> ()</pre> <p>Retrieves all <i>MapMarker</i> instances added to this layer.</p>
<pre>public boolean <i>removeMarker</i> (<i>MapMarker</i> marker)</pre> <p>Removes the given <i>MapMarker</i> from this layer.</p>
<pre>public boolean <i>removeMarkers</i> (java.util.Collection &lt;<i>MapMarker</i>&gt; markers)</pre> <p>Removes a collection of <i>MapMarker</i> from this layer.</p>
<pre>public void <i>setTheme</i> (<i>ClusterTheme</i> theme)</pre> <p>Sets the theme to be used during cluster marker rendering.</p>
<pre>public String <i>toString</i> ()</pre> <p>For documentation, see <i>java.lang.Object</i></p>

## Class Details

`ClusterLayer` is a container of `MapMarker` instances.

A newly created layer must be attached to the map before clustering begins. There is no restriction on calling the methods of this class when it is removed from (not added to) the map.

Once added to the layer, markers will start to cluster when the layer is attached to the map.

## Constructor Details

### `ClusterLayer ()`

Creates new cluster layer with a default theme.

## Method Details

```
public void addMarker (MapMarker marker)
```

Adds a `MapMarker` to this layer.

The marker is also added to the `Map` if the layer is added to it.

#### Parameters:

- **marker**  
The `MapMarker` to be added.

#### Throws:

- **NullPointerException**  
If the marker is null.

#### See also:

[addMarkers\(Collection<MapMarker>\)](#)

```
public void addMarkers (java.util.Collection <MapMarker> markers)
```

Adds a collection of `MapMarker` to this layer.

The markers are also added to the `Map` if the layer is added to it.

#### Parameters:

- **markers**  
A collection of `MapMarker` instances to be added

#### Throws:

- **NullPointerException**  
If the any marker in the collection is null.

#### See also:

*addMarker(MapMarker)*

```
public java.util.Collection <MapMarker> getMarkers ()
```

Retrieves all *MapMarker* instances added to this layer.

**Returns:**

a collection of all markers added to this layer

```
public boolean removeMarker (MapMarker marker)
```

Removes the given *MapMarker* from this layer.

The marker is also removed from the *Map* if the layer is already added to it.

Use *removeMarkers(Collection)* to remove a batch of map markers.

**Parameters:**

- **marker**  
A *MapMarker* to remove

**Returns:**

true if this layer was modified by this operation, false otherwise.

**See also:**

*removeMarkers(Collection<MapMarker>)*

```
public boolean removeMarkers (java.util.Collection <MapMarker> markers)
```

Removes a collection of *MapMarker* from this layer.

The markers are also removed from the *Map* if the layer already added to it.

**Parameters:**

- **markers**  
collection of *MapMarker* to remove

**Returns:**

true if this layer was modified by this operation, false otherwise.

```
public void setTheme (ClusterTheme theme)
```

Sets the theme to be used during cluster marker rendering.

If no theme is set using this method, a default theme is used.

**Parameters:**

- **theme**

theme to be used

**Throws:**

- **NullPointerException**  
if null is passed

```
public String toString ()
```

For documentation, see *java.lang.Object*

## ClusterStyle

The class *ClusterStyle* is a member of *com.here.android.mpa.cluster* .

### Class Summary

```
public abstract class ClusterStyle
```

```
extends java.lang.Object
```

A base class for customizing the look of the cluster icon used for a specific density range.

[For complete information, see the section *Class Details*]

**See also:**

*ClusterTheme*

### Class Details

A base class for customizing the look of the cluster icon used for a specific density range. Cluster density represents the number of map markers inside a cluster.

By default, a cluster is represented on a map by a circular icon with the density drawn in the middle.

**See also:**

*ClusterTheme*

## ClusterTheme

The class *ClusterTheme* is a member of *com.here.android.mpa.cluster* .

### Class Summary

```
public class ClusterTheme
```

```
extends java.lang.Object
```

A mapping of cluster density ranges to cluster icon styles.

[For complete information, see the section [Class Details](#)]

See also:

[setTheme\(ClusterTheme\)](#)

## Constructor Summary

Table 93: Constructors in ClusterTheme

Constructors
<p><b><a href="#">ClusterTheme</a></b> ()</p> <p>Creates a new theme with the default presentation style.</p>
<p><b><a href="#">ClusterTheme</a></b> (<a href="#">ClusterTheme</a> theme)</p> <p>Creates a new theme by copying ranges and styles from another.</p>

## Method Summary

Table 94: Methods in ClusterTheme

Methods
<p>public void <a href="#">setStyleForDensityRange</a> (int from, int to, <a href="#">ClusterStyle</a> style)</p> <p>Sets particular style for a specific range.</p>
<p>public void <a href="#">setStyleForDensityRange</a> (<a href="#">ClusterDensityRange</a> range, <a href="#">ClusterStyle</a> style)</p> <p>Sets particular style for a specific range.</p>

## Class Details

A mapping of cluster density ranges to cluster icon styles. Cluster density represents the number of markers inside a cluster.

See also:

[setTheme\(ClusterTheme\)](#)

## Constructor Details

### **ClusterTheme** ()

Creates a new theme with the default presentation style.

### **ClusterTheme** ([ClusterTheme](#) theme)

Creates a new theme by copying ranges and styles from another.

Parameters:

- **theme**  
theme to copy from

## Method Details

```
public void setStyleForDensityRange (int from, int to, ClusterStyle style)
```

Sets particular style for a specific range. Ranges set by this method should be valid and cannot overlap.

The default style is used for the ranges not set manually.

### Parameters:

- **from**  
lower density range limit (inclusive), must be greater than *MINIMUM\_CLUSTER\_DENSITY*
- **to**  
upper density range limit (inclusive), must be greater than or equal to lower limit
- **style**  
style for this range

### Throws:

- **IllegalArgumentException**  
If one of the following occurs: the lower limit is smaller than *MINIMUM\_CLUSTER\_DENSITY*, the lower limit is greater than the upper limit, or the range overlaps with one of the already added ranges to this theme.
- **NullPointerException**  
if style is null

### See also:

[setStyleForDensityRange\(ClusterDensityRange, ClusterStyle\)](#)

```
public void setStyleForDensityRange (ClusterDensityRange range, ClusterStyle style)
```

Sets particular style for a specific range. Ranges set by this method should be valid and cannot overlap.

The default style is used for the ranges not set manually.

### Parameters:

- **range**  
density range
- **style**  
style for this range

### Throws:

- **IllegalArgumentException**  
if the range overlaps with one of the already added ranges to this theme
- **NullPointerException**

if range or style is null

## ClusterViewObject

The class *ClusterViewObject* is a member of *com.here.android.mpa.cluster*.

### Class Summary

public final class **ClusterViewObject**

extends *com.here.android.mpa.mapping.MapProxyObject*, *com.here.android.mpa.common.ViewObject*, *java.lang.Object*

Represents a visual manifestation of a marker cluster.

[For complete information, see the section *Class Details*]

### Method Summary

Table 95: Methods in ClusterViewObject

Methods
<p>public boolean <i>equals</i> (Object obj)</p> <p>For documentation, see <i>java.lang.Object</i></p>
<p>public Type <i>getBaseType</i> ()</p> <p>Returns the real implementation type of the ViewObject .</p> <p>This method overrides <i>common.ViewObject.getBaseType(void)</i></p>
<p>public GeoBoundingBox <i>getBoundingBox</i> ()</p> <p>Returns a bounding box containing all markers in this cluster.</p>
<p>public java.util.Collection &lt;MapMarker&gt; <i>getMarkers</i> ()</p> <p>Returns all the markers represented by this cluster.</p>
<p>public Type <i>getType</i> ()</p> <p>Returns the type of object that the MapProxyObject represents.</p> <p>This method overrides <i>mapping.MapProxyObject.getType(void)</i></p>
<p>public int <i>hashCode</i> ()</p> <p>For documentation, see <i>java.lang.Object</i></p>
<p>public String <i>toString</i> ()</p> <p>For documentation, see <i>java.lang.Object</i></p>

### Class Details

Represents a visual manifestation of a marker cluster.

## Method Details

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

### Parameters:

- `obj`

```
public Type getBaseType ()
```

Returns the real implementation type of the `ViewObject` .

This method overrides *common.ViewObject.getBaseType(void)*

```
public GeoBoundingBox getBoundingBox ()
```

Returns a bounding box containing all markers in this cluster.

### Returns:

A minimal box containing all the markers from this cluster represented by a *GeoBoundingBox*.

```
public java.util.Collection <MapMarker> getMarkers ()
```

Returns all the markers represented by this cluster.

### Returns:

A shallow copy of markers clustered in this cluster

```
public Type getType ()
```

Returns the type of object that the `MapProxyObject` represents.

This method overrides *mapping.MapProxyObject.getType(void)*

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public String toString ()
```

For documentation, see *java.lang.Object*

## ImageClusterStyle

The class *ImageClusterStyle* is a member of *com.here.android.mpa.cluster*.

### Class Summary

public final class **ImageClusterStyle**

extends *com.here.android.mpa.cluster.ClusterStyle*, *java.lang.Object*

An implementation of a cluster style that uses an *Image* as the cluster icon.

[For complete information, see the section *Class Details*]

**See also:**

*ClusterTheme*

### Constructor Summary

Table 96: Constructors in ImageClusterStyle

Constructors
<i>ImageClusterStyle</i> ( <i>Image</i> image)
Creates an image cluster style using the given <i>Image</i>
<i>ImageClusterStyle</i> (int resId)
Creates an image cluster style from the given Android drawable resource.

### Method Summary

Table 97: Methods in ImageClusterStyle

Methods
public String <i>toString</i> ()
For documentation, see <i>java.lang.Object</i>

### Class Details

An implementation of a cluster style that uses an *Image* as the cluster icon.

**See also:**

*ClusterTheme*

### Constructor Details

**ImageClusterStyle** (*Image* image)

Creates an image cluster style using the given *Image*

## Parameters:

- **image**  
the image to be used to draw the cluster icon

## ImageClusterStyle (int resId)

Creates an image cluster style from the given Android drawable resource.

## Parameters:

- **resId**  
drawable resource to create the style from

## Method Details

```
public String toString ()
```

For documentation, see *java.lang.Object*

## common

---

The package *common* is a member of *com.here.android.mpa*.

## Package Summary

### common

This package includes classes, interfaces, and enumerations that are generally used by other packages in the Android SDK.

## Package Details

This package includes classes, interfaces, and enumerations that are generally used by other packages in the Android SDK.

However, the following classes are key classes that serves as the entry point to services provided by our SDK:

- *MapEngine* - is the entry point for all services provided. It must be initialized before using our services.
- *PositioningManager* - is the entry point for our positioning service.
- *MapActivity* - can be used for applications that uses our headless APIs without having to manually handle the *MapEngine* setup.

For more information, please refer to our User Guide or the documentation provided by the individual classes above.

## ApplicationContext

The class *ApplicationContext* is a member of *com.here.android.mpa.common*.

### Class Summary

public final class **ApplicationContext**

*extends java.lang.Object*

*ApplicationContext* manages setting of custom application credentials and map variant.

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 98: Constructors in *ApplicationContext*

Constructors
<p><i>ApplicationContext</i> (Context ctx)</p> <p>Creates a <i>ApplicationContext</i> with specified application context.</p>

### Method Summary

Table 99: Methods in *ApplicationContext*

Methods
<p>public <i>ApplicationContext</i> <i>setAppIdCode</i> (String appId, String appCode)</p> <p>Sets the application ID and application token that are obtained by registering at <a href="http://developer.here.com/">http://developer.here.com/</a>.</p>
<p>public <i>ApplicationContext</i> <i>setLicenseKey</i> (String licenseKey)</p> <p>Sets the license key that are obtained by registering at <a href="http://developer.here.com/">http://developer.here.com/</a>.</p>
<p>public <i>ApplicationContext</i> <i>setMapVariant</i> (MapVariant mapVariant)</p> <p>Sets needed map variant.</p>
<p>public <i>ApplicationContext</i> <i>setSdkVersionInCrashStack</i> (boolean value)</p> <p>Sets whether or not to show the HERE SDK Version in crash stack traces.</p>

### Class Details

*ApplicationContext* manages setting of custom application credentials and map variant. Setting of any type of configuration should be made before the *MapEngine* is initialized.

### Constructor Details

#### *ApplicationContext* (Context ctx)

Creates a *ApplicationContext* with specified application context.

## Parameters:

- **ctx**  
Application context.

## Method Details

```
public ApplicationContext setAppIdCode (String appId, String appCode)
```

Sets the application ID and application token that are obtained by registering at <http://developer.here.com/>.

## Parameters:

- **appId**  
unique application identifier. It is empty by default.
- **appCode**  
unique application code. It is empty by default.

## Returns:

The updated *ApplicationContext* object itself.

```
public ApplicationContext setLicenseKey (String licenseKey)
```

Sets the license key that are obtained by registering at <http://developer.here.com/>.

## Parameters:

- **licenseKey**  
the license key defining application permissions. It is empty by default.

## Returns:

The updated *ApplicationContext* object itself.

```
public ApplicationContext setMapVariant (MapVariant mapVariant)
```

Sets needed map variant.

## Parameters:

- **mapVariant**  
map variant to use. If never set, then *GLOBAL* will be used.

## Returns:

The updated *ApplicationContext* object itself.

```
public ApplicationContext setSdkVersionInCrashStack (boolean value)
```

Sets whether or not to show the HERE SDK Version in crash stack traces. The default value is true.

By default, for Java, a `Thread.UncaughtExceptionHandler` is added which appends the HERE SDK Version to the normal stack trace. For Native, a lightweight thread is started which sleeps in a function containing names as the HERE SDK Version. Setting this to false disables both previously described behaviours.

### Parameters:

- `value`

Indicates whether or not to show the HERE SDK Version in crash stack traces.

### Returns:

The updated `ApplicationContext` object itself.

## ConnectionInfo

The class `ConnectionInfo` is a member of `com.here.android.mpa.common`.

### Class Summary

public final class **ConnectionInfo**

*extends java.lang.Object*

Encapsulates information related to network connections.

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 100: Constructors in ConnectionInfo

Constructors
<code>ConnectionInfo ()</code> Public constructor.

### Method Summary

Table 101: Methods in ConnectionInfo

Methods
public long <code>getBytesDownloaded ()</code> Gets the amount of data downloaded in bytes.

### Class Details

Encapsulates information related to network connections.

## Constructor Details

### ConnectionInfo ()

Public constructor.

## Method Details

### public long getBytesDownloaded ()

Gets the amount of data downloaded in bytes.

The amount is cumulative since the application process was created. If the process is terminated and recreated, the count will begin again from 0.

#### Returns:

The data downloaded in bytes

## CopyrightLogoPosition

The enumeration *CopyrightLogoPosition* is a member of *com.here.android.mpa.common*.

## Enumeration Summary

public final enumeration **CopyrightLogoPosition**

extends *java.lang.Enum*, *java.lang.Object*

Represents values that describe on-display view positions for the HERE copyright logo.

[For complete information, see the section *Enumeration Details*]

## Enum Constant Summary

Table 102: Enum Constants in CopyrightLogoPosition

Fields
<pre>public static final CopyrightLogoPosition TOP_LEFT</pre> <p>The copyright logo is positioned at the top-left portion of the display view.</p>
<pre>public static final CopyrightLogoPosition TOP_CENTER</pre> <p>The copyright logo is positioned at the top-center portion of the display view.</p>
<pre>public static final CopyrightLogoPosition TOP_RIGHT</pre> <p>The copyright logo is positioned at the top-right portion of the display view.</p>
<pre>public static final CopyrightLogoPosition BOTTOM_CENTER</pre> <p>The copyright logo is positioned at the bottom-center portion of the display view.</p>

## Method Summary

Table 103: Methods in `CopyrightLogoPosition`

Methods
<pre>public static <i>CopyrightLogoPosition</i> valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>CopyrightLogoPosition</i>[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Represents values that describe on-display view positions for the HERE copyright logo.

### Enum Constant Details

```
public static final CopyrightLogoPosition TOP_LEFT
```

The copyright logo is positioned at the top-left portion of the display view.

```
public static final CopyrightLogoPosition TOP_CENTER
```

The copyright logo is positioned at the top-center portion of the display view.

```
public static final CopyrightLogoPosition TOP_RIGHT
```

The copyright logo is positioned at the top-right portion of the display view.

```
public static final CopyrightLogoPosition BOTTOM_CENTER
```

The copyright logo is positioned at the bottom-center portion of the display view.

## Method Details

```
public static CopyrightLogoPosition valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static CopyrightLogoPosition[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## CustomConfigurations

The class *CustomConfigurations* is a member of *com.here.android.mpa.common*.

### Class Summary

public final class **CustomConfigurations**

*extends java.lang.Object*

CustomConfigurations manages setting of custom configurations.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 104: Nested Classes in CustomConfigurations

Nested Classes
public static final enumeration <i>CustomConfigurations.Config</i> Argument keys for <i>set(Hashtable)</i> ,

### Constructor Summary

Table 105: Constructors in CustomConfigurations

Constructors
<i>CustomConfigurations</i> ( )

### Method Summary

Table 106: Methods in CustomConfigurations

Methods
public static void <i>set</i> (java.util.Hashtable < <i>Config</i> , java.lang.String> configFiles) Sets custom configuration.

### Class Details

CustomConfigurations manages setting of custom configurations. Setting of any type of configuration should be made before the MapEngine is initialized. *MAP* config must always be set together with *MAP\_RESOURCE* Note: This API should only be used in consultation with HERE technical support.

## Constructor Details

### CustomConfigurations ()

## Method Details

```
public static void set (java.util.Hashtable <Config, java.lang.String>
configFiles)
```

Sets custom configuration. This method must be called before the MapEngine is initialized. *MAP* config must always be set in pair with *MAP\_RESOURCE* Note: This API should only be used in consultation with HERE technical support.

#### Parameters:

- **configFiles**  
A Hashtable of Key/Value pairs where key is of type *CustomConfigurations.Config* and value is file path where the specified configuration is located.

#### Throws:

- **IllegalStateException**  
if MapEngine is already initialized.
- **FileNotFoundException**  
if at least one of the configuration files does not exist.
- **IllegalArgumentException**  
If the Hashtable of configuration key/value pairs provided is invalid, or only one config of types *MAP* and *MAP\_RESOURCE* was set.

## Config

The enumeration *Config* is a member of *com.here.android.mpa.common.CustomConfigurations*.

## Enumeration Summary

```
public static final enumeration CustomConfigurations.Config
```

```
extends java.lang.Enum, java.lang.Object
```

Argument keys for *set(Hashtable)*,

[For complete information, see the section *Enumeration Details*]

## Enum Constant Summary

Table 107: Enum Constants in Config

Fields
<pre>public static final Config MAP</pre> <p>Map Style Configuration</p>
<pre>public static final Config MAP_RESOURCE</pre> <p>Map Style Resource</p>
<pre>public static final Config TRAFFIC</pre> <p>Traffic Style Resource</p>
<pre>public static final Config CUSTOM_PREFERENCE</pre> <p>Custom Configuration</p>

## Method Summary

Table 108: Methods in Config

Methods
<pre>public static Config valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static CustomConfigurations.Config[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Argument keys for `set(Hashtable)`,

## Enum Constant Details

```
public static final Config MAP
```

Map Style Configuration

```
public static final Config MAP_RESOURCE
```

Map Style Resource

```
public static final Config TRAFFIC
```

Traffic Style Resource

```
public static final Config CUSTOM_PREFERENCE
```

Custom Configuration

## Method Details

public static *Config* valueOf (String name)

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

public static *CustomConfigurations.Config[]* values ()

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## DiskCacheUtility

The class *DiskCacheUtility* is a member of *com.here.android.mpa.common* .

### Class Summary

public final class **DiskCacheUtility**

*extends java.lang.Object*

Provides methods for manipulating the disk cache.

**Deprecated:** Provided only to help with the transition of pre-v3.4 disk caches to the current version.

[For complete information, see the section *Class Details*]

### Nested Class Summary

Table 109: Nested Classes in DiskCacheUtility

Nested Classes
public static final enumeration <i>DiskCacheUtility.MigrationResult</i>

### Constructor Summary

Table 110: Constructors in DiskCacheUtility

Constructors
<i>DiskCacheUtility</i> ()

## Method Summary

Table 111: Methods in DiskCacheUtility

Methods
<pre>public static <i>MigrationResult</i> migrate (String sourcePath, String destinationPath)</pre> <p>Migrates disk cache from previous SDK versions to current.</p>

## Class Details

Deprecated: Provided only to help with the transition of pre-v3.4 disk caches to the current version.

This class will be removed in a future release.

Provides methods for manipulating the disk cache.

## Constructor Details

**DiskCacheUtility** ()

## Method Details

```
public static MigrationResult migrate (String sourcePath, String destinationPath)
```

Migrates disk cache from previous SDK versions to current.

### Parameters:

- **sourcePath**  
Existing disk cache path. If path does not exist, *FAILED* will be returned.
- **destinationPath**  
Destination disk cache path. This should be used as path of *setIsolatedDiskCacheRootPath(String, String)*.

### Returns:

a *DiskCacheUtility.MigrationResult* as migration result

## MigrationResult

The enumeration *MigrationResult* is a member of *com.here.android.mpa.common.DiskCacheUtility*.

## Enumeration Summary

```
public static final enumeration DiskCacheUtility.MigrationResult
```

```
extends java.lang.Enum, java.lang.Object
```

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 112: Enum Constants in MigrationResult

Fields
<pre>public static final MigrationResult SUCCESS</pre> <p>Disk cache was migrated successfully.</p>
<pre>public static final MigrationResult ALREADY_EXISTS</pre> <p>New disk cache specified as the destination path for <code>migrate(String, String)</code> already exists .</p>
<pre>public static final MigrationResult MISSING_OLD_CACHE</pre> <p>Old cache specified as the source path for <code>migrate(String, String)</code> is missing.</p>
<pre>public static final MigrationResult PATH_NOT_ALLOWED</pre> <p>The source path or destination path specified in <code>migrate(String, String)</code> cannot be the same as the default shared disk cache path.</p>
<pre>public static final MigrationResult FAILED</pre> <p>Failed to move the cache.</p>

## Method Summary

Table 113: Methods in MigrationResult

Methods
<pre>public static MigrationResult valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static DiskCacheUtility.MigrationResult[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

### Enum Constant Details

```
public static final MigrationResult SUCCESS
```

Disk cache was migrated successfully.

```
public static final MigrationResult ALREADY_EXISTS
```

New disk cache specified as the destination path for `migrate(String, String)` already exists .

```
public static final MigrationResult MISSING_OLD_CACHE
```

Old cache specified as the source path for *migrate(String, String)* is missing.

```
public static final MigrationResult PATH_NOT_ALLOWED
```

The source path or destination path specified in *migrate(String, String)* cannot be the same as the default shared disk cache path.

```
public static final MigrationResult FAILED
```

Failed to move the cache. It could be missing rights for source or destination directory. It will also fail if you move the cache across drives.

### Method Details

```
public static MigrationResult valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static DiskCacheUtility.MigrationResult[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## GeoBoundingBox

The class *GeoBoundingBox* is a member of *com.here.android.mpa.common* .

### Class Summary

```
public final class GeoBoundingBox
```

```
extends java.lang.Object
```

Represents a rectangular area in a geographic coordinate system.

[For complete information, see the section *Class Details*]

## Constructor Summary

Table 114: Constructors in GeoBoundingBox

Constructors
<p><b><code>GeoBoundingBox (GeoCoordinate topLeft, GeoCoordinate bottomRight)</code></b> Creates a <code>GeoBoundingBox</code> with specified top-left and bottom-right coordinates.</p>
<p><b><code>GeoBoundingBox (GeoCoordinate center, float height, float width)</code></b> Creates a <code>GeoBoundingBox</code> with a specified center and width and height in distance.</p>

## Method Summary

Table 115: Methods in GeoBoundingBox

Methods
<p><b><code>public boolean contains (GeoBoundingBox bbox)</code></b> Determines whether the specified <code>GeoBoundingBox</code> is covered entirely by this <code>GeoBoundingBox</code>.</p>
<p><b><code>public boolean contains (GeoCoordinate coord)</code></b> Determines whether the specified <code>GeoCoordinate</code> is contained within this <code>GeoBoundingBox</code>.</p>
<p><b><code>public boolean equals (Object other)</code></b> For documentation, see <code>java.lang.Object</code></p>
<p><b><code>public void expand (float latitudeMeters, float longitudeMeters)</code></b> Expands the <code>GeoBoundingBox</code> by a fixed distance.</p>
<p><b><code>public GeoCoordinate getBottomRight ()</code></b> Gets the current bottom-right <code>GeoCoordinate</code> of the <code>GeoBoundingBox</code> with altitude set to zero.</p>
<p><b><code>public GeoCoordinate getBottomRightBack ()</code></b> Gets the current bottom-right-back <code>GeoCoordinate</code> of the <code>GeoBoundingBox</code>.</p>
<p><b><code>public static GeoBoundingBox getBoundingBoxContainingGeoCoordinates (java.util.List &lt;GeoCoordinate&gt; coordinates)</code></b> Constructs a <code>GeoBoundingBox</code> which contains all coordinates in an array.</p>
<p><b><code>public GeoCoordinate getCenter ()</code></b> Gets the center <code>GeoCoordinate</code> of the <code>GeoBoundingBox</code>.</p>
<p><b><code>public double getHeight ()</code></b> Gets the current <code>GeoBoundingBox</code> height, in degrees.</p>
<p><b><code>public GeoCoordinate getTopLeft ()</code></b> Gets the current top-left <code>GeoCoordinate</code> of the <code>GeoBoundingBox</code> with altitude set to zero</p>
<p><b><code>public GeoCoordinate getTopLeftFront ()</code></b> Gets the current top-left-front <code>GeoCoordinate</code> of the <code>GeoBoundingBox</code>.</p>

## Methods

```
public double getWidth ()
```

Gets the current *GeoBoundingBox* width, in degrees.

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public boolean intersects (GeoBoundingBox bbox)
```

Determines whether the intersection of this *GeoBoundingBox* instance and the specified *GeoBoundingBox* is non-empty.

```
public boolean isEmpty ()
```

Determines whether the size of the enclosed *GeoBoundingBox* area is 0.

```
public GeoBoundingBox merge (GeoBoundingBox bbox)
```

Merges two *GeoBoundingBox* objects by returning the smallest *GeoBoundingBox* covering both this *GeoBoundingBox* and the specified *GeoBoundingBox* .

```
public static GeoBoundingBox mergeBoxes (java.util.List <GeoBoundingBox> bboxes)
```

Merges multiple *GeoBoundingBox* objects by returning the smallest *GeoBoundingBox* covering all specified *GeoBoundingBox* objects.

```
public void resizeToCenter (GeoCoordinate coord)
```

Increases the size of the *GeoBoundingBox* until the specified *GeoCoordinate* is located at the center.

```
public boolean setBottomRight (GeoCoordinate bottomRight)
```

Sets a bottom-right coordinate for the *GeoBoundingBox*.

```
public boolean setCoordinates (GeoCoordinate topLeft, GeoCoordinate bottomRight)
```

Sets coordinates for the *GeoBoundingBox*.

```
public boolean setTopLeft (GeoCoordinate topLeft)
```

Sets a top-left coordinate for the *GeoBoundingBox*.

```
public String toString ()
```

For documentation, see *java.lang.Object*

## Class Details

Represents a rectangular area in a geographic coordinate system.

Although a bounding box is specified by its top-left and bottom-right corner, the box is not necessarily the smallest rectangle spanned by these two points. It is possible to define geobounding boxes that are wider than 180 degrees or higher than 90 degrees (e.g. by setting the longitude of the top-left corner to a bigger value than the longitude of the bottom-right corner). Please note the top-left corner's latitude must be greater than or equal to bottom-right corner's latitude. Otherwise, the bounding box will be in invalid state.

For example, a geobounding box with longitude of -180 degrees for the top-left corner and a longitude of 180 degrees for the bottom-right corner will construct an area that encircles the globe, whereas a geobounding box with the same longitude value for both corners will construct an area with a width of 0 degrees.

## Constructor Details

### GeoBoundingBox (*GeoCoordinate* topLeft, *GeoCoordinate* bottomRight)

Creates a *GeoBoundingBox* with specified top-left and bottom-right coordinates.

#### Parameters:

- **topLeft**  
A *GeoCoordinate* representing the top-left corner of the bounding box
- **bottomRight**  
A *GeoCoordinate* representing the bottom-right corner of the bounding box

#### Throws:

- **IllegalArgumentException**  
if the arguments will construct an invalid *GeoBoundingBox*.

### GeoBoundingBox (*GeoCoordinate* center, float height, float width)

Creates a *GeoBoundingBox* with a specified center and width and height in distance.

#### Parameters:

- **center**  
A *GeoCoordinate* representing the geographical center of the bounding box.
- **height**  
The geographical height in meters
- **width**  
The geographical width in meters

## Method Details

### public boolean contains (*GeoBoundingBox* bbox)

Determines whether the specified *GeoBoundingBox* is covered entirely by this *GeoBoundingBox* .

#### Parameters:

- **bbox**  
A *GeoBoundingBox* to check for containment within this *GeoBoundingBox*

#### Returns:

True if covered by the *GeoBoundingBox*, false otherwise

#### See also:

[contains\(GeoCoordinate\)](#)

```
public boolean contains (GeoCoordinate coord)
```

Determines whether the specified *GeoCoordinate* is contained within this *GeoBoundingBox*.

**Parameters:**

- **coord**  
A *GeoCoordinate* to check for containment within this *GeoBoundingBox*

**Returns:**

True if contained within the *GeoBoundingBox*, false otherwise

**See also:**

[contains\(\*GeoBoundingBox\*\)](#)

```
public boolean equals (Object other)
```

For documentation, see *java.lang.Object*

**Parameters:**

- **other**

```
public void expand (float latitudeMeters, float longitudeMeters)
```

Expands the *GeoBoundingBox* by a fixed distance.

**Parameters:**

- **latitudeMeters**  
The geographical height in meters to expand the *GeoBoundingBox*
- **longitudeMeters**  
The geographical width in meters to expand the *GeoBoundingBox*

```
public GeoCoordinate getBottomRight ()
```

Gets the current bottom-right *GeoCoordinate* of the *GeoBoundingBox* with altitude set to zero.

**Returns:**

The current bottom-right *GeoCoordinate*.

```
public GeoCoordinate getBottomRightBack ()
```

Gets the current bottom-right-back *GeoCoordinate* of the *GeoBoundingBox*. The altitude of this geocoordinate will be valid only when the *GeoBoundingBox* was created with this information.

**Returns:**

The current bottom-right-back *GeoCoordinate*.

```
public static GeoBoundingBox getBoundingBoxContainingGeoCoordinates  
(java.util.List <GeoCoordinate> coordinates)
```

Constructs a *GeoBoundingBox* which contains all coordinates in an array.

The constructed *GeoBoundingBox* will be the smallest possible box which contains all the *GeoCoordinate* in the input array.

**Parameters:**

- **coordinates**  
An array of *GeoCoordinate* defining the new *GeoBoundingBox*

**Returns:**

The *GeoBoundingBox*

```
public GeoCoordinate getCenter ()
```

Gets the center *GeoCoordinate* of the *GeoBoundingBox*.

**Returns:**

The center coordinate of the *GeoBoundingBox*

```
public double getHeight ()
```

Gets the current *GeoBoundingBox* height, in degrees.

**Returns:**

The current height

```
public GeoCoordinate getTopLeft ()
```

Gets the current top-left *GeoCoordinate* of the *GeoBoundingBox* with altitude set to zero

**Returns:**

The current top-left *GeoCoordinate*.

```
public GeoCoordinate getTopLeftFront ()
```

Gets the current top-left-front *GeoCoordinate* of the *GeoBoundingBox*. The altitude of this geocoordinate will be valid only when the *GeoBoundingBox* was created with this information.

**Returns:**

The current top-left-front *GeoCoordinate*.

```
public double getWidth ()
```

Gets the current *GeoBoundingBox* width, in degrees.

**Returns:**

The current width

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public boolean intersects (GeoBoundingBox bbox)
```

Determines whether the intersection of this *GeoBoundingBox* instance and the specified *GeoBoundingBox* is non-empty.

**Parameters:**

- **bbox**

A *GeoBoundingBox* to check for intersection with this *GeoBoundingBox*

**Returns:**

True if the intersection of *GeoBoundingBox* objects is non-empty, false otherwise

```
public boolean isEmpty ()
```

Determines whether the size of the enclosed *GeoBoundingBox* area is 0.

**Returns:**

True if the size of the enclosed area is 0, false otherwise

```
public GeoBoundingBox merge (GeoBoundingBox bbox)
```

Merges two *GeoBoundingBox* objects by returning the smallest *GeoBoundingBox* covering both this *GeoBoundingBox* and the specified *GeoBoundingBox*.

**Parameters:**

- **bbox**

A *GeoBoundingBox* to merge with this *GeoBoundingBox*

**Returns:**

The smallest *GeoBoundingBox* that covers both of the merged *GeoBoundingBox* objects

**See also:**

[\*mergeBoxes\(List<GeoBoundingBox>\)\*](#)

```
public static GeoBoundingBox mergeBoxes (java.util.List <GeoBoundingBox>
boxes)
```

Merges multiple *GeoBoundingBox* objects by returning the smallest *GeoBoundingBox* covering all specified *GeoBoundingBox* objects.

**Parameters:**

- **boxes**  
A list of *GeoBoundingBox* objects to merge

**Returns:**

The smallest *GeoBoundingBox* that covers all of the merged *GeoBoundingBox* objects

**See also:**

[merge\(\*GeoBoundingBox\*\)](#)

```
public void resizeToCenter (GeoCoordinate coord)
```

Increases the size of the *GeoBoundingBox* until the specified *GeoCoordinate* is located at the center.

**Parameters:**

- **coord**  
A *GeoCoordinate* that will become the center of the resized *GeoBoundingBox*

```
public boolean setBottomRight (GeoCoordinate bottomRight)
```

Sets a bottom-right coordinate for the *GeoBoundingBox*.

**Parameters:**

- **bottomRight**  
A *GeoCoordinate* representing the desired bottom-right coordinate

**Returns:**

True if *setBottomRight* complete successfully.

```
public boolean setCoordinates (GeoCoordinate topLeft, GeoCoordinate
bottomRight)
```

Sets coordinates for the *GeoBoundingBox*.

**Parameters:**

- **topLeft**  
A *GeoCoordinate* representing the desired top-left coordinate
- **bottomRight**  
A *GeoCoordinate* representing the desired bottom-right coordinate

**Returns:**

True if `setCoordinates` complete successfully.

```
public boolean setTopLeft (GeoCoordinate topLeft)
```

Sets a top-left coordinate for the *GeoBoundingBox*.

**Parameters:**

- **topLeft**

A *GeoCoordinate* representing the desired top-left coordinate

**Returns:**

True if `setTopLeft` complete successfully.

```
public String toString ()
```

For documentation, see *java.lang.Object*

## GeoCoordinate

The class *GeoCoordinate* is a member of *com.here.android.mpa.common* .

### Class Summary

```
public final class GeoCoordinate
```

*extends java.lang.Object*

Represents a WGS84 coordinate with double precision.

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 116: Constructors in *GeoCoordinate*

Constructors
<p><i>GeoCoordinate</i> (double latitude, double longitude)</p> <p>Creates a <i>GeoCoordinate</i> with specified latitude and longitude values.</p>
<p><i>GeoCoordinate</i> (double latitude, double longitude, double altitude)</p> <p>Creates a <i>GeoCoordinate</i> with specified latitude, longitude and altitude values.</p>
<p><i>GeoCoordinate</i> (<i>GeoCoordinate</i> coordinate)</p> <p>Creates a copy of an existing <i>GeoCoordinate</i> object.</p>

## Field Summary

Table 117: Fields in GeoCoordinate

Fields
<pre>public static final int UNKNOWN_ALTITUDE</pre> <p>Definition of an unknown altitude.</p>

## Method Summary

Table 118: Methods in GeoCoordinate

Methods
<pre>public double distanceTo (GeoCoordinate coord)</pre> <p>Calculates the distance (using the Haversine formula), as measured in meters, between this GeoCoordinate and the specified GeoCoordinate .</p>
<pre>public boolean equals (Object other)</pre> <p>For documentation, see <i>java.lang.Object</i></p>
<pre>public double getAltitude ()</pre> <p>Gets the current altitude, as measured in meters above sea level, of the GeoCoordinate (z-axis on a map).</p>
<pre>public double getHeading (GeoCoordinate coord)</pre> <p>Returns heading from this point to the given coordinate in degrees.</p>
<pre>public double getLatitude ()</pre> <p>Gets the current latitude, as measured in degrees, of the GeoCoordinate .</p>
<pre>public double getLongitude ()</pre> <p>Gets the current longitude, as measured in degrees, of the GeoCoordinate .</p>
<pre>public int hashCode ()</pre> <p>For documentation, see <i>java.lang.Object</i></p>
<pre>public boolean isValid ()</pre> <p>Determines whether the GeoCoordinate object is valid.</p>
<pre>public void setAltitude (double altitude)</pre> <p>Sets an altitude value, in meters above sea level, for the GeoCoordinate .</p>
<pre>public void setLatitude (double latitude)</pre> <p>Sets a latitude value, in degrees, for the GeoCoordinate .</p>
<pre>public void setLongitude (double longitude)</pre> <p>Sets a longitude value, in degrees, for the GeoCoordinate .</p>
<pre>public String toString ()</pre> <p>For documentation, see <i>java.lang.Object</i></p>

## Class Details

Represents a WGS84 coordinate with double precision. A `GeoCoordinate` encapsulates a latitude and longitude value, plus an optional altitude value.

## Constructor Details

### `GeoCoordinate (double latitude, double longitude)`

Creates a `GeoCoordinate` with specified latitude and longitude values.

#### Parameters:

- **latitude**  
Initial latitude value, in degrees, between -90.0 and 90.0 inclusive. If a passed value is above the maximum or below the minimum, it will be adjusted to the nearest acceptable value
- **longitude**  
Initial longitude value, in degrees, greater than or equal to -180.0 and less than 180.0. Any unsupported value will be converted to its equivalent within the supported range (e.g. a value of -200.0 will be corrected to 160.0 (-200.0 + 360.0))

#### See also:

[\*`GeoCoordinate\(double, double, double\)`\*](#)

### `GeoCoordinate (double latitude, double longitude, double altitude)`

Creates a `GeoCoordinate` with specified latitude, longitude and altitude values.

#### Parameters:

- **latitude**  
Initial latitude value, in degrees, between -90.0 and 90.0 inclusive. If a passed value is above the maximum or below the minimum, it will be adjusted to the nearest acceptable value
- **longitude**  
Initial longitude value, in degrees, greater than or equal to -180.0 and less than 180.0. Any unsupported value will be converted to its equivalent within the supported range (e.g. a value of -200.0 will be corrected to 160.0 (-200.0 + 360.0))
- **altitude**  
Initial altitude value, in meters, between -10000.0 and 10000.0 inclusive. If a passed value is above the maximum or below the minimum, it will be adjusted to the nearest acceptable value

#### See also:

[\*`GeoCoordinate\(double, double\)`\*](#)

[\*`GeoCoordinate\(GeoCoordinate\)`\*](#)

### `GeoCoordinate (GeoCoordinate coordinate)`

Creates a copy of an existing `GeoCoordinate` object.

**Parameters:**

- **coordinate**  
A `GeoCoordinate` object used to initialize the new `GeoCoordinate`

**See also:**

[GeoCoordinate\(double, double, double\)](#)

[GeoCoordinate\(double, double\)](#)

## Field Details

```
public static final int UNKNOWN_ALTITUDE
```

Definition of an unknown altitude.

## Method Details

```
public double distanceTo (GeoCoordinate coord)
```

Calculates the distance (using the Haversine formula), as measured in meters, between this `GeoCoordinate` and the specified `GeoCoordinate` .

**Parameters:**

- **coord**  
A second `GeoCoordinate` some distance away

**Returns:**

The distance between the coordinates

```
public boolean equals (Object other)
```

For documentation, see *java.lang.Object*

**Parameters:**

- **other**

```
public double getAltitude ()
```

Gets the current altitude, as measured in meters above sea level, of the `GeoCoordinate` (z-axis on a map).

**Returns:**

The current altitude (returns 0.0 if the altitude is unavailable)

```
public double getHeading (GeoCoordinate coord)
```

Returns heading from this point to the given coordinate in degrees.

**Parameters:**

- **coord**  
A second *GeoCoordinate* to which the heading is calculated

**Returns:**

Heading from this coordinate to the given coordinate, in degrees, from north increasing clockwise.

```
public double getLatitude ()
```

Gets the current latitude, as measured in degrees, of the *GeoCoordinate* . Latitude represents the north-south coordinate, or the y-axis on a map.

**Returns:**

The current latitude

```
public double getLongitude ()
```

Gets the current longitude, as measured in degrees, of the *GeoCoordinate* . Longitude represents the east-west coordinate, or the x-axis on a map.

**Returns:**

The current longitude

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public boolean isValid ()
```

Determines whether the *GeoCoordinate* object is valid. An invalid *GeoCoordinate* may be returned by [PositioningManager](#) if there is no positive lock on a GPS position.

**Returns:**

True if the *GeoCoordinate* is valid, false otherwise

```
public void setAltitude (double altitude)
```

Sets an altitude value, in meters above sea level, for the *GeoCoordinate* .

**Parameters:**

- **altitude**

A double-precision altitude value, a range of between -10000.0 and 10000.0 inclusive. If an invalid value is specified, it will be adjusted to the closest possible altitude value (For example, a specified value of -10200.0 will be set to -10000.0)

```
public void setLatitude (double latitude)
```

Sets a latitude value, in degrees, for the `GeoCoordinate` .

**Parameters:**

- **latitude**

A double-precision latitude value, a range between -90.0 and 90.0 inclusive. If an invalid value is specified, it will be adjusted to the closest possible latitude value (For example, a specified value of -100 will be set to -90.0)

```
public void setLongitude (double longitude)
```

Sets a longitude value, in degrees, for the `GeoCoordinate` .

**Parameters:**

- **longitude**

A double-precision longitude value, a range between -180.0 and less than 180.0 inclusive. If an invalid value is specified, it will be adjusted to the closest possible longitude value (For example, a specified value of -200.0 will be set to 160.0)

```
public String toString ()
```

For documentation, see *java.lang.Object*

## GeoPolygon

The class `GeoPolygon` is a member of `com.here.android.mpa.common` .

### Class Summary

```
public final class GeoPolygon
```

*extends* `com.here.android.mpa.common.GeoPolyline`, `java.lang.Object`

Represents a `GeoPolygon` a polygon object defined in terms of the geographic coordinates of its vertices.

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 119: Constructors in GeoPolygon

Constructors
<a href="#">GeoPolygon ()</a> Default Constructor
<a href="#">GeoPolygon (java.util.List &lt;GeoCoordinate&gt; points)</a> Constructor that creates a new instance of GeoPolygon from a list of points.

## Method Summary

Table 120: Methods in GeoPolygon

Methods
<code>public boolean equals (Object other)</code> Checks whether the given GeoPolygon object is equal to that supplied by the caller.
<code>public int hashCode ()</code> Obtains the hash code for the given object.

## Class Details

Represents a GeoPolygon a polygon object defined in terms of the geographic coordinates of its vertices.

The only difference between a GeoPolygon and a [GeoPolyline](#) is that the polygon represents a closed loop of points. The minimum number of points in a GeoPolygon must be three.

This class can be used with [MapPolygon](#) to render a polygon.

## Constructor Details

### GeoPolygon ()

Default Constructor

### GeoPolygon (java.util.List <GeoCoordinate> points)

Constructor that creates a new instance of GeoPolygon from a list of points.

#### Parameters:

- **points**  
A list of points to form the GeoPolygon.

#### See also:

[MapPolygon](#)

## Method Details

```
public boolean equals (Object other)
```

Checks whether the given `GeoPolygon` object is equal to that supplied by the caller. Two objects are equal if they are both instances of `GeoPolygon` and the coordinates of their vertices are the same.

### Parameters:

- **other**  
A polygon object to compare to the given polygon.

### Returns:

true if the polygons are equal, otherwise false.

```
public int hashCode ()
```

Obtains the hash code for the given object.

### Returns:

A value representing the hash code.

## GeoPolyline

The class `GeoPolyline` is a member of `com.here.android.mpa.common`.

## Class Summary

```
public class GeoPolyline
```

```
extends java.lang.Object
```

Interface representing a `GeoPolyline`.

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 121: Constructors in `GeoPolyline`

Constructors
<pre>GeoPolyline ()</pre> <p>Public Constructor</p>
<pre>GeoPolyline (java.util.List &lt;GeoCoordinate&gt; points)</pre> <p>Creates a <code>GeoPolyline</code> from a list of points.</p>

## Method Summary

Table 122: Methods in GeoPolyline

Methods
<pre>public void <b>add</b> (java.util.List &lt;GeoCoordinate&gt; points)</pre> <p>Adds a list of new points into the GeoPolyline .</p>
<pre>public void <b>add</b> (GeoCoordinate point)</pre> <p>Adds a new point into the GeoPolyline .</p>
<pre>public void <b>clear</b> ()</pre> <p>Removes all points from the GeoPolyline</p>
<pre>public boolean <b>contains</b> (GeoCoordinate point)</pre> <p>Checks to see if a GeoCoordinate resides within this GeoPolyline .</p>
<pre>public boolean <b>equals</b> (Object other)</pre> <p>For documentation, see <i>java.lang.Object</i></p>
<pre>public java.util.List &lt;GeoCoordinate&gt; <b>getAllPoints</b> ()</pre> <p>Gets all points in the GeoPolyline .</p>
<pre>public GeoBoundingBox <b>getBoundingBox</b> ()</pre> <p>Gets the geographic bounding box that contains this GeoPolyline .</p>
<pre>public GeoCoordinate <b>getNearest</b> (GeoCoordinate point)</pre> <p>Gets the GeoCoordinate along the path of the MapPolyline that is closest to the specified GeoCoordinate .</p>
<pre>public int <b>getNearestIndex</b> (GeoCoordinate point)</pre> <p>Gets the index of the point that is closest to the specified GeoCoordinate .</p>
<pre>public int <b>getNumberOfPoints</b> ()</pre> <p>Gets the total number of points currently in the GeoPolyline .</p>
<pre>public GeoCoordinate <b>getPoint</b> (int index)</pre> <p>Gets a point in the GeoPolyline .</p>
<pre>public int <b>hashCode</b> ()</pre> <p>For documentation, see <i>java.lang.Object</i></p>
<pre>public void <b>insert</b> (GeoCoordinate point, int index)</pre> <p>Inserts a point into the GeoPolyline at index .</p>
<pre>public double <b>length</b> ()</pre> <p>The geographical length of this GeoPolyline .</p>
<pre>public void <b>remove</b> (int index)</pre> <p>Removes a specific point from the GeoPolyline at the given index .</p>

## Class Details

Interface representing a `GeoPolyline`. A `GeoPolyline` consists of 2 or more points. This class can be used with `MapPolyline` to render a polyline.

## Constructor Details

### `GeoPolyline ()`

Public Constructor

### `GeoPolyline (java.util.List <GeoCoordinate> points)`

Creates a `GeoPolyline` from a list of points.

#### Parameters:

- `points`  
A list of points to form the `GeoPolyline`

#### See also:

[MapPolyline](#)

## Method Details

### `public void add (java.util.List <GeoCoordinate> points)`

Adds a list of new points into the `GeoPolyline`.

#### Parameters:

- `points`  
A list of `GeoCoordinate`s to be added

### `public void add (GeoCoordinate point)`

Adds a new point into the `GeoPolyline`.

#### Parameters:

- `point`  
Point to be added

### `public void clear ()`

Removes all points from the `GeoPolyline`

### `public boolean contains (GeoCoordinate point)`

Checks to see if a `GeoCoordinate` resides within this `GeoPolyline` .

**Parameters:**

- **point**

The coordinate that will be used to match against the points in this `GeoPolyline`

**Returns:**

boolean true if the point is in this `GeoPolyline`

```
public boolean equals (Object other)
```

For documentation, see *java.lang.Object*

**Parameters:**

- **other**

```
public java.util.List <GeoCoordinate> getAllPoints ()
```

Gets all points in the `GeoPolyline` .

**Returns:**

A list of `GeoCoordinate`.

```
public GeoBoundingBox getBoundingBox ()
```

Gets the geographic bounding box that contains this `GeoPolyline` .

**Returns:**

`GeoBoundingBox` that contains this `GeoPolyline`. Can be null if the line has fewer than 2 points.

```
public GeoCoordinate getNearest (GeoCoordinate point)
```

Gets the `GeoCoordinate` along the path of the `MapPolyline` that is closest to the specified `GeoCoordinate` .

**Parameters:**

- **point**

A `GeoCoordinate` reference point for finding the nearest `GeoCoordinate` along the `MapPolyline` path

**Returns:**

The `GeoCoordinate` along the `MapPolyline` path that is closest to the specified `GeoCoordinate`

**See also:**

[getNearestIndex\(GeoCoordinate\)](#)

```
public int getNearestIndex (GeoCoordinate point)
```

Gets the index of the point that is closest to the specified *GeoCoordinate* .

**Parameters:**

- **point**  
A *GeoCoordinate* reference point for finding the nearest point's list index

**Returns:**

The list index of the point that is closest to the specified *GeoCoordinate*

**See also:**

[getNearest\(\*GeoCoordinate\*\)](#)

```
public int getNumberOfPoints ()
```

Gets the total number of points currently in the *GeoPolyline* .

**Returns:**

int total number of points

```
public GeoCoordinate getPoint (int index)
```

Gets a point in the *GeoPolyline* .

**Parameters:**

- **index**  
index of the point to get.

**Returns:**

*GeoCoordinate*. Returns null if the index is out of bound.

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public void insert (GeoCoordinate point, int index)
```

Inserts a point into the *GeoPolyline* at index .

**Parameters:**

- **point**  
Point to be added
- **index**  
Index to add the point into the list. *index* must be within the bounds of 0 and current count of points.

```
public double length ()
```

The geographical length of this `GeoPolyline` .

**Returns:**

Length in meters.

```
public void remove (int index)
```

Removes a specific point from the `GeoPolyline` at the given `index` .

**Parameters:**

- **index**  
index of the point to be removed.

## GeoPosition

The class `GeoPosition` is a member of `com.here.android.mpa.common` .

### Class Summary

```
public class GeoPosition
```

```
extends java.lang.Object
```

Represents position, speed, and heading information as provided by a positioning device.

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 123: Constructors in `GeoPosition`

Constructors
<code>GeoPosition (GeoCoordinate coordinate)</code> Public constructor

### Field Summary

Table 124: Fields in `GeoPosition`

Fields
<code>public static final int SOURCE_CACHE</code> <code>GeoPosition</code> is returned from server cache.

## Fields

`public static final int` [SOURCE\\_FUSION](#)

GeoPosition is returned as filtered from several sources.

`public static final int` [SOURCE\\_HARDWARE](#)

GeoPosition is returned from hardware.

`public static final int` [SOURCE\\_INDOOR](#)

GeoPosition is returned from indoor radio maps.

`public static final int` [SOURCE\\_NONE](#)

Source is unknown or not available.

`public static final int` [SOURCE\\_OFFLINE](#)

GeoPosition is returned from radio maps.

`public static final int` [SOURCE\\_ONLINE](#)

GeoPosition is returned from server.

`public static final int` [TECHNOLOGY\\_BLE](#)

GeoPosition is calculated using Bluetooth LE measurements.

`public static final int` [TECHNOLOGY\\_CELL](#)

GeoPosition is calculated using Cell measurements.

`public static final int` [TECHNOLOGY\\_GNSS](#)

GeoPosition is calculated by GNSS chip.

`public static final int` [TECHNOLOGY\\_NONE](#)

Technology is unknown or not available.

`public static final int` [TECHNOLOGY\\_WIFI](#)

GeoPosition is calculated using Wi-Fi measurements.

`public static final int` [UNKNOWN](#)

Definition of an unknown accuracy, course (heading/bearing) or speed

## Method Summary

Table 125: Methods in GeoPosition

### Methods

`public boolean` [equals](#) (Object other)

For documentation, see *java.lang.Object*

`public float` [getAltitudeAccuracy](#) ()

Gets the current altitude accuracy as measured by the enabled positioning device.

`public String` [getBuildingId](#) ()

Get building ID of this position estimate, if known.

## Methods

```
public String getBuildingName ()
```

Get building name in human readable format, e.g.

```
public GeoCoordinate getCoordinate ()
```

Gets the current [GeoCoordinate](#) as measured by the enabled positioning device.

```
public Integer getFloorId ()
```

FloorId is identifying the floor level in the building.

```
public double getHeading ()
```

Gets the current course heading as measured by the enabled positioning device.

```
public float getLatitudeAccuracy ()
```

Gets the current latitude accuracy as measured by the enabled positioning device.

```
public float getLongitudeAccuracy ()
```

Gets the current longitude accuracy as measured by the enabled positioning device.

```
public int getPositionSource ()
```

Returns bitmask of sources for this [GeoPosition](#) update.

```
public int getPositionTechnology ()
```

Returns bitmask of technologies for this [GeoPosition](#) update.

```
public double getSpeed ()
```

Gets the current speed as measured by the enabled positioning device.

```
public Date getTimestamp ()
```

Gets the timestamp for the last position measured by the enabled positioning device.

```
public int hashCode ()
```

For documentation, see [java.lang.Object](#)

```
public boolean isValid ()
```

Determines whether the [GeoPosition](#) object is valid.

## Class Details

Represents position, speed, and heading information as provided by a positioning device.

## Constructor Details

### [GeoPosition](#) ([GeoCoordinate](#) coordinate)

Public constructor

#### Parameters:

- **coordinate**  
A [GeoCoordinate](#) to be used by this object.

## Field Details

```
public static final int SOURCE_CACHE
```

GeoPosition is returned from server cache.

```
public static final int SOURCE_FUSION
```

GeoPosition is returned as filtered from several sources.

```
public static final int SOURCE_HARDWARE
```

GeoPosition is returned from hardware.

```
public static final int SOURCE_INDOOR
```

GeoPosition is returned from indoor radio maps.

```
public static final int SOURCE_NONE
```

Source is unknown or not available.

```
public static final int SOURCE_OFFLINE
```

GeoPosition is returned from radio maps.

```
public static final int SOURCE_ONLINE
```

GeoPosition is returned from server.

```
public static final int TECHNOLOGY_BLE
```

GeoPosition is calculated using Bluetooth LE measurements.

```
public static final int TECHNOLOGY_CELL
```

GeoPosition is calculated using Cell measurements.

```
public static final int TECHNOLOGY_GNSS
```

GeoPosition is calculated by GNSS chip.

```
public static final int TECHNOLOGY_NONE
```

Technology is unknown or not available.

```
public static final int TECHNOLOGY_WIFI
```

GeoPosition is calculated using Wi-Fi measurements.

```
public static final int UNKNOWN
```

Definition of an unknown accuracy, course (heading/bearing) or speed

## Method Details

```
public boolean equals (Object other)
```

For documentation, see *java.lang.Object*

### Parameters:

- **other**

```
public float getAltitudeAccuracy ()
```

Gets the current altitude accuracy as measured by the enabled positioning device.

### Returns:

The current altitude accuracy or `GeoPosition.UNKNOWN` if unknown.

```
public String getBuildingId ()
```

Get building ID of this position estimate, if known.

### Returns:

Building ID as String or null if building is not set.

```
public String getBuildingName ()
```

Get building name in human readable format, e.g. "London Heathrow Airport". There can be different buildings with the same name.

### Returns:

Building name or null if building name is not set.

```
public GeoCoordinate getCoordinate ()
```

Gets the current `GeoCoordinate` as measured by the enabled positioning device.

**Returns:**

The current GeoCoordinate

```
public Integer getFloorId ()
```

FloorId is identifying the floor level in the building. Floor id 0 specifies the floor that is considered the Main Level of the building. In the case building has multiple levels that can be considered as Main Level, the lowest level which can be considered as Main Level, will be chosen. Floors below the chosen Main Level will have negative integers and floors above the chosen Main Level will have positive integers: The floor above the Main Level has floor id 1 and the floor below the Main Level has floor id -1.

**Returns:**

Floor ID or null if floor ID is not set.

```
public double getHeading ()
```

Gets the current course heading as measured by the enabled positioning device.

**Returns:**

The current course heading or `GeoPosition.UNKNOWN` if unknown.

```
public float getLatitudeAccuracy ()
```

Gets the current latitude accuracy as measured by the enabled positioning device.

**Returns:**

The current latitude accuracy or `GeoPosition.UNKNOWN` if unknown.

```
public float getLongitudeAccuracy ()
```

Gets the current longitude accuracy as measured by the enabled positioning device.

**Returns:**

The current longitude accuracy or `GeoPosition.UNKNOWN` if unknown.

```
public int getPositionSource ()
```

Returns bitmask of sources for this GeoPosition update.

**Returns:**

Bitmask of sources for this GeoPosition update.

**See also:**

[SOURCE\\_ONLINE](#)

[SOURCE\\_OFFLINE](#)

[SOURCE\\_CACHE](#)

[SOURCE\\_INDOOR](#)

[SOURCE\\_HARDWARE](#)

[SOURCE\\_FUSION](#)

```
public int getPositionTechnology ()
```

Returns bitmask of technologies for this GeoPosition update.

**Returns:**

Bitmask of technologies for this GeoPosition update.

**See also:**

[TECHNOLOGY\\_WIFI](#)

[TECHNOLOGY\\_CELL](#)

[TECHNOLOGY\\_BLE](#)

[TECHNOLOGY\\_GNSS](#)

```
public double getSpeed ()
```

Gets the current speed as measured by the enabled positioning device.

**Returns:**

The current speed or `GeoPosition.UNKNOWN` if unknown.

```
public Date getTimestamp ()
```

Gets the timestamp for the last position measured by the enabled positioning device.

**Returns:**

The timestamp

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public boolean isValid ()
```

Determines whether the GeoPosition object is valid. A GeoPosition is valid if its associated GeoCoordinate is valid.

**Returns:**

True if the GeoPosition is valid, false otherwise

## IconCategory

The enumeration *IconCategory* is a member of *com.here.android.mpa.common*.

### Enumeration Summary

public final enumeration **IconCategory**

extends *java.lang.Enum*, *java.lang.Object*

Represents all the possible categories for an icon.

[For complete information, see the section *Enumeration Details*]

**See also:**

*setCategory(IconCategory)*

### Enum Constant Summary

Table 126: Enum Constants in IconCategory

Fields
public static final <i>IconCategory</i> <b>AIRLINE_ACCESS</b>
public static final <i>IconCategory</i> <b>AMUSEMENT_PARK</b>
public static final <i>IconCategory</i> <b>CAR_DEALER</b>
public static final <i>IconCategory</i> <b>CASINO</b>
public static final <i>IconCategory</i> <b>CINEMA</b>
public static final <i>IconCategory</i> <b>COMPANY</b>
public static final <i>IconCategory</i> <b>CONCERT_HALL</b>
public static final <i>IconCategory</i> <b>CONGRESS</b>
public static final <i>IconCategory</i> <b>COURTHOUSE</b>
public static final <i>IconCategory</i> <b>CULTURAL_CENTRE</b>
public static final <i>IconCategory</i> <b>EXHIBITION_CENTRE</b>
public static final <i>IconCategory</i> <b>GOLF_COURSE</b>
public static final <i>IconCategory</i> <b>GOVERNMENT_OFFICE</b>
public static final <i>IconCategory</i> <b>HOLIDAY_PARK</b>
public static final <i>IconCategory</i> <b>MUSEUM</b>
public static final <i>IconCategory</i> <b>OPERA</b>
public static final <i>IconCategory</i> <b>PARKING_GARAGE</b>

**Fields**

```
public static final IconCategory PETROL_STATION
```

```
public static final IconCategory PLACE_OF_WORSHIP
```

```
public static final IconCategory POST_OFFICE
```

```
public static final IconCategory RENT_A_CAR_FACILITY
```

```
public static final IconCategory REST_AREA
```

```
public static final IconCategory RESTAURANT
```

```
public static final IconCategory SHOP
```

```
public static final IconCategory SHOPPING_CENTRE
```

```
public static final IconCategory STADIUM
```

```
public static final IconCategory THEATRE
```

```
public static final IconCategory TOURIST_ATTRACTION
```

```
public static final IconCategory TOURIST_INFORMATION_CENTRE
```

```
public static final IconCategory UNIVERSITY
```

```
public static final IconCategory ZOO
```

```
public static final IconCategory LIBRARY
```

```
public static final IconCategory CAMPING
```

```
public static final IconCategory BAR_DISCO
```

```
public static final IconCategory EMBASSY
```

```
public static final IconCategory FERRY_TERMINAL
```

```
public static final IconCategory FRONTIER_CROSSING
```

```
public static final IconCategory HOSPITAL
```

```
public static final IconCategory HOTEL
```

```
public static final IconCategory PARKING_AREA
```

```
public static final IconCategory POLICE
```

```
public static final IconCategory RAILWAY_STATION
```

```
public static final IconCategory METRO_STATION
```

```
public static final IconCategory AIRPORT
```

```
public static final IconCategory MOUNTAIN_PASS
```

```
public static final IconCategory MOUNTAIN_PEAK
```

```
public static final IconCategory CAR_REPAIR
```

```
public static final IconCategory CASH_DISPENSER
```

Fields	
<code>public static final</code>	<code>IconCategory</code> <b>PARK_RECREATION</b>
<code>public static final</code>	<code>IconCategory</code> <b>PHARMACY</b>
<code>public static final</code>	<code>IconCategory</code> <b>BEACH</b>
<code>public static final</code>	<code>IconCategory</code> <b>BUS_STATION</b>
<code>public static final</code>	<code>IconCategory</code> <b>EDUCATION</b>
<code>public static final</code>	<code>IconCategory</code> <b>RESIDENTIAL_AREA</b>
<code>public static final</code>	<code>IconCategory</code> <b>NIGHT_CLUB</b>
<code>public static final</code>	<code>IconCategory</code> <b>PUBLIC_TOILET</b>
<code>public static final</code>	<code>IconCategory</code> <b>LAUNDRY</b>
<code>public static final</code>	<code>IconCategory</code> <b>TAXI_STAND</b>
<code>public static final</code>	<code>IconCategory</code> <b>RAILWAY_ACCESS</b>
<code>public static final</code>	<code>IconCategory</code> <b>BARS_CAFES</b>
<code>public static final</code>	<code>IconCategory</code> <b>PARKING</b>
<code>public static final</code>	<code>IconCategory</code> <b>SPORT_OUTDOOR</b>
<code>public static final</code>	<code>IconCategory</code> <b>METRO_ACCESS</b>
<code>public static final</code>	<code>IconCategory</code> <b>AUT_METRO_ACCESS</b>
<code>public static final</code>	<code>IconCategory</code> <b>AUT_METRO_STOP</b>
<code>public static final</code>	<code>IconCategory</code> <b>BEL_METRO_ACCESS</b>
<code>public static final</code>	<code>IconCategory</code> <b>BEL_METRO_STOP</b>
<code>public static final</code>	<code>IconCategory</code> <b>CZE_METRO_ACCESS</b>
<code>public static final</code>	<code>IconCategory</code> <b>CZE_METRO_STOP</b>
<code>public static final</code>	<code>IconCategory</code> <b>DEN_METRO_ACCESS</b>
<code>public static final</code>	<code>IconCategory</code> <b>DEN_METRO_STOP</b>
<code>public static final</code>	<code>IconCategory</code> <b>FIN_METRO_ACCESS</b>
<code>public static final</code>	<code>IconCategory</code> <b>FIN_METRO_STOP</b>
<code>public static final</code>	<code>IconCategory</code> <b>FRA_METRO_ACCESS</b>
<code>public static final</code>	<code>IconCategory</code> <b>FRA_METRO_STOP</b>
<code>public static final</code>	<code>IconCategory</code> <b>FRA_RER_ACCESS</b>
<code>public static final</code>	<code>IconCategory</code> <b>FRA_RER_STOP</b>
<code>public static final</code>	<code>IconCategory</code> <b>DEU_METRO_ACCESS</b>
<code>public static final</code>	<code>IconCategory</code> <b>DEU_METRO_STOP</b>

**Fields**

```
public static final IconCategory DEU_SBAHN_ACCESS
public static final IconCategory DEU_SBAHN_STOP
public static final IconCategory ITA_METRO_ACCESS
public static final IconCategory ITA_METRO_STOP
public static final IconCategory NOR_METRO_ACCESS
public static final IconCategory NOR_METRO_STOP
public static final IconCategory PRT_METRO_ACCESS
public static final IconCategory PRT_METRO_STOP
public static final IconCategory ESP_BARCELONA_METRO_ACCESS
public static final IconCategory ESP_BARCELONA_METRO_STOP
public static final IconCategory ESP_CERCANIAS_METRO_ACCESS
public static final IconCategory ESP_CERCANIAS_METRO_STOP
public static final IconCategory ESP_MADRID_METRO_ACCESS
public static final IconCategory ESP_MADRID_METRO_STOP
public static final IconCategory SWE_METRO_ACCESS
public static final IconCategory SWE_METRO_STOP
public static final IconCategory GBR_GLASGOW_METRO_ACCESS
public static final IconCategory GBR_GLASGOW_METRO_STOP
public static final IconCategory GBR_LONDON_METRO_ACCESS
public static final IconCategory GBR_LONDON_METRO_STOP
public static final IconCategory ALL
```

**Method Summary**

Table 127: Methods in IconCategory

**Methods**

```
public static IconCategory valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static IconCategory[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

**Enumeration Details**

Represents all the possible categories for an icon.

See also:

[setCategory\(IconCategory\)](#)

## Enum Constant Details

public static final *IconCategory* AIRLINE\_ACCESS

public static final *IconCategory* AMUSEMENT\_PARK

public static final *IconCategory* CAR\_DEALER

public static final *IconCategory* CASINO

public static final *IconCategory* CINEMA

public static final *IconCategory* COMPANY

public static final *IconCategory* CONCERT\_HALL

public static final *IconCategory* CONGRESS

public static final *IconCategory* COURTHOUSE

public static final *IconCategory* CULTURAL\_CENTRE

public static final *IconCategory* EXHIBITION\_CENTRE

public static final *IconCategory* GOLF\_COURSE

public static final *IconCategory* GOVERNMENT\_OFFICE

public static final *IconCategory* HOLIDAY\_PARK

```
public static final IconCategory MUSEUM
```

```
public static final IconCategory OPERA
```

```
public static final IconCategory PARKING_GARAGE
```

```
public static final IconCategory PETROL_STATION
```

```
public static final IconCategory PLACE_OF_WORSHIP
```

```
public static final IconCategory POST_OFFICE
```

```
public static final IconCategory RENT_A_CAR_FACILITY
```

```
public static final IconCategory REST_AREA
```

```
public static final IconCategory RESTAURANT
```

```
public static final IconCategory SHOP
```

```
public static final IconCategory SHOPPING_CENTRE
```

```
public static final IconCategory STADIUM
```

```
public static final IconCategory THEATRE
```

```
public static final IconCategory TOURIST_ATTRACTION
```

```
public static final IconCategory TOURIST_INFORMATION_CENTRE
```

```
public static final IconCategory UNIVERSITY
```

```
public static final IconCategory ZOO
```

```
public static final IconCategory LIBRARY
```

```
public static final IconCategory CAMPING
```

```
public static final IconCategory BAR_DISCO
```

```
public static final IconCategory EMBASSY
```

```
public static final IconCategory FERRY_TERMINAL
```

```
public static final IconCategory FRONTIER_CROSSING
```

```
public static final IconCategory HOSPITAL
```

```
public static final IconCategory HOTEL
```

```
public static final IconCategory PARKING_AREA
```

```
public static final IconCategory POLICE
```

```
public static final IconCategory RAILWAY_STATION
```

```
public static final IconCategory METRO_STATION
```

```
public static final IconCategory AIRPORT
```

```
public static final IconCategory MOUNTAIN_PASS
```

```
public static final IconCategory MOUNTAIN_PEAK
```

```
public static final IconCategory CAR_REPAIR
```

```
public static final IconCategory CASH_DISPENSER
```

```
public static final IconCategory PARK_RECREATION
```

```
public static final IconCategory PHARMACY
```

```
public static final IconCategory BEACH
```

```
public static final IconCategory BUS_STATION
```

```
public static final IconCategory EDUCATION
```

```
public static final IconCategory RESIDENTIAL_AREA
```

```
public static final IconCategory NIGHT_CLUB
```

```
public static final IconCategory PUBLIC_TOILET
```

```
public static final IconCategory LAUNDRY
```

```
public static final IconCategory TAXI_STAND
```

```
public static final IconCategory RAILWAY_ACCESS
```

```
public static final IconCategory BARS_CAFES
```

```
public static final IconCategory PARKING
```

```
public static final IconCategory SPORT_OUTDOOR
```

```
public static final IconCategory METRO_ACCESS
```

```
public static final IconCategory AUT_METRO_ACCESS
```

```
public static final IconCategory AUT_METRO_STOP
```

```
public static final IconCategory BEL_METRO_ACCESS
```

```
public static final IconCategory BEL_METRO_STOP
```

```
public static final IconCategory CZE_METRO_ACCESS
```

```
public static final IconCategory CZE_METRO_STOP
```

```
public static final IconCategory DEN_METRO_ACCESS
```

```
public static final IconCategory DEN_METRO_STOP
```

```
public static final IconCategory FIN_METRO_ACCESS
```

```
public static final IconCategory FIN_METRO_STOP
```

```
public static final IconCategory FRA_METRO_ACCESS
```

```
public static final IconCategory FRA_METRO_STOP
```

```
public static final IconCategory FRA_RER_ACCESS
```

```
public static final IconCategory FRA_RER_STOP
```

```
public static final IconCategory DEU_METRO_ACCESS
```

```
public static final IconCategory DEU_METRO_STOP
```

```
public static final IconCategory DEU_SBAHN_ACCESS
```

```
public static final IconCategory DEU_SBAHN_STOP
```

```
public static final IconCategory ITA_METRO_ACCESS
```

```
public static final IconCategory ITA_METRO_STOP
```

```
public static final IconCategory NOR_METRO_ACCESS
```

```
public static final IconCategory NOR_METRO_STOP
```

```
public static final IconCategory PRT_METRO_ACCESS
```

```
public static final IconCategory PRT_METRO_STOP
```

```
public static final IconCategory ESP_BARCELONA_METRO_ACCESS
```

```
public static final IconCategory ESP_BARCELONA_METRO_STOP
```

```
public static final IconCategory ESP_CERCANIAS_METRO_ACCESS
```

```
public static final IconCategory ESP_CERCANIAS_METRO_STOP
```

```
public static final IconCategory ESP_MADRID_METRO_ACCESS
```

```
public static final IconCategory ESP_MADRID_METRO_STOP
```

```
public static final IconCategory SWE_METRO_ACCESS
```

```
public static final IconCategory SWE_METRO_STOP
```

```
public static final IconCategory GBR_GLASGOW_METRO_ACCESS
```

```
public static final IconCategory GBR_GLASGOW_METRO_STOP
```

```
public static final IconCategory GBR_LONDON_METRO_ACCESS
```

```
public static final IconCategory GBR_LONDON_METRO_STOP
```

```
public static final IconCategory ALL
```

## Method Details

```
public static IconCategory valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static IconCategory[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Identifier

The class *Identifier* is a member of `com.here.android.mpa.common`.

## Class Summary

public final class **Identifier**

*implements* `android.os.Parcelable`

*extends* `java.lang.Object`

Represents a 64-bit or 128-bit numeric identifier of an instance of `ViewObject` .

[For complete information, see the section [Class Details](#)]

## Field Summary

Table 128: Fields in Identifier

Fields
public static final <code>android.os.Parcelable.Creator &lt;Identifier&gt;</code> <b>CREATOR</b>

## Method Summary

Table 129: Methods in Identifier

Methods
public int <b>describeContents</b> () For documentation, see <code>android.os.Parcelable.describeContents()</code>
public boolean <b>equals</b> ( <code>Object other</code> ) For documentation, see <code>java.lang.Object</code>
public int <b>hashCode</b> () Obtains the hash code for the given object.
public String <b>toString</b> () Returns a string representing an <code>Identifier</code> in the form of a 64-bit or 128-bit number.
public void <b>writeToParcel</b> ( <code>Parcel dest</code> , <code>int flags</code> ) For documentation, see <code>android.os.Parcelable.writeToParcel()</code>

## Class Details

Represents a 64-bit or 128-bit numeric identifier of an instance of `ViewObject` . The identifiers are used by:

- [TransitDatabase](#)
- [MapTransitLayer](#)
- [MapBuildingLayer](#)
- [MapBuildingGroup](#)
- [TransitLineObject](#)
- [TransitLineInfo](#)
- [TransitAccessInfo](#)
- [TransitStopInfo](#)

## Field Details

```
public static final android.os.Parcelable.Creator <Identifier> CREATOR
```

## Method Details

```
public int describeContents ()
```

For documentation, see *android.os.Parcelable.describeContents()*

```
public boolean equals (Object other)
```

For documentation, see *java.lang.Object*

### Parameters:

- **other**

```
public int hashCode ()
```

Obtains the hash code for the given object.

### Returns:

A value representing the hash code.

```
public String toString ()
```

Returns a string representing an *Identifier* in the form of a 64-bit or 128-bit number.

### Returns:

A string representation of the *Identifier*.

```
public void writeToParcel (Parcel dest, int flags)
```

For documentation, see *android.os.Parcelable.writeToParcel()*

### Parameters:

- **dest**
- **flags**

## Image

The class *Image* is a member of *com.here.android.mpa.common*.

## Class Summary

public final class **Image**

*extends java.lang.Object*

Encapsulates an image file.

[For complete information, see the section [Class Details](#)]

## Nested Class Summary

Table 130: Nested Classes in Image

Nested Classes
public static final enumeration <i>Image.Type</i>
This helps the application know the base type of the Image .

## Constructor Summary

Table 131: Constructors in Image

Constructors
<i>Image</i> ()
Public Constructor

## Method Summary

Table 132: Methods in Image

Methods
public boolean <i>equals</i> (Object other)
For documentation, see <i>java.lang.Object</i>
public Bitmap <i>getBitmap</i> (int width, int height)
Creates a new Bitmap object with the given dimension from this Image .
public Bitmap <i>getBitmap</i> ()
Creates an android.graphics.Bitmap from this <i>Image</i> if the type is <i>BITMAP</i> , null otherwise.
public long <i>getHeight</i> ()
Gets the current height of the Image , in pixels.
public <i>Type</i> <i>getType</i> ()
Gets the file type of this <i>Image</i> .
public long <i>getWidth</i> ()
Gets the current width of the Image , in pixels.

## Methods

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public boolean isValid ()
```

Determines whether the Image object contains a valid image.

```
public boolean setBitmap (Bitmap bitmap)
```

Sets a Bitmap for the Image .

```
public void setCategory (IconCategory category)
```

Sets IconCategory for the Image .

```
public void setImageAsset (String assetName)
```

Sets Image data by an image in the assets directory.

```
public void setImageData (byte[] bytes)
```

Sets an array of byte data for the Image .

```
public void setImageFile (String fileName)
```

Sets Image data by an image file located in the internal storage.

```
public void setImageResource (int id)
```

Sets data for the Image by way of an application's resource.

```
public void setLocalUrl (String localUrl)
```

Sets a local URL that the Image can access for an image.

## Class Details

Encapsulates an image file.

An Image object can only be created with BMP, JPEG, and PNG data formats. However, although these 3 data formats are supported, only basic parsing of a BMP header is done (gamma correction and color profile information are ignored), and supported BMP data formats are limited to:

- BMP v3 (standard BMP) with 24/32 bits per pixel without compression
- BMP v4/v5 (newer BMP formats) with 24/32 bits per pixel, bit fields compression and A8R8G8B8 pixel format

## Constructor Details

### Image ()

Public Constructor

## Method Details

```
public boolean equals (Object other)
```

For documentation, see *java.lang.Object*

**Parameters:**

- **other**

```
public Bitmap getBitmap (int width, int height)
```

Creates a new `Bitmap` object with the given dimension from this `Image` . This method only supports `Image` s of `SVG`. `null` is returned for `Image` s not of the supported type(s).

**Parameters:**

- **width**  
The width (in pixels) of the new `Bitmap` to be created.
- **height**  
The height (in pixels) of the new `Bitmap` to be created.

**Returns:**

A new `Bitmap` object of the `Image`.

```
public Bitmap getBitmap ()
```

Creates an `android.graphics.Bitmap` from this `Image` if the type is `BITMAP`, `null` otherwise.

**Returns:**

An `android.graphics.Bitmap` or `null` if this `Image` is not `BITMAP`.

```
public long getHeight ()
```

Gets the current height of the `Image` , in pixels.

**Returns:**

The current height

```
public Type getType ()
```

Gets the file type of this `Image`.

**Returns:**

The `Image.Type` for this `Image` object.

```
public long getWidth ()
```

Gets the current width of the `Image` , in pixels.

**Returns:**

The current width

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public boolean isValid ()
```

Determines whether the Image object contains a valid image.

**Returns:**

True if the Image object is valid and can render an image, false otherwise

```
public boolean setBitmap (Bitmap bitmap)
```

Sets a Bitmap for the Image .

**Parameters:**

- **bitmap**  
A Bitmap to be used by the Image

**Returns:**

True if the Bitmap is set successfully, false otherwise

```
public void setCategory (IconCategory category)
```

Sets IconCategory for the Image .

**Parameters:**

- **category**  
An category (such as "museum") for the icon image.

```
public void setImageAsset (String assetName)
```

Sets Image data by an image in the assets directory. In particular, this calls `openFileInput(String)`.

SVG format files are not supported.

**Parameters:**

- **assetName**  
The name of an image in the assets directory.

**Throws:**

- **IOException**  
throws exception when failure to read the resource

```
public void setImageData (byte[] bytes)
```

Sets an array of byte data for the Image .

Only JPEG, BMP and PNG formats are supported.

**Parameters:**

- **bytes**  
An array of byte data containing the Image

```
public void setImageFile (String fileName)
```

Sets Image data by an image file located in the internal storage. In particular, this calls `openFileInput(String)`.

SVG format files are not supported.

**Parameters:**

- **fileName**  
The name of the image file.

**Throws:**

- **IOException**  
throws exception when failure to read the resource

```
public void setImageResource (int id)
```

Sets data for the Image by way of an application's resource.

**Parameters:**

- **id**  
An ID for the resource

**Throws:**

- **IOException**  
Upon a failure to read the resource

```
public void setLocalUrl (String localUrl)
```

Sets a local URL that the Image can access for an image.

SVG format files are not supported.

**Parameters:**

- **localUrl**  
The local URL that the Image uses

## Type

The enumeration *Type* is a member of *com.here.android.mpa.common.Image*.

### Enumeration Summary

public static final enumeration **Image.Type**

extends *java.lang.Enum*, *java.lang.Object*

This helps the application know the base type of the *Image* .

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 133: Enum Constants in *Type*

Fields
<pre>public static final Type UNKNOWN</pre> <p>Unknown image type.</p>
<pre>public static final Type BITMAP</pre> <p>Bitmap image type.</p>
<pre>public static final Type JPEG</pre> <p>JPEG image type.</p>
<pre>public static final Type PNG</pre> <p>PNG image type.</p>
<pre>public static final Type SVG</pre> <p>SVG image type.</p>

### Method Summary

Table 134: Methods in *Type*

Methods
<pre>public static Type valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static Image.Type[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

### Enumeration Details

This helps the application know the base type of the *Image* .

### Enum Constant Details

```
public static final Type UNKNOWN
```

Unknown image type.

```
public static final Type BITMAP
```

Bitmap image type.

```
public static final Type JPEG
```

JPEG image type.

```
public static final Type PNG
```

PNG image type.

```
public static final Type SVG
```

SVG image type. Creation of SVG Images are not supported. Only used as return Images.

### Method Details

```
public static Type valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static Image.Type[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## LocationDataSource

The class *LocationDataSource* is a member of [com.here.android.mpa.common](#).

### Class Summary

```
public abstract class LocationDataSource
```

*extends java.lang.Object*

Abstract class that defines the interface for providing positions updates from a location data source (e.g. [For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 135: Constructors in LocationDataSource

Constructors
<p><code>LocationDataSource ()</code> Creates a <code>LocationDataSource</code> instance</p>

## Method Summary

Table 136: Methods in LocationDataSource

Methods
<p><code>public abstract int <a href="#">getGpsStatus ()</a></code> Called by <code>PositioningManager</code> to get the current <code>GPS</code> location status.</p>
<p><code>public abstract int <a href="#">getIndoorStatus ()</a></code> Called by <code>PositioningManager</code> to get the current <code>LocationMethod::INDOOR</code> location status.</p>
<p><code>public abstract Location <a href="#">getLastKnownLocation ()</a></code> Called by <code>PositioningManager</code> to get the last known location.</p>
<p><code>public abstract int <a href="#">getNetworkStatus ()</a></code> Called by <code>PositioningManager</code> to get the current <code>LocationMethod::NETWORK</code> location status.</p>
<p><code>protected void <a href="#">onLocationUpdated (LocationMethod method, Location location)</a></code> Must be called by the derived class whenever the last known location is updated or the position fix has been lost.</p>
<p><code>protected void <a href="#">onStatusUpdated (LocationMethod method, int status)</a></code> Must be called by the derived class whenever the location status has been updated</p>
<p><code>public abstract boolean <a href="#">start (LocationMethod method)</a></code> Called by <code>PositioningManager</code> to start location updates using the specified location method.</p>
<p><code>public abstract void <a href="#">stop ()</a></code> Called by <code>PositioningManager</code> to stop location updates.</p>

## Class Details

Abstract class that defines the interface for providing positions updates from a location data source (e.g. an external GPS unit). Location data sources should provide a concrete implementation of this class and pass it to `PositioningManager.start(LocationMethod)`.

## Constructor Details

### LocationDataSource ()

Creates a *LocationDataSource* instance

## Method Details

### public abstract int getGpsStatus ()

Called by *PositioningManager* to get the current *GPS* location status.

#### Returns:

GPS location status. Return *OUT\_OF\_SERVICE* if *LocationMethod::GPS* is not supported for this location data source.

#### See also:

*android.location.LocationProvider*

### public abstract int getIndoorStatus ()

Called by *PositioningManager* to get the current *LocationMethod::INDOOR* location status.

#### Returns:

Indoor location status. Return *OUT\_OF\_SERVICE* if *LocationMethod::INDOOR* is not supported for this location data source.

#### See also:

*android.location.LocationProvider*

### public abstract Location getLastKnownLocation ()

Called by *PositioningManager* to get the last known location. Implement this to return the last known location using the "best" location method available for this location source. No guarantee regarding the freshness of the returned location is required.

#### Returns:

Last known location using best location method available. Return null if no location is available or if the position is lost.

### public abstract int getNetworkStatus ()

Called by *PositioningManager* to get the current *LocationMethod::NETWORK* location status.

## Returns:

Network location status. Return `OUT_OF_SERVICE` if `LocationMethod::NETWORK` is not supported for this location data source.

## See also:

`android.location.LocationProvider`

```
protected void onLocationUpdated (LocationMethod method, Location location)
```

Must be called by the derived class whenever the last known location is updated or the position fix has been lost.

## Parameters:

- **method**  
Location method providing the update.
- **location**  
Current location or null if the position has been lost.

```
protected void onStatusUpdated (LocationMethod method, int status)
```

Must be called by the derived class whenever the location status has been updated

## Parameters:

- **method**  
Location method that has an updated status.
- **status**  
Updated status.

## See also:

`android.location.LocationProvider`

```
public abstract boolean start (LocationMethod method)
```

Called by `PositioningManager` to start location updates using the specified location method.

## Parameters:

- **method**  
Location method(s) being requested. If the method requested is a combination of different methods (e.g. `GPS_NETWORK_INDOOR`) then only start position updates and return true if at least one of the methods (e.g. `GPS`) is available.

## Returns:

True if location updates have been started using any of the methods requested. False otherwise.

```
public abstract void stop ()
```

Called by `PositioningManager` to stop location updates.

## LocationDataSourceAutomotive

The class `LocationDataSourceAutomotive` is a member of `com.here.android.mpa.common`.

### Class Summary

public abstract class **LocationDataSourceAutomotive**

extends `com.here.android.mpa.common.LocationDataSource`, `java.lang.Object`

Abstract class that defines the interface for providing positions updates from an automotive location data source (e.g.

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 137: Constructors in `LocationDataSourceAutomotive`

Constructors
<code>LocationDataSourceAutomotive ()</code>

### Method Summary

Table 138: Methods in `LocationDataSourceAutomotive`

Methods
<pre>public float <a href="#">getCourseStandardDeviation ()</a></pre> <p>Called by <code>PositioningManager</code> to get Standard deviation of the course in degrees.</p>
<pre>public float <a href="#">getElevationStandardDeviation ()</a></pre> <p>Called by <code>PositioningManager</code> to get Standard deviation of the elevation in meters.</p>
<pre>public float <a href="#">getHorizontalLargeStandardDeviation ()</a></pre> <p>Called by <code>PositioningManager</code> to get Horizontal radial error (large component) as a standard deviation in meters.</p>
<pre>public float <a href="#">getHorizontalSmallStandardDeviation ()</a></pre> <p>Called by <code>PositioningManager</code> to get Horizontal radial error (small component) as a standard deviation in meters.</p>
<pre>public float <a href="#">getSpeedStandardDeviation ()</a></pre> <p>Called by <code>PositioningManager</code> to get Standard deviation of the speed in meters per second.</p>

## Class Details

Abstract class that defines the interface for providing positions updates from an automotive location data source (e.g. an external GPS or Dead Reckoning (DR) units). **IMPORTANT:** This is a Beta API, and is subject to change without notice. Location data sources should provide a concrete implementation of this class and pass it to `setDataSource(LocationDataSource)`. Setting a source derived from this class will force `PositioningManager` to use a map matching algorithm designed for automotive use cases which expects a constant stream of position and sensor data from a DR unit at a frequency of 10Hz. The automotive map matcher algorithm does not support any form of extrapolation so if a constant stream of position and sensor data is not provided in tunnels or areas of traditionally poor GPS coverage the map matching performance will be poor. Please note that pedestrian navigation is not supported when automotive location data source is used. \note Attempts to call `setDataSource(LocationDataSource)` with an object derived from `LocationDataSourceAutomotive` will be ignored and return false if access to this operation is denied. Contact your HERE representative for more information.

## Constructor Details

`LocationDataSourceAutomotive ()`

## Method Details

`public float getCourseStandardDeviation ()`

Called by `PositioningManager` to get Standard deviation of the course in degrees. Implement this to return the Standard deviation of the course in degrees. No guarantee regarding the freshness of the returned location is required.

**Returns:**

Standard deviation of the course in degrees.

`public float getElevationStandardDeviationn ()`

Called by `PositioningManager` to get Standard deviation of the elevation in meters. Implement this to return the Standard deviation of the elevation in meters. No guarantee regarding the freshness of the returned location is required.

**Returns:**

Standard deviation of the elevation in meters.

`public float getHorizontalLargeStandardDeviation ()`

Called by `PositioningManager` to get Horizontal radial error (large component) as a standard deviation in meters. Implement this to return the Horizontal radial error. No guarantee regarding the freshness of the returned location is required.

**Returns:**

Horizontal radial error (large component) as a standard deviation in meters.

```
public float getHorizontalSmallStandardDeviation ()
```

Called by `PositioningManager` to get Horizontal radial error (small component) as a standard deviation in meters. Implement this to return the Horizontal radial error. No guarantee regarding the freshness of the returned location is required.

**Returns:**

Horizontal radial error (small component) as a standard deviation in meters.

```
public float getSpeedStandardDeviation ()
```

Called by `PositioningManager` to get Standard deviation of the speed in meters per second. Implement this to return the Standard deviation of the speed in meters per second. No guarantee regarding the freshness of the returned location is required.

**Returns:**

Standard deviation of the speed meters per second.

## LocationDataSourceDevice

The class `LocationDataSourceDevice` is a member of `com.here.android.mpa.common`.

### Class Summary

```
public abstract class LocationDataSourceDevice
```

```
extends com.here.android.mpa.common.LocationDataSource, java.lang.Object
```

Abstract class that defines the interface for providing positions updates from a platform location data source.

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 139: Constructors in `LocationDataSourceDevice`

Constructors
<code>LocationDataSourceDevice ()</code>

## Method Summary

Table 140: Methods in `LocationDataSourceDevice`

Methods
<pre>public static <i>LocationDataSourceDevice</i> <i>getInstance</i> ()</pre>
Get access to the <code>LocationDataSourceDevice</code> Singleton.

## Class Details

Abstract class that defines the interface for providing positions updates from a platform location data source. Instance of this class can be created with `getInstance()` call.

## Constructor Details

### `LocationDataSourceDevice ()`

## Method Details

```
public static LocationDataSourceDevice getInstance ()
```

Get access to the `LocationDataSourceDevice` Singleton. `MapsEngine` has to be successfully initialized before the call.

#### Returns:

`LocationDataSourceDevice` instance

## LocationDataSourceHERE

The class `LocationDataSourceHERE` is a member of `com.here.android.mpa.common`.

## Class Summary

```
public abstract class LocationDataSourceHERE
```

```
extends com.here.android.mpa.common.LocationDataSource, java.lang.Object
```

Abstract class that defines the interface for providing positions updates from a HERE hybrid location data source.

[For complete information, see the section [Class Details](#)]

## Nested Class Summary

Table 141: Nested Classes in LocationDataSourceHERE

Nested Classes
public static final enumeration <code>LocationDataSourceHERE.IndoorPositioningMode</code> Defines supported indoor positioning modes.
public static final enumeration <code>LocationDataSourceHERE.IndoorPositioningModeSetResult</code> Defines result codes for indoor positioning mode set call.

## Constructor Summary

Table 142: Constructors in LocationDataSourceHERE

Constructors
<code>LocationDataSourceHERE ()</code>

## Method Summary

Table 143: Methods in LocationDataSourceHERE

Methods
public abstract <code>IndoorPositioningMode</code> <code>getIndoorPositioningMode ()</code> Get active indoor positioning mode.
public static <code>LocationDataSourceHERE</code> <code>getInstance ()</code> Get access to the LocationDataSourceHERE Singleton.
public static <code>LocationDataSourceHERE</code> <code>getInstance (StatusListener statusListener)</code> Get access to the LocationDataSourceHERE Singleton.
public abstract <code>RadioMapLoader</code> <code>getRadioMapLoader ()</code> Get instance of positioning radio map loader.
public abstract void <code>setDiagnosticsListener (DiagnosticsListener listener)</code> Register HERE positioning diagnostics listener instance for receiving positioning related events.
public abstract <code>IndoorPositioningModeSetResult</code> <code>setIndoorPositioningMode (IndoorPositioningMode mode)</code> Set indoor positioning mode.

## Class Details

Abstract class that defines the interface for providing positions updates from a HERE hybrid location data source. Instance of this class can be created with `getInstance(StatusListener)` call.

## Constructor Details

`LocationDataSourceHERE ()`

## Method Details

```
public abstract IndoorPositioningMode getIndoorPositioningMode ()
```

Get active indoor positioning mode.

### Returns:

Current indoor positioning mode.

### See also:

[LocationDataSourceHERE.IndoorPositioningMode](#)

```
public static LocationDataSourceHERE getInstance ()
```

Get access to the LocationDataSourceHERE Singleton. MapsEngine has to be successfully initialized before the call.

### Returns:

LocationDataSourceHERE instance

### Throws:

- **AccessControlException**  
if HERE positioning is not licensed.

```
public static LocationDataSourceHERE getInstance (StatusListener  
statusListener)
```

Get access to the LocationDataSourceHERE Singleton. MapsEngine has to be successfully initialized before the call.

### Parameters:

- **statusListener**  
Status listener instance for retrieving HERE positioning related events.

### Returns:

LocationDataSourceHERE instance

### Throws:

- **AccessControlException**  
if HERE positioning has not been licensed.

```
public abstract RadioMapLoader getRadioMapLoader ()
```

Get instance of positioning radio map loader. Radio map loader can be used for downloading positioning radio maps for specified areas.

**Returns:**

Radio map loader instance.

**Throws:**

- **AccessControlException**  
if positioning radio map downloading API has not been licensed.

```
public abstract void setDiagnosticsListener (DiagnosticsListener listener)
```

Register HERE positioning diagnostics listener instance for receiving positioning related events. Only one listener can be registered at a time. To unregister the existing listener, set `listener` to `null`.

**Parameters:**

- **listener**  
The Diagnostics listener instance for which HERE positioning related events should be delivered or null if you are no longer interested in diagnostic events.

```
public abstract IndoorPositioningModeSetResult setIndoorPositioningMode  
(IndoorPositioningMode mode)
```

Set indoor positioning mode. Mode defines which radio maps HERE positioning is allowed to use.

**Parameters:**

- **mode**  
New indoor positioning mode.

**Returns:**

Result for the mode change.

**See also:**

[LocationDataSourceHERE.IndoorPositioningMode](#)

## IndoorPositioningMode

The enumeration *IndoorPositioningMode* is a member of *com.here.android.mpa.common.LocationDataSourceHERE*.

### Enumeration Summary

```
public static final enumeration LocationDataSourceHERE.IndoorPositioningMode
```

```
extends java.lang.Enum, java.lang.Object
```

Defines supported indoor positioning modes.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 144: Enum Constants in IndoorPositioningMode

Fields
<pre>public static final IndoorPositioningMode NONE</pre> <p>Indoor positioning is not supported.</p>
<pre>public static final IndoorPositioningMode AUTOMATIC</pre> <p>Let the HERE positioning choose which radio maps to use, based on availability and accuracy.</p>
<pre>public static final IndoorPositioningMode COMMUNITY</pre> <p>Use community (public) indoor radio maps only</p>
<pre>public static final IndoorPositioningMode PRIVATE</pre> <p>Use private radio maps only</p>
<pre>public static final IndoorPositioningMode DRAFT</pre> <p>This is development feature for testing with draft radiomaps before publishing them to production.</p>

## Method Summary

Table 145: Methods in IndoorPositioningMode

Methods
<pre>public static IndoorPositioningMode valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static LocationDataSourceHERE.IndoorPositioningMode[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Defines supported indoor positioning modes.

### Enum Constant Details

```
public static final IndoorPositioningMode NONE
```

Indoor positioning is not supported. Only supported as return value for mode get result.

```
public static final IndoorPositioningMode AUTOMATIC
```

Let the HERE positioning choose which radio maps to use, based on availability and accuracy. This is the default mode when HERE indoor positioning is started.

```
public static final IndoorPositioningMode COMMUNITY
```

Use community (public) indoor radio maps only

```
public static final IndoorPositioningMode PRIVATE
```

Use private radio maps only

```
public static final IndoorPositioningMode DRAFT
```

This is development feature for testing with draft radiomaps before publishing them to production. Devices which are allowed to use this feature must be defined in AndroidManifest.xml file. Please read HERE Android SDK documentation for details about this feature and its usage.

### Method Details

```
public static IndoorPositioningMode valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static LocationDataSourceHERE.IndoorPositioningMode[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## IndoorPositioningModeSetResult

The enumeration *IndoorPositioningModeSetResult* is a member of *com.here.android.mpa.common.LocationDataSourceHERE*.

### Enumeration Summary

```
public static final enumeration LocationDataSourceHERE.IndoorPositioningModeSetResult
```

```
extends java.lang.Enum, java.lang.Object
```

Defines result codes for indoor positioning mode set call.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 146: Enum Constants in `IndoorPositioningModeSetResult`

Fields
<pre>public static final IndoorPositioningModeSetResult OK</pre> <p>Mode set succeeded</p>
<pre>public static final IndoorPositioningModeSetResult PENDING</pre> <p>Mode set accepted but could not completed because service connection is being established.</p>
<pre>public static final IndoorPositioningModeSetResult INTERNAL_ERROR</pre> <p>Location source not set.</p>
<pre>public static final IndoorPositioningModeSetResult FEATURE_NOT_LICENSED</pre> <p>Requested feature not licensed.</p>
<pre>public static final IndoorPositioningModeSetResult MODE_NOT_ALLOWED</pre> <p>Requested mode is not allowed for this device.</p>

## Method Summary

Table 147: Methods in `IndoorPositioningModeSetResult`

Methods
<pre>public static IndoorPositioningModeSetResult valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static LocationDataSourceHERE.IndoorPositioningModeSetResult[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Defines result codes for indoor positioning mode set call.

### Enum Constant Details

```
public static final IndoorPositioningModeSetResult OK
```

Mode set succeeded

```
public static final IndoorPositioningModeSetResult PENDING
```

Mode set accepted but could not completed because service connection is being established. Requested mode will be set when service connection is ready.

```
public static final IndoorPositioningModeSetResult INTERNAL_ERROR
```

Location source not set.

```
public static final IndoorPositioningModeSetResult FEATURE_NOT_LICENSED
```

Requested feature not licensed.

```
public static final IndoorPositioningModeSetResult MODE_NOT_ALLOWED
```

Requested mode is not allowed for this device. This error is returned if draft radio maps are tried to be accessed and the device is not listed in the set of allowed devices for draft radio map access in AndroidManifest.xml file. Check HERE Android SDK documentation for details about draft radio map feature usage.

## Method Details

```
public static IndoorPositioningModeSetResult valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static LocationDataSourceHERE.IndoorPositioningModeSetResult[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## MapActivity

The class *MapActivity* is a member of *com.here.android.mpa.common* .

### Class Summary

```
public class MapActivity
```

```
extends java.lang.Object
```

An activity class for managing the resource state of the *MapEngine*.

**Deprecated:** As of SDK 3.3, replaced by *MapFragment*.

[For complete information, see the section *Class Details*]

## Constructor Summary

Table 148: Constructors in MapActivity

Constructors
<a href="#">MapActivity ()</a>

## Method Summary

Table 149: Methods in MapActivity

Methods
protected void <a href="#">onCreate</a> (Bundle savedInstanceState) Called when an instance of the given class is created (map activity begins).
protected void <a href="#">onInitialized</a> (Error error) Called when MapEngine initialization completes.
protected void <a href="#">onPause</a> () Called when map activity pauses (is suspended).
protected void <a href="#">onResume</a> () Called when the given instance of map activity resumes.

## Class Details

**Deprecated:** As of SDK 3.3, replaced by [MapFragment](#).

An activity class for managing the resource state of the [MapEngine](#). When [onCreate\(Bundle\)](#) is called, it automatically initializes the [MapEngine](#).

Only activities that consume or use an API needs to inherit from [MapActivity](#).

This class overrides the methods `android.app.Activity#onCreate(Bundle)`, `android.app.Activity#onResume()`, and `android.app.Activity#onPause()` defined in `android.app.Activity`.

This will not work as expected if your `targetSdkVersion` is set to 23 and above running on device with Marshmallow and above. [MapActivity](#) initializes [MapEngine](#) before asking users for permissions resulting in a blank screen. Use [MapFragment](#) instead.

## Constructor Details

[MapActivity \(\)](#)

## Method Details

protected void [onCreate](#) (Bundle savedInstanceState)

Called when an instance of the given class is created (map activity begins). The method issues an initialization request to the *MapEngine*. When MapEngine initialization has completed, *onInitialized(OnEngineInitListener.Error)* is called.

**Parameters:**

- **savedInstanceState**

An object representing the previous saved state of *MapActivity*; used if a new instance of this class is to be recreated from a previous session.

**See also:**

*onInitialized(Error)*

## protected void **onInitialized** (*Error* error)

Called when MapEngine initialization completes. User of *MapActivity* class can override this to detect when or if MapEngine is ready for use.

**Parameters:**

- **error**

An *OnEngineInitListener.Error* enum value indicates if Engine initialization is successful or if an error has occurred

## protected void **onPause** ()

Called when map activity pauses (is suspended).

## protected void **onResume** ()

Called when the given instance of map activity resumes.

## MapEngine

The class *MapEngine* is a member of *com.here.android.mpa.common*.

### Class Summary

public final class **MapEngine**

*extends java.lang.Object*

MapEngine manages all mapping resources and services provided in this SDK.

[For complete information, see the section *Class Details*]

## Nested Class Summary

Table 150: Nested Classes in MapEngine

Nested Classes
<p>public static final enumeration <a href="#">MapEngine.MapVariant</a></p> <p>Supported map variants.</p>
<p>public static abstract interface <a href="#">MapEngine.OnMapDownloadListener</a></p> <p>Represents a listener to provide notification upon the start and completion of a data download event.</p>

## Method Summary

Table 151: Methods in MapEngine

Methods
<p>public void <a href="#">addMapDataDownloadListener</a> (<a href="#">OnMapDownloadListener</a> listener)</p> <p>Adds a <a href="#">OnMapDownloadListener</a> to listen for map data download events.</p>
<p>public static <a href="#">MapEngine</a> <a href="#">getInstance</a> ()</p> <p>Returns the MapEngine singleton, if one has already been created.</p>
<p>public int <a href="#">getResourceReferenceCount</a> ()</p> <p>Get the current reference count of map resource usage for this application.</p>
<p>public void <a href="#">init</a> (Context context, <a href="#">OnEngineInitListener</a> listener)</p> <p><b>Deprecated:</b> As of SDK 3.4.</p> <p>Asynchronously initialize the MapEngine .</p>
<p>public void <a href="#">init</a> (Context context, <a href="#">MapVariant</a> variant, <a href="#">OnEngineInitListener</a> listener)</p> <p><b>Deprecated:</b> As of SDK 3.4.</p> <p>Asynchronously initialize the MapEngine .</p>
<p>public void <a href="#">init</a> (<a href="#">ApplicationContext</a> context, <a href="#">OnEngineInitListener</a> listener)</p> <p>Asynchronously initialize the MapEngine .</p>
<p>public static boolean <a href="#">isInitialized</a> ()</p> <p>Gets the initialization state of MapEngine .</p>
<p>public static boolean <a href="#">isOnlineEnabled</a> ()</p> <p>Gets the online configuration state of MapEngine .</p>
<p>public void <a href="#">onPause</a> ()</p> <p>Decrements the reference count of map resource usage.</p>
<p>public void <a href="#">onResume</a> ()</p> <p>Increments the reference count of map resource usage.</p>
<p>public void <a href="#">removeMapDataDownloadListener</a> (<a href="#">OnMapDownloadListener</a> listener)</p> <p>Removes an existing <a href="#">MapDataDownloadListener</a> .</p>

## Methods

```
public static void setOnline (boolean online)
```

Alter the data connectivity mode of the MapEngine .

---

## Class Details

MapEngine manages all mapping resources and services provided in this SDK.

MapEngine must be initialized before any of the services can be used. For more information, see [init\(Context, OnEngineInitListener\)](#).

Users can maintain reference count through the use of [onPause\(\)](#) and [onResume\(\)](#) thus control when to relinquish MapEngine services.

MapEngine also allows users to subscribe to data download notifications to provide extra information.

## Method Details

```
public void addMapDataDownloadListener (OnMapDownloadListener listener)
```

Adds a [OnMapDownloadListener](#) to listen for map data download events.

### Parameters:

- **listener**  
A [OnMapDownloadListener](#) to add to the MapEngine

### See also:

[removeMapDataDownloadListener\(OnMapDownloadListener\)](#)

```
public static MapEngine getInstance ()
```

Returns the MapEngine singleton, if one has already been created.

Once the [MapEngine](#) instance is available, it must be initialized through one of the following methods before it can be used:

- [MapFragment.init\(OnEngineInitListener\)](#)
- [MapFragment.init\(ApplicationContext, OnEngineInitListener\)](#)

### Returns:

MapEngine instance

```
public int getResourceReferenceCount ()
```

Get the current reference count of map resource usage for this application. When this returns 0, it indicates that no reference to map resources is being held and the engine is paused. As a result, SDK functions will not work. When this returns 1 or greater, it is an indication that a reference to map resources is being held and the engine is active.

It is very important that an application holds a reference to map resources while in active operation and releases this reference when not in use (e.g. sent to the background). This method is a useful tool to use while developing an application. This value can be logged while testing to ensure that references to map resources are handled properly during the lifecycle of the app.

For users of *MapFragment* and *MapActivity* classes, map resource usage is handled automatically.

### Returns:

The current reference count of map resource usage

```
public void init (Context context, OnEngineInitListener listener)
```

Deprecated: As of SDK 3.4.

Use *init(ApplicationContext, OnEngineInitListener)* instead.

Asynchronously initialize the MapEngine . MapEngine cannot be used until it has been initialized successfully.

This method is particularly useful for users of headless APIs as the MapEngine is being automatically initialized as part of the setup process of *MapFragments*.

This method will initialize MapEngine with *GLOBAL* map variant on first SDK usage and with stored map variant on sub-sequent usages.

### Parameters:

- **context**  
context to be used during initialization.
- **listener**  
*OnEngineInitListener* to provide information when MapEngine initialization completes and if it has been successful.

### See also:

*init(OnEngineInitListener)*

*init(Context, OnEngineInitListener)*

```
public void init (Context context, MapVariant variant, OnEngineInitListener listener)
```

Deprecated: As of SDK 3.4.

Use *init(ApplicationContext, OnEngineInitListener)* instead.

Asynchronously initialize the MapEngine . MapEngine cannot be used until it has been initialized successfully.

This method is particularly useful for users of headless APIs as the MapEngine is being automatically initialized as part of the setup process of *MapFragments*.

This method can configure map variant which will be used by MapEngine. If initialization fails - *OPERATION\_NOT\_ALLOWED* will be reported. Currently following variants are supported: - *GLOBAL* - initialize

MapEngine to use international map variant; - *KOREA* - initialize MapEngine to use Korean map variant; - null - initialize MapEngine to use stored map variant or international map variant for first run. This method is used to configure MapEngine to use certain map variant. If MapEngine was already configured and passed variant differs - error will be reported and initialization fails.

**Parameters:**

- **context**  
context to be used during initialization.
- **variant**  
map variant to use.
- **listener**  
*OnEngineInitListener* to provide information when MapEngine initialization completes and if it has been successful.

**See also:**

*init(OnEngineInitListener)*

*init(Context, OnEngineInitListener)*

```
public void init (ApplicationContext context, OnEngineInitListener listener)
```

Asynchronously initialize the MapEngine . MapEngine cannot be used until it has been initialized successfully.

This method is particularly useful for users of headless APIs as the MapEngine is being automatically initialized as part of the setup process of *MapFragments*.

This method will initialize MapEngine with *ApplicationContext* to be used during initialization.

**Parameters:**

- **context**  
*ApplicationContext* to be used during initialization.
- **listener**  
*OnEngineInitListener* to provide information when MapEngine initialization completes and if it has been successful.

**See also:**

*init(OnEngineInitListener)*

*init(ApplicationContext, OnEngineInitListener)*

```
public static boolean isInitialized ()
```

Gets the initialization state of MapEngine .

**Returns:**

true if MapEngine is initialized and ready for service.

```
public static boolean isOnlineEnabled ()
```

Gets the online configuration state of MapEngine .

If false is returned then the HERE SDK will not access the network to download map data, perform searches, calculate routes or when providing any other service unless the service allows overriding this setting, e.g. see [CoreRouter.Connectivity](#), [Request.Connectivity](#), and [CLE2Request.CLE2ConnectivityMode](#).

**Returns:**

true if MapEngine is enabled to use network communications

```
public void onPause ()
```

Decrements the reference count of map resource usage. When the count drops to 0 the engine will be paused. This should usually be called in an activity's onPause .

For users of [MapFragment](#) and [MapActivity](#) classes, it is not necessary to call [onPause\(\)](#) as it is handled automatically.

```
public void onResume ()
```

Increments the reference count of map resource usage. This will open all mapping resources if the reference count becomes 1. This should usually be called in an activity's onResume .

For users of [MapFragment](#), and [MapActivity](#) classes, it is not necessary to call [onResume\(\)](#) as it is handled automatically.

```
public void removeMapDataDownloadListener (OnMapDownloadListener listener)
```

Removes an existing MapDataDownloadListener .

**Parameters:**

- **listener**  
A MapDataDownloadListener to remove from the MapEngine

```
public static void setOnline (boolean online)
```

Alter the data connectivity mode of the MapEngine .

**Parameters:**

- **online**  
Pass true to set MapEngine connectivity to ONLINE. If false, connectivity is OFFLINE.  
If set to false then the HERE SDK will not access the network to download map data, perform searches, calculate routes or when providing any other service unless the service allows overriding this setting, e.g. see [, ,](#) and [.](#)

## MapVariant

The enumeration *MapVariant* is a member of *com.here.android.mpa.common.MapEngine*.

### Enumeration Summary

public static final enumeration **MapEngine.MapVariant**

*extends* *java.lang.Enum*, *java.lang.Object*

Supported map variants.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 152: Enum Constants in MapVariant

Fields
public static final <i>MapVariant</i> <b>GLOBAL</b>
public static final <i>MapVariant</i> <b>KOREA</b>

### Method Summary

Table 153: Methods in MapVariant

Methods
public static <i>MapVariant</i> <b>fromShort</b> (short val)
public short <b>value</b> ()
public static <i>MapVariant</i> <b>valueOf</b> (String name)
This method retrieves the enumeration value that matches the name specified by the caller.
public static <i>MapEngine.MapVariant</i> [] <b>values</b> ()
This method retrieves an array of constants of the given enum type in the order in which they are declared.

### Enumeration Details

Supported map variants. Value will be stored and used on sub-sequent MapEngine initialization. User must use the same value for sub-sequent MapEngine initialization. Using different values in sub-sequent initialization will report error and initialization fails.

### Enum Constant Details

public static final *MapVariant* **GLOBAL**

```
public static final MapVariant KOREA
```

### Method Details

```
public static MapVariant fromShort (short val)
```

#### Parameters:

- `val`

```
public short value ()
```

```
public static MapVariant valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- `name`

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static MapEngine.MapVariant[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## OnMapDownloadListener

The interface *OnMapDownloadListener* is a member of *com.here.android.mpa.common.MapEngine*.

### Interface Summary

```
public static abstract interface MapEngine.OnMapDownloadListener
```

Represents a listener to provide notification upon the start and completion of a data download event.

[For complete information, see the section [Interface Details](#)]

### Method Summary

Table 154: Methods in OnMapDownloadListener

#### Methods

```
public abstract void onMapDataDownloadEnd ()
```

A callback indicating that the map data download has completed

## Methods

```
public abstract void onMapDataDownloadInProgress ()
```

A callback indicating that a map data download is in progress.

```
public abstract void onMapDataDownloadStart ()
```

A callback indicating that a map data download has started.

## Interface Details

Represents a listener to provide notification upon the start and completion of a data download event. This listener provides callback notifications for any data download event performed by the SDK regardless of the type of data that is downloaded (map data, traffic data, route data etc.) and regardless of the operation that triggered the download. Data download is triggered automatically by the SDK when not enough offline data is available on the device to perform an operation like: move the *Map* to a new location, display traffic, calculate a route etc. There can be multiple cycles of `#onMapDataDownloadStart()`, `#onMapDataDownloadEnd()` before all required map data is downloaded for a specific operation. Users are suggested to wait at least 1 second after receiving the callback `#onMapDataDownloadEnd()` to see if there is any new `#onMapDataDownloadStart()` notifications. No new notifications means that all required data was downloaded. The only operation that will not trigger these notifications is when search is performed.

## Method Details

```
public abstract void onMapDataDownloadEnd ()
```

A callback indicating that the map data download has completed

```
public abstract void onMapDataDownloadInProgress ()
```

A callback indicating that a map data download is in progress. This notification will be sent after `onMapDataDownloadStart`.

```
public abstract void onMapDataDownloadStart ()
```

A callback indicating that a map data download has started.

## MapSettings

The class *MapSettings* is a member of `com.here.android.mpa.common`.

## Class Summary

```
public final class MapSettings
```

```
extends java.lang.Object
```

Allows clients to modify map settings.

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 155: Constructors in MapSettings

Constructors
<a href="#">MapSettings</a> ()

## Method Summary

Table 156: Methods in MapSettings

Methods
public static boolean <a href="#">setIsolatedDiskCacheRootPath</a> (String path, String intentAction) Experimental method to allow switching of the disk cache to a separate service process and disk cache path.

## Class Details

Allows clients to modify map settings.

## Constructor Details

[MapSettings](#) ()

## Method Details

public static boolean [setIsolatedDiskCacheRootPath](#) (String path, String intentAction)

Experimental method to allow switching of the disk cache to a separate service process and disk cache path.

The method must be called before the [init\(\)](#) methods on [MapEngine](#).

The intent (second parameter) must be unique for the client application and must match the definition of the service in AndroidManifest.xml.

### Parameters:

- **path**  
A string containing the new disk cache path.
- **intentAction**  
A string containing "IntentAction" for the isolated service; must be unique for the client application.

### Returns:

`false` if path matches default disk cache path or path is file or invalid or is not writable or `intentAction` matches default service connection name, otherwise `true`.

**See also:**

[DiskCacheUtility](#)

## MatchedGeoPosition

The class *MatchedGeoPosition* is a member of *com.here.android.mpa.common*.

### Class Summary

public final class **MatchedGeoPosition**

extends *com.here.android.mpa.common.GeoPosition*, *java.lang.Object*

An extended *GeoPosition* class which provides additional position-related information.

[For complete information, see the section [Class Details](#)]

**See also:**

[onPositionUpdated\(LocationMethod, GeoPosition, boolean\)](#)

### Method Summary

Table 157: Methods in MatchedGeoPosition

Methods
<pre>public int <a href="#">getMatchQuality</a> ()</pre> <p>Returns a value indicating the quality of the given map-matched position object.</p>
<pre>public <i>GeoPosition</i> <a href="#">getRawPosition</a> ()</pre> <p>Obtains the raw position from which the given map-matched position was generated.</p>
<pre>public <i>RoadElement</i> <a href="#">getRoadElement</a> ()</pre> <p>Returns the <i>RoadElement</i> at this matched position.</p>
<pre>public boolean <a href="#">isExtrapolated</a> ()</pre> <p>Determines if this matched position is extrapolated.</p>
<pre>public boolean <a href="#">isOnStreet</a> ()</pre> <p>Determines if this map-matched position matches to a street.</p>

### Class Details

An extended *GeoPosition* class which provides additional position-related information. The class is designed to support walk or drive navigation.

**See also:**

*onPositionUpdated(LocationMethod, GeoPosition, boolean)*

## Method Details

```
public int getMatchQuality ()
```

Returns a value indicating the quality of the given map-matched position object.

**Returns:**

An integer in the range of [0,7], where 0 indicates a poor match and 7 a good match.

```
public GeoPosition getRawPosition ()
```

Obtains the raw position from which the given map-matched position was generated.

**Returns:**

A *GeoPosition* representing the raw position.

```
public RoadElement getRoadElement ()
```

Returns the *RoadElement* at this matched position.

**Returns:**

An object representing the road element at this map-matched position.

```
public boolean isExtrapolated ()
```

Determines if this matched position is extrapolated.

**Returns:**

true if the position is extrapolated, otherwise false

```
public boolean isOnStreet ()
```

Determines if this map-matched position matches to a street.

**Returns:**

true if the position is mapped to a street, otherwise false.

## OffScreenRenderer

The interface *OffScreenRenderer* is a member of *com.here.android.mpa.common* .

## Interface Summary

public abstract interface **OffScreenRenderer**

Base interface for an offscreen renderer.

[For complete information, see the section [Interface Details](#)]

See also:

[MapOffScreenRenderer](#)

## Nested Class Summary

Table 158: Nested Classes in OffScreenRenderer

Nested Classes
<p>public static abstract interface <a href="#">OffScreenRenderer.SurfaceUpdatedListener</a></p> <p>Listener interface to be notified when the surface has been re-drawn and comitted.</p>

## Method Summary

Table 159: Methods in OffScreenRenderer

Methods
<p>public abstract void <a href="#">getScreenCapture</a> (<a href="#">OnScreenCaptureListener</a> listener)</p> <p>Returns the full screen bitmap for the <a href="#">Map</a>.</p>
<p>public abstract <a href="#">OffScreenRenderer</a> <a href="#">setSize</a> (int width, int height)</p> <p>Set the size of the requested screen surface</p>
<p>public abstract void <a href="#">start</a> ()</p> <p>Start the offscreen renderer.</p>
<p>public abstract void <a href="#">start</a> (SurfaceHolder renderTarget, <a href="#">SurfaceUpdatedListener</a> listener)</p> <p>Start the offscreen renderer.</p>
<p>public abstract void <a href="#">stop</a> ()</p> <p>Stop the offscreen renderer.</p>

## Interface Details

Base interface for an offscreen renderer. This interface is useful for drawing a Map image without an actual View.

See also:

[MapOffScreenRenderer](#)

## Method Details

public abstract void [getScreenCapture](#) ([OnScreenCaptureListener](#) listener)

Returns the full screen bitmap for the [Map](#). This method is asynchronous and will invoke a callback once the operation is completed through the [OnScreenCaptureListener](#). The `OffScreenRenderer` must be running to create the screen capture.

**Parameters:**

- **listener**  
A `OnScreenCaptureListener` to listen for the callback when screen capture is complete.

```
public abstract OffScreenRenderer setSize (int width, int height)
```

Set the size of the requested screen surface

**Parameters:**

- **width**  
The screen surface width, in number of pixels
- **height**  
The screen surface height, in number of pixels

**Returns:**

This `OffScreenRenderer`

```
public abstract void start ()
```

Start the offscreen renderer. A new `PBuffer` based surface will be allocated. Before calling this method, [setSize\(int, int\)](#) must have been called with valid values.

```
public abstract void start (SurfaceHolder renderTarget, SurfaceUpdatedListener listener)
```

Start the offscreen renderer. The renderer will be attached to the supplied `SurfaceHolder` argument.

**Parameters:**

- **renderTarget**  
Surface to attach to.
- **listener**  
Callback when the surface has been updated

```
public abstract void stop ()
```

Stop the offscreen renderer. All resource allocated will be released.

## SurfaceUpdatedListener

The interface *SurfaceUpdatedListener* is a member of *com.here.android.mpa.common.OfflineRenderer*.

### Interface Summary

public static abstract interface **OfflineRenderer.SurfaceUpdatedListener**

Listener interface to be notified when the surface has been re-drawn and committed.

[For complete information, see the section [Interface Details](#)]

### Method Summary

Table 160: Methods in SurfaceUpdatedListener

Methods
<pre>public abstract void <i>onSurfaceUpdated</i> ()</pre>
Callback when the surface has been redrawn

### Interface Details

Listener interface to be notified when the surface has been re-drawn and committed.

### Method Details

```
public abstract void onSurfaceUpdated ()
```

Callback when the surface has been redrawn

## OnEngineInitListener

The interface *OnEngineInitListener* is a member of *com.here.android.mpa.common*.

### Interface Summary

public abstract interface **OnEngineInitListener**

Represents a listener to provide notification of the engine status upon completion of initialization.

[For complete information, see the section [Interface Details](#)]

**See also:**

[\*init\(ApplicationContext, OnEngineInitListener\)\*](#)

## Nested Class Summary

Table 161: Nested Classes in OnEngineInitListener

Nested Classes
public static final enumeration <a href="#">OnEngineInitListener.Error</a> Represents values describing initialization errors.

## Method Summary

Table 162: Methods in OnEngineInitListener

Methods
public abstract void <a href="#">onEngineInitializationCompleted</a> ( <b>Error</b> error) A callback indicating that map engine initialization has completed.

## Interface Details

Represents a listener to provide notification of the engine status upon completion of initialization.

See also:

[init\(ApplicationContext, OnEngineInitListener\)](#)

## Method Details

public abstract void **onEngineInitializationCompleted** (**Error** error)

A callback indicating that map engine initialization has completed.

Parameters:

- error**  
 If map engine initialized successfully, returns *NONE*. Otherwise, one of the other [OnEngineInitListener.Error](#) enum values indicating the reason of factory initialization failure.

## Error

The enumeration *Error* is a member of *com.here.android.mpa.common.OnEngineInitListener*.

## Enumeration Summary

public static final enumeration **OnEngineInitListener.Error**

*extends java.lang.Enum, java.lang.Object*

Represents values describing initialization errors.

[For complete information, see the section [Enumeration Details](#)]

See also:

[onEngineInitializationCompleted\(Error\)](#)

## Enum Constant Summary

Table 163: Enum Constants in Error

Fields
<p><code>public static final Error NONE</code> Initialization completed successfully</p>
<p><code>public static final Error USAGE_EXPIRED</code> Initialization failed as the SDK is expired</p>
<p><code>public static final Error MODEL_NOT_SUPPORTED</code> Initialization failed as the device's model is not supported by the SDK</p>
<p><code>public static final Error DEVICE_NOT_SUPPORTED</code> Initialization failed as the device is not supported by the SDK</p>
<p><code>public static final Error UNKNOWN</code> Initialization failed for unknown reasons</p>
<p><code>public static final Error MISSING_APP_CREDENTIAL</code> Initialization failed due to missing App ID and App Code.</p>
<p><code>public static final Error BUSY</code> Initialization cannot be completed as the system is currently busy.</p>
<p><code>public static final Error FILE_RW_ERROR</code> Unable to write to or read from disk cache.</p>
<p><code>public static final Error MISSING_PERMISSION</code> One of the permissions required to run the SDK is missing.</p>
<p><code>public static final Error MISSING_SERVICE</code> MapService cannot not be found</p>
<p><code>public static final Error WRONG_SERVICE_INTENT_NAME</code> Wrong service intent name for MapsEngine with isolated cache</p>
<p><code>public static final Error MISSING_LIBRARIES</code> Missing native libraries or missing dependent java libraries which cause native libraries to not load.</p>
<p><code>public static final Error OPERATION_NOT_ALLOWED</code> The required permission to initialize component is missing or the license key provided is invalid.</p>

## Method Summary

Table 164: Methods in Error

Methods
<pre>public String <i>getDetails</i> ()</pre>
<pre>public String <i>getStackTrace</i> ()</pre>
<pre>public Throwable <i>getThrowable</i> ()</pre>
<pre>public static <i>Error</i> <i>valueOf</i> (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>OnEngineInitListener.Error</i>[] <i>values</i> ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Represents values describing initialization errors.

**See also:**

[\*onEngineInitializationCompleted\(Error\)\*](#)

## Enum Constant Details

```
public static final Error NONE
```

Initialization completed successfully

```
public static final Error USAGE_EXPIRED
```

Initialization failed as the SDK is expired

```
public static final Error MODEL_NOT_SUPPORTED
```

Initialization failed as the device's model is not supported by the SDK

```
public static final Error DEVICE_NOT_SUPPORTED
```

Initialization failed as the device is not supported by the SDK

```
public static final Error UNKNOWN
```

Initialization failed for unknown reasons

```
public static final Error MISSING_APP_CREDENTIAL
```

Initialization failed due to missing App ID and App Code. Please make sure the following lines are added to AndroidManifest.xml (Replace with your own app\_id and app\_code pair) <meta-data android:name="com.here.android.maps.appid" android:value="APPID" /> <meta-data android:name="com.here.android.maps.apptoken" android:value="APPCODE" />

```
public static final Error BUSY
```

Initialization cannot be completed as the system is currently busy. User should check again later.

```
public static final Error FILE_RW_ERROR
```

Unable to write to or read from disk cache.

```
public static final Error MISSING_PERMISSION
```

One of the permissions required to run the SDK is missing. This refers to android application permission.

```
public static final Error MISSING_SERVICE
```

MapService cannot not be found

```
public static final Error WRONG_SERVICE_INTENT_NAME
```

Wrong service intent name for MapsEngine with isolated cache

```
public static final Error MISSING_LIBRARIES
```

Missing native libraries or missing dependent java libraries which cause native libraries to not load.

```
public static final Error OPERATION_NOT_ALLOWED
```

The required permission to initialize component is missing or the license key provided is invalid. This refers to the permission to be supplied for the entry `com.here.android.maps.license.key` in the AndroidManifest.xml.

## Method Details

```
public String getDetails ()
```

### Returns:

More details about the error and tips for the possible solution.

```
public String getStackTrace ()
```

**Returns:**

Stack trace of the associated Throwable object, useful for troubleshooting.

```
public Throwable getThrowable ()
```

**Returns:**

Throwable associated with the error.

```
public static Error valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

**Parameters:**

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static OnErrorListener.Error[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## OnScreenCaptureListener

The interface *OnScreenCaptureListener* is a member of *com.here.android.mpa.common* .

### Interface Summary

```
public abstract interface OnScreenCaptureListener
```

Listener for Screen Capture asynchronous callback.

[For complete information, see the section *Interface Details*]

**See also:**

*getScreenCapture(OnScreenCaptureListener)*

### Method Summary

Table 165: Methods in OnScreenCaptureListener

Methods
<pre>public abstract void <i>onScreenCaptured</i> (Bitmap bitmap)</pre> <p>A callback indicating the availability and validity of the created bitmap.</p>

## Interface Details

Listener for Screen Capture asynchronous callback. The API is supported by *MapFragment*

See also:

*getScreenCapture(OnScreenCaptureListener)*

## Method Details

```
public abstract void onScreenCaptured (Bitmap bitmap)
```

A callback indicating the availability and validity of the created bitmap.

Parameters:

- **bitmap**  
A Bitmap relative to the Map center. *bitmap* is null if failed to retrieve or create the bitmap.

## PositionSimulator

The class *PositionSimulator* is a member of *com.here.android.mpa.common* .

### Class Summary

```
public final class PositionSimulator
```

```
extends java.lang.Object
```

Provides a means to simulate the current device position by injecting Locations read from position log files into Android LocationManager.

[For complete information, see the section *Class Details*]

### Nested Class Summary

Table 166: Nested Classes in PositionSimulator

Nested Classes
public static final enumeration <i>PositionSimulator.PlaybackError</i> Playback Errors

### Constructor Summary

Table 167: Constructors in PositionSimulator

Constructors
<i>PositionSimulator</i> () Create an instance of the PositionSimulator.

## Method Summary

Table 168: Methods in PositionSimulator

Methods
<pre>public int <i>getCurrentPositionIndex</i> ()</pre> <p>Index of the currently playing GeoPosition from the position log file.</p>
<pre>public <i>GeoPosition</i> <i>getPosition</i> (int index)</pre> <p>GeoPosition from the currently playing position log file for the given index.</p>
<pre>public int <i>getPositionCount</i> ()</pre> <p>Number of GeoPositions in the currently playing position log file.</p>
<pre>public <i>PlaybackError</i> <i>startPlayback</i> (String logFilePath)</pre> <p>Starts play back of a position log file by pushing Test Locations to Android LocationManager.</p>
<pre>public void <i>stopPlayback</i> ()</pre> <p>Stops any currently playing position log file.</p>

## Class Details

Provides a means to simulate the current device position by injecting Locations read from position log files into Android LocationManager.

## Constructor Details

### PositionSimulator ()

Create an instance of the PositionSimulator.

Note that you should not attempt to replay position log files concurrently.

## Method Details

### public int *getCurrentPositionIndex* ()

Index of the currently playing GeoPosition from the position log file.

#### Returns:

Position index.

### public *GeoPosition* *getPosition* (int index)

GeoPosition from the currently playing position log file for the given index.

#### Parameters:

- **index**  
Position index.

## Returns:

GeoPosition or null if index is out of bounds.

```
public int getPositionCount ()
```

Number of GeoPositions in the currently playing position log file.

## Returns:

Position count.

```
public PlaybackError startPlayback (String logFilePath)
```

Starts play back of a position log file by pushing Test Locations to Android LocationManager.

Any currently playing file will be immediately stopped and the new position log file started.

When the last Position in the position log file has been played the LocationManager status will be set to unavailable but system GPS updates will not be resumed until stopPlayback() is called.

Position log file playback only works with the default location data source and requires the ACCESS\_FINE\_LOCATION and OPSTR MOCK\_LOCATION android application permissions.

## Parameters:

- **logFilePath**  
Fully qualified file path of the position log file.

## Returns:

PlaybackError.NONE if play back was started successfully, otherwise the failure reason.

```
public void stopPlayback ()
```

Stops any currently playing position log file. System GPS updates will be resumed.

## PlaybackError

The enumeration *PlaybackError* is a member of *com.here.android.mpa.common.PositionSimulator*.

### Enumeration Summary

```
public static final enumeration PositionSimulator.PlaybackError
```

```
extends java.lang.Enum, java.lang.Object
```

Playback Errors

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 169: Enum Constants in PlaybackError

Fields
<pre>public static final PlaybackError NONE</pre> <p>There is no error.</p>
<pre>public static final PlaybackError NO MOCK LOCATION PERMISSION</pre> <p>The application needs the Android OPSTR MOCK LOCATION developer permission in order to replay position log files.</p>
<pre>public static final PlaybackError LOCATION MANAGER</pre> <p>Unexpected error from Android LocationManager.</p>
<pre>public static final PlaybackError FILE NOT FOUND</pre> <p>Position log file was not found.</p>
<pre>public static final PlaybackError FILE PARSING</pre> <p>Error parsing the position log file.</p>
<pre>public static final PlaybackError LOCATION DATA SOURCE INVALID</pre> <p>PositioningManager has not yet been started or the current LocationDataSource does not support log file playback (currently only SDK default data sources are supported).</p>
<pre>public static final PlaybackError NO LOCATION PERMISSION</pre> <p>The application is missing the ACCESS_FINE_LOCATION android permission.</p>

## Method Summary

Table 170: Methods in PlaybackError

Methods
<pre>public static PlaybackError valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static Position Simulator PlaybackError [] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Playback Errors

### Enum Constant Details

```
public static final PlaybackError NONE
```

There is no error. Position playback has started.

```
public static final PlaybackError NO MOCK LOCATION PERMISSION
```

The application needs the Android `OPSTR MOCK_LOCATION` developer permission in order to replay position log files.

```
public static final PlaybackError LOCATION_MANAGER
```

Unexpected error from Android LocationManager.

```
public static final PlaybackError FILE_NOT_FOUND
```

Position log file was not found.

```
public static final PlaybackError FILE_PARSING
```

Error parsing the position log file. This error will be returned if the file is not of a supported format (currently only GPX is supported).

```
public static final PlaybackError LOCATION_DATA_SOURCE_INVALID
```

PositioningManager has not yet been started or the current LocationDataSource does not support log file playback (currently only SDK default data sources are supported).

```
public static final PlaybackError NO_LOCATION_PERMISSION
```

The application is missing the `ACCESS_FINE_LOCATION` android permission.

## Method Details

```
public static PlaybackError valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static PositionSimulator.PlaybackError[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## PositioningManager

The class *PositioningManager* is a member of `com.here.android.mpa.common`.

## Class Summary

public final class **PositioningManager**

extends *java.lang.Object*

Represents a manager for information received from positioning devices, such as updates to the current position and the average speed.

[For complete information, see the section [Class Details](#)]

## Nested Class Summary

Table 171: Nested Classes in PositioningManager

Nested Classes
public static final enumeration <a href="#">PositioningManager.LocationMethod</a> Represents values describing the location method.
public static final enumeration <a href="#">PositioningManager.LocationStatus</a> Represents values describing the location status of a particular location method.
public static final enumeration <a href="#">PositioningManager.LogType</a> Defines the available log types for GPX logging.
public static abstract interface <a href="#">PositioningManager.OnPositionChangedListener</a> Represents an interface for position update listeners.

## Method Summary

Table 172: Methods in PositioningManager

Methods
public void <a href="#">addListener</a> (java.lang.ref.WeakReference < <a href="#">OnPositionChangedListener</a> > listener) Adds a <a href="#">PositioningManager.OnPositionChangedListener</a> to the PositioningManager .
public double <a href="#">getAverageSpeed</a> () Gets the average speed of travel, in meters per second.
public <a href="#">LocationDataSource</a> <a href="#">getDataSource</a> () Get the current location data source used to provide position updates
public static <a href="#">PositioningManager</a> <a href="#">getInstance</a> () Get access to the PositioningManager Singleton
public <a href="#">GeoPosition</a> <a href="#">getLastKnownPosition</a> () Returns the last known (cached) position from the best available provider.
public <a href="#">LocationMethod</a> <a href="#">getLocationMethod</a> () Gets the method type used to determine positioning.

## Methods

```
public LocationStatus getLocationStatus (LocationMethod method)
```

Gets the status for a specified *LocationMethod* .

```
public java.util.EnumSet <LogType> getLogType ()
```

Returns the current GPX logging configuration.

```
public GeoPosition getPosition ()
```

Gets the *GeoPosition* for the current *PositioningManager.LocationMethod* if available.

```
public RoadElement getRoadElement ()
```

Get the *RoadElement* of the current position.

```
public boolean hasValidPosition ()
```

Determines whether the current position for the current active *PositioningManager.LocationMethod* is valid.

```
public boolean hasValidPosition (LocationMethod method)
```

Determines whether the current position for the specified *LocationMethod* is valid.

```
public boolean isActive ()
```

Determines whether the *PositioningManager* is active and whether position updates are being received.

```
public void removeListener (OnPositionChangedListener listener)
```

Removes a *PositioningManager.OnPositionChangedListener* from the *PositioningManager* .

```
public boolean setDataSource (LocationDataSource source)
```

Set the location data source from which to receive position updates.

```
public void setLogType (java.util.EnumSet <LogType> logType)
```

Configures position update logging.

```
public boolean start (LocationMethod method)
```

Starts receiving position updates from the current location data source.

```
public void stop ()
```

Stops receiving position updates from the positioning device.

## Class Details

Represents a manager for information received from positioning devices, such as updates to the current position and the average speed.

If the user of the application revokes the `ACCESS_FINE_LOCATION` permission at runtime while *PositioningManager* is active, the application will stop receiving location updates and methods of *PositioningManager* will stop functioning properly until the `ACCESS_FINE_LOCATION` permission is restored.

## Method Details

```
public void addListener (java.lang.ref.WeakReference  
<OnPositionChangedListener> listener)
```

Adds a *PositioningManager.OnPositionChangedListener* to the *PositioningManager*.

**Parameters:**

- **listener**

A *WeakReference* of the *OnPositionChangedListener* to add.

**See also:**

*removeListener(OnPositionChangedListener)*

```
public double getAverageSpeed ()
```

Gets the average speed of travel, in meters per second.

**Returns:**

The average speed

```
public LocationDataSource getDataSource ()
```

Get the current location data source used to provide position updates

**Returns:**

*LocationDataSource* passed to *setDataSource* or null if the current location data source is the HERE SDK default.

```
public static PositioningManager getInstance ()
```

Get access to the *PositioningManager* Singleton

**Returns:**

*PositioningManager* instance

```
public GeoPosition getLastKnownPosition ()
```

Returns the last known (cached) position from the best available provider. This is useful if there is no valid device position available (i.e. *hasValidPosition()* returns false). If *hasValidPosition()* returns true, please use the *getPosition()* API.

There is no guarantee regarding the freshness of the returned position. If no cached position is available, an invalid *GeoPosition* is returned (can be checked by way of *isValid()*).

**Returns:**

Last known position from the best available provider. Or an invalid *GeoPosition* if not available.

**See also:**

*getPosition()*

```
public LocationMethod getLocationMethod ()
```

Gets the method type used to determine positioning.

**Returns:**

The *LocationMethod*

```
public LocationStatus getLocationStatus (LocationMethod method)
```

Gets the status for a specified *LocationMethod*.

**Parameters:**

- **method**  
A *LocationMethod* used to determine the location status

**Returns:**

The status of the specified *LocationMethod*

```
public java.util.EnumSet <LogType> getLogType ()
```

Returns the current GPX logging configuration.

Defaults to an empty *EnumSet* (no logging).

**Returns:**

The set of all enabled log types.

**See also:**

[PositioningManager.LogType](#)

```
public GeoPosition getPosition ()
```

Gets the *GeoPosition* for the current *PositioningManager.LocationMethod* if available.

Availability of a position can be checked by way of the *hasValidPosition()* method, if that method returns false, the best available cached position can be obtained using the *getLastKnownPosition()* API.

The position returned is determined by the following criteria:

- If Navigation is active, the *MatchedGeoPosition* is returned, else
- If a valid position fix is available for the active *PositioningManager.LocationMethod* than it is returned. else,
- An invalid *GeoPosition* is returned (this can be checked by way of *isValid()*)

**Returns:**

The current *GeoPosition*

**See also:**

[getLastKnownPosition\(\)](#)

```
public RoadElement getRoadElement ()
```

Get the *RoadElement* of the current position.

**Returns:**

A *RoadElement* object representing the road element at the current position.

```
public boolean isValidPosition ()
```

Determines whether the current position for the current active *PositioningManager.LocationMethod* is valid.

**Returns:**

True if the position is valid, false otherwise

**See also:**

[\*isValidPosition\(LocationMethod\)\*](#)

```
public boolean isValidPosition (LocationMethod method)
```

Determines whether the current position for the specified *LocationMethod* is valid.

**Parameters:**

- **method**  
A *LocationMethod* to check for a valid position

**Returns:**

True if the position is valid, false otherwise

**See also:**

[\*isValidPosition\(\)\*](#)

```
public boolean isActive ()
```

Determines whether the *PositioningManager* is active and whether position updates are being received.

**Returns:**

True if the *PositioningManager* is actively receiving position updates, false otherwise

```
public void removeListener (OnPositionChangeListener listener)
```

Removes a *PositioningManager.OnPositionChangeListener* from the *PositioningManager*.

**Parameters:**

- **listener**  
A *OnPositionChangeListener* to remove

**See also:**

[addListener\(WeakReference<OnPositionChangedListener>\)](#)

```
public boolean setDataSource (LocationDataSource source)
```

Set the location data source from which to receive position updates.

Note: The default HERE SDK data source supports the GPS and network location methods.

**Parameters:**

- **source**  
LocationDataSource used to provide position updates. Specify null to use the default location data source provided by the HERE SDK.

**Returns:**

True if the data source was set successfully, false otherwise. One reason for returning false is that positioning is currently active and the new location source could not be started with the current location method.

```
public void setLogType (java.util.EnumSet <LogType> logType)
```

Configures position update logging.

LogType.DATA\_SOURCE will log "input positions" from the current LocationDataSource if the data source supports GPX logging. HERE SDK default data sources that use Android Location Manager will log to a GPX file ending with the suffix "\_lm". This GPX file is suitable for playback via [PositionSimulator](#).

LogType.RAW and LogType.MATCHED will log the results of processing the input position from the current data source. The content of these logs represents historical values that [getPosition\(\)](#) would return. GPX logs produced for these logging types are for analysis only and are not suitable for playback via [PositionSimulator](#).

GPX logs will be written to a "gpx" sub directory of the Application's data directory (for example, "/sdcard/Android/data/com.companyName.appName/files/gpx/"). Logs will be prefixed with a timestamp representing the time logging was enabled and suffix indicating the log type.

To ensure log files are flushed to disk make sure logging is disabled prior to application exit. Logging is disabled by setting the log type to EnumSet.noneOf(LogType.class).

Defaults to an empty EnumSet (no logging).

IMPORTANT: Logging should NOT be permanently enabled in production builds submitted to the Google Play Store.

**Parameters:**

- **logType**  
The set of all [PositioningManager.LogTypes](#) to be enabled

**See also:**

[PositioningManager.LogType](#)

```
public boolean start (LocationMethod method)
```

Starts receiving position updates from the current location data source.

When using *LocationDataSourceDevice* (the default) or *LocationDataSourceHERE*, this method will return `false` and the `PositioningManager` will not be started if the application does not have the `ACCESS_FINE_LOCATION` permission at the time of this call.

**Parameters:**

- `method`  
*LocationMethod* used to provide position updates

**Returns:**

True if current location data source was started OK, false otherwise (this may indicate the application does not have the `ACCESS_FINE_LOCATION` permission at the time of this call).

```
public void stop ()
```

Stops receiving position updates from the positioning device.

## LocationMethod

The enumeration *LocationMethod* is a member of *com.here.android.mpa.common.PositioningManager*.

### Enumeration Summary

```
public static final enumeration PositioningManager.LocationMethod
```

```
extends java.lang.Enum, java.lang.Object
```

Represents values describing the location method.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

**Table 173: Enum Constants in LocationMethod**

Fields
<pre>public static final <i>LocationMethod</i> <b>NONE</b></pre> <p>Device positioning is not active.</p>
<pre>public static final <i>LocationMethod</i> <b>GPS</b></pre> <p>Positioning is provided using a GPS device.</p>
<pre>public static final <i>LocationMethod</i> <b>NETWORK</b></pre> <p>Positioning is provided using a wireless network.</p>

### Fields

```
public static final LocationMethod GPS_NETWORK
```

Positioning is provided using a wireless network, or a GPS device, or both.

```
public static final LocationMethod GPS_NETWORK_INDOOR
```

Positioning is provided using GPS, or Wi-Fi or Bluetooth LE network.

```
public static final LocationMethod INDOOR
```

Positioning is provided using Wi-Fi or Bluetooth LE network using high accuracy radio maps.

## Method Summary

Table 174: Methods in `LocationMethod`

### Methods

```
public static LocationMethod valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static PositioningManager.LocationMethod[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Represents values describing the location method.

### Enum Constant Details

```
public static final LocationMethod NONE
```

Device positioning is not active.

```
public static final LocationMethod GPS
```

Positioning is provided using a GPS device.

```
public static final LocationMethod NETWORK
```

Positioning is provided using a wireless network.

```
public static final LocationMethod GPS_NETWORK
```

Positioning is provided using a wireless network, or a GPS device, or both.

```
public static final LocationMethod GPS_NETWORK_INDOOR
```

Positioning is provided using GPS, or Wi-Fi or Bluetooth LE network. Returned positions may contain building and floor information.

```
public static final LocationMethod INDOOR
```

Positioning is provided using Wi-Fi or Bluetooth LE network using high accuracy radio maps. Returned positions may contain building and floor information.

## Method Details

```
public static LocationMethod valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static PositioningManager.LocationMethod[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## LocationStatus

The enumeration *LocationStatus* is a member of *com.here.android.mpa.common.PositioningManager*.

## Enumeration Summary

```
public static final enumeration PositioningManager.LocationStatus
```

```
extends java.lang.Enum, java.lang.Object
```

Represents values describing the location status of a particular location method.

[For complete information, see the section [Enumeration Details](#)]

### See also:

[PositioningManager.LocationMethod](#)

## Enum Constant Summary

Table 175: Enum Constants in LocationStatus

Fields
<pre>public static final LocationStatus OUT_OF_SERVICE</pre> <p>The device is disabled.</p>
<pre>public static final LocationStatus TEMPORARILY_UNAVAILABLE</pre> <p>The device is enabled, but without a location fix.</p>
<pre>public static final LocationStatus AVAILABLE</pre> <p>The device is enabled with a GPS location fix.</p>

## Method Summary

Table 176: Methods in LocationStatus

Methods
<pre>public static LocationStatus valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static PositioningManager.LocationStatus[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Represents values describing the location status of a particular location method.

**See also:**

[PositioningManager.LocationMethod](#)

## Enum Constant Details

```
public static final LocationStatus OUT_OF_SERVICE
```

The device is disabled.

```
public static final LocationStatus TEMPORARILY_UNAVAILABLE
```

The device is enabled, but without a location fix.

```
public static final LocationStatus AVAILABLE
```

The device is enabled with a GPS location fix.

## Method Details

```
public static LocationStatus valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static PositioningManager.LocationStatus[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## LogType

The enumeration *LogType* is a member of *com.here.android.mpa.common.PositioningManager*.

## Enumeration Summary

```
public static final enumeration PositioningManager.LogType
```

```
extends java.lang.Enum, java.lang.Object
```

Defines the available log types for GPX logging.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 177: Enum Constants in LogType

Fields
<pre>public static final <i>LogType</i> <b>DATA_SOURCE</b></pre> <p>Logs position updates from the current <i>LocationDataSource</i> if it supports GPX logging</p>
<pre>public static final <i>LogType</i> <b>RAW</b></pre> <p>Logs raw position updates to <code>"*_raw.gpx"</code></p>
<pre>public static final <i>LogType</i> <b>MATCHED</b></pre> <p>Logs map matched position updates to <code>"*_matched.gpx"</code></p>

## Method Summary

Table 178: Methods in LogType

Methods
<pre>public static <i>LogType</i> valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>PositioningManager.LogType[]</i> values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Defines the available log types for GPX logging.

### Enum Constant Details

```
public static final LogType DATA_SOURCE
```

Logs position updates from the current LocationDataSource if it supports GPX logging

```
public static final LogType RAW
```

Logs raw position updates to "\*\_raw.gpx"

```
public static final LogType MATCHED
```

Logs map matched position updates to "\*\_matched.gpx"

## Method Details

```
public static LogType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static PositioningManager.LogType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## OnPositionChangeListener

The interface *OnPositionChangeListener* is a member of *com.here.android.mpa.common.PositioningManager*.

### Interface Summary

public static abstract interface **PositioningManager.OnPositionChangeListener**

Represents an interface for position update listeners.

[For complete information, see the section *Interface Details*]

See also:

*addListener(WeakReference<OnPositionChangeListener>)*

*removeListener(OnPositionChangeListener)*

### Method Summary

Table 179: Methods in OnPositionChangeListener

Methods
<pre>public abstract void <i>onPositionFixChanged</i> (<i>LocationMethod</i> method, <i>LocationStatus</i> status)</pre> <p>A callback indicating that the position fix has changed.</p>
<pre>public abstract void <i>onPositionUpdated</i> (<i>LocationMethod</i> method, <i>GeoPosition</i> position, boolean isMapMatched)</pre> <p>A callback indicating that the position has been updated.</p>

### Interface Details

Represents an interface for position update listeners.

See also:

*addListener(WeakReference<OnPositionChangeListener>)*

*removeListener(OnPositionChangeListener)*

### Method Details

```
public abstract void onPositionFixChanged (LocationMethod method, LocationStatus status)
```

A callback indicating that the position fix has changed.

Parameters:

- **method**  
A *LocationMethod* providing the status update (GPS or Network)
- **status**

A `LocationStatus` representing the updated positioning status

```
public abstract void onPositionUpdated (LocationMethod method, GeoPosition
position, boolean isMapMatched)
```

A callback indicating that the position has been updated.

**Parameters:**

- **method**  
A `LocationMethod` providing the position update (GPS or Network)
- **position**  
A `GeoPosition` representing the updated position. The position can return null if the MapsEngine has not been initialized.
- **isMapMatched**  
A boolean stating if the position is map matched or not. Map matching approximates user coordinates to the nearest road or navigation route. If the value is false then it means an unmatched (raw) position is received.

## RoadElement

The class `RoadElement` is a member of `com.here.android.mpa.common`.

### Class Summary

```
public final class RoadElement
```

```
extends java.lang.Object
```

Represents a single segment of a road.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 180: Nested Classes in `RoadElement`

Nested Classes
<pre>public static final enumeration <i>RoadElement.Attribute</i></pre> <p>Defined values for different road attributes</p>
<pre>public static final enumeration <i>RoadElement.FormOfWay</i></pre> <p>Form of Way Types</p>
<pre>public static final enumeration <i>RoadElement.PluralType</i></pre> <p>Plural type identifies when a Junction is made up of multiple Road Elements.</p>

## Method Summary

Table 181: Methods in RoadElement

Methods
<p>public boolean <code>equals</code> (Object other)</p> <p>For documentation, see <code>java.lang.Object</code></p>
<p>public java.util.EnumSet &lt;Attribute&gt; <code>getAttributes</code> ()</p> <p>Gets the road attributes.</p>
<p>public float <code>getDefaultSpeed</code> ()</p> <p>Gets the default speed of the road element.</p>
<p>public <code>FormOfWay</code> <code>getFormOfWay</code> ()</p> <p>Gets the form of way.</p>
<p>public java.util.List &lt;GeoCoordinate&gt; <code>getGeometry</code> ()</p> <p>Returns the geometry of the road element.</p>
<p>public double <code>getGeometryLength</code> ()</p> <p>Returns the length of the polyline associated with this RoadElement in meters.</p>
<p>public <code>Identifier</code> <code>getIdentifier</code> ()</p> <p>Get the Identifier for this particular RoadElement.</p>
<p>public int <code>getNumberOfLanes</code> ()</p> <p>Gets number of lanes in this road element.</p>
<p>public long <code>getPermanentDirectedLinkId</code> ()</p> <p>The Permanent Link ID (stable across different map versions) of the RoadElement with travel direction: positive sign (+) means driving in the 'canonical' direction of the road and negative sign (-) means driving against the 'canonical' direction of the road.</p>
<p>public long <code>getPermanentLinkId</code> ()</p> <p>Returns the Permanent Link ID (stable across different map versions) of the RoadElement .</p>
<p>public <code>PluralType</code> <code>getPluralType</code> ()</p> <p>Gets the plural type of the road element.</p>
<p>public static <code>RoadElement</code> <code>getRoadElement</code> (<code>GeoCoordinate</code> coordinate, String marcCode)</p> <p>Get the RoadElement of the current GeoCoordinate .</p>
<p>public static java.util.List &lt;<code>RoadElement</code>&gt; <code>getRoadElements</code> (<code>GeoBoundingBox</code> boundingBox, String marcCode)</p> <p>Get the list of RoadElement of the current GeoBoundingBox .</p>
<p>public String <code>getRoadName</code> ()</p> <p>Gets the name of the road that contains this current road element, such as "Still Creek Drive".</p>
<p>public String <code>getRouteName</code> ()</p> <p>Gets the route name of the road element.</p>

## Methods

```
public float getSpeedLimit ()
```

Gets the speed limit.

```
public Date getStartTime ()
```

Gets the (estimated) time at which this road element starts.

```
public float getStaticSpeed ()
```

Gets the static speed of the road element using only free-flow speeds.

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public boolean isPedestrian ()
```

Checks, if the road is allowed only for pedestrians.

```
public boolean isPlural ()
```

Tests if the road element is plural.

## Class Details

Represents a single segment of a road.

## Method Details

```
public boolean equals (Object other)
```

For documentation, see *java.lang.Object*

### Parameters:

- **other**

```
public java.util.EnumSet getAttributes (<Attribute>)
```

Gets the road attributes.

### Returns:

Set of *RoadElement.Attribute*

```
public float getDefaultSpeed ()
```

Gets the default speed of the road element. It uses the same speeds used during routing, includes dynamic events, for example, if traffic is enabled.

### Returns:

The default speed in m/s or 0.0 if the information is not available.

```
public FormOfWay getFormOfWay ()
```

Gets the form of way.

**Returns:**

The form of way of the road.

```
public java.util.List <GeoCoordinate> getGeometry ()
```

Returns the geometry of the road element. The geometry is returned as a list of *GeoCoordinate* that can be used to create a polyline.

**Returns:**

a list of *GeoCoordinate*

```
public double getGeometryLength ()
```

Returns the length of the polyline associated with this *RoadElement* in meters.

**Returns:**

length of polyline for this *RoadElement* in meters.

```
public Identifier getIdentifier ()
```

Get the Identifier for this particular *RoadElement*.

**Returns:**

*Identifier*

```
public int getNumberOfLanes ()
```

Gets number of lanes in this road element.

**Returns:**

The number of lanes in this road element.

```
public long getPermanentDirectedLinkId ()
```

The Permanent Link ID (stable across different map versions) of the *RoadElement* with travel direction: positive sign (+) means driving in the 'canonical' direction of the road and negative sign (-) means driving against the 'canonical' direction of the road. Every road element has two endpoints. Starting from which end point the link is being traversed? Each link has a geometry associated with it. The geometry gives the link a 'canonical' direction: if you traverse the link in the direction the geometry is stored, you are traveling in the positive direction. Otherwise, you are traveling in the negative direction. The assigned 'canonical' direction is completely arbitrary and no assumption should be made about it. This property is unavailable when the public transport mode *RouteOptions.TransportMode#PUBLIC\_TRANSPORT* is used. For all the other transport modes, it is available only in routes calculated with the online connectivity mode.

## Returns:

Permanent Link ID with direction of this element or 0 if not available.

## See also:

[getPermanentLinkId\(\)](#)

```
public long getPermanentLinkId ()
```

Returns the Permanent Link ID (stable across different map versions) of the `RoadElement` . This property is unavailable when the public transport mode `RouteOptions.TransportMode#PUBLIC_TRANSPORT` is used. For all the other transport modes, it is available only in routes calculated with the online connectivity mode.

## Returns:

Permanent Link ID of this element or 0 if not available.

## See also:

[getPermanentDirectedLinkId\(\)](#)

```
public PluralType getPluralType ()
```

Gets the plural type of the road element.

## Returns:

The plural type of the road element.

```
public static RoadElement getRoadElement (GeoCoordinate coordinate, String  
marcCode)
```

Get the `RoadElement` of the current `GeoCoordinate` . This method returns `null` if the `GeoCoordinate` is invalid or there is no `RoadElement` close enough to the `GeoCoordinate` .

## Parameters:

- **coordinate**  
The `GeoCoordinate` that defines the coordinate to retrieve `RoadElement`
- **marcCode**  
The text for `RoadElement` corresponds to the language MARC code.

## Returns:

The `RoadElement` of the current `GeoCoordinate`.

## Throws:

- **IllegalArgumentException**  
If `marcCode` is an empty string.
- **NullPointerException**  
If `coordinate` is null or `marcCode` is null.

```
public static java.util.List <RoadElement> getRoadElements (GeoBoundingBox boundingBox, String marcCode)
```

Get the list of RoadElement of the current GeoBoundingBox .

**Parameters:**

- **boundingBox**  
The GeoBoundingBox that defines the area to retrieve RoadElement
- **marcCode**  
The text for RoadElement corresponds to the language MARC code.

**Returns:**

The list of RoadElement of the current GeoBoundingBox.

```
public String getRoadName ()
```

Gets the name of the road that contains this current road element, such as "Still Creek Drive".

**Returns:**

The name of the road. Returns null or an empty string if the name is unknown, such as when the road element is on an unnamed service alley.

```
public String getRouteName ()
```

Gets the route name of the road element. The route name is a short label for the road, for example I5 for the Interstate 5 in the US. The method returns a null string if the route name is unknown.

**Returns:**

The route name of the road element.

```
public float getSpeedLimit ()
```

Gets the speed limit.

**Returns:**

The speed limit in m/s or 0 if the information is not available.

```
public Date getStartTime ()
```

Gets the (estimated) time at which this road element starts. If no departure time was set for the [RouteOptions](#) associated with this road element, than the time is relative to the system time when the route calculation took place. Otherwise, the times are relative to the specified departure time.

**Returns:**

The start time, or null if not available

**See also:**

[setTime\(Date, TimeType\)](#)

`public float getStaticSpeed ()`

Gets the static speed of the road element using only free-flow speeds. It does not include dynamic events, for example, excludes traffic even if enabled.

**Returns:**

The static speed in m/s or 0.0 if the information is not available.

`public int hashCode ()`

For documentation, see [java.lang.Object](#)

`public boolean isPedestrian ()`

Checks, if the road is allowed only for pedestrians.

**Returns:**

True, if road is allowed only for pedestrians, otherwise false.

`public boolean isPlural ()`

Tests if the road element is plural.

**Returns:**

True if the road element is plural.

## Attribute

The enumeration *Attribute* is a member of *com.here.android.mpa.common.RoadElement*.

### Enumeration Summary

`public static final enumeration RoadElement.Attribute`

*extends java.lang.Enum, java.lang.Object*

Defined values for different road attributes

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 182: Enum Constants in Attribute

Fields
<pre>public static final Attribute DIR_NO_CARS</pre> <p>Road direction.</p>
<pre>public static final Attribute DIR_FORWARD</pre>
<pre>public static final Attribute DIR_BACKWARD</pre>
<pre>public static final Attribute DIR_BOTH</pre>
<pre>public static final Attribute DIRT_ROAD</pre> <p>Road type.</p>
<pre>public static final Attribute USAGE_FEE_REQUIRED</pre>
<pre>public static final Attribute CARPOOL</pre>
<pre>public static final Attribute URBAN</pre>
<pre>public static final Attribute TOLLROAD</pre>
<pre>public static final Attribute NO_THROUGH_TRAFFIC</pre>
<pre>public static final Attribute TUNNEL</pre>
<pre>public static final Attribute EXPLICATION</pre>
<pre>public static final Attribute SLIPROAD</pre>
<pre>public static final Attribute HIGHWAY</pre>
<pre>public static final Attribute UNDER_CONSTRUCTION</pre>
<pre>public static final Attribute HAS_LANE_DIR</pre>
<pre>public static final Attribute HAS_LANE_EXIT</pre>
<pre>public static final Attribute FERRY</pre>
<pre>public static final Attribute CAR_SHUTTLE_TRAIN</pre>
<pre>public static final Attribute DIR_NO_TRUCKS</pre> <p>truck specific</p>
<pre>public static final Attribute DIR_TRUCK_FORWARD</pre>
<pre>public static final Attribute DIR_TRUCK_BACKWARD</pre>
<pre>public static final Attribute DIR_TRUCK_BOTH</pre>
<pre>public static final Attribute TRUCK_TOLLROAD</pre>
<pre>public static final Attribute TRUCK_NO_THROUGH</pre>

## Method Summary

Table 183: Methods in Attribute

Methods
<pre>public static <i>Attribute</i> valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>RoadElement.Attribute[]</i> values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Defined values for different road attributes

### Enum Constant Details

```
public static final Attribute DIR_NO_CARS
```

Road direction.

```
public static final Attribute DIR_FORWARD
```

```
public static final Attribute DIR_BACKWARD
```

```
public static final Attribute DIR_BOTH
```

```
public static final Attribute DIRT_ROAD
```

Road type.

```
public static final Attribute USAGE_FEE_REQUIRED
```

```
public static final Attribute CARPOOL
```

```
public static final Attribute URBAN
```

```
public static final Attribute TOLLROAD
```

```
public static final Attribute NO_THROUGH_TRAFFIC
```

```
public static final Attribute TUNNEL
```

```
public static final Attribute EXPLICATION
```

```
public static final Attribute SLIPROAD
```

```
public static final Attribute HIGHWAY
```

```
public static final Attribute UNDER_CONSTRUCTION
```

```
public static final Attribute HAS_LANE_DIR
```

```
public static final Attribute HAS_LANE_EXIT
```

```
public static final Attribute FERRY
```

```
public static final Attribute CAR_SHUTTLE_TRAIN
```

```
public static final Attribute DIR_NO_TRUCKS
```

truck specific

```
public static final Attribute DIR_TRUCK_FORWARD
```

```
public static final Attribute DIR_TRUCK_BACKWARD
```

```
public static final Attribute DIR_TRUCK_BOTH
```

```
public static final Attribute TRUCK_TOLLROAD
```

```
public static final Attribute TRUCK_NO_THROUGH
```

### Method Details

```
public static Attribute valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static RoadElement.Attribute[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## FormOfWay

The enumeration *FormOfWay* is a member of *com.here.android.mpa.common.RoadElement*.

### Enumeration Summary

```
public static final enumeration RoadElement.FormOfWay
```

```
extends java.lang.Enum, java.lang.Object
```

Form of Way Types

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 184: Enum Constants in FormOfWay

Fields
<pre>public static final <i>FormOfWay</i> <b>UNDEFINED</b></pre> <p>Road form of way is undefined/unknown.</p>
<pre>public static final <i>FormOfWay</i> <b>MOTORWAY</b></pre> <p>Road to which regulations will normally apply with regards to entry and use.</p>
<pre>public static final <i>FormOfWay</i> <b>MULTI_CARRIAGEWAY</b></pre> <p>Road with physically separated carriageways regardless of the number of lanes, which is not a motorway or a freeway.</p>
<pre>public static final <i>FormOfWay</i> <b>SINGLE_CARRIAGEWAY</b></pre> <p>Road where the traffic is not separated by any physical object.</p>

**Fields**

```
public static final FormOfWay ROUNDAABOUT
```

Road which forms a ring on which traffic travelling in only one direction is allowed.

```
public static final FormOfWay SPECIAL_TRAFFIC_FIGURE
```

Road that is part of a roundabout with a higher priority road cutting through the central island.

```
public static final FormOfWay SLIPROAD
```

Road especially designed to enter or exit another road.

```
public static final FormOfWay PEDESTRIAN_ZONE
```

Road within an area specially designed for use by pedestrians.

```
public static final FormOfWay PEDESTRIAN_WALKWAY
```

Paved or unpaved road for exclusive pedestrian use.

```
public static final FormOfWay SERVICE_ACCESS_PARKING
```

**Deprecated: As of Release 3.4.**

Road specially designed to enter or to leave a parking area.

```
public static final FormOfWay SERVICE_ACCESS_OTHER
```

**Deprecated: As of Release 3.4.**

Road designed to enter or to leave an uncategorized area.

```
public static final FormOfWay SERVICE_ROAD
```

**Deprecated: As of Release 3.4.**

Road running parallel to, and designed to connect, a road with a relatively high connectivity function with roads with a lower connectivity function.

```
public static final FormOfWay SERVICE_ACCESS
```

Road running parallel to, and designed to connect, a road with a relatively high connectivity function with roads with a lower connectivity function.

```
public static final FormOfWay ETA_PARKING_PLACE
```

Enclosed traffic area parking within a malls and shopping centers.

```
public static final FormOfWay ETA_PARKING_BUILDING
```

Enclosed traffic area parking within a building (also known as a parkage or parking garage).

```
public static final FormOfWay ETA_UNSTRUCTURED_TRAFFIC_SQUARE
```

Enclosed traffic area, (partly) enclosed by roads which is used for non-traffic purposes and which is not a roundabout.

```
public static final FormOfWay ROAD_FOR_AUTHORITIES
```

Road strictly used by security vehicles.

## Method Summary

Table 185: Methods in FormOfWay

Methods
<pre>public static <i>FormOfWay</i> <b>valueOf</b> (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>RoadElement.FormOfWay</i>[] <b>values</b> ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Form of Way Types

### Enum Constant Details

```
public static final FormOfWay UNDEFINED
```

Road form of way is undefined/unknown.

```
public static final FormOfWay MOTORWAY
```

Road to which regulations will normally apply with regards to entry and use. It has two or more mostly physically separated carriageways and no single level-crossings. Also known as a freeway or expressway.

```
public static final FormOfWay MULTI_CARRIAGEWAY
```

Road with physically separated carriageways regardless of the number of lanes, which is not a motorway or a freeway.

```
public static final FormOfWay SINGLE_CARRIAGEWAY
```

Road where the traffic is not separated by any physical object.

```
public static final FormOfWay ROUNDABOUT
```

Road which forms a ring on which traffic travelling in only one direction is allowed.

```
public static final FormOfWay SPECIAL_TRAFFIC_FIGURE
```

Road that is part of a roundabout with a higher priority road cutting through the central island.

```
public static final FormOfWay SLIPROAD
```

Road especially designed to enter or exit another road.

```
public static final FormOfWay PEDESTRIAN_ZONE
```

Road within an area specially designed for use by pedestrians.

```
public static final FormOfWay PEDESTRIAN_WALKWAY
```

Paved or unpaved road for exclusive pedestrian use. These walkways are closed to bicycles and normal vehicles.

```
public static final FormOfWay SERVICE_ACCESS_PARKING
```

Deprecated: As of Release 3.4.

No longer supported. No roads will have this form of way value.

Road specially designed to enter or to leave a parking area.

```
public static final FormOfWay SERVICE_ACCESS_OTHER
```

Deprecated: As of Release 3.4.

No longer supported. No roads will have this form of way value.

Road designed to enter or to leave an uncategorized area.

```
public static final FormOfWay SERVICE_ROAD
```

Deprecated: As of Release 3.4.

No longer supported. It is now replaced with [SERVICE\\_ACCESS](#)

Road running parallel to, and designed to connect, a road with a relatively high connectivity function with roads with a lower connectivity function.

```
public static final FormOfWay SERVICE_ACCESS
```

Road running parallel to, and designed to connect, a road with a relatively high connectivity function with roads with a lower connectivity function.

```
public static final FormOfWay ETA_PARKING_PLACE
```

Enclosed traffic area parking within a malls and shopping centers. At least two roads are connected to the area.

```
public static final FormOfWay ETA_PARKING_BUILDING
```

Enclosed traffic area parking within a building (also known as a parkage or parking garage). At least two roads are connected to the area.

```
public static final FormOfWay ETA_UNSTRUCTURED_TRAFFIC_SQUARE
```

Enclosed traffic area, (partly) enclosed by roads which is used for non-traffic purposes and which is not a roundabout.

```
public static final FormOfWay ROAD_FOR_AUTHORITIES
```

Road strictly used by security vehicles.

## Method Details

```
public static FormOfWay valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static RoadElement.FormOfWay[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## PluralType

The enumeration *PluralType* is a member of *com.here.android.mpa.common.RoadElement*.

## Enumeration Summary

```
public static final enumeration RoadElement.PluralType
```

*extends java.lang.Enum, java.lang.Object*

Plural type identifies when a Junction is made up of multiple Road Elements.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 186: Enum Constants in PluralType

Fields
<pre>public static final PluralType NONE</pre> <p>Junction is not plural</p>
<pre>public static final PluralType MANEUVER</pre> <p>Indicates that only one command should be given despite the fact that two Junctions occur; one at each end of the turn lane.</p>
<pre>public static final PluralType CONNECTOR</pre> <p>Indicates that a road segment should not be viewed as an individual piece of road but as part of the intersection.</p>
<pre>public static final PluralType INDETERMINATE</pre> <p>Indicates a maneuver that cannot be explained in one command or at all.</p>

## Method Summary

Table 187: Methods in PluralType

Methods
<pre>public static PluralType valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static RoadElement.PluralType[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Plural type identifies when a Junction is made up of multiple Road Elements. It also implies that a maneuver may require different explanation than implied by the geometry.

### Enum Constant Details

```
public static final PluralType NONE
```

Junction is not plural

```
public static final PluralType MANEUVER
```

Indicates that only one command should be given despite the fact that two Junctions occur; one at each end of the turn lane. It is only necessary to state "turn right" near the beginning of the maneuver because at the end the driver does not have a choice in direction.

```
public static final PluralType CONNECTOR
```

Indicates that a road segment should not be viewed as an individual piece of road but as part of the intersection. A separate guidance maneuver should not exist for this segment. For example, if making a u-turn in Example A in Figure 4B-113, the driver should receive the instruction to "make the u-turn" and not "turn left, turn left".

```
public static final PluralType INDETERMINATE
```

Indicates a maneuver that cannot be explained in one command or at all. A graphic may be needed to illustrate the turn. In these situations a driver may need to go right to make a left turn.

### Method Details

```
public static PluralType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static RoadElement.PluralType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Size

The class *Size* is a member of *com.here.android.mpa.common*.

### Class Summary

```
public final class Size
```

```
extends java.lang.Object
```

Represents size in pixels

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 188: Constructors in *Size*

Constructors
<i>Size</i> () Public constructor

**Constructors****Size** (int width, int height)

Public constructor

**Field Summary**

Table 189: Fields in Size

**Fields**public int *height*

Height of the screen in pixels

public int *width*

Width of the screen in pixels

**Method Summary**

Table 190: Methods in Size

**Methods**public boolean *equals* (Object other)For documentation, see *java.lang.Object*public int *hashCode* ()For documentation, see *java.lang.Object*public boolean *isNull* ()

Has no dimensions

**Class Details**

Represents size in pixels

**Constructor Details****Size ()**

Public constructor

**Size (int width, int height)**

Public constructor

**Parameters:**

- **width**  
Width of screen in pixels
- **height**

Height of screen in pixels

## Field Details

```
public int height
```

Height of the screen in pixels

```
public int width
```

Width if the screen in pixels

## Method Details

```
public boolean equals (Object other)
```

For documentation, see *java.lang.Object*

**Parameters:**

- **other**

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public boolean isNull ()
```

Has no dimensions

**Returns:**

Whether this object has no width and height

## TimeInterval

The class *TimeInterval* is a member of [com.here.android.mpa.common](#).

### Class Summary

```
public final class TimeInterval
```

*extends java.lang.Object*

This is the definition of the *TimeInterval* class.

[For complete information, see the section [Class Details](#)]

## Method Summary

Table 191: Methods in TimeInterval

Methods
<pre>public boolean equals (Object other)</pre> <p>For documentation, see <i>java.lang.Object</i></p>
<pre>public Date getEndTime ()</pre> <p>gets the end time for the TimeInterval</p>
<pre>public Date getStartTime ()</pre> <p>gets the start time for the TimeInterval</p>
<pre>public int hashCode ()</pre> <p>For documentation, see <i>java.lang.Object</i></p>

## Class Details

This is the definition of the TimeInterval class. A TimeInterval describes the start time and end time of any event

### Method Details

```
public boolean equals (Object other)
```

For documentation, see *java.lang.Object*

#### Parameters:

- **other**

```
public Date getEndTime ()
```

gets the end time for the TimeInterval

#### Returns:

End time as a *java.util.Date* object.

```
public Date getStartTime ()
```

gets the start time for the TimeInterval

#### Returns:

start time as a *java.util.Date* object.

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## TransitType

The enumeration *TransitType* is a member of *com.here.android.mpa.common* .

### Enumeration Summary

public final enumeration **TransitType**

extends *java.lang.Enum*, *java.lang.Object*

Represents values describing the types of transit that an application user might take.

[For complete information, see the section *Enumeration Details*]

### Enum Constant Summary

Table 192: Enum Constants in TransitType

Fields
<pre>public static final TransitType BUS_PUBLIC</pre> <p>A public bus.</p>
<pre>public static final TransitType BUS_TOURISTIC</pre> <p>A tourist bus.</p>
<pre>public static final TransitType BUS_INTERCITY</pre> <p>An intercity bus.</p>
<pre>public static final TransitType BUS_EXPRESS</pre> <p>An express bus.</p>
<pre>public static final TransitType RAIL_METRO</pre> <p>A metro railway.</p>
<pre>public static final TransitType RAIL_LIGHT</pre> <p>A light railway.</p>
<pre>public static final TransitType RAIL_REGIONAL</pre> <p>A regional railway.</p>
<pre>public static final TransitType TRAIN_REGIONAL</pre> <p>A regional train.</p>
<pre>public static final TransitType TRAIN_INTERCITY</pre> <p>An intercity train.</p>
<pre>public static final TransitType TRAIN_HIGH_SPEED</pre> <p>A high-speed train.</p>

## Fields

```
public static final TransitType MONORAIL
```

Monorail

```
public static final TransitType AERIAL
```

Aerial transit.

```
public static final TransitType INCLINED
```

Inclined transit.

```
public static final TransitType WATER
```

A water taxi or ferry.

```
public static final TransitType AIRLINE
```

An airline.

```
public static final TransitType UNKNOWN
```

An unknown transit type.

```
public static final TransitType TRAIN_INTERREGIONAL_AND_FAST
```

An inter-regional and fast train.

```
public static final TransitType ORDERED_SERVICES_OR_TAXI
```

An ordered services or taxi.

## Method Summary

Table 193: Methods in *TransitType*

### Methods

```
public static TransitType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static TransitType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Represents values describing the types of transit that an application user might take.

### Enum Constant Details

```
public static final TransitType BUS_PUBLIC
```

A public bus.

```
public static final TransitType BUS_TOURISTIC
```

A tourist bus.

```
public static final TransitType BUS_INTERCITY
```

An intercity bus.

```
public static final TransitType BUS_EXPRESS
```

An express bus.

```
public static final TransitType RAIL_METRO
```

A metro railway.

```
public static final TransitType RAIL_LIGHT
```

A light railway.

```
public static final TransitType RAIL_REGIONAL
```

A regional railway. Usually represents in-city services (such as commuter rail, RER, SBahn) that have a high frequency and lower speed.

```
public static final TransitType TRAIN_REGIONAL
```

A regional train. Usually represents intercity services (such as an Amtrak, DB, SNCF) that are infrequent and travel at high speeds.

```
public static final TransitType TRAIN_INTERCITY
```

An intercity train.

```
public static final TransitType TRAIN_HIGH_SPEED
```

A high-speed train.

```
public static final TransitType MONORAIL
```

Monorail

```
public static final TransitType AERIAL
```

Aerial transit.

```
public static final TransitType INCLINED
```

Inclined transit.

```
public static final TransitType WATER
```

A water taxi or ferry.

```
public static final TransitType AIRLINE
```

An airline.

```
public static final TransitType UNKNOWN
```

An unknown transit type.

```
public static final TransitType TRAIN_INTERREGIONAL_AND_FAST
```

An inter-regional and fast train.

```
public static final TransitType ORDERED_SERVICES_OR_TAXI
```

An ordered services or taxi.

## Method Details

```
public static TransitType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static TransitType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## UninitializedMapEngineException

The class *UninitializedMapEngineException* is a member of [com.here.android.mpa.common](http://com.here.android.mpa.common).

## Class Summary

public final class **UninitializedMapEngineException**

*extends java.lang.RuntimeException, java.lang.Exception, java.lang.Throwable, java.lang.Object*

UninitializedMapEngineException will be thrown if any object that require the MapEngine to be initialized is used without the initialized been initialized.

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 194: Constructors in UninitializedMapEngineException

Constructors
<a href="#">UninitializedMapEngineException ()</a>
Default constructor

## Class Details

UninitializedMapEngineException will be thrown if any object that require the MapEngine to be initialized is used without the initialized been initialized.

## Constructor Details

**UninitializedMapEngineException ()**

Default constructor

## Vector3f

The class *Vector3f* is a member of [com.here.android.mpa.common](#) .

## Class Summary

public final class **Vector3f**

*extends java.lang.Object*

Vector3f represents a 3D-Vector, capable to store x-,y- and z-coordinates in float values.

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 195: Constructors in Vector3f

Constructors
<b><code>Vector3f ()</code></b> Constructs and initializes a Vector3f to (0f,0f,0f).
<b><code>Vector3f (float x, float y, float z)</code></b> Constructs and initializes a Vector3f from the specified xyz coordinates.

## Method Summary

Table 196: Methods in Vector3f

Methods
<b><code>public boolean equals (Object obj)</code></b> For documentation, see <i>java.lang.Object</i>
<b><code>public float getX ()</code></b> Retrieves the x-component of the vector.
<b><code>public float getY ()</code></b> Retrieves the y-component of the vector.
<b><code>public float getZ ()</code></b> Retrieves the z-component of the vector.
<b><code>public int hashCode ()</code></b> For documentation, see <i>java.lang.Object</i>
<b><code>public void setX (float x)</code></b> Sets the x-component of the vector.
<b><code>public void setY (float y)</code></b> Sets the y-component of the vector.
<b><code>public void setZ (float z)</code></b> Sets the z-component of the vector.
<b><code>public String toString ()</code></b> For documentation, see <i>java.lang.Object</i>

## Class Details

Vector3f represents a 3D-Vector, capable to store x-,y- and z-coordinates in float values.

## Constructor Details

### Vector3f ()

Constructs and initializes a Vector3f to (0f,0f,0f).

## Vector3f (float x, float y, float z)

Constructs and initializes a Vector3f from the specified xyz coordinates.

### Parameters:

- **x**  
the x coordinate
- **y**  
the y coordinate
- **z**  
the z coordinate

## Method Details

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

### Parameters:

- **obj**

```
public float getX ()
```

Retrieves the x-component of the vector.

### Returns:

float representing the x component of the vector.

```
public float getY ()
```

Retrieves the y-component of the vector.

### Returns:

float representing the y component of the vector.

```
public float getZ ()
```

Retrieves the z-component of the vector.

### Returns:

float representing the z component of the vector.

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public void setX (float x)
```

Sets the x-component of the vector.

**Parameters:**

- **x**  
A float value for the x component of the vector.

```
public void setY (float y)
```

Sets the y-component of the vector.

**Parameters:**

- **y**  
A float value for the y component of the vector.

```
public void setZ (float z)
```

Sets the z-component of the vector.

**Parameters:**

- **z**  
A float value for the z component of the vector.

```
public String toString ()
```

For documentation, see *java.lang.Object*

## Version

The class *Version* is a member of *com.here.android.mpa.common* .

### Class Summary

```
public final class Version
```

```
extends java.lang.Object
```

Version information for the HERE SDK for Android.

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 197: Constructors in Version

Constructors
<a href="#">Version ()</a>

## Method Summary

Table 198: Methods in Version

Methods
<code>public static String <a href="#">getSdkVersion ()</a></code> Returns the version of the SDK in the form "major.minor.patch.build number"

## Class Details

Version information for the HERE SDK for Android.

## Constructor Details

### Version ()

## Method Details

```
public static String getSdkVersion \(\)
```

Returns the version of the SDK in the form "major.minor.patch.build number"

### Returns:

The SDK Version

## ViewObject

The class *ViewObject* is a member of [com.here.android.mpa.common](#).

## Class Summary

```
public abstract class ViewObject
```

```
extends java.lang.Object
```

Represents the base class implementation for all objects that are selectable from a view.

[For complete information, see the section [Class Details](#)]

## Nested Class Summary

Table 199: Nested Classes in ViewObject

Nested Classes
public static final enumeration <a href="#">ViewObject.Type</a> Represents values describing various types of selectable view objects.

## Method Summary

Table 200: Methods in ViewObject

Methods
public boolean <a href="#">equals</a> (Object obj) For documentation, see <a href="#">java.lang.Object</a>
public <a href="#">Type</a> <a href="#">getBaseType</a> () Returns the real implementation type of the ViewObject .
public int <a href="#">hashCode</a> () For documentation, see <a href="#">java.lang.Object</a>

## Class Details

Represents the base class implementation for all objects that are selectable from a view.

Selectable objects are featured on these views:

- [MapFragment](#)
- [MapView](#)

## Method Details

public boolean [equals](#) (Object obj)

For documentation, see [java.lang.Object](#)

**Parameters:**

- **obj**

public [Type](#) [getBaseType](#) ()

Returns the real implementation type of the ViewObject .

**Returns:**

The ViewObject.Type ViewObjectType, either a [USER\\_OBJECT](#) or a [PROXY\\_OBJECT](#).

public int [hashCode](#) ()

For documentation, see *java.lang.Object*

## Type

The enumeration *Type* is a member of *com.here.android.mpa.common.ViewObject*.

### Enumeration Summary

public static final enumeration **ViewObject.Type**

extends *java.lang.Enum*, *java.lang.Object*

Represents values describing various types of selectable view objects.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 201: Enum Constants in Type

Fields
<pre>public static final Type USER_OBJECT</pre> <p>Describes the type of view objects that are added by the application, such as <i>MapMarker</i>.</p>
<pre>public static final Type PROXY_OBJECT</pre> <p>Describes the type of view objects that are provided automatically, such as <i>TransitLineObject</i>, <i>TransitStopObject</i> or <i>TransitAccessObject</i> .</p>
<pre>public static final Type UNKNOWN_OBJECT</pre> <p>Describes the type of view objects that are neither a <i>USER_OBJECT</i> nor a <i>PROXY_OBJECT</i> .</p>

### Method Summary

Table 202: Methods in Type

Methods
<pre>public static Type valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static ViewObject.Type[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

### Enumeration Details

Represents values describing various types of selectable view objects.

### Enum Constant Details

```
public static final Type USER_OBJECT
```

Describes the type of view objects that are added by the application, such as [MapMarker](#).

```
public static final Type PROXY_OBJECT
```

Describes the type of view objects that are provided automatically, such as [TransitLineObject](#), [TransitStopObject](#) or [TransitAccessObject](#) . A proxy object may contain special information about the object, depending on the type (for example, [TransitStopObject](#) may provide transit stop-related information), but it cannot be created or modified.

```
public static final Type UNKNOWN_OBJECT
```

Describes the type of view objects that are neither a [USER\\_OBJECT](#) nor a [PROXY\\_OBJECT](#) .

### Method Details

```
public static Type valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static ViewObject.Type[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## ViewRect

The class [ViewRect](#) is a member of [com.here.android.mpa.common](#) .

### Class Summary

```
public final class ViewRect
```

```
extends java.lang.Object
```

Represents a rectangle defined by the top-left corner's coordinate and the width and height of the rectangle.

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 203: Constructors in ViewRect

### Constructors

***ViewRect*** (int x, int y, int width, int height)

Constructor that initializes specified X and Y coordinates of the top-left corner plus width and height values, in pixels, for the new *ViewRect* object.

## Method Summary

Table 204: Methods in ViewRect

### Methods

public boolean ***equals*** (Object other)

Determines whether the specified Object is equal to this *ViewRect* object.

public int ***getHeight*** ()

Gets the current height, in pixels, of the *ViewRect* .

public int ***getWidth*** ()

Gets the current width, in pixels, of the *ViewRect* .

public int ***getX*** ()

Gets the current X-coordinate of the *ViewRect* .

public int ***getY*** ()

Gets the current Y-coordinate of the *ViewRect* .

public int ***hashCode*** ()

Calculates and returns a hash code value for the *ViewRect* .

public boolean ***isValid*** ()

Determines whether the *ViewRect* object is valid.

public void ***setHeight*** (int height)

Sets a height, in pixels, for the *ViewRect* .

public void ***setWidth*** (int width)

Sets a width, in pixels, for the *ViewRect* .

public void ***setX*** (int x)

Sets an X-coordinate for the *ViewRect* .

public void ***setY*** (int y)

Sets a Y-coordinate for the *ViewRect* .

## Class Details

Represents a rectangle defined by the top-left corner's coordinate and the width and height of the rectangle.

## Constructor Details

**ViewRect (int x, int y, int width, int height)**

Constructor that initializes specified X and Y coordinates of the top-left corner plus width and height values, in pixels, for the new ViewRect object.

### Parameters:

- **x**  
An initial X-coordinate for the left side of the rectangle
- **y**  
An initial Y-coordinate for the top of the rectangle
- **width**  
An initial width for the rectangle
- **height**  
An initial height for the rectangle

## Method Details

**public boolean equals (Object other)**

Determines whether the specified Object is equal to this ViewRect object.

### Parameters:

- **other**  
An Object to compare with this ViewRect object for equality

### Returns:

True if the compared objects are equal, false otherwise

**public int getHeight ()**

Gets the current height, in pixels, of the ViewRect .

### Returns:

The current height

**public int getWidth ()**

Gets the current width, in pixels, of the ViewRect .

### Returns:

The current width

```
public int getX ()
```

Gets the current X-coordinate of the `ViewRect` .

**Returns:**

The current X-coordinate

```
public int getY ()
```

Gets the current Y-coordinate of the `ViewRect` .

**Returns:**

The current Y-coordinate

```
public int hashCode ()
```

Calculates and returns a hash code value for the `ViewRect` .

**Returns:**

The hash code

```
public boolean isValid ()
```

Determines whether the `ViewRect` object is valid.

**Returns:**

True if the `ViewRect` is valid, false otherwise

```
public void setHeight (int height)
```

Sets a height, in pixels, for the `ViewRect` .

**Parameters:**

- **height**  
Desired height

```
public void setWidth (int width)
```

Sets a width, in pixels, for the `ViewRect` .

**Parameters:**

- **width**  
Desired width

```
public void setX (int x)
```

Sets an X-coordinate for the ViewRect .

**Parameters:**

- **x**  
Desired X-coordinate

```
public void setY (int y)
```

Sets a Y-coordinate for the ViewRect .

**Parameters:**

- **y**  
Desired Y-coordinate

## customlocation2

---

The package *customlocation2* is a member of *com.here.android.mpa*.

### Package Summary

#### **customlocation2**

This package provides classes and interfaces that support the more advanced version of custom location search.

### Package Details

This package provides classes and interfaces that support the more advanced version of custom location search.

The following type of search is available:

- Proximity - Search for user-defined locations around a specified point

To perform a search, create a request of the desired search type and execute the request. For example:

```
CLE2ProximityRequest request = new CLE2ProximityRequest("layer_id", new GeoCoordinate(11.11, 11.11), 100);  
request.execute(new CLE2ResultListener() { ... });
```

For more information on how to use this feature, please see the "Custom Location Search 2" section in the HERE SDK for Android Developer's Guide

## CLE2AttributeRequest

The class *CLE2AttributeRequest* is a member of *com.here.android.mpa.customlocation2*.

### Class Summary

public class **CLE2AttributeRequest**

extends *com.here.android.mpa.customlocation2.CLE2Request*, *java.lang.Object*

Represents a custom geometry search request to retrieve all user-defined geometries along with its attribute on a specified layer.

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 205: Constructors in CLE2AttributeRequest

Constructors
<p><i>CLE2AttributeRequest</i> (String layerId)</p> <p>Creates an Attribute Request.</p>

### Class Details

Represents a custom geometry search request to retrieve all user-defined geometries along with its attribute on a specified layer.

### Constructor Details

#### CLE2AttributeRequest (String layerId)

Creates an Attribute Request.

Please note that *CLE2AttributeRequest* only supports *CLE2GeometryType#FULL*.

#### Parameters:

- **layerId**  
Name of layer specifying the layer to search.

#### Throws:

- **IllegalArgumentException**  
if *layerId* is invalid.

## CLE2BoundingBoxRequest

The class *CLE2BoundingBoxRequest* is a member of *com.here.android.mpa.customlocation2*.

## Class Summary

public class **CLE2BoundingBoxRequest**

extends *com.here.android.mpa.customlocation2.CLE2Request*, *java.lang.Object*

Represents a custom location search request that uses a bounding box to retrieve user-defined geometries.

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 206: Constructors in CLE2BoundingBoxRequest

Constructors
<b>CLE2BoundingBoxRequest</b> (String <i>layerId</i> , <i>GeoBoundingBox</i> <i>area</i> ) Creates a Bounding Box Geometry Request

## Class Details

Represents a custom location search request that uses a bounding box to retrieve user-defined geometries.

This type of request is used to search for user-defined geometries intersecting a specified bounding box.

A new `CLE2BoundingBoxRequest` should be created for each search.

## Constructor Details

**CLE2BoundingBoxRequest** (String *layerId*, *GeoBoundingBox* *area*)

Creates a Bounding Box Geometry Request

### Parameters:

- **layerId**  
Name of layer specifying the layer to search.
- **area**  
A *GeoBoundingBox* specifying the area to search.

### Throws:

- **IllegalArgumentException**  
if *area* is invalid.
- **IllegalArgumentException**  
if *area* is empty.

## CLE2CorridorRequest

The class `CLE2CorridorRequest` is a member of *com.here.android.mpa.customlocation2*.

## Class Summary

public class **CLE2CorridorRequest**

extends *com.here.android.mpa.customlocation2.CLE2Request*, *java.lang.Object*

Represents an corridor custom location search request to retrieve user-defined geometries previously stored using one or more search filter(s).

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 207: Constructors in CLE2CorridorRequest

Constructors
<b>CLE2CorridorRequest</b> (String layerId, java.util.List <GeoCoordinate> routeCoordinates, int radius) Creates an Corridor Request using an array of coordinates defining a route.

## Class Details

Represents an corridor custom location search request to retrieve user-defined geometries previously stored using one or more search filter(s).

This searches for user-defined geometries within the radius of a specified route or the radius of a specified list of GeoCoordinates.

A new CLE2CorridorRequest should be created for each search.

## Constructor Details

**CLE2CorridorRequest** (String layerId, java.util.List <GeoCoordinate> routeCoordinates, int radius)

Creates an Corridor Request using an array of coordinates defining a route.

### Parameters:

- **layerId**  
Name of layer specifying the layer to search.
- **routeCoordinates**  
A List of *GeoCoordinates* representing the polyline used as a corridor center line representing a route.
- **radius**  
An int specifying the search radius in meters.

### Throws:

- **IllegalArgumentException**  
if layerId is invalid.
- **IllegalArgumentException**  
if routeCoordinates is null or does not contain at least two GeoCoordinates.

- `IllegalArgumentException`  
if `radius` is smaller than or equal to zero.

## CLE2DataManager

The class `CLE2DataManager` is a member of `com.here.android.mpa.customlocation2`.

### Class Summary

public class `CLE2DataManager`

*extends* `java.lang.Object`

This class is responsible for managing layer data for CLE2 offline use.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 208: Nested Classes in `CLE2DataManager`

Nested Classes
<p>public static abstract interface <code>CLE2DataManager.CLE2DownloadListener</code> Represents a listener that reports information about the completion of layer download.</p>
<p>public static final enumeration <code>CLE2DataManager.OperationType</code> Indicated type of operation performed on CLE2 data.</p>
<p>public static final enumeration <code>CLE2DataManager.StorageType</code> Indicates which class of storage was affected by the data operation.</p>

### Method Summary

Table 209: Methods in `CLE2DataManager`

Methods
<p>public boolean <code>cancelAllLayerDownloads</code> () <b>Deprecated:</b> <b>Deprecated as of release 3.4.</b> Attempts to cancel execution of all ongoing downloads.</p>
<p>public boolean <code>cancelDownload</code> (String layerId) <b>Deprecated:</b> <b>Deprecated as of release 3.4.</b> Attempts to cancel execution of a specific layer download.</p>
<p>public boolean <code>deleteAll</code> () <b>Deprecated:</b> <b>Deprecated as of release 3.4.</b> Removes all data from the local storage.</p>

## Methods

```
public boolean deleteLayer (String layerId)
```

**Deprecated:** Deprecated as release of 3.4.

Delete one specific layer from the local storage.

```
public void downloadLayer (String layerId, CLE2DownloadListener listener)
```

**Deprecated:** Deprecated as of release 3.4.

Request the full download of a specific layer if layer doesn't exist locally and layer is not updated with server data.

```
public boolean equals (Object other)
```

For documentation, see *java.lang.Object*

```
public static CLE2DataManager getInstance ()
```

Returns the *CLE2DataManager* singleton instance.

```
public int getNumberOfStoredGeometries (String layerId)
```

Get the number of geometries stored of a given layer.

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public CLE2Task<CLE2OperationResult> newDeleteLayersTask (List layerIds, StorageType storageType)
```

Creates a task for deleting specified layers from the service or local storage.

```
public CLE2Task<CLE2OperationResult> newDownloadLayerTask (String layerId)
```

Creates a task for downloading a layer from CLE2 service and storing it in local storage.

```
public CLE2Task<CLE2Geometry> newFetchLocalLayersTask (List layerIds)
```

Creates a task for retrieving all geometries from specified locally stored layers.

```
public CLE2Task<CLE2OperationResult> newGeometryTask (OperationType operationType, String layerId,
java.util.List <CLE2Geometry> geometryData, StorageType storageType)
```

Creates a task for modifying CLE data.

```
public CLE2Task<String, CLE2LayerMetadata> newListLayersTask (StorageType storageType)
```

Creates a CLE2 task for getting a list of available layers.

```
public CLE2Task<CLE2OperationResult> newPurgeLocalStorageTask ()
```

Creates a task for removing all data from local storage.

```
public CLE2Task<CLE2OperationResult> newUploadLayerTask (String layerId, java.util.List
<CLE2Geometry> geometryData)
```

Creates a task for uploading a new layer into CLE service, creating a new layer with specified ID.

## Class Details

This class is responsible for managing layer data for CLE2 offline use. To download a full layer, call *downloadLayer(String, CLE2DataManager.CLE2DownloadListener)*. To store a subset of geometries, create a *CLE2Request* and *setCachingEnabled(boolean)* to true.

## Method Details

```
public boolean cancelAllLayerDownloads ()
```

Deprecated: Deprecated as of release 3.4.

Keep track of your download tasks and use `cancel()` instead

Attempts to cancel execution of all ongoing downloads. This attempt will fail if the task has already completed, already been cancelled, or could not be cancelled for some other reason. This call does not guarantee that any download task will be cancelled. For the end result, inspect `CLE2ErrorCode` value obtained from `CLE2Error` object passed to the listener.

### Returns:

true if there was at least one outstanding download task for which cancellation will be attempted; false otherwise

```
public boolean cancelDownload (String layerId)
```

Deprecated: Deprecated as of release 3.4.

Use `cancel()` on a download task obtained from `newDownloadLayerTask(String)`

Attempts to cancel execution of a specific layer download. This attempt will fail if the task has already completed, already been cancelled, or could not be cancelled for some other reason. This call does not guarantee that the download job will be cancelled. For the end result, inspect `CLE2ErrorCode` value obtained from `CLE2Error` object passed to the listener.

### Parameters:

- **layerId**  
Name of the layer specifying which download should stop.

### Returns:

true if there was a download task for specified layer for which cancellation will be attempted; false otherwise

```
public boolean deleteAll ()
```

Deprecated: Deprecated as of release 3.4.

Use `newPurgeLocalStorageTask()`

Removes all data from the local storage. This method is synchronous and blocks until database operation is finished, which in some circumstances can take some time.

### Returns:

true if the operation was successful.

```
public boolean deleteLayer (String layerId)
```

Deprecated: Deprecated as release of 3.4.

Use `newDeleteLayersTask(List, CLE2DataManager.StorageType)` with `LOCAL` instead

Delete one specific layer from the local storage. This method is synchronous and blocks until database operation is finished, which in some circumstances can take some time.

**Parameters:**

- **layerId**  
ID of a layer to remove from cache

**Returns:**

true if operation successful, false otherwise

```
public void downloadLayer (String layerId, CLE2DownloadListener listener)
```

Deprecated: Deprecated as of release 3.4.

Use `newDownloadLayerTask(String)` instead

Request the full download of a specific layer if layer doesn't exist locally and layer is not updated with server data.

Please note that this method will make two request. One for checking updates and another for downloading. If local stored data is up to date with server data, no downloading will happen.

**Parameters:**

- **layerId**  
Name of a layer to download
- **listener**  
listener to notify result of operation.

**Throws:**

- **IllegalArgumentException**  
if `layerId` is null or empty

```
public boolean equals (Object other)
```

For documentation, see `java.lang.Object`

**Parameters:**

- **other**

```
public static CLE2DataManager getInstance ()
```

Returns the `CLE2DataManager` singleton instance.

**Returns:**

`CLE2LayerDownloader` instance.

```
public int getNumberOfStoredGeometries (String layerId)
```

Get the number of geometries stored of a given layer.

**Parameters:**

- **layerId**  
The number of geometries of this layer will be returned.

**Returns:**

number of geometries stored for a given layer.

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public CLE2Task<CLE2OperationResult> newDeleteLayersTask (List layerIds,  
StorageType storageType)
```

Creates a task for deleting specified layers from the service or local storage.

When operating on local storage, this operation will delete all data for specified layers, regardless of how they got there (ie. search result caching or downloading of whole layer).

**Parameters:**

- **layerIds**  
the list of IDs of layers to remove
- **storageType**  
the location of data to be deleted

**Returns:**

a CLE2 task for removing a layer from the service

**Throws:**

- **IllegalArgumentException**  
if *layerIds* is null, empty or contains null or empty strings

```
public CLE2Task<CLE2OperationResult> newDownloadLayerTask (String layerId)
```

Creates a task for downloading a layer from CLE2 service and storing it in local storage.

When started, this operation will check if locally stored layer exists and if it's out of date before downloading data from the service. As such, no unnecessary download will take place if local data is up to date with the service.

Upon success, all data stored locally for the specified layer are the same as on the server at the time of download.

**Parameters:**

- **layerId**

id of layer to download

**Returns:**

a CLE2 task for downloading the layer

**Throws:**

- **IllegalArgumentException**  
if `layerId` is null or empty

```
public CLE2Task<CLE2Geometry> newFetchLocalLayersTask (List layerIds)
```

Creates a task for retrieving all geometries from specified locally stored layers.

**Parameters:**

- **layerIds**  
the list of ids of layers to retrieve data for

**Returns:**

a CLE2 task for retrieving the geometry data

**Throws:**

- **IllegalArgumentException**  
if `layerIds` is null, empty or contains null or empty strings

```
public CLE2Task<CLE2OperationResult> newGeometryTask (OperationType  
operationType, String layerId, java.util.List <CLE2Geometry> geometryData,  
StorageType storageType)
```

Creates a task for modifying CLE data. The nature of the modification is determined by the `operationType` and can be creation of new data items, updating of existing ones or deleting.

For local storage, running *CREATE* on a layer that does not exist will create it. For remote storage it will fail if the layer does not already exist in the service. To create a new remote layer, use *newUploadLayerTask(String, List)*.

**Parameters:**

- **operationType**  
type of operation to perform
- **layerId**  
id of layer to perform the operation on
- **geometryData**  
the data to be used for the operation
- **storageType**  
determines whether to modify locally stored data or remote ones

**Returns:**

a CLE2 task for modifying data

**Throws:**

- **IllegalArgumentException**  
if `@{code layerId}` is null or empty or `@{code geometryData}` is null or empty or contains `@{code null}` elements

```
public CLE2Task<String, CLE2LayerMetadata> newListLayersTask (StorageType  
storageType)
```

Creates a CLE2 task for getting a list of available layers. You can specify whether to retrieve it from the CLE2 service or from local storage. In case of local storage, only layers downloaded using [downloadLayer\(String, CLE2DataManager.CLE2DownloadListener\)](#) will be listed.

The result of this task is a map where the key is a layer ID and the value is a metadata object for this layer.

**Parameters:**

- **storageType**  
*LOCAL* to list layers only from local storage, *REMOTE* to list layers only from remote CLE2 service

**Returns:**

a CLE2 task for getting a list of available layers.

```
public CLE2Task<CLE2OperationResult> newPurgeLocalStorageTask ()
```

Creates a task for removing all data from local storage.

**Returns:**

a CLE2 task for purging all data from local storage

```
public CLE2Task<CLE2OperationResult> newUploadLayerTask (String layerId,  
java.util.List <CLE2Geometry> geometryData)
```

Creates a task for uploading a new layer into CLE service, creating a new layer with specified ID. Provided layer ID will be converted to all upper-case by CLE service. If a layer with the same ID already exist, it will be replaced by this one. This operation does not impact locally stored data. Note that layer data needs to be uniform, meaning all geometries be of the same type and have the same set of attributes.

**Parameters:**

- **layerId**  
the id of layer to upload
- **geometryData**  
geometry data to upload

**Returns:**

a CLE2 task for uploading the layer

**Throws:**

- **IllegalArgumentException**  
if `layerId` is null or empty or `geometryData` is null or empty or contains null elements

## CLE2DownloadListener

The interface *CLE2DownloadListener* is a member of *com.here.android.mpa.customlocation2.CLE2DataManager*.

### Interface Summary

public static abstract interface **CLE2DataManager.CLE2DownloadListener**

Represents a listener that reports information about the completion of layer download.

[For complete information, see the section *Interface Details*]

### Method Summary

Table 210: Methods in CLE2DownloadListener

Methods
public abstract void <i>onLayerDownloaded</i> (String layerId, <i>CLE2Error</i> error) A callback indicating the completion of layer download request.

### Interface Details

Represents a listener that reports information about the completion of layer download.

### Method Details

public abstract void *onLayerDownloaded* (String layerId, *CLE2Error* error)

A callback indicating the completion of layer download request.

**Parameters:**

- **layerId**  
Name of downloaded layer
- **error**  
*CLE2Error* to get the status of request.

## OperationType

The enumeration *OperationType* is a member of *com.here.android.mpa.customlocation2.CLE2DataManager*.

### Enumeration Summary

public static final enumeration **CLE2DataManager.OperationType**

*extends java.lang.Enum, java.lang.Object*

Indicated type of operation performed on CLE2 data.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 211: Enum Constants in OperationType

Fields
<pre>public static final OperationType CREATE</pre> <p>Indicates creation of new data.</p>
<pre>public static final OperationType UPDATE</pre> <p>Indicates modification of existing data.</p>
<pre>public static final OperationType DELETE</pre> <p>Indicates removal of existing data.</p>

### Method Summary

Table 212: Methods in OperationType

Methods
<pre>public static OperationType valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static CLE2DataManager.OperationType[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

### Enumeration Details

Indicated type of operation performed on CLE2 data.

### Enum Constant Details

public static final *OperationType* **CREATE**

Indicates creation of new data.

```
public static final OperationType UPDATE
```

Indicates modification of existing data.

```
public static final OperationType DELETE
```

Indicates removal of existing data.

### Method Details

```
public static OperationType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static CLE2DataManager.OperationType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## StorageType

The enumeration *StorageType* is a member of *com.here.android.mpa.customlocation2.CLE2DataManager*.

### Enumeration Summary

```
public static final enumeration CLE2DataManager.StorageType
```

*extends java.lang.Enum, java.lang.Object*

Indicates which class of storage was affected by the data operation.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 213: Enum Constants in *StorageType*

Fields
<pre>public static final <i>StorageType</i> <b>REMOTE</b></pre> <p>Indicates that a data operation was applied only to data on the remote CLE2 service.</p>
<pre>public static final <i>StorageType</i> <b>LOCAL</b></pre> <p>Indicates that a data operation was applied only to data stored locally.</p>

## Method Summary

Table 214: Methods in `StorageType`

Methods
<pre>public static <i>StorageType</i> valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>CLE2DataManager.StorageType[]</i> values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Indicates which class of storage was affected by the data operation.

### Enum Constant Details

```
public static final StorageType REMOTE
```

Indicates that a data operation was applied only to data on the remote CLE2 service.

```
public static final StorageType LOCAL
```

Indicates that a data operation was applied only to data stored locally.

## Method Details

```
public static StorageType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static CLE2DataManager.StorageType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## CLE2Geometry

The class `CLE2Geometry` is a member of `com.here.android.mpa.customlocation2`.

## Class Summary

```
public class CLE2Geometry
```

```
extends java.lang.Object
```

Specifies a user-defined geometry.

[For complete information, see the section [Class Details](#)]

## Method Summary

Table 215: Methods in CLE2Geometry

Methods
<pre>public boolean equals (Object obj)</pre> <p>For documentation, see <a href="#">java.lang.Object</a></p>
<pre>public Map getAttributes ()</pre> <p>Returns the Map of attributes containing a copy of the custom attributes of this CLE2Geometry</p>
<pre>public double getDistance ()</pre> <p>Returns the minimum distance to the geometry from the point used in a search query.</p>
<pre>public String getGeometryId ()</pre> <p>Identifier of a geometry object.</p>
<pre>public int hashCode ()</pre> <p>For documentation, see <a href="#">java.lang.Object</a></p>
<pre>public boolean isLocal ()</pre> <p>Checks if this geometry is local to the device or if it came from remote CLE service.</p>
<pre>public void setAttribute (String name, String value)</pre> <p>Set a value of an attribute for this geometry.</p>
<pre>public void setAttributes (Map attributes)</pre> <p>Sets attributes of this geometry to the ones provided.</p>

## Class Details

Specifies a user-defined geometry. This geometry can be a [PointGeometry](#), [MultiPointGeometry](#), [PolylineGeometry](#), [MultiPolylineGeometry](#), [PolygonGeometry](#) or [MultiPolygonGeometry](#).

## Method Details

```
public boolean equals (Object obj)
```

For documentation, see [java.lang.Object](#)

### Parameters:

- `obj`

```
public Map getAttributes ()
```

Returns the Map of attributes containing a copy of the custom attributes of this CLE2Geometry

**Returns:**

Map of attributes

```
public double getDistance ()
```

Returns the minimum distance to the geometry from the point used in a search query.

**Returns:**

A float representing distance of this geometry to the point used in the query or 0 if it is unknown or search query was performed offline.

```
public String getGeometryId ()
```

Identifier of a geometry object. This identifier is guaranteed to be unique only within a single layer, meaning that two geometry object belonging to different layers might have the same geometry ID. Only geometries that were once stored locally or remotely have an ID. Meaning that a newly created geometry object does not have an ID.

**Returns:**

identifier unique within a single layer or null if this geometry does not have an ID.

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public boolean isLocal ()
```

Checks if this geometry is local to the device or if it came from remote CLE service. Geometry that is stored locally but was initially retrieved from the server (for example, by downloading a whole layer or caching of search results) is not considered local.

**Returns:**

false if source of this geometry is a remote CLE2 service, true otherwise

```
public void setAttribute (String name, String value)
```

Set a value of an attribute for this geometry.

**Parameters:**

- name

name of the attribute to set

- **value**

value of the attribute to set

**Throws:**

- **IllegalArgumentException**  
if the name or value are null or name is an empty string.

### public void **setAttributes** (Map attributes)

Sets attributes of this geometry to the ones provided. The content of the provided map is copied and any changes made to it or the values within it afterwards have no effect on the attributes of this geometry object. `attributes` can be null or empty and in both cases it will cause removal of all the attributes from this geometry.

**Parameters:**

- **attributes**  
map of attributes to set for this geometry.

## CLE2LayerMetadata

The class `CLE2LayerMetadata` is a member of [com.here.android.mpa.customlocation2](#).

### Class Summary

public final class **CLE2LayerMetadata**

*extends java.lang.Object*

Encapsulates metadata describing a CLE2 layer.

[For complete information, see the section [Class Details](#)]

**See also:**

[newListLayersTask\(StorageType\)](#)

### Method Summary

Table 216: Methods in CLE2LayerMetadata

Methods
public String <a href="#">getLayerId</a> () Gets id (name) of the layer
public long <a href="#">getTimestamp</a> () Gets the timestamp of a CLE2 layer.

## Class Details

Encapsulates metadata describing a CLE2 layer.

**See also:**

[newListLayersTask\(StorageType\)](#)

## Method Details

```
public String getLayerId ()
```

Gets id (name) of the layer

**Returns:**

an id of the layer

```
public long getTimestamp ()
```

Gets the timestamp of a CLE2 layer. For layers on remote CLE2 service, this indicates time of last modification of any data contained within the layer. For layers stored locally, this is a timestamp of a CLE2 layer as it was at the time it was downloaded from remote CLE2 service. Layers that were created and stored locally do not have a timestamp.

**Returns:**

a timestamp - number of milliseconds since Unix epoch or 0 for layers that did not originate from remote CLE2 service

## CLE2MultiPointGeometry

The class *CLE2MultiPointGeometry* is a member of [com.here.android.mpa.customlocation2](#).

## Class Summary

```
public final class CLE2MultiPointGeometry
```

*extends* [com.here.android.mpa.customlocation2.CLE2Geometry](#), [java.lang.Object](#)

Specifies a user-defined multi point geometry.

[For complete information, see the section [Class Details](#)]

## Method Summary

Table 217: Methods in CLE2MultiPointGeometry

### Methods

```
public java.util.List <GeoCoordinate> getMultiPoint ()
```

Gets a list of [GeoCoordinate](#) of this geometry.

## Methods

```
public void setMultiPoint (java.util.List <GeoCoordinate> points)
```

Sets the list of *GeoCoordinate* for this geometry.

---

## Class Details

Specifies a user-defined multi point geometry. A multi point geometry represent a list of *GeoCoordinate*

## Method Details

```
public java.util.List <GeoCoordinate> getMultiPoint ()
```

Gets a list of *GeoCoordinate* of this geometry.

### Returns:

List of *GeoCoordinate*.

```
public void setMultiPoint (java.util.List <GeoCoordinate> points)
```

Sets the list of *GeoCoordinate* for this geometry.

### Parameters:

- **points**  
List of *GeoCoordinate*.

### Throws:

- **IllegalArgumentException**  
if *points* is empty or null.

## CLE2MultiPolygonGeometry

The class *CLE2MultiPolygonGeometry* is a member of *com.here.android.mpa.customlocation2*.

## Class Summary

```
public final class CLE2MultiPolygonGeometry
```

```
extends com.here.android.mpa.customlocation2.CLE2Geometry, java.lang.Object
```

Specifies a user-defined multi-polygon geometry.

[For complete information, see the section *Class Details*]

### See also:

*CLE2PolygonGeometry*

## Method Summary

Table 218: Methods in `CLE2MultiPolygonGeometry`

Methods
<pre>public java.util.List &lt;CLE2PolygonGeometry&gt; <b>getPolygons</b> ()</pre> <p>Gets all <code>CLE2PolygonGeometry</code> of this geometry.</p>
<pre>public void <b>setPolygons</b> (java.util.List &lt;CLE2PolygonGeometry&gt; polygons)</pre> <p>Sets polygon geometries that make up this multi polygon geometry.</p>

## Class Details

Specifies a user-defined multi-polygon geometry. A multi-polygon geometry represent a list of `CLE2PolygonGeometry` and each polygon can have outer and inner rings.

**See also:**

[CLE2PolygonGeometry](#)

## Method Details

```
public java.util.List <CLE2PolygonGeometry> getPolygons ()
```

Gets all `CLE2PolygonGeometry` of this geometry.

**Returns:**

A list of all `CLE2PolygonGeometry` of this geometry.

```
public void setPolygons (java.util.List <CLE2PolygonGeometry> polygons)
```

Sets polygon geometries that make up this multi polygon geometry.

**Parameters:**

- **polygons**  
list of polygons to define this multi polygon geometry

**Throws:**

- **IllegalArgumentException**  
if the list of polygons is null, empty or contains null elements

## CLE2MultiPolylineGeometry

The class `CLE2MultiPolylineGeometry` is a member of `com.here.android.mpa.customlocation2`.

## Class Summary

public final class **CLE2MultiPolylineGeometry**

extends *com.here.android.mpa.customlocation2.CLE2Geometry*, *java.lang.Object*

Specifies a user-defined multi polyline geometry.

[For complete information, see the section *Class Details*]

## Method Summary

Table 219: Methods in CLE2MultiPolylineGeometry

Methods
<pre>public java.util.List &lt;MapPolyline&gt; <b>getMapPolylines</b> ()</pre> <p>Gets the list of <i>MapPolyline</i> that are created from <i>GeoPolyline</i> to be added onto the map.</p>
<pre>public java.util.List &lt;GeoPolyline&gt; <b>getPolylines</b> ()</pre> <p>Gets the list of <i>GeoPolyline</i> of this geometry.</p>
<pre>public void <b>setPolylines</b> (java.util.List &lt;GeoPolyline&gt; polylines)</pre> <p>Sets a lists of polylines to define the shape of this CLE2MultiPolylineGeometry .</p>

## Class Details

Specifies a user-defined multi polyline geometry. A multi polyline geometry represent a list of *GeoPolyline*.

## Method Details

```
public java.util.List <MapPolyline> getMapPolylines ()
```

Gets the list of *MapPolyline* that are created from *GeoPolyline* to be added onto the map.

### Returns:

List of *MapPolyline* OR null if creating map polylines is not possible with *GeoPolylines*.

### See also:

*MapPolyline(GeoPolyline)*

```
public java.util.List <GeoPolyline> getPolylines ()
```

Gets the list of *GeoPolyline* of this geometry.

### Returns:

List of *GeoPolyline*.

```
public void setPolylines (java.util.List <GeoPolyline> polylines)
```

Sets a lists of polylines to define the shape of this CLE2MultiPolylineGeometry .

**Parameters:**

- `polylines`  
list of `polylines` defining the shape of this `CLE2MultiPolylineGeometry`

**Throws:**

- `IllegalArgumentException`  
if `polylines` is `null`, empty or contains `null` or invalid (ie. containing less than two points) elements

## CLE2OperationResult

The class `CLE2OperationResult` is a member of `com.here.android.mpa.customlocation2`.

### Class Summary

public final class **CLE2OperationResult**

extends `java.lang.Object`

Encapsulates information about CLE2 data change that was a result of a local or remote data operation.

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 220: Constructors in `CLE2OperationResult`

Constructors
<code>CLE2OperationResult ()</code>

### Field Summary

Table 221: Fields in `CLE2OperationResult`

Fields
public static final long <code>UNKNOWN_ITEM_COUNT</code>

### Method Summary

Table 222: Methods in `CLE2OperationResult`

Methods
public long <code>getAffectedItemCount ()</code> Gets number of data items affected by the operation.
public List <code>getAffectedLayerIds ()</code> Gets list of IDs of layers affected by the operation.

**Methods**

```
public OperationType getOperationType ()
```

**Class Details**

Encapsulates information about CLE2 data change that was a result of a local or remote data operation.

**Constructor Details**

```
CLE2OperationResult ()
```

**Field Details**

```
public static final long UNKNOWN_ITEM_COUNT
```

**Method Details**

```
public long getAffectedItemCount ()
```

Gets number of data items affected by the operation.

**Returns:**

number of affected items or *UNKNOWN\_ITEM\_COUNT* if undetermined

```
public List getAffectedLayerIds ()
```

Gets list of IDs of layers affected by the operation.

**Returns:**

list of layer IDs or null if unknown

```
public OperationType getOperationType ()
```

**Returns:**

type of data operation

## CLE2PointGeometry

The class *CLE2PointGeometry* is a member of *com.here.android.mpa.customlocation2*.

## Class Summary

public final class **CLE2PointGeometry**

extends *com.here.android.mpa.customlocation2.CLE2Geometry*, *java.lang.Object*

Specifies a user-defined point geometry.

[For complete information, see the section [Class Details](#)]

## Method Summary

Table 223: Methods in CLE2PointGeometry

Methods
<pre>public <i>GeoCoordinate</i> <b>getPoint</b> ()</pre> <p>Gets <i>GeoCoordinate</i> of this point geometry.</p>
<pre>public void <b>setPoint</b> (<i>GeoCoordinate</i> point)</pre> <p>Set <i>GeoCoordinate</i> for this geometry.</p>

## Class Details

Specifies a user-defined point geometry. A point geometry represent a single *GeoCoordinate*

## Method Details

```
public GeoCoordinate getPoint ()
```

Gets *GeoCoordinate* of this point geometry.

### Returns:

*GeoCoordinate* of this geometry.

```
public void setPoint (GeoCoordinate point)
```

Set *GeoCoordinate* for this geometry.

### Parameters:

- **point**  
*GeoCoordinate*.

### Throws:

- **IllegalArgumentException**  
if point is null.

## CLE2PolygonGeometry

The class `CLE2PolygonGeometry` is a member of `com.here.android.mpa.customlocation2`.

### Class Summary

public final class **CLE2PolygonGeometry**

extends `com.here.android.mpa.customlocation2.CLE2Geometry`, `java.lang.Object`

Specifies a user-defined polygon geometry.

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 224: Constructors in CLE2PolygonGeometry

Constructors
<p><code>CLE2PolygonGeometry</code> (<code>GeoPolygon</code> outerRing, <code>java.util.List</code> &lt;<code>GeoPolygon</code>&gt; innerRings)</p> <p>Creates a new polygon geometry with outer ring (shape) and inner rings (holes).</p>

### Method Summary

Table 225: Methods in CLE2PolygonGeometry

Methods
<p>public <code>java.util.List</code> &lt;<code>GeoPolygon</code>&gt; <code>getInnerRings</code> ()</p> <p>Gets the all inner ring of this geometry.</p>
<p>public <code>GeoPolygon</code> <code>getOuterRing</code> ()</p> <p>Gets the outer ring <code>GeoPolygon</code> of this geometry.</p>
<p>public void <code>setPolygon</code> (<code>GeoPolygon</code> outerRing)</p> <p>Sets the shape of this polygon to a solid one without any holes.</p>
<p>public void <code>setPolygon</code> (<code>GeoPolygon</code> outerRing, <code>java.util.List</code> &lt;<code>GeoPolygon</code>&gt; innerRings)</p> <p>Sets the geometry of this polygon with outer ring (shape) and inner rings (holes).</p>

### Class Details

Specifies a user-defined polygon geometry. The polygon geometry represent a list of `GeoPolygon`

Note: The concept of polygon in WKT (Well Known Text) format consists of one outer ring/polygon, plus zero or more inner rings/polygons. We map the WKT concept here with a `GeoPolygon` outer ring object, and a list of `GeoPolygon` as the inner rings (if any).

## Constructor Details

### CLE2PolygonGeometry (*GeoPolygon* outerRing, java.util.List <*GeoPolygon*> innerRings)

Creates a new polygon geometry with outer ring (shape) and inner rings (holes). Input polygons can be "closed" (ie. having the same first and last vertex) or not, both options are valid.

#### Parameters:

- **outerRing**  
the outer boundary of the polygon, defining its shape
- **innerRings**  
list if inner rings of the polygon, defining holes in the main shape, will be ignored if null or empty

#### Throws:

- **IllegalArgumentException**  
when `outerRing` is null or invalid, meaning it is not a polygon with an area greater than 0, or when `innerRings` contains null or invalid elements

## Method Details

### public java.util.List <*GeoPolygon*> getInnerRings ()

Gets the all inner ring of this geometry. The polygons returned by this method are always "closed", meaning that its last vertex is the same as the first one.

#### Returns:

a list of *GeoPolygon* defining holes in the polygon

### public *GeoPolygon* getOuterRing ()

Gets the outer ring *GeoPolygon* of this geometry. The polygon returned by this method is always "closed", meaning that its last vertex is the same as the first one.

#### Returns:

*GeoPolygon* defining the shape of this polygon

### public void setPolygon (*GeoPolygon* outerRing)

Sets the shape of this polygon to a solid one without any holes.

#### Parameters:

- **outerRing**  
the outer boundary of the polygon, defining its shape

#### Throws:

- **IllegalArgumentException**

when `outerRing` is null or invalid, meaning it is not a polygon with an area greater than 0

```
public void setPolygon (GeoPolygon outerRing, java.util.List <GeoPolygon>
innerRings)
```

Sets the geometry of this polygon with outer ring (shape) and inner rings (holes). Input polygons can be "closed" (ie. having the same first and last vertex) or not, both options are valid.

#### Parameters:

- **outerRing**  
the outer boundary of the polygon, defining its shape
- **innerRings**  
list of inner rings of the polygon, defining holes in the main shape, will be ignored if null or empty

#### Throws:

- **IllegalArgumentException**  
when `outerRing` is null or invalid, meaning it is not a polygon with an area greater than 0, or when `innerRings` contains null or invalid elements

## CLE2PolylineGeometry

The class *CLE2PolylineGeometry* is a member of *com.here.android.mpa.customlocation2*.

### Class Summary

public final class **CLE2PolylineGeometry**

extends *com.here.android.mpa.customlocation2.CLE2Geometry*, *java.lang.Object*

Specifies a user-defined polyline geometry.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 226: Methods in *CLE2PolylineGeometry*

#### Methods

```
public MapPolyline getMapPolyline ()
```

Gets the *MapPolyline* that are created from *GeoPolyline* to be added onto the map.

```
public GeoPolyline getPolyline ()
```

Gets the *GeoPolyline* in this geometry.

### Methods

```
public void setPolyline (GeoPolyline polyline)
```

Sets the shape of this polyline to the one supplied.

### Class Details

Specifies a user-defined polyline geometry. A polyline geometry represent a single *GeoPolyline*

### Method Details

```
public MapPolyline getMapPolyline ()
```

Gets the *MapPolyline* that are created from *GeoPolyline* to be added onto the map.

**Returns:**

*MapPolyline* OR null if creating map polyline is not possible with *GeoPolyline*.

```
public GeoPolyline getPolyline ()
```

Gets the *GeoPolyline* in this geometry.

**Returns:**

*GeoPolyline*.

```
public void setPolyline (GeoPolyline polyline)
```

Sets the shape of this polyline to the one supplied.

**Parameters:**

- **polyline**  
polyline defining the shape of this *CLE2PolylineGeometry*

## CLE2ProximityRequest

The class *CLE2ProximityRequest* is a member of *com.here.android.mpa.customlocation2*.

### Class Summary

```
public class CLE2ProximityRequest
```

```
extends com.here.android.mpa.customlocation2.CLE2Request, java.lang.Object
```

Represents a custom geometry search request that uses the area around a location to retrieve user-defined geometries.

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 227: Constructors in `CLE2ProximityRequest`

Constructors
<p><code>CLE2ProximityRequest</code> (<code>String</code> <code>layerId</code>, <code>GeoCoordinate</code> <code>center</code>, <code>int</code> <code>radius</code>)</p> <p>Creates a Proximity Request</p>
<p><code>CLE2ProximityRequest</code> (<code>List</code> <code>layerIds</code>, <code>GeoCoordinate</code> <code>center</code>, <code>int</code> <code>radius</code>)</p> <p>Creates a Proximity Request that searches through multiple layers.</p>

## Class Details

Represents a custom geometry search request that uses the area around a location to retrieve user-defined geometries.

This type of search request is used for user-defined geometries around a specified point.

A new `CLE2ProximityRequest` should be created for each search.

## Constructor Details

`CLE2ProximityRequest` (`String` `layerId`, `GeoCoordinate` `center`, `int` `radius`)

Creates a Proximity Request

### Parameters:

- **layerId**  
Name of layer specifying the layer to search.
- **center**  
A `GeoCoordinate` specifying the search center.
- **radius**  
An `int` specifying the search radius in meters.

### Throws:

- `IllegalArgumentException`  
if `center` is invalid.
- `IllegalArgumentException`  
if `radius` is smaller than or equal to zero.

`CLE2ProximityRequest` (`List` `layerIds`, `GeoCoordinate` `center`, `int` `radius`)

Creates a Proximity Request that searches through multiple layers.

### Parameters:

- **layerIds**  
List of layers name specifying the layer to search.

- **center**

A *GeoCoordinate* specifying the search center.

- **radius**

An *int* specifying the search radius in meters.

**Throws:**

- **IllegalArgumentException**

if *center* is invalid.

- **IllegalArgumentException**

if *radius* is smaller than or equal to zero.

## CLE2QuadkeyRequest

The class *CLE2QuadkeyRequest* is a member of *com.here.android.mpa.customlocation2*.

### Class Summary

public class **CLE2QuadkeyRequest**

extends *com.here.android.mpa.customlocation2.CLE2Request*, *java.lang.Object*

Represents a custom location search request that uses quadkey.

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 228: Constructors in *CLE2QuadkeyRequest*

Constructors
<p><i>CLE2QuadkeyRequest</i> (<i>String</i> layerId, <i>String</i> quadKey)</p> <p>Creates a quadkey request.</p>

### Class Details

Represents a custom location search request that uses quadkey. A quadkey is a string containing a numeric value. The value is obtained by interleaving the bits of the row and column coordinates of a tile in the grid at the given zoom level, then converting the result to a base-4 number (the leading zeros are retained). The length of a quadkey string (the number of digits/characters) equals the zoom level of the tile. Use this search to retrieve the geometries that overlap exact certain tiles of a quadkey-tile based bitmap display.

### Constructor Details

**CLE2QuadkeyRequest** (*String* layerId, *String* quadKey)

Creates a quadkey request.

**Parameters:**

- **layerId**  
Name of layer specifying the layer to search.
- **quadKey**  
The quad key number of the map tile area to search from.

**Throws:**

- **IllegalArgumentException**  
if `layerId` is invalid.

## CLE2Request

The class `CLE2Request` is a member of `com.here.android.mpa.customlocation2`.

### Class Summary

```
public class CLE2Request
```

```
extends java.lang.Object
```

Represents a custom location search request.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 229: Nested Classes in `CLE2Request`

Nested Classes
<pre>public static final enumeration <a href="#">CLE2Request.CLE2ConnectivityMode</a></pre> <p>Specifies the connectivity mode for a request.</p>
<pre>public static class <a href="#">CLE2Request.CLE2Error</a></pre> <p>Represents values describing possible search request errors.</p>
<pre>public static final enumeration <a href="#">CLE2Request.CLE2GeometryType</a></pre> <p>Specifies the geometry representation in the result.</p>
<pre>public static abstract interface <a href="#">CLE2Request.CLE2ResultListener</a></pre> <p>Represents a listener that reports information about the completion of a custom location search <code>CLE2Request</code>.</p>

## Method Summary

Table 230: Methods in CLE2Request

Methods
<pre>public void <b>cancel</b> ()</pre> <p> Cancels a search request in progress.</p>
<pre>public boolean <b>equals</b> (Object other)</pre> <p> For documentation, see <i>java.lang.Object</i></p>
<pre>public String <b>execute</b> (CLE2ResultListener listener)</pre> <p> Executes the asynchronous custom location request.</p>
<pre>public CLE2ConnectivityMode <b>getConnectivityMode</b> ()</pre> <p> Get request mode for this <i>CLE2Request</i>.</p>
<pre>public int <b>hashCode</b> ()</pre> <p> For documentation, see <i>java.lang.Object</i></p>
<pre>public CLE2Request <b>setCachingEnabled</b> (boolean cache)</pre> <p> Set if request output geometries should be stored locally.</p>
<pre>public CLE2Request <b>setConnectivityMode</b> (CLE2ConnectivityMode mode)</pre> <p> Sets the connectivity mode for this <i>CLE2Request</i>.</p>
<pre>public CLE2Request <b>setGeometry</b> (CLE2GeometryType geometry)</pre> <p> Sets the geometry representation in request.</p>
<pre>public CLE2Request <b>setQuery</b> (String query)</pre> <p> Specifies the filter(s) to be used for a custom location request.</p>

## Class Details

Represents a custom location search request.

## Method Details

```
public void cancel ()
```

Cancels a search request in progress. Otherwise, nothing happens.

```
public boolean equals (Object other)
```

For documentation, see *java.lang.Object*

### Parameters:

- **other**

```
public String execute (CLE2ResultListener listener)
```

Executes the asynchronous custom location request.

**Parameters:**

- **listener**  
A [CLE2Request.CLE2ResultListener](#) to be notified when the search request is completed.

**Returns:**

*NONE* if request is sent successfully, otherwise, error message.

**Throws:**

- **IllegalArgumentException**  
if listener is {code null}.

```
public CLE2ConnectivityMode getConnectivityMode ()
```

Get request mode for this [CLE2Request](#).

**Returns:**

[CLE2Request.CLE2ConnectivityMode](#) object.

```
public int hashCode ()
```

For documentation, see [java.lang.Object](#)

```
public CLE2Request setCachingEnabled (boolean cache)
```

Set if request output geometries should be stored locally. Default is false.

Please note that, if enabled, only *FULL* response will be stored. Other [CLE2Request.CLE2GeometryType](#) response will not be stored.

**Parameters:**

- **cache**  
boolean indicating store response or not.

**Returns:**

updated [CLE2Request](#) for chaining operation.

```
public CLE2Request setConnectivityMode (CLE2ConnectivityMode mode)
```

Sets the connectivity mode for this [CLE2Request](#). Default mode is *ONLINE*.

Please note that [CLE2AttributeRequest](#) only supports *ONLINE* mode.

**Parameters:**

- **mode**

`CLE2Request.CLE2ConnectivityMode` connectivity mode

**Returns:**

updated `CLE2Request` for chaining operation.

**Throws:**

- `IllegalArgumentException`

When `CLE2RequestMode` is not `ONLINE` for `CLE2AttributeRequest`.

```
public CLE2Request setGeometry (CLE2GeometryType geometry)
```

Sets the geometry representation in request.

Default value for all request is `FULL`.

When using `OFFLINE` or `AUTO`, only `FULL` is supported. Also, `CLE2AttributeRequest` only supports `FULL`.

**Parameters:**

- `geometry`

The geometry representation.

**Returns:**

current instance for chaining operation.

**Throws:**

- `IllegalArgumentException`

if request is `CLE2AttributeRequest` and `CLE2Request.CLE2GeometryType` is not `FULL`.

```
public CLE2Request setQuery (String query)
```

Specifies the filter(s) to be used for a custom location request. When specified, only geometries where expression evaluates to true will be returned. An example query can be like this "RATING > 3 && NAME != 'MyPlace23'" where RATING and NAME are column names.

Please note that this method is only supported in `ONLINE`.

**Parameters:**

- `query`

A JavaScript expression as a string being evaluated for each geometry.

**Returns:**

current instance for chaining operation.

**Throws:**

- `IllegalArgumentException`

if query is empty.

## CLE2ConnectivityMode

The enumeration `CLE2ConnectivityMode` is a member of `com.here.android.mpa.customlocation2.CLE2Request`.

### Enumeration Summary

public static final enumeration `CLE2Request.CLE2ConnectivityMode`

extends `java.lang.Enum`, `java.lang.Object`

Specifies the connectivity mode for a request.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 231: Enum Constants in `CLE2ConnectivityMode`

Fields
<pre>public static final CLE2ConnectivityMode ONLINE</pre> <p>Indicates online connectivity mode.</p>
<pre>public static final CLE2ConnectivityMode OFFLINE</pre> <p>Indicates offline connectivity mode.</p>
<pre>public static final CLE2ConnectivityMode AUTO</pre> <p>Set the auto mode for request.</p>

### Method Summary

Table 232: Methods in `CLE2ConnectivityMode`

Methods
<pre>public static CLE2ConnectivityMode valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static CLE2Request.CLE2ConnectivityMode[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

### Enumeration Details

Specifies the connectivity mode for a request.

### Enum Constant Details

public static final `CLE2ConnectivityMode ONLINE`

Indicates online connectivity mode. If no connection is present, request will fail. Offline request will not be attempted.

```
public static final CLE2ConnectivityMode OFFLINE
```

Indicates offline connectivity mode. If no data is present, request will fail. Online request will not be attempted.

```
public static final CLE2ConnectivityMode AUTO
```

Set the auto mode for request. If connection is present, request will be online, otherwise offline.

### Method Details

```
public static CLE2ConnectivityMode valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static CLE2Request.CLE2ConnectivityMode[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## CLE2Error

The class *CLE2Error* is a member of *com.here.android.mpa.customlocation2.CLE2Request*.

### Class Summary

```
public static class CLE2Request.CLE2Error
```

*extends java.lang.Object*

Represents values describing possible search request errors.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 233: Nested Classes in *CLE2Error*

Nested Classes
<pre>public static final enumeration <i>CLE2Request.CLE2Error.CLE2ErrorCode</i></pre> <p>Error codes</p>

## Constructor Summary

Table 234: Constructors in CLE2Error

Constructors
<p><code>CLE2Error</code> (<code>CLE2ErrorCode</code> code, <code>String</code> message)</p> <p>Constructor to create a <code>CLE2Error</code>.</p>

## Field Summary

Table 235: Fields in CLE2Error

Fields
<p><code>public static final String</code> <code>BUSY</code></p> <p>The search service was busy with another request.</p>
<p><code>public static final String</code> <code>CANCELLED</code></p> <p>Network request was cancelled.</p>
<p><code>public static final String</code> <code>INVALID_PARAMETER</code></p> <p>A query request parameter was invalid.</p>
<p><code>public static final String</code> <code>NETWORK_COMMUNICATION</code></p> <p>There was a network communications error.</p>
<p><code>public static final String</code> <code>NONE</code></p> <p>No error was encountered.</p>
<p><code>public static final String</code> <code>OPERATION_NOT_ALLOWED</code></p> <p>Access to this operation is denied.</p>
<p><code>public static final String</code> <code>UNKNOWN</code></p> <p>Some other unexpected error occurred.</p>

## Method Summary

Table 236: Methods in CLE2Error

Methods
<p><code>public CLE2ErrorCode</code> <code>getErrorCode</code> ()</p> <p>Get error code.</p>
<p><code>public String</code> <code>getErrorMessage</code> ()</p> <p>Get error description.</p>

## Class Details

Represents values describing possible search request errors.

## Constructor Details

**CLE2Error** (*CLE2ErrorCode* code, String message)

Constructor to create a CLE2Error .

### Parameters:

- **code**
  - error code.
- **message**
  - error message.

## Field Details

`public static final String BUSY`

The search service was busy with another request.

`public static final String CANCELLED`

Network request was cancelled.

`public static final String INVALID_PARAMETER`

A query request parameter was invalid.

`public static final String NETWORK_COMMUNICATION`

There was a network communications error.

`public static final String NONE`

No error was encountered.

`public static final String OPERATION_NOT_ALLOWED`

Access to this operation is denied. Contact your HERE representative for more information.

`public static final String UNKNOWN`

Some other unexpected error occurred.

## Method Details

```
public CLE2ErrorCode getErrorCode ()
```

Get error code.

### Returns:

error code

```
public String getErrorMessage ()
```

Get error description.

### Returns:

error message

## CLE2ErrorCode

The enumeration *CLE2ErrorCode* is a member of *com.here.android.mpa.customlocation2.CLE2Request.CLE2Error*.

## Enumeration Summary

```
public static final enumeration CLE2Request.CLE2Error.CLE2ErrorCode
```

*extends java.lang.Enum, java.lang.Object*

Error codes

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 237: Enum Constants in *CLE2ErrorCode*

Fields
<pre>public static final <i>CLE2ErrorCode</i> <b>NONE</b></pre> <p>No error code.</p>
<pre>public static final <i>CLE2ErrorCode</i> <b>INVALID_PARAMETER</b></pre> <p>Invalid parameter.</p>
<pre>public static final <i>CLE2ErrorCode</i> <b>NETWORK_COMMUNICATION</b></pre> <p>Network communication.</p>
<pre>public static final <i>CLE2ErrorCode</i> <b>OPERATION_NOT_ALLOWED</b></pre> <p>Operation not allowed.</p>
<pre>public static final <i>CLE2ErrorCode</i> <b>DATA_MANAGER_FAILED</b></pre> <p>Storage Error.</p>

## Fields

```
public static final CLE2ErrorCode SERVER_FAILED
```

Server error.

```
public static final CLE2ErrorCode PARTIAL_SUCCESS
```

Partial success.

```
public static final CLE2ErrorCode BUSY
```

Busy

```
public static final CLE2ErrorCode CANCELLED
```

Cancelled

```
public static final CLE2ErrorCode UNKNOWN
```

Unknown error code.

## Method Summary

Table 238: Methods in *CLE2ErrorCode*

### Methods

```
public int getValue ()
```

```
public static CLE2ErrorCode valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static CLE2Request.CLE2Error.CLE2ErrorCode[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Error codes

### Enum Constant Details

```
public static final CLE2ErrorCode NONE
```

No error code.

```
public static final CLE2ErrorCode INVALID_PARAMETER
```

Invalid parameter.

```
public static final CLE2ErrorCode NETWORK_COMMUNICATION
```

Network communication.

```
public static final CLE2ErrorCode OPERATION_NOT_ALLOWED
```

Operation not allowed.

```
public static final CLE2ErrorCode DATA_MANAGER_FAILED
```

Storage Error.

```
public static final CLE2ErrorCode SERVER_FAILED
```

Server error.

```
public static final CLE2ErrorCode PARTIAL_SUCCESS
```

Partial success.

```
public static final CLE2ErrorCode BUSY
```

Busy

```
public static final CLE2ErrorCode CANCELLED
```

Cancelled

```
public static final CLE2ErrorCode UNKNOWN
```

Unknown error code.

## Method Details

```
public int getValue ()
```

```
public static CLE2ErrorCode valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static CLE2Request.CLE2Error.CLE2ErrorCode[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## CLE2GeometryType

The enumeration `CLE2GeometryType` is a member of `com.here.android.mpa.customlocation2.CLE2Request`.

### Enumeration Summary

public static final enumeration `CLE2Request.CLE2GeometryType`

extends `java.lang.Enum`, `java.lang.Object`

Specifies the geometry representation in the result.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 239: Enum Constants in `CLE2GeometryType`

Fields
<pre>public static final CLE2GeometryType LOCAL</pre> <p>Local geometry is used for map display purposes, returning geometry pieces that cover the given search radius, bounding box or corridor polygon.</p>
<pre>public static final CLE2GeometryType FULL</pre> <p>Full geometry is mostly used for interactive editing, where the original geometry is required.</p>
<pre>public static final CLE2GeometryType NONE</pre> <p>None is used for applications like geofencing, which most of the time want to know only the ids of the geofence points/lines and the polygons they are in or near.</p>

### Method Summary

Table 240: Methods in `CLE2GeometryType`

Methods
<pre>public String value ()</pre>
<pre>public static CLE2GeometryType valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static CLE2Request.CLE2GeometryType[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

### Enumeration Details

Specifies the geometry representation in the result.

## Enum Constant Details

```
public static final CLE2GeometryType LOCAL
```

Local geometry is used for map display purposes, returning geometry pieces that cover the given search radius, bounding box or corridor polygon.

```
public static final CLE2GeometryType FULL
```

Full geometry is mostly used for interactive editing, where the original geometry is required.

```
public static final CLE2GeometryType NONE
```

None is used for applications like geofencing, which most of the time want to know only the ids of the geofence points/lines and the polygons they are in or near.

## Method Details

```
public String value ()
```

```
public static CLE2GeometryType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static CLE2Request.CLE2GeometryType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## CLE2ResultListener

The interface *CLE2ResultListener* is a member of *com.here.android.mpa.customlocation2.CLE2Request*.

## Interface Summary

```
public static abstract interface CLE2Request.CLE2ResultListener
```

Represents a listener that reports information about the completion of a custom location search *CLE2Request*.

[For complete information, see the section *Interface Details*]

## Method Summary

Table 241: Methods in `CLE2ResultListener`

Methods
<pre>public abstract void <i>onCompleted</i> (<i>CLE2Result</i> result, String error)</pre> <p>A callback indicating the completion of a custom location request</p>

## Interface Details

Represents a listener that reports information about the completion of a custom location search [CLE2Request](#).

## Method Details

```
public abstract void onCompleted (CLE2Result result, String error)
```

A callback indicating the completion of a custom location request

### Parameters:

- **result**  
Represents the data result of location request. If request failed, `result` should be ignored.
- **error**  
Represents the status of the location request. If `None`, the request was processed successfully, otherwise, one of the other error codes will be returned.

## CLE2Result

The class `CLE2Result` is a member of [com.here.android.mpa.customlocation2](#).

## Class Summary

```
public final class CLE2Result
```

```
extends java.lang.Object
```

Stores the user-defined locations or geometries retrieved from a [CLE2Request](#).

[For complete information, see the section [Class Details](#)]

## Method Summary

Table 242: Methods in `CLE2Result`

Methods
<pre>public <i>CLE2ConnectivityMode</i> <i>getConnectivityModeUsed</i> ()</pre> <p>Gets <code>ONLINE</code> or <code>OFFLINE</code> mode for received response.</p>

## Methods

```
public java.util.List <CLE2Geometry> getGeometries ()
```

Returns a List of user-defined *CLE2Geometry*(s).

---

## Class Details

Stores the user-defined locations or geometries retrieved from a *CLE2Request*.

## Method Details

```
public CLE2ConnectivityMode getConnectivityModeUsed ()
```

Gets *ONLINE* or *OFFLINE* mode for received response. This method can be useful to know whether the response comes from server or from local storage in case of *AUTO*.

### Returns:

*CLE2Request.CLE2ConnectivityMode* for received response.

```
public java.util.List <CLE2Geometry> getGeometries ()
```

Returns a List of user-defined *CLE2Geometry*(s).

### Returns:

A List of user-defined *CLE2Geometry*(s) retrieved from a *CLE2Request*.

## CLE2Task<ResultType>

The class *CLE2Task<ResultType>* is a member of *com.here.android.mpa.customlocation2* .

### Type Parameters:

- **ResultType**  
type of data the task retrieves from the service

## Class Summary

```
public class CLE2Task
```

```
extends java.lang.Object
```

Encapsulates an asynchronous CLE2 task (that usually involves network communication and/or database operations) and provides some common operations like observing, waiting for the result, cancelling or getting the result.

[For complete information, see the section *Class Details*]

## Nested Class Summary

Table 243: Nested Classes in `CLE2Task<ResultType>`

Nested Classes
<p>public static abstract interface <code>CLE2Task.Callback</code></p> <p>Used to notify the client of the result of the operation.</p>

## Method Summary

Table 244: Methods in `CLE2Task<ResultType>`

Methods
<p>public <code>CLE2Task&lt;ResultType&gt;</code> <code>cancel ()</code></p> <p>Attempts to cancel this task if it is running.</p>
<p>public <code>CLE2Error</code> <code>getError ()</code></p> <p>Gets the status of a finished task.</p>
<p>public <code>ResultType</code> <code>getResult ()</code></p> <p>Gets result of the operation represented by this task.</p>
<p>public boolean <code>isFinished ()</code></p> <p>Checks if the task has finished.</p>
<p>public boolean <code>isStarted ()</code></p> <p>Checks if the task has been started.</p>
<p>public <code>CLE2Task&lt;ResultType&gt;</code> <code>start ()</code></p> <p>Starts this task.</p>
<p>public <code>CLE2Task&lt;ResultType&gt;</code> <code>start (Callback&lt;ResultType&gt; callback)</code></p> <p>Starts this task and subscribes the supplied callback for result.</p>
<p>public <code>CLE2Task&lt;ResultType&gt;</code> <code>subscribe (Callback&lt;ResultType&gt; callback)</code></p> <p>Add a listener to be notified when this task finishes.</p>
<p>public <code>CLE2Task&lt;ResultType&gt;</code> <code>unsubscribe (Callback&lt;ResultType&gt; callback)</code></p> <p>Removes a listener from the list of subscribers to this task.</p>
<p>public <code>CLE2Task&lt;ResultType&gt;</code> <code>waitForResult (long timeout, TimeUnit unit)</code></p> <p>Waits for task's completion or until specified time passes.</p>
<p>public <code>CLE2Task&lt;ResultType&gt;</code> <code>waitForResult ()</code></p> <p>Waits for task's completion.</p>

## Class Details

Encapsulates an asynchronous CLE2 task (that usually involves network communication and/or database operations) and provides some common operations like observing, waiting for the result, cancelling or getting the result.

A typical use for a `CLE2Task` involves creating a task, subscribing to it and starting its execution. The factory methods usually look something like `newActionTask(parameters)` where `Action` is a descriptive name of what the task will do. For example, if you don't care about holding onto the task for later use or having more than one subscriber, you might write `CLE2DataManager.getInstance().newListLayersTask(StorageType.LOCAL).start(myListener)` to create and start a task that will get the list of locally stored layers.

`CLE2Task` also provides some more advanced features. For example, if you are performing a background operation that involves interacting with CLE2, a `CLE2Task` can be used in a synchronous manner by means of calling `waitForResult()` method and then getting the result and error from the finished task.

Having multiple subscribers to the task is also possible.

And finally, since `CLE2Task` object represents a unit of work, it can be held onto for later use, passed around, run repeatedly multiple times (for example, retrying a failed operation) and canceled.

## Method Details

```
public CLE2Task<ResultType> cancel ()
```

Attempts to cancel this task if it is running. There is no guarantee that the task will get cancelled, it might happen that it might be too late in the process to abort. Regardless of the outcome, all subscribers will get called. Refer to the error status in the subscriber callback `CLE2Task.Callback#onTaskFinished(Object, CLE2Request.CLE2Error)` to determine if the task was actually cancelled or not.

### Returns:

this task, for method chaining

```
public CLE2Error getError ()
```

Gets the status of a finished task. This is how to check if the operation finished successfully or learn of the reason for failure.

Only tasks that finished and are not currently in progress give a guarantee of returning a meaningful value.

### Returns:

error status

```
public ResultType getResult ()
```

Gets result of the operation represented by this task. Only tasks that finished successfully and are not currently in progress give a guarantee of returning a meaningful value.

### Returns:

result of the task if finished, undefined otherwise (refer to the documentation of the task creator)

```
public boolean isFinished ()
```

Checks if the task has finished.

NOTE: a task that is not started is always not finished.

**Returns:**

true if this task finished, false otherwise

```
public boolean isStarted ()
```

Checks if the task has been started.

NOTE: a finished task is also started. A task that is running is one that is started but not finished.

**Returns:**

true if this task was already started, false otherwise

```
public CLE2Task<ResultType> start ()
```

Starts this task. It will be run asynchronously. Attempting to start a task that is already running has no effect. Starting the task that has already finished will make it run again.

To be notified about the task's result you need to subscribe to it using [subscribe\(CLE2Task.Callback\)](#) or if synchronous operation is required [waitForResult\(\)](#) and use [getResult\(\)](#) and [getError\(\)](#).

**Returns:**

this task, for method chaining

```
public CLE2Task<ResultType> start (Callback<ResultType> callback)
```

Starts this task and subscribes the supplied callback for result. All subscribers are called on the main thread when the task finishes. Attempting to start a task that is already running is equivalent to calling [subscribe\(CLE2Task.Callback\)](#) on it with the callback. Starting the task that has already finished will make it run again.

**Parameters:**

- **callback**  
a subscriber to be notified of the result of this task

**Returns:**

this task, for method chaining

```
public CLE2Task<ResultType> subscribe (Callback<ResultType> callback)
```

Add a listener to be notified when this task finishes. They will be called in the same order as they were added.

Subscribing on a task that already finished will result in callback being invoked immediately with the result.

All subscribers are called on the main thread.

**Parameters:**

- **callback**

Listener to be notified when this task finishes.

**Returns:**

this task, for method chaining

```
public CLE2Task<ResultType> unsubscribe (Callback<ResultType> callback)
```

Removes a listener from the list of subscribers to this task. This method has no effect if the callback is not already a subscriber.

**Parameters:**

- **callback**

a callback/listener to subscribe on this task

**Returns:**

this task, for method chaining

```
public CLE2Task<ResultType> waitForResult (long timeout, TimeUnit unit)
```

Waits for task's completion or until specified time passes. Returns immediately if the task has already finished or is not started.

**Important:** never call this method from the main thread, that will result in `RuntimeException`. It is meant to be used in situations where you run a non-trivial sequence of operations on your own background thread.

**Parameters:**

- **timeout**

the maximum time to wait

- **unit**

the time unit of the timeout argument

**Returns:**

this task, for method chaining

```
public CLE2Task<ResultType> waitForResult ()
```

Waits for task's completion. Returns immediately if the task has already finished or is not started.

**Important:** never call this method from the main thread, that will result in `RuntimeException`. It is meant to be used in situations where you run a non-trivial sequence of operations on your own background thread.

**Returns:**

this task, for method chaining

## Callback<ResultType>

The interface *Callback<ResultType>* is a member of *com.here.android.mpa.customlocation2.CLE2Task*.

**Type Parameters:**

- **ResultType**  
data type of result

### Interface Summary

public static abstract interface **CLE2Task.Callback**

Used to notify the client of the result of the operation.

[For complete information, see the section [Interface Details](#)]

### Method Summary

Table 245: Methods in Callback<ResultType>

Methods
<pre>public abstract void <i>onTaskFinished</i> (ResultType result, <i>CLE2Error</i> error)</pre> <p>Called on main thread once CLE2Task finishes with a result and an error status.</p>

### Interface Details

Used to notify the client of the result of the operation.

### Method Details

```
public abstract void onTaskFinished (ResultType result, CLE2Error error)
```

Called on main thread once CLE2Task finishes with a result and an error status.

**Parameters:**

- **result**  
result of the operation if finished successfully, this value is meaningless on operation's failure
- **error**  
error status carrying information on how the operation finished

## electronic\_horizon

---

The package *electronic\_horizon* is a member of *com.here.android.mpa*.

### Package Summary

**electronic\_horizon**

### Package Details

## AdasisV2Engine

The class *AdasisV2Engine* is a member of *com.here.android.mpa.electronic\_horizon*.

### Class Summary

public final class **AdasisV2Engine**

*extends java.lang.Object*

*AdasisV2Engine* uses Electronic Horizon to predict upcoming streets and generates ADASIS v2 messages.

[For complete information, see the section *Class Details*]

### Nested Class Summary

Table 246: Nested Classes in AdasisV2Engine

Nested Classes
public static abstract interface <i>AdasisV2Engine.Listener</i>

### Constructor Summary

Table 247: Constructors in AdasisV2Engine

Constructors
<i>AdasisV2Engine</i> ( <i>AdasisV2MessageConfiguration</i> adasisMessageConfig)
Constructor.

### Method Summary

Table 248: Methods in AdasisV2Engine

Methods
public void <i>setListener</i> ( <i>Listener</i> listener)
Sets the <i>Listener</i> that listens to the messages generated by the <i>AdasisV2Engine</i> .

## Methods

```
public void update ()
```

Updates ADASIS engine with new position.

---

## Class Details

*AdasisV2Engine* uses Electronic Horizon to predict upcoming streets and generates ADASIS v2 messages.

## Constructor Details

**AdasisV2Engine** (*AdasisV2MessageConfiguration* adasisMessageConfig)

Constructor.

Parameters:

- **adasisMessageConfig**  
Instance of *AdasisV2MessageConfiguration* which switches ON or OFF necessary ADASIS messages

## Method Details

```
public void setListener (Listener listener)
```

Sets the *Listener* that listens to the messages generated by the *AdasisV2Engine*.

Parameters:

- **listener**  
*Listener* that listens to the messages generated by the *AdasisV2Engine*.

```
public void update ()
```

Updates ADASIS engine with new position. After calling update function, ADASIS version 2 protocol messages will be received via *Listener*.

## Listener

The interface *Listener* is a member of *com.here.android.mpa.electronic\_horizon.AdasisV2Engine*.

## Interface Summary

```
public static abstract interface AdasisV2Engine.Listener
```

[For complete information, see the section *Interface Details*]

## Field Summary

Table 249: Fields in Listener

Fields
<pre>public static final int <i>ADASIS_V2_MESSAGE_LENGTH</i></pre> <p>Constant length of each binary encoded ADASIS v2 message</p>

## Method Summary

Table 250: Methods in Listener

Methods
<pre>public abstract void <i>onAdasisMessageReceived</i> (byte[] bytes)</pre> <p>Called every time when new message is generated by ADASIS engine.</p>

## Interface Details

### Field Details

```
public static final int ADASIS_V2_MESSAGE_LENGTH
```

Constant length of each binary encoded ADASIS v2 message

### Method Details

```
public abstract void onAdasisMessageReceived (byte[] bytes)
```

Called every time when new message is generated by ADASIS engine.

#### Parameters:

- **bytes**

binary encoded ADASIS v2 message. It always not null and contain exactly *ADASIS\_V2\_MESSAGE\_LENGTH* bytes

Note: The slope information will not be received if the shared disk cache is used. Use isolated disk cache instead. To use isolated disk cache, check the documentation of function

## AdasisV2MessageConfiguration

The class *AdasisV2MessageConfiguration* is a member of *com.here.android.mpa.electronic\_horizon* .

### Class Summary

```
public final class AdasisV2MessageConfiguration
```

*extends java.lang.Object*

*AdasisV2MessageConfiguration* enables or disables generation of specific ADASIS v2 messages.

[For complete information, see the section [Class Details](#)]

## Method Summary

Table 251: Methods in *AdasisV2MessageConfiguration*

Methods
<p><code>public static <i>AdasisV2MessageConfiguration</i> <a href="#">createAllEnabled</a> ()</code> Creates <i>AdasisV2MessageConfiguration</i> with all possible ADASIS messages enabled.</p>
<p><code>public static <i>AdasisV2MessageConfiguration</i> <a href="#">createDefaultsEnabled</a> ()</code> Creates <i>AdasisV2MessageConfiguration</i> with default ADASIS messages enabled.</p>
<p><code>public boolean <a href="#">isLatitudeLongitudeEnabled</a> ()</code></p>
<p><code>public boolean <a href="#">isMetaDataEnabled</a> ()</code></p>
<p><code>public boolean <a href="#">isPVIDEnabled</a> ()</code></p>
<p><code>public boolean <a href="#">isPositionEnabled</a> ()</code></p>
<p><code>public boolean <a href="#">isRoadAccessibilityEnabled</a> ()</code></p>
<p><code>public boolean <a href="#">isSegmentEnabled</a> ()</code></p>
<p><code>public boolean <a href="#">isSlopeEnabled</a> ()</code></p>
<p><code>public boolean <a href="#">isStubEnabled</a> ()</code></p>
<p><code>public void <a href="#">setLatitudeLongitudeEnabled</a> (boolean enabled)</code> Set long profile LATITUDE and LONGITUDE messages enabled</p>
<p><code>public void <a href="#">setMetaDataEnabled</a> (boolean enabled)</code> Set META-DATA message enabled</p>
<p><code>public void <a href="#">setPVIDEnabled</a> (boolean enabled)</code> Set long profile PVID message enabled</p>
<p><code>public void <a href="#">setPositionEnabled</a> (boolean enabled)</code> Set POSITION message enabled</p>
<p><code>public void <a href="#">setRoadAccessibilityEnabled</a> (boolean enabled)</code> Set short profile ROAD_ACCESSIBILITY message enabled</p>
<p><code>public void <a href="#">setSegmentEnabled</a> (boolean enabled)</code> Set SEGMENT message enabled</p>
<p><code>public void <a href="#">setSlopeEnabled</a> (boolean enabled)</code> Set short profile SLOPE message enabled</p>
<p><code>public void <a href="#">setStubEnabled</a> (boolean enabled)</code> Set STUB message enabled</p>

## Class Details

*AdasisV2MessageConfiguration* enables or disables generation of specific ADASIS v2 messages.

## Method Details

```
public static AdasisV2MessageConfiguration createAllEnabled ()
```

Creates *AdasisV2MessageConfiguration* with all possible ADASIS messages enabled.

**Returns:**

Instance of *AdasisV2MessageConfiguration*

```
public static AdasisV2MessageConfiguration createDefaultsEnabled ()
```

Creates *AdasisV2MessageConfiguration* with default ADASIS messages enabled. It's POSITION, STUB, SEGMENT and META-DATA

**Returns:**

Instance of *AdasisV2MessageConfiguration*

```
public boolean isLatitudeLongitudeEnabled ()
```

**Returns:**

True if long profile LATITUDE and LONGITUDE messages are enabled

```
public boolean isMetaDataEnabled ()
```

**Returns:**

True if META-DATA message is enabled

```
public boolean isPVIDEnabled ()
```

**Returns:**

True if long profile PVID message is enabled

```
public boolean isPositionEnabled ()
```

**Returns:**

True if POSITION message is enabled

```
public boolean isRoadAccessibilityEnabled ()
```

**Returns:**

True if short profile ROAD\_ACCESSIBILITY message is enabled

```
public boolean isSegmentEnabled ()
```

**Returns:**

True if SEGMENT message is enabled

```
public boolean isSlopeEnabled ()
```

**Returns:**

True if short profile SLOPE message is enabled

```
public boolean isStubEnabled ()
```

**Returns:**

True if STUB message is enabled

```
public void setLatitudeLongitudeEnabled (boolean enabled)
```

Set long profile LATITUDE and LONGITUDE messages enabled

**Parameters:**

- **enabled**  
Are messages enabled

```
public void setMetaDataEnabled (boolean enabled)
```

Set META-DATA message enabled

**Parameters:**

- **enabled**  
Is message enabled

```
public void setPVIDEnabled (boolean enabled)
```

Set long profile PVID message enabled

**Parameters:**

- **enabled**  
Is message enabled

```
public void setPositionEnabled (boolean enabled)
```

Set POSITION message enabled

**Parameters:**

- **enabled**  
Is message enabled

```
public void setRoadAccessibilityEnabled (boolean enabled)
```

Set short profile ROAD\_ACCESSIBILITY message enabled

**Parameters:**

- **enabled**  
Is message enabled

```
public void setSegmentEnabled (boolean enabled)
```

Set SEGMENT message enabled

**Parameters:**

- **enabled**  
Is message enabled

```
public void setSlopeEnabled (boolean enabled)
```

Set short profile SLOPE message enabled

**Parameters:**

- **enabled**  
Is message enabled

```
public void setStubEnabled (boolean enabled)
```

Set STUB message enabled

**Parameters:**

- **enabled**  
Is message enabled

## DataNotReadyException

The class *DataNotReadyException* is a member of [com.here.android.mpa.electronic\\_horizon](#) .

## Class Summary

public class **DataNotReadyException**

*extends java.lang.Exception, java.lang.Throwable, java.lang.Object*

Exception is thrown in case when data is not ready yet.

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 252: Constructors in DataNotReadyException

Constructors
<a href="#">DataNotReadyException</a> (String message)

## Class Details

Exception is thrown in case when data is not ready yet. Probably you need to try access it later.

## Constructor Details

### DataNotReadyException (String message)

Parameters:

- `message`

# ElectronicHorizon

The class *ElectronicHorizon* is a member of [com.here.android.mpa.electronic\\_horizon](#).

## Class Summary

public final class **ElectronicHorizon**

*extends java.lang.Object*

*ElectronicHorizon* is a class that predicts upcoming streets and provides information about them.

[For complete information, see the section [Class Details](#)]

## Nested Class Summary

Table 253: Nested Classes in ElectronicHorizon

Nested Classes
public static abstract interface <a href="#">ElectronicHorizon.Listener</a>
Represents an interface for responding to electronic horizon events sent by the <i>ElectronicHorizon</i> .

## Constructor Summary

Table 254: Constructors in ElectronicHorizon

Constructors
<p><i>ElectronicHorizon</i> ()</p> <p>Constructor.</p>

## Method Summary

Table 255: Methods in ElectronicHorizon

Methods
<p>public <i>MapAccessor</i> <i>getMapAccessor</i> ()</p>
<p>public void <i>setListener</i> (<i>Listener</i> listener)</p> <p>Sets the <i>Listener</i> that listens to the events of the <i>ElectronicHorizon</i>.</p>
<p>public void <i>setLookAheadDistancesInCentimeters</i> (int... distancesInCentimeters)</p> <p>Sets look ahead distances.</p>
<p>public void <i>setRoute</i> (<i>Route</i> route)</p> <p>Sets route to follow.</p>
<p>public void <i>setTrailingDistanceInCentimeters</i> (int distanceInCentimeters)</p> <p>Sets trailing distance.</p>
<p>public void <i>update</i> ()</p> <p>Updates electronic horizon with new position.</p>

## Class Details

*ElectronicHorizon* is a class that predicts upcoming streets and provides information about them.

## Constructor Details

### ElectronicHorizon ()

Constructor.

## Method Details

### public *MapAccessor* *getMapAccessor* ()

#### Returns:

An instance of *MapAccessor* class, which can be used to access the information about any link.

```
public void setListener (Listener listener)
```

Sets the *Listener* that listens to the events of the *ElectronicHorizon*.

**Parameters:**

- **listener**  
*Listener* that listens to the events of the *ElectronicHorizon*.

```
public void setLookAheadDistancesInCentimeters (int...  
distancesInCentimeters)
```

Sets look ahead distances. New links and children will be added if distance between them and current position is less than distance on appropriate level.

**Parameters:**

- **distancesInCentimeters**  
Distances in centimeters where distance at index 0 means distance for main path and distance at N index means N level of children Examples: Only main path with length of 7 kilometers from current position: `setLookAheadDistancesInCentimeters(new int[] {700000})` Main path with length of 7 kilometers from current position and children with length of 1 kilometer from current position (i.e. children have 1 kilometer length only if it starts at the same point as current position, otherwise it have 1 kilometer minus offset between current position and child's offset at main path): `setLookAheadDistancesInCentimeters(new int[] {700000, 100000})`

```
public void setRoute (Route route)
```

Sets route to follow. Electronic horizon will take route into account to build path tree.

**Parameters:**

- **route**  
Route to follow Note: Only the routes with transport mode `RouteOptions.TransportMode#CAR` or `RouteOptions.TransportMode#TRACK` are supported.

**Throws:**

- **IllegalArgumentException**  
if route is null or mode doesn't match.

```
public void setTrailingDistanceInCentimeters (int distanceInCentimeters)
```

Sets trailing distance. Old links and children are removed only when they far at this trailing distance from current position.

**Parameters:**

- **distanceInCentimeters**  
Distance in centimeters

```
public void update ()
```

Updates electronic horizon with new position. After calling update function the path tree of electronic horizon might be changed.

## Listener

The interface *Listener* is a member of *com.here.android.mpa.electronic\_horizon.ElectronicHorizon*.

### Interface Summary

```
public static abstract interface ElectronicHorizon.Listener
```

Represents an interface for responding to electronic horizon events sent by the *ElectronicHorizon*.

[For complete information, see the section *Interface Details*]

### Method Summary

Table 256: Methods in Listener

Methods
<pre>public abstract void <i>onChildDetached</i> (<i>PathTree</i> parent, <i>PathTree</i> child)</pre> <p>Called every time a path is detached from its parent.</p>
<pre>public abstract void <i>onLinkAdded</i> (<i>PathTree</i> path, <i>Link</i> link)</pre> <p>Called every time a new link is added to the tree.</p>
<pre>public abstract void <i>onLinkRemoved</i> (<i>PathTree</i> path, <i>Link</i> link)</pre> <p>Called every time a link is removed from the tree.</p>
<pre>public abstract void <i>onNewPosition</i> (<i>Position</i> position)</pre> <p>Called when new position on most probable path or offroad position is computed.</p>
<pre>public abstract void <i>onPathAdded</i> (<i>PathTree</i> path)</pre> <p>Called every time a new path is added to the tree.</p>
<pre>public abstract void <i>onPathRemoved</i> (<i>PathTree</i> path)</pre> <p>Called every time a path is removed from the tree.</p>
<pre>public abstract void <i>onTreeReset</i> ()</pre> <p>Called every time when the tree is reset.</p>

### Interface Details

Represents an interface for responding to electronic horizon events sent by the *ElectronicHorizon*.

## Method Details

```
public abstract void onChildDetached (PathTree parent, PathTree child)
```

Called every time a path is detached from its parent.

### Parameters:

- **parent**  
The parent path tree element.
- **child**  
The child path tree element.

```
public abstract void onLinkAdded (PathTree path, Link link)
```

Called every time a new link is added to the tree.

### Parameters:

- **path**  
The path to which the link was added.
- **link**  
The link which was added.

```
public abstract void onLinkRemoved (PathTree path, Link link)
```

Called every time a link is removed from the tree.

### Parameters:

- **path**  
The path from which the link will be removed.
- **link**  
The link which will be removed.

```
public abstract void onNewPosition (Position position)
```

Called when new position on most probable path or offroad position is computed.

### Parameters:

- **position**  
Updated position which contains the the most probable path which we are currently on and offset from its origin.

```
public abstract void onPathAdded (PathTree path)
```

Called every time a new path is added to the tree.

## Parameters:

- **path**

The path which was added.

```
public abstract void onPathRemoved (PathTree path)
```

Called every time a path is removed from the tree.

## Parameters:

- **path**

The path which will be removed. Note: No additional events about removing will be fired for children and links of this path.

```
public abstract void onTreeReset ()
```

Called every time when the tree is reset. Note: Tree reset occurs when the new position cannot be matched to the horizon. The tree will be rebuilt based on the new position.

## Link

The class *Link* is a member of *com.here.android.mpa.electronic\_horizon* .

### Class Summary

```
public final class Link
```

```
extends java.lang.Object
```

Represents a link for electronic horizon.

[For complete information, see the section *Class Details*]

### Nested Class Summary

Table 257: Nested Classes in Link

Nested Classes
<pre>public static final enumeration <i>Link.Direction</i></pre>
Defines the direction of movement.

## Constructor Summary

Table 258: Constructors in Link

Constructors
<code>Link</code> (long id, <i>Direction</i> direction, int startOffsetCentimeters, int endOffsetCentimeters)
Constructor

## Method Summary

Table 259: Methods in Link

Methods
public boolean <code>equals</code> (Object obj) For documentation, see <i>java.lang.Object</i>
public <i>Direction</i> <code>getDirection</code> ()
public int <code>getEndOffsetCentimeters</code> ()
public long <code>getId</code> ()
public int <code>getStartOffsetCentimeters</code> ()
public int <code>hashCode</code> () For documentation, see <i>java.lang.Object</i>

## Class Details

Represents a link for electronic horizon.

### Constructor Details

`Link` (long id, *Direction* direction, int startOffsetCentimeters, int endOffsetCentimeters)

Constructor

Parameters:

- `id`
- `direction`
- `startOffsetCentimeters`
- `endOffsetCentimeters`

### Method Details

public boolean `equals` (Object obj)

For documentation, see *java.lang.Object*

**Parameters:**

- `obj`

```
public Direction getDirection ()
```

**Returns:**

The direction of movement.

```
public int getEndOffsetCentimeters ()
```

**Returns:**

The distance from beginning of path to end of link in centimeters.

```
public long getId ()
```

**Returns:**

The identifier of the link.

```
public int getStartOffsetCentimeters ()
```

**Returns:**

The distance in centimeters from the logical beginning of the path.

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## Direction

The enumeration *Direction* is a member of *com.here.android.mpa.electronic\_horizon.Link*.

### Enumeration Summary

```
public static final enumeration Link.Direction
```

```
extends java.lang.Enum, java.lang.Object
```

Defines the direction of movement.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 260: Enum Constants in Direction

Fields
<pre>public static final <i>Direction</i> FORWARD</pre> <p>Forward</p>
<pre>public static final <i>Direction</i> BACKWARD</pre> <p>Backward</p>

## Method Summary

Table 261: Methods in Direction

Methods
<pre>public static <i>Direction</i> valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>Link.Direction</i>[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Defines the direction of movement.

### Enum Constant Details

```
public static final Direction FORWARD
```

Forward

```
public static final Direction BACKWARD
```

Backward

### Method Details

```
public static Direction valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static Link.Direction\[\] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## LinkInformation

The class *LinkInformation* is a member of [com.here.android.mpa.electronic\\_horizon](#) .

### Class Summary

```
public final class LinkInformation
```

```
extends java.lang.Object
```

Represents a link for electronic horizon.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 262: Nested Classes in LinkInformation

Nested Classes
<pre>public static final enumeration <a href="#">LinkInformation.AllowedDirection</a></pre> <p>Determines the allowed direction for the Link.</p>
<pre>public static final enumeration <a href="#">LinkInformation.FormOfWay</a></pre> <p>Determines the form of the road for the Link</p>
<pre>public static final enumeration <a href="#">LinkInformation.FunctionalRoadClass</a></pre> <p>Determines the priority of the road for the Link.</p>

### Constructor Summary

Table 263: Constructors in LinkInformation

Constructors
<pre><a href="#">LinkInformation</a> (boolean isBridge, boolean isDividedRoad, boolean isTunnel, boolean isUrban, boolean isPedestrianOpen, double speedLimitMetersPerSecond, double lengthMeters, <a href="#">AllowedDirection</a> openForCars, <a href="#">AllowedDirection</a> carThroughOpen, <a href="#">FunctionalRoadClass</a> functionalRoadClass, <a href="#">FormOfWay</a> formOfWay)</pre> <p>Constructor</p>

## Method Summary

Table 264: Methods in LinkInformation

Methods
public <i>FormOfWay</i> <i>getFormOfWay</i> ()
public <i>FunctionalRoadClass</i> <i>getFunctionalRoadClass</i> ()
public double <i>getLengthMeters</i> ()
public double <i>getSpeedLimitMetersPerSecond</i> ()
public boolean <i>isBridge</i> ()
public boolean <i>isCarThroughOpen</i> ( <i>AllowedDirection</i> direction)
Checks whether the link is allowed to pass through with the cars on certain direction.
public boolean <i>isDividedRoad</i> ()
public boolean <i>isOpenForCars</i> ( <i>AllowedDirection</i> direction)
Checks whether the link is allowed for the cars with certain direction.
public boolean <i>isPedestrianOpen</i> ()
public boolean <i>isTunnel</i> ()
public boolean <i>isUrban</i> ()

## Class Details

Represents a link for electronic horizon.

## Constructor Details

**LinkInformation** (boolean *isBridge*, boolean *isDividedRoad*, boolean *isTunnel*, boolean *isUrban*, boolean *isPedestrianOpen*, double *speedLimitMetersPerSecond*, double *lengthMeters*, *AllowedDirection* *openForCars*, *AllowedDirection* *carThroughOpen*, *FunctionalRoadClass* *functionalRoadClass*, *FormOfWay* *formOfWay*)

Constructor

Parameters:

- *isBridge*
- *isDividedRoad*
- *isTunnel*
- *isUrban*
- *isPedestrianOpen*
- *speedLimitMetersPerSecond*
- *lengthMeters*
- *openForCars*

- `carThroughOpen`
- `functionalRoadClass`
- `formOfWay`

## Method Details

```
public FormOfWay getFormOfWay ()
```

### Returns:

The `FormOfWay` which determines the form of way for the link.

```
public FunctionalRoadClass getFunctionalRoadClass ()
```

### Returns:

The `FunctionalRoadClass` which determines the priority of the road.

```
public double getLengthMeters ()
```

### Returns:

The length of the link in meters.

```
public double getSpeedLimitMetersPerSecond ()
```

### Returns:

The speed limitation for the current link in meters per seconds.

```
public boolean isBridge ()
```

### Returns:

`true` if current link is bridge, `false` otherwise.

```
public boolean isCarThroughOpen (AllowedDirection direction)
```

Checks whether the link is allowed to pass through with the cars on certain direction.

### Parameters:

- `direction`

The direction from which the link will be checked.

### Returns:

`true` if link is allowed to pass with the cars, `false` otherwise.

```
public boolean isDividedRoad ()
```

**Returns:**

true if current link is divided road, false otherwise.

```
public boolean isOpenForCars (AllowedDirection direction)
```

Checks whether the link is allowed for the cars with certain direction.

**Parameters:**

- **direction**

The direction from which the link will be checked.

**Returns:**

true if link is allowed for cars, false otherwise.

```
public boolean isPedestrianOpen ()
```

**Returns:**

true if current link is allowed for the pedestrian, false otherwise.

```
public boolean isTunnel ()
```

**Returns:**

true if current link is tunnel, false otherwise.

```
public boolean isUrban ()
```

**Returns:**

true if current link is urban, false otherwise.

## AllowedDirection

The enumeration *AllowedDirection* is a member of *com.here.android.mpa.electronic\_horizon.LinkInformation*.

### Enumeration Summary

```
public static final enumeration LinkInformation.AllowedDirection
```

```
extends java.lang.Enum, java.lang.Object
```

Determines the allowed direction for the Link.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 265: Enum Constants in AllowedDirection

Fields
<pre>public static final AllowedDirection FORWARD</pre> <p>Forward</p>
<pre>public static final AllowedDirection BACKWARD</pre> <p>Backward</p>
<pre>public static final AllowedDirection BOTH</pre> <p>Both</p>
<pre>public static final AllowedDirection NONE</pre> <p>None</p>

## Method Summary

Table 266: Methods in AllowedDirection

Methods
<pre>public static AllowedDirection valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static LinkInformation.AllowedDirection[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Determines the allowed direction for the Link.

### Enum Constant Details

```
public static final AllowedDirection FORWARD
```

Forward

```
public static final AllowedDirection BACKWARD
```

Backward

```
public static final AllowedDirection BOTH
```

Both

```
public static final AllowedDirection NONE
```

None

### Method Details

```
public static AllowedDirection valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static LinkInformation.AllowedDirection[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## FormOfWay

The enumeration *FormOfWay* is a member of *com.here.android.mpa.electronic\_horizon.LinkInformation*.

### Enumeration Summary

```
public static final enumeration LinkInformation.FormOfWay
```

```
extends java.lang.Enum, java.lang.Object
```

Determines the form of the road for the Link

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 267: Enum Constants in FormOfWay

Fields
<pre>public static final <i>FormOfWay</i> <b>MULTIDIGITIZED</b></pre> <p>Multidigitized</p>
<pre>public static final <i>FormOfWay</i> <b>SINGLE_CARRIAGE</b></pre> <p>Single carriage</p>
<pre>public static final <i>FormOfWay</i> <b>SLIPROAD</b></pre> <p>Sliproad</p>
<pre>public static final <i>FormOfWay</i> <b>ROUNABOUT_CIRCLE</b></pre> <p>Roundabout circle</p>

### Fields

```
public static final FormOfWay SPECIAL_TRAFFIC_FIGURE
```

Special traffic figure

```
public static final FormOfWay PEDESTRIAN_ZONE
```

Pedestrian zone

```
public static final FormOfWay SERVICE_ROAD
```

Service road

## Method Summary

Table 268: Methods in *FormOfWay*

### Methods

```
public static FormOfWay valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static LinkInformation.FormOfWay[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Determines the form of the road for the Link

### Enum Constant Details

```
public static final FormOfWay MULTIDIGITIZED
```

Multidigitized

```
public static final FormOfWay SINGLE_CARRIAGE
```

Single carriage

```
public static final FormOfWay SLIPROAD
```

Sliproad

```
public static final FormOfWay ROUNDABOUT_CIRCLE
```

Roundabout circle

```
public static final FormOfWay SPECIAL_TRAFFIC_FIGURE
```

Special traffic figure

```
public static final FormOfWay PEDESTRIAN_ZONE
```

Pedestrian zone

```
public static final FormOfWay SERVICE_ROAD
```

Service road

### Method Details

```
public static FormOfWay valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static LinkInformation.FormOfWay[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## FunctionalRoadClass

The enumeration *FunctionalRoadClass* is a member of *com.here.android.mpa.electronic\_horizon.LinkInformation*.

### Enumeration Summary

```
public static final enumeration LinkInformation.FunctionalRoadClass
```

*extends java.lang.Enum, java.lang.Object*

Determines the priority of the road for the Link.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 269: Enum Constants in FunctionalRoadClass

Fields
<pre>public static final <i>FunctionalRoadClass</i> <b>FRC1</b></pre> <p>Functional road class 1</p>

## Fields

```
public static final FunctionalRoadClass FRC2
```

Functional road class 2

```
public static final FunctionalRoadClass FRC3
```

Functional road class 3

```
public static final FunctionalRoadClass FRC4
```

Functional road class 4

```
public static final FunctionalRoadClass FRC5
```

Functional road class 5

## Method Summary

Table 270: Methods in *FunctionalRoadClass*

### Methods

```
public static FunctionalRoadClass valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static LinkInformation.FunctionalRoadClass[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Determines the priority of the road for the Link. FRC1 is the highest priority road and the FRC5 is lowest priority road.

### Enum Constant Details

```
public static final FunctionalRoadClass FRC1
```

Functional road class 1

```
public static final FunctionalRoadClass FRC2
```

Functional road class 2

```
public static final FunctionalRoadClass FRC3
```

Functional road class 3

```
public static final FunctionalRoadClass FRC4
```

Functional road class 4

```
public static final FunctionalRoadClass FRC5
```

Functional road class 5

### Method Details

```
public static FunctionalRoadClass valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static LinkInformation.FunctionalRoadClass[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## LinkRange

The class *LinkRange* is a member of *com.here.android.mpa.electronic\_horizon* .

### Class Summary

```
public final class LinkRange
```

*implements java.lang.Iterable*

*extends java.lang.Object*

Represents an enumerable for iterating through PathTree elements.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 271: Methods in LinkRange

Methods
public int <i>getSize</i> ()
public java.util.Iterator < <i>electronic_horizon.Link</i> > <i>iterator</i> ()
public void <i>reset</i> ()
Resets the iterator to point to the beginning of the range.

## Class Details

Represents an enumerable for iterating through PathTree elements.

## Method Details

```
public int getSize ()
```

### Returns:

The number of PathTree objects in the range.

```
public java.util.Iterator <electronic_horizon.Link> iterator ()
```

### Returns:

The iterator that can be used to traverse through the elements in the range.

```
public void reset ()
```

Resets the iterator to point to the beginning of the range.

## MapAccessor

The class *MapAccessor* is a member of *com.here.android.mpa.electronic\_horizon*.

## Class Summary

```
public final class MapAccessor
```

*extends java.lang.Object*

Represents a class that provides information about any link.

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 272: Constructors in MapAccessor

Constructors
<i>MapAccessor</i> () Constructor.

## Method Summary

Table 273: Methods in MapAccessor

Methods
<pre>public java.util.List &lt;electronic_horizon.Link&gt; <b>getConnectedLinks</b> (<i>Link</i> link)</pre> <p>Retrieves the list of connected links of the link.</p>
<pre>public <i>LinkInformation</i> <b>getLinkInformation</b> (<i>Link</i> link)</pre> <p>Retrieves the information of the link.</p>
<pre>public <i>GeoPolyline</i> <b>getLinkPolyline</b> (<i>Link</i> link)</pre> <p>Retrieves the geometry of the link.</p>
<pre>public <i>MetaData</i> <b>getMetaData</b> (<i>Link</i> link)</pre> <p>Retrieves the meta data of the link.</p>
<pre>public String <b>getPVID</b> (<i>Link</i> link)</pre> <p>Retrieves the PVID of the link.</p>
<pre>public java.util.List &lt;electronic_horizon.SlopeDataPoint&gt; <b>getSlopeDataPoints</b> (<i>Link</i> link)</pre> <p>Retrieves the list of slope data points of the link.</p>

## Class Details

Represents a class that provides information about any link.

## Constructor Details

### MapAccessor ()

Constructor.

## Method Details

```
public java.util.List <electronic_horizon.Link> getConnectedLinks (Link link)
```

Retrieves the list of connected links of the link.

#### Parameters:

- **link**  
The link from which the connected links will be retrieved.

#### Returns:

The list of connected links if the operation was successful, otherwise the exception is thrown.

#### Throws:

- **IllegalArgumentException**  
The link parameter is Invalid.

- **DataNotReadyException**  
The map data is not loaded yet.
- **RuntimeException**  
Unexpected error.

```
public LinkInformation getLinkInformation (Link link)
```

Retrieves the information of the link.

**Parameters:**

- **link**  
The link from which the information will be retrieved.

**Returns:**

The linkInformation if the operation was successful, otherwise the exception is thrown.

**Throws:**

- **IllegalArgumentException**  
The link parameter is Invalid.
- **DataNotReadyException**  
The map data is not loaded yet.
- **RuntimeException**  
Unexpected error.

```
public GeoPolyline getLinkPolyline (Link link)
```

Retrieves the geometry of the link.

**Parameters:**

- **link**  
The link from which the geometry will be retrieved.

**Returns:**

The geometry if the operation was successful, otherwise the exception is thrown.

**Throws:**

- **IllegalArgumentException**  
The link parameter is Invalid.
- **DataNotReadyException**  
The map data is not loaded yet.
- **RuntimeException**  
Unexpected error.

```
public MetaData getMetaData (Link link)
```

Retrieves the meta data of the link.

**Parameters:**

- **link**  
The link from which the meta data will be retrieved.

**Returns:**

The meta data if the operation was successful, otherwise the exception is thrown.

**Throws:**

- **IllegalArgumentException**  
The link parameter is Invalid.
- **DataNotReadyException**  
The map data is not loaded yet.
- **RuntimeException**  
Unexpected error.

```
public String getPVID (Link link)
```

Retrieves the PVID of the link.

**Parameters:**

- **link**  
The link from which the PVID will be retrieved.

**Returns:**

The PVID if the operation was successful, otherwise the exception is thrown.

**Throws:**

- **IllegalArgumentException**  
The link parameter is Invalid.
- **DataNotReadyException**  
The map data is not loaded yet.
- **RuntimeException**  
Unexpected error.

```
public java.util.List <electronic_horizon.SlopeDataPoint> getSlopeDataPoints (Link link)
```

Retrieves the list of slope data points of the link.

Note: The slope information will not be available if the shared disk cache is used. In this case `RuntimeException` will be thrown. To avoid this use isolated disk cache instead. To use isolated disk cache, check the documentation of `setIsolatedDiskCacheRootPath` function

#### Parameters:

- **Link**

The link from which the slope data points will be retrieved.

#### Returns:

The list of slope data points if the operation was successful, otherwise the exception is thrown.

#### Throws:

- **IllegalArgumentException**

The link parameter is Invalid.

- **DataNotReadyException**

The map data is not loaded yet.

- **RuntimeException**

Unexpected error.

## MetaData

The class `MetaData` is a member of `com.here.android.mpa.electronic_horizon`.

### Class Summary

```
public final class MetaData
```

```
extends java.lang.Object
```

Represents a meta data which is unique for the region where the link is located for electronic horizon.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 274: Nested Classes in `MetaData`

#### Nested Classes

```
public static final enumeration MetaData.SideOfDriving
```

Defines the side of driving of the specific region where the Link is located.

```
public static final enumeration MetaData.UnitSystem
```

Defines the unit system of the specific region where the Link is located.

## Constructor Summary

Table 275: Constructors in MetaData

Constructors
<code>MetaData (SideOfDriving sideOfDriving, UnitSystem unitSystem, int countryCode, int regionCode)</code>
Constructor

## Method Summary

Table 276: Methods in MetaData

Methods
<code>public int getCountryCode ()</code>
<code>public int getRegionCode ()</code>
<code>public SideOfDriving getSideOfDriving ()</code>
<code>public UnitSystem getUnitSystem ()</code>

## Class Details

Represents a meta data which is unique for the region where the link is located for electronic horizon.

## Constructor Details

`MetaData (SideOfDriving sideOfDriving, UnitSystem unitSystem, int countryCode, int regionCode)`

Constructor

Parameters:

- `sideOfDriving`
- `unitSystem`
- `countryCode`
- `regionCode`

## Method Details

`public int getCountryCode ()`

Returns:

The ISO 3166-1 numeric country code where the link is located.

`public int getRegionCode ()`

Returns:

The ISO 3166-1 numeric region code where the link is located.

```
public SideOfDriving getSideOfDriving ()
```

**Returns:**

The side of driving where the link is located.

```
public UnitSystem getUnitSystem ()
```

**Returns:**

The unit system where the link is located.

## SideOfDriving

The enumeration *SideOfDriving* is a member of *com.here.android.mpa.electronic\_horizon.Metadata*.

### Enumeration Summary

```
public static final enumeration Metadata.SideOfDriving
```

```
extends java.lang.Enum, java.lang.Object
```

Defines the side of driving of the specific region where the Link is located.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 277: Enum Constants in SideOfDriving

Fields
<pre>public static final <i>SideOfDriving</i> <b>RIGHT</b></pre> <p>Right</p>
<pre>public static final <i>SideOfDriving</i> <b>LEFT</b></pre> <p>Left</p>
<pre>public static final <i>SideOfDriving</i> <b>UNKNOWN</b></pre> <p>Unknown</p>

## Method Summary

Table 278: Methods in SideOfDriving

Methods
<pre>public static SideOfDriving valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static Metadata.SideOfDriving[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Defines the side of driving of the specific region where the Link is located.

### Enum Constant Details

```
public static final SideOfDriving RIGHT
```

Right

```
public static final SideOfDriving LEFT
```

Left

```
public static final SideOfDriving UNKNOWN
```

Unknown

## Method Details

```
public static SideOfDriving valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static Metadata.SideOfDriving[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## UnitSystem

The enumeration *UnitSystem* is a member of *com.here.android.mpa.electronic\_horizon.Metadata*.

### Enumeration Summary

public static final enumeration **Metadata.UnitSystem**

*extends java.lang.Enum, java.lang.Object*

Defines the unit system of the specific region where the Link is located.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 279: Enum Constants in UnitSystem

Fields
public static final <i>UnitSystem</i> <b>METRIC</b> Metric
public static final <i>UnitSystem</i> <b>IMPERIAL</b> Imperial
public static final <i>UnitSystem</i> <b>UNKNOWN</b> Unknown

### Method Summary

Table 280: Methods in UnitSystem

Methods
public static <i>UnitSystem</i> <b>valueOf</b> (String name) This method retrieves the enumeration value that matches the name specified by the caller.
public static <i>Metadata.UnitSystem[]</i> <b>values</b> () This method retrieves an array of constants of the given enum type in the order in which they are declared.

### Enumeration Details

Defines the unit system of the specific region where the Link is located.

### Enum Constant Details

public static final *UnitSystem* **METRIC**

Metric

```
public static final UnitSystem IMPERIAL
Imperial
```

```
public static final UnitSystem UNKNOWN
Unknown
```

### Method Details

```
public static UnitSystem valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static MetaData.UnitSystem[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## PathTree

The class *PathTree* is a member of *com.here.android.mpa.electronic\_horizon*.

### Class Summary

```
public final class PathTree
```

```
extends java.lang.Object
```

Represents a tree like structure where each *PathTree* contains multiple children and links.

[For complete information, see the section *Class Details*]

### Method Summary

Table 281: Methods in *PathTree*

Methods
public boolean <i>equals</i> ( <i>Object</i> obj) For documentation, see <i>java.lang.Object</i>
public <i>PathTreeRange</i> <i>getChildren</i> ()
public <i>LinkRange</i> <i>getLinks</i> ()

## Methods

```
public int getOffsetCentimeters ()
```

```
public PathTree getParent ()
```

Note: The parent property of the root path tree is null.

```
public float getProbability ()
```

Note: The value of the property can be in range from 0 to 1.

```
public int hashCode ()
```

For documentation, see [java.lang.Object](#)

## Class Details

Represents a tree like structure where each [PathTree](#) contains multiple children and links.

## Method Details

```
public boolean equals (Object obj)
```

For documentation, see [java.lang.Object](#)

### Parameters:

- `obj`

```
public PathTreeRange getChildren ()
```

### Returns:

Enumerator of type [PathTreeRange](#), which allows to iterate through all the child path trees.

```
public LinkRange getLinks ()
```

### Returns:

Enumerator of type [LinkRange](#), which allows to iterate through all the links of the path tree.

```
public int getOffsetCentimeters ()
```

### Returns:

The distance from the logical beginning of parent path to the start of the path tree in centimeters.

```
public PathTree getParent ()
```

Note: The parent property of the root path tree is null.

### Returns:

The parent path tree in the hierarchy.

```
public float getProbability ()
```

Note: The value of the property can be in range from 0 to 1.

**Returns:**

The probability of taking this path.

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## PathTreeRange

The class *PathTreeRange* is a member of *com.here.android.mpa.electronic\_horizon* .

### Class Summary

```
public final class PathTreeRange
```

*implements java.lang.Iterable*

*extends java.lang.Object*

Represents an enumerable for iterating through PathTree elements.

[For complete information, see the section *Class Details*]

### Method Summary

Table 282: Methods in PathTreeRange

Methods
public int <i>getSize</i> ()
public java.util.Iterator < <i>electronic_horizon.PathTree</i> > <i>iterator</i> ()
public void <i>reset</i> ()
Resets the iterator to point to the beginning of the range.

### Class Details

Represents an enumerable for iterating through PathTree elements.

### Method Details

```
public int getSize ()
```

**Returns:**

The number of *PathTree* objects in the range.

```
public java.util.Iterator <electronic_horizon.PathTree> iterator ()
```

**Returns:**

The iterator that can be used to traverse through the elements in the range.

```
public void reset ()
```

Resets the iterator to point to the beginning of the range.

## Position

The class *Position* is a member of *com.here.android.mpa.electronic\_horizon*.

### Class Summary

```
public final class Position
```

```
extends java.lang.Object
```

Represents a link for electronic horizon.

[For complete information, see the section *Class Details*]

### Method Summary

Table 283: Methods in Position

Methods
public int <i>getOffsetCentimeters</i> ()
public <i>PathTree</i> <i>getPathTree</i> ()
public double <i>getSpeedMetersPerSecond</i> ()
public Date <i>getTimestamp</i> ()

### Class Details

Represents a link for electronic horizon.

### Method Details

```
public int getOffsetCentimeters ()
```

**Returns:**

The identifier of the link.

```
public PathTree getPathTree ()
```

**Returns:**

The distance from beginning of path to end of link in centimeters.

```
public double getSpeedMetersPerSecond ()
```

**Returns:**

The direction of movement.

```
public Date getTimestamp ()
```

**Returns:**

The distance in centimeters from the logical beginning of the path.

## SlopeDataPoint

The class *SlopeDataPoint* is a member of *com.here.android.mpa.electronic\_horizon* .

### Class Summary

```
public final class SlopeDataPoint
```

*extends java.lang.Object*

Represents a slope data points for specific link in electronic horizon.

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 284: Constructors in SlopeDataPoint

Constructors
<i>SlopeDataPoint</i> (double <i>relativePositionOnLink</i> , double <i>slopePercent</i> )
Constructor

### Method Summary

Table 285: Methods in SlopeDataPoint

Methods
public double <i>getRelativePositionOnLink</i> ()

## Methods

```
public double getSlopePercent ()
```

---

### Class Details

Represents a slope data points for specific link in electronic horizon.

### Constructor Details

**SlopeDataPoint** (double *relativePositionOnLink*, double *slopePercent*)

Constructor

Parameters:

- *relativePositionOnLink*
- *slopePercent*

### Method Details

```
public double getRelativePositionOnLink ()
```

Returns:

The relative position along the link, where 0.0 represents the start of the link and 1.0 represents the end of the link.

```
public double getSlopePercent ()
```

Returns:

The slope value. It can also be positive or negative infinity in case of a steep incline.

## fce

---

The package *fce* is a member of *com.here.android.mpa*.

### Package Summary

*fce*

The package *fce* (Fleet Connectivity Extensions) provides classes, interfaces, and enumerations that allow your application to support fleet management.

### Package Details

The package `fce` (Fleet Connectivity Extensions) provides classes, interfaces, and enumerations that allow your application to support fleet management.

## FleetConnectivityCustomEvent

The class `FleetConnectivityCustomEvent` is a member of `com.here.android.mpa.fce`.

### Class Summary

public class **FleetConnectivityCustomEvent**

extends `com.here.android.mpa.fce.FleetConnectivityEvent`, `java.lang.Object`

Represents event used for relaying custom data to the operator.

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 286: Constructors in FleetConnectivityCustomEvent

Constructors
<code>FleetConnectivityCustomEvent ()</code>

### Method Summary

Table 287: Methods in FleetConnectivityCustomEvent

Methods
protected boolean <code>dispatch (FleetConnectivityService service)</code> Internal method.
public void <code>setJobId (String jobId)</code> Sets the job ID to which this event relates.

### Class Details

Represents event used for relaying custom data to the operator.

### Constructor Details

`FleetConnectivityCustomEvent ()`

### Method Details

protected boolean `dispatch (FleetConnectivityService service)`

Internal method.

**Parameters:**

- `service`

```
public void setJobId (String jobId)
```

Sets the job ID to which this event relates. Specifying this property is optional.

**Parameters:**

- `jobId`  
Optional job ID.

## FleetConnectivityCustomMessage

The class *FleetConnectivityCustomMessage* is a member of *com.here.android.mpa.fce*.

### Class Summary

```
public class FleetConnectivityCustomMessage
```

extends *com.here.android.mpa.fce.FleetConnectivityMessage*, *java.lang.Object*

Represents incoming message with generic information from the operator.

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 288: Constructors in *FleetConnectivityCustomMessage*

Constructors
<i>FleetConnectivityCustomMessage</i> ()

### Class Details

Represents incoming message with generic information from the operator. The details of this message should be specified in the content map.

### Constructor Details

```
FleetConnectivityCustomMessage ()
```

## FleetConnectivityError

The class *FleetConnectivityError* is a member of *com.here.android.mpa.fce*.

## Class Summary

public class **FleetConnectivityError**

*extends java.lang.Object*

Represents error reported by the server or the %NMAFleetConnectivityService.

[For complete information, see the section [Class Details](#)]

## Nested Class Summary

Table 289: Nested Classes in FleetConnectivityError

Nested Classes
public static class <i>FleetConnectivityError.Issue</i> Represents issue reported by the server.
public static final enumeration <i>FleetConnectivityError.Type</i> Defines types of errors codes that can be reported by the @link <i>FleetConnectivityService</i> .

## Method Summary

Table 290: Methods in FleetConnectivityError

Methods
public String <i>getErrorId</i> ()
public java.util.List < <i>Issue</i> > <i>getIssues</i> ()
public int <i>getResponseCode</i> ()
public <i>Type</i> <i>getType</i> ()

## Class Details

Represents error reported by the server or the %NMAFleetConnectivityService.

## Method Details

public String **getErrorId** ()

### Returns:

Error ID that can be used for tracking the problem in case of server error.

public java.util.List <*Issue*> **getIssues** ()

### Returns:

List of issues reported by the server.

```
public int getResponseCode ()
```

**Returns:**

HTTP response code of the server.

```
public Type getType ()
```

**Returns:**

Type of this error.

## Issue

The class *Issue* is a member of *com.here.android.mpa.fce.FleetConnectivityError*.

### Class Summary

```
public static class FleetConnectivityError.Issue
```

```
extends java.lang.Object
```

Represents issue reported by the server.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 291: Methods in Issue

Methods
public String <i>getCode</i> ()
public String <i>getMessage</i> ()

### Class Details

Represents issue reported by the server.

### Method Details

```
public String getCode ()
```

**Returns:**

Code of the issue.

```
public String getMessage ()
```

**Returns:**

Details of the issue.

## Type

The enumeration *Type* is a member of *com.here.android.mpa.fce.FleetConnectivityError*.

### Enumeration Summary

public static final enumeration **FleetConnectivityError.Type**

extends *java.lang.Enum*, *java.lang.Object*

Defines types of errors codes that can be reported by the @link *FleetConnectivityService*.

[For complete information, see the section *Enumeration Details*]

### Enum Constant Summary

Table 292: Enum Constants in Type

Fields
public static final <i>Type</i> <b>SERVER_ERROR</b> Server reported error, for example due to incorrect data.
public static final <i>Type</i> <b>CONNECTION_ERROR</b> Connection problem occurred.

### Method Summary

Table 293: Methods in Type

Methods
public static <i>Type</i> <b>valueOf</b> (String name) This method retrieves the enumeration value that matches the name specified by the caller.
public static <i>FleetConnectivityError.Type</i> [] <b>values</b> () This method retrieves an array of constants of the given enum type in the order in which they are declared.

### Enumeration Details

Defines types of errors codes that can be reported by the @link *FleetConnectivityService*.

### Enum Constant Details

public static final *Type* **SERVER\_ERROR**

Server reported error, for example due to incorrect data.

```
public static final Type CONNECTION_ERROR
```

Connection problem occurred.

## Method Details

```
public static Type valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static FleetConnectivityError.Type[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## FleetConnectivityEvent

The class *FleetConnectivityEvent* is a member of *com.here.android.mpa.fce* .

### Class Summary

```
public abstract class FleetConnectivityEvent
```

```
extends java.lang.Object
```

Abstract class common for all outgoing events.

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 294: Constructors in FleetConnectivityEvent

Constructors
<i>FleetConnectivityEvent</i> ()

### Field Summary

Table 295: Fields in FleetConnectivityEvent

Fields
protected String <i>m_jobId</i>

## Method Summary

Table 296: Methods in FleetConnectivityEvent

Methods
protected abstract boolean <i>dispatch</i> ( <i>FleetConnectivityService</i> service)
public Map <i>getContent</i> ()
public String <i>getJobId</i> ()
public void <i>setContent</i> (Map content)
Generic map of strings.

## Class Details

Abstract class common for all outgoing events. It can be used to inform the operator about specific event, for example job start, or job cancellation etc. The event can be sent out by using [@{link sendEvent\(FleetConnectivityEvent\)}](#) method. The event is sent out asynchronously. To check the result of the dispatch, a listener should be set in [FleetConnectivityService](#).

## Constructor Details

FleetConnectivityEvent ()

## Field Details

protected String m\_jobId

## Method Details

protected abstract boolean *dispatch* (*FleetConnectivityService* service)

Parameters:

- *service*

public Map *getContent* ()

Returns:

Generic map of strings. Can be used for any purpose.

public String *getJobId* ()

Returns:

Job ID to which this event relates.

```
public void setContent (Map content)
```

Generic map of strings. Can be used for any purpose.

**Parameters:**

- **content**  
Generic map of strings.

**Throws:**

- **IllegalArgumentException**  
if the content is null.

## FleetConnectivityJobCancelledEvent

The class *FleetConnectivityJobCancelledEvent* is a member of *com.here.android.mpa.fce*.

### Class Summary

public class **FleetConnectivityJobCancelledEvent**

extends *com.here.android.mpa.fce.FleetConnectivityEvent*, *java.lang.Object*

Represents event used to inform the operator that the ongoing job was cancelled.

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 297: Constructors in FleetConnectivityJobCancelledEvent

Constructors
<i>FleetConnectivityJobCancelledEvent</i> ()

### Method Summary

Table 298: Methods in FleetConnectivityJobCancelledEvent

Methods
protected boolean <i>dispatch</i> ( <i>FleetConnectivityService</i> service)
Internal method.

### Class Details

Represents event used to inform the operator that the ongoing job was cancelled.

## Constructor Details

`FleetConnectivityJobCancelledEvent ()`

## Method Details

protected boolean `dispatch (FleetConnectivityService service)`

Internal method.

Parameters:

- `service`

## FleetConnectivityJobFinishedEvent

The class `FleetConnectivityJobFinishedEvent` is a member of `com.here.android.mpa.fce`.

## Class Summary

public class `FleetConnectivityJobFinishedEvent`

extends `com.here.android.mpa.fce.FleetConnectivityEvent`, `java.lang.Object`

Represents event used to inform the operator that the ongoing job was finished.

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 299: Constructors in `FleetConnectivityJobFinishedEvent`

Constructors
<code>FleetConnectivityJobFinishedEvent ()</code>

## Method Summary

Table 300: Methods in `FleetConnectivityJobFinishedEvent`

Methods
protected boolean <code>dispatch (FleetConnectivityService service)</code>
Internal method.

## Class Details

Represents event used to inform the operator that the ongoing job was finished.

## Constructor Details

`FleetConnectivityJobFinishedEvent ()`

## Method Details

protected boolean `dispatch (FleetConnectivityService service)`

Internal method.

Parameters:

- `service`

# FleetConnectivityJobMessage

The class `FleetConnectivityJobMessage` is a member of `com.here.android.mpa.fce`.

## Class Summary

public class `FleetConnectivityJobMessage`

extends `com.here.android.mpa.fce.FleetConnectivityMessage`, `java.lang.Object`

Represents incoming message with a job request.

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 301: Constructors in `FleetConnectivityJobMessage`

Constructors
<code>FleetConnectivityJobMessage ()</code>

## Method Summary

Table 302: Methods in `FleetConnectivityJobMessage`

Methods
public long <code>getEtaThreshold ()</code>
Optional ETA threshold proposed by the operator.

## Class Details

Represents incoming message with a job request. The job can be accepted or rejected, see [FleetConnectivityJobStartedEvent](#) and [FleetConnectivityJobRejectedEvent](#). The details of the job (like destination) should be specified in the content dictionary in this message.

## Constructor Details

`FleetConnectivityJobMessage ()`

## Method Details

`public long getEtaThreshold ()`

Optional ETA threshold proposed by the operator. See [FleetConnectivityJobStartedEvent](#) for more details.

### Returns:

ETA threshold proposed by the operator.

# FleetConnectivityJobRejectedEvent

The class `FleetConnectivityJobRejectedEvent` is a member of `com.here.android.mpa.fce`.

## Class Summary

`public class FleetConnectivityJobRejectedEvent`

*extends* `com.here.android.mpa.fce.FleetConnectivityEvent`, `java.lang.Object`

Represents event used to inform the operator that the incoming job was rejected.

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 303: Constructors in `FleetConnectivityJobRejectedEvent`

Constructors
<code>FleetConnectivityJobRejectedEvent ()</code>

## Method Summary

Table 304: Methods in `FleetConnectivityJobRejectedEvent`

Methods
<code>protected boolean dispatch (FleetConnectivityService service)</code> Internal method.
<code>public void setJobId (String jobId)</code> Job ID to which this event relates.

## Class Details

Represents event used to inform the operator that the incoming job was rejected.

## Constructor Details

`FleetConnectivityJobRejectedEvent ()`

## Method Details

protected boolean `dispatch (FleetConnectivityService service)`

Internal method.

Parameters:

- `service`

public void `setJobId (String jobId)`

Job ID to which this event relates. Should be set before sending out.

Parameters:

- `jobId`  
Job ID to which this event relates.

## FleetConnectivityJobStartedEvent

The class `FleetConnectivityJobStartedEvent` is a member of `com.here.android.mpa.fce`.

## Class Summary

public class `FleetConnectivityJobStartedEvent`

extends `com.here.android.mpa.fce.FleetConnectivityEvent`, `java.lang.Object`

Represents event used to inform the operator that the incoming job was accepted.

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 305: Constructors in `FleetConnectivityJobStartedEvent`

Constructors
<code>FleetConnectivityJobStartedEvent ()</code>

## Method Summary

Table 306: Methods in FleetConnectivityJobStartedEvent

Methods
<code>protected boolean <i>dispatch</i> (<i>FleetConnectivityService</i> service)</code> Internal method.
<code>public long <i>getEtaThreshold</i> ()</code> Estimated time of arrival change threshold, which will trigger the dispatch of ETA update event.
<code>public void <i>setEtaThreshold</i> (long etaThreshold)</code> Estimated time of arrival change threshold, which will trigger the dispatch of ETA update event.
<code>public void <i>setJobId</i> (String jobId)</code> Job ID to which this event relates.

## Class Details

Represents event used to inform the operator that the incoming job was accepted.

## Constructor Details

`FleetConnectivityJobStartedEvent ()`

## Method Details

`protected boolean dispatch (FleetConnectivityService service)`

Internal method.

### Parameters:

- `service`

`public long getEtaThreshold ()`

Estimated time of arrival change threshold, which will trigger the dispatch of ETA update event. If not set or greater than 100, then default threshold of 10% will be used.

### Returns:

ETA update threshold.

`public void setEtaThreshold (long etaThreshold)`

Estimated time of arrival change threshold, which will trigger the dispatch of ETA update event. If not set or greater than 100, then default threshold of 10% will be used.

### Parameters:

- **etaThreshold**  
ETA update threshold.

`public void setJobId (String jobId)`

Job ID to which this event relates. Should be set before sending out.

**Parameters:**

- **jobId**  
Job ID to which this event relates.

## FleetConnectivityMessage

The class *FleetConnectivityMessage* is a member of *com.here.android.mpa.fce* .

### Class Summary

public abstract class **FleetConnectivityMessage**

*extends java.lang.Object*

Abstract class representing incoming messages.

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 307: Constructors in FleetConnectivityMessage

Constructors
<i>FleetConnectivityMessage</i> ()

### Method Summary

Table 308: Methods in FleetConnectivityMessage

Methods
public String <i>getAssetId</i> ()
public Map <i>getContent</i> ()
public long <i>getCreationTimeMilliseconds</i> ()
public String <i>getDispatcherId</i> ()
public String <i>getJobId</i> ()
public String <i>getMessage</i> ()

## Class Details

Abstract class representing incoming messages.

## Constructor Details

`FleetConnectivityMessage ()`

## Method Details

`public String getAssetId ()`

**Returns:**

Asset ID of the device for which this message was intended (the local device).

`public Map getContent ()`

**Returns:**

Map of strings with custom content sent by the dispatcher.

`public long getCreationTimeMilliseconds ()`

**Returns:**

Creation time of this message in milliseconds (Unix timestamp).

`public String getDispatcherId ()`

**Returns:**

ID of the dispatcher of this message.

`public String getJobId ()`

**Returns:**

Job id related to this message, can be null.

`public String getMessage ()`

**Returns:**

Optional message from the dispatcher.

## FleetConnectivityService

The class `FleetConnectivityService` is a member of `com.here.android.mpa.fce`.

### Class Summary

public final class **FleetConnectivityService**

*extends java.lang.Object*

Main component of Fleet Connectivity Extension responsible for communication.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 309: Nested Classes in FleetConnectivityService

#### Nested Classes

public static abstract interface `FleetConnectivityService.Listener`

Represents a listener to handle `FleetConnectivityService` incoming messages.

### Method Summary

Table 310: Methods in FleetConnectivityService

#### Methods

public boolean `forcePoll ()`

Forces poll of new events, if the service is running.

public String `getAssetId ()`

Sets the asset ID that identifies this device.

public String `getDispatcherId ()`

Dispatcher ID that identifies the user of this device.

public static `FleetConnectivityService` `getInstance ()`

Returns the `FleetConnectivityService` singleton instance.

public long `getPollingInterval ()`

Polling interval specified in seconds.

public String `getRunningJobId ()`

Retrieves the ID of currently running job.

public boolean `sendEvent (FleetConnectivityEvent event)`

Dispatches the provided event.

public void `setAssetId (String assetId)`

Asset ID that identifies this device.

## Methods

```
public void setDispatcherId (String dispatcherId)
```

Sets the dispatcher ID that identifies the user of this device.

```
public void setListener (Listener listener)
```

Sets the *Listener* that listens for messages from the *FleetConnectivityService*.

```
public void setPollingInterval (long interval)
```

Sets the polling interval specified in seconds.

```
public boolean start ()
```

Starts the service if it is not already started.

```
public boolean stop ()
```

Stops the service if it is running.

## Class Details

Main component of Fleet Connectivity Extension responsible for communication.

## Method Details

```
public boolean forcePoll ()
```

Forces poll of new events, if the service is running.

### Returns:

false if service is not running.

```
public String getAssetId ()
```

Sets the asset ID that identifies this device. Will be reported in every event dispatched to the server. Server provides new messages based on this ID. Service won't start if it is not specified.

### Returns:

Specified assetId.

```
public String getDispatcherId ()
```

Dispatcher ID that identifies the user of this device. Service won't start if it is not specified.

### Returns:

Specified dispatcherId.

```
public static FleetConnectivityService getInstance ()
```

Returns the *FleetConnectivityService* singleton instance.

**Returns:**

FleetConnectivityService instance.

```
public long getPollingInterval ()
```

Polling interval specified in seconds. Default value is 10 seconds.

**Returns:**

Specified polling interval.

```
public String getRunningJobId ()
```

Retrieves the ID of currently running job.

**Returns:**

ID of the currently running job. Null if no job is in progress.

```
public boolean sendEvent (FleetConnectivityEvent event)
```

Dispatches the provided event.

**Parameters:**

- **event**

The FleetConnectivityEvent instance. See [FleetConnectivityJobStartedEvent](#), [FleetConnectivityJobRejectedEvent](#), [FleetConnectivityJobFinishedEvent](#), [FleetConnectivityJobCancelledEvent](#) and [FleetConnectivityCustomEvent](#).

**Returns:**

false if service is not running or conditions for given event are not met.

```
public void setAssetId (String assetId)
```

Asset ID that identifies this device. Will be reported in every event dispatched to the server. Server provides new messages based on this ID. Service won't start if it is not specified.

**Parameters:**

- **assetId**

Specified assetId.

```
public void setDispatcherId (String dispatcherId)
```

Sets the dispatcher ID that identifies the user of this device. Service won't start if it is not specified.

**Parameters:**

- **dispatcherId**

Specified dispatcherId.

```
public void setListener (Listener listener)
```

Sets the *Listener* that listens for messages from the *FleetConnectivityService*.

**Parameters:**

- **listener**  
*Listener* that listens for messages from the *FleetConnectivityService*.

```
public void setPollingInterval (long interval)
```

Sets the polling interval specified in seconds. Default value is 10 seconds. Can be set to values greater than 0, otherwise exception is thrown.

**Parameters:**

- **interval**  
Specified polling interval.

**Throws:**

- **IllegalArgumentException**  
if interval is equal or less than 0.

```
public boolean start ()
```

Starts the service if it is not already started. Fails if assetId or dispatcherId is not set.

**Returns:**

false if assetId or dispatcherId is not set or service is already started.

```
public boolean stop ()
```

Stops the service if it is running.

**Returns:**

false if service is not running.

## Listener

The interface *Listener* is a member of *com.here.android.mpa.fce.FleetConnectivityService*.

## Interface Summary

public static abstract interface **FleetConnectivityService.Listener**

Represents a listener to handle *FleetConnectivityService* incoming messages.

[For complete information, see the section *Interface Details*]

## Method Summary

Table 311: Methods in Listener

Methods
public abstract void <b>onEventAcknowledged</b> ( <i>FleetConnectivityEvent</i> event, <i>FleetConnectivityError</i> error) Called when server acknowledges dispatched event.
public abstract void <b>onMessageReceived</b> ( <i>FleetConnectivityMessage</i> message) Called when incoming message arrives.

## Interface Details

Represents a listener to handle *FleetConnectivityService* incoming messages.

Methods of this listener are called on the main thread.

## Method Details

public abstract void **onEventAcknowledged** (*FleetConnectivityEvent* event, *FleetConnectivityError* error)

Called when server acknowledges dispatched event.

### Parameters:

- **event**  
The *FleetConnectivityEvent* instance. Note that it won't be the same instance of event that was passed to the *sendEvent(FleetConnectivityEvent)* call.
- **error**  
The *FleetConnectivityError* instance in case of network failure or server error.

public abstract void **onMessageReceived** (*FleetConnectivityMessage* message)

Called when incoming message arrives.

### Parameters:

- **message**  
The *FleetConnectivityMessage* instance. See *FleetConnectivityJobMessage* and *FleetConnectivityCustomMessage*.

## guidance

---

The package *guidance* is a member of *com.here.android.mpa*.

### Package Summary

#### **guidance**

This package includes classes, interfaces, and enumerations related to guidance and turn-by-turn navigation, used by other packages in the APIs for Android SDK.

### Package Details

This package includes classes, interfaces, and enumerations related to guidance and turn-by-turn navigation, used by other packages in the APIs for Android SDK.

The key classes to this package is [NavigationManager](#). For more information on how to use this class, please consult the Developer Guide or the class Javadoc.

**Important:** The Turn-by-turn Guidance APIs are in beta. Application developers using these APIs are required to thoroughly test their applications in all expected usage scenarios to ensure safe and correct behavior. Application developers are responsible for warning their users of the following obligations:

- Do not follow instructions which may lead to an unsafe or illegal situation
- Obey all local laws.
- Be aware that using a mobile phone or some of its features while driving may be prohibited.
- Always keep hands free to operate the vehicle while driving.
- First consideration while driving should be road safety.

The following permission is required in each Android application that uses the guidance features of the HERE SDK for Android:

```
<uses-permission android:name="android.permission.VIBRATE" />
```

## AudioPlayerDelegate

The interface *AudioPlayerDelegate* is a member of *com.here.android.mpa.guidance*.

### Interface Summary

```
public abstract interface AudioPlayerDelegate
```

Interface for notifying *NavigationManager.AudioPlayer* functions used by *NavigationManager*.

[For complete information, see the section [Interface Details](#)]

## Method Summary

Table 312: Methods in `AudioPlayerDelegate`

Methods
<pre>public abstract boolean <i>playFiles</i> (String[] files)</pre> <p>Delegate function for <code>NavigationManager.AudioPlayer</code> used by <code>NavigationManager</code>.</p>
<pre>public abstract boolean <i>playText</i> (String text)</pre> <p>Delegate function for <code>NavigationManager.AudioPlayer</code> used by <code>NavigationManager</code>.</p>

## Interface Details

Interface for notifying `NavigationManager.AudioPlayer` functions used by `NavigationManager`. Clients can take over playback of audio files and TTS text strings by implementing this interface and submitting to `setDelegate(AudioPlayerDelegate)`.

## Method Details

```
public abstract boolean playFiles (String[] files)
```

Delegate function for `NavigationManager.AudioPlayer` used by `NavigationManager`. Clients will receive an array of audio file paths that be submitted to media players for playback.

### Parameters:

- **files**  
a string array of audio file paths to be sequentially played.

### Returns:

true if client is handling the audio playback, false will allow the SDK to handle it.

```
public abstract boolean playText (String text)
```

Delegate function for `NavigationManager.AudioPlayer` used by `NavigationManager`. Clients will receive a text string that can be submitted to TTS engines for playback.

### Parameters:

- **text**  
TTS text to be played.

### Returns:

true if client is handling the TTS playback, false will allow the SDK to handle it.

## LaneInformation

The class `LaneInformation` is a member of `com.here.android.mpa.guidance` .

## Class Summary

public final class **LaneInformation**

extends *java.lang.Object*

Gives information about a lane, e.g.

[For complete information, see the section [Class Details](#)]

## Nested Class Summary

Table 313: Nested Classes in LaneInformation

Nested Classes
public static final enumeration <a href="#">LaneInformation.CrossingRestriction</a> Crossing restriction to enter or exit a HOV lane.
public static final enumeration <a href="#">LaneInformation.Direction</a> All possible directions the lane leads.
public static final enumeration <a href="#">LaneInformation.MarkingType</a> Marking types for the divider and center marking.
public static final enumeration <a href="#">LaneInformation.RecommendationState</a> Recommendation for taking the lane according to the lane connectivity.

## Method Summary

Table 314: Methods in LaneInformation

Methods
public <a href="#">MarkingType</a> <a href="#">getCenterMarking</a> () Gets the divider marking type for the center mark.
public <a href="#">CrossingRestriction</a> <a href="#">getCrossingRestriction</a> () Gets the crossing restriction of the lane.
public java.util.EnumSet <a href="#">&lt;Direction&gt; getDirections</a> () Gets the directions of the lane as an EnumSet.
public <a href="#">MarkingType</a> <a href="#">getDividerMarking</a> () Gets the divider marking type for side marks.
public int <a href="#">getHeightRestriction</a> () Gets the height restriction in cm.
public <a href="#">RecommendationState</a> <a href="#">getRecommendationState</a> () Gets the recommendation state of the lane according to the current route.
public int <a href="#">getSpeedLimit</a> () Gets the speed limit on this lane in the positive lane direction in km/h.

## Methods

```
public int getWidth ()
```

Gets the lane width in cm.

```
public boolean isAcceleration ()
```

Returns whether this is an acceleration lane.

```
public boolean isAuxLane ()
```

Returns whether this is an auxiliary lane.

```
public boolean isCenterTurn ()
```

Returns whether this is a center turn lane.

```
public boolean isDeceleration ()
```

Returns whether this is a deceleration lane.

```
public boolean isDriveableShoulder ()
```

Returns whether this is a drivable shoulder lane.

```
public boolean isExpress ()
```

Returns whether this is an express lane.

```
public boolean isHOV ()
```

Returns whether this is a high occupancy vehicle (HOV) lane.

```
public boolean isPassing ()
```

Returns whether this is a passing lane.

```
public boolean isRegular ()
```

Returns whether this is a regular lane (i.e.

```
public boolean isRegulatedAccess ()
```

Returns whether this is a regulated access lane.

```
public boolean isReversible ()
```

Returns whether this is a reversible lane.

```
public boolean isSlow ()
```

Returns whether this is a slow lane.

```
public boolean isSyntheticDirection ()
```

Gets whether the direction of the lane is synthetic.

```
public boolean isTruckParking ()
```

Returns whether this is a truck parking lane.

```
public boolean isTurn ()
```

Returns whether this is a turn lane.

## Class Details

Gives information about a lane, e.g. its type, direction and recommendation state.

## Method Details

```
public MarkingType getCenterMarking ()
```

Gets the divider marking type for the center mark.

Center markings are markings between lanes in opposite direction.

### Returns:

The divider marking type for the center mark.

```
public CrossingRestriction getCrossingRestriction ()
```

Gets the crossing restriction of the lane. This indicates if it is illegal to enter or exit a lane.

### Returns:

The crossing restriction of the lane.

```
public java.util.EnumSet <Direction> getDirections ()
```

Gets the directions of the lane as an EnumSet. The EnumSet holds all the directions the lane leads to.

The *LaneInformation.Direction* values are stored in bitmask form, so it is possible to convert them to a bitmask if needed using the following code (e.g. for indexing image resources):

```
private long
convertDirectionToBitMask(EnumSet<Direction> directions) {
    long bitmask = 0;
    for (Direction dir : directions) {
        bitmask |= dir.value();
    }
    return bitmask;
}
```

### Returns:

An EnumSet that has each direction the lane leads to.

### See also:

[LaneInformation.Direction](#)

```
public MarkingType getDividerMarking ()
```

Gets the divider marking type for side marks.

Divider markings are markings between lanes of same direction

### Returns:

The divider marking type for side marks.

```
public int getHeightRestriction ()
```

Gets the height restriction in cm.

**Returns:**

The height restriction in cm or zero if there is no restriction or it is unknown.

```
public RecommendationState getRecommendationState ()
```

Gets the recommendation state of the lane according to the current route.

If the map data does not provide connectivity information for this lane, then the *RecommendationState* is set to *NOT\_AVAILABLE*.

**Returns:**

The recommendation state of the lane according to the current route.

```
public int getSpeedLimit ()
```

Gets the speed limit on this lane in the positive lane direction in km/h. Zero if the speed limit is not available. In the case of zero, the speed limit is the speed limit of the whole road (see *RoadElement*

**Returns:**

The speed limit on this lane in the positive lane direction in km/h (zero if not available).

```
public int getWidth ()
```

Gets the lane width in cm.

**Returns:**

The lane width in cm or zero if the lane width is not available.

```
public boolean isAcceleration ()
```

Returns whether this is an acceleration lane.

An acceleration lane (or merge lane) allows traffic entering a highway to accelerate to the speed of through traffic before merging with it.

**Returns:**

True if this lane is an acceleration lane. False otherwise.

```
public boolean isAuxLane ()
```

Returns whether this is an auxiliary lane.

An auxiliary lane is a lane other than a through lane, used to separate entering, exiting or turning traffic from the through traffic.

**Returns:**

True if this lane is an auxiliary lane. False otherwise.

## `public boolean isCenterTurn ()`

Returns whether this is a center turn lane.

Center turn lane is a bidirectional turn lane located in the middle of a road that allows traffic in both directions to turn left (right for left side driving countries).

### **Returns:**

True if this lane is a center turn lane. False otherwise.

## `public boolean isDeceleration ()`

Returns whether this is a deceleration lane.

A deceleration lane is a lane adjacent to the primary road or street allowing drivers to pull out of the through lane and decelerate safely before turning off a surface street or exiting a freeway.

### **Returns:**

True if this lane is a deceleration lane. False otherwise.

## `public boolean isDriveableShoulder ()`

Returns whether this is a drivable shoulder lane.

A shoulder lane is reserved paved area on the side of the road (one or both sides) that are not generally used for driving, although it is possible under certain circumstances. Only shoulder lanes designated as a part-time driving lanes are included.

### **Returns:**

True if this lane is a drivable shoulder lane. False otherwise.

## `public boolean isExpress ()`

Returns whether this is an express lane.

### **Returns:**

True if this lane is an express lane. False otherwise.

## `public boolean isHOV ()`

Returns whether this is a high occupancy vehicle (HOV) lane.

A HOV lane (or carpool lane) is reserved for carpool usage. Carpool lane requires a minimum number of passengers in order for the car to use the carpool lane. HOV lanes may also be reserved for hybrids, motorcycles, alternate fuel, etc. HOV Lane may require a fee

**Returns:**

True if this lane is an HOV lane. False otherwise.

```
public boolean isPassing ()
```

Returns whether this is a passing lane.

**Returns:**

True if this lane is a passing lane. False otherwise.

```
public boolean isRegular ()
```

Returns whether this is a regular lane (i.e. the lane has no other type).

Regular lanes are lanes which have no specific use (i.e. they are not a special type such as HOV, reversible, etc.)

**Returns:**

True if this lane is a regular lane. False otherwise.

```
public boolean isRegulatedAccess ()
```

Returns whether this is a regulated access lane.

(Trucks only) A regulated access lane is a lane designated as a holding zone, used to regulate traffic using time intervals.

**Returns:**

True if this lane is a regulated access lane. False otherwise.

```
public boolean isReversible ()
```

Returns whether this is a reversible lane.

A reversible lane is a lane in which traffic may travel in either direction, depending on certain conditions (also known as a tidal flow lane).

**Returns:**

True if this lane is a reversible lane. False otherwise.

```
public boolean isSlow ()
```

Returns whether this is a slow lane.

**Returns:**

True if this lane is a slow lane. False otherwise.

```
public boolean isSyntheticDirection ()
```

Gets whether the direction of the lane is synthetic.

Synthetic directions are derived from the connectivity of the lane. Non-synthetic directions represent actual physical arrows printed on the lane.

**Returns:**

True if the direction is synthetic. False otherwise.

```
public boolean isTruckParking ()
```

Returns whether this is a truck parking lane.

Truck parking lanes are wide shoulder lane that maybe used for truck parking as well as for emergency.

**Returns:**

True if this lane is a truck parking lane. False otherwise.

```
public boolean isTurn ()
```

Returns whether this is a turn lane.

Turn lane is an extra lane that is used for making a turn in order not to disrupt ongoing traffic.

**Returns:**

True if this lane is a turn lane. False otherwise.

## CrossingRestriction

The enumeration *CrossingRestriction* is a member of *com.here.android.mpa.guidance.LaneInformation*.

### Enumeration Summary

```
public static final enumeration LaneInformation.CrossingRestriction
```

```
extends java.lang.Enum, java.lang.Object
```

Crossing restriction to enter or exit a HOV lane.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 315: Enum Constants in CrossingRestriction

Fields
<pre>public static final CrossingRestriction NO_RESTRICTION</pre> <p>No restriction</p>
<pre>public static final CrossingRestriction LEFT</pre> <p>Left restricted</p>
<pre>public static final CrossingRestriction RIGHT</pre> <p>Right restricted</p>
<pre>public static final CrossingRestriction BOTH</pre> <p>Both directions restricted</p>

## Method Summary

Table 316: Methods in CrossingRestriction

Methods
<pre>public int getValue ()</pre>
<pre>public static CrossingRestriction valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static LaneInformation.CrossingRestriction[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Crossing restriction to enter or exit a HOV lane.

### Enum Constant Details

```
public static final CrossingRestriction NO_RESTRICTION
```

No restriction

```
public static final CrossingRestriction LEFT
```

Left restricted

```
public static final CrossingRestriction RIGHT
```

Right restricted

```
public static final CrossingRestriction BOTH
```

Both directions restricted

### Method Details

```
public int getValue ()
```

```
public static CrossingRestriction valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static LaneInformation.CrossingRestriction[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Direction

The enumeration *Direction* is a member of *com.here.android.mpa.guidance.LaneInformation*.

### Enumeration Summary

```
public static final enumeration LaneInformation.Direction
```

*extends java.lang.Enum, java.lang.Object*

All possible directions the lane leads.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 317: Enum Constants in Direction

Fields
<pre>public static final <i>Direction</i> UNDEFINED</pre> <p>Undefined.</p>
<pre>public static final <i>Direction</i> STRAIGHT</pre> <p>Straight.</p>

## Fields

```
public static final Direction SLIGHTLY_RIGHT
```

Slightly right.

```
public static final Direction RIGHT
```

Right.

```
public static final Direction SHARP_RIGHT
```

Sharp right.

```
public static final Direction U_TURN_LEFT
```

Left U-turn.

```
public static final Direction SHARP_LEFT
```

Sharp left.

```
public static final Direction LEFT
```

Left.

```
public static final Direction SLIGHTLY_LEFT
```

Slightly left.

```
public static final Direction MERGE_RIGHT
```

Merge right.

```
public static final Direction MERGE_LEFT
```

Merge left.

```
public static final Direction MERGE_LANES
```

Merge lanes.

```
public static final Direction U_TURN_RIGHT
```

Right U-turn.

```
public static final Direction SECOND_RIGHT
```

Second right.

```
public static final Direction SECOND_LEFT
```

Second left.

## Method Summary

Table 318: Methods in *Direction*

### Methods

```
public int value ()
```

```
public static Direction valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

## Methods

```
public static LaneInformation.Direction[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

All possible directions the lane leads.

### Enum Constant Details

```
public static final Direction UNDEFINED
```

Undefined. This indicates there are no markings on this lane and the direction is unknown.

```
public static final Direction STRAIGHT
```

Straight.

```
public static final Direction SLIGHTLY_RIGHT
```

Slightly right.

```
public static final Direction RIGHT
```

Right.

```
public static final Direction SHARP_RIGHT
```

Sharp right.

```
public static final Direction U_TURN_LEFT
```

Left U-turn.

```
public static final Direction SHARP_LEFT
```

Sharp left.

```
public static final Direction LEFT
```

Left.

```
public static final Direction SLIGHTLY_LEFT
```

Slightly left.

```
public static final Direction MERGE_RIGHT
```

Merge right.

```
public static final Direction MERGE_LEFT
```

Merge left.

```
public static final Direction MERGE_LANES
```

Merge lanes.

```
public static final Direction U_TURN_RIGHT
```

Right U-turn.

```
public static final Direction SECOND_RIGHT
```

Second right.

```
public static final Direction SECOND_LEFT
```

Second left.

## Method Details

```
public int value ()
```

```
public static Direction valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static LaneInformation.Direction[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## MarkingType

The enumeration *MarkingType* is a member of *com.here.android.mpa.guidance.LaneInformation*.

### Enumeration Summary

public static final enumeration **LaneInformation.MarkingType**

extends *java.lang.Enum*, *java.lang.Object*

Marking types for the divider and center marking.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 319: Enum Constants in *MarkingType*

Fields
<pre>public static final MarkingType NOT_AVAILABLE</pre> <p>Not available</p>
<pre>public static final MarkingType LONG_DASHED</pre> <p>Long dashed</p>
<pre>public static final MarkingType DOUBLE_SOLID_LINE</pre> <p>Double solid line</p>
<pre>public static final MarkingType SINGLE_SOLID_LINE</pre> <p>Single solid line</p>
<pre>public static final MarkingType DOUBLE_INNER_SINGLE_OUTER_DASHED</pre> <p>Double inner single outer dashed</p>
<pre>public static final MarkingType DOUBLE_INNER_DASHED_OUTER_SINGLE</pre> <p>Double inner dashed outer single</p>
<pre>public static final MarkingType SHORT_DASHED</pre> <p>Short dashed</p>
<pre>public static final MarkingType SHARED_AREA</pre> <p>Shared area</p>
<pre>public static final MarkingType DASHED_BLOCKS</pre> <p>Dashed blocks</p>
<pre>public static final MarkingType PHYSICAL_DIVIDER</pre> <p>Physical divider</p>

### Fields

```
public static final MarkingType DOUBLE_DASHED
```

Double dashed

```
public static final MarkingType NO_DIVIDER
```

No divider

```
public static final MarkingType CROSSING_ALERT
```

Crossing alert

## Method Summary

Table 320: Methods in *MarkingType*

### Methods

```
public int getValue ()
```

```
public static MarkingType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static LaneInformation.MarkingType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Marking types for the divider and center marking.

### Enum Constant Details

```
public static final MarkingType NOT_AVAILABLE
```

Not available

```
public static final MarkingType LONG_DASHED
```

Long dashed

```
public static final MarkingType DOUBLE_SOLID_LINE
```

Double solid line

```
public static final MarkingType SINGLE_SOLID_LINE
```

Single solid line

```
public static final MarkingType DOUBLE_INNER_SINGLE_OUTER_DASHED
```

Double inner single outer dashed

```
public static final MarkingType DOUBLE_INNER_DASHED_OUTER_SINGLE
```

Double inner dashed outer single

```
public static final MarkingType SHORT_DASHED
```

Short dashed

```
public static final MarkingType SHARED_AREA
```

Shared area

```
public static final MarkingType DASHED_BLOCKS
```

Dashed blocks

```
public static final MarkingType PHYSICAL_DIVIDER
```

Physical divider

```
public static final MarkingType DOUBLE_DASHED
```

Double dashed

```
public static final MarkingType NO_DIVIDER
```

No divider

```
public static final MarkingType CROSSING_ALERT
```

Crossing alert

## Method Details

```
public int getValue ()
```

```
public static MarkingType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

## Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static LaneInformation.MarkingType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## RecommendationState

The enumeration *RecommendationState* is a member of *com.here.android.mpa.guidance.LaneInformation*.

### Enumeration Summary

```
public static final enumeration LaneInformation.RecommendationState
```

```
extends java.lang.Enum, java.lang.Object
```

Recommendation for taking the lane according to the lane connectivity.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 321: Enum Constants in RecommendationState

Fields
<pre>public static final RecommendationState NOT_RECOMMENDED</pre> <p>The lane is not on the current route.</p>
<pre>public static final RecommendationState RECOMMENDED</pre> <p>The lane is on the route at least up to the next decision point, but not for the whole part of the route for which connectivity information is available.</p>
<pre>public static final RecommendationState HIGHLY_RECOMMENDED</pre> <p>The lane is on the current route for the whole part of the route for which connectivity information is available.</p>
<pre>public static final RecommendationState NOT_AVAILABLE</pre> <p>Recommendation information is not available.</p>

### Method Summary

Table 322: Methods in RecommendationState

Methods
<pre>public int value ()</pre>

## Methods

```
public static RecommendationState valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static LaneInformation.RecommendationState[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Recommendation for taking the lane according to the lane connectivity.

## Enum Constant Details

```
public static final RecommendationState NOT_RECOMMENDED
```

The lane is not on the current route.

```
public static final RecommendationState RECOMMENDED
```

The lane is on the route at least up to the next decision point, but not for the whole part of the route for which connectivity information is available.

```
public static final RecommendationState HIGHLY_RECOMMENDED
```

The lane is on the current route for the whole part of the route for which connectivity information is available.

```
public static final RecommendationState NOT_AVAILABLE
```

Recommendation information is not available.

## Method Details

```
public int value ()
```

```
public static RecommendationState valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static LaneInformation.RecommendationState[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## NavigationManager

The class *NavigationManager* is a member of *com.here.android.mpa.guidance*.

### Class Summary

```
public final class NavigationManager
```

```
extends java.lang.Object
```

This class controls turn by turn navigation.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 323: Nested Classes in NavigationManager

Nested Classes
<pre>public static final enumeration <i>NavigationManager.AspectRatio</i></pre> <p>A measure of an image's aspect ratio which is w x h.</p>
<pre>public static final enumeration <i>NavigationManager.AudioEvent</i></pre> <p>Used for enabling/disabling audio events during navigation.</p>
<pre>public static abstract class <i>NavigationManager.AudioFeedbackListener</i></pre> <p><i>AudioFeedbackListener</i> provides callback of audio related events from <i>NavigationManager</i>.</p>
<pre>public class <i>NavigationManager.AudioPlayer</i></pre>
<pre>public static final enumeration <i>NavigationManager.Error</i></pre> <p>Navigation Manager Error</p>
<pre>public static abstract class <i>NavigationManager.GpsSignalListener</i></pre> <p><i>GpsSignalListener</i> provides callback of GPS signal related events from <i>NavigationManager</i>.</p>
<pre>public static abstract class <i>NavigationManager.LaneInformationListener</i></pre> <p><i>LaneInformationListener</i> provides callback of <i>LaneInformation</i> related events from <i>NavigationManager</i>.</p>
<pre>public static abstract class <i>NavigationManager.ManeuverEventListener</i></pre> <p><i>ManeuverEventListener</i> provides callback of maneuver events from <i>NavigationManager</i>.</p>
<pre>public static final enumeration <i>NavigationManager.MapUpdateMode</i></pre> <p>Map Update Mode</p>
<pre>public static final enumeration <i>NavigationManager.NaturalGuidanceMode</i></pre> <p>Enum used to turn on/off features within natural guidance.</p>

**Nested Classes**

public static abstract class [NavigationManager.NavigationManagerEventListener](#)

[NavigationManagerEventListener](#) provides callback of general navigation manager related events from [NavigationManager](#).

public static final enumeration [NavigationManager.NavigationMode](#)

Possible Navigation Modes

public static final enumeration [NavigationManager.NavigationState](#)

Possible states of navigation

public static abstract class [NavigationManager.NewInstructionEventListener](#)

[NewInstructionEventListener](#) provides callback of new instruction events from [NavigationManager](#).

public static abstract class [NavigationManager.PositionListener](#)

[PositionListener](#) provides callback of position events from [NavigationManager](#).

public static abstract class [NavigationManager.RealisticViewListener](#)

[RealisticViewListenerAdapter](#) provides callback of realistic view related events from [NavigationManager](#).

public static final enumeration [NavigationManager.RealisticViewMode](#)

Enum used to turn on/off realistic view (junction view and 2D signs).

public static abstract class [NavigationManager.RerouteListener](#)

[RerouteListener](#) provides callback of route re-calculation related events from [NavigationManager](#).

public static class [NavigationManager.RoadView](#)

This static class controls road view of turn by turn navigation.

public static abstract class [NavigationManager.SafetySpotListener](#)

[SafetySpotListener](#) provides callback of safety spot related events from [NavigationManager](#).

public static abstract class [NavigationManager.SpeedWarningListener](#)

[SpeedListener](#) provides callback of speed warning related events from [NavigationManager](#).

public static final enumeration [NavigationManager.TrafficAvoidanceMode](#)

Specifies if traffic should be automatically avoided or not during navigation

public static abstract class [NavigationManager.TrafficRerouteListener](#)

This adapter class receives notifications from [NavigationManager](#) that indicates traffic re-routing events due to the use of different [NavigationManager.TrafficAvoidanceModes](#).

public static final enumeration [NavigationManager.TtsOutputFormat](#)

Used for specifying TTS output format in which the text should be generated.

public static final enumeration [NavigationManager.UnitSystem](#)

Supported unit system types

## Field Summary

Table 324: Fields in NavigationManager

Fields
<p>public static final Date <a href="#">INVALID_ETA_DATE</a></p> <p>Represents an invalid time of arrival.</p>

## Method Summary

Table 325: Methods in NavigationManager

Methods
<p>public void <a href="#">addAudioFeedbackListener</a> (java.lang.ref.WeakReference &lt;<a href="#">AudioFeedbackListener</a>&gt; listener)</p> <p>Add a <a href="#">NavigationManager.AudioFeedbackListener</a> to NavigationManager as a WeakReference .</p>
<p>public void <a href="#">addGpsSignalListener</a> (java.lang.ref.WeakReference &lt;<a href="#">GpsSignalListener</a>&gt; listener)</p> <p>Add a <a href="#">NavigationManager.GpsSignalListener</a> to NavigationManager to subscribe to route re-calculation events.</p>
<p>public void <a href="#">addLaneInformationListener</a> (java.lang.ref.WeakReference &lt;<a href="#">LaneInformationListener</a>&gt; listener)</p> <p>Add a <a href="#">NavigationManager.LaneInformationListener</a> to NavigationManager to subscribe to lane information related events.</p>
<p>public void <a href="#">addManeuverEventListener</a> (java.lang.ref.WeakReference &lt;<a href="#">ManeuverEventListener</a>&gt; listener)</p> <p>Add a <a href="#">NavigationManager.ManeuverEventListener</a> to NavigationManager to subscribe to new instruction event(s).</p>
<p>public void <a href="#">addNavigationManagerEventListener</a> (java.lang.ref.WeakReference &lt;<a href="#">NavigationManagerEventListener</a>&gt; listener)</p> <p>Add a <a href="#">NavigationManager.NavigationManagerEventListener</a> to NavigationManager to subscribe to general info events.</p>
<p>public void <a href="#">addNewInstructionEventListener</a> (java.lang.ref.WeakReference &lt;<a href="#">NewInstructionEventListener</a>&gt; listener)</p> <p>Add a <a href="#">NavigationManager.NewInstructionEventListener</a> to NavigationManager to subscribe to new instruction event(s).</p>
<p>public void <a href="#">addPositionListener</a> (java.lang.ref.WeakReference &lt;<a href="#">PositionListener</a>&gt; listener)</p> <p>Add a <a href="#">NavigationManager.PositionListener</a> to NavigationManager to subscribe to position event(s).</p>
<p>public void <a href="#">addRealisticViewAspectRatio</a> (<a href="#">AspectRatio</a> ratio)</p> <p>Adds an aspect ratio to the realistic view engine.</p>
<p>public void <a href="#">addRealisticViewListener</a> (java.lang.ref.WeakReference &lt;<a href="#">RealisticViewListener</a>&gt; listener)</p> <p>Add a <a href="#">NavigationManager.RealisticViewListener</a> to NavigationManager as a WeakReference .</p>
<p>public void <a href="#">addRerouteListener</a> (java.lang.ref.WeakReference &lt;<a href="#">RerouteListener</a>&gt; listener)</p> <p>Add a <a href="#">NavigationManager.RerouteListener</a> to NavigationManager to subscribe to route re-calculation events.</p>
<p>public void <a href="#">addSafetySpotListener</a> (java.lang.ref.WeakReference &lt;<a href="#">SafetySpotListener</a>&gt; listener)</p> <p>Add a <a href="#">NavigationManager.SafetySpotListener</a> to NavigationManager to subscribe to safety spot event(s).</p>

## Methods

```
public void addSpeedWarningListener (java.lang.ref.WeakReference <SpeedWarningListener> listener)
```

Add a *NavigationManager.SpeedWarningListener* to *NavigationManager* to subscribe to speed warning event(s).

```
public void addTrafficRerouteListener (java.lang.ref.WeakReference <TrafficRerouteListener> listener)
```

Add a traffic re-route listener as a *WeakReference* .

```
public void clearRealisticViewAspectRatios ()
```

Clear all aspect ratios from the realistic view engine.

```
public Maneuver getAfterNextManeuver ()
```

Returns the *Maneuver* after the next *Maneuver*

```
public long getAfterNextManeuverDistance ()
```

Returns the distance to the *Maneuver* after the next *Maneuver*

```
public AudioPlayer getAudioPlayer ()
```

Retrieve the *Audio Player* instance associated with the *NavigationManager*

```
public double getAverageSpeed ()
```

Returns the current average speed.

```
public String getCountryCode ()
```

Gets the three-letter country code (defined in ISO 3166-1) from current location.

```
public long getDestinationDistance ()
```

Returns the current distance to destination.

```
public UnitSystem getDistanceUnit ()
```

Gets the *Distance Unit*.

```
public long getElapsedDistance ()
```

Returns the elapsed distance from start of navigation, tracking or simulation.

```
public java.util.EnumSet <AudioEvent> getEnabledAudioEvents ()
```

Gets the set of all *NavigationManager.AudioEvents* that are currently enabled.

```
public Date getEta (boolean wholeRoute, TrafficPenaltyMode mode)
```

Returns the estimated time of arrival (ETA) of the route.

```
public float getHighSpeedWarningBoundary ()
```

The current speed boundary in meters/second.

```
public float getHighSpeedWarningOffset ()
```

The current high speed warning offset in meters/second.

```
public static NavigationManager getInstance ()
```

```
public float getLowSpeedWarningOffset ()
```

The current low speed warning offset in meters/second.

```
public MapUpdateMode getMapUpdateMode ()
```

Retrieves currently set *MapUpdateMode*

**Methods**

```
public java.util.EnumSet <NaturalGuidanceMode> getNaturalGuidanceMode ()
```

Get the natural guidance modes enabled.

```
public NavigationMode getNavigationMode ()
```

Retrieves the current Navigation Mode

```
public Maneuver getNextManeuver ()
```

Returns the next maneuver on the route, or null if no next maneuver.

```
public long getNextManeuverDistance ()
```

Returns the distance to the next Maneuver

```
public java.util.EnumSet <AspectRatio> getRealisticViewAspectRatios ()
```

Gets the aspect ratios currently being returned.

```
public RealisticViewMode getRealisticViewMode ()
```

Returns the currently set *NavigationManager.RealisticViewMode*.

```
public RoadView getRoadView ()
```

Retrieve the Road View instance associated with the *NavigationManager*

```
public NavigationState getRunningState ()
```

Retrieves the current Navigation Running State

```
public TrafficAvoidanceMode getTrafficAvoidanceMode ()
```

Get the way in which traffic should be handled during navigation.

```
public TrafficWarner getTrafficWarner ()
```

Retrieve the traffic warner instance for the navigation manager

```
public RouteTta getTta (TrafficPenaltyMode mode, boolean wholeRoute)
```

Returns the Time To Arrival (TTA).

```
public TtsOutputFormat getTtsOutputFormat ()
```

Gets the TTS text output format currently in use.

```
public VoiceSkin getVoiceSkin ()
```

Gets the voice skin currently in use.

```
public static boolean isManeuverVoiceoverEnabled (Action action)
```

Checks if guidance voice prompts are enabled for the given type of maneuver actions.

```
public boolean isSpeedWarningEnabled ()
```

Get the speed warning status.

```
public int isTtsLanguageAvailable (Locale locale)
```

Get the availability of the specified language as represented by the *Locale* .

```
public void pause ()
```

Suspend Navigation temporarily.

## Methods

```
public void removeAudioFeedbackListener (AudioFeedbackListener listener)
```

Remove a *NavigationManager.AudioFeedbackListener* previously added to *NavigationManager* .

```
public void removeGpsSignalListener (GpsSignalListener listener)
```

Remove a *NavigationManager.GpsSignalListener* previously added to *NavigationManager* .

```
public void removeLaneInformationListener (LaneInformationListener listener)
```

Remove a *NavigationManager.LaneInformationListener* previously added to *NavigationManager* .

```
public void removeManeuverEventListener (ManeuverEventListener listener)
```

Remove a *NavigationManager.NewInstructionEventListener* previously added to *NavigationManager*

```
public void removeNavigationManagerEventListener (NavigationManagerEventListener listener)
```

Remove a *NavigationManager.NavigationManagerEventListener* previously added to *NavigationManager*

```
public void removeNewInstructionEventListener (NewInstructionEventListener listener)
```

Remove a *NavigationManager.NewInstructionEventListener* previously added to *NavigationManager*

```
public void removePositionListener (PositionListener listener)
```

Remove a *NavigationManager.PositionListener* previously added to *NavigationManager* .

```
public void removeRealisticViewListener (RealisticViewListener listener)
```

Remove a *NavigationManager.RealisticViewListener* previously added to *NavigationManager* .

```
public void removeRerouteListener (RerouteListener listener)
```

Remove a *NavigationManager.RerouteListener* previously added to *NavigationManager* .

```
public void removeSafetySpotListener (SafetySpotListener listener)
```

Remove a *NavigationManager.SafetySpotListener* previously added to *NavigationManager* .

```
public void removeSpeedWarningListener (SpeedWarningListener listener)
```

Remove a *NavigationManager.SpeedWarningListener* previously added to *NavigationManager* .

```
public void removeTrafficRerouteListener (TrafficRerouteListener listener)
```

Remove a traffic re-route listener.

```
public void repeatVoiceCommand ()
```

Repeat last voice command.

```
public Error resume ()
```

Resume paused Navigation.

```
public Error setDistanceUnit (UnitSystem us)
```

Sets the measuring unit system that is used by voice guidance.

```
public void setEnabledAudioEvents (java.util.EnumSet <AudioEvent> events)
```

Used to enable/disable the playback of audio events during navigation.

```
public static boolean setManeuverVoiceoverEnabled (Action action, boolean enabled)
```

Enables or disables guidance voice prompts for a given type of maneuver action.

**Methods**

```
public void setMap (Map map)
```

Set *Map* to this Navigation Manager object and show the Navigation on Map .

```
public Error setMapUpdateMode (MapUpdateMode mode)
```

Sets the Map Update Mode, different modes changes the way position is updated.

```
public boolean setNaturalGuidanceMode (java.util.EnumSet <NaturalGuidanceMode> mode)
```

Set the natural guidance modes to be enabled.

```
public void setRealisticViewMode (RealisticViewMode mode)
```

Change realistic view mode.

```
public Error setRoute (Route route)
```

Sets the route navigation manager should use.

```
public Error setRouteRequestInterval (int value)
```

Set the time period between two re-routing.

```
public boolean setSpeedWarningEnabled (boolean value)
```

Set the speed warning state.

```
public Error setSpeedWarningOptions (float lowSpeedOffset, float highSpeedOffset, float highSpeedBoundary)
```

Set speed warning options.

```
public Error setTrafficAvoidanceMode (TrafficAvoidanceMode mode)
```

Set the way in which traffic should be handled during navigation.

```
public void setTtsOutputFormat (TtsOutputFormat format)
```

Sets the TTS text output format.

```
public Error setVoiceSkin (VoiceSkin skin)
```

sets the voice skin id for voice Navigation

```
public Error simulate (Route route, long speed)
```

Start route simulation.

```
public Error startNavigation (Route route)
```

Start navigation along the route.

```
public Error startTracking ()
```

Start tracking mode.

```
public void stop ()
```

Abort the current operation, which can be route navigation, route simulation or tracking.

```
public void stopSpeedWarning ()
```

Stop speed warning notifications for the current navigation session.

## Class Details

This class controls turn by turn navigation.

If the user of the application revokes the `ACCESS_FINE_LOCATION` permission at runtime while `NavigationManager` is active, navigation will stop functioning. Navigation must be restarted once the `ACCESS_FINE_LOCATION` permission is restored.

## Field Details

```
public static final Date INVALID_ETA_DATE
```

Represents an invalid time of arrival.

See also:

[\*getEta\(boolean, TrafficPenaltyMode\)\*](#)

## Method Details

```
public void addAudioFeedbackListener (java.lang.ref.WeakReference  
<AudioFeedbackListener> listener)
```

Add a [\*NavigationManager.AudioFeedbackListener\*](#) to `NavigationManager` as a `WeakReference`.

Parameters:

- `listener`  
The `WeakReference` of [\*NavigationManager.AudioFeedbackListener\*](#) to be added.

```
public void addGpsSignalListener (java.lang.ref.WeakReference  
<GpsSignalListener> listener)
```

Add a [\*NavigationManager.GpsSignalListener\*](#) to `NavigationManager` to subscribe to route re-calculation events.

Parameters:

- `listener`  
The `WeakReference` of the `GpsSignalListener` to be added.

```
public void addLaneInformationListener (java.lang.ref.WeakReference  
<LaneInformationListener> listener)
```

Add a [\*NavigationManager.LaneInformationListener\*](#) to `NavigationManager` to subscribe to lane information related events.

Parameters:

- `listener`

The `WeakReference` of the `LaneInformationListener` to be added.

```
public void addManeuverEventListener (java.lang.ref.WeakReference  
<ManeuverEventListener> listener)
```

Add a *NavigationManager.ManeuverEventListener* to `NavigationManager` to subscribe to new instruction event(s).

**Parameters:**

- `listener`

The `WeakReference` of the `ManeuverEventListener` to be added.

```
public void addNavigationManagerEventListener (java.lang.ref.WeakReference  
<NavigationManagerEventListener> listener)
```

Add a *NavigationManager.NavigationManagerEventListener* to `NavigationManager` to subscribe to general info events.

**Parameters:**

- `listener`

The `WeakReference` of the `NavigationManagerEventListener` to be added.

```
public void addNewInstructionEventListener (java.lang.ref.WeakReference  
<NewInstructionEventListener> listener)
```

Add a *NavigationManager.NewInstructionEventListener* to `NavigationManager` to subscribe to new instruction event(s).

**Parameters:**

- `listener`

The `WeakReference` of the `NewInstructionEventListener` to be added.

```
public void addPositionListener (java.lang.ref.WeakReference  
<PositionListener> listener)
```

Add a *NavigationManager.PositionListener* to `NavigationManager` to subscribe to position event(s).

**Parameters:**

- `listener`

The `WeakReference` of the `PositionListener` to be added.

```
public void addRealisticViewAspectRatio (AspectRatio ratio)
```

Adds an aspect ratio to the realistic view engine. By default all aspect ratios are off. Realistic view images are only generated for the requested aspect ratios.

**Parameters:**

- **ratio**  
The aspect ratio to be added.

**Throws:**

- **AccessControlException**  
Access to this operation is denied. Contact your HERE representative for more information.

```
public void addRealisticViewListener (java.lang.ref.WeakReference  
<RealisticViewListener> listener)
```

Add a *NavigationManager.RealisticViewListener* to *NavigationManager* as a *WeakReference* .

**Parameters:**

- **listener**  
The *WeakReference* of *NavigationManager.RealisticViewListener* to be added.

```
public void addRerouteListener (java.lang.ref.WeakReference <RerouteListener>  
listener)
```

Add a *NavigationManager.RerouteListener* to *NavigationManager* to subscribe to route re-calculation events.

**Parameters:**

- **listener**  
The *WeakReference* of the *RerouteListener* to be added.

```
public void addSafetySpotListener (java.lang.ref.WeakReference  
<SafetySpotListener> listener)
```

Add a *NavigationManager.SafetySpotListener* to *NavigationManager* to subscribe to safety spot event(s).

**Parameters:**

- **listener**  
The *WeakReference* of the *SafetySpotListener* to be added.

```
public void addSpeedWarningListener (java.lang.ref.WeakReference  
<SpeedWarningListener> listener)
```

Add a *NavigationManager.SpeedWarningListener* to *NavigationManager* to subscribe to speed warning event(s).

## Parameters:

- `listener`

The WeakReference of the `SpeedWarningListener` to be added.

```
public void addTrafficRerouteListener (java.lang.ref.WeakReference  
<TrafficRerouteListener> listener)
```

Add a traffic re-route listener as a WeakReference .

## Parameters:

- `listener`

A WeakReference of the [NavigationManager.TrafficRerouteListener](#) to be added.

## See also:

[NavigationManager.TrafficAvoidanceMode](#)

[setTrafficAvoidanceMode\(TrafficAvoidanceMode\)](#)

```
public void clearRealisticViewAspectRatios ()
```

Clear all aspect ratios from the realistic view engine. After this no images will be generated unless new aspect ratios are added with [addRealisticViewAspectRatio\(AspectRatio\)](#).

## Throws:

- `AccessControlException`

Access to this operation is denied. Contact your HERE representative for more information.

```
public Maneuver getAfterNextManeuver ()
```

Returns the Maneuver after the next Maneuver

## Returns:

The [Maneuver](#) after the next Maneuver.

```
public long getAfterNextManeuverDistance ()
```

Returns the distance to the Maneuver after the next Maneuver

## Returns:

distance to the Maneuver after the next Maneuver in meters. Returns -1 if an error occurred or if the maneuver after the next maneuver is not available yet.

```
public AudioPlayer getAudioPlayer ()
```

Retrieve the Audio Player instance associated with the `NavigationManager`

**Returns:**

AudioPlayer instance

```
public double getAverageSpeed ()
```

Returns the current average speed.

**Returns:**

average speed in m/s.

```
public String getCountryCode ()
```

Gets the three-letter country code (defined in ISO 3166-1) from current location. Navigation session should be started for this method to work.

**Returns:**

The country code from current location. null if the information is not available.

**Throws:**

- **AccessControlException**  
Access to this operation is denied. Contact your HERE representative for more information.

```
public long getDestinationDistance ()
```

Returns the current distance to destination.

**Returns:**

the distance to destination in meters.

```
public UnitSystem getDistanceUnit ()
```

Gets the Distance Unit. This is the measure unit used for voice guidance

**Returns:**

The *NavigationManager.UnitSystem* currently in use.

```
public long getElapsedDistance ()
```

Returns the elapsed distance from start of navigation, tracking or simulation.

**Returns:**

elapsed distance in meters.

```
public java.util.EnumSet <AudioEvent> getEnabledAudioEvents ()
```

Gets the set of all *NavigationManager.AudioEvents* that are currently enabled. Safety spot ( *SAFETY\_SPOT*) and re-routing ( *ROUTE*) audio events are disabled by default.

**Returns:**

The set of all enabled events.

```
public Date getEta (boolean wholeRoute, TrafficPenaltyMode mode)
```

Returns the estimated time of arrival (ETA) of the route.

**Parameters:**

- **wholeRoute**  
Calculate ETA for the whole route if true or for the current leg if false.
- **mode**  
The *TrafficPenaltyMode* to use.

**Returns:**

A valid ETA date is returned when actively navigating on a route (when the navigation mode is *NAVIGATION* or *SIMULATION*). Note that when a navigation event is being handled (for example, during a route recalculation), a *INVALID\_ETA\_DATE* can be returned. A *INVALID\_ETA\_DATE* will also be returned if not actively navigating on a route.

```
public float getHighSpeedWarningBoundary ()
```

The current speed boundary in meters/second.

**Returns:**

Boundary for high speed.

**See also:**

*setSpeedWarningOptions(float, float, float)*

```
public float getHighSpeedWarningOffset ()
```

The current high speed warning offset in meters/second.

**Returns:**

Offset in high speeds.

**See also:**

*setSpeedWarningOptions(float, float, float)*

```
public static NavigationManager getInstance ()
```

**Returns:**

*NavigationManager* instance.

```
public float getLowSpeedWarningOffset ()
```

The current low speed warning offset in meters/second.

**Returns:**

Offset in low speeds in m/s.

**See also:**

*setSpeedWarningOptions(float, float, float)*

```
public MapUpdateMode getMapUpdateMode ()
```

Retrieves currently set MapUpdateMode

**Returns:**

MapUpdateMode enum value

**See also:**

*NavigationManager.MapUpdateMode*

```
public java.util.EnumSet <NaturalGuidanceMode> getNaturalGuidanceMode ()
```

Get the natural guidance modes enabled.

**Returns:**

All enabled natural guidance modes.

```
public NavigationMode getNavigationMode ()
```

Retrieves the current Navigation Mode

**Returns:**

The current *NavigationManager.NavigationMode*

```
public Maneuver getNextManeuver ()
```

Returns the next maneuver on the route, or null if no next maneuver.

**Returns:**

next *Maneuver*.

```
public long getNextManeuverDistance ()
```

Returns the distance to the next Maneuver

**Returns:**

distance to the next Maneuver in meters. Returns Integer.MAX\_VALUE if an error occurred or if the next maneuver is not available yet.

```
public java.util.EnumSet <AspectRatio> getRealisticViewAspectRatios ()
```

Gets the aspect ratios currently being returned.

**Returns:**

The EnumSet of aspect ratios.

```
public RealisticViewMode getRealisticViewMode ()
```

Returns the currently set *NavigationManager.RealisticViewMode*.

**Returns:**

The RealisticViewMode.

```
public RoadView getRoadView ()
```

Retrieve the Road View instance associated with the NavigationManager

**Returns:**

RoadView instance, null if RoadView is not used.

```
public NavigationState getRunningState ()
```

Retrieves the current Navigation Running State

**Returns:**

The current *NavigationManager.NavigationState*

```
public TrafficAvoidanceMode getTrafficAvoidanceMode ()
```

Get the way in which traffic should be handled during navigation.

**Returns:**

The current *NavigationManager.TrafficAvoidanceMode*.

```
public TrafficWarner getTrafficWarner ()
```

Retrieve the traffic warner instance for the navigation manager

**Returns:**

The *TrafficWarner* instance currently in use.

```
public RouteTta getTta (TrafficPenaltyMode mode, boolean wholeRoute)
```

Returns the Time To Arrival (TTA).

**Parameters:**

- **mode**  
The *Route.TrafficPenaltyMode* to use for the calculation.
- **wholeRoute**  
True to return the TTA for the whole route, false to return the TTA for the next stopover waypoint.

**Returns:**

The current *RouteTta*. Can be null if not currently in guidance.

```
public TtsOutputFormat getTtsOutputFormat ()
```

Gets the TTS text output format currently in use.

**Returns:**

The *NavigationManager.TtsOutputFormat* used.

```
public VoiceSkin getVoiceSkin ()
```

Gets the voice skin currently in use.

**Returns:**

The voice skin.

```
public static boolean isManeuverVoiceoverEnabled (Action action)
```

Checks if guidance voice prompts are enabled for the given type of maneuver actions.

**Parameters:**

- **action**  
Maneuver action type to be checked.

**Returns:**

True if voice prompts for this maneuver action type is enabled, false otherwise.

```
public boolean isSpeedWarningEnabled ()
```

Get the speed warning status.

**Returns:**

true speed warning is enabled, false otherwise.

```
public int isTtsLanguageAvailable (Locale locale)
```

Get the availability of the specified language as represented by the Locale .

**Parameters:**

- **locale**

The Locale describing the language to be used.

**Returns:**

Return one of the values below:

- android.speech.tts.TextToSpeech#LANG\_AVAILABLE
- android.speech.tts.TextToSpeech#LANG\_COUNTRY\_AVAILABLE
- android.speech.tts.TextToSpeech#LANG\_COUNTRY\_VAR\_AVAILABLE
- android.speech.tts.TextToSpeech#LANG\_MISSING\_DATA
- android.speech.tts.TextToSpeech#LANG\_NOT\_SUPPORTED

**See also:**

android.speech.tts.TextToSpeech

```
public void pause ()
```

Suspend Navigation temporarily.

```
public void removeAudioFeedbackListener (AudioFeedbackListener listener)
```

Remove a *NavigationManager.AudioFeedbackListener* previously added to NavigationManager .

**Parameters:**

- **listener**

The *NavigationManager.AudioFeedbackListener* to be removed.

```
public void removeGpsSignalListener (GpsSignalListener listener)
```

Remove a *NavigationManager.GpsSignalListener* previously added to NavigationManager .

**Parameters:**

- **listener**

The GpsSignalListener to be removed.

```
public void removeLaneInformationListener (LaneInformationListener listener)
```

Remove a *NavigationManager.LaneInformationListener* previously added to NavigationManager .

**Parameters:**

- `listener`  
The `LaneInformationListener` to be removed.

```
public void removeManeuverEventListener (ManeuverEventListener listener)
```

Remove a *NavigationManager.NewInstructionEventListener* previously added to `NavigationManager`

**Parameters:**

- `listener`  
The `NewInstructionEventListener` to be removed.

```
public void removeNavigationManagerEventListener (NavigationManagerEventListener listener)
```

Remove a *NavigationManager.NavigationManagerEventListener* previously added to `NavigationManager`

**Parameters:**

- `listener`  
The `NavigationManagerEventListener` to be removed.

```
public void removeNewInstructionEventListener (NewInstructionEventListener listener)
```

Remove a *NavigationManager.NewInstructionEventListener* previously added to `NavigationManager`

**Parameters:**

- `listener`  
The `NewInstructionEventListener` to be removed.

```
public void removePositionListener (PositionListener listener)
```

Remove a *NavigationManager.PositionListener* previously added to `NavigationManager`.

**Parameters:**

- `listener`  
The `PositionListener` to be removed.

```
public void removeRealisticViewListener (RealisticViewListener listener)
```

Remove a *NavigationManager.RealisticViewListener* previously added to `NavigationManager`.

**Parameters:**

- `listener`

The *NavigationManager.RealisticViewListener* to be removed.

```
public void removeRerouteListener (RerouteListener listener)
```

Remove a *NavigationManager.RerouteListener* previously added to NavigationManager .

**Parameters:**

- **listener**

The RerouteListener to be removed.

```
public void removeSafetySpotListener (SafetySpotListener listener)
```

Remove a *NavigationManager.SafetySpotListener* previously added to NavigationManager .

**Parameters:**

- **listener**

The SafetySpotListener to be removed.

```
public void removeSpeedWarningListener (SpeedWarningListener listener)
```

Remove a *NavigationManager.SpeedWarningListener* previously added to NavigationManager .

**Parameters:**

- **listener**

The SpeedWarningListener to be removed.

```
public void removeTrafficRerouteListener (TrafficRerouteListener listener)
```

Remove a traffic re-route listener.

**Parameters:**

- **listener**

A *NavigationManager.TrafficRerouteListener* to be removed.

**See also:**

[addTrafficRerouteListener\(WeakReference<TrafficRerouteListener>\)](#)

```
public void repeatVoiceCommand ()
```

Repeat last voice command.

```
public Error resume ()
```

Resume paused Navigation.

**Returns:**

*NONE* if operation was successful, otherwise one of the other error codes in **Error**.

```
public Error setDistanceUnit (UnitSystem us)
```

Sets the measuring unit system that is used by voice guidance. The default *UnitSystem* is *METRIC*.

Note: If a new *VoiceSkin* is selected and it does not support the currently selected *UnitSystem* then *NavigationManager* will default to *METRIC*. It is recommended that after calling *setVoiceSkin(VoiceSkin)* then *setDistanceUnit(NavigationManager.UnitSystem)* be also called to setup the appropriate *UnitSystem*.

**Parameters:**

- **us**  
The desired *NavigationManager.UnitSystem* to be used.

**Returns:**

*NONE* if operation was successful, *INVALID\_OPERATION* if the selected *VoiceSkin* does not support the desired unit system. otherwise one of the other error codes in **Error**.

**See also:**

*setVoiceSkin(VoiceSkin)*

```
public void setEnabledAudioEvents (java.util.EnumSet <AudioEvent> events)
```

Used to enable/disable the playback of audio events during navigation. As the presence of an enum will enable the desired event, likewise the absence of an enum will disable the missing event.

**Parameters:**

- **events**  
The set of all *NavigationManager.AudioEvents* to be enabled.

```
public static boolean setManeuverVoiceoverEnabled (Action action, boolean enabled)
```

Enables or disables guidance voice prompts for a given type of maneuver action.

**Parameters:**

- **action**  
Maneuver voice prompt to be enabled/disabled.
- **enabled**  
State for maneuver voice prompt.

**Returns:**

true if operation was successful, false otherwise

```
public void setMap (Map map)
```

Set *Map* to this Navigation Manager object and show the Navigation on Map . Passing null will remove Navigation from the Map . Setting a new Map instance (e.g. `setMap(Map1) => setMap(Map2)` ) will cause Navigation to be removed from Map1 and added to Map2 .

Note: Setting the map while Navigation is ongoing is not supported.

**Parameters:**

- **map**  
The *Map* to show the Navigation on.

```
public Error setMapUpdateMode (MapUpdateMode mode)
```

Sets the Map Update Mode, different modes changes the way position is updated. The default Map Update Mode is *NONE*.

**Parameters:**

- **mode**  
The desired *NavigationManager.MapUpdateMode* to be used.

**Returns:**

Any *NavigationManager.Error* that resulted from the update

```
public boolean setNaturalGuidanceMode (java.util.EnumSet  
<NaturalGuidanceMode> mode)
```

Set the natural guidance modes to be enabled. By default, all of the natural guidance modes are disabled.

**Parameters:**

- **mode**  
One or more natural guidance modes to be enabled

**Returns:**

True if all modes were set successfully. False otherwise.

```
public void setRealisticViewMode (RealisticViewMode mode)
```

Change realistic view mode. By default the feature is off. By selecting day or night (and adding an aspect ratio with `addRealisticViewAspectRatio(AspectRatio)`) the feature is activated.

**Parameters:**

- **mode**  
The mode to set.

**Throws:**

- **AccessControlException**

Access to this operation is denied. Contact your HERE representative for more information.

```
public Error setRoute (Route route)
```

Sets the route navigation manager should use.

**Parameters:**

- **route**  
the new route navigation manager should use

**Returns:**

*NONE* if operation was successful, otherwise one of the other error codes in *Error*. *INVALID\_PARAMETERS* if route is null or is an online public transit, bicycle or online urban mobility route (route with *TransportMode* set to *PUBLIC\_TRANSPORT*, *BICYCLE* or calculated using *UMRouter*). *INVALID\_OPERATION* if *LocationDataSourceAutomotive* is provided as position source but a non-automotive route is used ( route with *TransportMode* NOT set to *CAR*). *OPERATION\_NOT\_ALLOWED* if access to this operation is denied.

```
public Error setRouteRequestInterval (int value)
```

Set the time period between two re-routing. Default interval is 5 minutes. This time period is applicable when *DYNAMIC* or *MANUAL* is in use.

**Parameters:**

- **value**  
The new route request interval in seconds

**Returns:**

*NONE* if operation was successful, otherwise one of the other error codes in *Error*.

**See also:**

[setTrafficAvoidanceMode\(TrafficAvoidanceMode\)](#)

```
public boolean setSpeedWarningEnabled (boolean value)
```

Set the speed warning state. The method makes it easy to turn on/off speed warning notifications during the same navigation session. The speed warning is automatically turned on when [setSpeedWarningOptions\(float, float, float\)](#) is called. Operation fails if called before starting navigation, tracking or simulation. Operation also fails when speed warner is not available or is not initialized, (for example, in pedestrian mode). Operation fails if [stopSpeedWarning\(\)](#) has already been called for the current navigation session.

**Parameters:**

- **value**  
speed warning state. The boolean value true indicates that the speed warning is going to be turned on. The boolean value false indicates that the speed warning is going to be turned off.

**Returns:**

true if operation was successful , false otherwise.

```
public Error setSpeedWarningOptions (float lowSpeedOffset, float  
highSpeedOffset, float highSpeedBoundary)
```

Set speed warning options. Speed warning is triggered by comparing current speed to speed limit with offset. i.e. if you exceed the speed limit beyond the given offset a warning will be issued Speed unit is m/s. Operation fails if called before starting navigation, tracking or simulation. Operation fails when speed warner is not available or is not initialized (eg:in pedestrian mode).

**Parameters:**

- **lowSpeedOffset**  
Offset in low speeds.
- **highSpeedOffset**  
Offset in high speeds.
- **highSpeedBoundary**  
Boundary for high speed. Above this speed high speed offset is used and below low speed offset.

**Returns:**

*NONE* if operation was successful, otherwise one of the other error codes in *Error*.

```
public Error setTrafficAvoidanceMode (TrafficAvoidanceMode mode)
```

Set the way in which traffic should be handled during navigation. Default *NavigationManager.TrafficAvoidanceMode* is *DISABLE*.

**Parameters:**

- **mode**  
The desired *TrafficAvoidanceMode*

**Returns:**

*NONE* if operation was successful, otherwise one of the other error codes in *Error*.

```
public void setTtsOutputFormat (TtsOutputFormat format)
```

Sets the TTS text output format. Default format is RAW (pure text without phonemes and escape sequences).

**Parameters:**

- **format**  
The *NavigationManager.TtsOutputFormat* to use.

```
public Error setVoiceSkin (VoiceSkin skin)
```

sets the voice skin id for voice Navigation

**Parameters:**

- **skin**

The *VoiceSkin* to use.

**Returns:**

*NONE* if operation was successful, otherwise one of the other error codes in **Error**.

```
public Error simulate (Route route, long speed)
```

Start route simulation.

Route simulation should only be used for testing purposes. Do not use this feature in a production application.

**Parameters:**

- **route**

The route to use.

- **speed**

simulation speed in meter per second. Valid range is 0 - 4294967295.

**Returns:**

*NONE* if operation was successful, otherwise one of the other error codes in **Error**. *INVALID\_PARAMETERS* if route is null or is an online public transit, bicycle or online urban mobility route (route with *TransportMode* set to *PUBLIC\_TRANSPORT*, *BICYCLE* or calculated using *UMRouter*). *INVALID\_OPERATION* if *LocationDataSourceAutomotive* is provided as position source but a non-automotive route is used ( route with *TransportMode* NOT set to *CAR*). *OPERATION\_NOT\_ALLOWED* if access to this operation is denied.

```
public Error startNavigation (Route route)
```

Start navigation along the route.

**Parameters:**

- **route**

The *Route* to use.

**Returns:**

*NONE* if operation was successful, otherwise one of the other error codes in **Error**. *INVALID\_PARAMETERS* if route is null or is an online public transit, bicycle or online urban mobility route (route with *TransportMode* set to *PUBLIC\_TRANSPORT*, *BICYCLE* or calculated using *UMRouter*). *INVALID\_OPERATION* if *LocationDataSourceAutomotive* is provided as position source but a non-automotive route is used ( route with *TransportMode* NOT set to *CAR*). *OPERATION\_NOT\_ALLOWED* if access to this operation is denied.

```
public Error startTracking ()
```

Start tracking mode.

**Returns:**

*NONE* if operation was successful, otherwise one of the other error codes in **Error**.

```
public void stop ()
```

Abort the current operation, which can be route navigation, route simulation or tracking.

```
public void stopSpeedWarning ()
```

Stop speed warning notifications for the current navigation session. After this method call, changing the speed warning state will have no effect during the current navigation session.

## AspectRatio

The enumeration *AspectRatio* is a member of *com.here.android.mpa.guidance.NavigationManager*.

### Enumeration Summary

public static final enumeration **NavigationManager.AspectRatio**

*extends java.lang.Enum, java.lang.Object*

A measure of an image's aspect ratio which is w x h.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 326: Enum Constants in AspectRatio

Fields
public static final <i>AspectRatio</i> <b>AR_16x9</b> 16 x 9
public static final <i>AspectRatio</i> <b>AR_3x5</b> 3 x 5
public static final <i>AspectRatio</i> <b>AR_5x3</b> 5 x 3
public static final <i>AspectRatio</i> <b>AR_4x3</b> 4 x 3

## Method Summary

Table 327: Methods in AspectRatio

Methods
<pre>public int value ()</pre>
<pre>public static AspectRatio valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static NavigationManager.AspectRatio[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

A measure of an image's aspect ratio which is w x h.

### Enum Constant Details

```
public static final AspectRatio AR_16x9
```

16 x 9

```
public static final AspectRatio AR_3x5
```

3 x 5

```
public static final AspectRatio AR_5x3
```

5 x 3

```
public static final AspectRatio AR_4x3
```

4 x 3

## Method Details

```
public int value ()
```

```
public static AspectRatio valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- `name`

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static NavigationManager.AspectRatio[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## AudioEvent

The enumeration *AudioEvent* is a member of *com.here.android.mpa.guidance.NavigationManager*.

### Enumeration Summary

```
public static final enumeration NavigationManager.AudioEvent
```

```
extends java.lang.Enum, java.lang.Object
```

Used for enabling/disabling audio events during navigation.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 328: Enum Constants in AudioEvent

Fields
<pre>public static final <i>AudioEvent</i> <b>MANEUVER</b></pre> <p>Maneuver output (maneuvers, stop-overs reached, destination reached).</p>
<pre>public static final <i>AudioEvent</i> <b>ROUTE</b></pre> <p>Route output (re-routing, route recalculated).</p>
<pre>public static final <i>AudioEvent</i> <b>GPS</b></pre> <p>GPS output (GPS lost, GPS restored).</p>
<pre>public static final <i>AudioEvent</i> <b>SPEED_LIMIT</b></pre> <p>Speed limit audio output (exceeded limit start, exceeded limit end).</p>
<pre>public static final <i>AudioEvent</i> <b>SAFETY_SPOT</b></pre> <p>Safety spot audio output (approaching safety spot).</p>
<pre>public static final <i>AudioEvent</i> <b>VIBRATION</b></pre> <p>Vibration (during walk navigation only).</p>

## Method Summary

Table 329: Methods in `AudioEvent`

Methods
<pre>public static <i>AudioEvent</i> valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>NavigationManager.AudioEvent</i>[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Used for enabling/disabling audio events during navigation. See [setEnabledAudioEvents\(EnumSet\)](#).

### Enum Constant Details

```
public static final AudioEvent MANEUVER
```

Maneuver output (maneuvers, stop-overs reached, destination reached).

```
public static final AudioEvent ROUTE
```

Route output (re-routing, route recalculated).

```
public static final AudioEvent GPS
```

GPS output (GPS lost, GPS restored).

```
public static final AudioEvent SPEED_LIMIT
```

Speed limit audio output (exceeded limit start, exceeded limit end).

```
public static final AudioEvent SAFETY_SPOT
```

Safety spot audio output (approaching safety spot).

```
public static final AudioEvent VIBRATION
```

Vibration (during walk navigation only). To enable, the app must also have `android.permission.VIBRATE` in `AndroidManifest.xml`.

## Method Details

```
public static AudioEvent valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static NavigationManager.AudioEvent[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## AudioFeedbackListener

The class *AudioFeedbackListener* is a member of *com.here.android.mpa.guidance.NavigationManager*.

### Class Summary

```
public static abstract class NavigationManager.AudioFeedbackListener
```

```
extends java.lang.Object
```

*AudioFeedbackListener* provides callback of audio related events from *NavigationManager*.

[For complete information, see the section [Class Details](#)]

### See also:

[\*setVoiceSkin\(VoiceSkin\)\*](#)

### Constructor Summary

Table 330: Constructors in *AudioFeedbackListener*

Constructors
<a href="#"><i>AudioFeedbackListener</i> ()</a>

### Method Summary

Table 331: Methods in *AudioFeedbackListener*

Methods
<pre>public void <a href="#"><i>onAudioEnd</i></a> ()</pre> <p>Callback after the playing of any voice navigation command ends.</p>
<pre>public void <a href="#"><i>onAudioStart</i></a> ()</pre> <p>Callback before the playing of any voice navigation command starts.</p>

## Methods

```
public void onVibrationEnd ()
```

Callback for when vibration has finished.

```
public void onVibrationStart ()
```

Callback for when vibration is about to start.

---

## Class Details

`AudioFeedbackListener` provides callback of audio related events from `NavigationManager`. By default, empty implementations are provided for all callbacks, users may selectively overload specific methods that are of interest.

**See also:**

[`setVoiceSkin\(VoiceSkin\)`](#)

## Constructor Details

`AudioFeedbackListener` ()

## Method Details

```
public void onAudioEnd ()
```

Callback after the playing of any voice navigation command ends.

```
public void onAudioStart ()
```

Callback before the playing of any voice navigation command starts.

```
public void onVibrationEnd ()
```

Callback for when vibration has finished. This is just an estimation as Android's `Vibrator` does not notify when complete.

```
public void onVibrationStart ()
```

Callback for when vibration is about to start.

## AudioPlayer

The class `AudioPlayer` is a member of `com.here.android.mpa.guidance.NavigationManager`.

## Class Summary

public class **NavigationManager.AudioPlayer**

extends *java.lang.Object*

[For complete information, see the section [Class Details](#)]

## Field Summary

Table 332: Fields in AudioPlayer

Fields
public static final float <b>DEFAULT_AUDIO_VOLUME</b> Default audio player volume
public static final float <b>DEFAULT_SPEECH_RATE</b> Default speech rate

## Method Summary

Table 333: Methods in AudioPlayer

Methods
public int <b>getStreamId</b> () Get the current Audio stream used by NavigationManager
public float <b>getTtsSpeechRate</b> () Gets the TTS speech rate used by NavigationManager
public float <b>getVolume</b> () Get the Audio Volume used by NavigationManager
public void <b>setDelegate</b> ( <i>AudioPlayerDelegate</i> delegate) Sets <i>NavigationManager.AudioPlayer</i> delegate.
public <i>AudioPlayer</i> <b>setStreamId</b> (int audioStream) Set the Audio Stream used by NavigationManager.
public void <b>setTtsSpeechRate</b> (float rate) Set the TTS speech rate used by NavigationManager when a TTS voice skin is chosen through <i>setVoiceSkin(VoiceSkin)</i> .
public <i>AudioPlayer</i> <b>setVolume</b> (float audioVolume) Set the Audio Volume used by NavigationManager
public void <b>stop</b> () Stop the navigation instruction currently being played.

## Class Details

### Field Details

```
public static final float DEFAULT_AUDIO_VOLUME
```

Default audio player volume

```
public static final float DEFAULT_SPEECH_RATE
```

Default speech rate

### Method Details

```
public int getStreamId ()
```

Get the current Audio stream used by `NavigationManager`

**Returns:**

the current audio stream id. One of the possible values from `{code android.media.AudioManager} stream Id` constants.

**See also:**

`android.media.AudioManager`

```
public float getTtsSpeechRate ()
```

Gets the TTS speech rate used by `NavigationManager`

**Returns:**

The TTS speech rate in the range of `(0.0f, 2.0f]` or `DEFAULT_SPEECH_RATE` if a custom value is not set.

```
public float getVolume ()
```

Get the Audio Volume used by `NavigationManager`

**Returns:**

float A float percentage value in the range of `[0.0f, 1.0f]` or `DEFAULT_AUDIO_VOLUME` if a custom value is not set

```
public void setDelegate (AudioPlayerDelegate delegate)
```

Sets `NavigationManager.AudioPlayer` delegate. Clients can implement `AudioPlayerDelegate` to take over playback of audio files and TTS strings. Note: by delegating `NavigationManager.AudioPlayer` it immediately stops all current audio and TTS playbacks by the SDK.

**Parameters:**

- **delegate**

The *NavigationManager.AudioPlayer* delegate.

```
public AudioPlayer setStreamId (int audioStream)
```

Set the Audio Stream used by *NavigationManager*. By default, *android.media.AudioManager.STREAM\_MUSIC* is used.

**Parameters:**

- **audioStream**

*int android.media.AudioManager* for the set of system streams.

**Returns:**

The updated *AudioPlayer* object itself.

**See also:**

*android.media.AudioManager*

```
public void setTtsSpeechRate (float rate)
```

Set the TTS speech rate used by *NavigationManager* when a TTS voice skin is chosen through *setVoiceSkin(VoiceSkin)*. The specified TTS speech rate is applied immediately if a TTS voice skin is chosen when this is called; otherwise, it will not be applied until a TTS voice skin is chosen.

**Parameters:**

- **rate**

A value in the range of (0.0f, 2.0f]. Default value is *DEFAULT\_SPEECH\_RATE*. Normal speech rate is 1.0. Smaller value results in slower speech.

**See also:**

*DEFAULT\_SPEECH\_RATE*

```
public AudioPlayer setVolume (float audioVolume)
```

Set the Audio Volume used by *NavigationManager*

The volume change will not take effect until the next navigation instruction is played. *stop()* can be used to stop the currently playing instruction.

**Parameters:**

- **audioVolume**

*float* A float percentage value in the range of [0.0f, 1.0f]. A value of *DEFAULT\_AUDIO\_VOLUME* can be set to use the system default volume.

**Returns:**

The updated `AudioPlayer` object itself.

**See also:**

[stop\(\)](#)

```
public void stop ()
```

Stop the navigation instruction currently being played. Future instructions will continue to be played.

This can be used in conjunction with [setVolume\(float\)](#) to mute the navigation audio immediately.

**See also:**

[setVolume\(float\)](#)

## Error

The enumeration `Error` is a member of `com.here.android.mpa.guidance.NavigationManager`.

### Enumeration Summary

```
public static final enumeration NavigationManager.Error
```

```
extends java.lang.Enum, java.lang.Object
```

Navigation Manager Error

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

**Table 334: Enum Constants in Error**

Fields
<pre>public static final <i>Error</i> <b>NONE</b></pre> <p>There is no error</p>
<pre>public static final <i>Error</i> <b>GUIDANCE_NOT_READY</b></pre> <p>Guidance is not ready for use</p>
<pre>public static final <i>Error</i> <b>POSITIONING_FAILED</b></pre> <p>Positioning Manager failed to start for navigation use.</p>
<pre>public static final <i>Error</i> <b>NOT_READY</b></pre> <p>Guidance polling must be continued.</p>
<pre>public static final <i>Error</i> <b>OUT_OF_MEMORY</b></pre> <p>Out of memory</p>

**Fields**

```
public static final Error INVALID_PARAMETERS
```

Invalid parameters

```
public static final Error INVALID_OPERATION
```

Operation not allowed at the time of the call

```
public static final Error NOT_FOUND
```

When something was not found (e.g.

```
public static final Error ABORTED
```

Operation aborted.

```
public static final Error OPERATION_NOT_ALLOWED
```

Access to this operation is denied.

```
public static final Error INVALID_CREDENTIALS
```

HERE Developer credentials are invalid or were not provided

```
public static final Error UNKNOWN
```

Generic error

**Method Summary**

Table 335: Methods in Error

**Methods**

```
public static Error valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static NavigationManager.Error[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

**Enumeration Details**

Navigation Manager Error

**Enum Constant Details**

```
public static final Error NONE
```

There is no error

```
public static final Error GUIDANCE_NOT_READY
```

Guidance is not ready for use

```
public static final Error POSITIONING_FAILED
```

Positioning Manager failed to start for navigation use. This could be because the application has not been granted the `ACCESS_FINE_LOCATION` android permission at the time of the call to `NavigationManager`.

```
public static final Error NOT_READY
```

Guidance polling must be continued.

```
public static final Error OUT_OF_MEMORY
```

Out of memory

```
public static final Error INVALID_PARAMETERS
```

Invalid parameters

```
public static final Error INVALID_OPERATION
```

Operation not allowed at the time of the call

```
public static final Error NOT_FOUND
```

When something was not found (e.g. voice skins)

```
public static final Error ABORTED
```

Operation aborted.

```
public static final Error OPERATION_NOT_ALLOWED
```

Access to this operation is denied. Contact your HERE representative for more information.

```
public static final Error INVALID_CREDENTIALS
```

HERE Developer credentials are invalid or were not provided

```
public static final Error UNKNOWN
```

Generic error

## Method Details

```
public static Error valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

**Parameters:**

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static NavigationManager.Error[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## GpsSignalListener

The class *GpsSignalListener* is a member of *com.here.android.mpa.guidance.NavigationManager*.

### Class Summary

public static abstract class **NavigationManager.GpsSignalListener**

*extends java.lang.Object*

*GpsSignalListener* provides callback of GPS signal related events from *NavigationManager*.

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 336: Constructors in *GpsSignalListener*

Constructors
<i>GpsSignalListener</i> ()

### Method Summary

Table 337: Methods in *GpsSignalListener*

Methods
public void <i>onGpsLost</i> () Callback for GPS signal lost event.
public void <i>onGpsRestored</i> () Callback for GPS signal restored event.

### Class Details

*GpsSignalListener* provides callback of GPS signal related events from *NavigationManager*. By default, empty implementations are provided for each callback method, users may selectively overload specific methods that are of interest.

## Constructor Details

`GpsSignalListener ()`

## Method Details

`public void onGpsLost ()`

Callback for GPS signal lost event.

`public void onGpsRestored ()`

Callback for GPS signal restored event.

## LaneInformationListener

The class *LaneInformationListener* is a member of *com.here.android.mpa.guidance.NavigationManager*.

## Class Summary

public static abstract class **NavigationManager.LaneInformationListener**

*extends java.lang.Object*

*LaneInformationListener* provides callback of *LaneInformation* related events from *NavigationManager*.

[For complete information, see the section *Class Details*]

## Constructor Summary

Table 338: Constructors in *LaneInformationListener*

Constructors
<i>LaneInformationListener ()</i>

## Method Summary

Table 339: Methods in *LaneInformationListener*

Methods
public void <i>onLaneInformation</i> (java.util.List < <i>LaneInformation</i> > lanes, <i>RoadElement</i> road)
Called when new information about lanes is available.

## Class Details

`LaneInformationListener` provides callback of *LaneInformation* related events from `NavigationManager`. Used to retrieve information about the lane configuration while navigating.

No callback will be triggered if the HERE license key is invalid.

## Constructor Details

`LaneInformationListener ()`

## Method Details

```
public void onLaneInformation (java.util.List <LaneInformation> lanes,  
RoadElement road)
```

Called when new information about lanes is available. This method is called whenever the current available lane information changes. No available lane information is indicated by an empty `List` (e.g. lane information should stop being displayed).

The lanes are ordered from left (index = 0) to right (index = lanes.size() - 1).

### Parameters:

- **lanes**  
A `List` of *LaneInformation* objects. An empty `List` indicates that no lane information is available and lane information should stop being shown. The lanes are ordered from left (index = 0) to right (index = lanes.size() - 1).
- **road**  
The *RoadElement* that the *LaneInformation* is associated with. `null` if not available or if lanes is empty.

## ManeuverEventListener

The class *ManeuverEventListener* is a member of `com.here.android.mpa.guidance.NavigationManager`.

## Class Summary

```
public static abstract class NavigationManager.ManeuverEventListener
```

```
extends java.lang.Object
```

`ManeuverEventListener` provides callback of maneuver events from `NavigationManager`.

[For complete information, see the section *Class Details*]

## Constructor Summary

Table 340: Constructors in `ManeuverEventListener`

Constructors
<code>ManeuverEventListener ()</code>

## Method Summary

Table 341: Methods in `ManeuverEventListener`

Methods
<pre>public void <i>onManeuverEvent</i> ()</pre> <p>Callback for new maneuver event.</p>

## Class Details

`ManeuverEventListener` provides callback of maneuver events from `NavigationManager`. By default, an empty implementation is provided for the callback method.

## Constructor Details

`ManeuverEventListener ()`

## Method Details

`public void onManeuverEvent ()`

Callback for new maneuver event. This callback is in sync with the playback of audio maneuver commands

Note that if this new maneuver event is a `Maneuver.Action#STOPOVER`, you will receive an additional callback, `onStopoverReached(int)`.

**See also:**

`getNextManeuver()`

`getNextManeuverDistance()`

`getAfterNextManeuver()`

`getAfterNextManeuverDistance()`

## MapUpdateMode

The enumeration `MapUpdateMode` is a member of `com.here.android.mpa.guidance.NavigationManager`.

## Enumeration Summary

public static final enumeration **NavigationManager.MapUpdateMode**

extends *java.lang.Enum*, *java.lang.Object*

Map Update Mode

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 342: Enum Constants in MapUpdateMode

Fields
<pre>public static final MapUpdateMode NONE</pre> <p>No automatic map movement (only <i>PositionIndicator</i> would move to reflect current location)</p>
<pre>public static final MapUpdateMode POSITION</pre> <p>Map updated with new position and direction</p>
<pre>public static final MapUpdateMode POSITION_ANIMATION</pre> <p>Map updated with new position and direction with animated movement</p>
<pre>public static final MapUpdateMode ROADVIEW</pre> <p>Map updated using <i>NavigationManager.RoadView</i>, with zoom level automatically adjusted according to the approaching maneuver, road type and speed.</p>
<pre>public static final MapUpdateMode ROADVIEW_NOZOOM</pre> <p>Map updated using <i>NavigationManager.RoadView</i></p>

## Method Summary

Table 343: Methods in MapUpdateMode

Methods
<pre>public int value ()</pre>
<pre>public static MapUpdateMode valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static NavigationManager.MapUpdateMode[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Map Update Mode

## Enum Constant Details

public static final *MapUpdateMode* NONE

No automatic map movement (only *PositionIndicator* would move to reflect current location)

```
public static final MapUpdateMode POSITION
```

Map updated with new position and direction

```
public static final MapUpdateMode POSITION_ANIMATION
```

Map updated with new position and direction with animated movement

```
public static final MapUpdateMode ROADVIEW
```

Map updated using *NavigationManager.RoadView*, with zoom level automatically adjusted according to the approaching maneuver, road type and speed.

```
public static final MapUpdateMode ROADVIEW_NOZOOM
```

Map updated using *NavigationManager.RoadView*

## Method Details

```
public int value ()
```

```
public static MapUpdateMode valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static NavigationManager.MapUpdateMode[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## NaturalGuidanceMode

The enumeration *NaturalGuidanceMode* is a member of *com.here.android.mpa.guidance.NavigationManager*.

## Enumeration Summary

public static final enumeration **NavigationManager.NaturalGuidanceMode**

extends *java.lang.Enum*, *java.lang.Object*

Enum used to turn on/off features within natural guidance.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 344: Enum Constants in NaturalGuidanceMode

Fields
<pre>public static final NaturalGuidanceMode TRAFFIC_LIGHT</pre> <p>Natural guidance for traffic lights.</p>
<pre>public static final NaturalGuidanceMode STOP_SIGN</pre> <p>Natural guidance for stop signs.</p>
<pre>public static final NaturalGuidanceMode JUNCTION</pre> <p>Natural guidance for junctions.</p>

## Method Summary

Table 345: Methods in NaturalGuidanceMode

Methods
<pre>public int value ()</pre>
<pre>public static NaturalGuidanceMode valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static NavigationManager.NaturalGuidanceMode[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Enum used to turn on/off features within natural guidance.

## Enum Constant Details

public static final *NaturalGuidanceMode* **TRAFFIC\_LIGHT**

Natural guidance for traffic lights.

public static final *NaturalGuidanceMode* **STOP\_SIGN**

Natural guidance for stop signs.

```
public static final NaturalGuidanceMode JUNCTION
```

Natural guidance for junctions.

### Method Details

```
public int value ()
```

```
public static NaturalGuidanceMode valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static NavigationManager.NaturalGuidanceMode[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## NavigationManagerEventListener

The class *NavigationManagerEventListener* is a member of *com.here.android.mpa.guidance.NavigationManager*.

### Class Summary

```
public static abstract class NavigationManager.NavigationManagerEventListener
```

```
extends java.lang.Object
```

*NavigationManagerEventListener* provides callback of general navigation manager related events from *NavigationManager*.

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 346: Constructors in *NavigationManagerEventListener*

Constructors
<i>NavigationManagerEventListener</i> ()

## Method Summary

Table 347: Methods in NavigationManagerEventListener

Methods
<pre>public void <b>onCountryInfo</b> (String currentCountry, String nextCountry)</pre> <p>Callback when country changes.</p>
<pre>public void <b>onEnded</b> (<i>NavigationMode</i> mode)</pre> <p>Callback when navigation, simulation or tracking has just been ended.</p>
<pre>public void <b>onMapDataAvailable</b> ()</pre> <p>Called when navigation manager resumes after previously suspending due to a lack of map data.</p>
<pre>public void <b>onMapDataInsufficient</b> ()</pre> <p>Called when navigation manager suspends due to insufficient map data.</p>
<pre>public void <b>onMapUpdateModeChanged</b> (<i>MapUpdateMode</i> mode)</pre> <p>Callback when the map update mode has been changed</p>
<pre>public void <b>onNavigationModeChanged</b> ()</pre> <p>Callback for Navigation Mode changed event.</p>
<pre>public void <b>onRouteUpdated</b> (<i>Route</i> newRoute)</pre> <p>Callback to notify that <i>setRoute(Route)</i> has taken effect.</p>
<pre>public void <b>onRunningStateChanged</b> ()</pre> <p>Callback for Navigation Manager state changed event.</p>
<pre>public void <b>onStopoverReached</b> (int index)</pre> <p>Callback indicating that a route stopover has been reached.</p>

## Class Details

NavigationManagerEventListener provides callback of general navigation manager related events from NavigationManager . By default, empty implementations are provided for each callback, users may selectively overload specific methods that are of interest.

## Constructor Details

**NavigationManagerEventListener ()**

## Method Details

```
public void onCountryInfo (String currentCountry, String nextCountry)
```

Callback when country changes.

No callback will be triggered if the HERE license key is invalid.

**Parameters:**

- **currentCountry**

The 3-letter country code related to current position

- **nextCountry**

The 3-letter country code you are entering

## `public void onEnded (NavigationMode mode)`

Callback when navigation, simulation or tracking has just been ended.

### Parameters:

- **mode**

The *NavigationManager.NavigationMode* indication which action (navigation, simulation or tracking) that has been ended.

## `public void onMapDataAvailable ()`

Called when navigation manager resumes after previously suspending due to a lack of map data.

This may be used as a notification that the map data for guidance is available again after previously being unavailable for the current location. This callback is only made if *onMapDataInsufficient()* was previously called. This callback will not be made if guidance is stopped before map data becomes available again.

## `public void onMapDataInsufficient ()`

Called when navigation manager suspends due to insufficient map data.

In order to operate *NavigationManager* relies on a constant stream of map matched positions from *PositioningManager*. One reason that map matching can fail is if map data for the current location is not available. If this situation arises then this callback will be made. If *Map* has never been used to view a particular location since your app was installed (note that map data is cached across app launches), *MapLoader* has not been used to download an *MapPackage* for this location, no network connection is available and navigation progresses to this location then the scenario described above will occur. To guarantee that navigation never encounters problems in poor network conditions use *MapLoader* to download map data for the region being navigated. Once map data is available again, *onMapDataAvailable()* will be called.

## `public void onMapUpdateModeChanged (MapUpdateMode mode)`

Callback when the map update mode has been changed

### Parameters:

- **mode**

The new *NavigationManager.MapUpdateMode*.

```
public void onNavigationModeChanged ()
```

Callback for Navigation Mode changed event.

```
public void onRouteUpdated (Route newRoute)
```

Callback to notify that [setRoute\(Route\)](#) has taken effect.

**Parameters:**

- **newRoute**  
The new [Route](#) used by the NavigationManager.

```
public void onRunningStateChanged ()
```

Callback for Navigation Manager state changed event.

```
public void onStopoverReached (int index)
```

Callback indicating that a route stopover has been reached.

Note that in addition to this, [onManeuverEvent\(\)](#) callback will also be received. Furthermore, note that a [RouteWaypoint](#) of type `RouteWaypoint.Type#VIA_WAYPOINT` is not considered to be a route stopover.

**Parameters:**

- **index**  
The index of the stopover that was reached, starting from 0. Stopovers can be retrieved by index from the RoutePlan.

**See also:**

[getWaypoint\(int\)](#)

## NavigationMode

The enumeration `NavigationMode` is a member of `com.here.android.mpa.guidance.NavigationManager`.

### Enumeration Summary

```
public static final enumeration NavigationManager.NavigationMode
```

```
extends java.lang.Enum, java.lang.Object
```

Possible Navigation Modes

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 348: Enum Constants in `NavigationMode`

Fields
<pre>public static final <i>NavigationMode</i> <b>NONE</b></pre> <p>Navigation is inactive.</p>
<pre>public static final <i>NavigationMode</i> <b>SIMULATION</b></pre> <p>Navigation is running in simulation mode (following a calculated route without using real GPS data)</p>
<pre>public static final <i>NavigationMode</i> <b>NAVIGATION</b></pre> <p>Navigation is running in navigation mode (following a route using GPS data, recalculation will occur if position deviates from route)</p>
<pre>public static final <i>NavigationMode</i> <b>TRACKING</b></pre> <p>Navigation is running in tracking mode (Not following a route, real GPS data drives map movement)</p>

## Method Summary

Table 349: Methods in `NavigationMode`

Methods
<pre>public static <i>NavigationMode</i> <b>valueOf</b> (<i>String</i> name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>NavigationManager.NavigationMode</i>[] <b>values</b> ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Possible Navigation Modes

### Enum Constant Details

```
public static final NavigationMode NONE
```

Navigation is inactive.

```
public static final NavigationMode SIMULATION
```

Navigation is running in simulation mode (following a calculated route without using real GPS data)

```
public static final NavigationMode NAVIGATION
```

Navigation is running in navigation mode (following a route using GPS data, recalculation will occur if position deviates from route)

```
public static final NavigationMode TRACKING
```

Navigation is running in tracking mode (Not following a route, real GPS data drives map movement)

### Method Details

```
public static NavigationMode valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static NavigationManager.NavigationMode[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## NavigationState

The enumeration *NavigationState* is a member of *com.here.android.mpa.guidance.NavigationManager*.

### Enumeration Summary

```
public static final enumeration NavigationManager.NavigationState
```

*extends java.lang.Enum, java.lang.Object*

Possible states of navigation

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 350: Enum Constants in *NavigationState*

Fields
<pre>public static final <i>NavigationState</i> <b>IDLE</b></pre> <p>Navigation has not been started, or is finished</p>
<pre>public static final <i>NavigationState</i> <b>RUNNING</b></pre> <p>Navigation is currently running</p>
<pre>public static final <i>NavigationState</i> <b>PAUSED</b></pre> <p>Navigation has been paused mid-route</p>

## Method Summary

Table 351: Methods in `NavigationState`

Methods
<pre>public static <i>NavigationState</i> <i>valueOf</i> (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>NavigationManager.NavigationState[]</i> <i>values</i> ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Possible states of navigation

### Enum Constant Details

```
public static final NavigationState IDLE
```

Navigation has not been started, or is finished

```
public static final NavigationState RUNNING
```

Navigation is currently running

```
public static final NavigationState PAUSED
```

Navigation has been paused mid-route

## Method Details

```
public static NavigationState valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static NavigationManager.NavigationState[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## NewInstructionEventListener

The class *NewInstructionEventListener* is a member of *com.here.android.mpa.guidance.NavigationManager*.

### Class Summary

public static abstract class **NavigationManager.NewInstructionEventListener**

*extends java.lang.Object*

*NewInstructionEventListener* provides callback of new instruction events from *NavigationManager*.

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 352: Constructors in *NewInstructionEventListener*

Constructors
<i>NewInstructionEventListener</i> ()

### Method Summary

Table 353: Methods in *NewInstructionEventListener*

Methods
public void <i>onNewInstructionEvent</i> () Callback for New Instruction event.

### Class Details

*NewInstructionEventListener* provides callback of new instruction events from *NavigationManager*. By default, an empty implementation is provided for the callback method.

### Constructor Details

***NewInstructionEventListener* ()**

### Method Details

public void ***onNewInstructionEvent*** ()

Callback for New Instruction event.

**See also:**

[\*getNextManeuver\(\)\*](#)

[\*getNextManeuverDistance\(\)\*](#)

[getAfterNextManeuver\(\)](#)

[getAfterNextManeuverDistance\(\)](#)

## PositionListener

The class *PositionListener* is a member of *com.here.android.mpa.guidance.NavigationManager*.

### Class Summary

public static abstract class **NavigationManager.PositionListener**

*extends java.lang.Object*

*PositionListener* provides callback of position events from *NavigationManager*.

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 354: Constructors in *PositionListener*

Constructors
<a href="#">PositionListener ()</a>

### Method Summary

Table 355: Methods in *PositionListener*

Methods
public void <a href="#">onPositionUpdated (GeoPosition loc)</a> Callback for Position Updated event.

### Class Details

*PositionListener* provides callback of position events from *NavigationManager*. By default, an empty implementation is provided for the callback method.

### Constructor Details

**PositionListener ()**

### Method Details

public void **onPositionUpdated (GeoPosition loc)**

Callback for Position Updated event.

**Parameters:**

- `loc`  
the updated position.

## RealisticViewListener

The class *RealisticViewListener* is a member of *com.here.android.mpa.guidance.NavigationManager*.

### Class Summary

public static abstract class **NavigationManager.RealisticViewListener**

*extends java.lang.Object*

*RealisticViewListenerAdapter* provides callback of realistic view related events from *NavigationManager*.

[For complete information, see the section *Class Details*]

**See also:**

[\*setRealisticViewMode\(RealisticViewMode\)\*](#)

### Constructor Summary

Table 356: Constructors in RealisticViewListener

Constructors
<a href="#"><i>RealisticViewListener</i> ()</a>

### Method Summary

Table 357: Methods in RealisticViewListener

Methods
public void <a href="#"><i>onRealisticViewHide</i></a> () Callback for hiding the realistic view.
public void <a href="#"><i>onRealisticViewNextManeuver</i></a> ( <i>AspectRatio</i> ratio, <i>Image</i> junctionImage, <i>Image</i> signImageIn2D) Callback for notifying the junction view and 2D sign image for the next maneuver.
public void <a href="#"><i>onRealisticViewShow</i></a> ( <i>AspectRatio</i> ratio, <i>Image</i> junctionImage, <i>Image</i> signImageIn2D) Callback for showing a junction view and 2D sign image.

## Class Details

`RealisticViewListenerAdapter` provides callback of realistic view related events from `NavigationManager`. By default, empty implementations are provided for all callbacks, users may selectively overload specific methods that are of interest.

No callback will be triggered if the HERE license key is invalid.

See also:

[`setRealisticViewMode\(RealisticViewMode\)`](#)

## Constructor Details

`RealisticViewListener ()`

## Method Details

`public void onRealisticViewHide ()`

Callback for hiding the realistic view.

`public void onRealisticViewNextManeuver (AspectRatio ratio, Image junctionImage, Image signImageIn2D)`

Callback for notifying the junction view and 2D sign image for the next maneuver.

Parameters:

- **ratio**  
The aspect ratio of the returned images.
- **junctionImage**  
The junction view image.
- **signImageIn2D**  
The 2D sign image.

`public void onRealisticViewShow (AspectRatio ratio, Image junctionImage, Image signImageIn2D)`

Callback for showing a junction view and 2D sign image.

Parameters:

- **ratio**  
The aspect ratio of the returned images.
- **junctionImage**  
The junction view image.
- **signImageIn2D**

A 2D sign image.

## RealisticViewMode

The enumeration *RealisticViewMode* is a member of *com.here.android.mpa.guidance.NavigationManager*.

### Enumeration Summary

public static final enumeration **NavigationManager.RealisticViewMode**

extends *java.lang.Enum*, *java.lang.Object*

Enum used to turn on/off realistic view (junction view and 2D signs).

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 358: Enum Constants in RealisticViewMode

Fields
<pre>public static final RealisticViewMode OFF</pre> <p>Off.</p>
<pre>public static final RealisticViewMode DAY</pre> <p>Day.</p>
<pre>public static final RealisticViewMode NIGHT</pre> <p>Night.</p>

### Method Summary

Table 359: Methods in RealisticViewMode

Methods
<pre>public int value ()</pre>
<pre>public static RealisticViewMode valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static NavigationManager.RealisticViewMode[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

### Enumeration Details

Enum used to turn on/off realistic view (junction view and 2D signs).

### Enum Constant Details

```
public static final RealisticViewMode OFF  
Off.
```

```
public static final RealisticViewMode DAY  
Day.
```

```
public static final RealisticViewMode NIGHT  
Night.
```

### Method Details

```
public int value ()
```

```
public static RealisticViewMode valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static NavigationManager.RealisticViewMode[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## RerouteListener

The class *RerouteListener* is a member of *com.here.android.mpa.guidance.NavigationManager*.

### Class Summary

```
public static abstract class NavigationManager.RerouteListener
```

```
extends java.lang.Object
```

*RerouteListener* provides callback of route re-calculation related events from *NavigationManager*.

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 360: Constructors in RerouteListener

Constructors
<a href="#">RerouteListener</a> ()

## Method Summary

Table 361: Methods in RerouteListener

Methods
public void <a href="#">onRerouteBegin</a> () Callback for Re-route begin event.
public void <a href="#">onRerouteEnd</a> ( <a href="#">Route</a> route) Deprecated: As of SDK 3.4. Callback for Re-route end event
public void <a href="#">onRerouteEnd</a> ( <a href="#">RouteResult</a> routeResult) Callback for Re-route end event.
public void <a href="#">onRerouteFailed</a> () Callback for Re-route failure event.

## Class Details

`RerouteListener` provides callback of route re-calculation related events from `NavigationManager`. By default, empty implementations are provided for each callback method, users may selectively overload specific methods that are of interest.

Note that this is different from route re-calculation due to traffic avoidance, instead, this normally triggered when user strays away from course. See [NavigationManager.TrafficAvoidanceMode](#).

## Constructor Details

`RerouteListener` ()

## Method Details

public void `onRerouteBegin` ()

Callback for Re-route begin event.

public void `onRerouteEnd` ([Route](#) route)

Deprecated: As of SDK 3.4.

Instead use `onRerouteEnd(RouteResult)`.

Callback for Re-route end event

**Parameters:**

- **route**  
The newly calculated Route.

```
public void onRerouteEnd (RouteResult routeResult)
```

Callback for Re-route end event.

**Parameters:**

- **routeResult**  
The *RouteResult* object.

**See also:**

[getViolatedOptions\(\)](#)

```
public void onRerouteFailed ()
```

Callback for Re-route failure event.

## RoadView

The class *RoadView* is a member of *com.here.android.mpa.guidance.NavigationManager*.

### Class Summary

```
public static class NavigationManager.RoadView
```

*extends java.lang.Object*

This static class controls road view of turn by turn navigation.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 362: Nested Classes in RoadView

Nested Classes
<pre>public static abstract interface <i>NavigationManager.RoadView.Listener</i></pre> <p>Interface to report RoadView events.</p>
<pre>public static abstract class <i>NavigationManager.RoadView.ListenerAdapter</i></pre> <p>class and overload specific methods to have a smaller code footprint.</p>

### Nested Classes

public static final enumeration [NavigationManager.RoadView.Orientation](#)

Used for setting the orientation when *ROADVIEW* or *ROADVIEW\_NOZOOM* is used.

## Method Summary

Table 363: Methods in RoadView

### Methods

public void [addListener](#) (java.lang.ref.WeakReference <[RoadView.Listener](#)> listener)

Adds a Road View event listener as a WeakReference.

public boolean [getAnimationEnabled](#) ()

**Deprecated:** As of SDK 3.5.

checks if animation between map movements is enabled.

public [Orientation](#) [getOrientation](#) ()

Gets the current orientation used by *ROADVIEW* and *ROADVIEW\_NOZOOM*.

public void [removeListener](#) ([Listener](#) listener)

Remove Road View event listener.

public void [setAnimationEnabled](#) (boolean enabled)

**Deprecated:** As of SDK 3.5.

set usage of animation between map movements.

public void [setOrientation](#) ([Orientation](#) orientation)

Sets the orientation for *ROADVIEW* and *ROADVIEW\_NOZOOM*.

public [Error](#) [zoomIn](#) ()

Zooms in the map.

public [Error](#) [zoomOut](#) ()

Zooms out the map.

## Class Details

This static class controls road view of turn by turn navigation.

## Method Details

public void [addListener](#) (java.lang.ref.WeakReference <[RoadView.Listener](#)> listener)

Adds a Road View event listener as a WeakReference.

### Parameters:

- **listener**  
the Road View event listener to add.

```
public boolean getAnimationEnabled ()
```

Deprecated: As of SDK 3.5.

This feature is no longer supported.

checks if animation between map movements is enabled.

**Returns:**

true if smooth animation is enabled between map movements in road view, false if no animation is used

```
public Orientation getOrientation ()
```

Gets the current orientation used by *ROADVIEW* and *ROADVIEW\_NOZOOM*.

**Returns:**

The *NavigationManager.RoadView.Orientation* currently in use.

```
public void removeListener (Listener listener)
```

Remove Road View event listener.

**Parameters:**

- **listener**  
the Road View event listener to remove.

```
public void setAnimationEnabled (boolean enabled)
```

Deprecated: As of SDK 3.5.

This feature is no longer supported.

set usage of animation between map movements.

**Parameters:**

- **enabled**  
true if smooth animation is enabled between map movements in road view, false if no animation is used.  
Note: Use of animation is disabled by default and should only be enabled when *ROADVIEW\_NOZOOM* is used.

```
public void setOrientation (Orientation orientation)
```

Sets the orientation for *ROADVIEW* and *ROADVIEW\_NOZOOM*. This method is only effective after the navigation has started running, otherwise *DYNAMIC* is used by default.

## Parameters:

- **orientation**

The *NavigationManager.RoadView.Orientation* to use.

```
public Error zoomIn ()
```

Zooms in the map.

## Returns:

*NONE* on success.

```
public Error zoomOut ()
```

Zooms out the map.

## Returns:

*NONE* on success.

## Listener

The interface *Listener* is a member of *com.here.android.mpa.guidance.NavigationManager.RoadView*.

## Interface Summary

```
public static abstract interface NavigationManager.RoadView.Listener
```

Interface to report RoadView events.

[For complete information, see the section *Interface Details*]

## Method Summary

Table 364: Methods in Listener

Methods
<pre>public abstract void <i>onPositionChanged</i> (<i>GeoCoordinate</i> geoCoordinate)</pre>
Callback when the position used by Road View has been changed.

## Interface Details

Interface to report RoadView events.

## Method Details

```
public abstract void onPositionChanged (GeoCoordinate geoCoordinate)
```

Callback when the position used by Road View has been changed. The main use case of this callback is for position indicator updates if client decides to implement their own for navigation with RoadView. This ensures a smooth tranistion of the indicator along with map movements as the operation is synchronized. **Note::** please do not perform a synchronized map redraw with this position update as this callback is within the scope of navigation manager's poll which is already doing a synchronized redraw. Any additional blocking operation will cause a deadlock.

**Parameters:**

- **geoCoordinate**  
*GeoCoordinate*

## ListenerAdapter

The class *ListenerAdapter* is a member of *com.here.android.mpa.guidance.NavigationManager.RoadView*.

### Class Summary

public static abstract class **NavigationManager.RoadView.ListenerAdapter**  
*implements* *com.here.android.mpa.guidance.NavigationManager.RoadView.Listener*  
*extends* *java.lang.Object*

class and overload specific methods to have a smaller code footprint.

[For complete information, see the section *Class Details*]

**See also:**

*NavigationManager.RoadView.Listener*

### Constructor Summary

Table 365: Constructors in ListenerAdapter

Constructors
<i>ListenerAdapter</i> ()

### Method Summary

Table 366: Methods in ListenerAdapter

Methods
public void <i>onPositionChanged</i> ( <i>GeoCoordinate</i> geoCoordinate)
Callback when the position used by Road View has been changed

### Class Details

class and overload specific methods to have a smaller code footprint.

See also:

[NavigationManager.RoadView.Listener](#)

## Constructor Details

**ListenerAdapter** ()

## Method Details

public void **onPositionChanged** ([GeoCoordinate](#) geoCoordinate)

Callback when the position used by Road View has been changed

Parameters:

- **geoCoordinate**  
[GeoCoordinate](#)

## Orientation

The enumeration *Orientation* is a member of *com.here.android.mpa.guidance.NavigationManager.RoadView*.

## Enumeration Summary

public static final enumeration **NavigationManager.RoadView.Orientation**

extends *java.lang.Enum*, *java.lang.Object*

Used for setting the orientation when *ROADVIEW* or *ROADVIEW\_NOZOOM* is used.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 367: Enum Constants in Orientation

Fields
public static final <i>Orientation</i> <b>DYNAMIC</b> Heading is at the top of the screen.
public static final <i>Orientation</i> <b>NORTH_UP</b> North is at the top of the screen.

## Method Summary

Table 368: Methods in Orientation

Methods
<pre>public int value ()</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static Orientation valueOf (String name)</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Used for setting the orientation when *ROADVIEW* or *ROADVIEW\_NOZOOM* is used.

### Enum Constant Details

```
public static final Orientation DYNAMIC
```

Heading is at the top of the screen.

```
public static final Orientation NORTH_UP
```

North is at the top of the screen.

### Method Details

```
public int value ()
```

```
public static Orientation valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static NavigationManager.RoadView.Orientation[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## SafetySpotListener

The class *SafetySpotListener* is a member of *com.here.android.mpa.guidance.NavigationManager*.

### Class Summary

public static abstract class **NavigationManager.SafetySpotListener**

extends *java.lang.Object*

*SafetySpotListener* provides callback of safety spot related events from *NavigationManager*.

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 369: Constructors in *SafetySpotListener*

Constructors
<i>SafetySpotListener</i> ()

### Method Summary

Table 370: Methods in *SafetySpotListener*

Methods
public void <i>onSafetySpot</i> ( <i>SafetySpotNotification</i> notification)
Callback to signal when safety spot notifications are available.

### Class Details

*SafetySpotListener* provides callback of safety spot related events from *NavigationManager*. By default, an empty implementation for the callback method is provided.

No callback will be triggered if the HERE license key is invalid.

### Constructor Details

***SafetySpotListener* ()**

### Method Details

public void *onSafetySpot* (*SafetySpotNotification* notification)

Callback to signal when safety spot notifications are available.

Parameters:

- **notification**

the safety spot notification.

## SpeedWarningListener

The class *SpeedWarningListener* is a member of *com.here.android.mpa.guidance.NavigationManager*.

### Class Summary

public static abstract class **NavigationManager.SpeedWarningListener**

*extends java.lang.Object*

*SpeedListener* provides callback of speed warning related events from *NavigationManager*.

[For complete information, see the section [Class Details](#)]

#### See also:

*setSpeedWarningEnabled(boolean)*

*setSpeedWarningOptions(float, float, float)*

### Constructor Summary

Table 371: Constructors in *SpeedWarningListener*

Constructors
<i>SpeedWarningListener</i> ()

### Method Summary

Table 372: Methods in *SpeedWarningListener*

Methods
public void <i>onSpeedExceeded</i> (String roadName, float speedLimit) Callback for Speed limit exceeded event.
public void <i>onSpeedExceededEnd</i> (String roadName, float speedLimit) Callback for Speed limit no longer exceeded event.

### Class Details

*SpeedListener* provides callback of speed warning related events from *NavigationManager*. By default, empty implementations are provided for each callback method, users may selectively overload specific methods that are of interest.

#### See also:

*setSpeedWarningEnabled(boolean)*

*setSpeedWarningOptions(float, float, float)*

## Constructor Details

**SpeedWarningListener** ()

## Method Details

**public void onSpeedExceeded (String roadName, float speedLimit)**

Callback for Speed limit exceeded event.

### Parameters:

- **roadName**  
Road name.
- **speedLimit**  
Current speed limit in meters per second.

**public void onSpeedExceededEnd (String roadName, float speedLimit)**

Callback for Speed limit no longer exceeded event.

### Parameters:

- **roadName**  
Road name.
- **speedLimit**  
Current speed limit in meters per second.

## TrafficAvoidanceMode

The enumeration *TrafficAvoidanceMode* is a member of *com.here.android.mpa.guidance.NavigationManager*.

### Enumeration Summary

**public static final enumeration NavigationManager.TrafficAvoidanceMode**

*extends java.lang.Enum, java.lang.Object*

Specifies if traffic should be automatically avoided or not during navigation

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 373: Enum Constants in `TrafficAvoidanceMode`

Fields
<pre>public static final <i>TrafficAvoidanceMode</i> <b>DYNAMIC</b></pre> <p>Route recalculated periodically taking traffic data into account.</p>
<pre>public static final <i>TrafficAvoidanceMode</i> <b>MANUAL</b></pre> <p>Traffic on route avoidance must be confirmed by the user</p>
<pre>public static final <i>TrafficAvoidanceMode</i> <b>DISABLE</b></pre> <p>Disable use of traffic for rerouting purpose</p>

## Method Summary

Table 374: Methods in `TrafficAvoidanceMode`

Methods
<pre>public int <i>value</i> ()</pre>
<pre>public static <i>TrafficAvoidanceMode</i> <i>valueOf</i> (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>NavigationManager.TrafficAvoidanceMode</i>[] <i>values</i> ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Specifies if traffic should be automatically avoided or not during navigation

### Enum Constant Details

```
public static final TrafficAvoidanceMode DYNAMIC
```

Route recalculated periodically taking traffic data into account. Updates automatically if the new route is better than existing one.

```
public static final TrafficAvoidanceMode MANUAL
```

Traffic on route avoidance must be confirmed by the user

```
public static final TrafficAvoidanceMode DISABLE
```

Disable use of traffic for rerouting purpose

## Method Details

```
public int value ()
```

```
public static TrafficAvoidanceMode valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static NavigationManager.TrafficAvoidanceMode[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## TrafficRerouteListener

The class *TrafficRerouteListener* is a member of *com.here.android.mpa.guidance.NavigationManager*.

### Class Summary

```
public static abstract class NavigationManager.TrafficRerouteListener
```

```
extends java.lang.Object
```

This adapter class receives notifications from *NavigationManager* that indicates traffic re-routing events due to the use of different *NavigationManager.TrafficAvoidanceModes*.

[For complete information, see the section *Class Details*]

### See also:

```
setTrafficAvoidanceMode(TrafficAvoidanceMode)
```

### Nested Class Summary

Table 375: Nested Classes in *TrafficRerouteListener*

Nested Classes
<pre>public static final enumeration <i>NavigationManager.TrafficRerouteListener.TrafficEnabledRoutingState</i></pre> <p>Enum used to describes the current route re-calculation due to traffic's status.</p>

## Constructor Summary

Table 376: Constructors in TrafficRerouteListener

Constructors
<a href="#">TrafficRerouteListener</a> ()

## Method Summary

Table 377: Methods in TrafficRerouteListener

Methods
<p>public void <a href="#">onTrafficRerouteBegin</a> (<a href="#">TrafficNotification</a> notification)</p> <p>Callback that is triggered when traffic-based route re-calculation has begun as a result of of a <a href="#">TrafficNotification</a>.</p>
<p>public void <a href="#">onTrafficRerouteFailed</a> (<a href="#">TrafficNotification</a> notification)</p> <p>Callback that is triggered when traffic-based route re-calculation has failed.</p>
<p>public void <a href="#">onTrafficRerouteState</a> (<a href="#">TrafficEnabledRoutingState</a> state)</p> <p>Callback to inform the user about current state of traffic enabled routing feature.</p>
<p>public void <a href="#">onTrafficRerouted</a> (<a href="#">Route</a> newRoute)</p> <p><b>Deprecated:</b> As of SDK 3.4.</p> <p>Callback to indicate a new <a href="#">Route</a> that has been calculated as a result of <a href="#">MANUAL</a> being in use.</p>
<p>public void <a href="#">onTrafficRerouted</a> (<a href="#">RouteResult</a> newRouteResult)</p> <p>Callback to indicate a new <a href="#">Route</a> that has been calculated as a result of <a href="#">MANUAL</a> being in use.</p>

## Class Details

This adapter class receives notifications from [NavigationManager](#) that indicates traffic re-routing events due to the use of different [NavigationManager.TrafficAvoidanceModes](#).

It provides an empty implementation by default. Sub-class of this adapter can selectively override methods that are of interest.

**See also:**

[setTrafficAvoidanceMode\(TrafficAvoidanceMode\)](#)

## Constructor Details

[TrafficRerouteListener](#) ()

## Method Details

public void [onTrafficRerouteBegin](#) ([TrafficNotification](#) notification)

Callback that is triggered when traffic-based route re-calculation has begun as a result of of a [TrafficNotification](#).

**Parameters:**

- **notification**

The [TrafficNotification](#) contains the avoided traffic events.

```
public void onTrafficRerouteFailed (TrafficNotification notification)
```

Callback that is triggered when traffic-based route re-calculation has failed.

**Parameters:**

- **notification**

The [TrafficNotification](#) associated with the callback.

```
public void onTrafficRerouteState (TrafficEnabledRoutingState state)
```

Callback to inform the user about current state of traffic enabled routing feature. Note that this callback will be triggered repeatedly during navigation.

**Parameters:**

- **state**

An enum [TrafficEnabledRoutingState](#) representing the current traffic enabled routing state.

**See also:**

[setTrafficAvoidanceMode\(TrafficAvoidanceMode\)](#)

```
public void onTrafficRerouted (Route newRoute)
```

**Deprecated:** As of SDK 3.4.

**Instead use** [onTrafficRerouted\(RouteResult\)](#).

Callback to indicate a new [Route](#) that has been calculated as a result of [MANUAL](#) being in use. The new Route is the fastest available at the time of the route calculation. Note: Clients can call [setRoute\(Route\)](#) to start using this new route.

**Parameters:**

- **newRoute**

The newly calculated Route.

```
public void onTrafficRerouted (RouteResult newRouteResult)
```

Callback to indicate a new [Route](#) that has been calculated as a result of [MANUAL](#) being in use. The new Route is the fastest available at the time of the route calculation. Note: Clients can call [setRoute\(Route\)](#) from [RouteResult.getRoute\(\)](#) to start using this new route.

**Parameters:**

- `newRouteResult`

The result indicating the new route.

**See also:**

[getViolatedOptions\(\)](#)

## TrafficEnabledRoutingState

The enumeration `TrafficEnabledRoutingState` is a member of `com.here.android.mpa.guidance.NavigationManager.TrafficRerouteListener`.

### Enumeration Summary

public static final enumeration `NavigationManager.TrafficRerouteListener.TrafficEnabledRoutingState`  
 extends `java.lang.Enum`, `java.lang.Object`

Enum used to describes the current route re-calculation due to traffic's status.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

**Table 378: Enum Constants in TrafficEnabledRoutingState**

Fields
<pre>public static final TrafficEnabledRoutingState OFF</pre> <p>Route re-calculation due to traffic is disabled, when traffic avoidance mode is set to <code>DISABLE</code>.</p>
<pre>public static final TrafficEnabledRoutingState ON</pre> <p>Route re-calculation due to traffic is enabled and not currently in use.</p>
<pre>public static final TrafficEnabledRoutingState ONGOING_REQUEST</pre> <p><b>Deprecated: As of SDK 3.4.</b>            Route re-calculation is enabled and it currently handling the on-going re-routing.</p>
<pre>public static final TrafficEnabledRoutingState NOT_AVAILABLE</pre> <p>Route re-calculation is enabled but re-routing cannot be processed.</p>

### Method Summary

**Table 379: Methods in TrafficEnabledRoutingState**

Methods
<pre>public static TrafficEnabledRoutingState valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>

## Methods

```
public static NavigationManager.TrafficRerouteListener.TrafficEnabledRoutingState[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

---

## Enumeration Details

Enum used to describes the current route re-calculation due to traffic's status.

### Enum Constant Details

```
public static final TrafficEnabledRoutingState OFF
```

Route re-calculation due to traffic is disabled, when traffic avoidance mode is set to *DISABLE*.

```
public static final TrafficEnabledRoutingState ON
```

Route re-calculation due to traffic is enabled and not currently in use.

```
public static final TrafficEnabledRoutingState ONGOING_REQUEST
```

Deprecated: As of SDK 3.4.

Will not occur.

Route re-calculation is enabled and it currently handling the on-going re-routing.

```
public static final TrafficEnabledRoutingState NOT_AVAILABLE
```

Route re-calculation is enabled but re-routing cannot be processed. For example, the application is currently offline.

## Method Details

```
public static TrafficEnabledRoutingState valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static NavigationManager.TrafficRerouteListener.TrafficEnabledRoutingState[] values  
()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## TtsOutputFormat

The enumeration *TtsOutputFormat* is a member of *com.here.android.mpa.guidance.NavigationManager*.

### Enumeration Summary

public static final enumeration **NavigationManager.TtsOutputFormat**

extends *java.lang.Enum*, *java.lang.Object*

Used for specifying TTS output format in which the text should be generated.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 380: Enum Constants in TtsOutputFormat

Fields
<pre>public static final TtsOutputFormat RAW</pre> <p>The text won't include any phonemes and escape sequences.</p>
<pre>public static final TtsOutputFormat NUANCE</pre> <p>The text will include phonemes in a format supported by Nuance TTS.</p>

### Method Summary

Table 381: Methods in TtsOutputFormat

Methods
<pre>public static TtsOutputFormat valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static NavigationManager.TtsOutputFormat[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

### Enumeration Details

Used for specifying TTS output format in which the text should be generated. See [setTtsOutputFormat\(NavigationManager.TtsOutputFormat\)](#).

### Enum Constant Details

public static final *TtsOutputFormat* **RAW**

The text won't include any phonemes and escape sequences.

```
public static final TtsOutputFormat NUANCE
```

The text will include phonemes in a format supported by Nuance TTS.

## Method Details

```
public static TtsOutputFormat valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static NavigationManager.TtsOutputFormat[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## UnitSystem

The enumeration *UnitSystem* is a member of *com.here.android.mpa.guidance.NavigationManager*.

### Enumeration Summary

```
public static final enumeration NavigationManager.UnitSystem
```

*extends java.lang.Enum, java.lang.Object*

Supported unit system types

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 382: Enum Constants in UnitSystem

Fields
<pre>public static final <i>UnitSystem</i> <b>METRIC</b></pre> <p>Meter and kilometer</p>
<pre>public static final <i>UnitSystem</i> <b>IMPERIAL</b></pre> <p>Miles and yards</p>
<pre>public static final <i>UnitSystem</i> <b>IMPERIAL_US</b></pre> <p>Miles and feet</p>

## Method Summary

Table 383: Methods in `UnitSystem`

Methods
<pre>public int value ()</pre>
<pre>public static UnitSystem valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static NavigationManager.UnitSystem[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Supported unit system types

### Enum Constant Details

```
public static final UnitSystem METRIC
```

Meter and kilometer

```
public static final UnitSystem IMPERIAL
```

Miles and yards

```
public static final UnitSystem IMPERIAL_US
```

Miles and feet

## Method Details

```
public int value ()
```

```
public static UnitSystem valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static NavigationManager.UnitSystem[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## SafetySpotNotification

The class *SafetySpotNotification* is a member of *com.here.android.mpa.guidance*.

### Class Summary

```
public final class SafetySpotNotification
```

```
extends java.lang.Object
```

Notification of incoming safety spots during navigation/tracking.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 384: Methods in SafetySpotNotification

Methods
<pre>public java.util.List &lt;<i>SafetySpotNotificationInfo</i>&gt; <b>getSafetySpotNotificationInfos</b> ()</pre> <p>Gets the list of <i>SafetySpotNotificationInfo</i> associated with this notification.</p>
<pre>public double <b>getSpeed</b> ()</pre> <p>Gets the speed at which the safety spots are approached in m/s.</p>

### Class Details

Notification of incoming safety spots during navigation/tracking.

### Method Details

```
public java.util.List <SafetySpotNotificationInfo> getSafetySpotNotificationInfos ()
```

Gets the list of *SafetySpotNotificationInfo* associated with this notification.

#### Returns:

The list of *SafetySpotNotificationInfo*.

```
public double getSpeed ()
```

Gets the speed at which the safety spots are approached in m/s.

#### Returns:

The speed.

## SafetySpotNotificationInfo

The class *SafetySpotNotificationInfo* is a member of *com.here.android.mpa.guidance*.

### Class Summary

```
public final class SafetySpotNotificationInfo
```

```
extends java.lang.Object
```

Notification information for this safety spot.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 385: Methods in SafetySpotNotificationInfo

#### Methods

```
public long getDistance ()
```

Gets the distance to this safety spot.

```
public SafetySpotInfo getSafetySpot ()
```

Gets the safety spot associated with this notification info.

```
public String toString ()
```

For documentation, see *java.lang.Object*

### Class Details

Notification information for this safety spot.

### Method Details

```
public long getDistance ()
```

Gets the distance to this safety spot.

#### Returns:

The distance in meters.

```
public SafetySpotInfo getSafetySpot ()
```

Gets the safety spot associated with this notification info.

#### Returns:

The safety spot.

```
public String toString ()
```

For documentation, see *java.lang.Object*

## TrafficNotification

The class *TrafficNotification* is a member of *com.here.android.mpa.guidance* .

### Class Summary

```
public final class TrafficNotification
```

*extends java.lang.Object*

Represents the traffic notification for the current navigation session.

[For complete information, see the section *Class Details*]

### Method Summary

Table 386: Methods in TrafficNotification

#### Methods

```
public java.util.List <TrafficNotificationInfo> getInfoList ()
```

Retrieves the list of traffic notification infos *TrafficNotificationInfo* associated with the traffic notification *TrafficNotification*

```
public String toString ()
```

For documentation, see *java.lang.Object*

### Class Details

Represents the traffic notification for the current navigation session.

### Method Details

```
public java.util.List <TrafficNotificationInfo> getInfoList ()
```

Retrieves the list of traffic notification infos *TrafficNotificationInfo* associated with the traffic notification *TrafficNotification*

#### Returns:

a list of traffic notification info

```
public String toString ()
```

For documentation, see *java.lang.Object*

## TrafficNotificationInfo

The class *TrafficNotificationInfo* is a member of *com.here.android.mpa.guidance*.

### Class Summary

public final class **TrafficNotificationInfo**

*extends java.lang.Object*

Represents the details information for the traffic notification.

[For complete information, see the section *Class Details*]

### Nested Class Summary

Table 387: Nested Classes in TrafficNotificationInfo

Nested Classes
public static final enumeration <i>TrafficNotificationInfo.Type</i> Type for a traffic notification, with regards to the current route

### Method Summary

Table 388: Methods in TrafficNotificationInfo

Methods
public <i>GeoBoundingBox</i> <i>getAffectedArea</i> () Return the bounding box affecting this <i>TrafficNotificationInfo</i> .
public long <i>getAffectedLength</i> () Returns the full length of the traffic event during tracking or the portion of the route affected by the traffic event during navigation.
public long <i>getDistanceInMeters</i> () The distance from the last callback position to the traffic notification
public <i>Severity</i> <i>getSeverity</i> () Gets the <i>TrafficEvent.Severity</i> of this traffic notification.
public long <i>getTravelTime</i> () Returns the free flow travel time for the road segments covered by the location of the traffic notification.
public long <i>getTravelTimeWithTraffic</i> () Returns the traffic travel time for the road segments covered by the location of the traffic notification.
public <i>Type</i> <i>getType</i> () The type of the traffic notification info <i>TrafficNotificationInfo</i>

## Methods

```
public String toString ()
```

For documentation, see *java.lang.Object*

---

## Class Details

Represents the details information for the traffic notification.

## Method Details

```
public GeoBoundingBox getAffectedArea ()
```

Return the bounding box affecting this *TrafficNotificationInfo* .

### Returns:

The *GeoBoundingBox* representing the area affected.

```
public long getAffectedLength ()
```

Returns the full length of the traffic event during tracking or the portion of the route affected by the traffic event during navigation.

### Returns:

The affected length (in meters).

```
public long getDistanceInMeters ()
```

The distance from the last callback position to the traffic notification

### Returns:

true if the traffic notification info is valid

```
public Severity getSeverity ()
```

Gets the *TrafficEvent.Severity* of this traffic notification.

### Returns:

The *TrafficEvent.Severity* of this traffic notification.

```
public long getTravelTime ()
```

Returns the free flow travel time for the road segments covered by the location of the traffic notification.

### Returns:

The travel time in seconds.

```
public long getTravelTimeWithTraffic ()
```

Returns the traffic travel time for the road segments covered by the location of the traffic notification.

**Returns:**

The traffic travel time in seconds.

```
public Type getType ()
```

The type of the traffic notification info [TrafficNotificationInfo](#)

**Returns:**

type of the traffic notification info

```
public String toString ()
```

For documentation, see [java.lang.Object](#)

## Type

The enumeration `Type` is a member of `com.here.android.mpa.guidance.TrafficNotificationInfo`.

### Enumeration Summary

```
public static final enumeration TrafficNotificationInfo.Type
```

*extends java.lang.Enum, java.lang.Object*

Type for a traffic notification, with regards to the current route

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 389: Enum Constants in Type

Fields
<pre>public static final Type UNDEFINED</pre> <p>Undefined.</p>
<pre>public static final Type ON_ROUTE</pre> <p>On route.</p>
<pre>public static final Type ON_HIGHWAY</pre> <p>On highway.</p>

## Fields

```
public static final Type NEAR_START
```

Near start.

```
public static final Type NEAR_STOPOVER
```

Near stopover.

```
public static final Type NEAR_DESTINATION
```

Near Destination.

## Method Summary

Table 390: Methods in Type

### Methods

```
public int value ()
```

```
public static Type valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static TrafficNotificationInfo.Type[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Type for a traffic notification, with regards to the current route

### Enum Constant Details

```
public static final Type UNDEFINED
```

Undefined.

```
public static final Type ON_ROUTE
```

On route.

```
public static final Type ON_HIGHWAY
```

On highway.

```
public static final Type NEAR_START
```

Near start.

```
public static final Type NEAR_STOPOVER
```

Near stopover.

```
public static final Type NEAR_DESTINATION
```

Near Destination.

### Method Details

```
public int value ()
```

```
public static Type valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static TrafficNotificationInfo.Type[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## TrafficUpdater

The class *TrafficUpdater* is a member of *com.here.android.mpa.guidance*.

### Class Summary

```
public final class TrafficUpdater
```

*extends java.lang.Object*

Handles traffic update requests.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 391: Nested Classes in TrafficUpdater

#### Nested Classes

```
public static final enumeration TrafficUpdater.Error
```

Traffic status errors

**Nested Classes**

public static abstract interface [TrafficUpdater.GetEventsListener](#)

Interface for report TrafficUpdaters events.

public static abstract interface [TrafficUpdater.Listener](#)

Interface to report traffic status changes.

public static final class [TrafficUpdater.RequestInfo](#)

Holds the error code and request id from a request for traffic.

public static final enumeration [TrafficUpdater.RequestState](#)

Traffic status enumeration

**Method Summary**

Table 392: Methods in TrafficUpdater

**Methods**

public void [cancelRequest](#) (long requestId)

Cancels a currently pending request.

public void [clear](#) ()

Clear current traffic events.

public void [enableUpdate](#) (boolean update)

Enable traffic updates.

public void [getEvents](#) (Route route, [GetEventsListener](#) listener)

Gets a list of [TrafficEvent](#) objects that affect the given route.

public void [getEvents](#) (RouteElement element, [GetEventsListener](#) listener)

Gets a list of [TrafficEvent](#) objects that affect the given route element.

public void [getEvents](#) (java.util.List <[RouteElement](#)> elements, [GetEventsListener](#) listener)

Gets a list of [TrafficEvent](#) objects that affect the given route elements.

public void [getEvents](#) (RouteElements elements, [GetEventsListener](#) listener)

Gets a list of [TrafficEvent](#) objects that affect the given [RouteElements](#).

public static [TrafficUpdater](#) [getInstance](#) ()

Gets the [TrafficUpdater](#) instance.

public boolean [isUpdateEnabled](#) ()

Check to see if traffic updating is enabled.

public [RequestInfo](#) [request](#) ([GeoCoordinate](#) center, [Listener](#) listener)

Request traffic with given center coordinates and the default radius (10km).

public [RequestInfo](#) [request](#) ([GeoCoordinate](#) center, int radius, [Listener](#) listener)

Request traffic with given center coordinates and radius.

## Methods

```
public RequestInfo request (Route route, Listener listener)
```

Request traffic for given route with a default radius (10km) around each waypoint.

```
public RequestInfo request (Route route, int radius, Listener listener)
```

Request traffic for given route and radius around each waypoint.

```
public RequestInfo request (RouteElements elements, Listener listener)
```

Request traffic for a *RouteElements* object.

```
public boolean setRefreshInterval (int refreshInterval)
```

Sets the interval at which traffic data is refreshed.

## Class Details

Handles traffic update requests.

## Method Details

```
public void cancelRequest (long requestId)
```

Cancels a currently pending request.

### Parameters:

- **requestId**

The request ID to cancel. Can be obtained from the *getRequestId()* returned in the original request.

```
public void clear ()
```

Clear current traffic events.

```
public void enableUpdate (boolean update)
```

Enable traffic updates.

### Parameters:

- **update**

True if traffic updates requested. False otherwise.

```
public void getEvents (Route route, GetEventsListener listener)
```

Gets a list of *TrafficEvent* objects that affect the given route. It's a good idea to call *request(Route, TrafficUpdater.Listener)* prior to making this call.

NOTE: Truck routes and public transit timetable routes are unsupported. *TrafficUpdater.GetEventsListener* will return with error *UNSUPPORTED\_ROUTE\_MODE*.

### Parameters:

- **route**

The *Route* to check for traffic events.

- **listener**

The listener which will receive the list of *TrafficEvents*.

```
public void getEvents (RouteElement element, GetEventsListener listener)
```

Gets a list of *TrafficEvent* objects that affect the given route element. It's a good idea to call *request(Route, TrafficUpdater.Listener)* prior to making this call.

NOTE: Truck routes and public transit timetable routes are unsupported. *TrafficUpdater.GetEventsListener* will return with error *UNSUPPORTED\_ROUTE\_MODE*.

**Parameters:**

- **element**

The *RouteElement* to check for traffic events.

- **listener**

The listener which will receive the list of *TrafficEvents*.

```
public void getEvents (java.util.List <RouteElement> elements, GetEventsListener listener)
```

Gets a list of *TrafficEvent* objects that affect the given route elements. It's a good idea to call *request(RouteElements, TrafficUpdater.Listener)* prior to making this call.

NOTE: Truck routes and public transport timetable routes are unsupported. *TrafficUpdater.GetEventsListener* will return with error *UNSUPPORTED\_ROUTE\_MODE*.

**Parameters:**

- **elements**

The list of *RouteElement* objects to check for traffic events.

- **listener**

The listener which will receive the list of *TrafficEvents*.

```
public void getEvents (RouteElements elements, GetEventsListener listener)
```

Gets a list of *TrafficEvent* objects that affect the given *RouteElements*. It's a good idea to call *request(RouteElements, TrafficUpdater.Listener)* prior to making this call.

NOTE: Truck routes and public transport timetable routes are unsupported. *TrafficUpdater.GetEventsListener* will return with error *UNSUPPORTED\_ROUTE\_MODE*.

**Parameters:**

- **elements**

The *RouteElements* to check for traffic events.

- **listener**

The listener which will receive the list of `TrafficEvents`.

```
public static TrafficUpdater getInstance ()
```

Gets the `TrafficUpdater` instance.

**Returns:**

The `TrafficUpdater` instance.

```
public boolean isUpdateEnabled ()
```

Check to see if traffic updating is enabled. If it is not, no calls to any request traffic functions will have any effect.

**Returns:**

true if traffic updating is enabled. false otherwise.

```
public RequestInfo request (GeoCoordinate center, Listener listener)
```

Request traffic with given center coordinates and the default radius (10km).

**Parameters:**

- **center**  
Center coordinate where traffic updates are requested.
- **listener**  
Listener that will notified when request completes.

**Returns:**

A `TrafficUpdater.RequestInfo` containing the error code of the request and a request id if the error is `NONE`.

```
public RequestInfo request (GeoCoordinate center, int radius, Listener listener)
```

Request traffic with given center coordinates and radius. Using a radius greater than the default (10km) can impact performance.

**Parameters:**

- **center**  
Center coordinate where traffic updates are requested.
- **radius**  
Distance (in km) of the request radius.
- **listener**  
Listener that will notified when request completes.

**Returns:**

A *TrafficUpdater.RequestInfo* containing the error code of the request and a request id if the error is *NONE*.

```
public RequestInfo request (Route route, Listener listener)
```

Request traffic for given route with a default radius (10km) around each waypoint.

NOTE: Truck routes and public transport timetable routes are unsupported. *TrafficUpdater.RequestInfo* will return *UNSUPPORTED\_ROUTE\_MODE*.

**Parameters:**

- **route**  
Route used to query traffic events.
- **listener**  
Listener that will notified when request completes.

**Returns:**

A *TrafficUpdater.RequestInfo* containing the error code of the request and a request id if the error is *NONE*.

```
public RequestInfo request (Route route, int radius, Listener listener)
```

Request traffic for given route and radius around each waypoint.

NOTE: Truck routes and public transport timetable routes are unsupported. *TrafficUpdater.RequestInfo* will return *UNSUPPORTED\_ROUTE\_MODE*.

**Parameters:**

- **route**  
Route used to query traffic events.
- **radius**  
Distance (in km) of the request radius.
- **listener**  
Listener that will notified when request completes.

**Returns:**

A *TrafficUpdater.RequestInfo* containing the error code of the request and a request id if the error is *NONE*.

```
public RequestInfo request (RouteElements elements, Listener listener)
```

Request traffic for a *RouteElements* object.

NOTE: Truck route elements and public transport timetable route elements are unsupported. *TrafficUpdater.RequestInfo* will return *UNSUPPORTED\_ROUTE\_MODE*.

**Parameters:**

- **elements**

The `RouteElements` object to request traffic on.

- **listener**

Listener that will notified when request completes.

**Returns:**

A `TrafficUpdater.RequestInfo` containing the error code of the request and a request id if the error is `NONE`.

## `public boolean setRefreshInterval (int refreshInterval)`

Sets the interval at which traffic data is refreshed. This method **MUST** be called before the HERE SDK uses any traffic in the current app session - e.g. before any other `TrafficUpdater` methods are called, before traffic is enabled on a Map View and before routing with traffic is performed. If this method is called too late then false will be returned. Traffic refresh interval defaults to a value determined by the HERE traffic servers.

**Parameters:**

- **refreshInterval**

Refresh interval in seconds. Must be within the range 60..300.

**Returns:**

refreshInterval True the interval was set successfully, NO if traffic is already initialized or if refreshInterval is outside the valid range.

## Error

The enumeration `Error` is a member of `com.here.android.mpa.guidance.TrafficUpdater`.

### Enumeration Summary

`public static final enumeration TrafficUpdater.Error`

*extends java.lang.Enum, java.lang.Object*

Traffic status errors

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 393: Enum Constants in Error

Fields
<code>public static final Error NONE</code> No error.
<code>public static final Error INVALID_PARAMETERS</code> Invalid parameters

### Fields

```
public static final Error OUT_OF_MEMORY
```

Out of memory

```
public static final Error INVALID_OPERATION
```

Operation not allowed at the time of the call because another request is already in progress

```
public static final Error REQUEST_FAILED
```

Operation failed. Usually happens when traffic request is initiated when map is moving, panning or when network connection is not available

```
public static final Error INVALID_CREDENTIALS
```

HERE Developer credentials are invalid or were not provided

```
public static final Error UNKNOWN
```

Generic error

```
public static final Error UNSUPPORTED_ROUTE_MODE
```

The route mode is not supported by TrafficUpdater

```
public static final Error OPERATION_NOT_ALLOWED
```

Access to this operation is denied.

## Method Summary

Table 394: Methods in Error

### Methods

```
public int value ()
```

```
public static Error valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static TrafficUpdater.Error[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Traffic status errors

### Enum Constant Details

```
public static final Error NONE
```

No error.

```
public static final Error INVALID_PARAMETERS
```

Invalid parameters

```
public static final Error OUT_OF_MEMORY
```

Out of memory

```
public static final Error INVALID_OPERATION
```

Operation not allowed at the time of the call because another request is already in progress

```
public static final Error REQUEST_FAILED
```

Operation failed. Usually happens when traffic request is initiated when map is moving, panning or when network connection is not available

```
public static final Error INVALID_CREDENTIALS
```

HERE Developer credentials are invalid or were not provided

```
public static final Error UNKNOWN
```

Generic error

```
public static final Error UNSUPPORTED_ROUTE_MODE
```

The route mode is not supported by TrafficUpdater

```
public static final Error OPERATION_NOT_ALLOWED
```

Access to this operation is denied. Contact your HERE representative for more information.

## Method Details

```
public int value ()
```

```
public static Error valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static TrafficUpdater.Error\[\] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## GetEventsListener

The interface *GetEventsListener* is a member of *com.here.android.mpa.guidance.TrafficUpdater*.

### Interface Summary

```
public static abstract interface TrafficUpdater.GetEventsListener
```

Interface for report TrafficUpdaters events.

[For complete information, see the section [Interface Details](#)]

### Method Summary

Table 395: Methods in GetEventsListener

Methods
public abstract void <a href="#">onComplete</a> (java.util.List < <a href="#">TrafficEvent</a> > events, <a href="#">Error</a> error)

### Interface Details

Interface for report TrafficUpdaters events.

### Method Details

```
public abstract void onComplete (java.util.List <TrafficEvent> events, Error error)
```

Parameters:

- **events**
- **error**

## Listener

The interface *Listener* is a member of *com.here.android.mpa.guidance.TrafficUpdater*.

### Interface Summary

```
public static abstract interface TrafficUpdater.Listener
```

Interface to report traffic status changes.

[For complete information, see the section [Interface Details](#)]

## Method Summary

Table 396: Methods in Listener

Methods
<pre>public abstract void <i>onStatusChanged</i> (<i>RequestState</i> state)</pre> <p>Callback for Traffic status changes.</p>

## Interface Details

Interface to report traffic status changes.

## Method Details

```
public abstract void onStatusChanged (RequestState state)
```

Callback for Traffic status changes.

### Parameters:

- **state**  
representing the traffic request status.

## RequestInfo

The class *RequestInfo* is a member of *com.here.android.mpa.guidance.TrafficUpdater*.

## Class Summary

```
public static final class TrafficUpdater.RequestInfo
```

*extends java.lang.Object*

Holds the error code and request id from a request for traffic.

[For complete information, see the section [Class Details](#)]

## Method Summary

Table 397: Methods in RequestInfo

Methods
<pre>public <i>Error</i> <i>getError</i> ()</pre> <p>The error code for the request.</p>
<pre>public long <i>getRequestId</i> ()</pre> <p>The request id of the request.</p>

## Class Details

Holds the error code and request id from a request for traffic.

## Method Details

```
public Error getError ()
```

The error code for the request.

### Returns:

The error code.

```
public long getRequestId ()
```

The request id of the request. Can be used to cancel a request. Note that this is only valid if error is *NONE*.

### Returns:

The request id.

### See also:

[cancelRequest\(long\)](#)

## RequestState

The enumeration *RequestState* is a member of *com.here.android.mpa.guidance.TrafficUpdater*.

## Enumeration Summary

```
public static final enumeration TrafficUpdater.RequestState
```

```
extends java.lang.Enum, java.lang.Object
```

Traffic status enumeration

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 398: Enum Constants in RequestState

Fields
public static final <i>RequestState</i> <b>ERROR</b>
public static final <i>RequestState</i> <b>DONE</b>

## Method Summary

Table 399: Methods in RequestState

Methods
<pre>public int value ()</pre>
<pre>public static RequestState valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static TrafficUpdater.RequestState[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Traffic status enumeration

### Enum Constant Details

```
public static final RequestState ERROR
```

```
public static final RequestState DONE
```

## Method Details

```
public int value ()
```

```
public static RequestState valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static TrafficUpdater.RequestState[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## TrafficWarner

The class *TrafficWarner* is a member of *com.here.android.mpa.guidance*.

## Class Summary

public final class **TrafficWarner**

extends *java.lang.Object*

Represents the traffic warning information for the current navigation session.

[For complete information, see the section [Class Details](#)]

## Nested Class Summary

Table 400: Nested Classes in TrafficWarner

Nested Classes
public static abstract class <i>TrafficWarner.Listener</i> A listener for traffic notifications which should be added to a traffic warner

## Method Summary

Table 401: Methods in TrafficWarner

Methods
public void <i>addListener</i> (java.lang.ref.WeakReference <Listener> listener) Adds a listener for the traffic warner
public void <i>clear</i> () Clears the traffic warner
public static <i>TrafficNotification</i> <i>getNotificationOnRoute</i> () Gets the traffic notification for the route currently in use by <i>NavigationManager</i> .
public static <i>TrafficNotification</i> <i>getNotificationOnRoute</i> (Route route) Gets the traffic notification for a given <i>Route</i> .
public boolean <i>init</i> () Initializes the traffic warner, and starts it automatically.
public boolean <i>isAhead</i> ( <i>TrafficNotification</i> notification) Determines whether or not a traffic notification <i>TrafficNotification</i> is ahead of the last callback position
public boolean <i>isOnRoute</i> (Route route, <i>TrafficNotification</i> notification) Determines whether or not a traffic notification <i>TrafficNotification</i> is on a given route <i>Route</i>
public boolean <i>isValid</i> () Determines whether or not the traffic warner is valid
public void <i>removeListener</i> (Listener listener) Removes a listener from the traffic warner
public void <i>start</i> () Starts the traffic warner

### Methods

```
public void stop ()
```

Stops the traffic warner

### Class Details

Represents the traffic warning information for the current navigation session.

### Method Details

```
public void addListener (java.lang.ref.WeakReference <Listener> listener)
```

Adds a listener for the traffic warner

#### Parameters:

- **listener**  
to be added

```
public void clear ()
```

Clears the traffic warner

```
public static TrafficNotification getNotificationOnRoute ()
```

Gets the traffic notification for the route currently in use by *NavigationManager*.

#### Returns:

The notification for the route currently in use by *NavigationManager* or null if navigation is not active.

#### Throws:

- **AccessControlException**  
Access to this operation is denied. Contact your HERE representative for more information.

```
public static TrafficNotification getNotificationOnRoute (Route route)
```

Gets the traffic notification for a given *Route*.

#### Parameters:

- **route**  
The route to query for a traffic notification.

#### Returns:

The traffic notification object.

#### Throws:

- **AccessControlException**

Access to this operation is denied. Contact your HERE representative for more information.

```
public boolean init ()
```

Initializes the traffic warner, and starts it automatically. This method should be called only after [NavigationManager](#) is running with tracking, simulation, or navigation, or `false` will be returned.

**Returns:**

`true` if the initialization succeeded without errors.

**Throws:**

- **AccessControlException**

Access to this operation is denied. Contact your HERE representative for more information.

```
public boolean isAhead (TrafficNotification notification)
```

Determines whether or not a traffic notification [TrafficNotification](#) is ahead of the last callback position

**Parameters:**

- **notification**

[TrafficNotification](#) to be checked

**Returns:**

`true` if the notification is ahead of last callback position

```
public boolean isOnRoute (Route route, TrafficNotification notification)
```

Determines whether or not a traffic notification [TrafficNotification](#) is on a given route [Route](#)

**Parameters:**

- **route**  
Route to be used
- **notification**  
Notification to be checked

**Returns:**

`true` if the notification is on the route

```
public boolean isValid ()
```

Determines whether or not the traffic warner is valid

**Returns:**

`true` if traffic warner is valid

```
public void removeListener (Listener listener)
```

Removes a listener from the traffic warner

**Parameters:**

- **listener**  
to be removed

```
public void start ()
```

Starts the traffic warner

```
public void stop ()
```

Stops the traffic warner

## Listener

The class *Listener* is a member of *com.here.android.mpa.guidance.TrafficWarner*.

### Class Summary

```
public static abstract class TrafficWarner.Listener
```

*extends java.lang.Object*

A listener for traffic notifications which should be added to a traffic warner

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 402: Constructors in Listener

Constructors
<i>Listener</i> ()

### Method Summary

Table 403: Methods in Listener

Methods
public abstract void <i>onTraffic</i> ( <i>TrafficNotification</i> notification)
Callback for the traffic warner

## Class Details

A listener for traffic notifications which should be added to a traffic warner

## Constructor Details

### Listener ()

## Method Details

public abstract void **onTraffic** (*TrafficNotification* notification)

Callback for the traffic warner

#### Parameters:

- **notification**  
associated with the callback

## VoiceCatalog

The class *VoiceCatalog* is a member of *com.here.android.mpa.guidance*.

## Class Summary

public final class **VoiceCatalog**

*extends java.lang.Object*

Manages the voice catalog used to download new voice skins.

[For complete information, see the section *Class Details*]

## Nested Class Summary

Table 404: Nested Classes in VoiceCatalog

### Nested Classes

public static final enumeration *VoiceCatalog.Error*

Error codes for *VoiceCatalog.OnDownloadDoneListener*.

public static abstract interface *VoiceCatalog.OnDownloadDoneListener*

Callback from report that the voice catalog/package download is done

public static abstract interface *VoiceCatalog.OnProgressListener*

Callback to report the catalog/package download progress.

## Field Summary

Table 405: Fields in VoiceCatalog

Fields
<pre>public static final int <b>ID_BEEPS_VIBRATE</b></pre> <p>Pass this to <code>getLocalVoiceSkin(long)</code> to get the locally deployed skin for beeps and vibration.</p>

## Method Summary

Table 406: Methods in VoiceCatalog

Methods
<pre>public void <b>cancel</b> ()</pre> <p>Cancels any current downloads</p>
<pre>public boolean <b>deleteVoiceSkin</b> (long id)</pre> <p>Deletes a voice skin by voice skin id from the file system Once deletion is complete the voice catalog is refreshed</p>
<pre>public boolean <b>deleteVoiceSkin</b> (VoiceSkin skin)</pre> <p>Deletes a voice skin from the file system.</p>
<pre>public boolean <b>downloadCatalog</b> (OnDownloadDoneListener listener)</pre> <p>Start downloading the catalog for the current device locale language.</p>
<pre>public boolean <b>downloadVoice</b> (long id, OnDownloadDoneListener listener)</pre> <p>Start downloading voice package with given identifier.</p>
<pre>public java.util.List &lt;VoicePackage&gt; <b>getCatalogList</b> ()</pre> <p>Get the voice package description from the local catalog.</p>
<pre>public static VoiceCatalog <b>getInstance</b> ()</pre> <p>Get access to the VoiceCatalog Singleton.</p>
<pre>public VoiceSkin <b>getLocalVoiceSkin</b> (long id)</pre> <p>Get the voice using a specific identifier from the local storage.</p>
<pre>public java.util.List &lt;VoiceSkin&gt; <b>getLocalVoiceSkins</b> ()</pre> <p>Get the voice list from the local storage.</p>
<pre>public boolean <b>isDownloading</b> ()</pre> <p>Checks if the <i>VoiceCatalog</i> is downloading</p>
<pre>public boolean <b>isLocalCatalogAvailable</b> ()</pre> <p>Check if the voice catalog for the current device locale is available in local storage.</p>
<pre>public boolean <b>isLocalVoiceSkin</b> (long id)</pre> <p>Check if voice skin with given id is locally stored.</p>

## Methods

```
public void refreshVoiceSkins ()
```

Method to refresh the list of voice skins on the file system Note: If there are any pending downloads, it will be cancelled before the list is refreshed.

```
public void setOnProgressEventListener (OnProgressListener listener)
```

Register VoiceCatalog download progress listener.

## Class Details

Manages the voice catalog used to download new voice skins.

## Field Details

```
public static final int ID_BEEPS_VIBRATE
```

Pass this to *getLocalVoiceSkin(long)* to get the locally deployed skin for beeps and vibration. The beeps and vibration skin is not part of the online catalog.

## Method Details

```
public void cancel ()
```

Cancels any current downloads

```
public boolean deleteVoiceSkin (long id)
```

Deletes a voice skin by voice skin id from the file system Once deletion is complete the voice catalog is refreshed

### Parameters:

- **id**  
The Id of the Voice Skin to be deleted

### Returns:

true if voice skin is successfully deleted, false otherwise.

```
public boolean deleteVoiceSkin (VoiceSkin skin)
```

Deletes a voice skin from the file system. Once deletion is complete the voice catalog is refreshed

### Parameters:

- **skin**  
*VoiceSkin* to delete

### Returns:

true if successful, false otherwise

```
public boolean downloadCatalog (OnDownloadDoneListener listener)
```

Start downloading the catalog for the current device locale language. Catalog file is then stored locally for future access.

**Parameters:**

- **listener**  
Download completion listener.

**Returns:**

true if download initialization is successful, otherwise false is returned. Use *isDownloading()* to check if there is already an outstanding voice catalog download request that causes false to be returned.

**See also:**

*isDownloading()*

```
public boolean downloadVoice (long id, OnDownloadDoneListener listener)
```

Start downloading voice package with given identifier. Note: only one voice package download at time is possible.

**Parameters:**

- **id**  
Voice package identifier.
- **listener**  
Download completion listener.

**Returns:**

true if download is initialized successfully. false otherwise.

```
public java.util.List <VoicePackage> getCatalogList ()
```

Get the voice package description from the local catalog. If no catalog matching the device's current locale is present, the list of voice package(s) in the most recently used local voice catalog will be returned instead. In the event this last known local voice catalog is not available, an empty list will be returned.

When device locale is changed, user must call *refreshVoiceSkins()* to reload the voice catalog that adheres to the new locale language. If the voice catalog associated with the new locale language is not available locally, this method will default back to the most recently used local catalog. Therefore, users are recommended to check if there is a local catalog available of the device's current locale by calling *isLocalCatalogAvailable()*. If the local catalog is unavailable, call *downloadCatalog(OnDownloadDoneListener)* to download of the voice catalog for the new locale language.

Occasionally, an existing catalog can also become obsolete and returns an empty voice package List . This will require the download of the voice catalog again.

**Returns:**

A List of VoicePackage objects. An empty List can be returned.

**See also:**

[downloadCatalog\(OnDownloadDoneListener\)](#)

[setMapDisplayLanguage\(Locale\)](#)

```
public static VoiceCatalog getInstance ()
```

Get access to the VoiceCatalog Singleton.

**Returns:**

VoiceCatalog instance

**Throws:**

- **AccessControlException**  
Access to this operation is denied. Contact your HERE representative for more information.

```
public VoiceSkin getLocalVoiceSkin (long id)
```

Get the voice using a specific identifier from the local storage. If no voice with the identifier is present, a null reference is returned.

**Parameters:**

- **id**  
VoiceSkin identifier.

**Returns:**

VoiceSkin if found. Null otherwise.

```
public java.util.List <VoiceSkin> getLocalVoiceSkins ()
```

Get the voice list from the local storage. If no voice is present an empty array is returned

**Returns:**

Array of VoiceSkin objects (can be empty).

```
public boolean isDownloading ()
```

Checks if the *VoiceCatalog* is downloading

**Returns:**

True if downloading, false otherwise.

```
public boolean isLocalCatalogAvailable ()
```

Check if the voice catalog for the current device locale is available in local storage. If not, user can download it using [downloadCatalog\(OnDownloadDoneListener\)](#).

**Returns:**

true if the voice catalog is available in local storage. false otherwise.

```
public boolean isLocalVoiceSkin (long id)
```

Check if voice skin with given id is locally stored.

**Parameters:**

- **id**  
Voice skin identifier.

**Returns:**

True if voice skin with given id is locally stored.

```
public void refreshVoiceSkins ()
```

Method to refresh the list of voice skins on the file system Note: If there are any pending downloads, it will be cancelled before the list is refreshed. After calling this function, clients can get the updated catalog list by calling `getCatalogList()`

```
public void setOnProgressEventListener (OnProgressListener listener)
```

Register VoiceCatalog download progress listener.

**Parameters:**

- **listener**  
Download progress listener.

## Error

The enumeration *Error* is a member of *com.here.android.mpa.guidance.VoiceCatalog*.

### Enumeration Summary

```
public static final enumeration VoiceCatalog.Error
```

```
extends java.lang.Enum, java.lang.Object
```

Error codes for *VoiceCatalog.OnDownloadDoneListener*.

[For complete information, see the section *Enumeration Details*]

## Enum Constant Summary

Table 407: Enum Constants in Error

Fields
<pre>public static final Error NONE</pre> <p>No error.</p>
<pre>public static final Error UNKNOWN</pre> <p>Unknown error.</p>
<pre>public static final Error NOT_ENOUGH_DISK_SPACE</pre> <p>The disk does not have the space required to perform the requested <i>VoiceCatalog</i> operation.</p>

## Method Summary

Table 408: Methods in Error

Methods
<pre>public int value ()</pre>
<pre>public static Error valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static VoiceCatalog.Error[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Error codes for *VoiceCatalog.OnDownloadDoneListener*.

### Enum Constant Details

```
public static final Error NONE
```

No error.

```
public static final Error UNKNOWN
```

Unknown error.

```
public static final Error NOT_ENOUGH_DISK_SPACE
```

The disk does not have the space required to perform the requested *VoiceCatalog* operation.

## Method Details

```
public int value ()
```

```
public static Error valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static VoiceCatalog.Error[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## OnDownloadDoneListener

The interface *OnDownloadDoneListener* is a member of *com.here.android.mpa.guidance.VoiceCatalog*.

### Interface Summary

```
public static abstract interface VoiceCatalog.OnDownloadDoneListener
```

Callback from report that the voice catalog/package download is done

[For complete information, see the section [Interface Details](#)]

### Method Summary

Table 409: Methods in OnDownloadDoneListener

Methods
<pre>public abstract void <i>onDownloadDone</i> (<i>Error</i> error)</pre> <p>Report download completion.</p>

### Interface Details

Callback from report that the voice catalog/package download is done

### Method Details

```
public abstract void onDownloadDone (Error error)
```

Report download completion.

**Parameters:**

- **error**

Download completion error code. *NONE* is returned if successful. Otherwise error. Note: It will return *NOT\_ENOUGH\_DISK\_SPACE* if the device storage with the requested voice package installed would reach the critical level of 500MB. Below this level the device's file system may reject file operations which will result in installation failures.

## OnProgressListener

The interface *OnProgressListener* is a member of *com.here.android.mpa.guidance.VoiceCatalog*.

### Interface Summary

public static abstract interface **VoiceCatalog.OnProgressListener**

Callback to report the catalog/package download progress.

[For complete information, see the section *Interface Details*]

### Method Summary

Table 410: Methods in OnProgressListener

Methods
public abstract void <i>onProgress</i> (int percentage) Report download progress.

### Interface Details

Callback to report the catalog/package download progress.

### Method Details

public abstract void **onProgress** (int percentage)

Report download progress.

**Parameters:**

- **percentage**

Percentage of download completion.

## VoicePackage

The class *VoicePackage* is a member of *com.here.android.mpa.guidance* .

## Class Summary

public final class **VoicePackage**

*extends java.lang.Object*

Return information about downloaded voice packages.

[For complete information, see the section [Class Details](#)]

## Nested Class Summary

Table 411: Nested Classes in VoicePackage

Nested Classes
public static final enumeration <a href="#">VoicePackage.Gender</a> Gender for a VoicePackage .
public static final enumeration <a href="#">VoicePackage.TravelMode</a> Travel Mode of voice package.

## Method Summary

Table 412: Methods in VoicePackage

Methods
public String <a href="#">getBCP47Code</a> () Get the international BCP-47 code describing the language of the voice skin (see <a href="http://tools.ietf.org/rfc/bcp/bcp47.txt">http://tools.ietf.org/rfc/bcp/bcp47.txt</a> ).
public float <a href="#">getContentSize</a> () Size of the package after unzipping to the device
public Hashtable <a href="#">getCustomAttributes</a> () Gets the custom attributes from the Voice package.
public float <a href="#">getDownloadSize</a> () Size of the download required for this package
public <a href="#">Gender</a> <a href="#">getGender</a> () Gets the gender of the voice skin.
public long <a href="#">getId</a> () Get the package identifier.
public String <a href="#">getLocalizedGender</a> () Gets the localized description of the gender for this voice skin.
public String <a href="#">getLocalizedLanguage</a> () Get the localized description of the language of this voice skin.
public String <a href="#">getLocalizedQuality</a> () Get the localized description of the voice skin quality

## Methods

```
public String getLocalizedType ()
```

Get the localized description for the type of voice package.

```
public String getMarcCode ()
```

Get the international MARC code describing the language of the voice skin (see <http://www.loc.gov/marc/languages>).

```
public String getName ()
```

Get the package name.

```
public String getQuality ()
```

Get the text description of the voice skin quality

```
public TravelMode getTravelMode ()
```

Get the *VoicePackage.TravelMode* of voice package.

```
public String getVersion ()
```

Get the package version.

```
public boolean isLocal ()
```

Check if the voice is locally installed.

```
public boolean isTts ()
```

Get voice TextToSpeech capability.

```
public boolean isTtsLanguageAvailable ()
```

Gets whether this voice package language is supported by this TTS engine.

## Class Details

Return information about downloaded voice packages. Used in *VoiceCatalog*.

## Method Details

```
public String getBCP47Code ()
```

Get the international BCP-47 code describing the language of the voice skin (see <http://tools.ietf.org/rfc/bcp/bcp47.txt>).

### Returns:

The BCP-47 code, e.g. "en".

```
public float getContentSize ()
```

Size of the package after unzipping to the device

### Returns:

float, number of megabytes

```
public Hashtable getCustomAttributes ()
```

Gets the custom attributes from the Voice package.

**Returns:**

a hashtable containing key values pairs representing the Attributes

```
public float getDownloadSize ()
```

Size of the download required for this package

**Returns:**

float, number of megabytes

```
public Gender getGender ()
```

Gets the gender of the voice skin.

Note: if the voice package is a TTS package, then the gender is only a suggestion. The current Android TTS engine does not support switching voice genders. Clients that use third-party engines that support genders may use this API as a suggestion.

**Returns:**

The *VoicePackage.Gender* of the voice skin.

```
public long getId ()
```

Get the package identifier.

**Returns:**

Package identifier.

```
public String getLocalizedGender ()
```

Gets the localized description of the gender for this voice skin.

Note: if the voice package is a TTS package, then the gender is only a suggestion. The current Android TTS engine does not support switching voice genders. Clients that use third-party engines that support genders may use this API as a suggestion.

**Returns:**

A localized String representing the gender of the voice skin.

```
public String getLocalizedLanguage ()
```

Get the localized description of the language of this voice skin.

**Returns:**

A localized `String` representing the language of this voice skin.

```
public String getLocalizedQuality ()
```

Get the localized description of the voice skin quality

**Returns:**

localized description of the voice skin quality, this field can be empty if no quality information is available.

```
public String getLocalizedType ()
```

Get the localized description for the type of voice package.

**Returns:**

A localized `String` representing the type of the voice package.

```
public String getMarcCode ()
```

Get the international MARC code describing the language of the voice skin (see <http://www.loc.gov/marc/languages>).

**Returns:**

The MARC code, e.g. "eng".

```
public String getName ()
```

Get the package name.

**Returns:**

Package name.

```
public String getQuality ()
```

Get the text description of the voice skin quality

**Returns:**

text description of the voice skin quality, this field can be empty if no quality information is available.

```
public TravelMode getTravelMode ()
```

Get the *VoicePackage.TravelMode* of voice package.

**Returns:**

The *VoicePackage.TravelMode* of voice package.

```
public String getVersion ()
```

Get the package version.

**Returns:**

Package version.

```
public boolean isLocal ()
```

Check if the voice is locally installed.

**Returns:**

True if locally installed. False otherwise.

```
public boolean isTts ()
```

Get voice TextToSpeech capability.

**Returns:**

True if the voice is TTS capable.

```
public boolean isTtsLanguageAvailable ()
```

Gets whether this voice package language is supported by this TTS engine.

**Returns:**

true if the currently installed TextToSpeech engine supports the language of this voice package, false otherwise.

## Gender

The enumeration *Gender* is a member of *com.here.android.mpa.guidance.VoicePackage*.

### Enumeration Summary

```
public static final enumeration VoicePackage.Gender
```

```
extends java.lang.Enum, java.lang.Object
```

Gender for a *VoicePackage* .

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 413: Enum Constants in Gender

Fields
<pre>public static final Gender FEMALE</pre> <p>Female.</p>
<pre>public static final Gender MALE</pre> <p>Male.</p>

## Method Summary

Table 414: Methods in Gender

Methods
<pre>public static Gender valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static VoicePackage.Gender[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Gender for a VoicePackage .

### Enum Constant Details

```
public static final Gender FEMALE
```

Female.

```
public static final Gender MALE
```

Male.

### Method Details

```
public static Gender valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static VoicePackage.Gender[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## TravelMode

The enumeration *TravelMode* is a member of *com.here.android.mpa.guidance.VoicePackage*.

### Enumeration Summary

```
public static final enumeration VoicePackage.TravelMode
```

*extends java.lang.Enum, java.lang.Object*

Travel Mode of voice package.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 415: Enum Constants in *TravelMode*

Fields
<pre>public static final <i>TravelMode</i> <b>WALK_DRIVE</b></pre> <p>Pedestrian and car navigation.</p>
<pre>public static final <i>TravelMode</i> <b>DRIVE</b></pre> <p>Car navigation only.</p>
<pre>public static final <i>TravelMode</i> <b>WALK</b></pre> <p>Pedestrian navigation only.</p>
<pre>public static final <i>TravelMode</i> <b>UNKNOWN</b></pre> <p>Unknown navigation type.</p>

### Method Summary

Table 416: Methods in *TravelMode*

Methods
<pre>public static <i>TravelMode</i> <b>valueOf</b> (<b>String</b> name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>VoicePackage.TravelMode[]</i> <b>values</b> ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Travel Mode of voice package. If a voice package's skin is used during navigation and the type of navigation is not supported by the selected skin, *NavigationManager* will use a default skin instead. See *getTravelMode()*.

## Enum Constant Details

```
public static final TravelMode WALK_DRIVE
```

Pedestrian and car navigation.

Note: Pedestrian voice guidance is offered as a beta. It may be modified or removed at any time.

```
public static final TravelMode DRIVE
```

Car navigation only.

```
public static final TravelMode WALK
```

Pedestrian navigation only.

Note: Pedestrian voice guidance is offered as a beta. It may be modified or removed at any time.

```
public static final TravelMode UNKNOWN
```

Unknown navigation type.

## Method Details

```
public static TravelMode valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static VoicePackage.TravelMode[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## VoiceSkin

The class *VoiceSkin* is a member of *com.here.android.mpa.guidance* .

## Class Summary

public final class **VoiceSkin**

*extends java.lang.Object*

Defines a voice skin used for guidance.

[For complete information, see the section [Class Details](#)]

## Nested Class Summary

Table 417: Nested Classes in VoiceSkin

Nested Classes
public static final enumeration <a href="#">VoiceSkin.OutputType</a> Voice Skin Output Types

## Method Summary

Table 418: Methods in VoiceSkin

Methods
public boolean <a href="#">delete</a> () Delete the voice skin from the device
public String <a href="#">getDescription</a> () Get the human readable description of the voice skin.
public String <a href="#">getGender</a> () Gets the gender of the voice skin: "f" female, "m" male.
public long <a href="#">getId</a> () Get the voice skin identifier.
public String <a href="#">getLanguage</a> () Get the human readable language name of the voice skin.
public String <a href="#">getLanguageCode</a> () Returns language code in BCP-47 format: language-COUNTRY
public String <a href="#">getMarcCode</a> () Get the international MARC code describing the language of the voice skin (see <a href="http://www.loc.gov/marc/languages">http://www.loc.gov/marc/languages</a> ).
public <a href="#">OutputType</a> <a href="#">getOutputType</a> () Get the voice skin output voice type.
public String <a href="#">getQuality</a> () Get the text description of the voice skin quality
public String <a href="#">getSpeaker</a> () Get the speaker of the voice skin.

## Methods

```
public String getVersion ()
```

Get the version number string of the voice skin.

## Class Details

Defines a voice skin used for guidance.

## Method Details

```
public boolean delete ()
```

Delete the voice skin from the device

### Returns:

true if deletion was successful, false otherwise

```
public String getDescription ()
```

Get the human readable description of the voice skin.

### Returns:

The description, e.g. "English Female".

```
public String getGender ()
```

Gets the gender of the voice skin: "f" female, "m" male.

Note: if the voice skin is a TTS voice skin, then the gender is only a suggestion. The current Android TTS engine does not support switching voice genders. Clients that use third-party engines that support genders may use this API as a suggestion.

### Returns:

"f" if female, "m" if male.

```
public long getId ()
```

Get the voice skin identifier.

### Returns:

The voice skin identifier.

```
public String getLanguage ()
```

Get the human readable language name of the voice skin.

### Returns:

The language name, e.g. "English".

```
public String getLanguageCode ()
```

Returns language code in BCP-47 format: language-COUNTRY

**Returns:**

language code in BCP-47 format

```
public String getMarcCode ()
```

Get the international MARC code describing the language of the voice skin (see <http://www.loc.gov/marc/languages>).

**Returns:**

The MARC code, e.g. "eng".

```
public OutputType getOutputType ()
```

Get the voice skin output voice type.

**Returns:**

The voice skin output voice type.

```
public String getQuality ()
```

Get the text description of the voice skin quality

**Returns:**

text description of the voice skin quality, this field can be empty if no quality information is available.

```
public String getSpeaker ()
```

Get the speaker of the voice skin.

**Returns:**

The name of the speaker.

```
public String getVersion ()
```

Get the version number string of the voice skin.

**Returns:**

The version number, e.g. "0.2.0.0".

## OutputType

The enumeration *OutputType* is a member of *com.here.android.mpa.guidance.VoiceSkin*.

### Enumeration Summary

public static final enumeration **VoiceSkin.OutputType**

extends *java.lang.Enum*, *java.lang.Object*

Voice Skin Output Types

[For complete information, see the section [Enumeration Details](#)]

See also:

[getOutputType\(\)](#)

### Enum Constant Summary

Table 419: Enum Constants in OutputType

Fields
<pre>public static final OutputType AUDIO</pre> <p>Audio output (wav files).</p>
<pre>public static final OutputType TEXT</pre> <p>Text output, but no text to speech associated.</p>
<pre>public static final OutputType TTS</pre> <p>Text to speech output.</p>
<pre>public static final OutputType NONE</pre> <p>Invalid skin.</p>

### Method Summary

Table 420: Methods in OutputType

Methods
<pre>public int value ()</pre>
<pre>public static OutputType valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static VoiceSkin.OutputType[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

### Enumeration Details

Voice Skin Output Types

See also:

[getOutputType\(\)](#)

## Enum Constant Details

```
public static final OutputType AUDIO
```

Audio output (wav files).

```
public static final OutputType TEXT
```

Text output, but no text to speech associated.

```
public static final OutputType TTS
```

Text to speech output.

```
public static final OutputType NONE
```

Invalid skin.

## Method Details

```
public int value ()
```

```
public static OutputType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

**Parameters:**

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static VoiceSkin.OutputType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## mapping

---

The package *mapping* is a member of *com.here.android.mpa*.

## Package Summary

### mapping

The mapping package provides classes, interfaces, and enumerations that display an interactive map, and related functionality that allows your application to create and add map content.

## Package Details

The mapping package provides classes, interfaces, and enumerations that display an interactive map, and related functionality that allows your application to create and add map content.

Some key classes and interfaces in this package are:

- `Map`
- `MapGesture`
- `MapFragment`
- `MapObject`
- `MapTransitLayer`

### Map

The `Map` interface represents the interactive map itself.

Map schemes (e.g. Satellite, Terrain, etc.) can be changed as follows:

```
map.setMapScheme ( Map.Scheme.NORMAL_DAY );
```

Refer to the `Map.Scheme` class for a description of supported schemes.

A `Map` can contain visual objects, which are instantiated from the children of the `MapObject` class, such as:

- `MapCircle`
- `MapMarker`
- `MapPolygon`
- `MapPolyline`
- `MapRoute`

A polygon, for example, can be drawn on the map as follows:

```
...  
MapPolygon polygon = new MapPolygon();  
map.addMapObject( polygon );
```

Notice that the parent map object class, `MapContainer`, does not itself represent a visual object. A `MapContainer` determines the stacking order (z-index ordering) of objects on a map.

### MapObjects and z-index ordering

The z-index of a `MapObject` specifies its stacking order within a `Map`. In general, an object with a higher z-index appears closer to the viewer than an object with a lower z-index.

The stack order of a `Map` is defined hierarchically, according to the following specifications:

- The `MapObject` with the highest z-index is drawn on top of any other instances of `MapObject`.
- Within a `MapContainer`, the `MapObject` with highest z-index is drawn on top of any other instances of `MapObject`.

## Colors

Color values in this package are defined in terms of ARGB integer values, where the 24 least significant bits define red, green, and blue components while the eight most significant bits define the alpha value (0xAARRGGBB) of opacity, for which 0xFFRRGGBB is fully opaque and 0x00RRGGBB is fully transparent.

Note: if the target platform does not support transparency, the alpha value is ignored and the color is displayed as fully opaque.

## GeoMesh

The class `GeoMesh` is a member of `com.here.android.mpa.mapping`.

### Class Summary

public final class **GeoMesh**

extends `com.here.android.mpa.mapping.Mesh`, `java.lang.Object`

Represents the mesh data for a `MapGeoModel`.

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 421: Constructors in GeoMesh

Constructors
<p><code>GeoMesh</code> ()</p> <p>Creates a <code>GeoMesh</code>.</p>

### Method Summary

Table 422: Methods in GeoMesh

Methods
<p>public <code>GeoMesh</code> <code>setVertices</code> (<code>java.util.List</code> &lt;<code>GeoCoordinate</code>&gt; <code>vertices</code>)</p> <p>Sets a <code>List</code> of <code>GeoCoordinate</code> objects representing the vertices associated with the <code>GeoMesh</code>.</p>
<p>public <code>GeoMesh</code> <code>setVertices</code> (<code>DoubleBuffer</code> <code>vertices</code>)</p> <p>Sets a <code>DoubleBuffer</code> representing a list of vertices associated with the <code>GeoMesh</code>.</p>

### Class Details

Represents the mesh data for a `MapGeoModel`.

The properties of a `GeoMesh` include vertices, specified as either `GeoCoordinate` objects or an array of `double` values representing the latitude, longitude and altitude of each vertex sequentially.

## Constructor Details

### `GeoMesh ()`

Creates a `GeoMesh`.

## Method Details

### `public GeoMesh setVertices (java.util.List <GeoCoordinate> vertices)`

Sets a `List` of `GeoCoordinate` objects representing the vertices associated with the `GeoMesh`.

#### Parameters:

- **vertices**  
A `List` of `GeoCoordinate` representing the vertices used to form the `GeoMesh`.

#### Returns:

The updated `GeoMesh`.

#### Throws:

- `IllegalArgumentException`  
if `vertices` is empty.
- `IllegalArgumentException`  
if `vertices` contains more than 65536 `GeoCoordinate`.

### `public GeoMesh setVertices (DoubleBuffer vertices)`

Sets a `DoubleBuffer` representing a list of vertices associated with the `GeoMesh`.

Each vertex is specified as triplets of latitude, longitude and altitude. All triplets are then placed into a `DoubleBuffer` sequentially to represent the list of vertices.

#### Parameters:

- **vertices**  
Desired `DoubleBuffer` list of `GeoCoordinate`, i.e. vertex, in multiples of three.

#### Returns:

The updated `GeoMesh`.

#### Throws:

- `IllegalArgumentException`  
if `vertices` is empty.
- `IllegalArgumentException`

if `vertices` does not contain triplets of double, representing the latitude, longitude and altitude values of a vertex.

- **`IllegalArgumentException`**

if `vertices` contains more than 65536 triplets, each representing a `GeoCoordinate`.

See also:

[java.nio.DoubleBuffer](#)

## HistoricalTrafficRasterTileSource

The class `HistoricalTrafficRasterTileSource` is a member of [com.here.android.mpa.mapping](#).

### Class Summary

public final class **HistoricalTrafficRasterTileSource**

extends [com.here.android.mpa.mapping.UrlMapRasterTileSourceBase](#),  
[com.here.android.mpa.mapping.MapRasterTileSource](#), [java.lang.Object](#)

This class displays a street map tile overlay showing the typical traffic pattern for a specific time point during the week.

[For complete information, see the section [Class Details](#)]

See also:

[addRasterTileSource\(MapRasterTileSource\)](#)

[removeRasterTileSource\(MapRasterTileSource\)](#)

### Constructor Summary

Table 423: Constructors in `HistoricalTrafficRasterTileSource`

Constructors
<p><b><code>HistoricalTrafficRasterTileSource</code></b> (<code>int</code> dayOfWeek, <code>int</code> hourOfDay)</p> <p>Public constructor to instantiate a raster tile that displays history traffic for the time requested.</p>
<p><b><code>HistoricalTrafficRasterTileSource</code></b> (<code>int</code> dayOfWeek, <code>int</code> hourOfDay, <code>int</code> minOfHour)</p> <p>Public constructor to instantiate a raster tile that displays history traffic for the time requested.</p>

## Method Summary

Table 424: Methods in `HistoricalTrafficRasterTileSource`

Methods
<pre>public String <i>getUrl</i> (int x, int y, int zoomLevel)</pre> <p>Gets the URL representing the source of the specified raster tile image.</p> <p>This method overrides <code>mapping.UrlMapRasterTileSourceBase.getUrl(int, int, int)</code></p>

## Class Details

This class displays a street map tile overlay showing the typical traffic pattern for a specific time point during the week.

### See also:

[addRasterTileSource\(MapRasterTileSource\)](#)

[removeRasterTileSource\(MapRasterTileSource\)](#)

## Constructor Details

### `HistoricalTrafficRasterTileSource (int dayOfWeek, int hourOfDay)`

Public constructor to instantiate a raster tile that displays history traffic for the time requested.

The time specified is local to the location requesting the historic traffic. For example, regardless of what the device's locale setting is, where the device's current location, nor what is the current time, if the target area for the historic traffic request is for Berlin, Germany at 3:00pm Monday, then the `hourOfDay` used should be 15 and the `dayOfWeek` should be `Calendar.Monday`.

### Parameters:

- dayOfWeek**  
 One of the values defined in `Calendar` class, to be used when setting `Calendar.DAY_OF_WEEK`. eg. `Calendar.MONDAY`.
- hourOfDay**  
 An `int` representing the hour to request historic traffic at. It uses the 24-hour clock format. E.g., at 07:00 PM, use 19.

### Throws:

- `IllegalArgumentException`**  
 If requested time's `dayOfWeek` is invalid.
- `IllegalArgumentException`**  
 If requested time's `hourOfDay` is invalid.
- `AccessControlException`**  
 Access to this operation is denied. Contact your HERE representative for more information.

## **HistoricalTrafficRasterTileSource (int dayOfWeek, int hourOfDay, int minOfHour)**

Public constructor to instantiate a raster tile that displays history traffic for the time requested.

The time specified is local to the location requesting the historic traffic. For example, regardless of what the device's locale setting is, where the device's current location, nor what is the current time, if the target area for the historic traffic request is for Berlin, Germany at 3:30pm Monday, then the `hourOfDay` used should be 15, `minOfHour` used should be 30, and the `dayOfWeek` should be `Calendar.Monday`.

### Parameters:

- **dayOfWeek**  
One of the values defined in `Calendar` class, to be used when setting `Calendar.DAY_OF_WEEK`. eg. `Calendar.MONDAY`.
- **hourOfDay**  
An `int` representing the hour to request historic traffic at. It uses the 24-hour clock format. E.g., at 07:04 PM, use 19.
- **minOfHour**  
An `int` indicating the minute within the hour to request historic traffic. E.g., at 07:04 PM use 4.

### Throws:

- **IllegalArgumentException**  
If requested time's `dayOfWeek` is invalid.
- **IllegalArgumentException**  
If requested time's `hourOfDay` is invalid.
- **IllegalArgumentException**  
If requested time's `minOfHour` is invalid.
- **AccessControlException**  
Access to this operation is denied. Contact your HERE representative for more information.

## Method Details

```
public String getUrl (int x, int y, int zoomLevel)
```

Gets the URL representing the source of the specified raster tile image.

Note: implementations of raster tile sources must override this method to provide a complete URL string pointing to the raster tile image.

This method overrides [mapping.UrlMapRasterTileSourceBase.getUrl\(int, int, int\)](#)

### Parameters:

- **x**
- **y**
- **zoomLevel**

## LocalMesh

The class *LocalMesh* is a member of *com.here.android.mpa.mapping*.

### Class Summary

public final class **LocalMesh**

extends *com.here.android.mpa.mapping.Mesh*, *java.lang.Object*

Represents the mesh data for a *MapLocalModel*.

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 425: Constructors in LocalMesh

Constructors
<p><i>LocalMesh</i> ()</p> <p>Creates a LocalMesh .</p>

### Method Summary

Table 426: Methods in LocalMesh

Methods
<p>public FloatBuffer <i>getVertices</i> ()</p> <p>Gets a FloatBuffer representing a list of vertices associated with the LocalMesh .</p>
<p>public <i>LocalMesh</i> <i>setVertices</i> (FloatBuffer vertices)</p> <p>Sets a FloatBuffer representing a list of vertices associated with the LocalMesh .</p>

### Class Details

Represents the mesh data for a *MapLocalModel*.

The properties of a LocalMesh include vertices, specified as triplets. A unit of 1 represents 1 meter in the real world.

### Constructor Details

**LocalMesh** ()

Creates a LocalMesh .

## Method Details

```
public FloatBuffer getVertices ()
```

Gets a `FloatBuffer` representing a list of vertices associated with the `LocalMesh`.

Note: vertices for a `LocalMesh` are specified as triplets.

### Returns:

vertices associated with the mesh

```
public LocalMesh setVertices (FloatBuffer vertices)
```

Sets a `FloatBuffer` representing a list of vertices associated with the `LocalMesh`.

Note: vertices for a `LocalMesh` are specified as triplets.

### Parameters:

- **vertices**  
Desired `FloatBuffer` list of vertices, in triplets

### Returns:

The updated `LocalMesh`

### Throws:

- **IllegalArgumentException**  
if `vertices` is empty.
- **IllegalArgumentException**  
if `vertices` does not contain triplets of floats, i.e. `vertices`'s capacity is not in multiples of 3.
- **IllegalArgumentException**  
if `vertices` contains more than 65536 triplets, each representing a vertex.

### See also:

[java.nio.FloatBuffer](#)

## Location

The class `Location` is a member of [com.here.android.mpa.mapping](#).

## Class Summary

```
public final class Location
```

```
extends java.lang.Object
```

Class which provides ways to retrieve certain parameters of an icon or a marker.

[For complete information, see the section [Class Details](#)]

See also:

[MapCartoMarker](#)

## Method Summary

Table 427: Methods in Location

Methods
<pre>public <i>GeoBoundingBox</i> <b>getBoundingBox</b> ()</pre> <p>Gets the <i>GeoBoundingBox</i> of this location object</p>
<pre>public <i>GeoCoordinate</i> <b>getCoordinate</b> ()</pre> <p>Gets the <i>GeoCoordinate</i> of this location object</p>
<pre>public <i>LocationInfo</i> <b>getInfo</b> ()</pre> <p>Gets the <i>LocationInfo</i> of this location object</p>

## Class Details

Class which provides ways to retrieve certain parameters of an icon or a marker.

See also:

[MapCartoMarker](#)

## Method Details

```
public GeoBoundingBox getBoundingBox ()
```

Gets the *GeoBoundingBox* of this location object

**Returns:**

the *GeoBoundingBox* of this location object

```
public GeoCoordinate getCoordinate ()
```

Gets the *GeoCoordinate* of this location object

**Returns:**

the *GeoCoordinate* of this location object

```
public LocationInfo getInfo ()
```

Gets the *LocationInfo* of this location object

**Returns:**

the *LocationInfo* of this location object

## LocationInfo

The class *LocationInfo* is a member of *com.here.android.mpa.mapping*.

### Class Summary

public final class **LocationInfo**

*extends java.lang.Object*

Class which contains information about a particular icon/marker.

[For complete information, see the section *Class Details*]

**See also:**

*Location*

### Nested Class Summary

Table 428: Nested Classes in LocationInfo

Nested Classes
public static final enumeration <i>LocationInfo.Field</i> Fields for a LocationInfo object which can be retrieved

### Method Summary

Table 429: Methods in LocationInfo

Methods
public boolean <i>equals</i> (Object other) For documentation, see <i>java.lang.Object</i>
public String <i>getField</i> (Field field) Retrieves the value of the specified <i>LocationInfo.Field</i> for the object
public boolean <i>hasField</i> (Field field) Determines whether or not the object has a particular <i>LocationInfo.Field</i>
public int <i>hashCode</i> () For documentation, see <i>java.lang.Object</i>

### Class Details

Class which contains information about a particular icon/marker.

**See also:**

*Location*

## Method Details

```
public boolean equals (Object other)
```

For documentation, see *java.lang.Object*

### Parameters:

- **other**

```
public String getField (Field field)
```

Retrieves the value of the specified *LocationInfo.Field* for the object

### Parameters:

- **field**  
Field to determine

### Returns:

the string value of the specified Field

```
public boolean hasField (Field field)
```

Determines whether or not the object has a particular *LocationInfo.Field*

### Parameters:

- **field**  
Field to determine

### Returns:

true if the object has the Field

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## Field

The enumeration *Field* is a member of *com.here.android.mpa.mapping.LocationInfo*.

## Enumeration Summary

```
public static final enumeration LocationInfo.Field
```

*extends java.lang.Enum, java.lang.Object*

Fields for a LocationInfo object which can be retrieved

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 430: Enum Constants in Field

Fields
<p><code>public static final Field ADDR_COUNTRY_CODE</code> Country code of address, named as in ISO 3166 alpha-3</p>
<p><code>public static final Field ADDR_COUNTRY_NAME</code> Country Name</p>
<p><code>public static final Field ADDR_STATE_NAME</code> Name of federal state</p>
<p><code>public static final Field ADDR_STATE_CODE</code> Code of federal state</p>
<p><code>public static final Field ADDR_PROVINCE_NAME</code> Province Name</p>
<p><code>public static final Field ADDR_COUNTY_NAME</code> County Name</p>
<p><code>public static final Field ADDR_CITY_NAME</code> City Name</p>
<p><code>public static final Field ADDR_DISTRICT_NAME</code> District Name</p>
<p><code>public static final Field ADDR_POSTAL_CODE</code> Postal Code</p>
<p><code>public static final Field ADDR_TOWNSHIP_NAME</code> Township Name</p>
<p><code>public static final Field ADDR_NEIGHBORHOOD_NAME</code> Name of the neighborhood within the city</p>
<p><code>public static final Field ADDR_STREET_NAME</code> Street name</p>
<p><code>public static final Field ADDR_HOUSE_NUMBER</code> House number of address.</p>
<p><code>public static final Field ADDR_CONTINENT_NAME</code> Continent name</p>
<p><code>public static final Field ADDR_TYPE_NAME</code> Type of address (city, street, etc.)</p>

## Fields

```
public static final Field ADDR_POPULATION
```

Population living at this address

```
public static final Field ADDR_BUILDING_NAME
```

Building Name

```
public static final Field ADDR_BUILDING_FLOOR
```

Building Floor

```
public static final Field ADDR_BUILDING_ROOM
```

Building Room

```
public static final Field ADDR_BUILDING_ZONE
```

Building Zone

```
public static final Field PLACE_NAME
```

Place Name

```
public static final Field PLACE_PRE_NAME
```

Place prefix.

```
public static final Field PLACE_POST_NAME
```

Place postfix.

```
public static final Field PLACE_TYPE
```

Type of the place (premium, adplace, recommendation, etc.)

```
public static final Field PLACE_CATEGORY
```

Name of the category of the place

```
public static final Field PLACE_CATEGORY_ID
```

The identifier (number as a string) of the category.

```
public static final Field PLACE_DESCRIPTION
```

Short description of the place.

```
public static final Field PLACE_PHONE_NUMBER
```

Phone number of the place.

```
public static final Field PLACE_URL
```

URL belonging to the place.

```
public static final Field PLACE_PREMIUM_URL_ID
```

Premium POI URL Id.

```
public static final Field PLACE_PREMIUM_NODE_ID
```

Premium POI Node Id.

```
public static final Field PLACE_ADVERTISEMENT_STRING
```

Advertisement string

## Fields

public static final *Field* **TZ\_OFFSET\_MINUTES**

Time zone offset in minutes

public static final *Field* **OTHER\_DATA**

Can be used to return some other information for the location.

public static final *Field* **PLACE\_ICON\_ID**

The place's icon identifier.

public static final *Field* **LOCATION\_TYPE**

ADDRESS, POI, STRING.

public static final *Field* **LOCATION\_META**

Additional flags to mark results

public static final *Field* **LOCATION\_TEXT**

Formatted text of the location

public static final *Field* **ADDR\_AREA\_ID**

Area Id

public static final *Field* **FOREIGN\_ID**

Foreign ID

public static final *Field* **FOREIGN\_ID\_SOURCE**

Foreign ID source.

## Method Summary

Table 431: Methods in Field

### Methods

public static *Field* **valueOf** (String name)

This method retrieves the enumeration value that matches the name specified by the caller.

public static *LocationInfo.Field[]* **values** ()

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Fields for a LocationInfo object which can be retrieved

### Enum Constant Details

public static final *Field* **ADDR\_COUNTRY\_CODE**

Country code of address, named as in ISO 3166 alpha-3

```
public static final Field ADDR_COUNTRY_NAME
```

Country Name

```
public static final Field ADDR_STATE_NAME
```

Name of federal state

```
public static final Field ADDR_STATE_CODE
```

Code of federal state

```
public static final Field ADDR_PROVINCE_NAME
```

Province Name

```
public static final Field ADDR_COUNTY_NAME
```

County Name

```
public static final Field ADDR_CITY_NAME
```

City Name

```
public static final Field ADDR_DISTRICT_NAME
```

District Name

```
public static final Field ADDR_POSTAL_CODE
```

Postal Code

```
public static final Field ADDR_TOWNSHIP_NAME
```

Township Name

```
public static final Field ADDR_NEIGHBORHOOD_NAME
```

Name of the neighborhood within the city

```
public static final Field ADDR_STREET_NAME
```

Street name

```
public static final Field ADDR_HOUSE_NUMBER
```

House number of address. Can include characters.

```
public static final Field ADDR_CONTINENT_NAME
```

Continent name

```
public static final Field ADDR_TYPE_NAME
```

Type of address (city, street, etc.)

```
public static final Field ADDR_POPULATION
```

Population living at this address

```
public static final Field ADDR_BUILDING_NAME
```

Building Name

```
public static final Field ADDR_BUILDING_FLOOR
```

Building Floor

```
public static final Field ADDR_BUILDING_ROOM
```

Building Room

```
public static final Field ADDR_BUILDING_ZONE
```

Building Zone

```
public static final Field PLACE_NAME
```

Place Name

```
public static final Field PLACE_PRE_NAME
```

Place prefix.

```
public static final Field PLACE_POST_NAME
```

Place postfix.

```
public static final Field PLACE_TYPE
```

Type of the place (premium, adplace, recommendation, etc.)

```
public static final Field PLACE_CATEGORY
```

Name of the category of the place

```
public static final Field PLACE_CATEGORY_ID
```

The identifier (number as a string) of the category.

```
public static final Field PLACE_DESCRIPTION
```

Short description of the place. Also used as input for place search.

```
public static final Field PLACE_PHONE_NUMBER
```

Phone number of the place.

```
public static final Field PLACE_URL
```

URL belonging to the place.

```
public static final Field PLACE_PREMIUM_URL_ID
```

Premium POI URL Id.

```
public static final Field PLACE_PREMIUM_NODE_ID
```

Premium POI Node Id.

```
public static final Field PLACE_ADVERTISEMENT_STRING
```

Advertisement string

```
public static final Field TZ_OFFSET_MINUTES
```

Time zone offset in minutes

```
public static final Field OTHER_DATA
```

Can be used to return some other information for the location.

```
public static final Field PLACE_ICON_ID
```

The place's icon identifier. This is for Plug-In usage only. S60 shall make use of PlaceCategoryDataStore.

```
public static final Field LOCATION_TYPE
```

ADDRESS, POI, STRING.

```
public static final Field LOCATION_META
```

Additional flags to mark results

```
public static final Field LOCATION_TEXT
```

Formatted text of the location

```
public static final Field ADDR_AREA_ID
```

Area Id

```
public static final Field FOREIGN_ID
```

Foreign ID

```
public static final Field FOREIGN_ID_SOURCE
```

Foreign ID source. MapCartoMarker markers will have a source of "pvid"

## Method Details

```
public static Field valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static LocationInfo.Field[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Map

The class *Map* is a member of *com.here.android.mpa.mapping*.

### Class Summary

```
public final class Map
```

```
extends java.lang.Object
```

A *Map* object represents a virtual model of the world.

[For complete information, see the section *Class Details*]

### Nested Class Summary

Table 432: Nested Classes in *Map*

Nested Classes
<pre>public static final enumeration <i>Map.Animation</i></pre> <p>Represents values that describe animation types for on-screen map movements.</p>
<pre>public static final enumeration <i>Map.FleetFeature</i></pre> <p>Fleet features to be rendered on the map</p>
<pre>public static final enumeration <i>Map.LayerCategory</i></pre> <p>Definition for layer categories within a map.</p>
<pre>public static abstract interface <i>Map.OnSchemeChangeListener</i></pre> <p>Listener for <i>Map</i> scheme changed events.</p>
<pre>public static abstract interface <i>Map.OnTransformListener</i></pre> <p>Listener for <i>Map</i> transform events.</p>
<pre>public static final enumeration <i>Map.PedestrianFeature</i></pre> <p>Pedestrian features to be rendered on the map</p>
<pre>public static class <i>Map.PixelResult</i></pre> <p>Result class for conversion of a <i>GeoCoordinate</i> to screen pixel coordinates.</p>
<pre>public static final enumeration <i>Map.Projection</i></pre> <p>The projection scheme used to render the map.</p>
<pre>public static final class <i>Map.Scheme</i></pre> <p>Represents a collection of schemes that the <i>Map</i> class supports.</p>

## Constructor Summary

Table 433: Constructors in Map

Constructors
<code>Map ()</code>
Default Constructor

## Field Summary

Table 434: Fields in Map

Fields
<code>public static final int ABSTRACT_CITY_MODEL</code>
<code>public static final int AIRPORT_AREA</code>
<code>public static final int AMUSEMENT_PARK</code>
<code>public static final int ANIMAL_PARK</code>
<code>public static final int BACKGROUND</code>
<code>public static final int BEACH</code>
<code>public static final int BORDER_BUILTUP</code>
<code>public static final int BORDER_COUNTRY</code>
<code>public static final int BORDER_LINE_OF_CONTROL</code>
<code>public static final int BORDER_REGIONAL</code>
<code>public static final int BORDER_STATE</code>
<code>public static final int BUILDING</code>
<code>public static final int BUILTUP</code>
<code>public static final int CEMETERY</code>
<code>public static final int CITY_PARK</code>
<code>public static final int DESERT</code>
<code>public static final int EXIT_SIGN</code>
<code>public static final int FERRY</code>
<code>public static final int GLACIER</code>
<code>public static final int GOLF_COURSE</code>
<code>public static final int HARBOR_AREA</code>
<code>public static final int HOSPITAL_CAMPUS</code>
<code>public static final int ICON_MOUNTAIN</code>

**Fields**

```
public static final int ICON\_PUBLIC\_TRANSIT\_STATION
```

```
public static final int INDUSTRIAL\_COMPLEX
```

```
public static final int LABEL\_AIRPORT\_AREA
```

```
public static final int LABEL\_AMUSEMENT\_PARK
```

```
public static final int LABEL\_ANIMAL\_PARK
```

```
public static final int LABEL\_BEACH
```

```
public static final int LABEL\_BUILDING
```

```
public static final int LABEL\_CEMETERY
```

```
public static final int LABEL\_CITY\_CAPITAL
```

```
public static final int LABEL\_CITY\_OTHER
```

```
public static final int LABEL\_CITY\_PARK
```

```
public static final int LABEL\_CITY\_STATE\_CAPITAL
```

```
public static final int LABEL\_CONTINENT
```

```
public static final int LABEL\_DESERT
```

```
public static final int LABEL\_FERRY
```

```
public static final int LABEL\_GLACIER
```

```
public static final int LABEL\_GOLF\_COURSE
```

```
public static final int LABEL\_HARBOR\_AREA
```

```
public static final int LABEL\_HOSPITAL\_CAMPUS
```

```
public static final int LABEL\_INDUSTRIAL\_COMPLEX
```

```
public static final int LABEL\_ISLAND
```

```
public static final int LABEL\_MAJOR\_COUNTRY
```

```
public static final int LABEL\_MILITARY\_BASE
```

```
public static final int LABEL\_MINOR\_COUNTRY
```

```
public static final int LABEL\_MOUNTAIN
```

```
public static final int LABEL\_NATIONAL\_PARK
```

```
public static final int LABEL\_NATIVE\_RESERVATION
```

```
public static final int LABEL\_NEIGHBORHOOD\_AREA
```

```
public static final int LABEL\_OCEAN
```

```
public static final int LABEL\_PEDESTRIAN\_AREA
```

```
public static final int LABEL\_PUBLIC\_TRANSIT\_LINE
```

## Fields

```
public static final int LABEL_PUBLIC_TRANSIT_STATION
```

```
public static final int LABEL_RAILYARD
```

```
public static final int LABEL_SEA
```

```
public static final int LABEL_SHOPPING_COMPLEX
```

```
public static final int LABEL_SPORTS_COMPLEX
```

```
public static final int LABEL_STATE
```

```
public static final int LABEL_STATE_ABBREVIATION
```

```
public static final int LABEL_STREET_CATEGORY_0
```

```
public static final int LABEL_STREET_CATEGORY_1
```

```
public static final int LABEL_STREET_CATEGORY_2
```

```
public static final int LABEL_STREET_CATEGORY_3
```

```
public static final int LABEL_STREET_CATEGORY_4
```

```
public static final int LABEL_STREET_CATEGORY_PEDESTRIAN
```

```
public static final int LABEL_STREET_CATEGORY_WALKWAY
```

```
public static final int LABEL_UNIVERSITY_CAMPUS
```

```
public static final int LABEL_WATER_OTHER
```

```
public static final int LABEL_WOODLAND
```

```
public static final int LAND
```

```
public static final int LANDMARK_3D
```

```
public static final int LAND_PARCEL
```

```
public static final int MILITARY_BASE
```

```
public static final float MOVE_PRESERVE_ORIENTATION
```

A valid orientation value that lies outside the minimum and maximum supported tilt range, used to indicate that the current orientation should be preserved.

```
public static final float MOVE_PRESERVE_TILT
```

A valid tilt value that lies outside the range of *getMinTilt()* and *getMaxTilt()*, used to indicate that the current tilt should be preserved.

```
public static final double MOVE_PRESERVE_ZOOM_LEVEL
```

A valid zoom level value that lies outside the range of *getMinZoomLevel()* and *getMaxZoomLevel()*, used to indicate that the current zoom level should be preserved.

```
public static final int NATIONAL_PARK
```

```
public static final int NATIVE_RESERVATION
```

```
public static final int NEIGHBORHOOD_AREA
```

## Fields

```

public static final int OUTLINE_MILITARY_BASE
public static final int OUTLINE_NATIONAL_PARK
public static final int OUTLINE_NATIVE_RESERVATION
public static final int PEDESTRIAN_AREA
public static final int PEDESTRIAN_FEATURE
public static final int POINT_ADDRESS
public static final int POI_ICON
public static final int POI_LABEL
public static final int PUBLIC_TRANSIT_LINE
public static final int RAILROAD
public static final int RAILYARD
public static final int RELIEF
public static final int ROADSIGN_ICON
public static final int SHOPPING_COMPLEX
public static final int SPORTS_COMPLEX
public static final int STREET_CATEGORY_0
public static final int STREET_CATEGORY_1
public static final int STREET_CATEGORY_2
public static final int STREET_CATEGORY_3
public static final int STREET_CATEGORY_4
public static final int STREET_CATEGORY_PEDESTRIAN
public static final int STREET_CATEGORY_WALKWAY
public static final int UNIVERSITY_CAMPUS
public static final int WATER
public static final int WOODLAND

```

## Method Summary

Table 435: Methods in Map

## Methods

```

public void addClusterLayer (ClusterLayer layer)

```

Attaches cluster layer to the map.

## Methods

```
public boolean addMapObject (MapObject object)
```

Adds a *MapObject* to this Map .

```
public boolean addMapObjects (java.util.List <MapObject> objects)
```

Adds a List of multiple *MapObject* objects to this Map .

```
public boolean addMapOverlay (MapOverlay overlay)
```

Adds a *MapOverlay* to this Map .

```
public boolean addRasterTileSource (MapRasterTileSource source)
```

Adds a user-defined *MapRasterTileSource* to this Map .

```
public void addSchemeChangeListener (OnSchemeChangeListener listener)
```

Adds a *Map.OnSchemeChangeListener* to listen for map scheme change events.

```
public void addTransformListener (OnTransformListener listener)
```

Adds a *Map.OnTransformListener* to this Map to listen for map transform events.

```
public boolean areCartoMarkersVisible ()
```

Returns a boolean indicating whether all *MapCartoMarkers* of all *IconCategory* are visible.

```
public boolean areCartoMarkersVisible (IconCategory category)
```

Get if *MapCartoMarkers* of a certain POI category is shown.

```
public boolean areExtrudedBuildingsVisible ()
```

Returns a boolean indicating whether the extruded buildings layer is shown on this map.

```
public boolean areLandmarksVisible ()
```

Returns a boolean indicating whether 3D landmarks are currently visible.

```
public boolean areSafetySpotsVisible ()
```

Gets the current visibility of safety spots.

```
public static int convert (LayerCategory cat)
```

```
public CustomizableScheme createCustomizableScheme (String newSchemeName, String baseSchemeName)
```

Creates a customizable scheme based on an existing *Map.Scheme*.

```
public Map disableTrafficAutoUpdate ()
```

Disables automatic traffic information updates.

```
public static void enableMaximumFpsLimit (boolean isLimited)
```

Function to enable/disable the FPS draw limit.

```
public void executeSynchronized (Runnable task)
```

Execute a batched set of commands to the Map .

```
public GeoBoundingBox getBoundingBox ()
```

Returns the current visible map area as a *GeoBoundingBox*.

```
public GeoCoordinate getCenter ()
```

Returns the *GeoCoordinate* location at the current center of this Map .

**Methods**

```
public String getCopyright ()
```

Returns the copyright notice text for this Map .

```
public CustomizableScheme getCustomizableScheme (String schemeName)
```

Retrieves a customizable scheme by using its name.

```
public java.util.EnumSet <FleetFeature> getFleetFeaturesVisible ()
```

Get the set of fleet features visible.

```
public int getHeight ()
```

Returns the current height of this Map , in number of pixels.

```
public MapBuildingLayer getMapBuildingLayer ()
```

Returns the *MapBuildingLayer* for this Map .

```
public String getMapDisplayLanguage ()
```

Get the language which the Map is set to render

```
public String getMapScheme ()
```

Returns the current scheme for the Map .

```
public List getMapSchemes ()
```

Returns a list containing all supported schemes for the Map .

```
public String getMapSecondaryDisplayLanguage ()
```

Get the secondary language which the Map is set to render

```
public MapState getMapState ()
```

Returns the current tilt, perspective, and zoom of the map as a *MapState* object.

```
public MapTrafficLayer getMapTrafficLayer ()
```

Get the *MapTrafficLayer*

```
public MapTransitLayer getMapTransitLayer ()
```

Returns the *MapTransitLayer* associated with this Map .

```
public float getMaxTilt ()
```

Returns the maximum degree allowed to be set as tilt angle for the Map .

```
public double getMaxZoomLevel ()
```

Returns the highest valid zoom level for Map , representing the closest view near the street-level

```
public static int getMaximumFps ()
```

Function to get the maximum drawing frames-per-second.

```
public float getMinTilt ()
```

Returns the minimum degree allowed to be set as tilt angle for the Map .

```
public double getMinZoomLevel ()
```

Returns the lowest valid zoom level for Map , representing the most distant view away from street-level.

## Methods

```
public float getOrientation ()
```

Returns the current orientation for this `Map`, in degrees relative to true-north, which has an orientation of 0 degrees.

```
public java.util.EnumSet <PedestrianFeature> getPedestrianFeaturesVisible ()
```

Get the set of pedestrian features visible.

```
public PositionIndicator getPositionIndicator ()
```

**Deprecated:** As of SDK 3.3.

Returns the *PositionIndicator* instance that renders the current position with a marker.

```
public Projection getProjectionMode ()
```

Gets the current map projection mode.

```
public double getScaleFromZoomLevel (double level)
```

Returns a map scale value based on the specified zoom level.

```
public java.util.List <ViewObject> getSelectedObjects (PointF p)
```

Returns the list of selectable *ViewObject* instances which are located at the specified screen pixel coordinates.

```
public java.util.List <ViewObject> getSelectedObjects (ViewRect rect)
```

Returns the list of selectable *ViewObject* objects which are within a specified *ViewRect*.

```
public java.util.List <ViewObject> getSelectedObjectsNearby (PointF p)
```

Returns the list of selectable *ViewObject* instances which are located at the specified screen pixel coordinates.

```
public List getSupportedMapDisplayLanguages ()
```

Get the list of supported display languages.

```
public float getTilt ()
```

Returns the current tilt angle for this `Map`, in degrees.

```
public PointF getTransformCenter ()
```

Returns the current center coordinate for `Map` transformations such as zooming and rotation.

```
public java.util.EnumSet <LayerCategory> getVisibleLayers ()
```

Get the set of `Map` layers being rendered.

```
public int getWidth ()
```

Returns the current width of this `Map`, in number of pixels.

```
public double getZoomLevel ()
```

Returns the current zoom level, which will be within a range between *getMinZoomLevel()* and *getMaxZoomLevel()*.

```
public static boolean isMaximumFpsLimited ()
```

Function to check if the FPS draw limit is enabled or not.

```
public boolean isStreetLevelCoverageVisible ()
```

Returns a `boolean` indicating whether street level coverage is visible.

```
public boolean isTrafficAutoUpdateEnabled ()
```

Returns a `boolean` indicating whether automatic traffic updates are enabled.

**Methods**

```
public boolean isTrafficInfoVisible ()
```

Returns a boolean indicating whether traffic information is currently visible on the Map .

```
public void pan (PointF from, PointF to)
```

Moves the map from one specified screen pixel coordinates to another in a linear motion.

```
public GeoCoordinate pixelToGeo (PointF point)
```

Converts and returns *GeoCoordinate* from screen pixel coordinates.

```
public GeoCoordinate pixelToGeo (PointF point, float altitude)
```

Converts and returns *GeoCoordinate* from screen pixel coordinates at specific altitude.

```
public java.util.List <GeoCoordinate> pixelToGeo (List points)
```

Converts and returns a list of *GeoCoordinate* objects from a List of screen pixel coordinates.

```
public PixelResult projectToPixel (GeoCoordinate coordinate)
```

Converts and returns a *PixelResult* that represents screen pixel coordinates from a *GeoCoordinate*.

```
public java.util.List <PixelResult> projectToPixel (java.util.List <GeoCoordinate> coordinates)
```

Converts and returns a list of *Map.PixelResult* elements that represent screen pixel coordinates from a List of *GeoCoordinate* objects.

```
public void removeClusterLayer (ClusterLayer layer)
```

Detaches the cluster from the map.

```
public boolean removeCustomizableScheme (String schemeName)
```

Remove customizable scheme.

```
public boolean removeMapObject (MapObject object)
```

Removes a *MapObject* from this Map .

```
public boolean removeMapObjects (java.util.List <MapObject> objects)
```

Removes a List of multiple *MapObject* objects from this Map .

```
public boolean removeMapOverlay (MapOverlay overlay)
```

Removes a *MapOverlay* from this Map .

```
public boolean removeRasterTileSource (MapRasterTileSource source)
```

Removes a user-defined *MapRasterTileSource* from this Map .

```
public void removeSchemeChangeListener (OnSchemeChangeListener listener)
```

Removes an existing *Map.OnSchemeChangeListener*.

```
public void removeTransformListener (OnTransformListener listener)
```

Removes an existing *Map.OnTransformListener* from this Map .

```
public Map setCartoMarkersVisible (boolean visible)
```

Show or hide all *MapCartoMarkers* on Map .

```
public Map setCartoMarkersVisible (IconCategory category, boolean visible)
```

Toggles the visibility of a particular POI category's *MapCartoMarkers*.

**Methods**

```
public void setCenter (GeoCoordinate point, Animation animation, double level, float orientation, float tilt)
```

Moves the center of this Map to a specific *GeoCoordinate*, while simultaneously setting a zoom level (a fraction within the range of minimum and maximum levels), orientation (from 0 degrees to 360 degrees), and tilt (within the range of minimum and maximum tilt angles).

```
public void setCenter (GeoCoordinate point, Animation animation)
```

Moves the center of this Map to the specified *GeoCoordinate* using the given *Map.Animation*.

```
public void setCenter (PointF newCenter, Animation animation, double zoomLevel, float orientation, float tilt)
```

Centers the map at the specified screen pixel coordinates.

```
public static void setCustomMapConfiguration (String pathToConfigFile, String pathToResourceFile)
```

Deprecated: As of SDK 3.4.

Set a custom map style configuration.

```
public boolean setExtrudedBuildingsVisible (boolean visible)
```

Show or hide the extruded buildings layer on this map.

```
public Map setFadingAnimations (boolean enabled)
```

Enable or disable animations for labels and icons shown on the map.

```
public Map setFleetFeaturesVisible (java.util.EnumSet <FleetFeature> features)
```

Set a set of fleet features to be visible.

```
public Map setLandmarksVisible (boolean visible)
```

Sets 3D landmarks to be either visible or invisible for this Map .

```
public boolean setMapDisplayLanguage (Locale language)
```

Set the map display language using a locale.

```
public Map setMapScheme (String scheme)
```

Sets a scheme for the Map to the specified String value.

```
public Map setMapScheme (CustomizableScheme customizableScheme)
```

Sets a scheme for the Map to the specified customizable scheme.

```
public boolean setMapSecondaryDisplayLanguage (Locale language)
```

Set the map secondary display language using a locale.

```
public static void setMaximumFps (int fps)
```

Function to set the maximum drawing frames-per-second.

```
public void setMaximumTiltFunction (ZoomLevelToTiltFunction function)
```

The functional relationship between zoom and maximum tilt.

```
public Map setOrientation (float angle)
```

Sets an absolute orientation for this Map to the specified angle, in degrees, where true-north is 0 degrees.

## Methods

```
public void setOrientation (float angle, Animation animation)
```

Sets an absolute orientation for this Map to the specified angle, in degrees, where true-north is 0 degrees.

```
public Map setPedestrianFeaturesVisible (java.util.EnumSet <PedestrianFeature> features)
```

Set a set of pedestrian features to be visible.

```
public Map setProjectionMode (Projection projection)
```

Change the projection mode used to render the map.

```
public void setSafetySpotsVisible (boolean visible)
```

Sets safety spots visible.

```
public Map setStreetLevelCoverageVisible (boolean visible)
```

Sets street level coverage to be either visible or invisible for the Map .

```
public Map setTilt (float angle)
```

Sets a tilt angle for this Map , in degrees.

```
public void setTilt (float angle, Animation animation)
```

Sets a tilt angle for the Map , in degrees.

```
public Map setTrafficInfoVisible (boolean visible)
```

Sets traffic information to be either visible or invisible for this Map .

```
public Map setTransformCenter (PointF center)
```

Sets a center coordinate for Map transformations such as zooming and rotation.

```
public boolean setUseSystemLanguage ()
```

Set the map display language using the system default locale.

```
public Map setVisibleLayers (java.util.EnumSet <LayerCategory> layers, boolean enable)
```

Toggles the visibility of the map layer categories to be rendered.

```
public Map setZoomLevel (double level)
```

Sets a zoom level for the Map to a fraction that is within the range of minimum and maximum zoom levels.

```
public void setZoomLevel (double level, Animation animation)
```

Sets a zoom level for the Map to a fraction that is within the range of minimum and maximum zoom levels.

```
public void setZoomLevel (double level, PointF focus, Animation animation)
```

Sets a zoom level for the Map to a fraction that is within the range of minimum and maximum zoom levels while keeping the specified screen coordinate at the same Geographical Location.

```
public void zoomTo (GeoBoundingBox geoRect, Animation animation, float orientation)
```

Moves this Map instance's map center and changes the zoom level to show the specified *GeoBoundingBox* at the given orientation.

```
public void zoomTo (GeoBoundingBox geoRect, Animation animation, float orientation, float perspective)
```

Moves this Map instance's map center and changes the zoom level to show the specified *GeoBoundingBox* at the given orientation.

## Methods

```
public void zoomTo (GeoBoundingBox geoRect, ViewRect viewport, Animation animation, float orientation)
```

Moves this Map instance and changes its zoom level to show the specified *GeoBoundingBox* within the provided *ViewRect*.

```
public void zoomTo (GeoBoundingBox geoRect, int width, int height, Animation animation, float orientation)
```

Moves this Map instance and changes its zoom level to show the specified *GeoBoundingBox* within the specified pixel dimensions around the transform center.

## Class Details

A Map object represents a virtual model of the world. When embedded in a *MapFragment*, or *MapView*, Map objects can be used to show maps, add/remove map objects, and enable user interactions.

## Constructor Details

### Map ()

Default Constructor

## Field Details

```
public static final int ABSTRACT_CITY_MODEL
```

```
public static final int AIRPORT_AREA
```

```
public static final int AMUSEMENT_PARK
```

```
public static final int ANIMAL_PARK
```

```
public static final int BACKGROUND
```

```
public static final int BEACH
```

```
public static final int BORDER_BUILTUP
```

```
public static final int BORDER_COUNTRY
```

```
public static final int BORDER_LINE_OF_CONTROL
```

```
public static final int BORDER_REGIONAL
```

```
public static final int BORDER_STATE
```

```
public static final int BUILDING
```

```
public static final int BUILTUP
```

```
public static final int CEMETERY
```

```
public static final int CITY_PARK
```

```
public static final int DESERT
```

```
public static final int EXIT_SIGN
```

```
public static final int FERRY
```

```
public static final int GLACIER
```

```
public static final int GOLF_COURSE
```

```
public static final int HARBOR_AREA
```

```
public static final int HOSPITAL_CAMPUS
```

```
public static final int ICON_MOUNTAIN
```

```
public static final int ICON_PUBLIC_TRANSIT_STATION
```

```
public static final int INDUSTRIAL_COMPLEX
```

```
public static final int LABEL_AIRPORT_AREA
```

```
public static final int LABEL_AMUSEMENT_PARK
```

```
public static final int LABEL_ANIMAL_PARK
```

```
public static final int LABEL_BEACH
```

```
public static final int LABEL_BUILDING
```

```
public static final int LABEL_CEMETERY
```

```
public static final int LABEL_CITY_CAPITAL
```

```
public static final int LABEL_CITY_OTHER
```

```
public static final int LABEL_CITY_PARK
```

```
public static final int LABEL_CITY_STATE_CAPITAL
```

```
public static final int LABEL_CONTINENT
```

```
public static final int LABEL_DESERT
```

```
public static final int LABEL_FERRY
```

```
public static final int LABEL_GLACIER
```

```
public static final int LABEL_GOLF_COURSE
```

```
public static final int LABEL_HARBOR_AREA
```

```
public static final int LABEL_HOSPITAL_CAMPUS
```

```
public static final int LABEL_INDUSTRIAL_COMPLEX
```

```
public static final int LABEL_ISLAND
```

```
public static final int LABEL_MAJOR_COUNTRY
```

```
public static final int LABEL_MILITARY_BASE
```

```
public static final int LABEL_MINOR_COUNTRY
```

```
public static final int LABEL_MOUNTAIN
```

```
public static final int LABEL_NATIONAL_PARK
```

```
public static final int LABEL_NATIVE_RESERVATION
```

```
public static final int LABEL_NEIGHBORHOOD_AREA
```

```
public static final int LABEL_OCEAN
```

```
public static final int LABEL_PEDESTRIAN_AREA
```

```
public static final int LABEL_PUBLIC_TRANSIT_LINE
```

```
public static final int LABEL_PUBLIC_TRANSIT_STATION
```

```
public static final int LABEL_RAILYARD
```

```
public static final int LABEL_SEA
```

```
public static final int LABEL_SHOPPING_COMPLEX
```

```
public static final int LABEL_SPORTS_COMPLEX
```

```
public static final int LABEL_STATE
```

```
public static final int LABEL_STATE_ABBREVIATION
```

```
public static final int LABEL_STREET_CATEGORY_0
```

```
public static final int LABEL_STREET_CATEGORY_1
```

```
public static final int LABEL_STREET_CATEGORY_2
```

```
public static final int LABEL_STREET_CATEGORY_3
```

```
public static final int LABEL_STREET_CATEGORY_4
```

```
public static final int LABEL_STREET_CATEGORY_PEDESTRIAN
```

```
public static final int LABEL_STREET_CATEGORY_WALKWAY
```

```
public static final int LABEL_UNIVERSITY_CAMPUS
```

```
public static final int LABEL_WATER_OTHER
```

```
public static final int LABEL_WOODLAND
```

```
public static final int LAND
```

```
public static final int LANDMARK_3D
```

```
public static final int LAND_PARCEL
```

```
public static final int MILITARY_BASE
```

```
public static final float MOVE_PRESERVE_ORIENTATION
```

A valid orientation value that lies outside the minimum and maximum supported tilt range, used to indicate that the current orientation should be preserved. Pass this value to preserve the orientation when calling compound `Map` transform operations.

```
public static final float MOVE_PRESERVE_TILT
```

A valid tilt value that lies outside the range of `getMinTilt()` and `getMaxTilt()`, used to indicate that the current tilt should be preserved. Pass this value to preserve the tilt when calling compound `Map` transform operations.

```
public static final double MOVE_PRESERVE_ZOOM_LEVEL
```

A valid zoom level value that lies outside the range of `getMinZoomLevel()` and `getMaxZoomLevel()`, used to indicate that the current zoom level should be preserved. Pass this value to preserve the zoom level when calling compound `Map` transform operations.

```
public static final int NATIONAL_PARK
```

```
public static final int NATIVE_RESERVATION
```

```
public static final int NEIGHBORHOOD_AREA
```

```
public static final int OUTLINE_MILITARY_BASE
```

```
public static final int OUTLINE_NATIONAL_PARK
```

```
public static final int OUTLINE_NATIVE_RESERVATION
```

```
public static final int PEDESTRIAN_AREA
```

```
public static final int PEDESTRIAN_FEATURE
```

```
public static final int POINT_ADDRESS
```

```
public static final int POI_ICON
```

```
public static final int POI_LABEL
```

```
public static final int PUBLIC_TRANSIT_LINE
```

```
public static final int RAILROAD
```

```
public static final int RAILYARD
```

```
public static final int RELIEF
```

```
public static final int ROADSIGN_ICON
```

```
public static final int SHOPPING_COMPLEX
```

```
public static final int SPORTS_COMPLEX
```

```
public static final int STREET_CATEGORY_0
```

```
public static final int STREET_CATEGORY_1
```

```
public static final int STREET_CATEGORY_2
```

```
public static final int STREET_CATEGORY_3
```

```
public static final int STREET_CATEGORY_4
```

```
public static final int STREET_CATEGORY_PEDESTRIAN
```

```
public static final int STREET_CATEGORY_WALKWAY
```

```
public static final int UNIVERSITY_CAMPUS
```

```
public static final int WATER
```

```
public static final int WOODLAND
```

## Method Details

```
public void addClusterLayer (ClusterLayer layer)
```

Attaches cluster layer to the map. From this moment on the markers added to the layer will be also added to the map. After the layer is added clustering will happen automatically.

### Parameters:

- **layer**  
layer to add

### Throws:

- **NullPointerException**  
if null is passed as an argument

```
public boolean addMapObject (MapObject object)
```

Adds a *MapObject* to this Map .

### Parameters:

- **object**

A `MapObject` to add

**Returns:**

True if the `MapObject` was added successfully, false otherwise (if the object has already been added, as duplicates are not allowed).

**Throws:**

- `NullPointerException`  
if object is null.

**See also:**

[addMapObjects\(List<MapObject>\)](#)

[removeMapObject\(MapObject\)](#)

```
public boolean addMapObjects (java.util.List <MapObject> objects)
```

Adds a `List` of multiple `MapObject` objects to this `Map` .

**Parameters:**

- `objects`  
A `List` of `MapObject` objects to add

**Returns:**

True if all the `MapObjects` in the `List` were added successfully, false otherwise (if any of the objects have already been added, as duplicates are not allowed).

**Throws:**

- `NullPointerException`  
if `objects` is null

**See also:**

[addMapObject\(MapObject\)](#)

[removeMapObjects\(List<MapObjects>\)](#)

```
public boolean addMapOverlay (MapOverlay overlay)
```

Adds a `MapOverlay` to this `Map` .

**Parameters:**

- `overlay`  
A `MapOverlay` to add.

**Returns:**

True if the `MapOverlay` was added successfully, false otherwise.

**Throws:**

- **NullPointerException**

if overlay is null

**See also:**

[removeMapOverlay\(MapOverlay\)](#)

```
public boolean addRasterTileSource (MapRasterTileSource source)
```

Adds a user-defined *MapRasterTileSource* to this Map .

**Parameters:**

- **source**

A *MapRasterTileSource* representing a user-defined raster tile source

**Returns:**

True if the raster tile source was added successfully, false otherwise

**See also:**

[removeRasterTileSource\(MapRasterTileSource\)](#)

```
public void addSchemeChangeListener (OnSchemeChangeListener listener)
```

Adds a *Map.OnSchemeChangeListener* to listen for map scheme change events.

**Parameters:**

- **listener**

A *Map.OnSchemeChangeListener* to add to the Map

**See also:**

[removeTransformListener\(OnTransformListener\)](#)

```
public void addTransformListener (OnTransformListener listener)
```

Adds a *Map.OnTransformListener* to this Map to listen for map transform events.

**Parameters:**

- **listener**

A *Map.OnTransformListener* to add to the Map

**See also:**

[removeTransformListener\(OnTransformListener\)](#)

```
public boolean areCartoMarkersVisible ()
```

Returns a boolean indicating whether all *MapCartoMarkers* of all *IconCategory* are visible.

This is equivalent to calling `areCartoMarkersVisible(IconCategory)` with `IconCategory.ALL`.

**Returns:**

true if MapCartoMarkers of all IconCategory are visible, false otherwise.

```
public boolean areCartoMarkersVisible (IconCategory category)
```

Get if *MapCartoMarkers* of a certain POI category is shown.

**Parameters:**

- **category**  
See *IconCategory* for category list.

**Returns:**

true if the MapCartoMarkers of the specified category is visible, false otherwise.

```
public boolean areExtrudedBuildingsVisible ()
```

Returns a boolean indicating whether the extruded buildings layer is shown on this map.

**Returns:**

true if shown, false otherwise.

```
public boolean areLandmarksVisible ()
```

Returns a boolean indicating whether 3D landmarks are currently visible.

**Returns:**

True if landmarks are visible, false otherwise

```
public boolean areSafetySpotsVisible ()
```

Gets the current visibility of safety spots.

**Returns:**

true if safety spot visibility has been enabled.

```
public static int convert (LayerCategory cat)
```

**Parameters:**

- **cat**

```
public CustomizableScheme createCustomizableScheme (String newSchemeName,  
String baseSchemeName)
```

Creates a customizable scheme based on an existing [Map.Scheme](#). Please note that created schemes are destroyed when the application life cycle ends.

#### Parameters:

- **newSchemeName**  
Name of the new scheme which you want to create.
- **baseSchemeName**  
Name of base scheme. New scheme will be derived from this base scheme. Base scheme should be one from [getMapSchemes\(\)](#)

#### Returns:

A customizable Scheme Instance.

#### Throws:

- **AccessControlException**  
Access to this operation is denied. Contact your HERE representative for more information.
- **NullPointerException**  
if newSchemeName OR baseSchemeName is null.
- **InvalidParameterException**  
if baseSchemeName is not valid OR newSchemeName already exist.

```
public Map disableTrafficAutoUpdate ()
```

Disables automatic traffic information updates.

To implement custom traffic updates in an app, use this method to turn off automatic updating, then call `TrafficUpdater#request(GeoCoordinate, int, TrafficUpdater.Listener)` as needed to request traffic in a radius around a given location.

This method must be called before [setTrafficInfoVisible\(boolean\)](#).

#### Returns:

The modified Map itself.

```
public static void enableMaximumFpsLimit (boolean isLimited)
```

Function to enable/disable the FPS draw limit. When enabled, the redraw of the map will be limited to the value set using [setMaximumFps\(int\)](#). When disabled, the redraw rate will be hardware limited.

#### Parameters:

- **isLimited**  
True if FPS limiting is to be enabled. False, to disable limiting.

```
public void executeSynchronized (Runnable task)
```

Execute a batched set of commands to the `Map` . This is useful to improve performance when multiple operations require re-rendering of the display.

**Parameters:**

- **task**

Task block to execute synchronously.

```
public GeoBoundingBox getBoundingBox ()
```

Returns the current visible map area as a *GeoBoundingBox*.

Note that a bounding box is always rectangular, and its sides are always parallel to latitude and longitude. If the map is rotated when this method is called (for example, if the orientation is 10 degrees east of true-north), the returned bounding box will be a circumscribed rectangle that is larger than the visible map area. Similarly, when the map is tilted (for example, if the map is tilted by 45 degrees), the visible map area represents a trapezoidal area in the world. Calling *getBoundingBox()* will then return a larger circumscribed rectangle that contains this trapezoid area.

The bounding box may be invalid when this method is called at low zoom levels, as the map area does not fill the screen.

**Returns:**

The *GeoBoundingBox* containing the visible map area.

```
public GeoCoordinate getCenter ()
```

Returns the *GeoCoordinate* location at the current center of this `Map` .

**Returns:**

The current map center

```
public String getCopyright ()
```

Returns the copyright notice text for this `Map` . This text is only available after `Map` completes rendering for the first time.

**Returns:**

The copyright notice

```
public CustomizableScheme getCustomizableScheme (String schemeName)
```

Retrieves a customizable scheme by using its name.

**Parameters:**

- **schemeName**

Name of customizable scheme name.

**Returns:**

A customizable Scheme Instance OR null if no scheme found.

**Throws:**

- **InvalidParameterException**  
if scheme with this name is not configurable.

```
public java.util.EnumSet <FleetFeature> getFleetFeaturesVisible ()
```

Get the set of fleet features visible.

**Returns:**

The EnumSet of fleet features enabled

```
public int getHeight ()
```

Returns the current height of this Map , in number of pixels.

**Returns:**

The current height

```
public MapBuildingLayer getMapBuildingLayer ()
```

Returns the *MapBuildingLayer* for this Map . This layer enables user interactions with extruded buildings on the map.

**Returns:**

A *MapBuildingLayer* instance for this Map.

**Throws:**

- **AccessControlException**  
Access to this operation is denied. Contact your HERE representative for more information.

```
public String getMapDisplayLanguage ()
```

Get the language which the Map is set to render

**Returns:**

String MARC code of the displayed language.

```
public String getMapScheme ()
```

Returns the current scheme for the Map .

**Returns:**

The current scheme

**See also:**

[Map.Scheme](#)

[getMapSchemes\(\)](#)

```
public List getMapSchemes ()
```

Returns a list containing all supported schemes for the Map .

**Returns:**

The supported schemes

**See also:**

[Map.Scheme](#)

[getMapScheme\(\)](#)

[setMapScheme\(String\)](#)

```
public String getMapSecondaryDisplayLanguage ()
```

Get the secondary language which the Map is set to render

**Returns:**

String MARC code of the displayed language.

```
public MapState getMapState ()
```

Returns the current tilt, perspective, and zoom of the map as a [MapState](#) object.

**Returns:**

[MapState](#) object representing current state of the map.

```
public MapTrafficLayer getMapTrafficLayer ()
```

Get the [MapTrafficLayer](#)

**Returns:**

MapTrafficLayer

```
public MapTransitLayer getMapTransitLayer ()
```

Returns the [MapTransitLayer](#) associated with this Map .

**Returns:**

The `MapTransitLayer`

```
public float getMaxTilt ()
```

Returns the maximum degree allowed to be set as tilt angle for the `Map` .

**Returns:**

float maximum tilt angle in degrees.

```
public double getMaxZoomLevel ()
```

Returns the highest valid zoom level for `Map` , representing the closest view near the street-level

**Returns:**

The maximum zoom level

```
public static int getMaximumFps ()
```

Function to get the maximum drawing frames-per-second.

**Returns:**

The maximum drawing frames-per-second.

```
public float getMinTilt ()
```

Returns the minimum degree allowed to be set as tilt angle for the `Map` .

**Returns:**

float minimum tilt angle in degrees.

```
public double getMinZoomLevel ()
```

Returns the lowest valid zoom level for `Map` , representing the most distant view away from street-level.

**Returns:**

The minimum zoom level

```
public float getOrientation ()
```

Returns the current orientation for this `Map` , in degrees relative to true-north, which has an orientation of 0 degrees.

**Returns:**

The current orientation angle

```
public java.util.EnumSet <PedestrianFeature> getPedestrianFeaturesVisible ()
```

Get the set of pedestrian features visible.

**Returns:**

The EnumSet of Pedestrian features enabled

```
public PositionIndicator getPositionIndicator ()
```

Deprecated: As of SDK 3.3.

Use `getPositionIndicator()` or `getPositionIndicator()` instead.

Returns the *PositionIndicator* instance that renders the current position with a marker. The position indicator should be used with *PositioningManager*.

**Returns:**

The PositionIndicator

```
public Projection getProjectionMode ()
```

Gets the current map projection mode.

**Returns:**

Projection current projection mode.

```
public double getScaleFromZoomLevel (double level)
```

Returns a map scale value based on the specified zoom level. Scale units are in physical geo centimeters per screen inch.

**Parameters:**

- `level`

The zoom level to be translated to a map scale.

**Returns:**

Scale value for the passed `level`. Units are in geo centimeters per screen inch

```
public java.util.List <ViewObject> getSelectedObjects (PointF p)
```

Returns the list of selectable *ViewObject* instances which are located at the specified screen pixel coordinates.

**Parameters:**

- `p`

Screen pixel coordinate to check for *ViewObject*.

**Returns:**

The list of `ViewObject` objects at the pixel coordinate. If no object exists at `p`, returns an empty list.

```
public java.util.List <ViewObject> getSelectedObjects (ViewRect rect)
```

Returns the list of selectable `ViewObject` objects which are within a specified `ViewRect`.

**Parameters:**

- `rect`  
A `ViewRect` with selected `ViewObject` objects

**Returns:**

The list of `ViewObjects` within the `ViewRect`. If no object exists within `rect`, returns an empty list.

```
public java.util.List <ViewObject> getSelectedObjectsNearby (PointF p)
```

Returns the list of selectable `ViewObject` instances which are located at the specified screen pixel coordinates.

**Parameters:**

- `p`  
Screen pixel coordinate to check for `ViewObject`.

**Returns:**

The list of `ViewObject` objects at the pixel coordinate. If no object exists at `p`, returns an empty list.

```
public List getSupportedMapDisplayLanguages ()
```

Get the list of supported display languages.

**Returns:**

a list of supported map display languages

```
public float getTilt ()
```

Returns the current tilt angle for this `Map`, in degrees.

**Returns:**

The current tilt angle

```
public PointF getTransformCenter ()
```

Returns the current center coordinate for `Map` transformations such as zooming and rotation. The transform center may be different than the `Map` center.

**Returns:**

The `PointF` representing the current center used for transformations

```
public java.util.EnumSet <LayerCategory> getVisibleLayers ()
```

Get the set of Map layers being rendered.

**Returns:**

An `EnumSet` identifying the rendered layers.

```
public int getWidth ()
```

Returns the current width of this `Map`, in number of pixels.

**Returns:**

The current width

```
public double getZoomLevel ()
```

Returns the current zoom level, which will be within a range between [getMinZoomLevel\(\)](#) and [getMaxZoomLevel\(\)](#). The zoom level is only precise to three decimal places due to numerical operations performed internally when rendering the map.

**Returns:**

The zoom level within the fractional range

```
public static boolean isMaximumFpsLimited ()
```

Function to check if the FPS draw limit is enabled or not.

**Returns:**

True if FPS draw limit is enabled. False otherwise.

```
public boolean isStreetLevelCoverageVisible ()
```

Returns a `boolean` indicating whether street level coverage is visible.

**Returns:**

True if street level coverage is visible, false otherwise

```
public boolean isTrafficAutoUpdateEnabled ()
```

Returns a `boolean` indicating whether automatic traffic updates are enabled.

**Returns:**

True if traffic updates are requested automatically, false otherwise.

```
public boolean isTrafficInfoVisible ()
```

Returns a boolean indicating whether traffic information is currently visible on the Map .

**Returns:**

True if traffic information is visible, false otherwise

```
public void pan (PointF from, PointF to)
```

Moves the map from one specified screen pixel coordinates to another in a linear motion.

**Parameters:**

- **from**  
A `PointF` representing the screen pixel coordinates to pan the map from.
- **to**  
A `PointF` representing the screen pixel coordinates to pan the map to.

```
public GeoCoordinate pixelToGeo (PointF point)
```

Converts and returns *GeoCoordinate* from screen pixel coordinates.

This method returns `null` if the conversion fails. (For example, if the coordinate is not a valid value.)

**Parameters:**

- **point**  
The screen pixel coordinates to convert

**Returns:**

A *GeoCoordinate* representing the map location. `null` if the conversion fails.

**See also:**

[pixelToGeo\(PointF, float\)](#)

[pixelToGeo\(List<PointF>\)](#)

```
public GeoCoordinate pixelToGeo (PointF point, float altitude)
```

Converts and returns *GeoCoordinate* from screen pixel coordinates at specific altitude.

This method returns `null` if the conversion fails. (For example, if the coordinate is not a valid value.)

**Parameters:**

- **point**  
The screen pixel coordinates to convert
- **altitude**  
A height in meters on which *GeoCoordinate* need to be calculated.

**Returns:**

A `GeoCoordinate` representing the map location. `null` if the conversion fails.

**See also:**

[pixelToGeo\(PointF\)](#)

[pixelToGeo\(List<PointF>\)](#)

```
public java.util.List <GeoCoordinate> pixelToGeo (List points)
```

Converts and returns a list of `GeoCoordinate` objects from a `List` of screen pixel coordinates.

This method returns one or more list elements as `null` if the conversion of the corresponding pixel coordinates fails.

**Parameters:**

- **points**

A `List` of screen pixel coordinates to convert

**Returns:**

A list of `GeoCoordinate` or `null` elements.

**See also:**

[pixelToGeo\(PointF\)](#)

[pixelToGeo\(PointF, float\)](#)

```
public PixelResult projectToPixel (GeoCoordinate coordinate)
```

Converts and returns a `PixelResult` that represents screen pixel coordinates from a `GeoCoordinate`. This method is converts a `GeoCoordinate` from world space to screen space.

**Parameters:**

- **coordinate**

A `GeoCoordinate` to convert

**Returns:**

A `PixelResult` representing screen pixel coordinates and operation success code. Check `PixelResult#getError()` to check the success of the conversion.

**See also:**

[projectToPixel\(List<GeoCoordinate>\)](#)

```
public java.util.List <PixelResult> projectToPixel (java.util.List  
<GeoCoordinate> coordinates)
```

Converts and returns a list of *Map.PixelResult* elements that represent screen pixel coordinates from a List of *GeoCoordinate* objects.

This method returns one or more list elements as null if the conversion of the corresponding *GeoCoordinate* instances fails.

**Parameters:**

- **coordinates**

A List of *GeoCoordinate* objects to convert

**Returns:**

The list of *PixelResult* results. Check *PixelResult#getError()* to check the success of each conversion.

**See also:**

[projectToPixel\(GeoCoordinate\)](#)

```
public void removeClusterLayer (ClusterLayer layer)
```

Detaches the cluster from the map. After this call completes markers on this layer will be removed from the map.

**Parameters:**

- **layer**

layer to remove

```
public boolean removeCustomizableScheme (String schemeName)
```

Remove customizable scheme. Please note that the current scheme cannot be removed.

**Parameters:**

- **schemeName**

Name of the scheme which you want to remove.

**Returns:**

Boolean indicating scheme has been removed successfully.

**Throws:**

- **NullPointerException**

if schemeName is null.

- **InvalidParameterException**

if schemeName is not valid OR not removable.

```
public boolean removeMapObject (MapObject object)
```

Removes a *MapObject* from this Map .

**Parameters:**

- **object**

A `MapObject` to remove

**Returns:**

True if the `MapObject` was removed successfully, false otherwise

**See also:**

[removeMapObjects\(List<MapObject>\)](#)

```
public boolean removeMapObjects (java.util.List <MapObject> objects)
```

Removes a `List` of multiple `MapObject` objects from this `Map` .

**Parameters:**

- **objects**

A `List` of `MapObject` objects to remove

**Returns:**

True if all the `MapObjects` in the `List` were removed successfully, false otherwise

**See also:**

[removeMapObject\(MapObject\)](#)

```
public boolean removeMapOverlay (MapOverlay overlay)
```

Removes a `MapOverlay` from this `Map` .

**Parameters:**

- **overlay**

A `MapOverlay` to remove

**Returns:**

True if the `MapOverlay` was removed successfully, false otherwise.

**Throws:**

- **NullPointerException**

if `overlay` is null

```
public boolean removeRasterTileSource (MapRasterTileSource source)
```

Removes a user-defined `MapRasterTileSource` from this `Map` .

**Parameters:**

- **source**

A *MapRasterTileSource* representing a user-defined raster tile source

**Returns:**

True if the raster tile source was removed successfully, false otherwise

```
public void removeSchemeChangeListener (OnSchemeChangeListener listener)
```

Removes an existing *Map.OnSchemeChangeListener*.

**Parameters:**

- **listener**  
A *Map.OnSchemeChangeListener* to remove from the Map

```
public void removeTransformListener (OnTransformListener listener)
```

Removes an existing *Map.OnTransformListener* from this Map .

**Parameters:**

- **listener**  
A *Map.OnTransformListener* to remove from the Map

```
public Map setCartoMarkersVisible (boolean visible)
```

Show or hide all *MapCartoMarkers* on Map .

**Parameters:**

- **visible**  
Whether the *MapCartoMarkers* should be visible.

**Returns:**

The updated Map.

```
public Map setCartoMarkersVisible (IconCategory category, boolean visible)
```

Toggles the visibility of a particular POI category's *MapCartoMarkers*. To toggle visibility for *IconCategory.ALL* categories, *setCartoMarkersVisible(boolean)* can also be used.

**Parameters:**

- **category**  
See *IconCategory* for category list.
- **visible**  
Intended visibility for the specific POI category's *MapCartoMarkers*.

**Returns:**

The updated Map itself.

```
public void setCenter (GeoCoordinate point, Animation animation, double level,  
float orientation, float tilt)
```

Moves the center of this Map to a specific *GeoCoordinate*, while simultaneously setting a zoom level (a fraction within the range of minimum and maximum levels), orientation (from 0 degrees to 360 degrees), and tilt (within the range of minimum and maximum tilt angles). If you wish to keep the current zoom level, orientation, or tilt after setting a new center, pass one or more of the following values as the relevant parameter:

- *MOVE\_PRESERVE\_ZOOM\_LEVEL* to keep the current zoom level
- *MOVE\_PRESERVE\_ORIENTATION* to keep the current orientation
- *MOVE\_PRESERVE\_TILT* to keep the current tile

Note: it is unlikely that you would pass all three of the special *MOVE\_PRESERVE\_ZOOM\_LEVEL*, *MOVE\_PRESERVE\_ORIENTATION* and *MOVE\_PRESERVE\_TILT* parameters when calling this method (it would make more sense to call *setCenter(GeoCoordinate, Animation)*). More likely, you would use one or two of the special parameters (for example, change the orientation and tilt along with the center coordinate while keeping the current zoom level).

#### Parameters:

- **point**  
A *GeoCoordinate* representing the new center
- **animation**  
A *Map.Animation* to illustrate the transformation
- **level**  
Desired zoom level of the newly-centered Map (pass *MOVE\_PRESERVE\_ZOOM\_LEVEL* to keep the current level)
- **orientation**  
Desired orientation of the newly-centered Map (pass *MOVE\_PRESERVE\_ORIENTATION* to keep the current orientation)
- **tilt**  
Desired tilt angle of the newly-centered Map (pass *MOVE\_PRESERVE\_TILT* to keep the current tilt)

#### See also:

[setCenter\(GeoCoordinate, Animation\)](#)

[getMaxZoomLevel\(\)](#)

[getMinZoomLevel\(\)](#)

[getMaxTilt\(\)](#)

[getMinTilt\(\)](#)

```
public void setCenter (GeoCoordinate point, Animation animation)
```

Moves the center of this Map to the specified GeoCoordinate using the given *Map.Animation*.

#### Parameters:

- **point**  
A GeoCoordinate representing the new center
- **animation**  
An Animation to illustrate the transformation

#### See also:

*setCenter(GeoCoordinate, Animation, double, float, float)*

```
public void setCenter (PointF newCenter, Animation animation, double zoomLevel, float orientation, float tilt)
```

Centers the map at the specified screen pixel coordinates. The zoom level, orientation and tilt angle be adjusted at the same time.

#### Parameters:

- **newCenter**  
A PointF representing the screen pixel coordinates to set as map center.
- **animation**  
An Animation to illustrate the transformation
- **zoomLevel**  
Desired zoom level of the newly-centered Map. Use *MOVE\_PRESERVE\_ZOOM\_LEVEL* to keep the current zoom level.
- **orientation**  
Desired orientation of the newly-centered Map. Use *MOVE\_PRESERVE\_ORIENTATION* to keep the current orientation angle.
- **tilt**  
Desired tilt angle of the newly-centered Map. Use *MOVE\_PRESERVE\_TILT* to keep the current tilt angle.

#### Throws:

- **IllegalArgumentException**  
if unsupported zoom level or orientation angel is specified.

#### See also:

*setCenter(GeoCoordinate, Animation, double, float, float)*

```
public static void setCustomMapConfiguration (String pathToConfigFile, String pathToResourceFile)
```

Deprecated: As of SDK 3.4.

Use *set(Hashtable)* instead.

Set a custom map style configuration. The custom map style setting should be made before the first Map is created. Note: This API should only be used in consultation with HERE technical support.

**Parameters:**

- **pathToConfigFile**  
Map Style Configuration File.
- **pathToResourceFile**  
Map Style Resource File. Can be null where default file will be used.

**Throws:**

- **FileNotFoundException**  
If pathToConfigFile or pathToResourceFile not exists.

```
public boolean setExtrudedBuildingsVisible (boolean visible)
```

Show or hide the extruded buildings layer on this map.

**Parameters:**

- **visible**  
true to show extruded building, false otherwise

**Returns:**

boolean True if extruded build visibility has been changed successfully. False, otherwise.

```
public Map setFadingAnimations (boolean enabled)
```

Enable or disable animations for labels and icons shown on the map. Note: the fading animations property will take effect when the map is redrawn.

**Parameters:**

- **enabled**  
true to enable animations (default), false to disable animations

**Returns:**

The updated Map.

```
public Map setFleetFeaturesVisible (java.util.EnumSet <FleetFeature>  
features)
```

Set a set of fleet features to be visible. Features not in the set will be set invisible. An empty set means no features are visible.

**Parameters:**

- **features**  
A set of visible fleet features

## Returns:

The updated Map itself.

## Throws:

- **AccessControlException**  
Access to this operation is denied. Contact your HERE representative for more information.

## public *Map* setLandmarksVisible (boolean visible)

Sets 3D landmarks to be either visible or invisible for this Map .

If the map scheme is set to any Hybrid or Satellite map schemes (such as *SATELLITE\_DAY* or *HYBRID\_DAY*), this method will have no visible effect.

## Parameters:

- **visible**  
A boolean specifying whether 3D landmarks should be visible

## Returns:

The updated Map.

## Throws:

- **AccessControlException**  
Access to this operation is denied. Contact your HERE representative for more information.

## public boolean setMapDisplayLanguage (Locale language)

Set the map display language using a locale. Causes a map redraw when language is set.

When this method is called, it will override the device's current locale until the device's locale is changed. This language change does not affect other features like search.

## Parameters:

- **language**  
The language locale as described in <http://developer.android.com/reference/java/util/Locale.htm..>

## Returns:

true if the language is accepted by the Map, false otherwise.

## public *Map* setMapScheme (String scheme)

Sets a scheme for the Map to the specified String value.

## Parameters:

- **scheme**  
The desired scheme from *getMapSchemes()*.

## Returns:

The updated Map.

## Throws:

- **AccessControlException**  
Access to this operation is denied. Contact your HERE representative for more information.

## See also:

[Map.Scheme](#)

[getMapSchemes\(\)](#)

```
public Map setMapScheme (CustomizableScheme customizableScheme)
```

Sets a scheme for the Map to the specified customizable scheme.

## Parameters:

- **customizableScheme**  
CustomizableScheme instance.

## Returns:

The updated Map.

## Throws:

- **AccessControlException**  
Access to this operation is denied. Contact your HERE representative for more information.

## See also:

[Map.Scheme](#)

[getMapSchemes\(\)](#)

```
public boolean setMapSecondaryDisplayLanguage (Locale language)
```

Set the map secondary display language using a locale. Causes a map redraw when language is set. Passing null will cause the display of secondary language to be disabled.

Setting a secondary display language will cause the language to be displayed below the primary language for some map labels (e.g. countries).

## Parameters:

- **language**  
The language locale as described in <http://developer.android.com/reference/java/util/Locale.htm>.. or null to disable display of secondary language.

## Returns:

true if the language is accepted by the Map, false otherwise.

**See also:**

[setMapDisplayLanguage\(Locale\)](#)

```
public static void setMaximumFps (int fps)
```

Function to set the maximum drawing frames-per-second. The FPS rate is used if [enableMaximumFpsLimit\(boolean\)](#) is enabled.

IMPORTANT: Setting this property less than 5 fps is not recommended, as the map view's usability suffers dramatically. For example, the position indicator may not function correctly. Tilting and zooming may also become overly slow.

**Parameters:**

- **fps**  
Frames-per-second (must be greater than zero)

```
public void setMaximumTiltFunction (ZoomLevelToTiltFunction function)
```

The functional relationship between zoom and maximum tilt. Using the `setMaximumTiltFunction`, an application may control the maximum tilt of a map at different zoom levels. The maximum applies to all sources of map tilt, including gestures and animations.

**Parameters:**

- **function**  
- function that provides a tilt value output for a zoom level input.

```
public Map setOrientation (float angle)
```

Sets an absolute orientation for this `Map` to the specified angle, in degrees, where true-north is 0 degrees. No animation will be used to illustrate the transformation.

**Parameters:**

- **angle**  
Desired orientation angle

**Returns:**

The updated `Map`.

**See also:**

[setOrientation\(float, Animation\)](#)

```
public void setOrientation (float angle, Animation animation)
```

Sets an absolute orientation for this `Map` to the specified angle, in degrees, where true-north is 0 degrees.

Note: animation is only visible for `BOW`. No animation is performed for `LINEAR` and `NONE`.

## Parameters:

- **angle**  
Desired orientation angle
- **animation**  
An `Animation` to illustrate the transformation

## See also:

[setOrientation\(float\)](#)

```
public Map setPedestrianFeaturesVisible (java.util.EnumSet <PedestrianFeature> features)
```

Set a set of pedestrian features to be visible. Features not in the set will be set invisible. An empty set means no features are visible

## Parameters:

- **features**  
A set of visible pedestrian features

## Returns:

The updated `Map` itself.

```
public Map setProjectionMode (Projection projection)
```

Change the projection mode used to render the map.

## Parameters:

- **projection**  
The new projection mode.

## Returns:

Map builder pattern

## Throws:

- **IllegalArgumentException**  
if deprecated `Map.Projection` modes are used.

```
public void setSafetySpotsVisible (boolean visible)
```

Sets safety spots visible.

## Parameters:

- **visible**  
true for visible, false to hide.

## Throws:

- **AccessControlException**

Access to this operation is denied. Contact your HERE representative for more information.

```
public Map setStreetLevelCoverageVisible (boolean visible)
```

Sets street level coverage to be either visible or invisible for the Map .

## Parameters:

- **visible**

A boolean specifying whether street level coverage should be visible

## Returns:

The updated Map.

## Throws:

- **AccessControlException**

Access to this operation is denied. Contact your HERE representative for more information.

```
public Map setTilt (float angle)
```

Sets a tilt angle for this Map , in degrees.

## Parameters:

- **angle**

Desired tilt angle. Acceptable values are the range between *getMinTilt()* and *getMaxTilt()* inclusive.

## Returns:

The updated Map.

## See also:

[setTilt\(float, Animation\)](#)

[getMinTilt\(\)](#)

[getMaxTilt\(\)](#)

```
public void setTilt (float angle, Animation animation)
```

Sets a tilt angle for the Map , in degrees.

Note: The tilt animation is not cancelled when other map operations (for example, *setCenter(GeoCoordinate, Animation)*) are performed. Therefore, the tilt animation can occur concurrently with other animations.

## Parameters:

- **angle**

Desired tilt angle. Acceptable values are the range between *getMinTilt()* and *getMaxTilt()* inclusive.

- **animation**

An `Animation` to illustrate the transformation

**See also:**

[setTilt\(float\)](#)

[getMinTilt\(\)](#)

[getMaxTilt\(\)](#)

## `public Map setTrafficInfoVisible (boolean visible)`

Sets traffic information to be either visible or invisible for this `Map` .

Traffic can only be displayed on one `Map` at a time. It is recommended that you turn off traffic display on other `Maps` before enabling traffic display on a new `Map` otherwise the results may be unpredictable. If multiple `Maps` are shown at the same time with `setTrafficInfoVisible` true, only one will display traffic.

**Parameters:**

- **visible**

A `boolean` specifying whether traffic information should be visible.

**Returns:**

The modified `Map` itself.

**Throws:**

- **`AccessControlException`**

Access to this operation is denied. Contact your HERE representative for more information.

## `public Map setTransformCenter (PointF center)`

Sets a center coordinate for `Map` transformations such as zooming and rotation. Transformations performed after calling this method will be based on this new center coordinate. The transform center may be different than the `Map` center.

**Parameters:**

- **center**

A `PointF` representing the center used for transformations

**Returns:**

The updated `Map`

## `public boolean setUseSystemLanguage ()`

Set the map display language using the system default locale. Causes a map redraw when language is set.

**Returns:**

true if the language update is accepted by the Map, false otherwise.

```
public Map setVisibleLayers (java.util.EnumSet <LayerCategory> layers,  
boolean enable)
```

Toggles the visibility of the map layer categories to be rendered.

By default, all layer categories are enabled.

**Parameters:**

- **layers**  
EnumSet of layers to change visibility.
- **enable**  
true to render, false to not render

**Returns:**

The updated Map itself.

```
public Map setZoomLevel (double level)
```

Sets a zoom level for the Map to a fraction that is within the range of minimum and maximum zoom levels. No animation will be used to illustrate the transformation.

Legal values are the range between [getMinZoomLevel\(\)](#) and [getMaxZoomLevel\(\)](#), inclusive.

If this method is called before map animation has finished (for example, if you had called [setCenter\(GeoCoordinate, Animation\)](#)), the existing animation may be stopped and the map will proceed directly to change the zoom level. Consider using other methods that combine multiple actions to avoid unintentionally canceling map animations. For example, use [setCenter\(GeoCoordinate, Animation, double, float, float\)](#).

Note: The zoom level is only precise to three decimal places due to numerical operations performed internally when rendering the map.

**Parameters:**

- **level**  
Desired fractional zoom level

**Returns:**

The updated Map.

**See also:**

[setZoomLevel\(double, Animation\)](#)

[setZoomLevel\(double, PointF, Animation\)](#)

[getMinZoomLevel\(\)](#)

[getMaxZoomLevel\(\)](#)

```
public void setZoomLevel (double level, Animation animation)
```

Sets a zoom level for the Map to a fraction that is within the range of minimum and maximum zoom levels.

Legal values are the range between *getMinZoomLevel()* and *getMaxZoomLevel()* inclusive.

If this method is called before map animation is finished (for example, if you had called *setCenter(GeoCoordinate, Animation)*), the existing animation may be stopped and the map will proceed directly to change the zoom level. Consider using other methods that combine multiple actions to avoid unintentionally canceling map animations. For example, use *setCenter(GeoCoordinate, Animation, double, float, float)*.

Note: The zoom level is only precise to three decimal places due to numerical operations performed internally when rendering the map.

**Parameters:**

- **level**  
Desired fractional zoom level
- **animation**  
An Animation to illustrate the transformation

**See also:**

*setZoomLevel(double)*

*setZoomLevel(double, PointF, Animation)*

*getMinZoomLevel()*

*getMaxZoomLevel()*

```
public void setZoomLevel (double level, PointF focus, Animation animation)
```

Sets a zoom level for the Map to a fraction that is within the range of minimum and maximum zoom levels while keeping the specified screen coordinate at the same Geographical Location. Concretely, the *GeoCoordinate* of the specified *PointF* is the same before and after the transformation.

Legal values are the range between *getMinZoomLevel()* and *getMaxZoomLevel()* inclusive.

For the purposes of calculating the focus *GeoCoordinate* , the tilt of the map is considered to be 0. The actual map tilt will not change.

Note: do not call this method before setting the map is initialized. If you call this method while either *getWidth()* or *getHeight()* returns 0 it will throw a *RuntimeException* .

Note: The zoom level is only precise to three decimal places due to numerical operations performed internally when rendering the map.

**Parameters:**

- **level**  
Desired fractional zoom level
- **focus**

A `PointF` to keep fixed, in pixel coordinates.

- **animation**

An `Animation` to illustrate the transformation

**See also:**

[setZoomLevel\(double\)](#)

[setZoomLevel\(double, Animation\)](#)

[getMinZoomLevel\(\)](#)

[getMaxZoomLevel\(\)](#)

```
public void zoomTo (GeoBoundingBox geoRect, Animation animation, float  
orientation)
```

Moves this `Map` instance's map center and changes the zoom level to show the specified [GeoBoundingBox](#) at the given orientation.

Do not call this method before this map instance is initialized. If you call this method while this map is uninitialized (either [getWidth\(\)](#) or [getHeight\(\)](#) returns 0), it will throw a `RuntimeException`. Please note the effects of this method will apply on `Map` slightly after the method invocation.

**Parameters:**

- **geoRect**  
A `GeoBoundingBox` to show after the transformation
- **animation**  
An `Animation` to illustrate the transformation
- **orientation**  
Desired orientation of the `Map` (Use [MOVE\\_PRESERVE\\_ORIENTATION](#) to keep the current orientation)

**See also:**

[zoomTo\(GeoBoundingBox, ViewRect, Animation, float\)](#)

[zoomTo\(GeoBoundingBox, int, int, Animation, float\)](#)

```
public void zoomTo (GeoBoundingBox geoRect, Animation animation, float  
orientation, float perspective)
```

Moves this `Map` instance's map center and changes the zoom level to show the specified [GeoBoundingBox](#) at the given orientation.

Do not call this method before this map instance is initialized. If you call this method while this map is uninitialized (either [getWidth\(\)](#) or [getHeight\(\)](#) returns 0), it will throw a `RuntimeException`. Please note the effects of this method will apply on `Map` slightly after the method invocation.

**Parameters:**

- **geoRect**

A `GeoBoundingBox` to show after the transformation

- **animation**

An `Animation` to illustrate the transformation

- **orientation**

Desired orientation of the Map (Use `MOVE_PRESERVE_ORIENTATION` to keep the current orientation)

- **perspective**

Desired perspective of the Map (Use `MOVE_PRESERVE_TILT` to keep the current tilt)

See also:

[zoomTo\(GeoBoundingBox, ViewRect, Animation, float\)](#)

[zoomTo\(GeoBoundingBox, int, int, Animation, float\)](#)

```
public void zoomTo (GeoBoundingBox geoRect, ViewRect viewport, Animation
animation, float orientation)
```

Moves this Map instance and changes its zoom level to show the specified `GeoBoundingBox` within the provided `ViewRect`.

Do not call this method before this map instance is initialized. If you call this method while this map is uninitialized (either `getWidth()` or `getHeight()` returns 0), it will throw a `RuntimeException`. Please note the effects of this method will apply on Map slightly after the method invocation.

Parameters:

- **geoRect**

A `GeoBoundingBox` to show after the transformation

- **viewport**

A `ViewRect` representing the view port into which the `GeoBoundingBox` fits. The `ViewRect` is interpreted as being in the same `MapFragment` as this Map instance.

- **animation**

An `Animation` to illustrate the transformation

- **orientation**

Desired orientation of the Map (pass `MOVE_PRESERVE_ORIENTATION` to keep the current orientation)

See also:

[zoomTo\(GeoBoundingBox, Animation, float\)](#)

[zoomTo\(GeoBoundingBox, int, int, Animation, float\)](#)

```
public void zoomTo (GeoBoundingBox geoRect, int width, int height, Animation
animation, float orientation)
```

Moves this Map instance and changes its zoom level to show the specified `GeoBoundingBox` within the specified pixel dimensions around the transform center.

Do not call this method before this map instance is initialized. If you call this method while this map is uninitialized (either `getWidth()` or `getHeight()` returns 0), it will throw a `RuntimeException`. Please note the effects of this method will apply on Map slightly after the method invocation.

**Parameters:**

- **geoRect**  
A `GeoBoundingBox` to show after the transformation
- **width**  
The width, in number of pixels, of the bounding area around the transform center, which the `geoRect` will fit into.
- **height**  
The height, in number of pixels, of the bounding area around the transform center, which the `geoRect` will fit into.
- **animation**  
An `Animation` to illustrate the transformation
- **orientation**  
Desired orientation of the Map (pass `MOVE_PRESERVE_ORIENTATION` to keep the current orientation)

**Throws:**

- **`IllegalArgumentException`**  
if width or height is less than or equal to 0

**See also:**

[setTransformCenter\(PointF\)](#)

[zoomTo\(GeoBoundingBox, Animation, float\)](#)

[zoomTo\(GeoBoundingBox, ViewRect, Animation, float\)](#)

## Animation

The enumeration `Animation` is a member of `com.here.android.mpa.mapping.Map`.

### Enumeration Summary

public static final enumeration **Map.Animation**

extends `java.lang.Enum`, `java.lang.Object`

Represents values that describe animation types for on-screen map movements.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 436: Enum Constants in Animation

Fields
<pre>public static final Animation BOW</pre> <p>Zooms out and then in again in a bow-like manner as the map resets to a new position.</p>
<pre>public static final Animation LINEAR</pre> <p>Moves in a linear manner as the map resets to a new position.</p>
<pre>public static final Animation NONE</pre> <p>No animation is performed as the map resets to a new position.</p>

## Method Summary

Table 437: Methods in Animation

Methods
<pre>public static Animation valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static Map.Animation[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Represents values that describe animation types for on-screen map movements.

If the map changes size or the app comes to the foreground while `Animation.LINEAR` or `Animation.BOW` is being used in a `Map` attribute setter method, then the animation will abort, and the transition will appear as failed. To avoid this behavior, use the `Animation.NONE` animation type or wait until the map is stable before performing the transition operation.

## Enum Constant Details

```
public static final Animation BOW
```

Zooms out and then in again in a bow-like manner as the map resets to a new position.

```
public static final Animation LINEAR
```

Moves in a linear manner as the map resets to a new position.

```
public static final Animation NONE
```

No animation is performed as the map resets to a new position.

## Method Details

```
public static Animation valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static Map.Animation[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## FleetFeature

The enumeration *FleetFeature* is a member of *com.here.android.mpa.mapping.Map*.

### Enumeration Summary

```
public static final enumeration Map.FleetFeature
```

```
extends java.lang.Enum, java.lang.Object
```

Fleet features to be rendered on the map

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 438: Enum Constants in FleetFeature

Fields
<pre>public static final <i>FleetFeature</i> <b>TRUCK_RESTRICTIONS</b></pre> <p>Truck restrictions</p>
<pre>public static final <i>FleetFeature</i> <b>ENVIRONMENTAL_ZONES</b></pre> <p>Environmental zones</p>
<pre>public static final <i>FleetFeature</i> <b>CONGESTION_ZONES</b></pre> <p>Congestion zones</p>

## Method Summary

Table 439: Methods in FleetFeature

Methods
<pre>public static <i>FleetFeature</i> <i>valueOf</i> (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>Map.FleetFeature[]</i> <i>values</i> ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Fleet features to be rendered on the map

### Enum Constant Details

```
public static final FleetFeature TRUCK_RESTRICTIONS
```

Truck restrictions

```
public static final FleetFeature ENVIRONMENTAL_ZONES
```

Environmental zones

```
public static final FleetFeature CONGESTION_ZONES
```

Congestion zones

## Method Details

```
public static FleetFeature valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static Map.FleetFeature[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## LayerCategory

The enumeration *LayerCategory* is a member of *com.here.android.mpa.mapping.Map*.

### Enumeration Summary

public static final enumeration **Map.LayerCategory**

*extends java.lang.Enum, java.lang.Object*

Definition for layer categories within a map.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 440: Enum Constants in LayerCategory

Fields
<pre>public static final LayerCategory LAND</pre> <p>Land</p>
<pre>public static final LayerCategory WATER</pre> <p>Water</p>
<pre>public static final LayerCategory LABEL_OCEAN</pre> <p>Labels for oceans</p>
<pre>public static final LayerCategory LABEL_SEA</pre> <p>Labels for seas</p>
<pre>public static final LayerCategory LABEL_WATER_OTHER</pre> <p>Labels for lakes, rivers, canals, etc.</p>
<pre>public static final LayerCategory BEACH</pre> <p>Beach</p>
<pre>public static final LayerCategory WOODLAND</pre> <p>Woodland</p>
<pre>public static final LayerCategory DESERT</pre> <p>Desert</p>
<pre>public static final LayerCategory GLACIER</pre> <p>Glacier</p>
<pre>public static final LayerCategory LABEL_BEACH</pre> <p>Labels for beaches</p>
<pre>public static final LayerCategory LABEL_WOODLAND</pre> <p>Labels for woodland</p>

## Fields

```
public static final LayerCategory LABEL_DESERT
```

Labels for deserts

```
public static final LayerCategory LABEL_GLACIER
```

Labels for glaciers

```
public static final LayerCategory AIRPORT_AREA
```

Airport area

```
public static final LayerCategory AMUSEMENT_PARK
```

Amusement park

```
public static final LayerCategory ANIMAL_PARK
```

Animal park

```
public static final LayerCategory BUILTUP
```

Built-up area

```
public static final LayerCategory CEMETERY
```

Cemetery

```
public static final LayerCategory GOLF_COURSE
```

Golf course

```
public static final LayerCategory HARBOR_AREA
```

Harbor area

```
public static final LayerCategory HOSPITAL_CAMPUS
```

Hospital campus

```
public static final LayerCategory INDUSTRIAL_COMPLEX
```

Industrial complex

```
public static final LayerCategory MILITARY_BASE
```

Military base

```
public static final LayerCategory NATIONAL_PARK
```

National park

```
public static final LayerCategory NATIVE_RESERVATION
```

Native reserves

```
public static final LayerCategory OUTLINE_MILITARY_BASE
```

Military base outline

```
public static final LayerCategory OUTLINE_NATIONAL_PARK
```

National park outline

```
public static final LayerCategory OUTLINE_NATIVE_RESERVATION
```

Native reserves outline

## Fields

```
public static final LayerCategory CITY_PARK
```

City park

```
public static final LayerCategory PEDESTRIAN_AREA
```

Pedestrian area

```
public static final LayerCategory RAILYARD
```

Rail yard

```
public static final LayerCategory SHOPPING_COMPLEX
```

Shopping complex

```
public static final LayerCategory SPORTS_COMPLEX
```

Sports complex

```
public static final LayerCategory UNIVERSITY_CAMPUS
```

University campus

```
public static final LayerCategory LABEL_AIRPORT_AREA
```

Airport area labels

```
public static final LayerCategory LABEL_AMUSEMENT_PARK
```

Amusement park labels

```
public static final LayerCategory LABEL_ANIMAL_PARK
```

Animal park labels

```
public static final LayerCategory LABEL_CEMETERY
```

Cemetery labels

```
public static final LayerCategory LABEL_GOLF_COURSE
```

Golf course labels

```
public static final LayerCategory LABEL_HARBOR_AREA
```

Harbor area labels

```
public static final LayerCategory LABEL_HOSPITAL_CAMPUS
```

Hospital campus labels

```
public static final LayerCategory LABEL_INDUSTRIAL_COMPLEX
```

Industrial complex labels

```
public static final LayerCategory LABEL_MILITARY_BASE
```

Military base labels

```
public static final LayerCategory LABEL_NATIONAL_PARK
```

National park labels

```
public static final LayerCategory LABEL_NATIVE_RESERVATION
```

Native reserve labels

**Fields**

```
public static final LayerCategory LABEL_CITY_PARK
```

City park labels

```
public static final LayerCategory LABEL_PEDESTRIAN_AREA
```

Pedestrian area labels

```
public static final LayerCategory LABEL_RAILYARD
```

Rail yard labels

```
public static final LayerCategory LABEL_SHOPPING_COMPLEX
```

Shopping complex labels

```
public static final LayerCategory LABEL_SPORTS_COMPLEX
```

Sports complex labels

```
public static final LayerCategory LABEL_UNIVERSITY_CAMPUS
```

University campus labels

```
public static final LayerCategory STREET_CATEGORY_0
```

Street of highest importance, for example, national highways

```
public static final LayerCategory STREET_CATEGORY_1
```

Street of 2nd highest importance

```
public static final LayerCategory STREET_CATEGORY_2
```

Street of medium importance

```
public static final LayerCategory STREET_CATEGORY_3
```

Street of 2nd lowest importance

```
public static final LayerCategory STREET_CATEGORY_4
```

Street of lowest importance, for example, small local roads.

```
public static final LayerCategory STREET_CATEGORY_PEDESTRIAN
```

Pedestrian-friendly streets

```
public static final LayerCategory STREET_CATEGORY_WALKWAY
```

Pedestrian-only streets

```
public static final LayerCategory LABEL_STREET_CATEGORY_0
```

Labels for streets included in *STREET\_CATEGORY\_0*.

```
public static final LayerCategory LABEL_STREET_CATEGORY_1
```

Labels for streets included in *STREET\_CATEGORY\_1*.

```
public static final LayerCategory LABEL_STREET_CATEGORY_2
```

Labels for streets included in *STREET\_CATEGORY\_2*.

```
public static final LayerCategory LABEL_STREET_CATEGORY_3
```

Labels for streets included in *STREET\_CATEGORY\_3*.

**Fields**

```
public static final LayerCategory LABEL_STREET_CATEGORY_4
```

Labels for streets included in *STREET\_CATEGORY\_4*.

```
public static final LayerCategory LABEL_STREET_CATEGORY_PEDESTRIAN
```

Labels for Pedestrian-friendly streets

```
public static final LayerCategory LABEL_STREET_CATEGORY_WALKWAY
```

Labels for Pedestrian-only streets

```
public static final LayerCategory ROADSIGN_ICON
```

Roadside icon

```
public static final LayerCategory EXIT_SIGN
```

Exit sign

```
public static final LayerCategory BORDER_COUNTRY
```

Country border

```
public static final LayerCategory BORDER_STATE
```

State border

```
public static final LayerCategory BORDER_REGIONAL
```

Region border

```
public static final LayerCategory BORDER_BUILTUP
```

Builtup border

```
public static final LayerCategory BORDER_LINE_OF_CONTROL
```

Line of control border

```
public static final LayerCategory NEIGHBORHOOD_AREA
```

Neighborhood area

```
public static final LayerCategory LAND_PARCEL
```

Land parcel

```
public static final LayerCategory LABEL_CONTINENT
```

Continent label

```
public static final LayerCategory LABEL_MAJOR_COUNTRY
```

Major country label

```
public static final LayerCategory LABEL_MINOR_COUNTRY
```

Minor country label

```
public static final LayerCategory LABEL_STATE
```

State label

```
public static final LayerCategory LABEL_STATE_ABBREVIATION
```

State abbreviation label

**Fields**

```
public static final LayerCategory LABEL_CITY_CAPITAL
```

National capital city label

```
public static final LayerCategory LABEL_CITY_STATE_CAPITAL
```

Provincial/State capital city label

```
public static final LayerCategory LABEL_CITY_OTHER
```

Other cities label

```
public static final LayerCategory LABEL_NEIGHBORHOOD_AREA
```

Neighborhood area label

```
public static final LayerCategory PUBLIC_TRANSIT_LINE
```

Public transit line

```
public static final LayerCategory LABEL_PUBLIC_TRANSIT_LINE
```

Public transit line label

```
public static final LayerCategory ICON_PUBLIC_TRANSIT_STATION
```

Public transit icon

```
public static final LayerCategory LABEL_PUBLIC_TRANSIT_STATION
```

Public transit label

```
public static final LayerCategory RELIEF
```

Relief

```
public static final LayerCategory BACKGROUND
```

Background

```
public static final LayerCategory LABEL_MOUNTAIN
```

Mountain label

```
public static final LayerCategory ICON_MOUNTAIN
```

Mountain icon

```
public static final LayerCategory LABEL_ISLAND
```

Island label

```
public static final LayerCategory BUILDING
```

Building

```
public static final LayerCategory LABEL_BUILDING
```

Building label

```
public static final LayerCategory POINT_ADDRESS
```

Point addresses, alphanumeric house-numbers which are assigned to a street segment.

```
public static final LayerCategory PEDESTRIAN_FEATURE
```

Pedestrian features that includes: crosswalk, stairs, escalator, elevator, tunnel, and bridge

### Fields

```
public static final LayerCategory RAILROAD
```

Railroad

```
public static final LayerCategory FERRY
```

Ferry

```
public static final LayerCategory LABEL_FERRY
```

Ferry label

```
public static final LayerCategory POI_ICON
```

POI icon

```
public static final LayerCategory POI_LABEL
```

POI label

```
public static final LayerCategory ABSTRACT_CITY_MODEL
```

Abstract city model

```
public static final LayerCategory LANDMARK_3D
```

3D Landmark

## Method Summary

Table 441: Methods in LayerCategory

### Methods

```
public static LayerCategory valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static Map.LayerCategory[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Definition for layer categories within a map. These layer categories can be enabled or disabled dynamically through `setVisibleLayers(EnumSet, boolean)`.

### Enum Constant Details

```
public static final LayerCategory LAND
```

Land

```
public static final LayerCategory WATER
```

Water

```
public static final LayerCategory LABEL_OCEAN
```

Labels for oceans

```
public static final LayerCategory LABEL_SEA
```

Labels for seas

```
public static final LayerCategory LABEL_WATER_OTHER
```

Labels for lakes, rivers, canals, etc.

```
public static final LayerCategory BEACH
```

Beach

```
public static final LayerCategory WOODLAND
```

Woodland

```
public static final LayerCategory DESERT
```

Desert

```
public static final LayerCategory GLACIER
```

Glacier

```
public static final LayerCategory LABEL_BEACH
```

Labels for beaches

```
public static final LayerCategory LABEL_WOODLAND
```

Labels for woodland

```
public static final LayerCategory LABEL_DESERT
```

Labels for deserts

```
public static final LayerCategory LABEL_GLACIER
```

Labels for glaciers

```
public static final LayerCategory AIRPORT_AREA
```

Airport area

```
public static final LayerCategory AMUSEMENT_PARK
```

Amusement park

```
public static final LayerCategory ANIMAL_PARK
```

Animal park

```
public static final LayerCategory BUILTUP
```

Built-up area

```
public static final LayerCategory CEMETERY
```

Cemetery

```
public static final LayerCategory GOLF_COURSE
```

Golf course

```
public static final LayerCategory HARBOR_AREA
```

Harbor area

```
public static final LayerCategory HOSPITAL_CAMPUS
```

Hospital campus

```
public static final LayerCategory INDUSTRIAL_COMPLEX
```

Industrial complex

```
public static final LayerCategory MILITARY_BASE
```

Military base

```
public static final LayerCategory NATIONAL_PARK
```

National park

```
public static final LayerCategory NATIVE_RESERVATION
```

Native reserves

```
public static final LayerCategory OUTLINE_MILITARY_BASE
```

Military base outline

```
public static final LayerCategory OUTLINE_NATIONAL_PARK
```

National park outline

```
public static final LayerCategory OUTLINE_NATIVE_RESERVATION
```

Native reserves outline

```
public static final LayerCategory CITY_PARK
```

City park

```
public static final LayerCategory PEDESTRIAN_AREA
```

Pedestrian area

```
public static final LayerCategory RAILYARD
```

Rail yard

```
public static final LayerCategory SHOPPING_COMPLEX
```

Shopping complex

```
public static final LayerCategory SPORTS_COMPLEX
```

Sports complex

```
public static final LayerCategory UNIVERSITY_CAMPUS
```

University campus

```
public static final LayerCategory LABEL_AIRPORT_AREA
```

Airport area labels

```
public static final LayerCategory LABEL_AMUSEMENT_PARK
```

Amusement park labels

```
public static final LayerCategory LABEL_ANIMAL_PARK
```

Animal park labels

```
public static final LayerCategory LABEL_CEMETERY
```

Cemetery labels

```
public static final LayerCategory LABEL_GOLF_COURSE
```

Golf course labels

```
public static final LayerCategory LABEL_HARBOR_AREA
```

Harbor area labels

```
public static final LayerCategory LABEL_HOSPITAL_CAMPUS
```

Hospital campus labels

```
public static final LayerCategory LABEL_INDUSTRIAL_COMPLEX
```

Industrial complex labels

```
public static final LayerCategory LABEL_MILITARY_BASE
```

Military base labels

```
public static final LayerCategory LABEL_NATIONAL_PARK
```

National park labels

```
public static final LayerCategory LABEL_NATIVE_RESERVATION
```

Native reserve labels

```
public static final LayerCategory LABEL_CITY_PARK
```

City park labels

```
public static final LayerCategory LABEL_PEDESTRIAN_AREA
```

Pedestrian area labels

```
public static final LayerCategory LABEL_RAILYARD
```

Rail yard labels

```
public static final LayerCategory LABEL_SHOPPING_COMPLEX
```

Shopping complex labels

```
public static final LayerCategory LABEL_SPORTS_COMPLEX
```

Sports complex labels

```
public static final LayerCategory LABEL_UNIVERSITY_CAMPUS
```

University campus labels

```
public static final LayerCategory STREET_CATEGORY_0
```

Street of highest importance, for example, national highways

```
public static final LayerCategory STREET_CATEGORY_1
```

Street of 2nd highest importance

```
public static final LayerCategory STREET_CATEGORY_2
```

Street of medium importance

```
public static final LayerCategory STREET_CATEGORY_3
```

Street of 2nd lowest importance

```
public static final LayerCategory STREET_CATEGORY_4
```

Street of lowest importance, for example, small local roads.

```
public static final LayerCategory STREET_CATEGORY_PEDESTRIAN
```

Pedestrian-friendly streets

```
public static final LayerCategory STREET_CATEGORY_WALKWAY
```

Pedestrian-only streets

```
public static final LayerCategory LABEL_STREET_CATEGORY_0
```

Labels for streets included in *STREET\_CATEGORY\_0*.

```
public static final LayerCategory LABEL_STREET_CATEGORY_1
```

Labels for streets included in *STREET\_CATEGORY\_1*.

```
public static final LayerCategory LABEL_STREET_CATEGORY_2
```

Labels for streets included in *STREET\_CATEGORY\_2*.

```
public static final LayerCategory LABEL_STREET_CATEGORY_3
```

Labels for streets included in *STREET\_CATEGORY\_3*.

```
public static final LayerCategory LABEL_STREET_CATEGORY_4
```

Labels for streets included in *STREET\_CATEGORY\_4*.

```
public static final LayerCategory LABEL_STREET_CATEGORY_PEDESTRIAN
```

Labels for Pedestrian-friendly streets

```
public static final LayerCategory LABEL_STREET_CATEGORY_WALKWAY
```

Labels for Pedestrian-only streets

```
public static final LayerCategory ROADSIGN_ICON
```

Roadside icon

```
public static final LayerCategory EXIT_SIGN
```

Exit sign

```
public static final LayerCategory BORDER_COUNTRY
```

Country border

```
public static final LayerCategory BORDER_STATE
```

State border

```
public static final LayerCategory BORDER_REGIONAL
```

Region border

```
public static final LayerCategory BORDER_BUILTUP
```

Builtup border

```
public static final LayerCategory BORDER_LINE_OF_CONTROL
```

Line of control border

```
public static final LayerCategory NEIGHBORHOOD_AREA
```

Neighborhood area

```
public static final LayerCategory LAND_PARCEL
```

Land parcel

```
public static final LayerCategory LABEL_CONTINENT
```

Continent label

```
public static final LayerCategory LABEL_MAJOR_COUNTRY
```

Major country label

```
public static final LayerCategory LABEL_MINOR_COUNTRY
```

Minor country label

```
public static final LayerCategory LABEL_STATE
```

State label

```
public static final LayerCategory LABEL_STATE_ABBREVIATION
```

State abbreviation label

```
public static final LayerCategory LABEL_CITY_CAPITAL
```

National capital city label

```
public static final LayerCategory LABEL_CITY_STATE_CAPITAL
```

Provincial/State capital city label

```
public static final LayerCategory LABEL_CITY_OTHER
```

Other cities label

```
public static final LayerCategory LABEL_NEIGHBORHOOD_AREA
```

Neighborhood area label

```
public static final LayerCategory PUBLIC_TRANSIT_LINE
```

Public transit line

```
public static final LayerCategory LABEL_PUBLIC_TRANSIT_LINE
```

Public transit line label

```
public static final LayerCategory ICON_PUBLIC_TRANSIT_STATION
```

Public transit icon

```
public static final LayerCategory LABEL_PUBLIC_TRANSIT_STATION
```

Public transit label

```
public static final LayerCategory RELIEF
```

Relief

```
public static final LayerCategory BACKGROUND
```

Background

```
public static final LayerCategory LABEL_MOUNTAIN
```

Mountain label

```
public static final LayerCategory ICON_MOUNTAIN
```

Mountain icon

```
public static final LayerCategory LABEL_ISLAND
```

Island label

```
public static final LayerCategory BUILDING
```

Building

```
public static final LayerCategory LABEL_BUILDING
```

Building label

```
public static final LayerCategory POINT_ADDRESS
```

Point addresses, alphanumeric house-numbers which are assigned to a street segment.

```
public static final LayerCategory PEDESTRIAN_FEATURE
```

Pedestrian features that includes: crosswalk, stairs, escalator, elevator, tunnel, and bridge

```
public static final LayerCategory RAILROAD
```

Railroad

```
public static final LayerCategory FERRY
```

Ferry

```
public static final LayerCategory LABEL_FERRY
```

Ferry label

```
public static final LayerCategory POI_ICON
```

POI icon

```
public static final LayerCategory POI_LABEL
```

POI label

```
public static final LayerCategory ABSTRACT_CITY_MODEL
```

Abstract city model

```
public static final LayerCategory LANDMARK_3D
```

3D Landmark

## Method Details

```
public static LayerCategory valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static Map.LayerCategory[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## OnSchemeChangeListener

The interface *OnSchemeChangeListener* is a member of *com.here.android.mpa.mapping.Map*.

### Interface Summary

```
public static abstract interface Map.OnSchemeChangeListener
```

Listener for Map scheme changed events.

[For complete information, see the section [Interface Details](#)]

## Method Summary

Table 442: Methods in OnSchemeChangeListener

Methods
<pre>public abstract void <i>onMapSchemeChanged</i> (String schemeName)</pre> <p>A callback indicating that the map scheme has changed.</p>

## Interface Details

Listener for Map scheme changed events.

## Method Details

```
public abstract void onMapSchemeChanged (String schemeName)
```

A callback indicating that the map scheme has changed.

### Parameters:

- **schemeName**  
Updated scheme name.

### See also:

[\*setMapScheme\(String\)\*](#)

## OnTransformListener

The interface *OnTransformListener* is a member of *com.here.android.mpa.mapping.Map*.

## Interface Summary

```
public static abstract interface Map.OnTransformListener
```

Listener for Map transform events.

[For complete information, see the section [Interface Details](#)]

## Method Summary

Table 443: Methods in OnTransformListener

Methods
<pre>public abstract void <i>onMapTransformEnd</i> (MapState mapState)</pre> <p>Called after <a href="#"><i>onMapTransformStart()</i></a> once the <i>MapState</i> returns to a steady value (such as when it has stopped moving).</p>

## Methods

```
public abstract void onMapTransformStart ()
```

Called just before the *MapState* begins to change.

---

## Interface Details

Listener for *Map* transform events. *Map* transform events are triggered by any operation which causes the *MapState* to change. This includes user interaction (such as map gestures) as well as programmatic calls to the map.

*onMapTransformStart()* is called just before the map state begins to change, while *onMapTransformEnd(MapState)* is called after the map state returns to a steady value. Therefore, there can be a significant amount of time between when the two callbacks are made in cases such as animated map movement events and continuous user interaction.

If you need to update UI widgets as the map state changes, the recommended approach is to trigger a *Runnable* object when *onMapTransformStart()* is called. This method periodically checks the current map state (at no more than 30fps) and updates the UI widgets. The *Runnable* object can then be cancelled upon a call to *onMapTransformEnd(MapState)*. An *android.os.Handler* object can be used to implement this elegantly.

Do not update UI widgets in *onPostDraw(boolean, long)* as this method is too frequently called.

## Method Details

```
public abstract void onMapTransformEnd (MapState mapState)
```

Called after *onMapTransformStart()* once the *MapState* returns to a steady value (such as when it has stopped moving).

### Parameters:

- **mapState**  
The current state of the map at the time of this callback

```
public abstract void onMapTransformStart ()
```

Called just before the *MapState* begins to change. This can be triggered by user interaction (such as map gestures) as well as programmatic calls to the map. This method will not be called again until an *onMapTransformEnd(MapState)* call has been made.

## PedestrianFeature

The enumeration *PedestrianFeature* is a member of *com.here.android.mpa.mapping.Map*.

## Enumeration Summary

public static final enumeration **Map.PedestrianFeature**

*extends java.lang.Enum, java.lang.Object*

Pedestrian features to be rendered on the map

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 444: Enum Constants in PedestrianFeature

Fields
<pre>public static final PedestrianFeature CROSSWALK</pre> <p>Crosswalk</p>
<pre>public static final PedestrianFeature STAIRS</pre> <p>Stairs</p>
<pre>public static final PedestrianFeature ESCALATOR</pre> <p>Escalator</p>
<pre>public static final PedestrianFeature ELEVATOR</pre> <p>Elevator</p>
<pre>public static final PedestrianFeature TUNNEL</pre> <p>Tunnel</p>
<pre>public static final PedestrianFeature BRIDGE</pre> <p>Bridge</p>

## Method Summary

Table 445: Methods in PedestrianFeature

Methods
<pre>public static PedestrianFeature valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static Map.PedestrianFeature[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Pedestrian features to be rendered on the map

## Enum Constant Details

public static final *PedestrianFeature* CROSSWALK

Crosswalk

```
public static final PedestrianFeature STAIRS
```

Stairs

```
public static final PedestrianFeature ESCALATOR
```

Escalator

```
public static final PedestrianFeature ELEVATOR
```

Elevator

```
public static final PedestrianFeature TUNNEL
```

Tunnel

```
public static final PedestrianFeature BRIDGE
```

Bridge

## Method Details

```
public static PedestrianFeature valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static Map.PedestrianFeature[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## PixelResult

The class *PixelResult* is a member of *com.here.android.mpa.mapping.Map*.

## Class Summary

public static class **Map.PixelResult**

*extends java.lang.Object*

Result class for conversion of a GeoCoordinate to screen pixel coordinates.

[For complete information, see the section [Class Details](#)]

**See also:**

[projectToPixel\(GeoCoordinate\)](#)

## Nested Class Summary

Table 446: Nested Classes in PixelResult

Nested Classes
public static final enumeration <a href="#">Map.PixelResult.Error</a> Error code for the computation of GeoCoordinate to screen pixel coordinate projection

## Method Summary

Table 447: Methods in PixelResult

Methods
public <a href="#">Error</a> <a href="#">getError</a> () Get the <a href="#">Map.PixelResult.Error</a> of the GeoCoordinate to screen Pixel conversion.
public <a href="#">PointF</a> <a href="#">getResult</a> () Get the result of the GeoCoordinate to screen Pixel conversion.

## Class Details

Result class for conversion of a GeoCoordinate to screen pixel coordinates.

**See also:**

[projectToPixel\(GeoCoordinate\)](#)

## Method Details

public [Error](#) [getError](#) ()

Get the [Map.PixelResult.Error](#) of the GeoCoordinate to screen Pixel conversion.

**Returns:**

Error screen space in pixels.

public [PointF](#) [getResult](#) ()

Get the result of the GeoCoordinate to screen Pixel conversion.

#### Returns:

PointF screen space in pixels.

## Error

The enumeration *Error* is a member of *com.here.android.mpa.mapping.Map.PixelResult*.

### Enumeration Summary

public static final enumeration **Map.PixelResult.Error**

*extends java.lang.Enum, java.lang.Object*

Error code for the computation of GeoCoordinate to screen pixel coordinate projection

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 448: Enum Constants in Error

Fields
public static final <i>Error</i> <b>NONE</b>
public static final <i>Error</i> <b>NOT_IN_VIEW</b>
public static final <i>Error</i> <b>OVERFLOW</b>
public static final <i>Error</i> <b>UNKNOWN</b>

### Method Summary

Table 449: Methods in Error

Methods
public static <i>Error</i> <b>valueOf</b> (String name)
This method retrieves the enumeration value that matches the name specified by the caller.
public static <i>Map.PixelResult.Error</i> [] <b>values</b> ()
This method retrieves an array of constants of the given enum type in the order in which they are declared.

### Enumeration Details

Error code for the computation of GeoCoordinate to screen pixel coordinate projection

### Enum Constant Details

public static final *Error* **NONE**

```
public static final Error NOT_IN_VIEW
```

```
public static final Error OVERFLOW
```

```
public static final Error UNKNOWN
```

### Method Details

```
public static Error valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static Map.PixelResult.Error[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Projection

The enumeration *Projection* is a member of *com.here.android.mpa.mapping.Map*.

### Enumeration Summary

```
public static final enumeration Map.Projection
```

*extends java.lang.Enum, java.lang.Object*

The projection scheme used to render the map.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 450: Enum Constants in Projection

Fields
<pre>public static final <i>Projection</i> <b>MERCATOR</b></pre> <p>A mercator projection.</p>

## Fields

```
public static final Projection GLOBE
```

A globe.

---

## Method Summary

Table 451: Methods in *Projection*

### Methods

```
public static Projection valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static Map.Projection[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

---

## Enumeration Details

The projection scheme used to render the map.

### Enum Constant Details

```
public static final Projection MERCATOR
```

A mercator projection.

```
public static final Projection GLOBE
```

A globe.

### Method Details

```
public static Projection valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static Map.Projection[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Scheme

The class *Scheme* is a member of *com.here.android.mpa.mapping.Map*.

### Class Summary

public static final class **Map.Scheme**

*extends java.lang.Object*

Represents a collection of schemes that the **Map** class supports.

[For complete information, see the section [Class Details](#)]

### Field Summary

Table 452: Fields in Scheme

Fields
<p>public static final String <b>CARNAV_DAY</b></p> <p>Normal scheme presented in "day" colors that is suitable for car guidance.</p>
<p>public static final String <b>CARNAV_DAY_GREY</b></p> <p>Normal scheme presented in "day" colors that is suitable for car guidance use cases in which map still has a high relevance but is used as background for overlays.</p>
<p>public static final String <b>CARNAV_HYBRID_DAY</b></p> <p>Satellite tile scheme presented in "day" colors, with visible roads, that is suitable for for car guidance.</p>
<p>public static final String <b>CARNAV_HYBRID_NIGHT</b></p> <p>Satellite tile scheme presented in "night" colors, with visible roads, that is suitable for car guidance.</p>
<p>public static final String <b>CARNAV_NIGHT</b></p> <p>Normal scheme presented in "night" colors that is suitable for car guidance.</p>
<p>public static final String <b>CARNAV_NIGHT_GREY</b></p> <p>Normal scheme presented in "night" colors that is suitable for car guidance use cases in which map still has a high relevance but is used as background for overlays.</p>
<p>public static final String <b>CARNAV_TRAFFIC_DAY</b></p> <p>Normal scheme presented in "day" colors that is suitable for displaying traffic in car guidance.</p>
<p>public static final String <b>CARNAV_TRAFFIC_HYBRID_DAY</b></p> <p>Satellite tile scheme presented in "day" colors, with visible roads, that is suitable for for displaying traffic in car guidance.</p>
<p>public static final String <b>CARNAV_TRAFFIC_HYBRID_NIGHT</b></p> <p>Satellite tile scheme presented in "night" colors, with visible roads, that is suitable for displaying traffic in car guidance.</p>
<p>public static final String <b>CARNAV_TRAFFIC_NIGHT</b></p> <p>Normal scheme presented in "night" colors that is suitable for displaying traffic in car guidance.</p>

**Fields**

```
public static final String HYBRID_DAY
```

Satellite tile scheme presented in "day" colors, with visible roads.

```
public static final String HYBRID_DAY_TRANSIT
```

Satellite tile scheme presented in "night" colors, with visible roads and highlighted transit lines.

```
public static final String HYBRID_GREY_DAY
```

Satellite tile scheme presented in "day" colors, with visible roads, that is suitable for use cases in which map still has a high relevance but is used as background for overlays (like venue maps).

```
public static final String HYBRID_GREY_NIGHT
```

Satellite tile scheme presented in "night" colors, with visible roads, that is suitable for use cases in which map still has a high relevance but is used as background for overlays (like venue maps).

```
public static final String HYBRID_NIGHT
```

Satellite tile scheme presented in "night" colors, with visible roads.

```
public static final String HYBRID_NIGHT_TRANSIT
```

Satellite tile scheme presented in "night" colors, with visible roads and highlighted transit lines. In all hybrid night schemes the only difference to the hybrid day schemes is the sky.

```
public static final String HYBRID_REDUCED_DAY
```

Satellite tile scheme presented in "day" colors, with visible roads, that is suitable for use cases in which map has a low relevance and it is used as background for overlays.

```
public static final String HYBRID_REDUCED_NIGHT
```

Satellite tile scheme presented in "night" colors, with visible roads, that is suitable for use cases in which map has a low relevance and it is used as background for overlays.

```
public static final String HYBRID_TRAFFIC_DAY
```

Satellite tile scheme presented in "day" colors, with visible roads, that is suitable for traffic.

```
public static final String HYBRID_TRAFFIC_NIGHT
```

Satellite tile scheme presented in "night" colors, with visible roads, that is suitable for traffic.

```
public static final String MANEUVER_DAY
```

Normal scheme suitable for single maneuver overview.

```
public static final String NORMAL_DAY
```

Normal scheme presented in "day" colors.

```
public static final String NORMAL_DAY_GREY
```

Normal scheme presented in "day" colors that is suitable for use cases in which map still has a high relevance but is used as background for overlays (like venue maps).

```
public static final String NORMAL_DAY_TRANSIT
```

Normal scheme presented in "day" colors that is suitable for transit.

```
public static final String NORMAL_NIGHT
```

Normal scheme presented in "night" colors.

**Fields**

```
public static final String NORMAL_NIGHT_GREY
```

Normal scheme presented in "night" colors that is suitable for use cases in which map still has a high relevance but is used as background for overlays (like venue maps).

```
public static final String NORMAL_NIGHT_TRANSIT
```

Normal scheme presented in "night" colors that is suitable for transit.

```
public static final String NORMAL_TRAFFIC_DAY
```

Normal scheme presented in "day" colors that is suitable for traffic.

```
public static final String NORMAL_TRAFFIC_NIGHT
```

Normal scheme presented in "night" colors that is suitable for traffic.

```
public static final String PEDESTRIAN_DAY
```

Normal scheme presented in "day" colors that is suitable for pedestrian use cases.

```
public static final String PEDESTRIAN_DAY_HYBRID
```

Satellite tile scheme presented in "day" colors, with visible roads, that is suitable for pedestrian use cases.

```
public static final String PEDESTRIAN_NIGHT
```

Normal scheme presented in "night" colors that is suitable for pedestrian use cases.

```
public static final String PEDESTRIAN_NIGHT_HYBRID
```

Satellite tile scheme presented in "night" colors, with visible roads, that is suitable for pedestrian use cases. To show/hide pedestrian features see [setPedestrianFeaturesVisible\(EnumSet\)](#)

```
public static final String REDUCED_DAY
```

Normal scheme presented in "day" colors that is suitable for use cases in which map has a low relevance and it is used as background for overlays.

```
public static final String REDUCED_NIGHT
```

Normal scheme presented in "night" colors that is suitable for use cases in which map has a low relevance and it is used as background for overlays.

```
public static final String SATELLITE_DAY
```

Satellite tile scheme presented in "day" colors.

```
public static final String SATELLITE_NIGHT
```

Satellite tile scheme presented in "night" colors.

```
public static final String TERRAIN_DAY
```

Terrain bitmap scheme presented in "day" colors.

```
public static final String TRUCKNAV_DAY
```

Normal scheme presented in "day" colors that is suitable for truck guidance.

```
public static final String TRUCKNAV_HYBRID_DAY
```

Satellite tile scheme presented in "day" colors, with visible roads, that is suitable for truck guidance.

```
public static final String TRUCKNAV_HYBRID_NIGHT
```

Satellite tile scheme presented in "night" colors, with visible roads, that is suitable for truck guidance.

## Fields

```
public static final String TRUCKNAV_NIGHT
```

Normal scheme presented in "night" colors that is suitable for truck guidance.

```
public static final String TRUCK_DAY
```

Truck scheme presented in "day" colors.

```
public static final String TRUCK_HYBRID_DAY
```

Satellite tile scheme presented in "day" colors with truck related attributes.

```
public static final String TRUCK_HYBRID_NIGHT
```

Satellite tile scheme presented in "night" colors with truck related attributes.

```
public static final String TRUCK_NIGHT
```

Truck scheme presented in "night" colors.

---

## Class Details

Represents a collection of schemes that the `Map` class supports. Each of the schemes in this class can be set by way of the `setMapScheme(String)` method.

## Field Details

```
public static final String CARNAV_DAY
```

Normal scheme presented in "day" colors that is suitable for car guidance.

```
public static final String CARNAV_DAY_GREY
```

Normal scheme presented in "day" colors that is suitable for car guidance use cases in which map still has a high relevance but is used as background for overlays.

```
public static final String CARNAV_HYBRID_DAY
```

Satellite tile scheme presented in "day" colors, with visible roads, that is suitable for for car guidance.

```
public static final String CARNAV_HYBRID_NIGHT
```

Satellite tile scheme presented in "night" colors, with visible roads, that is suitable for car guidance. In all hybrid night schemes the only difference to the hybrid day schemes is the sky. A night sky is being used instead of a day sky. This is only visible in 3D.

```
public static final String CARNAV_NIGHT
```

Normal scheme presented in "night" colors that is suitable for car guidance.

```
public static final String CARNAV_NIGHT_GREY
```

Normal scheme presented in "night" colors that is suitable for car guidance use cases in which map still has a high relevance but is used as background for overlays.

```
public static final String CARNAV_TRAFFIC_DAY
```

Normal scheme presented in "day" colors that is suitable for displaying traffic in car guidance. To show/hide traffic see [setTrafficInfoVisible\(boolean\)](#).

```
public static final String CARNAV_TRAFFIC_HYBRID_DAY
```

Satellite tile scheme presented in "day" colors, with visible roads, that is suitable for displaying traffic in car guidance.

```
public static final String CARNAV_TRAFFIC_HYBRID_NIGHT
```

Satellite tile scheme presented in "night" colors, with visible roads, that is suitable for displaying traffic in car guidance. In all hybrid night schemes the only difference to the hybrid day schemes is the sky. A night sky is being used instead of a day sky. This is only visible in 3D.

```
public static final String CARNAV_TRAFFIC_NIGHT
```

Normal scheme presented in "night" colors that is suitable for displaying traffic in car guidance. To show/hide traffic see [setTrafficInfoVisible\(boolean\)](#).

```
public static final String HYBRID_DAY
```

Satellite tile scheme presented in "day" colors, with visible roads.

```
public static final String HYBRID_DAY_TRANSIT
```

Satellite tile scheme presented in "night" colors, with visible roads and highlighted transit lines. To show/hide transit lines see [MapTransitLayer.setMode\(Mode\)](#).

```
public static final String HYBRID_GREY_DAY
```

Satellite tile scheme presented in "day" colors, with visible roads, that is suitable for use cases in which map still has a high relevance but is used as background for overlays (like venue maps).

```
public static final String HYBRID_GREY_NIGHT
```

Satellite tile scheme presented in "night" colors, with visible roads, that is suitable for use cases in which map still has a high relevance but is used as background for overlays (like venue maps). In all hybrid night

schemes the only difference to the hybrid day schemes is the sky. A night sky is being used instead of a day sky. This is only visible in 3D.

```
public static final String HYBRID_NIGHT
```

Satellite tile scheme presented in "night" colors, with visible roads. In all hybrid night schemes the only difference to the hybrid day schemes is the sky. A night sky is being used instead of a day sky. This is only visible in 3D.

```
public static final String HYBRID_NIGHT_TRANSIT
```

Satellite tile scheme presented in "night" colors, with visible roads and highlighted transit lines. In all hybrid night schemes the only difference to the hybrid day schemes is the sky. A night sky is being used instead of a day sky. This is only visible in 3D. To show/hide transit lines see [MapTransitLayer.setMode\(Mode\)](#).

```
public static final String HYBRID_REDUCED_DAY
```

Satellite tile scheme presented in "day" colors, with visible roads, that is suitable for use cases in which map has a low relevance and it is used as background for overlays.

```
public static final String HYBRID_REDUCED_NIGHT
```

Satellite tile scheme presented in "night" colors, with visible roads, that is suitable for use cases in which map has a low relevance and it is used as background for overlays. In all hybrid night schemes the only difference to the hybrid day schemes is the sky. A night sky is being used instead of a day sky. This is only visible in 3D.

```
public static final String HYBRID_TRAFFIC_DAY
```

Satellite tile scheme presented in "day" colors, with visible roads, that is suitable for traffic. To show/hide traffic see [setTrafficInfoVisible\(boolean\)](#).

```
public static final String HYBRID_TRAFFIC_NIGHT
```

Satellite tile scheme presented in "night" colors, with visible roads, that is suitable for traffic. In all hybrid night schemes the only difference to the hybrid day schemes is the sky. A night sky is being used instead of a day sky. To show/hide traffic see [setTrafficInfoVisible\(boolean\)](#).

```
public static final String MANEUVER_DAY
```

Normal scheme suitable for single maneuver overview. This scheme is useful for guidance and routing use cases. This scheme can be used for day and night since it has a strong contrast.

```
public static final String NORMAL_DAY
```

Normal scheme presented in "day" colors.

```
public static final String NORMAL_DAY_GREY
```

Normal scheme presented in "day" colors that is suitable for use cases in which map still has a high relevance but is used as background for overlays (like venue maps).

```
public static final String NORMAL_DAY_TRANSIT
```

Normal scheme presented in "day" colors that is suitable for transit. To show/hide transit lines see [MapTransitLayer.setMode\(Mode\)](#).

```
public static final String NORMAL_NIGHT
```

Normal scheme presented in "night" colors.

```
public static final String NORMAL_NIGHT_GREY
```

Normal scheme presented in "night" colors that is suitable for use cases in which map still has a high relevance but is used as background for overlays (like venue maps).

```
public static final String NORMAL_NIGHT_TRANSIT
```

Normal scheme presented in "night" colors that is suitable for transit. To show/hide transit lines see [MapTransitLayer.setMode\(Mode\)](#).

```
public static final String NORMAL_TRAFFIC_DAY
```

Normal scheme presented in "day" colors that is suitable for traffic. To show/hide traffic see [setTrafficInfoVisible\(boolean\)](#).

```
public static final String NORMAL_TRAFFIC_NIGHT
```

Normal scheme presented in "night" colors that is suitable for traffic. To show/hide traffic see [setTrafficInfoVisible\(boolean\)](#).

```
public static final String PEDESTRIAN_DAY
```

Normal scheme presented in "day" colors that is suitable for pedestrian use cases. To show/hide pedestrian features see [setPedestrianFeaturesVisible\(EnumSet\)](#)

```
public static final String PEDESTRIAN_DAY_HYBRID
```

Satellite tile scheme presented in "day" colors, with visible roads, that is suitable for pedestrian use cases. To show/hide pedestrian features see [setPedestrianFeaturesVisible\(EnumSet\)](#)

```
public static final String PEDESTRIAN_NIGHT
```

Normal scheme presented in "night" colors that is suitable for pedestrian use cases. To show/hide pedestrian features see [setPedestrianFeaturesVisible\(EnumSet\)](#)

```
public static final String PEDESTRIAN_NIGHT_HYBRID
```

Satellite tile scheme presented in "night" colors, with visible roads, that is suitable for pedestrian use cases. To show/hide pedestrian features see [setPedestrianFeaturesVisible\(EnumSet\)](#)

```
public static final String REDUCED_DAY
```

Normal scheme presented in "day" colors that is suitable for use cases in which map has a low relevance and it is used as background for overlays.

```
public static final String REDUCED_NIGHT
```

Normal scheme presented in "night" colors that is suitable for use cases in which map has a low relevance and it is used as background for overlays.

```
public static final String SATELLITE_DAY
```

Satellite tile scheme presented in "day" colors. No roads are shown in this scheme.

```
public static final String SATELLITE_NIGHT
```

Satellite tile scheme presented in "night" colors. No roads are shown in this scheme.

```
public static final String TERRAIN_DAY
```

Terrain bitmap scheme presented in "day" colors.

```
public static final String TRUCKNAV_DAY
```

Normal scheme presented in "day" colors that is suitable for truck guidance.

```
public static final String TRUCKNAV_HYBRID_DAY
```

Satellite tile scheme presented in "day" colors, with visible roads, that is suitable for truck guidance.

```
public static final String TRUCKNAV_HYBRID_NIGHT
```

Satellite tile scheme presented in "night" colors, with visible roads, that is suitable for truck guidance. In all hybrid night schemes the only difference to the hybrid day schemes is the sky. A night sky is being used instead of a day sky. This is only visible in 3D.

```
public static final String TRUCKNAV_NIGHT
```

Normal scheme presented in "night" colors that is suitable for truck guidance.

```
public static final String TRUCK_DAY
```

Truck scheme presented in "day" colors. To show/hide fleet features see [setFleetFeaturesVisible\(EnumSet\)](#)

```
public static final String TRUCK_HYBRID_DAY
```

Satellite tile scheme presented in "day" colors with truck related attributes. To show/hide fleet features see [setFleetFeaturesVisible\(EnumSet\)](#)

```
public static final String TRUCK_HYBRID_NIGHT
```

Satellite tile scheme presented in "night" colors with truck related attributes. To show/hide fleet features see [setFleetFeaturesVisible\(EnumSet\)](#)

```
public static final String TRUCK_NIGHT
```

Truck scheme presented in "night" colors. To show/hide fleet features see [setFleetFeaturesVisible\(EnumSet\)](#)

## MapBuildingGroup

The class *MapBuildingGroup* is a member of [com.here.android.mpa.mapping](#).

### Class Summary

```
public final class MapBuildingGroup
```

```
extends java.lang.Object
```

Represents a group of extruded buildings.

[For complete information, see the section [Class Details](#)]

**See also:**

[MapBuildingLayer](#)

[MapBuildingObject](#)

## Nested Class Summary

Table 453: Nested Classes in MapBuildingGroup

Nested Classes
<p>public static final enumeration <a href="#">MapBuildingGroup.BuildingFace</a></p> <p>Addressable building faces for the <a href="#">MapBuildingObject</a> instances in this building group.</p>

## Method Summary

Table 454: Methods in MapBuildingGroup

Methods
<p>public boolean <a href="#">addBuilding</a> (<a href="#">Identifier</a> identifier)</p> <p>Adds a building to this <a href="#">MapBuildingGroup</a>.</p>
<p>public boolean <a href="#">addBuildings</a> (java.util.List &lt;<a href="#">Identifier</a>&gt; identifiers)</p> <p>Adds a List of buildings to this <a href="#">MapBuildingGroup</a></p>
<p>public <a href="#">Identifier</a> <a href="#">convertStringToIdentifier</a> (String id)</p> <p>Convert a String building identifier to a concrete building <a href="#">Identifier</a>.</p>
<p>public int <a href="#">getBuildingCount</a> ()</p> <p>Gets the number of buildings in this <a href="#">MapBuildingGroup</a></p>
<p>public int <a href="#">getColor</a> (<a href="#">BuildingFace</a> face)</p> <p>Gets the color for this <a href="#">MapBuildingGroup</a>'s specified building face.</p>
<p>public float <a href="#">getVerticalScale</a> ()</p> <p>Gets the <a href="#">MapBuildingGroup</a>'s height scaling factor.</p>
<p>public boolean <a href="#">removeAllBuildings</a> ()</p> <p>Removes all <a href="#">MapBuildingObject</a> from this <a href="#">MapBuildingGroup</a></p>
<p>public boolean <a href="#">removeBuilding</a> (<a href="#">Identifier</a> identifier)</p> <p>Removes a building from this <a href="#">MapBuildingGroup</a></p>
<p>public boolean <a href="#">removeBuildings</a> (java.util.List &lt;<a href="#">Identifier</a>&gt; identifiers)</p> <p>Removes a List of buildings from this <a href="#">MapBuildingGroup</a></p>
<p>public void <a href="#">setColor</a> (int color, java.util.EnumSet &lt;<a href="#">BuildingFace</a>&gt; faces)</p> <p>Sets the color for the specified building faces.</p>
<p>public void <a href="#">setVerticalScale</a> (float scale)</p> <p>Sets the <a href="#">MapBuildingGroup</a>'s height scaling factor.</p>

## Class Details

Represents a group of extruded buildings.

**See also:**

[MapBuildingLayer](#)

[MapBuildingObject](#)

## Method Details

```
public boolean addBuilding (Identifier identifier)
```

Adds a building to this [MapBuildingGroup](#).

**Parameters:**

- **identifier**

[Identifier](#) of the building to be added. The [Identifier](#) can be retrieved from [PlaceLink](#).

**Returns:**

true if added, false otherwise.

```
public boolean addBuildings (java.util.List <Identifier> identifiers)
```

Adds a List of buildings to this [MapBuildingGroup](#)

**Parameters:**

- **identifiers**

List of building [Identifiers](#) of buildings to be added.

**Returns:**

true if added, false otherwise.

```
public Identifier convertStringToIdentifier (String id)
```

Convert a String building identifier to a concrete building [Identifier](#).

**Parameters:**

- **id**

String building id retrieved from [BUILDING\\_ID\\_REFERENCE\\_NAME](#)

**Returns:**

An [Identifier](#) that can be used to highlight or query buildings.

```
public int getBuildingCount ()
```

Gets the number of buildings in this [MapBuildingGroup](#)

**Returns:**

number of buildings in the `MapBuildingGroup`

```
public int getColor (BuildingFace face)
```

Gets the color for this *MapBuildingGroup*'s specified building face.

**Parameters:**

- **face**

*MapBuildingGroup.BuildingFace*

**Returns:**

An integer representing `android.graphics.Color`

```
public float getVerticalScale ()
```

Gets the *MapBuildingGroup*'s height scaling factor.

**Returns:**

float scaling factor [0,1]

```
public boolean removeAllBuildings ()
```

Removes all *MapBuildingObject* from this *MapBuildingGroup*

**Returns:**

true if removed, false otherwise

```
public boolean removeBuilding (Identifier identifier)
```

Removes a building from this *MapBuildingGroup*

**Parameters:**

- **identifier**

Building *Identifier*

**Returns:**

true if removed, false otherwise.

```
public boolean removeBuildings (java.util.List <Identifier> identifiers)
```

Removes a List of buildings from this *MapBuildingGroup*

**Parameters:**

- **identifiers**

List of building *Identifiers*

**Returns:**

true if removed, false otherwise.

```
public void setColor (int color, java.util.EnumSet <BuildingFace> faces)
```

Sets the color for the specified building faces. All *MapBuildingObject* in this building group will be affected.

**Parameters:**

- **color**  
An integer representing `android.graphics.Color`. The format is #AARRGGBB.
- **faces**  
EnumSet of *MapBuildingGroup.BuildingFaces*.

```
public void setVerticalScale (float scale)
```

Sets the *MapBuildingGroup*'s height scaling factor. All *MapBuildingObject* in this building group will be affected.

**Parameters:**

- **scale**  
Scale factor

## BuildingFace

The enumeration *BuildingFace* is a member of *com.here.android.mpa.mapping.MapBuildingGroup*.

### Enumeration Summary

```
public static final enumeration MapBuildingGroup.BuildingFace
```

*extends java.lang.Enum, java.lang.Object*

Addressable building faces for the *MapBuildingObject* instances in this building group.

[For complete information, see the section *Enumeration Details*]

### Enum Constant Summary

Table 455: Enum Constants in BuildingFace

Fields
<pre>public static final BuildingFace ROOF</pre> <p>The top of a building</p>

## Fields

```
public static final BuildingFace WALLTOP
```

The upper portion of a building's side walls

```
public static final BuildingFace WALLBOTTOM
```

The bottom portion of a building's side walls

```
public static final BuildingFace OUTLINE
```

The seams between each face of the building

```
public static final BuildingFace LANDMARKS
```

Only applicable for landmarks.

## Method Summary

Table 456: Methods in BuildingFace

### Methods

```
public int mask ()
```

Retrieve the declared enumeration value

```
public static BuildingFace valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static MapBuildingGroup.BuildingFace[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Addressable building faces for the *MapBuildingObject* instances in this building group.

### Enum Constant Details

```
public static final BuildingFace ROOF
```

The top of a building

```
public static final BuildingFace WALLTOP
```

The upper portion of a building's side walls

```
public static final BuildingFace WALLBOTTOM
```

The bottom portion of a building's side walls

```
public static final BuildingFace OUTLINE
```

The seams between each face of the building

```
public static final BuildingFace LANDMARKS
```

Only applicable for landmarks. When this value is used, the entire landmark is shaded.

## Method Details

```
public int mask ()
```

Retrieve the declared enumeration value

### Returns:

the declared enumeration value

```
public static BuildingFace valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static MapBuildingGroup.BuildingFace[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## MapBuildingLayer

The class *MapBuildingLayer* is a member of *com.here.android.mpa.mapping* .

### Class Summary

```
public final class MapBuildingLayer
```

```
extends java.lang.Object
```

Represents a map layer that enables interactions with extruded buildings.

[For complete information, see the section [Class Details](#)]

### See also:

[\*getMapBuildingLayer\(\)\*](#)

## Nested Class Summary

Table 457: Nested Classes in MapBuildingLayer

Nested Classes
<p>public static final class <i>MapBuildingLayer.BuildingSearchResult</i></p> <p>Represents search results information for a building search</p>
<p>public static final enumeration <i>MapBuildingLayer.DefaultBuildingColor</i></p> <p>A set of pre-defined colors to change a <i>MapBuildingGroup</i>'s color property</p>
<p>public static final enumeration <i>MapBuildingLayer.DefaultBuildingGroups</i></p> <p>Default groups of buildings on the <i>Map</i>.</p>

## Method Summary

Table 458: Methods in MapBuildingLayer

Methods
<p>public <i>MapBuildingGroup</i> <i>createNewBuildingGroup</i> ()</p> <p>Create a new <i>MapBuildingGroup</i> for custom building selection.</p>
<p>public <i>MapBuildingGroup</i> <i>createNewBuildingGroup</i> (<i>DefaultBuildingColor</i> color)</p> <p>Create a new <i>MapBuildingGroup</i> with the given color for custom building selection.</p>
<p>public <i>MapBuildingObject</i> <i>getBuilding</i> (<i>Identifier</i> buildingId, <i>GeoCoordinate</i> positionHint)</p> <p>Find a particular building on the <i>Map</i> around the given position.</p>
<p>public <i>MapBuildingObject</i> <i>getBuilding</i> (<i>Identifier</i> buildingId)</p> <p>Find a particular building on the <i>Map</i></p>
<p>public <i>BuildingSearchResult</i> <i>getBuildingsInside</i> (<i>GeoBoundingBox</i> boundingBox)</p> <p>Find all buildings located inside a <i>GeoBoundingBox</i>.</p>
<p>public <i>MapBuildingGroup</i> <i>getDefaultBuildingGroup</i> (<i>DefaultBuildingGroups</i> group)</p> <p>Get a building group of a <i>MapBuildingLayer.DefaultBuildingGroups</i> type.</p>
<p>public java.util.HashMap &lt;<i>Identifier</i>, java.lang.Float&gt; <i>getTransparency</i> (java.util.List &lt;<i>Identifier</i>&gt; buildingIds)</p> <p>Retrieve the transparency (alpha) [0,1] factor of a list of buildings.</p>
<p>public java.util.HashMap &lt;<i>Identifier</i>, java.lang.Float&gt; <i>getVerticalScale</i> (java.util.List &lt;<i>Identifier</i>&gt; buildingIds)</p> <p>Retrieve the vertical scale [0,1] factor of a list of buildings.</p>
<p>public void <i>releaseBuildingGroup</i> (<i>MapBuildingGroup</i> group)</p> <p>Release the <i>MapBuildingGroup</i> created for custom building selection.</p>

## Class Details

Represents a map layer that enables interactions with extruded buildings.

This class can be used to find *MapBuildingObject* and create *MapBuildingGroup* instances.

**See also:**

[getMapBuildingLayer\(\)](#)

### Method Details

```
public MapBuildingGroup createNewBuildingGroup ()
```

Create a new *MapBuildingGroup* for custom building selection.

At run time, there can only be a maximum number of *MapBuildingGroup* s, when the limit is reached, no new *MapBuildingGroup* can be created unless some are being freed up by calling [releaseBuildingGroup\(\*MapBuildingGroup\*\)](#).

**Returns:**

*MapBuildingGroup*. By default, a new *MapBuildingGroup* has the *MapBuildingGroup* with color *SELECTED*.

**See also:**

[releaseBuildingGroup\(\*MapBuildingGroup\*\)](#)

```
public MapBuildingGroup createNewBuildingGroup (DefaultBuildingColor color)
```

Create a new *MapBuildingGroup* with the given color for custom building selection.

At run time, there can only be a maximum number of *MapBuildingGroup* s, when the limit is reached, no new *MapBuildingGroup* can be created unless some are being freed up by calling [releaseBuildingGroup\(\*MapBuildingGroup\*\)](#).

**Parameters:**

- **color**  
Color of buildings in the new *MapBuildingGroup*

**Returns:**

*MapBuildingGroup*. Returns null if no more new *MapBuildingGroup* can be created. At run time, there is a maximum number of *MapBuildingGroup*s created. When the limit is reached, no new *MapBuildingGroup* can be created unless some are being freed up by calling [releaseBuildingGroup\(\*MapBuildingGroup\*\)](#).

**See also:**

[releaseBuildingGroup\(\*MapBuildingGroup\*\)](#)

```
public MapBuildingObject getBuilding (Identifier buildingId, GeoCoordinate positionHint)
```

Find a particular building on the *Map* around the given position.

**Parameters:**

- **buildingId**

*Identifier* of the building. Obtainable from *PlaceLink*. This parameter can be null, if it is null it will try to find the building located at *positionHint*.

- **positionHint**

A *GeoCoordinate* of the approximate location of the building.

**Returns:**

*MapBuildingObject*

```
public MapBuildingObject getBuilding (Identifier buildingId)
```

Find a particular building on the *Map*

**Parameters:**

- **buildingId**

*Identifier* of the building. Obtainable from *PlaceLink*

**Returns:**

*MapBuildingObject*

```
public BuildingSearchResult getBuildingsInside (GeoBoundingBox boundingBox)
```

Find all buildings located inside a *GeoBoundingBox*. This API will return all buildings located inside a bounding box area. Map data for this area must be downloaded. If the search result returns *NEEDS\_DATA*, retry the request after some delay. Map data download request will be triggered.

**Parameters:**

- **boundingBox**

A *GeoBoundingBox* representing the bounding box area.

**Returns:**

*MapBuildingLayer.BuildingSearchResult*. Use the method *getResultCode()* to determine success of the operation. Building results can be retrieved via *getResults()*

```
public MapBuildingGroup getDefaultBuildingGroup (DefaultBuildingGroups group)
```

Get a building group of a *MapBuildingLayer.DefaultBuildingGroups* type. The default building group is a generic group that represents all possible buildings of that type in the entire world.

**Parameters:**

- **group**

One of the values in the enum *DefaultBuildingGroups*

**Returns:**

*MapBuildingGroup*

```
public java.util.HashMap <Identifier, java.lang.Float> getTransparency  
(java.util.List <Identifier> buildingIds)
```

Retrieve the transparency (alpha) [0,1] factor of a list of buildings. This is useful to animate any markers that are anchored to specific buildings.

This API can be used in conjunction with [getVerticalScale\(List\)](#) to perform custom animations of [MapMarker](#). This API should be called from [onPostDraw\(boolean, long\)](#) to synchronize with rendering.

**Parameters:**

- **buildingIds**

A List of [identifiers](#) for the buildings of which the current transparency are to be retrieved

**Returns:**

A HashMap of Identifier-to-transparency mappings.

```
public java.util.HashMap <Identifier, java.lang.Float> getVerticalScale  
(java.util.List <Identifier> buildingIds)
```

Retrieve the vertical scale [0,1] factor of a list of buildings. This is useful to animate any markers that are anchored to specific buildings.

This API can be used in conjunction with [getTransparency\(List\)](#) to perform custom animations of [MapMarker](#). This API should be called from [onPostDraw\(boolean, long\)](#) to synchronize with rendering.

**Parameters:**

- **buildingIds**

A List of [identifiers](#) identifiers for the buildings of which the current vertical scale are to be retrieved.

**Returns:**

A HashMap of the Identifier-to-scaling factor mappings.

```
public void releaseBuildingGroup (MapBuildingGroup group)
```

Release the [MapBuildingGroup](#) created for custom building selection.

**Parameters:**

- **group**

The [MapBuildingGroup](#) to be released. The [MapBuildingGroup](#) instance becomes invalid and unusable again. To create a new [MapBuildingGroup](#), use [createNewBuildingGroup\(\)](#).

**Throws:**

- **IllegalArgumentException**

if group is a default [MapBuildingGroup](#) retrieved from [getDefaultBuildingGroup\(DefaultBuildingGroups\)](#).

## BuildingSearchResult

The class *BuildingSearchResult* is a member of *com.here.android.mpa.mapping.MapBuildingLayer*.

### Class Summary

public static final class **MapBuildingLayer.BuildingSearchResult**

*extends java.lang.Object*

Represents search results information for a building search

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 459: Nested Classes in BuildingSearchResult

Nested Classes
public static final enumeration <i>MapBuildingLayer.BuildingSearchResult.ErrorCode</i> Error codes for building search result

### Method Summary

Table 460: Methods in BuildingSearchResult

Methods
public <i>ErrorCode</i> <b>getResultCode</b> () Get the error code.
public java.util.List < <i>MapBuildingObject</i> > <b>getResults</b> () Get the list of buildings

### Class Details

Represents search results information for a building search

### Method Details

public *ErrorCode* **getResultCode** ()

Get the error code.

#### Returns:

*MapBuildingLayer.BuildingSearchResult.ErrorCode* The completion code for the building search.

public java.util.List <*MapBuildingObject*> **getResults** ()

Get the list of buildings

**Returns:**

A list of buildings

## ErrorCode

The enumeration *ErrorCode* is a member of *com.here.android.mpa.mapping.MapBuildingLayer.BuildingSearchResult*.

### Enumeration Summary

public static final enumeration **MapBuildingLayer.BuildingSearchResult.ErrorCode**

*extends java.lang.Enum, java.lang.Object*

Error codes for building search result

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 461: Enum Constants in ErrorCode

Fields
<pre>public static final ErrorCode NONE</pre> <p>No error.</p>
<pre>public static final ErrorCode NEEDS_DATA</pre> <p>Map Data is not available at the requested area.</p>
<pre>public static final ErrorCode AREA_TOO_LARGE</pre> <p>Search area is too large.</p>
<pre>public static final ErrorCode UNKNOWN</pre> <p>Unknown error.</p>

### Method Summary

Table 462: Methods in ErrorCode

Methods
<pre>public static ErrorCode valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static MapBuildingLayer.BuildingSearchResult.ErrorCode[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Error codes for building search result

### Enum Constant Details

```
public static final ErrorCode NONE
```

No error.

```
public static final ErrorCode NEEDS_DATA
```

Map Data is not available at the requested area. Requires download.

```
public static final ErrorCode AREA_TOO_LARGE
```

Search area is too large. Search with a smaller boundingbox.

```
public static final ErrorCode UNKNOWN
```

Unknown error.

### Method Details

```
public static ErrorCode valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static MapBuildingLayer.BuildingSearchResult.ErrorCode[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## DefaultBuildingColor

The enumeration *DefaultBuildingColor* is a member of *com.here.android.mpa.mapping.MapBuildingLayer*.

### Enumeration Summary

```
public static final enumeration MapBuildingLayer.DefaultBuildingColor
```

*extends java.lang.Enum, java.lang.Object*

A set of pre-defined colors to change a *MapBuildingGroup*'s color property

[For complete information, see the section *Enumeration Details*]

## Enum Constant Summary

Table 463: Enum Constants in DefaultBuildingColor

Fields
<code>public static final DefaultBuildingColor <b>SELECTED</b></code>
<code>public static final DefaultBuildingColor <b>HIGHLIGHT</b></code>
<code>public static final DefaultBuildingColor <b>HIGHLIGHT2</b></code>
<code>public static final DefaultBuildingColor <b>HIGHLIGHT3</b></code>
<code>public static final DefaultBuildingColor <b>HIGHLIGHT4</b></code>
<code>public static final DefaultBuildingColor <b>HIGHLIGHT5</b></code>

## Method Summary

Table 464: Methods in DefaultBuildingColor

Methods
<code>public static DefaultBuildingColor <b>valueOf</b> (String name)</code> This method retrieves the enumeration value that matches the name specified by the caller.
<code>public static MapBuildingLayer.DefaultBuildingColor[] <b>values</b> ()</code> This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

A set of pre-defined colors to change a *MapBuildingGroup*'s color property

### Enum Constant Details

`public static final DefaultBuildingColor SELECTED`

`public static final DefaultBuildingColor HIGHLIGHT`

`public static final DefaultBuildingColor HIGHLIGHT2`

`public static final DefaultBuildingColor HIGHLIGHT3`

```
public static final DefaultBuildingColor HIGHLIGHT4
```

```
public static final DefaultBuildingColor HIGHLIGHT5
```

### Method Details

```
public static DefaultBuildingColor valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static MapBuildingLayer.DefaultBuildingColor[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## DefaultBuildingGroups

The enumeration *DefaultBuildingGroups* is a member of *com.here.android.mpa.mapping.MapBuildingLayer*.

### Enumeration Summary

```
public static final enumeration MapBuildingLayer.DefaultBuildingGroups
```

*extends java.lang.Enum, java.lang.Object*

Default groups of buildings on the *Map*.

[For complete information, see the section *Enumeration Details*]

### Enum Constant Summary

Table 465: Enum Constants in DefaultBuildingGroups

Fields
<pre>public static final <i>DefaultBuildingGroups</i> <b>NORMAL_BUILDINGS</b></pre> <p>Basic buildings.</p>
<pre>public static final <i>DefaultBuildingGroups</i> <b>IMPORTANT_BUILDINGS</b></pre> <p>Special buildings, such as landmarks.</p>

## Method Summary

Table 466: Methods in DefaultBuildingGroups

Methods
<pre>public static <i>DefaultBuildingGroups</i> valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>MapBuildingLayer.DefaultBuildingGroups[]</i> values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Default groups of buildings on the *Map*.

### Enum Constant Details

```
public static final DefaultBuildingGroups NORMAL_BUILDINGS
```

Basic buildings.

```
public static final DefaultBuildingGroups IMPORTANT_BUILDINGS
```

Special buildings, such as landmarks.

## Method Details

```
public static DefaultBuildingGroups valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- name**  
 A string containing the name of the enumeration member whose value is to be retrieved.

```
public static MapBuildingLayer.DefaultBuildingGroups[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## MapBuildingObject

The class *MapBuildingObject* is a member of *com.here.android.mpa.mapping*.

## Class Summary

public final class **MapBuildingObject**

extends *com.here.android.mpa.mapping.MapProxyObject*, *com.here.android.mpa.common.ViewObject*,  
*java.lang.Object*

This class represents a specific building on the map.

[For complete information, see the section [Class Details](#)]

## Method Summary

Table 467: Methods in MapBuildingObject

Methods
<pre>public float <b>getHeight</b> ()</pre> <p>Gets the height of the <i>MapBuildingObject</i></p>
<pre>public <i>Identifier</i> <b>getIdentifier</b> ()</pre> <p>Gets the <i>Identifier</i> of the building.</p>
<pre>public String <b>getPlaceName</b> ()</pre> <p>Gets the name of the <i>MapBuildingObject</i>.</p>
<pre>public <i>GeoCoordinate</i> <b>getPosition</b> ()</pre> <p>Gets the position of the <i>MapBuildingObject</i></p>

## Class Details

This class represents a specific building on the map. Using the *Identifier*, the *MapBuildingObject* can be attached to *MapBuildingGroup* groups to manipulate color and height properties.

## Method Details

```
public float getHeight ()
```

Gets the height of the *MapBuildingObject*

**Returns:**

height in meters relative to ground level.

```
public Identifier getIdentifier ()
```

Gets the *Identifier* of the building. The identifier can be matched against results in *PlaceLink*

**Returns:**

*Identifier* id of the building

```
public String getPlaceName ()
```

Gets the name of the *MapBuildingObject*. This information is only available in 3D Landmarks.

**Returns:**

Name of the landmark

```
public GeoCoordinate getPosition ()
```

Gets the position of the *MapBuildingObject*

**Returns:**

*GeoCoordinate* position of the building

## MapCartoMarker

The class *MapCartoMarker* is a member of *com.here.android.mpa.mapping* .

### Class Summary

```
public final class MapCartoMarker
```

extends *com.here.android.mpa.mapping.MapProxyObject*, *com.here.android.mpa.common.ViewObject*,  
*java.lang.Object*

Represents a selectable cartography icon displayed at a geographical position on a map.

[For complete information, see the section *Class Details*]

### Method Summary

Table 468: Methods in MapCartoMarker

Methods
<pre>public <i>Location</i> getLocation ()</pre> <p>Returns the <i>Location</i> object for the <i>MapCartoMarker</i></p>

### Class Details

Represents a selectable cartography icon displayed at a geographical position on a map. It cannot be added, removed or modified by users.

### Method Details

```
public Location getLocation ()
```

Returns the *Location* object for the *MapCartoMarker*

**Returns:**

The *Location* object for the *MapCartoMarker*.

## MapCircle

The class *MapCircle* is a member of *com.here.android.mpa.mapping*.

### Class Summary

public final class **MapCircle**

extends *com.here.android.mpa.mapping.MapObject*, *com.here.android.mpa.common.ViewObject*,  
*java.lang.Object*

Represents a *MapObject* in the shape of a circle.

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 469: Constructors in MapCircle

Constructors
<i>MapCircle</i> () Constructs a <i>MapCircle</i> , which is a <i>MapObject</i> in the shape of a circle.
<i>MapCircle</i> (double radius, <i>GeoCoordinate</i> center) Constructs a <i>MapCircle</i> , which is a <i>MapObject</i> in the shape of a circle.

### Method Summary

Table 470: Methods in MapCircle

Methods
public <i>GeoCoordinate</i> <i>getCenter</i> () Returns the <i>GeoCoordinate</i> representing the current center of the <i>MapCircle</i> .
public boolean <i>getDepthTestEnabled</i> () Returns a boolean indicating whether the <i>MapCircle</i> is rendered with depth test.
public int <i>getFillColor</i> () Returns the current fill color for this <i>MapCircle</i> , returning an ARGB (Alpha/Red/Green/Blue) integer color value.
public int <i>getLineColor</i> () Returns the current border line color for this <i>MapCircle</i> , as an ARGB (Alpha/Red/Green/Blue) integer color value.
public int <i>getLineWidth</i> () Returns the current border line width for this <i>MapCircle</i> , in pixels.
public double <i>getRadius</i> () Returns the current radius of the <i>MapCircle</i> , in meters.

## Methods

```
public MapCircle setCenter (GeoCoordinate center)
```

Sets the center for this *MapCircle* to a specified *GeoCoordinate*.

```
public void setDepthTestEnabled (boolean enabled)
```

Set whether to render *MapCircle* with depth test.

```
public MapCircle setFillColor (int argbColor)
```

Sets a fill color for this *MapCircle* using an ARGB (Alpha/Red/Green/Blue) integer color value.

```
public MapCircle setLineColor (int argbColor)
```

Sets a border line color for this *MapCircle* , using an ARGB (Alpha/Red/Green/Blue) integer color value.

```
public MapCircle setLineWidth (int width)
```

Sets a border line width, in pixels, for this *MapCircle* , an *int* value within the [0..100] range.

```
public MapCircle setRadius (double radius)
```

Sets a radius for this *MapCircle* , in meters.

## Class Details

Represents a *MapObject* in the shape of a circle.

## Constructor Details

### *MapCircle* ()

Constructs a *MapCircle* , which is a *MapObject* in the shape of a circle.

### *MapCircle* (double radius, *GeoCoordinate* center)

Constructs a *MapCircle* , which is a *MapObject* in the shape of a circle.

#### Parameters:

- **radius**  
Desired radius of the *MapCircle*, in meters
- **center**  
A *GeoCoordinate* representing the center of the *MapCircle*.

#### Throws:

- **IllegalArgumentException**  
if *center* is invalid.

## Method Details

```
public GeoCoordinate getCenter ()
```

Returns the *GeoCoordinate* representing the current center of the `MapCircle` .

**Returns:**

The current `MapCircle` center

```
public boolean getDepthTestEnabled ()
```

Returns a `boolean` indicating whether the `MapCircle` is rendered with depth test. By default, depth test is disabled.

**Returns:**

True if the `MapCircle` is rendered with depth test, false otherwise

```
public int getFillColor ()
```

Returns the current fill color for this `MapCircle` , returning an ARGB (Alpha/Red/Green/Blue) integer color value. Default fill color is solid blue or in ARGB color, `0xFF0000FF`.

**Returns:**

The current ARGB integer color value. The packed integer is made up of 4 bytes: alpha, red, green, blue. Each color component has a value range from [0..255] with 0 meaning no contribution for that component, and 255 meaning 100% contribution

**See also:**

[android.graphics.Color](#)

```
public int getLineColor ()
```

Returns the current border line color for this `MapCircle` , as an ARGB (Alpha/Red/Green/Blue) integer color value. Default line color is solid blue, or in ARGB color, `0xFF0000FF`.

**Returns:**

The current ARGB integer color value. The packed integer is made up of 4 bytes: alpha, red, green, blue. Each color component has a value range from [0..255] with 0 meaning no contribution for that component, and 255 meaning 100% contribution

**See also:**

[android.graphics.Color](#)

```
public int getLineWidth ()
```

Returns the current border line width for this `MapCircle` , in pixels. The default width is 0 pixels.

**Returns:**

The current width of the line defining the border of the `MapCircle`.

```
public double getRadius ()
```

Returns the current radius of the `MapCircle`, in meters. The default radius of a `MapCircle` instance is 1.

**Returns:**

The current radius of this `MapCircle`.

```
public MapCircle setCenter (GeoCoordinate center)
```

Sets the center for this `MapCircle` to a specified *GeoCoordinate*.

**Parameters:**

- **center**  
Desired *GeoCoordinate* for this `MapCircle` center.

**Returns:**

The updated `MapCircle` itself.

**Throws:**

- **`IllegalArgumentException`**  
if center is invalid.

```
public void setDepthTestEnabled (boolean enabled)
```

Set whether to render `MapCircle` with depth test.

Rendering with depth test should be used if map object altitude is relevant in your application. Rendering objects with different heights while disabling depth test may cause object occlusion.

**Parameters:**

- **enabled**  
true if `MapCircle` is rendered with depth test

```
public MapCircle setFillColor (int argbColor)
```

Sets a fill color for this `MapCircle` using an ARGB (Alpha/Red/Green/Blue) integer color value.

**Parameters:**

- **argbColor**  
Desired ARGB integer color value. The packed integer is made up of 4 bytes: alpha, red, green, blue. Each color component has a value range from [0..255] with 0 meaning no contribution for that component, and 255 meaning 100% contribution

**Returns:**

The updated `MapCircle` itself.

**See also:**

[android.graphics.Color](#)

```
public MapCircle setLineColor (int argbColor)
```

Sets a border line color for this *MapCircle* , using an ARGB (Alpha/Red/Green/Blue) integer color value.

**Parameters:**

- **argbColor**

Desired ARGB integer color value. The packed integer is made up of 4 bytes: alpha, red, green, blue. Each color component has a value range from [0..255] with 0 meaning no contribution for that component, and 255 meaning 100% contribution

**Returns:**

The updated *MapCircle* itself.

**See also:**

[android.graphics.Color](#)

```
public MapCircle setLineWidth (int width)
```

Sets a border line width, in pixels, for this *MapCircle* , an *int* value within the [0..100] range.

**Parameters:**

- **width**

Desired width of the line defining the border of the *MapCircle*

**Returns:**

The updated *MapCircle* itself.

**Throws:**

- **IllegalArgumentException**  
is width is out of range.

```
public MapCircle setRadius (double radius)
```

Sets a radius for this *MapCircle* , in meters.

**Parameters:**

- **radius**

Desired radius of the *MapCircle*.

**Returns:**

The updated *MapCircle* itself.

**Throws:**

- **IllegalArgumentException**

if radius supplied is less than or equal to 0.0.

## MapContainer

The class *MapContainer* is a member of *com.here.android.mpa.mapping*.

### Class Summary

public final class **MapContainer**

extends *com.here.android.mpa.mapping.MapObject*, *com.here.android.mpa.common.ViewObject*, *java.lang.Object*

Represents a container that determines the stacking order of objects on a *Map*.

[For complete information, see the section *Class Details*]

#### See also:

*setVisible(boolean)*

*setVisibleMask(int)*

*setVisibleMask(int, int)*

### Constructor Summary

Table 471: Constructors in MapContainer

Constructors
<p><i>MapContainer</i> ()</p> <p>Creates an empty <i>MapContainer</i>.</p>

### Method Summary

Table 472: Methods in MapContainer

Methods
<p>public boolean <i>addMapObject</i> (<i>MapObject</i> object)</p> <p>Adds a <i>MapObject</i> to this <i>MapContainer</i>.</p>
<p>public java.util.List &lt;<i>MapObject</i>&gt; <i>getAllMapObjects</i> ()</p> <p>Returns the list of all <i>MapObject</i> objects within this <i>MapContainer</i>.</p>
<p>public boolean <i>removeAllMapObjects</i> ()</p> <p>Removes all <i>MapObject</i> objects currently within this <i>MapContainer</i>.</p>
<p>public boolean <i>removeMapObject</i> (<i>MapObject</i> object)</p> <p>Removes the specified <i>MapObject</i> from this <i>MapContainer</i>.</p>

## Class Details

Represents a container that determines the stacking order of objects on a *Map*. Applications can add certain types of *MapObject* objects into a *MapContainer*. For more details, refer to *addMapObject(MapObject)*.

You can use *MapContainer.setVisible(boolean)* to control whether the objects in the container are visible. If *MapContainer.setVisible(true)*, then the visibility settings of each map object in the container are used.

Unlike other map objects, *MapContainer* does not support the use of visibility masks, so you cannot set container visibility on a zoom level basis.

**See also:**

*setVisible(boolean)*

*setVisibleMask(int)*

*setVisibleMask(int, int)*

## Constructor Details

### **MapContainer ()**

Creates an empty *MapContainer*.

## Method Details

### **public boolean addMapObject (*MapObject* object)**

Adds a *MapObject* to this *MapContainer*. Only the following types of *MapObject* can be added:

- *MapMarker* objects
- *MapLabeledMarker* objects
- *MapScreenMarker* objects
- *MapCircle* objects
- *MapPolyline* objects
- *MapPolygon* objects

For a complete enumeration of available *MapObject* types, refer to *MapObject.Type*.

**Parameters:**

- **object**  
A *MapObject* to add to this *MapContainer*

**Returns:**

True if the *MapObject* was added successfully to this *MapContainer*, false otherwise

**See also:**

*removeMapObject(MapObject)*

```
public java.util.List <MapObject> getAllMapObjects ()
```

Returns the list of all *MapObject* objects within this *MapContainer*. Modifications to objects returned from the array are not guaranteed to be reflected properly in the *MapContainer*. Use *addMapObject(MapObject)* and *removeMapObject(MapObject)* to modify individual array elements.

Note: the order of the *MapObjects* returned in the *List* is arbitrary. There is no guarantee the list is sorted in the order the *MapObjects* were added to the *MapContainer*.

**Returns:**

A list containing all *MapObject* objects within the *MapContainer*. If the *MapContainer* contains no map object, an empty array will be returned.

```
public boolean removeAllMapObjects ()
```

Removes all *MapObject* objects currently within this *MapContainer*.

**Returns:**

True if all *MapObject* objects were removed successfully from this *MapContainer*, false otherwise

**See also:**

*removeMapObject(MapObject)*

```
public boolean removeMapObject (MapObject object)
```

Removes the specified *MapObject* from this *MapContainer*. If the specified *MapObject* is not contained within the *MapContainer*, the container will be unchanged.

**Parameters:**

- **object**

A *MapObject* to remove from this *MapContainer*

**Returns:**

True if the *MapObject* was removed successfully from this *MapContainer*, false otherwise

**See also:**

*removeAllMapObjects()*

## MapFragment

The class *MapFragment* is a member of *com.here.android.mpa.mapping*.

### Class Summary

```
public class MapFragment
```

```
extends java.lang.Object
```

A fragment class that automatically creates a [Map](#) and handles map UI interactions such as panning and zooming.

[For complete information, see the section [Class Details](#)]

See also:

[android.app.Fragment](#)

## Constructor Summary

Table 473: Constructors in MapFragment

Constructors
<p><a href="#">MapFragment</a> ()</p> <p>Constructor</p>

## Method Summary

Table 474: Methods in MapFragment

Methods
<p>public void <a href="#">addOnMapRenderListener</a> (<a href="#">OnMapRenderListener</a> listener)</p> <p>Adds a <a href="#">OnMapRenderListener</a> to listen for map render events.</p>
<p>public <a href="#">ViewRect</a> <a href="#">getClipRect</a> ()</p> <p>Returns the <a href="#">ViewRect</a> representing the clip rectangle for this <a href="#">MapFragment</a>.</p>
<p>public <a href="#">Rect</a> <a href="#">getCopyrightBoundaryRect</a> ()</p> <p>Gets the current HERE copyright logo's boundary rectangle.</p>
<p>public int <a href="#">getCopyrightLogoHeight</a> ()</p> <p>Returns the height of the copyright logo.</p>
<p>public <a href="#">CopyrightLogoPosition</a> <a href="#">getCopyrightLogoPosition</a> ()</p> <p>Returns the on-screen position of the HERE copyright logo as a <a href="#">CopyrightLogoPosition</a> value.</p>
<p>public int <a href="#">getCopyrightLogoWidth</a> ()</p> <p>Returns the width of the copyright logo.</p>
<p>public int <a href="#">getCopyrightMargin</a> ()</p> <p>Returns the current margin for the HERE copyright logo, in number of pixels, as an offset from the edge of the visible map area to the edge of the logo.</p>
<p>public <a href="#">Map</a> <a href="#">getMap</a> ()</p> <p>Returns the instance of <a href="#">Map</a> associated with this map fragment</p>
<p>public <a href="#">MapGesture</a> <a href="#">getMapGesture</a> ()</p> <p>Returns the <a href="#">MapGesture</a> object representing the current gesture handler for the <a href="#">MapFragment</a>.</p>
<p>public <a href="#">PositionIndicator</a> <a href="#">getPositionIndicator</a> ()</p> <p>Returns the <a href="#">PositionIndicator</a> instance that renders the current position with a marker.</p>

## Methods

```
public void getScreenCapture (OnScreenCaptureListener listener)
```

Returns the full screen bitmap for the *MapFragment*.

```
public void init (OnEngineInitListener listener)
```

Initializes the *MapEngine* and displays a map that occupies the entire *MapFragment*'s view rectangle.

```
public void init (Context context, MapVariant variant, OnEngineInitListener listener)
```

**Deprecated:** As of SDK 3.4.

Initializes the *MapEngine* and displays a map that occupies the entire *MapFragment*'s view rectangle.

```
public void init (Context context, OnEngineInitListener listener)
```

**Deprecated:** As of SDK 3.4.

Initializes the *MapEngine* and displays a map that occupies the entire *MapFragment*'s view rectangle.

```
public void init (ApplicationContext context, OnEngineInitListener listener)
```

Initializes the *MapEngine* and displays a map that occupies the entire *MapFragment*'s view rectangle.

```
public View onCreateView (LayoutInflater inflater, ViewGroup container, Bundle savedInstanceState)
```

Called when this fragment is first attached to its Activity.

```
public void onDestroyView ()
```

Called when the view previously created by *onCreateView(LayoutInflater, ViewGroup, Bundle)* has been detached from this fragment.

```
public void onInflate (Activity activity, AttributeSet attrs, Bundle savedInstanceState)
```

**Deprecated:** Deprecated as of release 3.5.

Called when this fragment is being created as part of a view layout inflation, typically from setting the content view of an activity.

```
public void onInflate (Context context, AttributeSet attrs, Bundle savedInstanceState)
```

Called when this fragment is being created as part of a view layout inflation, typically from setting the content view of an activity.

```
public void onPause ()
```

Called when this fragment is no longer resumed.

```
public void onResume ()
```

Called when this fragment is visible to the user and actively running.

```
public void onSaveInstanceState (Bundle outState)
```

Called when this fragment has been asked to save its current dynamic state.

```
public void removeOnMapRenderListener (OnMapRenderListener listener)
```

Removes an existing *OnMapRenderListener*.

```
public void setClipRect (ViewRect rect, PointF transformCenter)
```

Sets a clipping rectangle to the *MapFragment*.

```
public void setClipRect (ViewRect rect)
```

Sets a clipping rectangle to this *MapFragment*.

## Methods

public void [setCopyrightBoundaryRect](#) (Rect rect)

Sets a rectangle, in pixels, relative to the top left corner of the [MapFragment](#)'s boundary, for the placement of the HERE copyright logo.

public void [setCopyrightLogoPosition](#) ([CopyrightLogoPosition](#) position)

Sets a position for the HERE copyright logo.

public void [setCopyrightMargin](#) (int margin)

Sets a margin for the HERE copyright logo, in number of pixels, as an offset from the edge of the visible map area to the edge of the logo (depending on the placement).

public void [setMapMarkerDragListener](#) ([OnDragListener](#) listener)

Sets a [MapMarker.OnDragListener](#) to be invoked whenever any [MapMarker](#) on a [Map](#) that is attached to this fragment is dragged.

public void [setOnTouchListener](#) ([View.OnTouchListener](#) listener)

Sets an `android.view.OnTouchListener` to be invoked whenever a touch event is sent to the [MapFragment](#).

## Class Details

A fragment class that automatically creates a [Map](#) and handles map UI interactions such as panning and zooming. [MapFragment](#) extends the Android Fragment class and retains its lifecycle behaviors.

Upon the initialization of [MapFragment](#) , a [Map](#) object is automatically created and bound to the fragment. This [Map](#) object is then persisted throughout the [MapFragment](#) 's lifetime. Since [MapFragment](#) internally calls `Fragment.setRetainInstance(true)` , the [Map](#) will retain any properties applied to it during an application's lifetime.

[MapFragment](#) objects have their own lifecycle, state, and back stack, thus it is unsafe to assume objects returned by a [MapFragment](#) instance (with the exception of [Map](#) ) will be available throughout the lifetime of its attached activity.

A [MapFragment](#) is defined in an Android layout XML file. For example:

```
<fragment
  class="com.here.android.mpa.mapping.MapFragment"
  android:id="@+id/map_fragment"
  android:layout_width="fill_parent"
  android:layout_height="fill_parent" />
```

Note: [MapFragment](#) automatically handles [MapEngine](#) pausing and resuming during activity state changes, thus it is not necessary for the activity that owns [MapFragment](#) instances to manually call [onPause\(\)](#) or [onResume\(\)](#) during the activity's [onPause\(\)](#) and [onResume\(\)](#). However, considerations should be made in how much processing is done during the `onResume()` method. Performing significant amounts of processing may delay view rendering in cases such as device orientation changes. In these cases, it is recommended to use a specifically designated handler to organize the amount of processing to be done.

See also:

[android.app.Fragment](#)

## Constructor Details

### MapFragment ()

Constructor

## Method Details

```
public void addOnMapRenderListener (OnMapRenderListener listener)
```

Adds a *OnMapRenderListener* to listen for map render events.

#### Parameters:

- **listener**  
A *OnMapRenderListener* to add to the *MapFragment*

#### See also:

[removeOnMapRenderListener\(\*OnMapRenderListener\*\)](#)

```
public ViewRect getClipRect ()
```

Returns the *ViewRect* representing the clip rectangle for this *MapFragment*.

#### Returns:

The clip rectangle for rendering *MapObject* objects and similar map-related screen elements. Null if the view's layout process has yet to be completed.

If the process is not yet complete, users can either retry later or subscribe as a *OnMapRenderListener* and call this method upon the callback *onSizeChanged(int, int)*.

```
public Rect getCopyrightBoundaryRect ()
```

Gets the current HERE copyright logo's boundary rectangle. Returns null if a boundary rect has not been set previously.

#### Returns:

The copyright logo's boundary rect. null if a boundary rect has not been set previously.

#### See also:

[setCopyrightBoundaryRect\(\*Rect\*\)](#)

```
public int getCopyrightLogoHeight ()
```

Returns the height of the copyright logo.

This method only returns a valid value once fragment initialization has taken completed.

#### Returns:

The height of the copyright logo, in number of pixels

```
public CopyrightLogoPosition getCopyrightLogoPosition ()
```

Returns the on-screen position of the HERE copyright logo as a *CopyrightLogoPosition* value.

**Returns:**

The position of the logo.

```
public int getCopyrightLogoWidth ()
```

Returns the width of the copyright logo.

This method only returns a valid value once fragment initialization has completed.

**Returns:**

The width of the copyright logo, in number of pixels

```
public int getCopyrightMargin ()
```

Returns the current margin for the HERE copyright logo, in number of pixels, as an offset from the edge of the visible map area to the edge of the logo.

This method only returns a valid value once fragment initialization has taken place.

**Returns:**

The current offset from the edge of the *MapFragment*, in number of pixels

```
public Map getMap ()
```

Returns the instance of *Map* associated with this map fragment

**Returns:**

The *Map* object currently displayed in this fragment.

```
public MapGesture getMapGesture ()
```

Returns the *MapGesture* object representing the current gesture handler for the *MapFragment*. Applications can intercept this object and override the default event behaviors.

**Returns:**

The *MapGesture*

```
public PositionIndicator getPositionIndicator ()
```

Returns the *PositionIndicator* instance that renders the current position with a marker. The position indicator should be used with *PositioningManager*.

**Returns:**

The *PositionIndicator*

```
public void getScreenCapture (OnScreenCaptureListener listener)
```

Returns the full screen bitmap for the *MapFragment*. This method is asynchronous and will invoke a callback once the operation is completed through the *OnScreenCaptureListener*. The *MapFragment* must be visible to create the screen capture.

**Parameters:**

- **listener**

A *OnScreenCaptureListener* to listen for the callback when screen capture is complete.

```
public void init (OnEngineInitListener listener)
```

Initializes the *MapEngine* and displays a map that occupies the entire *MapFragment*'s view rectangle. Users of *MapFragment* should call this method or *init(ApplicationContext, OnEngineInitListener)* after the fragment is first attached to its activity. This method should only be used for fragments declared in a layout XML. Do not use this method when *MapFragment* is created programmatically.

This method will initialize *MapEngine* with *GLOBAL* map variant on first SDK usage and with stored map variant on sub-sequent usages.

**Parameters:**

- **listener**

A *OnEngineInitListener* object that will be called when *MapFragment* initialization is finished. A null object can be supplied if the caller does not expect any notification when initialization completes.

**See also:**

[OnEngineInitListener](#)

[init\(ApplicationContext, OnEngineInitListener\)](#)

[init\(ApplicationContext, OnEngineInitListener\)](#)

```
public void init (Context context, MapVariant variant, OnEngineInitListener listener)
```

Deprecated: As of SDK 3.4.

Use [init\(ApplicationContext, OnEngineInitListener\)](#) instead.

Initializes the *MapEngine* and displays a map that occupies the entire *MapFragment*'s view rectangle. Users of *MapFragment* should call this method after the fragment is first attached to its activity.

This method can be used for `MapFragment` objects that are created programmatically or declared in a layout XML file.

This method can configure map variant which will be used by `MapEngine`. If initialization fails - `OPERATION_NOT_ALLOWED` will be reported. Currently following variants are supported: - `GLOBAL` - initialize `MapEngine` to use international map variant; - `KOREA` - initialize `MapEngine` to use Korean map variant; - null - initialize `MapEngine` to use stored map variant or international map variant for first run. This method is used to configure `MapEngine` to use certain map variant. If `MapEngine` was already configured and passed `variant` differs - error will be reported and initialization fails.

**Parameters:**

- **context**  
The application context of this fragment.
- **variant**  
Map data variant to use.
- **listener**  
A `OnEngineInitListener` object that will be called when `MapFragment` initialization is finished. A null object can be supplied if the caller does not require any notification when initialization completes.

**See also:**

[OnEngineInitListener](#)

[init\(Context, OnEngineInitListener\)](#)

[init\(OnEngineInitListener\)](#)

```
public void init (Context context, OnEngineInitListener listener)
```

Deprecated: As of SDK 3.4.

Use [init\(ApplicationContext, OnEngineInitListener\)](#) instead.

Initializes the `MapEngine` and displays a map that occupies the entire `MapFragment`'s view rectangle. Users of `MapFragment` should call this method after the fragment is first attached to its activity.

This method can be used for `MapFragment` objects that are created programmatically or declared in a layout XML file.

This method will initialize `MapEngine` with `GLOBAL` map variant on first SDK usage and with stored map variant on sub-subsequent usages.

**Parameters:**

- **context**  
The application context of this fragment.
- **listener**  
A `OnEngineInitListener` object that will be called when `MapFragment` initialization is finished. A null object can be supplied if the caller does not require any notification when initialization completes.

**See also:**

[OnEngineInitListener](#)

*init(Context, OnEngineInitListener)*

*init(OnEngineInitListener)*

```
public void init (ApplicationContext context, OnEngineInitListener listener)
```

Initializes the *MapEngine* and displays a map that occupies the entire *MapFragment*'s view rectangle. Users of *MapFragment* should call this method after the fragment is first attached to its activity.

This method can be used for *MapFragment* objects that are created programmatically or declared in a layout XML file.

This method will initialize *MapEngine* with *ApplicationContext* to be used during initialization.

**Parameters:**

- **context**  
*ApplicationContext* to be used during initialization.
- **listener**  
A *OnEngineInitListener* object that will be called when *MapFragment* initialization is finished. A null object can be supplied if the caller does not require any notification when initialization completes.

**See also:**

*OnEngineInitListener*

*init(ApplicationContext, OnEngineInitListener)*

```
public View onCreateView (LayoutInflater inflater, ViewGroup container,  
Bundle savedInstanceState)
```

Called when this fragment is first attached to its *Activity* . Automatically starts to initialize the *MapEngine* for later use.

**Parameters:**

- **inflater**
- **container**
- **savedInstanceState**

**Returns:**

The created *MapView* object.

**See also:**

*android.app.Fragment#onAttach(android.app.Activity)*

```
public void onDestroyView ()
```

Called when the view previously created by *onCreateView(LayoutInflater, ViewGroup, Bundle)* has been detached from this fragment. The *MapView* object created earlier will detach itself of its associated *Map* instance.

**See also:**

[android.app.Fragment#onDestroyView\(\)](#)

```
public void onInflate (Activity activity, AttributeSet attrs, Bundle
savedInstanceState)
```

**Deprecated:** *Deprecated as of release 3.5.*

Use [#onInflate\(Context, android.util.AttributeSet, android.os.Bundle\)](#) instead.

Called when this fragment is being created as part of a view layout inflation, typically from setting the content view of an activity. This method may be called immediately after the fragment is created from a tag in a layout file.

**Parameters:**

- **activity**
- **attrs**
- **savedInstanceState**

**See also:**

[android.app.Fragment#onInflate\(Activity, AttributeSet, Bundle\)](#)

```
public void onInflate (Context context, AttributeSet attrs, Bundle
savedInstanceState)
```

Called when this fragment is being created as part of a view layout inflation, typically from setting the content view of an activity. This method may be called immediately after the fragment is created from a tag in a layout file.

**Parameters:**

- **context**
- **attrs**
- **savedInstanceState**

**See also:**

[android.app.Fragment#onInflate\(Activity, AttributeSet, Bundle\)](#)

```
public void onPause ()
```

Called when this fragment is no longer resumed. All *MapEngine* activities will be paused automatically.

**See also:**

[android.app.Fragment#onPause\(\)](#)

```
public void onResume ()
```

Called when this fragment is visible to the user and actively running. All *MapEngine* activities will be resumed automatically.

**See also:**

`android.app.Fragment#onResume()`

## `public void onSaveInstanceState (Bundle outState)`

Called when this fragment has been asked to save its current dynamic state. Saving its current state allows for it to be later reconstructed in a new instance.

**Parameters:**

- `outState`

**See also:**

`android.app.Fragment#onSaveInstanceState(android.os.Bundle)`

## `public void removeOnMapRenderListener (OnMapRenderListener listener)`

Removes an existing *OnMapRenderListener*.

**Parameters:**

- `listener`

A *OnMapRenderListener* to remove from the *MapFragment*

## `public void setClipRect (ViewRect rect, PointF transformCenter)`

Sets a clipping rectangle to the *MapFragment*. Only the area specified by the *ViewRect* will be used for rendering, while the rest of the view will be masked in black. This rectangle will be reset to the full size of the *MapFragment* upon screen rotation or upon recreating the screen.

Note that setting a clipping rectangle will also reset the *MapFragment*'s viewing rectangle to its full default size.

If the *ViewRect* is not valid, this method does nothing.

**Parameters:**

- `rect`

A *ViewRect* for rendering *MapObject* objects and similar map-related screen elements

- `transformCenter`

A `android.graphics.PointF` representing the center coordinate for map transformations such as zooming and rotation

**See also:**

[\*setClipRect\(ViewRect\)\*](#)

```
public void setClipRect (ViewRect rect)
```

Sets a clipping rectangle to this *MapFragment*. Only the area specified by the *ViewRect* will be used for rendering, while the rest of the view will be masked in black. This rectangle will be reset to the full size of the *MapFragment* upon screen rotation or upon recreating the screen.

If the *ViewRect* is not valid, this method does nothing.

**Parameters:**

- **rect**

A *ViewRect* for rendering *MapObject* objects and similar map-related screen elements

**See also:**

[setClipRect\(ViewRect, PointF\)](#)

```
public void setCopyrightBoundaryRect (Rect rect)
```

Sets a rectangle, in pixels, relative to the top left corner of the *MapFragment*'s boundary, for the placement of the HERE copyright logo.

If the specified rectangle is not contained completely within the current visible map area, their area of intersection will be used instead of the specified rectangle's area. The copyright logo and copyright margin must fit into the rectangle, otherwise specified rectangle will be ignored.

The rectangle is reset upon screen rotation or upon screen re-creation, or it can be done by setting a `null` *Rect* .

**Parameters:**

- **rect**

A *Rect* representing the desired rectangular container to be used for positioning the copyright logo. Use `null` *Rect* to reset the boundary container.

**Throws:**

- **IllegalArgumentException**

if *Rect* supplied is invalid

```
public void setCopyrightLogoPosition (CopyrightLogoPosition position)
```

Sets a position for the HERE copyright logo. The current default is to place the logo at the center-bottom of the visible map view area.

After the logo's position is set, the position stays effective even when the screen is rotated or re-created.

**Parameters:**

- **position**

A *CopyrightLogoPosition* value representing the desired placement of the HERE copyright logo with respect to the visible map view area

```
public void setCopyrightMargin (int margin)
```

Sets a margin for the HERE copyright logo, in number of pixels, as an offset from the edge of the visible map area to the edge of the logo (depending on the placement).

**Parameters:**

- **margin**  
Desired offset from the edge of the [MapFragment](#)

```
public void setMapMarkerDragListener (OnDragListener listener)
```

Sets a [MapMarker.OnDragListener](#) to be invoked whenever any [MapMarker](#) on a [Map](#) that is attached to this fragment is dragged.

**Parameters:**

- **listener**  
An [MapMarker.OnDragListener](#) to set for this [MapFragment](#)

```
public void setOnTouchListener (View.OnTouchListener listener)
```

Sets an `android.view.OnTouchListener` to be invoked whenever a touch event is sent to the [MapFragment](#).

**Parameters:**

- **listener**  
An `android.view.OnTouchListener` to set for the [MapFragment](#)

**See also:**

[android.view.View.OnTouchListener](#)

## MapGeoModel

The class [MapGeoModel](#) is a member of [com.here.android.mpa.mapping](#) .

### Class Summary

```
public final class MapGeoModel
```

extends [com.here.android.mpa.mapping.MapModelObject](#), [com.here.android.mpa.mapping.MapObject](#),  
[com.here.android.mpa.common.ViewObject](#), [java.lang.Object](#)

A [MapGeoModel](#) is a [GeoCoordinate](#) mesh displayed on a map.

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 475: Constructors in MapGeoModel

Constructors
<code>MapGeoModel ()</code> Creates a MapGeoModel .

## Method Summary

Table 476: Methods in MapGeoModel

Methods
<code>public GeoMesh getMesh ()</code> Gets the GeoMesh currently associated with the MapGeoModel .
<code>public Image getTexture ()</code> Gets the current texture Image of the MapGeoModel .
<code>public MapGeoModel setMesh (GeoMesh model)</code> Sets a GeoMesh for the MapGeoModel .
<code>public MapGeoModel setTexture (Image texture)</code> Sets a texture Image for the MapGeoModel .

## Class Details

A MapGeoModel is a [GeoCoordinate](#) mesh displayed on a map. The mesh is represented by a [GeoMesh](#) object, which internally holds an array of [GeoCoordinate](#) .

Properties of a MapGeoModel mesh include its texture, which is an [Image](#) applied to the mesh. 2D plane objects will respect the texture's transparency, while the alpha transparency for a texture being applied to a 3D object is undefined.

## Constructor Details

### MapGeoModel ()

Creates a MapGeoModel .

## Method Details

### public GeoMesh getMesh ()

Gets the GeoMesh currently associated with the MapGeoModel .

#### Returns:

The GeoMesh

```
public Image getTexture ()
```

Gets the current texture *Image* of the *MapGeoModel* .

**Returns:**

The texture *Image*

```
public MapGeoModel setMesh (GeoMesh model)
```

Sets a *GeoMesh* for the *MapGeoModel* .

**Parameters:**

- **model**  
Desired *GeoMesh*

**Returns:**

The updated *MapGeoMesh* itself.

```
public MapGeoModel setTexture (Image texture)
```

Sets a texture *Image* for the *MapGeoModel* .

**Parameters:**

- **texture**  
Desired texture *Image*

**Returns:**

The updated *MapGeoMesh* itself.

## MapGesture

The interface *MapGesture* is a member of *com.here.android.mpa.mapping* .

### Interface Summary

```
public abstract interface MapGesture
```

Encapsulates all user interactions and touch gestures.

[For complete information, see the section *Interface Details*]

## Nested Class Summary

Table 477: Nested Classes in MapGesture

Nested Classes
<p>public static abstract interface <a href="#">MapGesture.OnGestureListener</a></p> <p>Event Listener interface for gesture events.</p>

## Method Summary

Table 478: Methods in MapGesture

Methods
<p>public abstract void <a href="#">addOnGestureListener</a> (<a href="#">OnGestureListener</a> listener)</p> <p><b>Deprecated:</b> As of SDK 3.3, use <a href="#">addOnGestureListener(MapGesture.OnGestureListener, int, boolean)</a> instead.</p> <p>Adds a <a href="#">MapGesture.OnGestureListener</a> to listen for map gesture events.</p>
<p>public abstract void <a href="#">addOnGestureListener</a> (<a href="#">OnGestureListener</a> listener, int priority, boolean isSync)</p> <p>Adds a <a href="#">MapGesture.OnGestureListener</a> to listen for map gesture events.</p>
<p>public abstract void <a href="#">cancelKineticPanning</a> ()</p> <p>Cancels all currently active motions caused by kinetic panning.</p>
<p>public abstract boolean <a href="#">isAutoSnapToNorthEnabled</a> ()</p> <p>Returns a boolean value indicating whether map automatically rotates to the north if previous rotation did not exceed certain small amount of degrees starting from north.</p>
<p>public abstract boolean <a href="#">isDoubleTapEnabled</a> ()</p> <p>Returns a boolean value indicating whether double-tap is enabled for the MapGesture .</p>
<p>public abstract boolean <a href="#">isFixedMapCenterOnMapRotateZoom</a> ()</p> <p>Returns a boolean value indicating whether the transform center is applied on rotate and zoom interactions.</p>
<p>public abstract boolean <a href="#">isKineticFlickEnabled</a> ()</p> <p>Returns a boolean value indicating whether flick-to-scroll (with kinetic momentum) is enabled for the MapGesture .</p>
<p>public abstract boolean <a href="#">isLongPressEnabled</a> ()</p> <p>Returns a boolean value indicating whether long-press is enabled for this MapGesture .</p>
<p>public abstract boolean <a href="#">isPanningEnabled</a> ()</p> <p>Returns a boolean value indicating whether panning is enabled for this MapGesture .</p>
<p>public abstract boolean <a href="#">isPinchEnabled</a> ()</p> <p>Returns a boolean value indicating whether pinch is enabled for this MapGesture .</p>
<p>public abstract boolean <a href="#">isRotateEnabled</a> ()</p> <p>Returns a boolean value indicating whether two-finger rotation is enabled for this MapGesture .</p>
<p>public abstract boolean <a href="#">isSingleTapEnabled</a> ()</p> <p>Returns a boolean value indicating whether single-tap is enabled for this MapGesture .</p>

## Methods

```
public abstract boolean isTiltEnabled ()
```

Returns a boolean value indicating whether tilt is enabled for this `MapGesture` .

```
public abstract boolean isTwoFingerPanningEnabled ()
```

Returns a boolean value indicating whether two-finger panning interactions are enabled for this `MapGesture` .

```
public abstract boolean isTwoFingerTapEnabled ()
```

Returns a boolean value indicating whether two-finger tap is enabled for this `MapGesture` .

```
public abstract void removeOnGestureListener (OnGestureListener listener)
```

Removes an existing `MapGesture.OnGestureListener`.

```
public abstract MapGesture setAllGesturesEnabled (boolean enabled)
```

Sets all possible kinds of gesture interaction to be either enabled or disabled for the `MapGesture` .

```
public abstract MapGesture setAutoSnapToNorthEnabled (boolean enabled)
```

Sets whether map automatically rotates to the north if previous rotation did not exceed certain small amount of degrees starting from north.

```
public abstract MapGesture setDoubleTapEnabled (boolean enabled)
```

Sets whether double-tap interactions are enabled or disabled for this `MapGesture` .

```
public abstract MapGesture setFixedMapCenterOnMapRotateZoom (boolean lock)
```

Sets whether the transform center is applied during multitouch gestures.

```
public abstract MapGesture setKineticFlickEnabled (boolean enabled)
```

Sets whether flick-to-scroll (with kinetic momentum) interactions are enabled for this `MapGesture` .

```
public abstract MapGesture setLongPressEnabled (boolean enabled)
```

Sets whether long-press interactions are enabled or disabled for this `MapGesture` .

```
public abstract MapGesture setPanningEnabled (boolean enabled)
```

Sets panning interactions to be either enabled or disabled for this `MapGesture` .

```
public abstract MapGesture setPinchEnabled (boolean enabled)
```

Sets whether pinch interactions are enabled or disabled for this `MapGesture` .

```
public abstract MapGesture setRotateEnabled (boolean enabled)
```

Sets whether two-finger rotate interactions are enabled for this `MapGesture` .

```
public abstract MapGesture setSingleTapEnabled (boolean enabled)
```

Sets whether single-tap interactions are enabled or disabled for this `MapGesture` .

```
public abstract MapGesture setTiltEnabled (boolean enabled)
```

Sets whether tilt interactions are enabled or disabled for this `MapGesture` .

```
public abstract MapGesture setTwoFingerPanningEnabled (boolean enable)
```

Sets whether the two-finger panning interaction is enabled for this `MapGesture` .

```
public abstract MapGesture setTwoFingerTapEnabled (boolean enabled)
```

Sets whether two-finger tap gestures are enabled or disabled for this `MapGesture` .

## Interface Details

Encapsulates all user interactions and touch gestures.

Default gestures made available through this interface include:

- Panning - allows a user to pan around a map by holding one finger on the screen and dragging to a new geographical location
- Kinetic Flick - allows a user to pan around a map by "flicking" the screen with one finger (faster than panning but less precise)
- Pinch To Zoom - allows a user to zoom out or zoom in by, respectively, pinching or spreading two fingers being held to the screen
- Double Tap - allows a user to zoom in to view closer geographical details
- Two-Finger Tap - allows a user to zoom out to view a wider geographical area
- Two-Finger Vertical Drag - allows a user to tilt a map to an angle between "straight down from above" and "looking toward the horizon"
- Two-Finger Rotate - allows a user to rotate a map to a desired compass orientation
- Single Tap - does not encapsulate any default behavior. Developers can add application-specific functionality to this gesture.
- Long Press - does not encapsulate any default behavior. Developers can add application-specific functionality to this gesture.

Various setter methods of this interface allow an application developer to set specific gestures as either enabled or disabled. There is also a [setAllGesturesEnabled\(boolean\)](#) method which simultaneously enables or disables all gestures.

Note: the default functionality of one or more gestures can be customized by implementing the [MapGesture.OnGestureListener](#) class and overriding appropriate methods to define desired gesture functionality (this must be done to make use of the long press gesture).

## Method Details

```
public abstract void addOnGestureListener (OnGestureListener listener)
```

**Deprecated:** As of SDK 3.3, use [addOnGestureListener\(MapGesture.OnGestureListener, int, boolean\)](#) instead.

Adds a [MapGesture.OnGestureListener](#) to listen for map gesture events. When there are multiple listeners subscribed to the `MapGesture` events, the order when a subscriber receives a callback is determined by the order when they are added to `MapGesture`.

It is important that after adding an [MapGesture.OnGestureListener](#) in an user application, remember to call [removeOnGestureListener\(MapGesture.OnGestureListener\)](#) when there's no longer a need to listen for map gesture events to free up application resources.

### Parameters:

- **listener**  
A [MapGesture.OnGestureListener](#) to add to this `MapGesture`

### See also:

[addOnGestureListener\(OnGestureListener, int, boolean\)](#)

[removeOnGestureListener\(OnGestureListener\)](#)

```
public abstract void addOnGestureListener (OnGestureListener listener, int
priority, boolean isSync)
```

Adds a *MapGesture.OnGestureListener* to listen for map gesture events. When there are multiple listeners subscribed to the *MapGesture* events, all synchronous subscriber(s) will receive the gesture event callback first, followed by the asynchronous subscriber(s), unless the event is consumed by one of the synchronous subscriber(s). Within the same group of synchronous or asynchronous subscriber(s), the order when a subscriber receives a callback is then determined first by the priority, then within the same priority, it is determined next by the order when they are added to *MapGesture* . Once one of the subscriber(s) consumes a gesture event, no other subscriber(s) will receive the event.

*OnGestureListeners* added by way of *addOnGestureListener(MapGesture.OnGestureListener, int, boolean)* can return their callbacks synchronously or asynchronously depending on the value of *isSync* used when calling the method.

If a listener has previously been added as an asynchronous listener and is added again as a synchronous listener, it will automatically be de-registered from the asynchronous to ensure the same listener can only be an asynchronous or synchronous but not both. Similarly, the same applies for the case of synchronous listener then switching to asynchronous.

It is important that after adding an *MapGesture.OnGestureListener* in an user application, remember to call *removeOnGestureListener(MapGesture.OnGestureListener)* when there's no longer a need to listen for map gesture events to free up application resources.

#### Parameters:

- **listener**  
A *MapGesture.OnGestureListener* to add to this *MapGesture*
- **priority**  
An *int* representing the priority of this listener to be added. The value *Integer.MIN\_VALUE* is reserved for internal use.
- **isSync**  
Use *true* to add this listener to receive callbacks synchronously, use *false* otherwise. Only synchronous listeners can consume a gesture event.

#### See also:

*removeOnGestureListener(OnGestureListener)*

```
public abstract void cancelKineticPanning ()
```

Cancels all currently active motions caused by kinetic panning.

```
public abstract boolean isAutoSnapToNorthEnabled ()
```

Returns a boolean value indicating whether map automatically rotates to the north if previous rotation did not exceed certain small amount of degrees starting from north. By default, this value is set to true.

#### Returns:

True if auto snap to north is enabled, false otherwise.

```
public abstract boolean isDoubleTapEnabled ()
```

Returns a boolean value indicating whether double-tap is enabled for the `MapGesture` . By default, this value is set to true.

**Returns:**

True if double-tap is enabled, false otherwise

```
public abstract boolean isFixedMapCenterOnMapRotateZoom ()
```

Returns a boolean value indicating whether the transform center is applied on rotate and zoom interactions. The default value is false.

**Returns:**

True if transform center is fixed during zoom, False otherwise.

```
public abstract boolean isKineticFlickEnabled ()
```

Returns a boolean value indicating whether flick-to-scroll (with kinetic momentum) is enabled for the `MapGesture` . By default, this value is set to true.

**Returns:**

True if kinetic flick is enabled, false otherwise

```
public abstract boolean isLongPressEnabled ()
```

Returns a boolean value indicating whether long-press is enabled for this `MapGesture` . By default, this value is set to true.

**Returns:**

True if long-press is enabled, false otherwise

```
public abstract boolean isPanningEnabled ()
```

Returns a boolean value indicating whether panning is enabled for this `MapGesture` . By default, this value is set to true.

**Returns:**

True if panning is enabled, false otherwise

```
public abstract boolean isPinchEnabled ()
```

Returns a boolean value indicating whether pinch is enabled for this `MapGesture` . By default, this value is set to true.

**Returns:**

True if pinch is enabled, false otherwise

```
public abstract boolean isRotateEnabled ()
```

Returns a boolean value indicating whether two-finger rotation is enabled for this `MapGesture` . By default, this value is set to true.

**Returns:**

True if rotate is enabled, false otherwise

```
public abstract boolean isSingleTapEnabled ()
```

Returns a boolean value indicating whether single-tap is enabled for this `MapGesture` . By default, this value is set to true.

**Returns:**

True if single-tap is enabled, false otherwise

```
public abstract boolean isTiltEnabled ()
```

Returns a boolean value indicating whether tilt is enabled for this `MapGesture` . By default, this value is set to true.

**Returns:**

True if tilt is enabled, false otherwise

```
public abstract boolean isTwoFingerPanningEnabled ()
```

Returns a boolean value indicating whether two-finger panning interactions are enabled for this `MapGesture` . By default, this value is set to true.

**Returns:**

A boolean true if enabled, false if disabled.

```
public abstract boolean isTwoFingerTapEnabled ()
```

Returns a boolean value indicating whether two-finger tap is enabled for this `MapGesture` . By default, this value is set to true.

**Returns:**

True if two-finger tap is enabled, false otherwise

```
public abstract void removeOnGestureListener (OnGestureListener listener)
```

Removes an existing *MapGesture.OnGestureListener*. Call this method to free up application resources when there's no longer any need to listen for map gesture events.

**Parameters:**

- **listener**  
A *MapGesture.OnGestureListener* to remove from this MapGesture

```
public abstract MapGesture setAllGesturesEnabled (boolean enabled)
```

Sets all possible kinds of gesture interaction to be either enabled or disabled for the MapGesture .

**Parameters:**

- **enabled**  
A boolean specifying whether all gestures are enabled

**Returns:**

The modified MapGesture itself.

```
public abstract MapGesture setAutoSnapToNorthEnabled (boolean enabled)
```

Sets whether map automatically rotates to the north if previous rotation did not exceed certain small amount of degrees starting from north. By default, this value is set to true.

**Parameters:**

- **enabled**  
A boolean specifying whether auto snap to north is enabled.

**Returns:**

The modified MapGesture itself.

```
public abstract MapGesture setDoubleTapEnabled (boolean enabled)
```

Sets whether double-tap interactions are enabled or disabled for this MapGesture .

**Parameters:**

- **enabled**  
A boolean specifying whether double-tap is enabled

**Returns:**

The modified MapGesture itself.

```
public abstract MapGesture setFixedMapCenterOnMapRotateZoom (boolean lock)
```

Sets whether the transform center is applied during multitouch gestures. If this value is enabled, rotation and zoom will always be applied using the transform center, instead of a point relative the touch interaction.

**Parameters:**

- **lock**

A boolean specifying whether transform center is fixed . Default is false

**Returns:**

The modified MapGesture itself.

```
public abstract MapGesture setKineticFlickEnabled (boolean enabled)
```

Sets whether flick-to-scroll (with kinetic momentum) interactions are enabled for this MapGesture .

**Parameters:**

- **enabled**

A boolean specifying whether kinetic flick is enabled

**Returns:**

The modified MapGesture itself.

```
public abstract MapGesture setLongPressEnabled (boolean enabled)
```

Sets whether long-press interactions are enabled or disabled for this MapGesture .

**Parameters:**

- **enabled**

A boolean specifying whether long-press is enabled

**Returns:**

The modified MapGesture itself.

```
public abstract MapGesture setPanningEnabled (boolean enabled)
```

Sets panning interactions to be either enabled or disabled for this MapGesture . Note that when panning is disabled, kinetic panning will also be blocked, even if it is enabled.

**Parameters:**

- **enabled**

A boolean specifying whether panning is enabled

**Returns:**

The modified MapGesture itself.

```
public abstract MapGesture setPinchEnabled (boolean enabled)
```

Sets whether pinch interactions are enabled or disabled for this `MapGesture` .

**Parameters:**

- **enabled**  
A boolean specifying whether pinch is enabled

**Returns:**

The modified `MapGesture` itself.

```
public abstract MapGesture setRotateEnabled (boolean enabled)
```

Sets whether two-finger rotate interactions are enabled for this `MapGesture` .

**Parameters:**

- **enabled**  
A boolean specifying whether rotate is enabled

**Returns:**

The modified `MapGesture` itself.

```
public abstract MapGesture setSingleTapEnabled (boolean enabled)
```

Sets whether single-tap interactions are enabled or disabled for this `MapGesture` .

**Parameters:**

- **enabled**  
A boolean specifying whether single-tap is enabled

**Returns:**

The modified `MapGesture` itself.

```
public abstract MapGesture setTiltEnabled (boolean enabled)
```

Sets whether tilt interactions are enabled or disabled for this `MapGesture` .

**Parameters:**

- **enabled**  
A boolean specifying whether tilt is enabled

**Returns:**

The modified `MapGesture` itself.

```
public abstract MapGesture setTwoFingerPanningEnabled (boolean enable)
```

Sets whether the two-finger panning interaction is enabled for this `MapGesture` .

**Parameters:**

- **enable**

True if two finger panning will be enabled (default). False if two-finger panning will not be enabled.

**Returns:**

The modified MapGesture itself.

```
public abstract MapGesture setTwoFingerTapEnabled (boolean enable)
```

Sets whether two-finger tap gestures are enabled or disabled for this MapGesture .

**Parameters:**

- **enabled**

A boolean specifying whether two-finger tap is enabled

**Returns:**

The modified MapGesture itself.

## OnGestureListener

The interface *OnGestureListener* is a member of *com.here.android.mpa.mapping.MapGesture*.

### Interface Summary

```
public static abstract interface MapGesture.OnGestureListener
```

Event Listener interface for gesture events.

[For complete information, see the section *Interface Details*]

### Nested Class Summary

Table 479: Nested Classes in OnGestureListener

Nested Classes
<pre>public static abstract class <i>MapGesture.OnGestureListener.OnGestureListenerAdapter</i></pre> <p>Default implementation for the OnGestureListener interface.</p>

### Method Summary

Table 480: Methods in OnGestureListener

Methods
<pre>public abstract boolean <i>onDoubleTapEvent</i> (PointF p)</pre> <p>A callback indicating that a user has performed a double tap gesture on a map.</p>

**Methods**

```
public abstract boolean onLongPressEvent (PointF p)
```

A callback indicating that a user has performed a long-press gesture on a map.

```
public abstract void onLongPressRelease ()
```

A callback indicating that a user has released a long-press gesture on a map.

```
public abstract boolean onMapObjectsSelected (java.util.List <ViewObject> objects)
```

A callback indicating that at least one *ViewObject* has been selected as a result of a user tapping on the map.

```
public abstract void onMultiFingerManipulationEnd ()
```

A callback indicating the user has removed all or all-except-one fingers from the screen.

```
public abstract void onMultiFingerManipulationStart ()
```

A callback indicating the user has put more than one finger onto the screen.

```
public abstract void onPanEnd ()
```

A callback indicating the user has lifted up their finger and stopped panning.

```
public abstract void onPanStart ()
```

A callback indicating the user has put one finger on the screen and moved their finger to trigger panning.

```
public abstract void onPinchLocked ()
```

A callback indicating that a user has pinched enough to be recognized as the two-finger zoom gesture.

```
public abstract boolean onPinchZoomEvent (float scaleFactor, PointF p)
```

A callback indicating that a user has performed a pinch-to-zoom gesture on a map.

```
public abstract boolean onRotateEvent (float rotateAngle)
```

A callback indicating that a user has performed a rotate gesture on a map.

```
public abstract void onRotateLocked ()
```

A callback indicating that a user has rotated enough to be recognized as the two-finger rotation gesture.

```
public abstract boolean onTapEvent (PointF p)
```

A callback indicating that a user has performed a single-tap gesture on a map.

```
public abstract boolean onTiltEvent (float angle)
```

A callback indicating that a user has performed a two-finger-tilt gesture on a map.

```
public abstract boolean onTwoFingerTapEvent (PointF p)
```

A callback indicating that a user has performed a two-finger tap gesture on a map.

**Interface Details**

Event Listener interface for gesture events. Please use *MapGesture.OnGestureListener* if all events are necessary and *MapGesture.OnGestureListener.OnGestureListenerAdapter* if some events are required. This interface can be added via *addOnGestureListener(MapGesture.OnGestureListener, int, boolean)* and removed via *removeOnGestureListener(MapGesture.OnGestureListener)* Please see *MapGesture* for a full set of configurable APIs.

## Method Details

```
public abstract boolean onDoubleTapEvent (PointF p)
```

A callback indicating that a user has performed a double tap gesture on a map.

### Parameters:

- **p**  
A `PointF` representing the on-screen point of the double-tap gesture

### Returns:

True if consumed (which prevents the default map zoom-in behavior), false otherwise

```
public abstract boolean onLongPressEvent (PointF p)
```

A callback indicating that a user has performed a long-press gesture on a map.

If a `MapMarker` with dragging enabled is located at the same location, returning `true` for this method will nullify that setting.

### Parameters:

- **p**  
A `PointF` representing the on-screen point where a user has long-pressed

### Returns:

True if consumed (which prevents the default map move-to-here behavior), false otherwise

### See also:

[setDraggable\(boolean\)](#)

```
public abstract void onLongPressRelease ()
```

A callback indicating that a user has released a long-press gesture on a map.

This callback may also occur when the user has panned around the map.

```
public abstract boolean onMapObjectsSelected (java.util.List <ViewObject> objects)
```

A callback indicating that at least one `ViewObject` has been selected as a result of a user tapping on the map.

If the user tapping on the map results in `ViewObject` selection (there are selectable objects located at the tap point), this callback will be made after `onTapEvent(PointF)`, if and only if, `false` is returned for that callback.

Note: If the user taps on an Android view in a `MapOverlay`, this method is triggered, but objects will be populated with a list of substitute `MapMarker` objects. These markers have the same geocoordinates as the map overlays. To avoid this behavior and these substitute markers, do not use this callback method. Instead, use Android gesture handling on the `MapOverlay` subclass.

## Parameters:

- **objects**

A list of selected `ViewObject` objects

## Returns:

`true` if consumed, `false` otherwise

## See also:

[`getSelectedObjectsNearby\(PointF\)`](#)

```
public abstract void onMultiFingerManipulationEnd ()
```

A callback indicating the user has removed all or all-except-one fingers from the screen.

```
public abstract void onMultiFingerManipulationStart ()
```

A callback indicating the user has put more than one finger onto the screen. Pinch, Rotate or Tilt manipulation events may also be called back.

## See also:

[`onTiltEvent\(float\)`](#)

[`onRotateEvent\(float\)`](#)

[`onPinchZoomEvent\(float, PointF\)`](#)

```
public abstract void onPanEnd ()
```

A callback indicating the user has lifted up their finger and stopped panning.

```
public abstract void onPanStart ()
```

A callback indicating the user has put one finger on the screen and moved their finger to trigger panning.

```
public abstract void onPinchLocked ()
```

A callback indicating that a user has pinched enough to be recognized as the two-finger zoom gesture. This callback will only occur if `MapGesture` is set to exclusive mode from [`setRotateEnabled\(boolean\)`](#)

## See also:

[`setRotateEnabled\(boolean\)`](#)

```
public abstract boolean onPinchZoomEvent (float scaleFactor, PointF p)
```

A callback indicating that a user has performed a pinch-to-zoom gesture on a map.

## Parameters:

- **scaleFactor**  
A scale factor relative to the points of the two simultaneous touches at separate screen coordinates
- **p**  
A `PointF` representing the on-screen point of the pinch gesture

## Returns:

True if consumed (which prevents the default map zoom-in or zoom-out behavior), false otherwise

```
public abstract boolean onRotateEvent (float rotateAngle)
```

A callback indicating that a user has performed a rotate gesture on a map.

## Parameters:

- **rotateAngle**  
An angle, in degrees, of the user interaction gesture since its last change

## Returns:

True if consumed (which prevents the default map rotate-to-here behavior), false otherwise

```
public abstract void onRotateLocked ()
```

A callback indicating that a user has rotated enough to be recognized as the two-finger rotation gesture. This callback will only occur if `MapGesture` is set to exclusive mode from [setRotateEnabled\(boolean\)](#)

## See also:

[setRotateEnabled\(boolean\)](#)

```
public abstract boolean onTapEvent (PointF p)
```

A callback indicating that a user has performed a single-tap gesture on a map.

If `true` is returned from this callback, no [onMapObjectsSelected\(List\)](#) callback will be made to any gesture subscribers even if any objects are found at the screen point.

## Parameters:

- **p**  
A `PointF` representing the on-screen point of the single-tap gesture

## Returns:

true if consumed (which prevents the default pan-to-here behavior), false otherwise.

## See also:

[getSelectedObjectsNearby\(PointF\)](#)

```
public abstract boolean onTiltEvent (float angle)
```

A callback indicating that a user has performed a two-finger-tilt gesture on a map.

**Parameters:**• **angle**

An angle, in degrees between the range of the minimum and maximum angle inclusively, to which the map tilt will change. The minimum and maximum angle can be retrieved thru the calls [getMinTilt\(\)](#) and [getMaxTilt\(\)](#).

**Returns:**

True if consumed (which prevents the default map tilt-to-here behavior), false otherwise

**See also:**

[getMaxTilt\(\)](#)

[getMinTilt\(\)](#)

```
public abstract boolean onTwoFingerTapEvent (PointF p)
```

A callback indicating that a user has performed a two-finger tap gesture on a map.

**Parameters:**• **p**

A `PointF` representing the on-screen point where the two-finger tap occurred

**Returns:**

True if consumed (which prevents the default map zoom-out behavior), false otherwise

## OnGestureListenerAdapter

The class `OnGestureListenerAdapter` is a member of `com.here.android.mpa.mapping.MapGesture.OnGestureListener`.

### Class Summary

```
public static abstract class MapGesture.OnGestureListener.OnGestureListenerAdapter
```

```
    implements com.here.android.mpa.mapping.MapGesture.OnGestureListener
```

```
    extends java.lang.Object
```

Default implementation for the `OnGestureListener` interface.

[For complete information, see the section [Class Details](#)]

**See also:**

[MapGesture.OnGestureListener](#)

## Constructor Summary

Table 481: Constructors in OnGestureListenerAdapter

Constructors
<a href="#">OnGestureListenerAdapter</a> ()

## Method Summary

Table 482: Methods in OnGestureListenerAdapter

Methods
<p>public boolean <a href="#">onDoubleTapEvent</a> (PointF p)</p> <p>A callback indicating that a user has performed a double tap gesture on a map.</p> <p>This method overrides <a href="#">mapping.MapGesture.OnGestureListener.onDoubleTapEvent(PointF)</a></p>
<p>public boolean <a href="#">onLongPressEvent</a> (PointF p)</p> <p>A callback indicating that a user has performed a long-press gesture on a map.</p> <p>This method overrides <a href="#">mapping.MapGesture.OnGestureListener.onLongPressEvent(PointF)</a></p>
<p>public void <a href="#">onLongPressRelease</a> ()</p> <p>A callback indicating that a user has released a long-press gesture on a map.</p> <p>This method overrides <a href="#">mapping.MapGesture.OnGestureListener.onLongPressRelease(void)</a></p>
<p>public boolean <a href="#">onMapObjectsSelected</a> (java.util.List &lt;ViewObject&gt; objects)</p> <p>A callback indicating that at least one <a href="#">ViewObject</a> has been selected as a result of a user tapping on the map.</p> <p>This method overrides <a href="#">mapping.MapGesture.OnGestureListener.onMapObjectsSelected(List)</a></p>
<p>public void <a href="#">onMultiFingerManipulationEnd</a> ()</p> <p>A callback indicating the user has removed all or all-except-one fingers from the screen.</p> <p>This method overrides <a href="#">mapping.MapGesture.OnGestureListener.onMultiFingerManipulationEnd(void)</a></p>
<p>public void <a href="#">onMultiFingerManipulationStart</a> ()</p> <p>A callback indicating the user has put more than one finger onto the screen.</p> <p>This method overrides <a href="#">mapping.MapGesture.OnGestureListener.onMultiFingerManipulationStart(void)</a></p>
<p>public void <a href="#">onPanEnd</a> ()</p> <p>A callback indicating the user has lifted up their finger and stopped panning.</p> <p>This method overrides <a href="#">mapping.MapGesture.OnGestureListener.onPanEnd(void)</a></p>
<p>public void <a href="#">onPanStart</a> ()</p> <p>A callback indicating the user has put one finger on the screen and moved their finger to trigger panning.</p> <p>This method overrides <a href="#">mapping.MapGesture.OnGestureListener.onPanStart(void)</a></p>
<p>public void <a href="#">onPinchLocked</a> ()</p> <p>A callback indicating that a user has pinched enough to be recognized as the two-finger zoom gesture.</p> <p>This method overrides <a href="#">mapping.MapGesture.OnGestureListener.onPinchLocked(void)</a></p>

## Methods

```
public boolean onPinchZoomEvent (float scaleFactor, PointF p)
```

A callback indicating that a user has performed a pinch-to-zoom gesture on a map.

This method overrides [mapping.MapGesture.OnGestureListener.onPinchZoomEvent\(float, PointF\)](#)

```
public boolean onRotateEvent (float rotateAngle)
```

A callback indicating that a user has performed a rotate gesture on a map.

This method overrides [mapping.MapGesture.OnGestureListener.onRotateEvent\(float\)](#)

```
public void onRotateLocked ()
```

A callback indicating that a user has rotated enough to be recognized as the two-finger rotation gesture.

This method overrides [mapping.MapGesture.OnGestureListener.onRotateLocked\(void\)](#)

```
public boolean onTapEvent (PointF p)
```

A callback indicating that a user has performed a single-tap gesture on a map.

This method overrides [mapping.MapGesture.OnGestureListener.onTapEvent\(PointF\)](#)

```
public boolean onTiltEvent (float angle)
```

A callback indicating that a user has performed a two-finger-tilt gesture on a map.

This method overrides [mapping.MapGesture.OnGestureListener.onTiltEvent\(float\)](#)

```
public boolean onTwoFingerTapEvent (PointF p)
```

A callback indicating that a user has performed a two-finger tap gesture on a map.

This method overrides [mapping.MapGesture.OnGestureListener.onTwoFingerTapEvent\(PointF\)](#)

## Class Details

Default implementation for the `OnGestureListener` interface. Users may use this abstract class and overload specific methods to have a smaller code footprint.

### See also:

[MapGesture.OnGestureListener](#)

## Constructor Details

`OnGestureListenerAdapter ()`

## Method Details

```
public boolean onDoubleTapEvent (PointF p)
```

A callback indicating that a user has performed a double tap gesture on a map.

This method overrides [mapping.MapGesture.OnGestureListener.onDoubleTapEvent\(PointF\)](#)

### Parameters:

- `p`

```
public boolean onLongPressEvent (PointF p)
```

A callback indicating that a user has performed a long-press gesture on a map.

If a [MapMarker](#) with dragging enabled is located at the same location, returning `true` for this method will nullify that setting.

This method overrides [mapping.MapGesture.OnGestureListener.onLongPressEvent\(PointF\)](#)

**Parameters:**

- `p`

```
public void onLongPressRelease ()
```

A callback indicating that a user has released a long-press gesture on a map.

This callback may also occur when the user has panned around the map.

This method overrides [mapping.MapGesture.OnGestureListener.onLongPressRelease\(void\)](#)

```
public boolean onMapObjectsSelected (java.util.List <ViewObject> objects)
```

A callback indicating that at least one [ViewObject](#) has been selected as a result of a user tapping on the map.

If the user tapping on the map results in [ViewObject](#) selection (there are selectable objects located at the tap point), this callback will be made after [onTapEvent\(PointF\)](#), if and only if, `false` is returned for that callback.

Note: If the user taps on an Android view in a [MapOverlay](#), this method is triggered, but `objects` will be populated with a list of substitute [MapMarker](#) objects. These markers have the same geocoordinates as the map overlays. To avoid this behavior and these substitute markers, do not use this callback method. Instead, use Android gesture handling on the [MapOverlay](#) subclass.

This method overrides [mapping.MapGesture.OnGestureListener.onMapObjectsSelected\(List\)](#)

**Parameters:**

- `objects`

```
public void onMultiFingerManipulationEnd ()
```

A callback indicating the user has removed all or all-except-one fingers from the screen.

This method overrides [mapping.MapGesture.OnGestureListener.onMultiFingerManipulationEnd\(void\)](#)

```
public void onMultiFingerManipulationStart ()
```

A callback indicating the user has put more than one finger onto the screen. Pinch, Rotate or Tilt manipulation events may also be called back.

This method overrides [mapping.MapGesture.OnGestureListener.onMultiFingerManipulationStart\(void\)](#)

```
public void onPanEnd ()
```

A callback indicating the user has lifted up their finger and stopped panning.

This method overrides [mapping.MapGesture.OnGestureListener.onPanEnd\(void\)](#)

```
public void onPanStart ()
```

A callback indicating the user has put one finger on the screen and moved their finger to trigger panning.

This method overrides [mapping.MapGesture.OnGestureListener.onPanStart\(void\)](#)

```
public void onPinchLocked ()
```

A callback indicating that a user has pinched enough to be recognized as the two-finger zoom gesture. This callback will only occur if `MapGesture` is set to exclusive mode from [setRotateEnabled\(boolean\)](#)

This method overrides [mapping.MapGesture.OnGestureListener.onPinchLocked\(void\)](#)

```
public boolean onPinchZoomEvent (float scaleFactor, PointF p)
```

A callback indicating that a user has performed a pinch-to-zoom gesture on a map.

This method overrides [mapping.MapGesture.OnGestureListener.onPinchZoomEvent\(float, PointF\)](#)

**Parameters:**

- `scaleFactor`
- `p`

```
public boolean onRotateEvent (float rotateAngle)
```

A callback indicating that a user has performed a rotate gesture on a map.

This method overrides [mapping.MapGesture.OnGestureListener.onRotateEvent\(float\)](#)

**Parameters:**

- `rotateAngle`

```
public void onRotateLocked ()
```

A callback indicating that a user has rotated enough to be recognized as the two-finger rotation gesture. This callback will only occur if `MapGesture` is set to exclusive mode from [setRotateEnabled\(boolean\)](#)

This method overrides [mapping.MapGesture.OnGestureListener.onRotateLocked\(void\)](#)

```
public boolean onTapEvent (PointF p)
```

A callback indicating that a user has performed a single-tap gesture on a map.

If `true` is returned from this callback, no `onMapObjectsSelected(List)` callback will be made to any gesture subscribers even if any objects are found at the screen point.

This method overrides `mapping.MapGesture.OnGestureListener.onTapEvent(PointF)`

**Parameters:**

- `p`

```
public boolean onTiltEvent (float angle)
```

A callback indicating that a user has performed a two-finger-tilt gesture on a map.

This method overrides `mapping.MapGesture.OnGestureListener.onTiltEvent(float)`

**Parameters:**

- `angle`

```
public boolean onTwoFingerTapEvent (PointF p)
```

A callback indicating that a user has performed a two-finger tap gesture on a map.

This method overrides `mapping.MapGesture.OnGestureListener.onTwoFingerTapEvent(PointF)`

**Parameters:**

- `p`

## MapLabeledMarker

The class `MapLabeledMarker` is a member of `com.here.android.mpa.mapping` .

### Class Summary

```
public final class MapLabeledMarker
```

```
extends com.here.android.mpa.mapping.MapObject, com.here.android.mpa.common.ViewObject,  
java.lang.Object
```

This class represents a labeled icon on the `Map`.

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 483: Constructors in MapLabeledMarker

Constructors
<p><b>MapLabeledMarker</b> (<i>GeoCoordinate</i> loc)</p> <p>Creates a MapLabeledMarker at a specific <i>GeoCoordinate</i> with a default POI icon.</p>
<p><b>MapLabeledMarker</b> (<i>GeoCoordinate</i> loc, <i>Image</i> icon)</p> <p>Creates a MapLabeledMarker at a specific <i>GeoCoordinate</i> with the specified <i>Image</i>.</p>

## Method Summary

Table 484: Methods in MapLabeledMarker

Methods
<p>public PointF <b>getAnchorPoint</b> ()</p> <p>Returns the anchor point for this MapLabeledMarker .</p>
<p>public <i>GeoCoordinate</i> <b>getCoordinate</b> ()</p> <p>Returns the current <i>GeoCoordinate</i> for this MapLabeledMarker .</p>
<p>public float <b>getFontScalingFactor</b> ()</p> <p>This method get the current font scaling factor applied to draw the fonts.</p>
<p>public String <b>getLabelText</b> (String marcCode)</p> <p>This method retrieves the localized text of the MapLabeledMarker .</p>
<p>public float <b>getTransparency</b> ()</p> <p>Gets the current transparency for the icon.</p>
<p>public boolean <b>isDeclutteringEnabled</b> ()</p> <p>This method queries if the icon decluttering is enabled.</p>
<p>public boolean <b>isFadingAnimationEnabled</b> ()</p> <p>This method queries whether fading animation is enabled for the label.</p>
<p>public boolean <b>isOverlappingEnabled</b> ()</p> <p>This method queries if icons can be rendered overlapping the labels in the map if they share a common screen area.</p>
<p>public <i>MapLabeledMarker</i> <b>setAnchorPoint</b> (PointF anchor)</p> <p>Sets an anchor point for this MapLabeledMarker .</p>
<p>public <i>MapLabeledMarker</i> <b>setCoordinate</b> (<i>GeoCoordinate</i> value)</p> <p>Sets a <i>GeoCoordinate</i> for this MapLabeledMarker .</p>
<p>public <i>MapLabeledMarker</i> <b>setDeclutteringEnabled</b> (boolean enabled)</p> <p>This method enables or disables decluttering in tilted view.</p>
<p>public <i>MapLabeledMarker</i> <b>setFadingAnimationEnabled</b> (boolean enabled)</p> <p>This method enables or disables fading animation for the label.</p>

## Methods

```
public MapLabeledMarker setFontScalingFactor (float value)
```

This method set the new font scaling factor will be applied to draw the fonts.

```
public MapLabeledMarker setIcon (IconCategory value)
```

Sets this MapLabeledMarker to use the default places category icon of the specified *IconCategory*.

```
public MapLabeledMarker setIcon (Image icon)
```

Sets an icon image for this MapLabeledMarker .

```
public MapLabeledMarker setLabelText (String marcCode, String text)
```

This method sets the localized text of the MapLabeledMarker .

```
public MapLabeledMarker setOverlappingEnabled (boolean enabled)
```

This method enables or disables labels rendered later in the map to overlap on the icon if they share a common screen area.

```
public MapLabeledMarker setTransparency (float value)
```

Sets a transparency level, within the range of [0..1], for the icon.

## Class Details

This class represents a labeled icon on the *Map*.

Different from *MapMarkers*, the *MapLabeledMarker* s avoid overlapping with other user-defined labeled icons as well as built-in icons and texts on the map. It provides the possibility of using built-in POI icons by specifying a *IconCategory* or using an *Image*. One can specify multilingual texts to the icon. Depending on the current language and secondary language of *Map* , different language of text can be displayed.

## Constructor Details

### MapLabeledMarker (GeoCoordinate loc)

Creates a *MapLabeledMarker* at a specific *GeoCoordinate* with a default POI icon.

#### Parameters:

- *loc*  
A *GeoCoordinate* representing this marker's location.

#### Throws:

- *IllegalArgumentException*  
if *loc* is invalid.

### MapLabeledMarker (GeoCoordinate loc, Image icon)

Creates a *MapLabeledMarker* at a specific *GeoCoordinate* with the specified *Image*.

#### Parameters:

- *loc*

A `GeoCoordinate` representing this marker's location.

- `icon`

An `Image` representing this marker's icon.

**Throws:**

- `IllegalArgumentException`

if `loc` or `icon` is invalid.

## Method Details

```
public PointF getAnchorPoint ()
```

Returns the anchor point for this `MapLabeledMarker` .

The marker is drawn with the specified pixel offset from its `getCoordinate()` position. To clear an anchor set previously, pass a `PointF` to this method with an X-coordinate equal to half the width of the marker and a Y-coordinate equal to half the height of the marker.

By default, there is no offset and the `MapLabeledMarker` is centered in the center of the icon image.

**Returns:**

The anchor point for this `MapLabeledMarker`.

```
public GeoCoordinate getCoordinate ()
```

Returns the current `GeoCoordinate` for this `MapLabeledMarker` .

**Returns:**

The current `GeoCoordinate` location

```
public float getFontScalingFactor ()
```

This method get the current font scaling factor applied to draw the fonts.

**Returns:**

A `float` value representing the current font factor. If the value cannot be retrieved, returns -1.

```
public String getLabelText (String marcCode)
```

This method retrieves the localized text of the `MapLabeledMarker` .

For more information about MARC code, see <http://www.loc.gov/marc/languages>.

**Parameters:**

- `marcCode`

The international MARC code describing the language of the text. Case-insensitive.

## Returns:

The text for the marker corresponds to the language MARC code.

## Throws:

- **IllegalArgumentException**  
if invalid `marcCode` provided.

## `public float getTransparency ()`

Gets the current transparency for the icon.

The transparency level is only precise to two decimal places due to numerical operations performed internally when rendering the map.

## Returns:

The current transparency of the icon

## `public boolean isDeclutteringEnabled ()`

This method queries if the icon decluttering is enabled.

## Returns:

`true` if the decluttering is enabled. Otherwise returns `false`.

## `public boolean isFadingAnimationEnabled ()`

This method queries whether fading animation is enabled for the label.

## Returns:

`true` if fading animation is enabled, `false` otherwise.

## `public boolean isOverlappingEnabled ()`

This method queries if icons can be rendered overlapping the labels in the map if they share a common screen area.

## Returns:

`true` if icon overlapping is enabled, `false` otherwise.

## `public MapLabeledMarker setAnchorPoint (PointF anchor)`

Sets an anchor point for this `MapLabeledMarker` .

The marker is drawn with the specified pixel offset from its `getCoordinate()` position. To clear an anchor set previously, pass a `PointF` to this method with an X-coordinate equal to half the width of the marker and a Y-coordinate equal to half the height of the marker.

By default, there is no offset and the `MapLabeledMarker` is centered in the center of the icon image.

**Parameters:**

- **anchor**  
A `PointF` relative to the top-left corner of the `MapLabeledMarker`.

**Returns:**

The updated `MapLabeledMarker` itself.

```
public MapLabeledMarker setCoordinate (GeoCoordinate value)
```

Sets a *GeoCoordinate* for this `MapLabeledMarker`.

**Parameters:**

- **value**  
Desired *GeoCoordinate* location for this marker.

**Returns:**

The updated `MapLabeledMarker` itself.

**Throws:**

- **`IllegalArgumentException`**  
if `value` is invalid.

```
public MapLabeledMarker setDeclutteringEnabled (boolean enabled)
```

This method enables or disables decluttering in tilted view. By enabling this, icons will not be shown when they are faraway in tilted view. By default, decluttering is disabled.

**Parameters:**

- **enabled**  
true means enabling icon decluttering.

**Returns:**

The updated `MapLabeledMarker` itself.

```
public MapLabeledMarker setFadingAnimationEnabled (boolean enabled)
```

This method enables or disables fading animation for the label. However, the fading animation set using *setFadingAnimations(boolean)* takes priority over this setting. For example, if the fading animation is disabled for the *Map*, which contains the label, the fading will be also disabled for the label regardless the state set to this label.

Fading animation is enabled by default.

**Parameters:**

- **enabled**

true to enable fading animation.

**Returns:**

The updated `MapLabeledMarker` itself.

```
public MapLabeledMarker setFontScalingFactor (float value)
```

This method set the new font scaling factor will be applied to draw the fonts.

**Parameters:**

- **value**

A floating point value representing the new font factor. Valid values must be between 1.0 and 2.0.

**Returns:**

The updated `MapLabeledMarker` itself.

**Throws:**

- **IllegalArgumentException**

if invalid value provided is out of range.

```
public MapLabeledMarker setIcon (IconCategory value)
```

Sets this `MapLabeledMarker` to use the default places category icon of the specified *IconCategory*.

If no icon is available for the specified *IconCategory* , a default icon will be used.

**Parameters:**

- **value**

An *IconCategory* of the icon to be used for the marker.

**Returns:**

The updated `MapLabeledMarker` itself.

```
public MapLabeledMarker setIcon (Image icon)
```

Sets an icon image for this `MapLabeledMarker` .

**Parameters:**

- **icon**

An *Image* representing this marker's icon

**Returns:**

The updated `MapLabeledMarker` itself.

**Throws:**

- **IllegalArgumentException**  
if icon is invalid.

```
public MapLabeledMarker setLabelText (String marcCode, String text)
```

This method sets the localized text of the `MapLabeledMarker`. If there is an existing localization for the specified language, the existing one will be replaced. Otherwise, the new localized text will be stored. When text is an empty string, the existing localized text, if any, will be removed.

If the text contains any glyphs, which are currently not supported by the fonts shipped with the library, those glyphs will not be displayed.

The text label may not be displayed in certain *Schemes* to ensure scheme-specific visual effects are unaffected.

For more information about MARC code, see <http://www.loc.gov/marc/languages>.

**Parameters:**

- **marcCode**  
The international MARC code describing the language of the text. Case-insensitive.
- **text**  
The text for the marker in the language described by the `marcCode`.

**Returns:**

The updated `MapLabeledMarker` itself.

**Throws:**

- **IllegalArgumentException**  
if invalid `marcCode` provided.

```
public MapLabeledMarker setOverlappingEnabled (boolean enabled)
```

This method enables or disables labels rendered later in the map to overlap on the icon if they share a common screen area. By default, overlapping is enabled.

**Parameters:**

- **enabled**  
`true` to enable icon overlapping, `false` otherwise.

**Returns:**

The updated `MapLabeledMarker` itself.

```
public MapLabeledMarker setTransparency (float value)
```

Sets a transparency level, within the range of [0..1], for the icon. By default, transparency level is 1.

**Parameters:**

- **value**

Desired alpha value for the icon, 0 for fully transparent, 1 for fully opaque.

**Returns:**

The updated `MapLabeledMarker` itself.

**Throws:**

- **`IllegalArgumentException`**  
if `value` is out of range.

## MapLocalModel

The class `MapLocalModel` is a member of `com.here.android.mpa.mapping`.

### Class Summary

public final class **MapLocalModel**

extends `com.here.android.mpa.mapping.MapModelObject`, `com.here.android.mpa.mapping.MapObject`,  
`com.here.android.mpa.common.ViewObject`, `java.lang.Object`

Represents a relative local coordinate mesh displayed on a map.

[For complete information, see the section [Class Details](#)]

**See also:**

[LocalMesh](#)

[MapGeoModel](#)

### Constructor Summary

Table 485: Constructors in `MapLocalModel`

Constructors
<p><code>MapLocalModel ()</code> Creates a <code>MapLocalModel</code>.</p>

### Method Summary

Table 486: Methods in `MapLocalModel`

Methods
<p>public <code>GeoCoordinate</code> <code>getAnchor ()</code> Gets the <code>GeoCoordinate</code> representing the anchor that is currently associated with the <code>MapLocalModel</code>.</p>
<p>public <code>LocalMesh</code> <code>getMesh ()</code> Gets the <code>LocalMesh</code> currently associated with the <code>MapLocalModel</code>.</p>

## Methods

```
public float getPitch ()
```

Gets the current pitch of the `MapLocalModel` .

```
public float getRoll ()
```

Gets the current roll of the `MapLocalModel` .

```
public float getScale ()
```

Gets the current scaling factor for the `LocalMesh` .

```
public Image getTexture ()
```

Gets the current texture `Image` of the `MapLocalModel` .

```
public float getYaw ()
```

Gets the current yaw of the `MapLocalModel` .

```
public boolean isDynamicScalingEnabled ()
```

Gets the boolean indicating whether dynamic scaling is enabled for the `MapLocalModel` .

```
public MapLocalModel setAnchor (GeoCoordinate anchor)
```

Sets an anchor `GeoCoordinate` for the `MapLocalModel` .

```
public MapLocalModel setDynamicScalingEnabled (boolean enable)
```

Sets dynamic scaling to be either enabled or disabled for the `MapLocalModel` .

```
public MapLocalModel setMesh (LocalMesh mesh)
```

Sets a `LocalMesh` for the `MapLocalModel` .

```
public MapLocalModel setPitch (float angle)
```

Sets a pitch value for the `MapLocalModel` .

```
public MapLocalModel setRoll (float angle)
```

Sets a roll value for the `MapLocalModel` .

```
public MapLocalModel setScale (float scale)
```

Sets a scaling factor used to scale the size of the `LocalMesh` .

```
public MapLocalModel setTexture (Image texture)
```

Sets a texture `Image` for the `MapLocalModel` .

```
public MapLocalModel setYaw (float angle)
```

Sets a yaw value for the `MapLocalModel` .

## Class Details

Represents a relative local coordinate mesh displayed on a map. The format for the mesh is interpreted as an array of `float` offsets relative to the anchor, which itself specifies the center base of the objects.

A unit of 1.0f represents 1 meter in the real world. For example, a `Vector3f( 100, 200, 300 )` represents a point offset by 100 meters in the x-axis direction (east), 200 meters in the y-axis direction (north), and 300 meters in the z-axis direction (up), all relative to the anchor.

Note: a `MapLocalModel` object can be augmented by specifying additional attributes such as scale, scale style, or rotation.

**See also:**

[LocalMesh](#)

[MapGeoModel](#)

## Constructor Details

### `MapLocalModel ()`

Creates a `MapLocalModel` .

## Method Details

```
public GeoCoordinate getAnchor ()
```

Gets the `GeoCoordinate` representing the anchor that is currently associated with the `MapLocalModel` .

**Returns:**

The `GeoCoordinate`

```
public LocalMesh getMesh ()
```

Gets the `LocalMesh` currently associated with the `MapLocalModel` .

**Returns:**

The `LocalMesh`

```
public float getPitch ()
```

Gets the current pitch of the `MapLocalModel` .

**Returns:**

The current pitch in degrees

```
public float getRoll ()
```

Gets the current roll of the `MapLocalModel` .

**Returns:**

The current roll in degrees

```
public float getScale ()
```

Gets the current scaling factor for the *LocalMesh*.

**Returns:**

The current scaling factor

```
public Image getTexture ()
```

Gets the current texture *Image* of the *MapLocalModel* .

**Returns:**

The texture *Image*

```
public float getYaw ()
```

Gets the current yaw of the *MapLocalModel* .

**Returns:**

The current yaw in degrees

```
public boolean isDynamicScalingEnabled ()
```

Gets the boolean indicating whether dynamic scaling is enabled for the *MapLocalModel* .

**Returns:**

True if dynamic scaling is enabled, false otherwise

```
public MapLocalModel setAnchor (GeoCoordinate anchor)
```

Sets an anchor *GeoCoordinate* for the *MapLocalModel* .

**Parameters:**

- **anchor**  
Desired *GeoCoordinate*

**Returns:**

The modified *MapLocalModel* itself.

```
public MapLocalModel setDynamicScalingEnabled (boolean enable)
```

Sets dynamic scaling to be either enabled or disabled for the *MapLocalModel* . When dynamic scaling is enabled, the rendered size of the model on screen is constant regardless of the map's zoom level.

**Parameters:**

- **enable**  
A boolean specifying whether dynamic scaling is enabled

## Returns:

The modified `MapLocalModel` itself.

```
public MapLocalModel setMesh (LocalMesh mesh)
```

Sets a `LocalMesh` for the `MapLocalModel`

## Parameters:

- `mesh`  
Desired `LocalMesh`

## Returns:

The modified `MapLocalModel` itself.

```
public MapLocalModel setPitch (float angle)
```

Sets a pitch value for the `MapLocalModel` .

## Parameters:

- `angle`  
Desired pitch in degrees

## Returns:

The modified `MapLocalModel` itself.

```
public MapLocalModel setRoll (float angle)
```

Sets a roll value for the `MapLocalModel` .

## Parameters:

- `angle`  
Desired roll in degrees

## Returns:

The modified

```
public MapLocalModel setScale (float scale)
```

Sets a scaling factor used to scale the size of the `LocalMesh`.

**Note:** The effect of scale on the model size varies significantly depending on whether or not dynamic scaling is enabled and the magnitude of the model vertices. Therefore, depending on these factors you may have to tweak the scale (by orders of magnitude perhaps) to get a model of the same relative size as another.

## Parameters:

- `scale`

Desired scaling factor

**Returns:**

The modified `MapLocalModel` itself.

**See also:**

[setDynamicScalingEnabled\(boolean\)](#)

```
public MapLocalModel setTexture (Image texture)
```

Sets a texture `Image` for the `MapLocalModel` .

**Parameters:**

- **texture**

Desired texture `Image`

**Returns:**

The modified `MapLocalModel` itself.

```
public MapLocalModel setYaw (float angle)
```

Sets a yaw value for the `MapLocalModel` .

**Parameters:**

- **angle**

Desired yaw in degrees

**Returns:**

The modified `MapLocalModel` itself.

## MapMarker

The class `MapMarker` is a member of [com.here.android.mpa.mapping](#) .

### Class Summary

```
public final class MapMarker
```

*extends* [com.here.android.mpa.mapping.MapObject](#), [com.here.android.mpa.common.ViewObject](#),  
[java.lang.Object](#)

Represents a marker used to display an icon at a geographical position on a map.

[For complete information, see the section [Class Details](#)]

## Nested Class Summary

Table 487: Nested Classes in MapMarker

Nested Classes
<p>public static abstract interface <a href="#">MapMarker.OnDragListener</a></p> <p>Callback interface for drag events on MapMarker objects.</p>

## Constructor Summary

Table 488: Constructors in MapMarker

Constructors
<p><a href="#">MapMarker</a> ()</p> <p>Creates a default <a href="#">MapMarker</a>.</p>
<p><a href="#">MapMarker</a> (float hue)</p> <p>Creates a default <a href="#">MapMarker</a>.</p>
<p><a href="#">MapMarker</a> (<a href="#">GeoCoordinate</a> coordinate, <a href="#">Image</a> image)</p> <p>Creates a <a href="#">MapMarker</a> with a specified <a href="#">GeoCoordinate</a> and <a href="#">Image</a>.</p>

## Method Summary

Table 489: Methods in MapMarker

Methods
<p>public PointF <a href="#">getAnchorPoint</a> ()</p> <p>Returns the anchor point for this MapMarker .</p>
<p>public <a href="#">GeoCoordinate</a> <a href="#">getCoordinate</a> ()</p> <p>Returns the current map GeoCoordinate for this MapMarker .</p>
<p>public String <a href="#">getDescription</a> ()</p> <p>Gets the current description text.</p>
<p>public <a href="#">Image</a> <a href="#">getIcon</a> ()</p> <p>Returns the icon image for this MapMarker .</p>
<p>public int <a href="#">getInfoBubbleHashCode</a> ()</p> <p><b>Deprecated:</b> <b>Deprecated as of version 3.6.</b></p> <p>Returns non-zero hash code of the info bubble if it is showing.</p>
<p>public float <a href="#">getSvgIconScaling</a> ()</p> <p>Get the scaling factor for markers using SVG Image .</p>
<p>public String <a href="#">getTitle</a> ()</p> <p>Gets the current title to be used by the default info bubble.</p>

## Methods

```
public float getTransparency ()
```

Gets the current transparency for the icon

```
public boolean isDeclutteringEnabled ()
```

This method queries if the icon decluttering is enabled.

```
public boolean isDraggable ()
```

Returns a boolean indicating whether the marker is draggable.

```
public boolean isInfoBubbleVisible ()
```

**Deprecated:** Deprecated as of version 3.6.

Returns a boolean indicating if the info bubble is currently displayed on this marker.

```
public MapMarker setAnchorPoint (PointF anchor)
```

Sets an anchor point for this *MapMarker* .

```
public MapMarker setCoordinate (GeoCoordinate coordinate)
```

Sets a map *GeoCoordinate* for this *MapMarker* .

```
public MapMarker setDeclutteringEnabled (boolean enabled)
```

This method enables or disables decluttering in tilted view.

```
public MapMarker setDescription (String description)
```

Sets the description text.

```
public MapMarker setDraggable (boolean isDraggable)
```

Sets whether this marker is draggable or not.

```
public MapMarker setIcon (Image icon)
```

Sets an icon image for this *MapMarker* .

```
public boolean setSvgIconScaling (float scale)
```

Set a scaling factor for markers using SVG Image .

```
public MapMarker setTitle (String title)
```

Sets a title to be used by the default info bubble.

```
public boolean setTransparency (float alpha)
```

Sets a transparency level, within the range of [0..1], for the icon.

## Class Details

Represents a marker used to display an icon at a geographical position on a map. The map handles proper placement of icons on the screen as well as panning and rotation.

*MapMarker* objects can be selected by application users.

## Constructor Details

*MapMarker* ()

Creates a default *MapMarker*. The marker will contain the default marker image.

**See also:**

[MapMarker\(float\)](#)

[MapMarker\(GeoCoordinate, Image\)](#)

## MapMarker (float hue)

Creates a default *MapMarker*. The marker will contain a colorization of the default marker image.

**Parameters:**

- **hue**  
The hue of the marker. Value must be greater or equal to 0 and less than 360.

**Throws:**

- **IllegalArgumentException**  
For hue values outside the acceptable range.

**See also:**

[MapMarker\(\)](#)

[MapMarker\(GeoCoordinate, Image\)](#)

## MapMarker (GeoCoordinate coordinate, Image image)

Creates a *MapMarker* with a specified *GeoCoordinate* and *Image*.

**Parameters:**

- **coordinate**  
A *GeoCoordinate* representing the map coordinates of the marker
- **image**  
An *Image* used to display the marker

**See also:**

[MapMarker\(\)](#)

[MapMarker\(float\)](#)

## Method Details

```
public PointF getAnchorPoint ()
```

Returns the anchor point for this *MapMarker*.

The marker is drawn with the specified pixel offset from its [getCoordinate\(\)](#) position. To clear an anchor set previously, pass a `PointF` to this method with an X-coordinate equal to half the width of the marker and a Y-coordinate equal to half the height of the marker.

By default, there is no offset and the `MapMarker` is centered in the center of the icon image.

**Returns:**

The anchor point for this `MapMarker`.

```
public GeoCoordinate getCoordinate ()
```

Returns the current map `GeoCoordinate` for this `MapMarker` .

**Returns:**

The current `GeoCoordinate` location

```
public String getDescription ()
```

Gets the current description text.

**Returns:**

The current description. Can be null if it has not been set.

```
public Image getIcon ()
```

Returns the icon image for this `MapMarker` .

**Returns:**

An `Image` representing this marker's icon

```
public int getInfoBubbleHashCode ()
```

**Deprecated:** Deprecated as of version 3.6.

**Always returns 0.** Use [MapOverlay](#) instead.

Returns non-zero hash code of the info bubble if it is showing.

Use this hash code to compare against the hash code of the objects returned by [onMapObjectsSelected\(List\)](#) to determine if object selected is an info bubble.

**Returns:**

The hash code of the info bubble that is visible. 0 if the info bubble is not showing.

**See also:**

[onMapObjectsSelected\(List<ViewObject>\)](#)

```
public float getSvgIconScaling ()
```

Get the scaling factor for markers using SVG Image .

**Returns:**

scale

```
public String getTitle ()
```

Gets the current title to be used by the default info bubble.

**Returns:**

The current title. Can be null if it has not been set.

```
public float getTransparency ()
```

Gets the current transparency for the icon

The transparency level is only precise to two decimal places due to numerical operations performed internally when rendering the map.

**Returns:**

The current transparency of the icon

```
public boolean isDeclutteringEnabled ()
```

This method queries if the icon decluttering is enabled.

**Returns:**

True if the decluttering is enabled. Otherwise return false.

```
public boolean isDraggable ()
```

Returns a boolean indicating whether the marker is draggable.

**Returns:**

True if the marker is draggable, false otherwise.

```
public boolean isInfoBubbleVisible ()
```

**Deprecated:** Deprecated as of version 3.6.

**Always returns false.** Use [MapOverlay](#) instead.

Returns a boolean indicating if the info bubble is currently displayed on this marker.

**Returns:**

True if the info bubble is displayed, false otherwise.

```
public MapMarker setAnchorPoint (PointF anchor)
```

Sets an anchor point for this *MapMarker* .

The marker is drawn with the specified pixel offset from its *getCoordinate()* position. To clear an anchor set previously, pass a *PointF* to this method with an X-coordinate equal to half the width of the marker and a Y-coordinate equal to half the height of the marker.

By default, there is no offset and the *MapMarker* is centered in the center of the icon image.

**Parameters:**

- **anchor**  
A *PointF* relative to the top-left corner of the *MapMarker*.

**Returns:**

The updated *MapMarker* itself.

```
public MapMarker setCoordinate (GeoCoordinate coordinate)
```

Sets a map *GeoCoordinate* for this *MapMarker* .

**Parameters:**

- **coordinate**  
Desired *GeoCoordinate* location for this marker

**Returns:**

The updated *MapMarker* itself.

```
public MapMarker setDeclutteringEnabled (boolean enabled)
```

This method enables or disables decluttering in tilted view. By enabling this, icons will not be shown when they are faraway in tilted view. By default, decluttering is disabled.

**Parameters:**

- **enabled**  
true means enabling icon decluttering.

**Returns:**

The updated *MapMarker* itself.

```
public MapMarker setDescription (String description)
```

Sets the description text. This will be shown below the title in normal typeface.

**Parameters:**

- **description**  
The description to be set.

## Returns:

The updated `MapMarker` itself.

```
public MapMarker setDraggable (boolean isDraggable)
```

Sets whether this marker is draggable or not. By default, the marker is not draggable.

If any user overridden methods of `onLongPressEvent(PointF)` or `onDoubleTapEvent(PointF)` that is registered with `MapGesture` returns `true`, the `MapMarker` will ignore any drag events even if the marker is set to enable dragging.

## Parameters:

- `isDraggable`  
true if the marker is draggable, false otherwise.

## Returns:

The updated `MapMarker` itself.

## See also:

[MapGesture](#)

```
public MapMarker setIcon (Image icon)
```

Sets an icon image for this `MapMarker`.

## Parameters:

- `icon`  
An `Image` representing this marker's icon

## Returns:

The updated `MapMarker` itself.

```
public boolean setSvgIconScaling (float scale)
```

Set a scaling factor for markers using `SVG Image`. Only works with scales from 1.0 to 2.0 inclusive.

## Parameters:

- `scale`  
Scaling factor.

## Returns:

true if the scaling factor has been applied (number from 1.0 to 2.0), false otherwise.

```
public MapMarker setTitle (String title)
```

Sets a title to be used by the default info bubble.

**Parameters:**

- **title**

The title to set.

**Returns:**

The updated `MapMarker` itself.

```
public boolean setTransparency (float alpha)
```

Sets a transparency level, within the range of [0..1], for the icon.

**Parameters:**

- **alpha**

Desired alpha value for the icon, 0 for fully transparent, 1 for fully opaque (the default value is 1)

**Returns:**

True if successful, false otherwise.

## OnDragListener

The interface `OnDragListener` is a member of `com.here.android.mpa.mapping.MapMarker`.

### Interface Summary

```
public static abstract interface MapMarker.OnDragListener
```

Callback interface for drag events on `MapMarker` objects.

[For complete information, see the section [Interface Details](#)]

### Method Summary

Table 490: Methods in `OnDragListener`

Methods
<pre>public abstract void onMarkerDrag (MapMarker marker)</pre> <p>Called repeatedly while a marker is being dragged.</p>
<pre>public abstract void onMarkerDragEnd (MapMarker marker)</pre> <p>Called when a marker has finished being dragged.</p>
<pre>public abstract void onMarkerDragStart (MapMarker marker)</pre> <p>Called when a marker starts being dragged.</p>

## Interface Details

Callback interface for drag events on `MapMarker` objects.

## Method Details

```
public abstract void onMarkerDrag (MapMarker marker)
```

Called repeatedly while a marker is being dragged. The `MapMarker`'s location can be accessed through `getCoordinate()`.

### Parameters:

- **marker**  
The `MapMarker` that is being dragged.

```
public abstract void onMarkerDragEnd (MapMarker marker)
```

Called when a marker has finished being dragged. The `MapMarker`'s location can be accessed through `getCoordinate()`.

### Parameters:

- **marker**  
The `MapMarker` that is being dragged.

```
public abstract void onMarkerDragStart (MapMarker marker)
```

Called when a marker starts being dragged. The `MapMarker`'s location can be accessed via `getCoordinate()`. This position may be different to the position prior to the start of the drag because the marker is popped up above the touch point.

### Parameters:

- **marker**  
The `MapMarker` that is being dragged.

## MapModelObject

The class `MapModelObject` is a member of `com.here.android.mpa.mapping`.

## Class Summary

```
public class MapModelObject
```

```
extends com.here.android.mpa.mapping.MapObject, com.here.android.mpa.common.ViewObject,  
java.lang.Object
```

Base class for `MapLocalModel` and `MapGeoModel`.

[For complete information, see the section [Class Details](#)]

## Nested Class Summary

Table 491: Nested Classes in MapModelObject

Nested Classes
<pre>public static final class <a href="#">MapModelObject.Directionallight</a></pre> <p>This class specifies a directional light.</p>
<pre>public static abstract interface <a href="#">MapModelObject.Light</a></pre> <p>Base Interface for all Lights supported by MapModel This class will be extended in the new future with more methods.</p>
<pre>public static abstract interface <a href="#">MapModelObject.Material</a></pre> <p>Base Interface for all Materials supported by MapModel This class will be extended in future with more methods.</p>
<pre>public static final class <a href="#">MapModelObject.PhongMaterial</a></pre> <p>PhongMaterial is used for shading a model.</p>

## Method Summary

Table 492: Methods in MapModelObject

Methods
<pre>public static int <a href="#">ARGBToRGBA</a> (int color)</pre> <p>Simple color converter.</p>
<pre>public static int <a href="#">RGBAToARGB</a> (int color)</pre> <p>Simple color converter.</p>
<pre>public boolean <a href="#">addLight</a> (<a href="#">Light</a> light)</pre> <p>Add a light to the object.</p>
<pre>public <a href="#">Light</a> <a href="#">getLight</a> (int index)</pre> <p>Get an already added Light</p>
<pre>public <a href="#">Material</a> <a href="#">getMaterial</a> ()</pre> <p>Get the Material</p>
<pre>public int <a href="#">getNumLights</a> ()</pre> <p>Get the number of lights.</p>
<pre>public int <a href="#">getNumberLightsSupported</a> ()</pre> <p>Get the maximum number of lights supported.</p>
<pre>public boolean <a href="#">removeAllLights</a> ()</pre> <p>Remove all lights from this model object.</p>
<pre>public boolean <a href="#">setLight</a> (int index, <a href="#">Light</a> light)</pre> <p>Update the light for a particular light</p>

## Methods

```
public boolean setMaterial (Material material)
```

Set the Material

---

## Class Details

Base class for *MapLocalModel* and *MapGeoModel*. This class provides additional functionalities to set lighting and material properties to a model object.

## Method Details

```
public static int ARGBToRGBA (int color)
```

Simple color converter. Converts from ARGB to RGBA.

### Parameters:

- **color**  
Color to be converted.

### Returns:

Color in RGBA.

```
public static int RGBAToARGB (int color)
```

Simple color converter. Converts from RGBA to ARGB.

### Parameters:

- **color**  
Color to be converted.

### Returns:

Color in ARGB.

```
public boolean addLight (Light light)
```

Add a light to the object.

### Parameters:

- **light**  
New light to add.

### Returns:

true if successful, false otherwise.

### See also:

[getNumberLightsSupported\(\)](#)

```
public Light getLight (int index)
```

Get an already added *Light*

**Parameters:**

- **index**  
Index of the light to get

**Returns:**

*Light* object if successful

```
public Material getMaterial ()
```

Get the *Material*

**Returns:**

*Material* object.

```
public int getNumLights ()
```

Get the number of lights.

**Returns:**

int, number of lights.

```
public int getNumberLightsSupported ()
```

Get the maximum number of lights supported.

**Returns:**

int maximum light count.

```
public boolean removeAllLights ()
```

Remove all lights from this model object.

**Returns:**

true if the operation was successful.

```
public boolean setLight (int index, Light light)
```

Update the light for a particular light

**Parameters:**

- **index**

Index of the light to update

- **light**

Light object to update

**Returns:**

true if successful, false otherwise.

```
public boolean setMaterial (Material material)
```

Set the Material

**Parameters:**

- **material**  
Material to be used.

**Returns:**

boolean true if successful, false otherwise.

## DirectionalLight

The class *DirectionalLight* is a member of *com.here.android.mpa.mapping.MapModelObject*.

### Class Summary

public static final class **MapModelObject.DirectionLight**

*implements* *com.here.android.mpa.mapping.MapModelObject.Light*

*extends* *java.lang.Object*

This class specifies a directional light.

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 493: Constructors in DirectionalLight

Constructors
<i>DirectionalLight</i> () Default Constructor
<i>DirectionalLight</i> ( <i>Vector3f</i> direction) Construct a DirectionalLight.

## Method Summary

Table 494: Methods in DirectionalLight

Methods
<pre>public <i>Vector3f</i> getSource ()</pre> <p>Get the directional light direction.</p>
<pre>public void setSource (<i>Vector3f</i> direction)</pre> <p>Set the directional light source.</p>

## Class Details

This class specifies a directional light.

## Constructor Details

### DirectionalLight ()

Default Constructor

### DirectionalLight (*Vector3f* direction)

Construct a DirectionalLight.

#### Parameters:

- **direction**  
The directional light direction.

## Method Details

### public *Vector3f* getSource ()

Get the directional light direction.

#### Returns:

Vector3d vector containing the light direction.

### public void setSource (*Vector3f* direction)

Set the directional light source. This will only take effect before the light is added.

#### Parameters:

- **direction**  
The directional light direction.

## Light

The interface *Light* is a member of *com.here.android.mpa.mapping.MapModelObject*.

### Interface Summary

public static abstract interface **MapModelObject.Light**

Base Interface for all Lights supported by MapModel This class will be extended in the new future with more methods.

[For complete information, see the section [Interface Details](#)]

### Interface Details

Base Interface for all Lights supported by MapModel This class will be extended in the new future with more methods.

## Material

The interface *Material* is a member of *com.here.android.mpa.mapping.MapModelObject*.

### Interface Summary

public static abstract interface **MapModelObject.Material**

Base Interface for all Materials supported by MapModel This class will be extended in future with more methods.

[For complete information, see the section [Interface Details](#)]

### Interface Details

Base Interface for all Materials supported by MapModel This class will be extended in future with more methods.

## PhongMaterial

The class *PhongMaterial* is a member of *com.here.android.mpa.mapping.MapModelObject*.

### Class Summary

public static final class **MapModelObject.PhongMaterial**

*implements* [com.here.android.mpa.mapping.MapModelObject.Material](#)

*extends* [java.lang.Object](#)

PhongMaterial is used for shading a model.

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 495: Constructors in PhongMaterial

Constructors
<code>PhongMaterial ()</code> Default constructor
<code>PhongMaterial (int diffuseColor, int ambientColor)</code>

## Field Summary

Table 496: Fields in PhongMaterial

Fields
<code>public static final int DEFAULT_AMBIANT_COLOR</code>
<code>public static final int DEFAULT_DIFFUSE_COLOR</code>

## Method Summary

Table 497: Methods in PhongMaterial

Methods
<code>public int getAmbientColor ()</code> Get the Ambient Material color
<code>public int getDiffuseColor ()</code> Get the Diffuse Material color
<code>public PhongMaterial setAmbientColor (int color)</code> Set the Ambient Material color
<code>public PhongMaterial setDiffuseColor (int color)</code> Set the Diffuse Material color

## Class Details

`PhongMaterial` is used for shading a model. This class can be used to change the transparency or color of textured map models.

### Constructor Details

#### `PhongMaterial ()`

Default constructor

#### `PhongMaterial (int diffuseColor, int ambientColor)`

## Parameters:

- `diffuseColor`
- `ambientColor`

## Field Details

```
public static final int DEFAULT_AMBIANT_COLOR
```

```
public static final int DEFAULT_DIFFUSE_COLOR
```

## Method Details

```
public int getAmbientColor ()
```

Get the Ambient Material color

### Returns:

color Color The color format is in ARGB

```
public int getDiffuseColor ()
```

Get the Diffuse Material color

### Returns:

color Color

```
public PhongMaterial setAmbientColor (int color)
```

Set the Ambient Material color

### Parameters:

- `color`  
Color The color format is in ARGB

### Returns:

PhongMaterial builder pattern.

```
public PhongMaterial setDiffuseColor (int color)
```

Set the Diffuse Material color

### Parameters:

- `color`

Color

**Returns:**

PhongMaterial builder pattern.

## MapObject

The class *MapObject* is a member of *com.here.android.mpa.mapping* .

### Class Summary

public abstract class **MapObject**

extends *com.here.android.mpa.common.ViewObject*, *java.lang.Object*

Represents a base class for all map-related objects that users can add to a *Map*.

[For complete information, see the section *Class Details*]

### Nested Class Summary

Table 498: Nested Classes in MapObject

Nested Classes
public static final enumeration <i>MapObject.Type</i> Represents values describing the types of <i>MapObject</i> objects that can be added to a <i>Map</i> .

### Method Summary

Table 499: Methods in MapObject

Methods
public <i>MapOverlayType</i> <i>getOverlayType</i> () Returns the overlay in which this <i>MapObject</i> appears.
public <i>MapContainer</i> <i>getParent</i> () Returns the parent of this <i>MapObject</i> .
public <i>MapOverlayType</i> <i>getReserveOverlayType</i> () Returns the overlay in which this <i>MapObject</i> reserves screen space.
public <i>Type</i> <i>getType</i> () Returns the type of object that this <i>MapObject</i> represents.
public <i>BitSet</i> <i>getVisibleMask</i> () Returns the visibility bit mask of this <i>MapObject</i>

## Methods

```
public int getZIndex ()
```

Returns the current z-index (stacking order) of this `MapObject` .

```
public boolean isVisible ()
```

Determines whether the visibility of this `MapObject` on the map is enabled.

```
public MapObject resetVisibleMask (boolean set)
```

Resets the entire visibility bit mask of this `MapObject` to be either 1s or 0s.

```
public MapObject setOverlayType (MapOverlayType type)
```

Sets the display order in which this `MapObject` appears relating to other layers of the map.

```
public MapObject setReserveOverlayType (MapOverlayType type)
```

Currently this method is only supported for `MapLabeledMarker` objects.

```
public MapObject setVisible (boolean isVisible)
```

Sets whether the visibility of the `MapObject` on the map is enabled.

```
public MapObject setVisibleMask (int level)
```

Sets this `MapObject` to be visible at the specified zoom level.

```
public MapObject setVisibleMask (int levelStart, int levelEnd)
```

Sets this `MapObject` to be visible for the specified range of zoom levels.

```
public MapObject setZIndex (int index)
```

Sets a z-index (stacking order) value for this `MapObject` .

```
public MapObject unsetVisibleMask (int level)
```

Sets this `MapObject` to be invisible at the specified zoom level by unsetting the visibility bit mask.

```
public MapObject unsetVisibleMask (int levelStart, int levelEnd)
```

Sets this `MapObject` to be invisible for the specified range of zoom levels by unsetting the visibility bit mask.

## Class Details

Represents a base class for all map-related objects that users can add to a `Map`.

This abstract class serves as a base for several more specified map object types, bundling their common properties. The types of map objects that you can add to a map include:

- [MapContainer](#)
- [MapCircle](#)
- [MapPolygon](#)
- [MapPolyline](#)
- [MapRoute](#)
- [MapMarker](#)
- [MapScreenMarker](#)
- [MapLocalModel](#)
- [MapGeoModel](#)

Objects extending this class, with the exception of *MapRoute* and *MapContainer*, can be grouped within a *MapContainer* instance.

For a complete enumeration of available *MapObject* types, refer to *MapObject.Type*.

## Method Details

```
public MapOverlayType getOverlayType ()
```

Returns the overlay in which this *MapObject* appears.

**Returns:**

A *MapOverlayType* specifying the display grouping of the *MapObject*

```
public MapContainer getParent ()
```

Returns the parent of this *MapObject* .

**Returns:**

The parent *MapContainer*. If the current object is the root object, `null` is returned.

```
public MapOverlayType getReserveOverlayType ()
```

Returns the overlay in which this *MapObject* reserves screen space.

**Returns:**

A *MapOverlayType* specifying the display grouping of the *MapObject*

```
public Type getType ()
```

Returns the type of object that this *MapObject* represents.

**Returns:**

One of the *MapObject.Type* values

```
public BitSet getVisibleMask ()
```

Returns the visibility bit mask of this *MapObject*

**Returns:**

*BitSet* which defines the visibility bit mask of the *MapObject*

```
public int getZIndex ()
```

Returns the current z-index (stacking order) of this *MapObject* . A higher z-index indicates that the object is positioned more in front.

## Returns:

The current ordinal z-index number

```
public boolean isVisible ()
```

Determines whether the visibility of this `MapObject` on the map is enabled. Whether the `MapObject` is actually visible depends on whether the visible mask is set for the desired zoom level.

## Returns:

True if this `MapObject` is visible, false otherwise

## See also:

[setVisibleMask\(int\)](#)

[setVisibleMask\(int, int\)](#)

[unsetVisibleMask\(int\)](#)

[unsetVisibleMask\(int, int\)](#)

[getVisibleMask\(\)](#)

```
public MapObject resetVisibleMask (boolean set)
```

Resets the entire visibility bit mask of this `MapObject` to be either 1s or 0s. This method can only be used after the `MapObject` has been added to the `Map`.

Note: The `MapObject` is visible at the specified zoom level only if the visibility of the `MapObject` is also set to true via [setVisible\(boolean\)](#).

## Parameters:

- **set**  
True to reset mask to all 1s; false to reset mask to all 0s

## Returns:

The updated `MapObject` itself.

## See also:

[setVisible\(boolean\)](#)

```
public MapObject setOverlayType (MapOverlayType type)
```

Sets the display order in which this `MapObject` appears relating to other layers of the map. Note that this API only takes effect if the object is currently not added to a `Map`. To change the [MapOverlayType](#), the `MapObject` object must be removed and added from the map again.

## Parameters:

- **type**

A `MapOverlayType` specifying the display grouping of this `MapObject`

**Returns:**

The updated `MapObject` itself.

**See also:**

[addMapObject\(MapObject\)](#)

[removeMapObject\(MapObject\)](#)

```
public MapObject setReserveOverlayType (MapOverlayType type)
```

Currently this method is only supported for `MapLabeledMarker` objects.

It sets the reserve order in which this `MapObject` reserves screen space relating to other layers of the map. When applied, the screen space around the label will be reserved for the layer and ensure the label can be rendered without obstruction by other objects.

Note that this API only takes effect if the object is currently not added to a `Map`. To change the `MapOverlayType`, the `MapObject` object must be removed and added from the map again.

**Parameters:**

- **type**

A `MapOverlayType` specifying the display grouping of this `MapObject`

**Returns:**

The updated `MapObject` itself.

**Throws:**

- `IllegalArgumentException`  
if the `MapObject` is not a `MapLabeledMarker` object.

**See also:**

[addMapObject\(MapObject\)](#)

[removeMapObject\(MapObject\)](#)

```
public MapObject setVisible (boolean isVisible)
```

Sets whether the visibility of the `MapObject` on the map is enabled. Whether the `MapObject` is actually visible depends on whether the visible mask is set for the desired zoom level.

This setting is independent but takes priority over the per-zoom level mask. For example, if you call `setVisibleMask(0, 6)` and then call `setVisible(false)`, the object will not appear on the map. Calling `setVisible(true)` will then cause the object to be visible in zoom levels 0 to 6.

**Parameters:**

- **isVisible**

A boolean variable specifying whether this `MapObject` is visible

## Returns:

The updated `MapObject` itself.

## See also:

[setVisibleMask\(int\)](#)

[setVisibleMask\(int, int\)](#)

[unsetVisibleMask\(int\)](#)

[unsetVisibleMask\(int, int\)](#)

[getVisibleMask\(\)](#)

## `public MapObject setVisibleMask (int level)`

Sets this `MapObject` to be visible at the specified zoom level. The `MapObject` is only visible at the specified zoom level only if the visibility of the `MapObject` is set to true via [setVisible\(boolean\)](#).

Setting the bit mask at a particular zoom level does not affect other levels. By default, the visibility bit masks for all zoom levels are set to true.

## Parameters:

- `level`  
A zoom level

## Returns:

The updated `MapObject` itself.

## See also:

[setVisible\(boolean\)](#)

[setVisibleMask\(int, int\)](#)

[unsetVisibleMask\(int\)](#)

[unsetVisibleMask\(int, int\)](#)

[getVisibleMask\(\)](#)

## `public MapObject setVisibleMask (int levelStart, int levelEnd)`

Sets this `MapObject` to be visible for the specified range of zoom levels. The `MapObject` is only visible for the specified range of zoom levels only if the visibility of the `MapObject` is set to true via [setVisible\(boolean\)](#).

Setting the bit mask on a range of zoom levels does not affect other levels. By default, the visibility bit masks for all zoom levels are set to true.

## Parameters:

- `levelStart`  
A starting zoom level of the range

- **levelEnd**

An ending zoom level of the range

**Returns:**

The updated `MapObject` itself.

**See also:**

[setVisible\(boolean\)](#)

[setVisibleMask\(int\)](#)

[unsetVisibleMask\(int\)](#)

[unsetVisibleMask\(int, int\)](#)

[getVisibleMask\(\)](#)

```
public MapObject setZIndex (int index)
```

Sets a z-index (stacking order) value for this `MapObject` .

Note that this API is not supported by [MapLabeledMarker](#).

**Parameters:**

- **index**

A new z-index value for this `MapObject`, a 16-bit `int` within the range of [0..65535]

**Returns:**

The updated `MapObject` itself.

**Throws:**

- **IllegalArgumentException**

if `index` is not within the valid range.

```
public MapObject unsetVisibleMask (int level)
```

Sets this `MapObject` to be invisible at the specified zoom level by unsetting the visibility bit mask.

Setting the bit mask at a particular zoom level does not affect other levels. By default, the visibility bit masks for all zoom levels are set to true.

**Parameters:**

- **level**

A zoom level

**Returns:**

The updated `MapObject` itself.

**See also:**

[setVisible\(boolean\)](#)

[unsetVisibleMask\(int, int\)](#)

[setVisibleMask\(int\)](#)

[setVisibleMask\(int, int\)](#)

[getVisibleMask\(\)](#)

```
public MapObject unsetVisibleMask (int levelStart, int levelEnd)
```

Sets this `MapObject` to be invisible for the specified range of zoom levels by unsetting the visibility bit mask.

Unsetting the bit mask on a range of zoom levels does not affect other levels. By default, the visibility bit masks for all zoom levels are set to true.

**Parameters:**

- **levelStart**  
A starting zoom level of the range
- **levelEnd**  
An ending zoom level of the range

**Returns:**

The updated `MapObject` itself.

**See also:**

[setVisible\(boolean\)](#)

[unsetVisibleMask\(int\)](#)

[setVisibleMask\(int\)](#)

[setVisibleMask\(int, int\)](#)

[getVisibleMask\(\)](#)

## Type

The enumeration `Type` is a member of `com.here.android.mpa.mapping.MapObject`.

### Enumeration Summary

```
public static final enumeration MapObject.Type
```

```
extends java.lang.Enum, java.lang.Object
```

Represents values describing the types of `MapObject` objects that can be added to a `Map`.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 500: Enum Constants in Type

Fields
<pre>public static final Type UNKNOWN</pre> <p>An unknown type of MapObject .</p>
<pre>public static final Type MARKER</pre> <p>A MapMarker.</p>
<pre>public static final Type SCREEN_MARKER</pre> <p>A MapScreenMarker.</p>
<pre>public static final Type POLYGON</pre> <p>A MapPolygon.</p>
<pre>public static final Type POLYLINE</pre> <p>A MapPolyline.</p>
<pre>public static final Type ROUTE</pre> <p>A MapRoute.</p>
<pre>public static final Type CONTAINER</pre> <p>A MapContainer.</p>
<pre>public static final Type CIRCLE</pre> <p>A MapCircle.</p>
<pre>public static final Type LOCAL_MODEL</pre> <p>A MapLocalModel.</p>
<pre>public static final Type GEO_MODEL</pre> <p>A MapGeoModel.</p>
<pre>public static final Type LABELED_MARKER</pre> <p>A MapLabeledMarker.</p>

## Method Summary

Table 501: Methods in Type

Methods
<pre>public static Type valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static MapObject.Type[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Represents values describing the types of *MapObject* objects that can be added to a *Map*.

### Enum Constant Details

```
public static final Type UNKNOWN
```

An unknown type of *MapObject*.

```
public static final Type MARKER
```

A *MapMarker*.

```
public static final Type SCREEN_MARKER
```

A *MapScreenMarker*.

```
public static final Type POLYGON
```

A *MapPolygon*.

```
public static final Type POLYLINE
```

A *MapPolyline*.

```
public static final Type ROUTE
```

A *MapRoute*.

```
public static final Type CONTAINER
```

A *MapContainer*.

```
public static final Type CIRCLE
```

A *MapCircle*.

```
public static final Type LOCAL_MODEL
```

A *MapLocalModel*.

```
public static final Type GEO_MODEL
```

A *MapGeoModel*.

```
public static final Type LABELED_MARKER
```

A *MapLabeledMarker*.

### Method Details

```
public static Type valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static MapObject.Type[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## MapOffScreenRenderer

The class *MapOffScreenRenderer* is a member of *com.here.android.mpa.mapping*.

### Class Summary

```
public final class MapOffScreenRenderer
```

*implements* *com.here.android.mpa.common.OffScreenRenderer*

*extends* *java.lang.Object*

*Map* derivation of the *OffScreenRenderer*.

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 502: Constructors in MapOffScreenRenderer

Constructors
<p><i>MapOffScreenRenderer</i> (Context ctx)</p> <p>Constructor of a <i>MapOffScreenRenderer</i>.</p>

## Method Summary

Table 503: Methods in `MapOffScreenRenderer`

Methods
<pre>public void <b>addOnMapRenderListener</b> (<i>OnMapRenderListener</i> listener)</pre> <p>Adds a <i>OnMapRenderListener</i> to listen for map render events.</p>
<pre>public boolean <b>getBlockingRendering</b> ()</pre> <p>Get whether the offscreen renderer is rendering synchronously.</p>
<pre>public void <b>getScreenCapture</b> (<i>OnScreenCaptureListener</i> listener)</pre> <p>Returns the full screen bitmap for the Map .</p>
<pre>public void <b>pause</b> ()</pre> <p>Pause currently running offscreen renderer.</p>
<pre>public void <b>removeOnMapRenderListener</b> (<i>OnMapRenderListener</i> listener)</pre> <p>Removes an existing <i>OnMapRenderListener</i>.</p>
<pre>public void <b>resume</b> ()</pre> <p>Resume currently paused offscreen renderer.</p>
<pre>public <i>MapOffScreenRenderer</i> <b>setBlockingRendering</b> (boolean blocking)</pre> <p>Toggle if the offscreen renderer draws synchronously.</p>
<pre>public <i>MapOffScreenRenderer</i> <b>setMap</b> (<i>Map</i> map)</pre> <p>Associate the Map with the OffScreen renderer.</p>
<pre>public <i>MapOffScreenRenderer</i> <b>setSize</b> (int width, int height)</pre> <p>Set the size of the requested screen surface.</p>
<pre>public <i>MapOffScreenRenderer</i> <b>setViewRect</b> (<i>ViewRect</i> viewRect)</pre> <p>Set the view rectangle where the map will be drawn.</p>
<pre>public void <b>start</b> ()</pre> <p>Start the offscreen renderer.</p>
<pre>public void <b>start</b> (<i>SurfaceHolder</i> renderTarget, <i>SurfaceUpdatedListener</i> listener)</pre> <p>Start the offscreen renderer.</p>
<pre>public void <b>stop</b> ()</pre> <p>Stop the offscreen renderer.</p>

## Class Details

*Map* derivation of the *OffScreenRenderer*. This class as allows users to capture screenshots of a Map with or without the map rendered in an Android `android.view.android.view.View`.

Here's a short example to capture a screenshot of a Map not rendered in a View :

```
OnMapRenderListener listener = new OnMapRenderListener() {
// ...
```

```
public void onPostDraw(boolean invalidated, long renderTime)
{
    // map has been rendered, now it's OK to get screen
    capture!
    renderer.getScreenshot(...);
}
// ...
} Map map = new Map();
MapOffScreenRenderer renderer = new MapOffScreenRenderer(ctx);
renderer.setMap(map);
renderer.setSize(500, 500);
renderer.addRenderListener(listener);
renderer.start();
// ...
// option to pause renderer, e.g. if UI is not visible anymore
renderer.pause();
// ...
// option to resume renderer, e.g. if UI becomes visible
renderer.resume();
// ...
renderer.stop();
renderer.removeRenderListener(listener);
renderer.setMap(null);
```

## Constructor Details

### MapOffScreenRenderer (Context ctx)

Constructor of a MapOffScreenRenderer .

#### Parameters:

- **ctx**  
Context to be used by the MapOffScreenRenderer

## Method Details

### public void addOnMapRenderListener (*OnMapRenderListener* listener)

Adds a *OnMapRenderListener* to listen for map render events. This method is only effective after a Map has been associated with the renderer by calling *setMap(Map)*.

#### Parameters:

- **listener**  
A OnMapRenderListener to add to the MapOffScreenRenderer

#### See also:

[removeOnMapRenderListener\(OnMapRenderListener\)](#)

### public boolean getBlockingRendering ()

Get whether the offscreen renderer is rendering synchronously.

This API only takes effect after *setMap(Map)* has been called. By default, blocking rendering is disabled.

**Returns:**

true if rendering synchronously, false otherwise.

```
public void getScreenCapture (OnScreenCaptureListener listener)
```

Returns the full screen bitmap for the `Map`. This method is asynchronous and will invoke a callback once the operation is completed through the *OnScreenCaptureListener*.

The `MapOffScreenRenderer` must have been started and the `Map` rendered in order to create the screen capture. For `Map` being rendered in a `View`, users can use the methods *getHeight()* or *getWidth()* to verify that the `Map` has been rendered. Otherwise, users can also utilize the *onPostDraw(boolean, long)* callback to confirm when the `Map` has been rendered.

Note that this requires the device to support EGL pBuffer Surfaces. It is recommended to have a size of a power of two. (For example 128x128, 256x256).

**Parameters:**

- **listener**  
A *OnScreenCaptureListener* to listen for the callback when screen capture is complete.

**Throws:**

- **IllegalArgumentException**  
if `listener` is null.

**See also:**

[start\(\)](#)

[start\(SurfaceHolder, SurfaceUpdatedListener\)](#)

[onPostDraw\(boolean, long\)](#)

```
public void pause ()
```

Pause currently running offscreen renderer. Use this method if renderer needs to be paused for some time. Allocated resources will not be released. To resume renderer call *resume()*. Only started renderer can be paused.

**Throws:**

- **IllegalStateException**  
if this `MapOffScreenRenderer` is not started.

**See also:**

[resume\(\)](#)

[stop\(\)](#)

```
public void removeOnMapRenderListener (OnMapRenderListener listener)
```

Removes an existing *OnMapRenderListener*.

**Parameters:**

- **listener**  
A *OnMapRenderListener* to remove from the *MapOffScreenRenderer*

```
public void resume ()
```

Resume currently paused offscreen renderer. Only paused renderer can be resumed.

**Throws:**

- **IllegalStateException**  
if this *MapOffScreenRenderer* is not in pause state.

**See also:**

[pause\(\)](#)

```
public MapOffScreenRenderer setBlockingRendering (boolean blocking)
```

Toggle if the offscreen renderer draws synchronously. This means it will block waiting for all required data to complete rendering.

This API only takes effect after [setMap\(Map\)](#) has been called.

It is also recommended animations be disabled with the method [setFadingAnimations\(boolean\)](#).

**Parameters:**

- **blocking**  
`true` if rendering will block, `false` otherwise. Default is `false`.

**Returns:**

This *MapOffScreenRenderer* object

```
public MapOffScreenRenderer setMap (Map map)
```

Associate the *Map* with the *OffScreen* renderer.

Make sure to set the map back to `null` after calling [stop\(\)](#) to free up resources properly.

**Parameters:**

- **map**  
*Map* instance to render in the offscreen renderer.

**Returns:**

This *MapOffScreenRenderer* object

```
public MapOffScreenRenderer setSize (int width, int height)
```

Set the size of the requested screen surface. This method must be called before [start\(\)](#).

**Parameters:**

- **width**  
The screen surface width, in number of pixels
- **height**  
The screen surface height, in number of pixels

**Returns:**

This *MapOffScreenRenderer* object

**Throws:**

- **IllegalArgumentException**  
if width or length is less than or equal to 0

```
public MapOffScreenRenderer setViewRect (ViewRect viewRect)
```

Set the view rectangle where the map will be drawn. This API can only called after the [setMap\(Map\)](#) with a valid Map has been called.

**Parameters:**

- **viewRect**  
Rectangle where the map will be drawn to the view.

**Returns:**

This *MapOffScreenRenderer* object

**Throws:**

- **RuntimeException**  
if a map has not been set to the *MapOffScreenRenderer*.

```
public void start ()
```

Start the offscreen renderer. A new PBuffer based surface will be allocated. Before calling this method, [setSize\(int, int\)](#) must have been called with valid values.

**Throws:**

- **IllegalStateException**  
if *MapOffScreenRenderer* is already started.

**See also:**

[pause\(\)](#)

[stop\(\)](#)

```
public void start (SurfaceHolder renderTarget, SurfaceUpdatedListener
listener)
```

Start the offscreen renderer. The renderer will be attached to the supplied `SurfaceHolder` argument.

**Parameters:**

- **renderTarget**  
Surface to attach to.
- **listener**  
Callback when the surface has been updated

**Throws:**

- **IllegalStateException**  
if `MapOffScreenRenderer` is already started.

**See also:**

[pause\(\)](#)

[stop\(\)](#)

```
public void stop ()
```

Stop the offscreen renderer. All resource allocated will be released. Use this method if renderer is not needed anymore, otherwise use [pause\(\)](#).

**See also:**

[pause\(\)](#)

[resume\(\)](#)

## MapOverlay

The class `MapOverlay` is a member of `com.here.android.mpa.mapping` .

### Class Summary

```
public class MapOverlay
```

```
extends java.lang.Object
```

The `MapOverlay` class can be used to display custom Android View-based content at a fixed location on the map.

[For complete information, see the section [Class Details](#)]

**See also:**

[addMapOverlay\(MapOverlay\)](#)

[removeMapOverlay\(MapOverlay\)](#)

## Constructor Summary

Table 504: Constructors in MapOverlay

Constructors
<p><b><a href="#">MapOverlay</a></b> (<a href="#">View</a> view, <a href="#">GeoCoordinate</a> coordinate)</p> <p>Constructs new MapOverlay object.</p>

## Method Summary

Table 505: Methods in MapOverlay

Methods
<p>public <a href="#">PointF</a> <a href="#">getAnchorPoint</a> ()</p> <p>Returns the anchor point for this MapOverlay .</p>
<p>public <a href="#">GeoCoordinate</a> <a href="#">getCoordinate</a> ()</p> <p>Returns the current map GeoCoordinate for this MapOverlay .</p>
<p>public <a href="#">View</a> <a href="#">getView</a> ()</p> <p>Returns the View object that was passed to the constructor.</p>
<p>public <a href="#">MapOverlay</a> <a href="#">setAnchorPoint</a> (<a href="#">PointF</a> anchor)</p> <p>Sets an anchor point for this MapOverlay .</p>
<p>public <a href="#">MapOverlay</a> <a href="#">setCoordinate</a> (<a href="#">GeoCoordinate</a> coordinate)</p> <p>Sets a map GeoCoordinate for this MapOverlay .</p>

## Class Details

The MapOverlay class can be used to display custom Android View-based content at a fixed location on the map.

To use, create a MapOverlay with the custom view you wish to display and the position at which the view should be displayed. The overlay should be then added to the map with [addMapOverlay\(MapOverlay\)](#) method. The overlay will be automatically repositioned on the screen as the map moves.

**See also:**

[addMapOverlay\(MapOverlay\)](#)

[removeMapOverlay\(MapOverlay\)](#)

## Constructor Details

**[MapOverlay](#)** ([View](#) view, [GeoCoordinate](#) coordinate)

Constructs new MapOverlay object.

**Parameters:**

- **view**  
Custom view that will be displayed on the map.
- **coordinate**  
Position at which the view should be displayed.

**Throws:**

- **NullPointerException**  
If any of given parameters is null.
- **IllegalArgumentException**  
If given coordinates are not valid.

## Method Details

```
public PointF getAnchorPoint ()
```

Returns the anchor point for this `MapOverlay` .

The overlay is drawn with the specified pixel offset from its `getCoordinate()` position.

By default, there is no offset and the `MapOverlay` anchor is positioned in the center of the overlay.

**Returns:**

The current `MapOverlay` anchor point.

```
public GeoCoordinate getCoordinate ()
```

Returns the current map `GeoCoordinate` for this `MapOverlay` .

**Returns:**

The current `GeoCoordinate` location.

```
public View getView ()
```

Returns the `View` object that was passed to the constructor.

**Returns:**

`View` assigned to this `MapOverlay`

```
public MapOverlay setAnchorPoint (PointF anchor)
```

Sets an anchor point for this `MapOverlay` .

The overlay is drawn with the specified pixel offset from its `getCoordinate()` position. To clear an anchor set previously, pass a `PointF` to this method with an X-coordinate equal to half the width of the view and a Y-coordinate equal to half the height of the view.

By default, there is no offset and the `MapOverlay` anchor is positioned in the center of the overlay.

**Parameters:**

- **anchor**  
A `PointF` relative to the top-left corner of the `MapOverlay`.

**Returns:**

The updated `MapOverlay` itself.

```
public MapOverlay setCoordinate (GeoCoordinate coordinate)
```

Sets a map `GeoCoordinate` for this `MapOverlay`.

**Parameters:**

- **coordinate**  
Desired `GeoCoordinate` location for this overlay.

**Returns:**

The updated `MapOverlay` itself.

## MapOverlayType

The enumeration `MapOverlayType` is a member of [com.here.android.mpa.mapping](#).

### Enumeration Summary

```
public final enumeration MapOverlayType
```

```
extends java.lang.Enum, java.lang.Object
```

Represents values describing the display grouping of `MapObject` objects when added to a `Map`.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 506: Enum Constants in `MapOverlayType`

Fields
<pre>public static final <i>MapOverlayType</i> <b>FOREGROUND_OVERLAY</b></pre> <p>Identifies objects that are to be placed on top of any other objects.</p>
<pre>public static final <i>MapOverlayType</i> <b>POI_OVERLAY</b></pre> <p>Identifies objects which augment POI information.</p>
<pre>public static final <i>MapOverlayType</i> <b>TRANSIT_STOP_OVERLAY</b></pre> <p>Identifies objects which augment Transit Stop information.</p>

## Fields

```
public static final MapOverlayType ROAD_OVERLAY
```

Identifies objects which add some information to the road network, such as traffic or GPS location.

```
public static final MapOverlayType AREA_OVERLAY
```

Identifies objects which add information to area features such as heat maps.

```
public static final MapOverlayType BACKGROUND_OVERLAY
```

Identifies objects which are placed directly over (on top of or in front of) BACKGROUND\_REPLACEMENT objects.

```
public static final MapOverlayType BACKGROUND_REPLACEMENT
```

Identifies objects that replace the background, such as custom satellite data.

## Method Summary

Table 507: Methods in *MapOverlayType*

### Methods

```
public int getValue ()
```

```
public static MapOverlayType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static MapOverlayType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Represents values describing the display grouping of *MapObject* objects when added to a *Map*.

### Enum Constant Details

```
public static final MapOverlayType FOREGROUND_OVERLAY
```

Identifies objects that are to be placed on top of any other objects. These objects appear closer to the viewer than other objects.

```
public static final MapOverlayType POI_OVERLAY
```

Identifies objects which augment POI information.

```
public static final MapOverlayType TRANSIT_STOP_OVERLAY
```

Identifies objects which augment Transit Stop information. Transit-related objects have higher priority over street names and other area feature labels.

```
public static final MapOverlayType ROAD_OVERLAY
```

Identifies objects which add some information to the road network, such as traffic or GPS location.

```
public static final MapOverlayType AREA_OVERLAY
```

Identifies objects which add information to area features such as heat maps.

```
public static final MapOverlayType BACKGROUND_OVERLAY
```

Identifies objects which are placed directly over (on top or in front of) `BACKGROUND_REPLACEMENT` objects. Apply this type to custom raster tiles and other map objects that should be drawn on top of the (background) map, but should not hide other objects.

```
public static final MapOverlayType BACKGROUND_REPLACEMENT
```

Identifies objects that replace the background, such as custom satellite data. Note that this semantic type does not disable rendering of the background.

## Method Details

```
public int getValue ()
```

```
public static MapOverlayType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static MapOverlayType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## MapPolygon

The class *MapPolygon* is a member of *com.here.android.mpa.mapping*.

## Class Summary

```
public final class MapPolygon
```

extends [com.here.android.mpa.mapping.MapObject](#), [com.here.android.mpa.common.ViewObject](#), [java.lang.Object](#)

A graphical representation of a [GeoPolygon](#) to be rendered on a map.

[For complete information, see the section [Class Details](#)]

See also:

[GeoPolygon](#)

## Constructor Summary

Table 508: Constructors in [MapPolygon](#)

Constructors
<p><a href="#">MapPolygon</a> ()</p> <p>Creates a <a href="#">MapPolygon</a> , which is a <a href="#">MapObject</a> in the shape of a polygon.</p>
<p><a href="#">MapPolygon</a> (<a href="#">GeoPolygon</a> polygon)</p> <p>Creates a <a href="#">MapPolygon</a> , which is a <a href="#">MapObject</a> in the shape of a polygon.</p>

## Method Summary

Table 509: Methods in [MapPolygon](#)

Methods
<p>public boolean <a href="#">getDepthTestEnabled</a> ()</p> <p>Returns a boolean indicating whether the <a href="#">MapPolygon</a> is rendered with depth test.</p>
<p>public int <a href="#">getFillColor</a> ()</p> <p>Returns the current fill color for this <a href="#">MapPolygon</a> , returning an ARGB (Alpha/Red/Green/Blue) integer color value.</p>
<p>public <a href="#">GeoPolygon</a> <a href="#">getGeoPolygon</a> ()</p> <p>Gets a copy of the <a href="#">GeoPolygon</a> rendered by this <a href="#">MapPolygon</a> .</p>
<p>public int <a href="#">getLineColor</a> ()</p> <p>Returns the current border line color for this <a href="#">MapPolygon</a> , returning an ARGB (Alpha/Red/Green/Blue) integer color value.</p>
<p>public int <a href="#">getLineWidth</a> ()</p> <p>Returns the current border line width for the <a href="#">MapPolygon</a> , in pixels.</p>
<p>public boolean <a href="#">isGeodesicEnabled</a> ()</p> <p>Returns a boolean indicating whether each segment of this <a href="#">GeoPolygon</a> is drawn as a geodesic.</p>
<p>public void <a href="#">setDepthTestEnabled</a> (boolean enabled)</p> <p>Set whether to render <a href="#">MapPolygon</a> with depth test.</p>
<p>public <a href="#">MapPolygon</a> <a href="#">setFillColor</a> (int color)</p> <p>Sets a fill color for this <a href="#">MapPolygon</a> , using an ARGB (Alpha/Red/Green/Blue) integer color value.</p>

## Methods

```
public MapPolygon setGeoPolygon (GeoPolygon polygon)
```

Changes the *GeoPolygon* rendered by this *MapPolygon* .

```
public MapPolygon setGeodesicEnabled (boolean enabled)
```

Specifies whether to draw each segment of the represented *GeoPolygon* as a geodesic.

```
public MapPolygon setLineColor (int color)
```

Sets a border line color for this *MapPolygon* , using an ARGB (Alpha/Red/Green/Blue) integer color value.

```
public MapPolygon setLineWidth (int width)
```

Sets a border line width, in pixels, for this *MapPolygon* , an *int* value within the [0..100] range.

## Class Details

A graphical representation of a *GeoPolygon* to be rendered on a map. In contrast to a *MapPolyline*, it is assumed that the last coordinate within the path is connected with the first coordinate, thereby constructing an enclosed geometry. Self-intersecting polygons rendering are not supported.

See also:

[GeoPolygon](#)

## Constructor Details

### *MapPolygon* ()

Creates a *MapPolygon* , which is a *MapObject* in the shape of a polygon.

### *MapPolygon* (*GeoPolygon* polygon)

Creates a *MapPolygon* , which is a *MapObject* in the shape of a polygon.

Parameters:

- **polygon**  
*GeoPolygon* to construct the *MapPolygon*

Throws:

- **IllegalArgumentException**  
if the input *GeoPolygon* is invalid, it is a self-intersecting polygon or vertices are at different altitudes.

## Method Details

```
public boolean getDepthTestEnabled ()
```

Returns a *boolean* indicating whether the *MapPolygon* is rendered with depth test. By default, depth test is disabled.

**Returns:**

True if the `MapPolygon` is rendered with depth test, false otherwise

```
public int getFillColor ()
```

Returns the current fill color for this `MapPolygon` , returning an ARGB (Alpha/Red/Green/Blue) integer color value.

**Returns:**

The current ARGB integer color value. The packed integer is made up of 4 bytes: alpha, red, green, blue. Each color component has a value range from [0..255], with 0 meaning no contribution for that component, and 255 meaning 100% contribution

**See also:**

[android.graphics.Color](#)

```
public GeoPolygon getGeoPolygon ()
```

Gets a copy of the [GeoPolygon](#) rendered by this `MapPolygon` .

**Returns:**

rendered [GeoPolygon](#).

```
public int getLineColor ()
```

Returns the current border line color for this `MapPolygon` , returning an ARGB (Alpha/Red/Green/Blue) integer color value.

**Returns:**

The current ARGB integer color value. The packed integer is made up of 4 bytes: alpha, red, green, blue. Each color component has a value range from [0..255], with 0 meaning no contribution for that component, and 255 meaning 100% contribution

**See also:**

[android.graphics.Color](#)

```
public int getLineWidth ()
```

Returns the current border line width for the `MapPolygon` , in pixels.

**Returns:**

The current width of the line defining the border of the `MapPolygon`

```
public boolean isGeodesicEnabled ()
```

Returns a boolean indicating whether each segment of this `GeoPolygon` is drawn as a geodesic.

**Returns:**

true if `GeoPolygon` segments are drawn as a geodesic, false otherwise.

## `public void setDepthTestEnabled (boolean enabled)`

Set whether to render `MapPolygon` with depth test.

Rendering with depth test should be used if map object altitude is relevant in your application. Rendering objects with different heights while disabling depth test may cause object occlusion.

**Parameters:**

- **enabled**  
true if `MapPolygon` is rendered with depth test

## `public MapPolygon setFillColor (int color)`

Sets a fill color for this `MapPolygon` , using an ARGB (Alpha/Red/Green/Blue) integer color value.

**Parameters:**

- **color**  
The ARGB integer color value. The packed integer is made up of 4 bytes: alpha, red, green, blue. Each color component has a value range from [0..255], with 0 meaning no contribution for that component, and 255 meaning 100% contribution

**Returns:**

The updated `MapPolygon` object itself.

**See also:**

[android.graphics.Color](#)

## `public MapPolygon setGeoPolygon (GeoPolygon polygon)`

Changes the `GeoPolygon` rendered by this `MapPolygon` .

**Parameters:**

- **polygon**  
`GeoPolygon` to be rendered

**Returns:**

The updated `MapPolygon` itself.

**Throws:**

- **IllegalArgumentException**  
if the input `GeoPolygon` is invalid, it is a self-intersecting polygon or vertices are at different altitudes.

```
public MapPolygon setGeodesicEnabled (boolean enabled)
```

Specifies whether to draw each segment of the represented `GeoPolygon` as a geodesic.

**Parameters:**

- **enabled**  
true if `GeoPolygon` segments will be drawn as a geodesic

**Returns:**

The updated @ code `MapPolygon`} itself.

```
public MapPolygon setLineColor (int color)
```

Sets a border line color for this `MapPolygon` , using an ARGB (Alpha/Red/Green/Blue) integer color value.

**Parameters:**

- **color**  
The ARGB integer color value. The packed integer is made up of 4 bytes: alpha, red, green, blue. Each color component has a value range from [0..255], with 0 meaning no contribution for that component, and 255 meaning 100% contribution

**Returns:**

The updated @ code `MapPolygon`} itself.

**See also:**

[android.graphics.Color](#)

```
public MapPolygon setLineWidth (int width)
```

Sets a border line width, in pixels, for this `MapPolygon` , an `int` value within the [0..100] range. By default, the line width is 1.

**Parameters:**

- **width**  
Width of the line defining the border of the `MapPolygon`

**Returns:**

The updated @ code `MapPolygon`} itself.

**Throws:**

- **IllegalArgumentException**  
is width is out of range.

## MapPolyline

The class `MapPolyline` is a member of `com.here.android.mpa.mapping`.

### Class Summary

public final class **MapPolyline**

extends `com.here.android.mpa.mapping.MapObject`, `com.here.android.mpa.common.ViewObject`,  
`java.lang.Object`

A graphical representation of a `GeoPolyline` that can be rendered on a map.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 510: Nested Classes in MapPolyline

Nested Classes
public static final enumeration <code>MapPolyline.CapStyle</code> Line ending cap rendering styles

### Constructor Summary

Table 511: Constructors in MapPolyline

Constructors
<code>MapPolyline ()</code> Creates a <code>MapPolyline</code> , which is a <code>MapObject</code> in the shape of a polyline.
<code>MapPolyline (GeoPolyline polyline)</code> Creates a <code>MapPolyline</code> , which is a <code>MapObject</code> in the shape of a polyline.

### Method Summary

Table 512: Methods in MapPolyline

Methods
public <code>CapStyle</code> <code>getCapStyle ()</code> Get the <code>MapPolyline</code> rendering cap style
public int <code>getDashPrimaryLength ()</code> Returns the current length of the primary dash segment of a dashed <code>MapPolyline</code> , in pixels.
public int <code>getDashSecondaryLength ()</code> Returns the current length of the secondary (empty) dash segments of a dashed <code>MapPolyline</code> , in pixels.

**Methods**

```
public boolean getDepthTestEnabled ()
```

Returns a boolean indicating whether the MapPolyline is rendered with depth test.

```
public GeoPolyline getGeoPolyline ()
```

Gets copy of the *GeoPolyline* rendered by this MapPolyline .

```
public int getLineColor ()
```

Gets the current line color for this MapPolyline , returning an ARGB (Alpha/Red/Green/Blue) integer color value.

```
public int getLineWidth ()
```

Returns the current line width for this MapPolyline , in pixels.

```
public int getOutlineColor ()
```

Gets the current outline color for this MapPolyline , returning an ARGB (Alpha/Red/Green/Blue) integer color value.

```
public int getOutlineWidth ()
```

Returns the current outline width for this MapPolyline , in pixels.

```
public boolean isDashEnabled ()
```

Returns a boolean indicating whether the MapPolyline appears as a dashed line.

```
public boolean isGeodesicEnabled ()
```

Returns a boolean indicating whether each segment of this GeoPolyline is drawn as a geodesic.

```
public boolean isPerspectiveEnabled ()
```

Returns a boolean indicating whether the MapPolyline appears thinner further away when the map is tilted.

```
public MapPolyline setCapStyle (CapStyle style)
```

Set the MapPolyline rendering cap style.

```
public MapPolyline setDashEnabled (boolean enabled)
```

Sets the appearance of this MapPolyline as either a dashed or solid line.

```
public MapPolyline setDashPrimaryLength (int length)
```

Sets a length, in pixels, for the primary dash segment of a dashed MapPolyline .

```
public MapPolyline setDashSecondaryLength (int length)
```

Sets a length, in pixels, for the secondary (empty) dash segments of a dashed MapPolyline .

```
public void setDepthTestEnabled (boolean enabled)
```

Set whether to render MapPolyline with depth test.

```
public MapPolyline setGeoPolyline (GeoPolyline polyline)
```

Changes the GeoPolyline rendered by this GeoPolyline

```
public MapPolyline setGeodesicEnabled (boolean enabled)
```

Set whether to draw each segment of the represented GeoPolyline as a geodesic.

```
public MapPolyline setLineColor (int color)
```

Sets a line color for this MapPolyline , using an ARGB (Alpha/Red/Green/Blue) integer color value.

## Methods

```
public MapPolyline setLineWidth (int width)
```

Sets a line width, in pixels, for this *MapPolyline* , an int value within the [0..100] range.

```
public MapPolyline setOutlineColor (int color)
```

Sets an outline color for this *MapPolyline* , using an ARGB (Alpha/Red/Green/Blue) integer color value.

```
public MapPolyline setOutlineWidth (int width)
```

Sets an outline width, in pixels, for this *MapPolyline* , an int value within the [0..100] range.

```
public MapPolyline setPerspectiveEnabled (boolean enabled)
```

Sets the width of this *MapPolyline* to be thinner further away when the map is tilted.

## Class Details

A graphical representation of a *GeoPolyline* that can be rendered on a map. A *MapPolyline* has multiple points that combine to create its path.

## Constructor Details

### *MapPolyline* ()

Creates a *MapPolyline* , which is a *MapObject* in the shape of a polyline.

### *MapPolyline* (*GeoPolyline* polyline)

Creates a *MapPolyline* , which is a *MapObject* in the shape of a polyline.

#### Parameters:

- **polyline**  
*GeoPolyline* to construct the *MapPolyline*.

## Method Details

```
public CapStyle getCapStyle ()
```

Get the *MapPolyline* rendering cap style

#### Returns:

*CapStyle* cap style.

```
public int getDashPrimaryLength ()
```

Returns the current length of the primary dash segment of a dashed *MapPolyline* , in pixels.

#### Returns:

The current length of the primary dash

**See also:**

[getDashSecondaryLength\(\)](#)

```
public int getDashSecondaryLength ()
```

Returns the current length of the secondary (empty) dash segments of a dashed `MapPolyline` , in pixels.

**Returns:**

The current length of the empty dash

**See also:**

[getDashPrimaryLength\(\)](#)

```
public boolean getDepthTestEnabled ()
```

Returns a `boolean` indicating whether the `MapPolyline` is rendered with depth test. By default, depth test is disabled.

**Returns:**

True if the `MapPolyline` is rendered with depth test, false otherwise

```
public GeoPolyline getGeoPolyline ()
```

Gets copy of the [GeoPolyline](#) rendered by this `MapPolyline` .

**Returns:**

rendered [GeoPolyline](#).

```
public int getLineColor ()
```

Gets the current line color for this `MapPolyline` , returning an ARGB (Alpha/Red/Green/Blue) integer color value.

**Returns:**

The current ARGB integer color value. The packed integer is made up of 4 bytes: alpha, red, green, blue. Each color component has a value range from [0..255], with 0 meaning no contribution for that component and 255 meaning 100% contribution

**See also:**

[android.graphics.Color](#)

```
public int getLineWidth ()
```

Returns the current line width for this `MapPolyline` , in pixels.

**Returns:**

The current line width for this `MapPolyline`

```
public int getOutlineColor ()
```

Gets the current outline color for this `MapPolyline` , returning an ARGB (Alpha/Red/Green/Blue) integer color value.

**Returns:**

The current ARGB integer color value. The packed integer is made up of 4 bytes: alpha, red, green, blue. Each color component has a value range from [0..255], with 0 meaning no contribution for that component and 255 meaning 100% contribution

**See also:**

[android.graphics.Color](#)

```
public int getOutlineWidth ()
```

Returns the current outline width for this `MapPolyline` , in pixels.

**Returns:**

The current line width for this `MapPolyline`

```
public boolean isDashEnabled ()
```

Returns a `boolean` indicating whether the `MapPolyline` appears as a dashed line. By default, dash is disabled.

**Returns:**

True if the `MapPolyline` is dashed, false otherwise

```
public boolean isGeodesicEnabled ()
```

Returns a `boolean` indicating whether each segment of this `GeoPolyline` is drawn as a geodesic. By default, `GeoDesic` is disabled.

**Returns:**

true if `GeoPolyline` segments are drawn as a geodesic, false otherwise.

```
public boolean isPerspectiveEnabled ()
```

Returns a `boolean` indicating whether the `MapPolyline` appears thinner further away when the map is tilted. By default, perspective is disabled.

**Returns:**

true if the `MapPolyline` has perspective enabled, false otherwise

```
public MapPolyline setCapStyle (CapStyle style)
```

Set the *MapPolyline* rendering cap style.

**Parameters:**

- **style**  
*CapStyle*

**Returns:**

The updated *MapPolyline* itself.

```
public MapPolyline setDashEnabled (boolean enabled)
```

Sets the appearance of this *MapPolyline* as either a dashed or solid line.

**Parameters:**

- **enabled**  
A boolean specifying whether the *MapPolyline* should be dashed

**Returns:**

The updated *MapPolyline* itself.

```
public MapPolyline setDashPrimaryLength (int length)
```

Sets a length, in pixels, for the primary dash segment of a dashed *MapPolyline*. By default, the primary dash length is 1.

**Parameters:**

- **length**  
Desired length of the primary dash

**Returns:**

The updated *MapPolyline* itself.

**Throws:**

- ***IllegalArgumentException***  
if *length* is less than or equal to 0.

**See also:**

[\*setDashSecondaryLength\(int\)\*](#)

```
public MapPolyline setDashSecondaryLength (int length)
```

Sets a length, in pixels, for the secondary (empty) dash segments of a dashed *MapPolyline*. By default, the secondary dash length is 1.

**Parameters:**

- **length**

Desired length of the empty dash

**Returns:**

The updated `MapPolyline` itself.

**Throws:**

- **`IllegalArgumentException`**  
if `length` is less than or equal 0.

**See also:**

[`setDashPrimaryLength\(int\)`](#)

```
public void setDepthTestEnabled (boolean enabled)
```

Set whether to render `MapPolyline` with depth test.

Rendering with depth test should be used if map object altitude is relevant in your application. Rendering objects with different heights while disabling depth test may cause object occlusion.

**Parameters:**

- **enabled**  
true if `MapPolyline` is rendered with depth test

```
public MapPolyline setGeoPolyline (GeoPolyline polyline)
```

Changes the `GeoPolyline` rendered by this `GeoPolyline`

**Parameters:**

- **polyline**  
`GeoPolyline` to be rendered

**Returns:**

The updated `MapPolyline` itself.

```
public MapPolyline setGeodesicEnabled (boolean enabled)
```

Set whether to draw each segment of the represented `GeoPolyline` as a geodesic.

**Parameters:**

- **enabled**  
true if `GeoPolyline` segments will be drawn as a geodesic

**Returns:**

The updated `MapPolyline` itself.

```
public MapPolyline setLineColor (int color)
```

Sets a line color for this *MapPolyline* , using an ARGB (Alpha/Red/Green/Blue) integer color value. The default line color is `Color.BLUE` .

**Parameters:**

- **color**

The ARGB integer color value. The packed integer is made up of 4 bytes: alpha, red, green, blue. Each color component has a value range from [0..255] with 0 meaning no contribution for that component, and 255 meaning 100% contribution

**Returns:**

The updated *MapPolyline* itself.

**See also:**

[android.graphics.Color](#)

```
public MapPolyline setLineWidth (int width)
```

Sets a line width, in pixels, for this *MapPolyline* , an `int` value within the [0..100] range. By default, the line width is 1.

**Parameters:**

- **width**

Desired width of the line defining the *MapPolyline*

**Returns:**

The updated *MapPolyline* itself.

**Throws:**

- **IllegalArgumentException**

if width is out of range.

```
public MapPolyline setOutlineColor (int color)
```

Sets an outline color for this *MapPolyline* , using an ARGB (Alpha/Red/Green/Blue) integer color value. The default line color is `Color.TRANSPARENT` .

**Parameters:**

- **color**

The ARGB integer color value. The packed integer is made up of 4 bytes: alpha, red, green, blue. Each color component has a value range from [0..255] with 0 meaning no contribution for that component, and 255 meaning 100% contribution

**Returns:**

The updated `MapPolyline` itself.

**See also:**

[android.graphics.Color](#)

```
public MapPolyline setOutlineWidth (int width)
```

Sets an outline width, in pixels, for this `MapPolyline`, an `int` value within the [0..100] range. By default, the line width is 0.

**Parameters:**

- **width**  
Desired width of the outline defining the `MapPolyline`

**Returns:**

The updated `MapPolyline` itself.

**Throws:**

- `IllegalArgumentException`  
if width is out of range.

```
public MapPolyline setPerspectiveEnabled (boolean enabled)
```

Sets the width of this `MapPolyline` to be thinner further away when the map is tilted.

**Parameters:**

- **enabled**  
A boolean specifying whether the `MapPolyline` should have perspective enabled

**Returns:**

The updated `MapPolyline` itself.

## CapStyle

The enumeration `CapStyle` is a member of `com.here.android.mpa.mapping.MapPolyline`.

### Enumeration Summary

```
public static final enumeration MapPolyline.CapStyle
```

```
extends java.lang.Enum, java.lang.Object
```

Line ending cap rendering styles

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 513: Enum Constants in CapStyle

Fields
<pre>public static final CapStyle BUTT</pre> <p>The line ends exactly where the endpoint is located.</p>
<pre>public static final CapStyle ROUND</pre> <p>Adding a round cap to the endpoint.</p>

## Method Summary

Table 514: Methods in CapStyle

Methods
<pre>public static CapStyle toCapStyle (int style)</pre>
<pre>public int value ()</pre>
<pre>public static CapStyle valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static MapPolyline.CapStyle[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Line ending cap rendering styles

### Enum Constant Details

```
public static final CapStyle BUTT
```

The line ends exactly where the endpoint is located.

```
public static final CapStyle ROUND
```

Adding a round cap to the endpoint.

### Method Details

```
public static CapStyle toCapStyle (int style)
```

Parameters:

- `style`

```
public int value ()
```

```
public static CapStyle valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

**Parameters:**

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static MapPolyline.CapStyle[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## MapProxyObject

The class *MapProxyObject* is a member of *com.here.android.mpa.mapping*.

### Class Summary

```
public abstract class MapProxyObject
```

```
extends com.here.android.mpa.common.ViewObject, java.lang.Object
```

Represents a base interface for all view objects rendered as part of the map.

[For complete information, see the section *Class Details*]

### Nested Class Summary

Table 515: Nested Classes in MapProxyObject

Nested Classes
<pre>public static final enumeration <i>MapProxyObject.Type</i></pre> <p>Represents values describing the types of <i>MapProxyObject</i> objects that can be added to a <i>Map</i>.</p>

### Method Summary

Table 516: Methods in MapProxyObject

Methods
<pre>public <i>Type</i> <i>getType</i> ()</pre> <p>Returns the type of object that the <i>MapProxyObject</i> represents.</p>

## Class Details

Represents a base interface for all view objects rendered as part of the map. A proxy object may contain special information depending on its type (for example, `TransitStopObject` may provide transit stop-related information), but it cannot be created or modified.

This interface serves as a generalization for several more specified proxy object types, bundling their common properties.

## Method Details

```
public Type getType ()
```

Returns the type of object that the `MapProxyObject` represents.

### Returns:

The `MapProxyObject.Type`

## Type

The enumeration `Type` is a member of `com.here.android.mpa.mapping.MapProxyObject`.

## Enumeration Summary

```
public static final enumeration MapProxyObject.Type
```

```
extends java.lang.Enum, java.lang.Object
```

Represents values describing the types of `MapProxyObject` objects that can be added to a `Map`.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 517: Enum Constants in `Type`

Fields
<pre>public static final <i>Type</i> UNKNOWN</pre> <p>An unknown type of <code>MapProxyObject</code>.</p>
<pre>public static final <i>Type</i> SAFETY_SPOT</pre> <p>A <code>SafetySpotObject</code>.</p>
<pre>public static final <i>Type</i> TRAFFIC_EVENT</pre> <p>A <code>TrafficEventObject</code>.</p>
<pre>public static final <i>Type</i> TRANSIT_ACCESS</pre> <p>A <code>TransitAccessObject</code>.</p>

## Fields

public static final *Type* **TRANSIT\_LINE**

A TransitLineObject .

public static final *Type* **TRANSIT\_LINE\_SEGMENT**

A TransitLineSegmentObject .

public static final *Type* **TRANSIT\_STOP**

A TransitStopObject .

public static final *Type* **EXTRUDED\_BUILDING**

A MapBuildingObject .

public static final *Type* **MAP\_CARTO\_MARKER**

A MapCartoMarker .

public static final *Type* **CLUSTER\_MARKER**

A com.here.android.mpa.cluster.ClusterViewObject .

## Method Summary

Table 518: Methods in Type

### Methods

public static *Type* **valueOf** (String name)

This method retrieves the enumeration value that matches the name specified by the caller.

public static *MapProxyObject.Type[]* **values** ()

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Represents values describing the types of *MapProxyObject* objects that can be added to a *Map*.

### Enum Constant Details

public static final *Type* **UNKNOWN**

An unknown type of MapProxyObject .

public static final *Type* **SAFETY\_SPOT**

A SafetySpotObject . Not supported.

public static final *Type* **TRAFFIC\_EVENT**

A TrafficEventObject .

```
public static final Type TRANSIT_ACCESS  
A TransitAccessObject.
```

```
public static final Type TRANSIT_LINE  
A TransitLineObject.
```

```
public static final Type TRANSIT_LINE_SEGMENT  
A TransitLineSegmentObject.
```

```
public static final Type TRANSIT_STOP  
A TransitStopObject.
```

```
public static final Type EXTRUDED_BUILDING  
A MapBuildingObject.
```

```
public static final Type MAP_CARTO_MARKER  
A MapCartoMarker.
```

```
public static final Type CLUSTER_MARKER  
A com.here.android.mpa.cluster.ClusterViewObject.
```

## Method Details

```
public static Type valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static MapProxyObject.Type[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## MapRasterTileSource

The class *MapRasterTileSource* is a member of *com.here.android.mpa.mapping*.

### Class Summary

public abstract class **MapRasterTileSource**

*extends java.lang.Object*

Represents an interface for a map raster tile source, used to render custom tile images on top of a *Map*.

[For complete information, see the section *Class Details*]

### Nested Class Summary

Table 519: Nested Classes in MapRasterTileSource

Nested Classes
public static final class <i>MapRasterTileSource.MapTileSystemHelper</i> Represents a helper class for converting raster tile coordinates to other tile system values.
public static class <i>MapRasterTileSource.TileResult</i> Result class for getting tile.
public static final enumeration <i>MapRasterTileSource.Transparency</i> Represents values describing the state of raster tile image transparency.

### Constructor Summary

Table 520: Constructors in MapRasterTileSource

Constructors
<i>MapRasterTileSource</i> ()

### Method Summary

Table 521: Methods in MapRasterTileSource

Methods
public <i>GeoBoundingBox</i> <i>getBoundingArea</i> () Gets the <i>GeoBoundingBox</i> representing the bounding area within which raster tiles are visible.
public int <i>getCacheExpiration</i> () Get the cache expiration time
public <i>MapOverlayType</i> <i>getOverlayType</i> () Gets the raster tile overlay type.

**Methods**

```
public int getTileSize ()
```

Gets the raster tile image size, in pixels.

```
public TileResult getTileWithError (int x, int y, int zoomLevel)
```

Method to be overwritten by derived class to get a tile.

```
public int getZIndex ()
```

Gets the current z-index (stacking order) of the `MapObject` .

```
public abstract boolean hasTile (int x, int y, int zoomLevel)
```

Abstract method to be overwritten by derived class to check if a tile exists.

```
public boolean hasTransparency ()
```

Determines whether raster tile images have transparency enabled.

```
public MapRasterTileSource hideAtZoomLevel (int level)
```

Hides tiles at the specified zoom level of the `Map` .

```
public MapRasterTileSource hideAtZoomRange (int beginZoomLevel, int endZoomLevel)
```

Hides tiles within a given zoom level range of the `Map` .

```
public boolean isCachingEnabled ()
```

Get whether tiles are cached to the file system

```
public boolean isShownAtZoomLevel (int zoomLevel)
```

Determines whether raster tiles are shown at the specified zoom level of the `Map` .

```
public MapRasterTileSource setBoundingArea (GeoBoundingBox boundingBox)
```

Sets a bounding area within which raster tiles are visible.

```
public MapRasterTileSource setCacheExpiration (int expireSeconds)
```

Set the cache expiration time

```
public MapRasterTileSource setCachePrefix (String cache)
```

Set the cache file prefix

```
public MapRasterTileSource setCachingEnabled (boolean enabled)
```

Set whether tiles are cached to the file system.

```
public MapRasterTileSource setOverlayType (MapOverlayType newValue)
```

Sets a `MapOverlayType` for the `MapRasterTileSource` .

```
public MapRasterTileSource setTileSize (int newValue)
```

Sets a size, in pixels, for the raster tile image.

```
public MapRasterTileSource setTransparency (Transparency value)
```

Sets a `Transparency` state for raster tile image.

```
public MapRasterTileSource setZIndex (int zIndex)
```

Sets a z-index (stacking order) value for the `MapObject` .

## Methods

```
public MapRasterTileSource showAtZoomLevel (int level)
```

Shows tiles at the specified zoom level of the Map .

```
public MapRasterTileSource showAtZoomRange (int beginZoomLevel, int endZoomLevel)
```

Shows tiles within a given zoom level range of the Map .

## Class Details

Represents an interface for a map raster tile source, used to render custom tile images on top of a *Map*.

Default attribute values are as follows:

Overlay type:	<code>RasterTileOverlayType.BACKGROUND_REPLACEMENT</code>
Transparency:	<code>Transparency.TRANSPARENCY_ON</code>
Tile size:	256x256 pixels
Valid zoom levels:	0-20 (all zoom levels)
Bounding area:	Top-Left coordinate: (-180.0, 90.0), Bottom-Right coordinate: (179.99, -90.0)

Note: the currently supported pixel format for the tile images is RGBA.

## Constructor Details

`MapRasterTileSource ()`

## Method Details

```
public GeoBoundingBox getBoundingArea ()
```

Gets the *GeoBoundingBox* representing the bounding area within which raster tiles are visible.

### Returns:

The raster tile bounding area

```
public int getCacheExpiration ()
```

Get the cache expiration time

### Returns:

Expire time in seconds

```
public MapOverlayType getOverlayType ()
```

Gets the raster tile overlay type.

### Returns:

The raster tile overlay type, a *MapOverlayType* value

```
public int getTileSize ()
```

Gets the raster tile image size, in pixels.

**Returns:**

The size of the raster tile image

```
public TileResult getTileWithError (int x, int y, int zoomLevel)
```

Method to be overwritten by derived class to get a tile.

**Parameters:**

- **x**  
X coordinate
- **y**  
Y coordinate
- **zoomLevel**  
zoom level

**Returns:**

A *TileResult* representing tile data and operation error. Check *TileResult*#*getError()* to check for error. Check *TileResult*#*getData()* to get *RasterTile*

```
public int getZIndex ()
```

Gets the current z-index (stacking order) of the *MapObject* .

**Returns:**

The current ordinal z-index number

```
public abstract boolean hasTile (int x, int y, int zoomLevel)
```

Abstract method to be overwritten by derived class to check if a tile exists.

**Parameters:**

- **x**  
X coordinate
- **y**  
Y coordinate
- **zoomLevel**  
zoom level

**Returns:**

true if the tile exists, false otherwise

```
public boolean hasTransparency ()
```

Determines whether raster tile images have transparency enabled.

**Returns:**

True if raster tile images are set to *Transparency.TRANSPARENCY\_ON*, false otherwise

```
public MapRasterTileSource hideAtZoomLevel (int level)
```

Hides tiles at the specified zoom level of the Map .

**Parameters:**

- **level**  
Zoom level at which tiles are to be hidden (see *getMaxZoomLevel()* and *getMinZoomLevel()* to retrieve the supported zoom level range)

**Returns:**

The updated MapRasterTileSource itself.

```
public MapRasterTileSource hideAtZoomRange (int beginZoomLevel, int endZoomLevel)
```

Hides tiles within a given zoom level range of the Map .

**Parameters:**

- **beginZoomLevel**  
Zoom level representing the beginning of the range within which tiles are to be hidden (see *getMaxZoomLevel()* and *getMinZoomLevel()* to retrieve the supported zoom level range).
- **endZoomLevel**  
Zoom level representing the end of the range within which tiles are to be hidden

**Returns:**

The updated MapRasterTileSource itself (see *getMaxZoomLevel()* and *getMinZoomLevel()* to retrieve the supported zoom level range).

```
public boolean isCachingEnabled ()
```

Get whether tiles are cached to the file system

**Returns:**

True of tiles are cached. False otherwise.

```
public boolean isShownAtZoomLevel (int zoomLevel)
```

Determines whether raster tiles are shown at the specified zoom level of the Map .

**Parameters:**

- **zoomLevel**  
Zoom level to check for raster tile visibility (see [getZoomLevel\(\)](#) to retrieve the current zoom level of the Map).

**Returns:**

True if raster tiles are shown at the specified zoom level, false otherwise

```
public MapRasterTileSource setBoundingBox (GeoBoundingBox boundingBox)
```

Sets a bounding area within which raster tiles are visible.

**Parameters:**

- **boundingBox**  
A [GeoBoundingBox](#) representing the bounding area of visible raster tiles

**Returns:**

The updated `MapRasterTileSource` itself.

```
public MapRasterTileSource setCacheExpiration (int expireSeconds)
```

Set the cache expiration time

**Parameters:**

- **expireSeconds**  
Expire time in seconds

**Returns:**

The updated `MapRasterTileSource` itself.

```
public MapRasterTileSource setCachePrefix (String cache)
```

Set the cache file prefix

**Parameters:**

- **cache**  
Prefix tag

**Returns:**

The updated `MapRasterTileSource` itself.

```
public MapRasterTileSource setCachingEnabled (boolean enabled)
```

Set whether tiles are cached to the file system.

**Parameters:**

- **enabled**  
True to cache, False otherwise

**Returns:**

The updated *MapRasterTileSource* itself.

```
public MapRasterTileSource setOverlayType (MapOverlayType newValue)
```

Sets a *MapOverlayType* for the *MapRasterTileSource* .

**Parameters:**

- **newValue**  
A *MapOverlayType* value representing the desired raster tile overlay type

**Returns:**

The updated *MapRasterTileSource* itself.

```
public MapRasterTileSource setTileSize (int newValue)
```

Sets a size, in pixels, for the raster tile image.

**Parameters:**

- **newValue**  
Desired size of the raster tile image

**Returns:**

The updated *MapRasterTileSource* itself.

```
public MapRasterTileSource setTransparency (Transparency value)
```

Sets a *Transparency* state for raster tile image.

**Parameters:**

- **value**  
A *Transparency* value representing the desired raster tile image transparency

**Returns:**

The updated *MapRasterTileSource* itself.

```
public MapRasterTileSource setZIndex (int zIndex)
```

Sets a z-index (stacking order) value for the `MapObject` .

**Parameters:**

- **zIndex**

A new z-index value for the `MapObject`, a 16-bit `int` within the range of [0..655xx]

**Returns:**

The updated `MapRasterTileSource` itself.

```
public MapRasterTileSource showAtZoomLevel (int level)
```

Shows tiles at the specified zoom level of the `Map` .

**Parameters:**

- **level**

Zoom level at which tiles are to be shown (see [getMaxZoomLevel\(\)](#) and [getMinZoomLevel\(\)](#) to retrieve the supported zoom level range).

**Returns:**

The updated `MapRasterTileSource` itself.

```
public MapRasterTileSource showAtZoomRange (int beginZoomLevel, int endZoomLevel)
```

Shows tiles within a given zoom level range of the `Map` .

**Parameters:**

- **beginZoomLevel**

Zoom level representing the beginning of the range within which tiles are to be shown (see [getMaxZoomLevel\(\)](#) and [getMinZoomLevel\(\)](#) to retrieve the supported zoom level range).

- **endZoomLevel**

Zoom level representing the end of the range within which tiles are to be shown

**Returns:**

The updated `MapRasterTileSource` itself (see [getMaxZoomLevel\(\)](#) and [getMinZoomLevel\(\)](#) to retrieve the supported zoom level range).

## MapTileSystemHelper

The class `MapTileSystemHelper` is a member of `com.here.android.mpa.mapping.MapRasterTileSource`.

### Class Summary

```
public static final class MapRasterTileSource.MapTileSystemHelper
```

*extends java.lang.Object*

Represents a helper class for converting raster tile coordinates to other tile system values.

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 522: Constructors in MapTileSystemHelper

Constructors
<a href="#">MapTileSystemHelper</a> ()

## Method Summary

Table 523: Methods in MapTileSystemHelper

Methods
public static String <a href="#">tileXYToQuadKey</a> (int x, int y, int zoomLevel) Converts a raster tile's X-coordinate and Y-coordinate into an equivalent QuadKey at a specified zoom level.

## Class Details

Represents a helper class for converting raster tile coordinates to other tile system values.

## Constructor Details

[MapTileSystemHelper](#) ()

## Method Details

public static String [tileXYToQuadKey](#) (int x, int y, int zoomLevel)

Converts a raster tile's X-coordinate and Y-coordinate into an equivalent QuadKey at a specified zoom level.

See also [The Tile Coordinates and Quadkeys](#).

### Parameters:

- **x**  
Current X-coordinate of the tile
- **y**  
Current Y-coordinate of the tile
- **zoomLevel**  
Desired zoom level, an int within a range from 1 (lowest detail) to 20 (highest detail)

### Returns:

The QuadKey

## TileResult

The class *TileResult* is a member of *com.here.android.mpa.mapping.MapRasterTileSource*.

### Class Summary

public static class **MapRasterTileSource.TileResult**

*extends java.lang.Object*

Result class for getting tile.

[For complete information, see the section [Class Details](#)]

**See also:**

[getTileWithError\(int, int, int\)](#)

### Nested Class Summary

Table 524: Nested Classes in TileResult

Nested Classes
public static final enumeration <a href="#">MapRasterTileSource.TileResult.Error</a> Error code for raster tile result.

### Constructor Summary

Table 525: Constructors in TileResult

Constructors
<a href="#">TileResult</a> ( <a href="#">Error</a> error, byte[] data)

### Method Summary

Table 526: Methods in TileResult

Methods
public byte[] <a href="#">getData</a> () Get the retrieved tile.
public <a href="#">Error</a> <a href="#">getError</a> () Get the <a href="#">Error</a> for get tile operation

### Class Details

Result class for getting tile.

See also:

[getTileWithError\(int, int, int\)](#)

## Constructor Details

**TileResult** (*Error* error, byte[] data)

Parameters:

- **error**
- **data**

## Method Details

public byte[] **getData** ()

Get the retrieved tile.

Returns:

RasterTile

public *Error* **getError** ()

Get the *Error* for get tile operation

Returns:

Error encountered during get tile operation

## Error

The enumeration *Error* is a member of *com.here.android.mpa.mapping.MapRasterTileSource.TileResult*.

## Enumeration Summary

public static final enumeration **MapRasterTileSource.TileResult.Error**

*extends java.lang.Enum, java.lang.Object*

Error code for raster tile result.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 527: Enum Constants in Error

Fields
public static final <i>Error</i> <b>NONE</b>

## Fields

```
public static final Error NOT_READY
```

```
public static final Error NOT_FOUND
```

## Method Summary

Table 528: Methods in Error

### Methods

```
public static Error valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static MapRasterTileSource.TileResult.Error[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Error code for raster tile result.

## Enum Constant Details

```
public static final Error NONE
```

```
public static final Error NOT_READY
```

```
public static final Error NOT_FOUND
```

## Method Details

```
public static Error valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static MapRasterTileSource.TileResult.Error[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Transparency

The enumeration *Transparency* is a member of *com.here.android.mpa.mapping.MapRasterTileSource*.

### Enumeration Summary

public static final enumeration **MapRasterTileSource.Transparency**

extends *java.lang.Enum*, *java.lang.Object*

Represents values describing the state of raster tile image transparency.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 529: Enum Constants in Transparency

Fields
public static final <i>Transparency</i> <b>ON</b> Raster tile image transparency is enabled.
public static final <i>Transparency</i> <b>OFF</b> Raster tile image transparency is disabled.

### Method Summary

Table 530: Methods in Transparency

Methods
public static <i>Transparency</i> <b>valueOf</b> ( <b>String</b> name) This method retrieves the enumeration value that matches the name specified by the caller.
public static <i>MapRasterTileSource.Transparency</i> [] <b>values</b> () This method retrieves an array of constants of the given enum type in the order in which they are declared.

### Enumeration Details

Represents values describing the state of raster tile image transparency.

### Enum Constant Details

public static final *Transparency* **ON**

Raster tile image transparency is enabled.

public static final *Transparency* **OFF**

Raster tile image transparency is disabled.

### Method Details

```
public static Transparency valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static MapRasterTileSource.Transparency[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## MapRoute

The class *MapRoute* is a member of *com.here.android.mpa.mapping* .

### Class Summary

```
public final class MapRoute
```

*extends* *com.here.android.mpa.mapping.MapObject*, *com.here.android.mpa.common.ViewObject*, *java.lang.Object*

Represents a *Route* that can be displayed on a *Map*.

[For complete information, see the section *Class Details*]

### Nested Class Summary

Table 531: Nested Classes in MapRoute

Nested Classes
<pre>public static final enumeration <i>MapRoute.RenderType</i></pre> <p>Render style of the route.</p>

## Constructor Summary

Table 532: Constructors in MapRoute

Constructors
<p><b>MapRoute</b> ()</p> <p>Creates a MapRoute object.</p>
<p><b>MapRoute</b> (<i>Route</i> route)</p> <p>Creates a MapRoute with a specified Route .</p>

## Method Summary

Table 533: Methods in MapRoute

Methods
<p>public int <b>getColor</b> ()</p> <p>Returns the current ARGB (Alpha/Red/Green/Blue) integer color value used to display this route.</p>
<p>public <i>RenderType</i> <b>getRenderType</b> ()</p> <p>Returns the RenderType associated with this MapRoute .</p>
<p>public <i>Route</i> <b>getRoute</b> ()</p> <p>Returns the Route that has been displayed on the Map .</p>
<p>public int <b>getTraveledColor</b> ()</p> <p>Returns the current ARGB (Alpha/Red/Green/Blue) integer color value used to display the traveled route.</p>
<p>public boolean <b>isManeuverNumberVisible</b> ()</p> <p>Returns a boolean indicating whether maneuver numbers are displayed along with this route.</p>
<p>public boolean <b>isTrafficEnabled</b> ()</p> <p>Checks if traffic is enabled for this route.</p>
<p>public <i>MapRoute</i> <b>setColor</b> (int argbColor)</p> <p>Sets a color for displaying the route, using an ARGB (Alpha/Red/Green/Blue) integer color value.</p>
<p>public <i>MapRoute</i> <b>setManeuverNumberVisible</b> (boolean visible)</p> <p>Sets maneuver numbers to be either displayed along with this route or not displayed.</p>
<p>public <i>MapRoute</i> <b>setRenderType</b> (<i>RenderType</i> type)</p> <p>Sets the RenderType associated with this MapRoute .</p>
<p>public <i>MapRoute</i> <b>setRoute</b> (<i>Route</i> route)</p> <p>Sets a Route that will be displayed on the Map .</p>
<p>public <i>MapRoute</i> <b>setTrafficEnabled</b> (boolean enable)</p> <p>Enable display of traffic on this MapRoute .</p>
<p>public <i>MapRoute</i> <b>setTraveledColor</b> (int argbColor)</p> <p>Sets a color for displaying the traveled route, using an ARGB (Alpha/Red/Green/Blue) integer color value.</p>

## Class Details

Represents a *Route* that can be displayed on a *Map*.

## Constructor Details

### MapRoute ()

Creates a MapRoute object.

### MapRoute (*Route* route)

Creates a MapRoute with a specified Route .

Typically, a MapRoute is created after a Route has been calculated. An application can pass a calculated Route as a parameter to this method instead of making an explicit call to *setRoute(Route)*. Adding the new MapRoute object to a Map can be done by way of the *addMapObject(MapObject)* method.

#### Parameters:

- **route**  
A calculated Route used to set to the MapRoute

## Method Details

### public int getColor ()

Returns the current ARGB (Alpha/Red/Green/Blue) integer color value used to display this route.

If *MapRoute.RenderType* is set to *USER\_DEFINED* getting this property will return the value you set. Otherwise, will return pre-defined value for map scheme. If *MapRoute* is not added to map, 0 will be returned.

Note: Alpha-value transparency is supported.

#### Returns:

The current ARGB integer color value. The packed integer is made up of 4 bytes: alpha, red, green, blue. Each color component has a value range from [0..255], with 0 meaning no contribution for that component and 255 meaning 100% contribution

#### See also:

[android.graphics.Color](#)

### public *RenderType* getRenderType ()

Returns the RenderType associated with this MapRoute .

Default value is *PRIMARY*.

#### Returns:

The RenderType associated with the *MapRoute*.

```
public Route getRoute ()
```

Returns the *Route* that has been displayed on the *Map* .

**Returns:**

The *Route*

```
public int getTraveledColor ()
```

Returns the current ARGB (Alpha/Red/Green/Blue) integer color value used to display the traveled route.

If *MapRoute.RenderType* is set to *USER\_DEFINED* getting this property will return the value you set. Otherwise, will return pre-defined value for map scheme. If *MapRoute* is not added to map, 0 will be returned.

Note: Alpha-value transparency is supported.

**Returns:**

The current ARGB integer color value. The packed integer is made up of 4 bytes: alpha, red, green, blue. Each color component has a value range from [0..255], with 0 meaning no contribution for that component and 255 meaning 100% contribution.

**See also:**

[android.graphics.Color](#)

```
public boolean isManeuverNumberVisible ()
```

Returns a *boolean* indicating whether maneuver numbers are displayed along with this route.

**Returns:**

True if maneuver numbers are displayed with the route, false otherwise

```
public boolean isTrafficEnabled ()
```

Checks if traffic is enabled for this route.

**Returns:**

True if traffic is enabled for this *MapRoute*, false otherwise.

```
public MapRoute setColor (int argbColor)
```

Sets a color for displaying the route, using an ARGB (Alpha/Red/Green/Blue) integer color value.

Setting this property will change the color of the *MapRoute* and change the *RenderType* to *USER\_DEFINED*. Calling *setRenderType(MapRoute.RenderType)* other than *USER\_DEFINED* will reset any color previously set by using this method.

Note: Alpha-value transparency is supported.

**Parameters:**

- **argbColor**

The ARGB integer color value. The packed integer is made up of 4 bytes: alpha, red, green, blue. Each color component has a value range from [0..255], with 0 meaning no contribution for that component and 255 meaning 100% contribution.

**Returns:**

The updated `MapRoute` itself.

**See also:**

[android.graphics.Color](#)

```
public MapRoute setManeuverNumberVisible (boolean visible)
```

Sets maneuver numbers to be either displayed along with this route or not displayed. By default, maneuver number is invisible.

**Parameters:**

- **visible**

A boolean specifying whether maneuver numbers are displayed

**Returns:**

The updated `MapRoute` itself.

```
public MapRoute setRenderType (RenderType type)
```

Sets the `RenderType` associated with this `MapRoute` .

Note: setting `setColor(int)` or `setTraveledColor(int)` will reset `MapRoute.RenderType` to `USER_DEFINED`.

Default value is `PRIMARY`.

Note: `MapRoute` must be added to a `Map` before calling this method. Otherwise, its value will not be changed.

**Parameters:**

- **type**

The `RenderType` to be used.

**Returns:**

The updated `MapRoute` itself.

**Throws:**

- **IllegalArgumentException**  
if `type` is invalid.
- **IllegalStateException**  
if `MapRoute` is not added to `Map`.

```
public MapRoute setRoute (Route route)
```

Sets a *Route* that will be displayed on the *Map* .

**Parameters:**

- **route**  
A *Route* representing the route to be displayed on the *Map*.

**Returns:**

The updated *MapRoute* itself.

```
public MapRoute setTrafficEnabled (boolean enable)
```

Enable display of traffic on this *MapRoute* . By default traffic on route is disabled.

Note: Truck routes and public transport timetable routes are unsupported.

**Parameters:**

- **enable**  
True will display traffic if *ONROUTE* and *setTrafficInfoVisible(boolean)* have been enabled. False will hide traffic on route rendering for this route.

**Returns:**

The updated *MapRoute* itself.

```
public MapRoute setTraveledColor (int argbColor)
```

Sets a color for displaying the traveled route, using an ARGB (Alpha/Red/Green/Blue) integer color value.

Setting this property will change the traveled color of the *MapRoute* and change the *RenderType* to *USER\_DEFINED*. Calling *setRenderType(MapRoute.RenderType)* other than *USER\_DEFINED* will reset any color previously set by using this method.

*setTraveledColor(int)* is not supported by Transit and UrbanMobility routes.

Note: Alpha-value transparency is supported.

**Parameters:**

- **argbColor**  
The ARGB integer color value. The packed integer is made up of 4 bytes: alpha, red, green, blue. Each color component has a value range from [0..255], with 0 meaning no contribution for that component and 255 meaning 100% contribution.

**Returns:**

The updated *MapRoute* itself.

**See also:**

[android.graphics.Color](#)

## RenderType

The enumeration *RenderType* is a member of *com.here.android.mpa.mapping.MapRoute*.

### Enumeration Summary

public static final enumeration **MapRoute.RenderType**

*extends* *java.lang.Enum*, *java.lang.Object*

Render style of the route.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 534: Enum Constants in RenderType

Fields
<pre>public static final RenderType PRIMARY</pre> <p>Predefined "Primary" route style with fixed color.</p>
<pre>public static final RenderType SECONDARY</pre> <p>Predefined "Secondary" route style with fixed color.</p>
<pre>public static final RenderType TRAVELED</pre> <p><b>Deprecated: As of SDK 3.6.</b></p> <p>Predefined "Traveled" route style with fixed colors.</p>
<pre>public static final RenderType USER_DEFINED</pre> <p>Configurable custom route style.</p>

### Method Summary

Table 535: Methods in RenderType

Methods
<pre>public void setValue (int val)</pre> <p>Please contact HERE technical support if you require a custom configuration.</p>
<pre>public int value ()</pre>
<pre>public static RenderType valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static MapRoute.RenderType[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Render style of the route.

Note: route render style is defined per map scheme.

## Enum Constant Details

```
public static final RenderType PRIMARY
```

Predefined "Primary" route style with fixed color.

```
public static final RenderType SECONDARY
```

Predefined "Secondary" route style with fixed color. Designed for rendering alternate routes.

```
public static final RenderType TRAVELED
```

Deprecated: As of SDK 3.6.

Use `setTraveledColor(int)`.

Predefined "Traveled" route style with fixed colors. Renders the traveled and remaining sections of the route in different colors.

```
public static final RenderType USER_DEFINED
```

Configurable custom route style. Use this render type to customize the route colors.

## Method Details

```
public void setValue (int val)
```

Please contact HERE technical support if you require a custom configuration.

### Parameters:

- `val`  
*MapRoute.RenderType* value.

```
public int value ()
```

```
public static RenderType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- `name`

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static MapRoute.RenderType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## MapScreenMarker

The class *MapScreenMarker* is a member of *com.here.android.mpa.mapping* .

### Class Summary

```
public final class MapScreenMarker
```

extends *com.here.android.mpa.mapping.MapObject*, *com.here.android.mpa.common.ViewObject*,  
*java.lang.Object*

Represents a marker used to display an icon at a screen position on a map.

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 536: Constructors in MapScreenMarker

Constructors
<pre><i>MapScreenMarker</i> ()</pre> <p>Default constructor.</p>
<pre><i>MapScreenMarker</i> (PointF position, <i>Image</i> icon)</pre> <p>Constructor</p>

### Method Summary

Table 537: Methods in MapScreenMarker

Methods
<pre>public PointF <i>getAnchorPoint</i> ()</pre> <p>Gets the anchor point for the MapScreenMarker .</p>
<pre>public <i>Image</i> <i>getIcon</i> ()</pre> <p>Gets the icon image for the MapScreenMarker .</p>
<pre>public PointF <i>getScreenCoordinate</i> ()</pre> <p>Gets the screen location of the MapScreenMarker .</p>

## Methods

```
public float getTransparency ()
```

Gets the current transparency level of the MapScreenMarker .

```
public MapScreenMarker setAnchorPoint (PointF anchor)
```

Sets an anchor point for the MapScreenMarker .

```
public MapScreenMarker setIcon (Image icon)
```

Sets an icon image for the MapScreenMarker .

```
public MapScreenMarker setScreenCoordinate (PointF position)
```

Sets the screen location of the MapScreenMarker .

```
public MapScreenMarker setTransparency (float alpha)
```

Sets a transparency level, within the range of [0..1], for the MapScreenMarker .

## Class Details

Represents a marker used to display an icon at a screen position on a map. The marker stays at its screen location regardless of map movements such as panning and rotation.

MapScreenMarker are selectable [MapObjects](#).

## Constructor Details

### MapScreenMarker ()

Default constructor. Call [setIcon\(Image\)](#) and [setAnchorPoint\(PointF\)](#) to place the marker.

### MapScreenMarker (PointF position, Image icon)

Constructor

#### Parameters:

- **position**  
Anchor position
- **icon**  
An [Image](#) representing the icon. @see

#### See also:

[setAnchorPoint\(PointF\)](#)

[setIcon\(Image\)](#)

## Method Details

```
public PointF getAnchorPoint ()
```

Gets the anchor point for the `MapScreenMarker` .

By default, the `MapScreenMarker` is anchored at the center of the icon image.

**Returns:**

A `PointF` representing the anchor point of the `MapScreenMarker`.

```
public Image getIcon ()
```

Gets the icon image for the `MapScreenMarker` .

**Returns:**

An *Image* representing the icon.

```
public PointF getScreenCoordinate ()
```

Gets the screen location of the `MapScreenMarker` .

**Returns:**

A `PointF` representing the screen location of the marker.

```
public float getTransparency ()
```

Gets the current transparency level of the `MapScreenMarker` .

The transparency level is only precise to two decimal places due to numerical operations performed internally when rendering the map.

**Returns:**

The current transparency level of the `MapScreenMarker`.

```
public MapScreenMarker setAnchorPoint (PointF anchor)
```

Sets an anchor point for the `MapScreenMarker` .

The marker is drawn with the specified pixel offset from its *getScreenCoordinate()* position. To clear an anchor set previously, pass a `PointF` to this method with an X-coordinate equal to half the width of the marker and a Y-coordinate equal to half the height of the marker.

By default, the `MapScreenMarker` is anchored at the center of the icon image.

**Parameters:**

- **anchor**

A `PointF` representing the anchor point of the `MapScreenMarker`.

**Returns:**

The updated `MapScreenMarker` itself.

```
public MapScreenMarker setIcon (Image icon)
```

Sets an icon image for the *MapScreenMarker* .

**Parameters:**

- **icon**  
An *Image* representing the icon.

**Returns:**

The updated *MapScreenMarker* object itself.

```
public MapScreenMarker setScreenCoordinate (PointF position)
```

Sets the screen location of the *MapScreenMarker* .

**Parameters:**

- **position**  
A *PointF*

**Returns:**

The updated *MapScreenMarker* itself.

```
public MapScreenMarker setTransparency (float alpha)
```

Sets a transparency level, within the range of [0..1], for the *MapScreenMarker* .

**Parameters:**

- **alpha**  
Desired alpha value for the *MapScreenMarker*, 0 for fully transparent, 1 for fully opaque. Default value is 1.

**Returns:**

The modified *MapScreenMarker* itself.

**Throws:**

- **IllegalArgumentException**  
if alpha is not within the range [0..1]

## MapState

The class *MapState* is a member of [com.here.android.mpa.mapping](http://com.here.android.mpa.mapping) .

### Class Summary

```
public final class MapState
```

*implements android.os.Parcelable*

*extends java.lang.Object*

Represents a composite class comprised of tilt, orientation, zoom level and center point for a [Map](#).

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 538: Constructors in MapState

Constructors
<p><b>MapState</b> (float tilt, float orientation, double zoomLevel, <a href="#">GeoCoordinate</a> center)</p> <p>A constructor that initializes state values for tilt, orientation, zoom level, and map center.</p>

## Field Summary

Table 539: Fields in MapState

Fields
<p>public static final android.os.Parcelable.Creator <a href="#">MapState</a> <b>CREATOR</b></p>

## Method Summary

Table 540: Methods in MapState

Methods
<p>public int <a href="#">describeContents</a> ()</p> <p>For documentation, see <a href="#">android.os.Parcelable.describeContents()</a></p>
<p>public <a href="#">GeoCoordinate</a> <a href="#">getCenter</a> ()</p> <p>Returns the <a href="#">GeoCoordinate</a> representing the center position.</p>
<p>public float <a href="#">getOrientation</a> ()</p> <p>Returns the orientation, in degrees relative to true-north (which is designated as being an orientation of 0 degrees).</p>
<p>public float <a href="#">getTilt</a> ()</p> <p>Returns the tilt, in degrees.</p>
<p>public double <a href="#">getZoomLevel</a> ()</p> <p>Returns the zoom level.</p>
<p>public void <a href="#">writeToParcel</a> (Parcel dest, int flags)</p> <p>For documentation, see <a href="#">android.os.Parcelable.writeToParcel()</a></p>

## Class Details

Represents a composite class comprised of tilt, orientation, zoom level and center point for a [Map](#). This object can be retrieved by calling [getMapState\(\)](#).

## Constructor Details

`MapState` (`float tilt`, `float orientation`, `double zoomLevel`, [GeoCoordinate center](#))

A constructor that initializes state values for tilt, orientation, zoom level, and map center.

### Parameters:

- **tilt**  
tilt value, in degrees
- **orientation**  
orientation value, in degrees, where true-north is 0 degrees
- **zoomLevel**  
zoom level value
- **center**  
A [GeoCoordinate](#) representing the center of the map

### See also:

[setTilt\(float\)](#)

[setOrientation\(float\)](#)

[setZoomLevel\(double\)](#)

## Field Details

```
public static final android.os.Parcelable.Creator <MapState> CREATOR
```

## Method Details

```
public int describeContents ()
```

For documentation, see [android.os.Parcelable.describeContents\(\)](#)

```
public GeoCoordinate getCenter ()
```

Returns the [GeoCoordinate](#) representing the center position.

### Returns:

The center position [GeoCoordinate](#)

```
public float getOrientation ()
```

Returns the orientation, in degrees relative to true-north (which is designated as being an orientation of 0 degrees).

**Returns:**

orientation, in degrees relative to true-north

```
public float getTilt ()
```

Returns the tilt, in degrees.

**Returns:**

tilt, in degrees

```
public double getZoomLevel ()
```

Returns the zoom level.

**Returns:**

zoom level

```
public void writeToParcel (Parcel dest, int flags)
```

For documentation, see *android.os.Parcelable.writeToParcel()*

**Parameters:**

- **dest**
- **flags**

## MapTrafficLayer

The class *MapTrafficLayer* is a member of *com.here.android.mpa.mapping* .

### Class Summary

```
public final class MapTrafficLayer
```

```
extends java.lang.Object
```

Class to represent Traffic rendering information.

[For complete information, see the section *Class Details*]

**See also:**

*getMapTrafficLayer()*

## Nested Class Summary

Table 541: Nested Classes in MapTrafficLayer

Nested Classes
public static final enumeration <a href="#">MapTrafficLayer.RenderLayer</a> Represents values describing various traffic layers that can be displayed within a MapTrafficLayer .

## Method Summary

Table 542: Methods in MapTrafficLayer

Methods
public <i>Severity</i> <a href="#">getDisplayFilter</a> () This method retrieves current value of the display filter.
public boolean <a href="#">isEnabled</a> ( <a href="#">RenderLayer</a> layer) Checks if a Traffic Layer defined in RenderLayer is enabled.
public boolean <a href="#">setDisplayFilter</a> ( <i>Severity</i> severity) This method sets a minimal severity of Traffic Events which shall be displayed.
public void <a href="#">setEnabled</a> ( <a href="#">RenderLayer</a> layer, boolean enable) Enable a Traffic Layer defined in RenderLayer .

## Class Details

Class to represent Traffic rendering information. This class can be used to control which types of traffic are rendered.

See also:

[getMapTrafficLayer\(\)](#)

## Method Details

public *Severity* [getDisplayFilter](#) ()

This method retrieves current value of the display filter.

Returns:

*severity* The current value of the display filter.

public boolean [isEnabled](#) ([RenderLayer](#) layer)

Checks if a Traffic Layer defined in RenderLayer is enabled.

Parameters:

- `layer`

a traffic layer defined in `RenderLayer`.

**Returns:**

True if the layer is enabled. False, otherwise.

**public boolean setDisplayFilter (*Severity* severity)**

This method sets a minimal severity of Traffic Events which shall be displayed. So, calling `setDisplayFilter(Severity)` with filter set to `BLOCKING` means that only blocking events will be displayed. Calling `setDisplayFilter(Severity)` with filter set to `NORMAL` means that all events (`BLOCKING`, `VERY_HIGH`, `HIGH`, `NORMAL`) will be displayed. The default display filter is `NORMAL`.

**Parameters:**

- **severity**  
A minimal severity which shall be displayed.

**Returns:**

true if successful, false otherwise. Passing `UNDEFINED` will return false.

**public void setEnabled (*RenderLayer* layer, boolean enable)**

Enable a Traffic Layer defined in `RenderLayer`. The default behavior is that all `RenderLayers` are enabled.

**Parameters:**

- **layer**  
a traffic layer defined in `RenderLayer`.
- **enable**  
True to enable, false to disable.

## RenderLayer

The enumeration `RenderLayer` is a member of `com.here.android.mpa.mapping.MapTrafficLayer`.

### Enumeration Summary

```
public static final enumeration MapTrafficLayer.RenderLayer
```

```
extends java.lang.Enum, java.lang.Object
```

Represents values describing various traffic layers that can be displayed within a `MapTrafficLayer`.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 543: Enum Constants in RenderLayer

Fields
<pre>public static final <i>RenderLayer</i> FLOW</pre> <p>Show traffic flow layer</p>
<pre>public static final <i>RenderLayer</i> INCIDENT</pre> <p>Show traffic incidents layer</p>
<pre>public static final <i>RenderLayer</i> ONROUTE</pre> <p>Show on route traffic layer</p>

## Method Summary

Table 544: Methods in RenderLayer

Methods
<pre>public int <i>getValue</i> ()</pre>
<pre>public static <i>RenderLayer</i> <i>valueOf</i> (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>MapTrafficLayer.RenderLayer[]</i> <i>values</i> ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Represents values describing various traffic layers that can be displayed within a `MapTrafficLayer`.

### Enum Constant Details

```
public static final RenderLayer FLOW
```

Show traffic flow layer

```
public static final RenderLayer INCIDENT
```

Show traffic incidents layer

```
public static final RenderLayer ONROUTE
```

Show on route traffic layer

## Method Details

```
public int getValue ()
```

```
public static RenderLayer valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static MapTrafficLayer.RenderLayer[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## MapTransitLayer

The class *MapTransitLayer* is a member of *com.here.android.mpa.mapping* .

### Class Summary

```
public final class MapTransitLayer
```

```
extends java.lang.Object
```

Represents a *Map* layer that can display any combination of transit stops, accesses, and lines (including none).

[For complete information, see the section *Class Details*]

### See also:

*getMapTransitLayer()*

### Nested Class Summary

Table 545: Nested Classes in MapTransitLayer

#### Nested Classes

```
public static final enumeration MapTransitLayer.Mode
```

Represents values describing various ways to display public transit within a *MapTransitLayer* .

## Method Summary

Table 546: Methods in MapTransitLayer

Methods
<pre>public void <b>clearTransitHighlights</b> ()</pre> <p>Clears all MapTransitLayer elements, resetting them to a non-highlighted state.</p>
<pre>public <i>Mode</i> <b>getMode</b> ()</pre> <p>Gets the Mode for the MapTransitLayer .</p>
<pre>public void <b>highlightTransitAccesses</b> (java.util.List &lt;Identifier&gt; ids)</pre> <p>Highlights a specified list of transit accesses.</p>
<pre>public void <b>highlightTransitLineSegments</b> (java.util.List &lt;Identifier&gt; ids)</pre> <p>Highlights a specified list of transit segment lines.</p>
<pre>public void <b>highlightTransitLines</b> (java.util.List &lt;Identifier&gt; ids)</pre> <p>Highlights a specified list of transit lines.</p>
<pre>public void <b>highlightTransitStops</b> (java.util.List &lt;Identifier&gt; ids)</pre> <p>Highlights a specified list of transit stops.</p>
<pre>public void <b>setMode</b> (<i>Mode</i> mode)</pre> <p>Sets a Mode for the MapTransitLayer .</p>

## Class Details

Represents a *Map* layer that can display any combination of transit stops, accesses, and lines (including none).

**See also:**

[getMapTransitLayer\(\)](#)

## Method Details

```
public void clearTransitHighlights ()
```

Clears all MapTransitLayer elements, resetting them to a non-highlighted state.

```
public Mode getMode ()
```

Gets the Mode for the MapTransitLayer .

**Returns:**

The Mode

```
public void highlightTransitAccesses (java.util.List <Identifier> ids)
```

Highlights a specified list of transit accesses. Previously highlighted lines remain highlighted until `clearTransitHighlights()` is called to clear all highlighted objects.

**Parameters:**

- **ids**

A list of IDs `Identifier` representing the accesses to highlight. If an `Identifier` supplied does not match any transit accesses, it will be ignored.

**See also:**

[getStopId\(\)](#)

[getId\(\)](#)

[clearTransitHighlights\(\)](#)

```
public void highlightTransitLineSegments (java.util.List <Identifier> ids)
```

Highlights a specified list of transit segment lines. Previously highlighted lines remain highlighted until `clearTransitHighlights()` is called to clear all highlighted objects.

**Parameters:**

- **ids**

A list of IDs `Identifier` representing the segment lines to highlight. If an `Identifier` supplied does not match any transit segment lines, it will be ignored.

**See also:**

[getLineSegmentId\(\)](#)

[clearTransitHighlights\(\)](#)

```
public void highlightTransitLines (java.util.List <Identifier> ids)
```

Highlights a specified list of transit lines. Previously highlighted lines remain highlighted until `clearTransitHighlights()` is called to clear all highlighted objects.

**Parameters:**

- **ids**

A list of `Identifiers` representing the lines to highlight. If an `Identifier` supplied does not match any transit lines, it will be ignored.

**See also:**

[getLineId\(\)](#)

[clearTransitHighlights\(\)](#)

```
public void highlightTransitStops (java.util.List <Identifier> ids)
```

Highlights a specified list of transit stops. Previously highlighted lines remain highlighted until `clearTransitHighlights()` is called to clear all highlighted objects.

**Parameters:**

- **ids**

A list of `Identifier`s representing the stops to highlight. If an `Identifier` supplied does not match any transit stops, it will be ignored.

**See also:**

[getStopId\(\)](#)

[getId\(\)](#)

[clearTransitHighlights\(\)](#)

```
public void setMode (Mode mode)
```

Sets a `Mode` for the `MapTransitLayer`. The default mode is `STOPS_AND_ACCESSES`.

**Parameters:**

- **mode**

A `Mode` to set

## Mode

The enumeration `Mode` is a member of `com.here.android.mpa.mapping.MapTransitLayer`.

### Enumeration Summary

```
public static final enumeration MapTransitLayer.Mode
```

```
extends java.lang.Enum, java.lang.Object
```

Represents values describing various ways to display public transit within a `MapTransitLayer`.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 547: Enum Constants in `Mode`

#### Fields

```
public static final Mode NOTHING
```

Hide all transit stops, accesses, and lines.

```
public static final Mode STOPS_AND_ACCESSES
```

(Default) Show transit stops and accesses, but hide transit lines.

## Fields

```
public static final Mode EVERYTHING
```

Show transit stops, accesses, and lines.

## Method Summary

Table 548: Methods in Mode

### Methods

```
public int getValue ()
```

```
public static Mode valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static MapTransitLayer.Mode[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Represents values describing various ways to display public transit within a `MapTransitLayer`.

### Enum Constant Details

```
public static final Mode NOTHING
```

Hide all transit stops, accesses, and lines.

```
public static final Mode STOPS_AND_ACCESSES
```

(Default) Show transit stops and accesses, but hide transit lines.

```
public static final Mode EVERYTHING
```

Show transit stops, accesses, and lines.

### Method Details

```
public int getValue ()
```

```
public static Mode valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- `name`

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static MapTransitLayer.Mode[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## MapView

The class *MapView* is a member of *com.here.android.mpa.mapping* .

### Class Summary

```
public class MapView
```

```
extends java.lang.Object
```

Represents a map view.

[For complete information, see the section *Class Details*]

**See also:**

*MapActivity*

*android.view.ViewGroup*

### Constructor Summary

Table 549: Constructors in *MapView*

Constructors
<p><i>MapView</i> (Context context)</p> <p>Constructor that initializes the context.</p>
<p><i>MapView</i> (Context context, AttributeSet attrs)</p> <p>Constructor that initializes the context and a set of attributes.</p>

### Method Summary

Table 550: Methods in *MapView*

Methods
<p>public void <i>addOnMapRenderListener</i> (<i>OnMapRenderListener</i> listener)</p> <p>Adds a <i>OnMapRenderListener</i> to listen for map render events.</p>
<p>protected void <i>dispatchRestoreInstanceState</i> (SparseArray container)</p> <p>Override to prevent thawing of any child views.</p>

**Methods**

```
protected void dispatchSaveInstanceState (SparseArray container)
```

Override to prevent freezing of any child views.

```
public ViewRect getClipRect ()
```

Gets the **ViewRect** representing the clip rectangle for the **MapView**.

```
public Rect getCopyrightBoundaryRect ()
```

Gets the current rectangle relative to the **MapView's** boundary as a container for the HERE copyright logo.

```
public int getCopyrightLogoHeight ()
```

Gets the height of the copyright logo.

```
public CopyrightLogoPosition getCopyrightLogoPosition ()
```

Gets the current position for the HERE copyright logo.

```
public int getCopyrightLogoVisibility ()
```

Gets the visibility of the HERE copyright logo.

```
public int getCopyrightLogoWidth ()
```

Gets the width of the copyright logo.

```
public int getCopyrightMargin ()
```

Gets the current margin, in pixels, for the HERE copyright logo, an offset from the edge of the visible map area to the edge of the logo.

```
public Map getMap ()
```

Returns the instance of **Map** associated with this **MapView**

```
public MapGesture getMapGesture ()
```

Gets the **MapGesture** representing the current gesture handler for the **MapView**.

```
public PositionIndicator getPositionIndicator ()
```

Returns the **PositionIndicator** instance that renders the current position with a marker.

```
public void getScreenCapture (OnScreenCaptureListener listener)
```

Gets the full screen bitmap for the **MapView**.

```
protected void onLayout (boolean changed, int left, int top, int right, int bottom)
```

For documentation, see *android.view.ViewGroup*

```
protected void onMeasure (int widthMeasureSpec, int heightMeasureSpec)
```

For documentation, see *android.view.ViewGroup*

```
public void onPause ()
```

Propagates an activity's **onPause()** event to the view.

```
public void onRestoreInstanceState (Parcelable state)
```

Callback indicating that a stored view state was restored (e.g.

```
public void onResume ()
```

Propagates an activity's **onResume()** event to the view.

## Methods

```
public Parcelable onSaveInstanceState ()
```

Callback indicating that the internal state of a view was saved for later use (e.g.

```
public void removeOnMapRenderListener (OnMapRenderListener listener)
```

Removes an existing *OnMapRenderListener*.

```
public void setClipRect (ViewRect rect, PointF transformCenter)
```

Sets a clipping rectangle to the *MapView* .

```
public void setClipRect (ViewRect rect)
```

Sets a clipping rectangle to the *MapView* .

```
public void setCopyrightBoundaryRect (Rect rect)
```

Sets a rectangle, in pixels, relative to the top left corner of the *MapView*'s boundary, for the placement of the HERE copyright logo.

```
public void setCopyrightLogoPosition (CopyrightLogoPosition position)
```

Sets a position for the HERE copyright logo.

```
public void setCopyrightMargin (int margin)
```

Sets a margin, in pixels, for the HERE copyright logo, an offset from the edge of the visible map area (or copyright boundary rect, if used) to the edge of the logo (depending on the placement).

```
public void setMap (Map aMap)
```

Associates the graphical view element with a *Map* .

```
public void setMapMarkerDragListener (OnDragListener listener)
```

Sets a *MapMarker.OnDragListener* to be invoked whenever any *MapMarker* added onto a *Map* that is attached to this *MapView* is dragged.

```
public void setOnTouchListener (View.OnTouchListener listener)
```

Sets an *OnTouchListener* to be invoked whenever a touch event is sent to the *MapView* .

## Class Details

Represents a map view. This is the "View" UI class designed to handle all UI-related use cases, including rendering and screen touch events.

Each *MapView* must be bound to a *Map*, and map-related objects should be persisted during application runtime. *MapView* objects live and expire according to the associated activity's lifecycle.

A *MapView* is defined in an Android layout XML file. For example:

```
<com.here.android.mpa.mapping.MapView
    android:id="@+id/mapview"
    android:layout_width="fill_parent"
    android:layout_height="fill_parent"
    android:visibility="visible"/>
```

Each *MapView* should follow the regular android lifecycle. When an activity's *onResume()* and *onPause()* are called, the view should also be notified via calls from within those methods. Please take care in how

much processing is done in the `onResume()` method of an activity. Performing significant amounts of processing may delay the view rendering in cases such as device orientation change. It is recommended to use a specifically designated handler for organizing the amount of processing to be done in such cases.

Note that *MapView* does not notify the *MapEngine* when it is paused or resumed. User of *MapView* is responsible for handling the pausing and resuming of the *MapEngine* if needed. Another option is to utilize the *MapActivity* class when creating an activity with a *MapView*.

Although this class inherits from `ViewGroup`, it is not advisable for users to add children to *MapView* as no layout actions will be performed on any added children views.

**See also:**

[MapActivity](#)

[android.view.ViewGroup](#)

## Constructor Details

### MapView (Context context)

Constructor that initializes the context.

**Parameters:**

- **context**  
Context of the MapView

**See also:**

[MapView\(Context, AttributeSet\)](#)

[android.content.Context](#)

### MapView (Context context, AttributeSet attrs)

Constructor that initializes the context and a set of attributes.

**Parameters:**

- **context**  
Context of the MapView
- **attrs**  
An `AttributeSet` representing attributes of the MapView

**See also:**

[MapView\(Context\)](#)

[android.content.Context](#)

[android.util.AttributeSet](#)

## Method Details

```
public void addOnMapRenderListener (OnMapRenderListener listener)
```

Adds a *OnMapRenderListener* to listen for map render events.

### Parameters:

- **listener**  
A *OnMapRenderListener* to add to the *MapView*

### See also:

[removeOnMapRenderListener\(\*OnMapRenderListener\*\)](#)

```
protected void dispatchRestoreInstanceState (SparseArray container)
```

Override to prevent thawing of any child views. As child views created and added to the view group dynamically have the same id as the parent, causing conflict when the state is saved, all child views are blocked from being saved. Instead, this container will manually trigger the save and restore.

### Parameters:

- **container**

```
protected void dispatchSaveInstanceState (SparseArray container)
```

Override to prevent freezing of any child views. As child views created and added to the view group dynamically have the same id as the parent, causing conflict when the state is saved, all child views are blocked from being saved. Instead, this container will manually trigger the save and restore.

### Parameters:

- **container**

```
public ViewRect getClipRect ()
```

Gets the *ViewRect* representing the clip rectangle for the *MapView*.

### Returns:

The clip rectangle for rendering *MapObject* objects and similar map-related screen elements

```
public Rect getCopyrightBoundaryRect ()
```

Gets the current rectangle relative to the *MapView's* boundary as a container for the HERE copyright logo. *null* is returned unless a boundary rect has been set previously.

### Returns:

The boundary rect (null if not set).

### See also:

[getClipRect\(\)](#)

[setCopyrightBoundaryRect\(Rect\)](#)

```
public int getCopyrightLogoHeight ()
```

Gets the height of the copyright logo.

This method only returns a valid value once a [Map](#) has been set to this view.

**Returns:**

The height of the copyright logo in pixels. Returns -1 if unavailable.

```
public CopyrightLogoPosition getCopyrightLogoPosition ()
```

Gets the current position for the HERE copyright logo.

**Returns:**

The position of the logo.

```
public int getCopyrightLogoVisibility ()
```

Gets the visibility of the HERE copyright logo. Copyright logo is defaulted to be visible. Once changed, the visibility of logo stays effective even when the screen is rotated or re-created.

**Returns:**

One of the two values `View.VISIBLE` or `View.INVISIBLE` to represent the copyright logo's visibility.

```
public int getCopyrightLogoWidth ()
```

Gets the width of the copyright logo.

This method only returns a valid value once a [Map](#) has been set to this view.

**Returns:**

The width of the copyright logo in pixels. Returns -1 if unavailable.

```
public int getCopyrightMargin ()
```

Gets the current margin, in pixels, for the HERE copyright logo, an offset from the edge of the visible map area to the edge of the logo.

This method only returns a valid value once a [Map](#) has been set to this view.

**Returns:**

The current offset from the edge of the `MapView`

```
public Map getMap ()
```

Returns the instance of *Map* associated with this *MapView*

**Returns:**

The *Map* object currently displayed in this view.

```
public MapGesture getMapGesture ()
```

Gets the *MapGesture* representing the current gesture handler for the *MapView*. Applications can intercept this object and override the default events.

**Returns:**

The *MapGesture*

```
public PositionIndicator getPositionIndicator ()
```

Returns the *PositionIndicator* instance that renders the current position with a marker. The position indicator should be used with *PositioningManager*.

**Returns:**

The *PositionIndicator*

```
public void getScreenCapture (OnScreenCaptureListener listener)
```

Gets the full screen bitmap for the *MapView*. This API can be used to capture a screen shot of the *MapView*. The API is asynchronous and will callback once the operation is completed via *OnScreenCaptureListener*. Note the *MapView* must be visible to create the screen capture.

**Parameters:**

- **listener**  
A *OnScreenCaptureListener* to callback on screen capture completion.

```
protected void onLayout (boolean changed, int left, int top, int right, int bottom)
```

For documentation, see *android.view.ViewGroup*

**Parameters:**

- **changed**
- **left**
- **top**
- **right**
- **bottom**

```
protected void onMeasure (int widthMeasureSpec, int heightMeasureSpec)
```

For documentation, see *android.view.ViewGroup*

**Parameters:**

- `widthMeasureSpec`
- `heightMeasureSpec`

```
public void onPause ()
```

Propagates an activity's `onPause()` event to the view. Applications can call this method within the `onPause()` method of any activity which has a `MapView` as part of its view hierarchy. Note that unlike *MapFragment*, `MapView` does not automatically handle the pausing and/or resuming of `MapEngine`. Owner of *MapView* is responsible to address the handling of *onPause()* if needed.

**See also:**

[onPause\(\)](#)

[onPause\(\)](#)

```
public void onRestoreInstanceState (Parcelable state)
```

Callback indicating that a stored view state was restored (e.g. to create a new `MapView` with the same state).

**Parameters:**

- `state`  
An *android.os.Parcelable* in which the view state was stored

**See also:**

[android.view.View.onRestoreInstanceState\(Parcelable\)](#)

```
public void onResume ()
```

Propagates an activity's `onResume()` event to the view. Applications can call this method within the `onResume()` method of any activity which has a `MapView` as part of its view hierarchy. Note that unlike *MapFragment*, `MapView` does not automatically handle the pausing and/or resuming of `MapEngine`. Owner of *MapView* is responsible to address the handling of *onResume()* if needed.

**See also:**

[onResume\(\)](#)

[onResume\(\)](#)

```
public Parcelable onSaveInstanceState ()
```

Callback indicating that the internal state of a view was saved for later use (e.g. to create a new `MapView` with the same state).

## Returns:

The *android.os.Parcelable* for storing the view state

## See also:

[android.view.View.onSaveInstanceState\(\)](#)

```
public void removeOnMapRenderListener (OnMapRenderListener listener)
```

Removes an existing *OnMapRenderListener*.

## Parameters:

- **listener**  
A *OnMapRenderListener* to remove from the *MapView*

```
public void setClipRect (ViewRect rect, PointF transformCenter)
```

Sets a clipping rectangle to the *MapView* .

The center of the map is not moved and remains at the center of the map control. Only the *ViewRect* specified here will be used for rendering.

Note that the size of the map remains the same as the size of the map control.

The clipping rectangle (and the view rectangle) is reset to full-screen upon screen rotation or upon recreating the screen.

Moreover, setting the clipping rectangle will reset the view rectangle to full-screen.

## Parameters:

- **rect**  
A *ViewRect* for rendering *MapObject* objects and similar map-related screen elements
- **transformCenter**  
A *PointF* representing the center coordinate for map transformations such as zooming and rotation

## Throws:

- **IllegalArgumentException**  
if *ViewRect* is not valid.

## See also:

[setClipRect\(ViewRect\)](#)

```
public void setClipRect (ViewRect rect)
```

Sets a clipping rectangle to the *MapView* .

Note that the size of the map remains the same as the size of the map control.

The clipping rectangle (and the view rectangle) is reset to full-screen upon screen rotation or upon recreating the screen.

**Parameters:**

- **rect**  
A `ViewRect` for rendering `MapObject` objects and similar map-related screen elements

**Throws:**

- **`IllegalArgumentException`**  
if `ViewRect` is not valid.

**See also:**

[setClipRect\(ViewRect, PointF\)](#)

## `public void setCopyrightBoundaryRect (Rect rect)`

Sets a rectangle, in pixels, relative to the top left corner of the `MapView`'s boundary, for the placement of the HERE copyright logo.

If the specified rectangle is not contained completely within the current visible map area, their area of intersection will be used instead of the specified rectangle's area. If the specified rectangle is outside the current visible map area, it will be ignored. The copyright logo and copyright margin must fit into the rectangle, otherwise specified rectangle will be ignored.

The copyright boundary rectangle is reset upon screen rotation or upon screen re-creation.

**Parameters:**

- **rect**  
A `Rect` representing the rectangular container to position the copyright logo. Use `null Rect` to reset the boundary container.

**Throws:**

- **`IllegalArgumentException`**  
if `Rect` supplied is invalid

## `public void setCopyrightLogoPosition (CopyrightLogoPosition position)`

Sets a position for the HERE copyright logo. The current default is to place the logo at the center-bottom of the visible map view area.

Note: after the logo's position is set, it stays effective even when the screen is rotated or re-created.

**Parameters:**

- **position**  
A `CopyrightLogoPosition` value representing the desired placement of the HERE copyright logo with respect to the visible map view area

```
public void setCopyrightMargin (int margin)
```

Sets a margin, in pixels, for the HERE copyright logo, an offset from the edge of the visible map area (or copyright boundary rect, if used) to the edge of the logo (depending on the placement). The logo and margin must fit into the visible area (or copyright bounding rect). Therefore, the maximum allowed margin value is:  $(\text{bounding rect dimension} - \text{logo size}) / 2$ . The default (minimum) margin value is 1/2 of logo width. A margin value smaller than the default will not be saved.

**Parameters:**

- **margin**  
Desired offset from the edge of the MapView

**See also:**

[setCopyrightBoundaryRect\(Rect\)](#)

```
public void setMap (Map aMap)
```

Associates the graphical view element with a `Map` . Applications must call this method to bind the `MapView` and `Map` .

Note: the `Map` that gets passed as a parameter to this method could be `null` , in which case all listeners will be cleaned up.

Users are advised to call [setMap\(Map\)](#) with `null` to detach the map only after the [onPause\(\)](#) is called to avoid memory leaks.

Calling this method with `null` , allows map resources to be released in case there are no more references on `Map` object. Otherwise map resources will not be released.

**Parameters:**

- **aMap**  
A `Map` to associate with the `MapView` (could be `null`)

```
public void setMapMarkerDragListener (OnDragListener listener)
```

Sets a `MapMarker.OnDragListener` to be invoked whenever any `MapMarker` added onto a `Map` that is attached to this `MapView` is dragged.

**Parameters:**

- **listener**  
An `MapMarker.OnDragListener` to set for this `MapView`

```
public void setOnTouchListener (View.OnTouchListener listener)
```

Sets an `OnTouchListener` to be invoked whenever a touch event is sent to the `MapView` .

**Parameters:**

- **listener**

An `OnTouchListener` to set for the `MapView`

See also:

[android.view.View.OnTouchListener](#)

## Mesh

The class `Mesh` is a member of [com.here.android.mpa.mapping](#) .

### Class Summary

public abstract class **Mesh**

extends `java.lang.Object`

Represents a base class specifying common mesh data for a `MapGeoModelObject` or `MapLocalModelObject` .

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 551: Methods in Mesh

Methods
<pre>public FloatBuffer <a href="#">getTextureCoordinates</a> ()</pre> <p>Gets a <code>FloatBuffer</code> containing the list of uv coordinates for the mesh.</p>
<pre>public IntBuffer <a href="#">getVertexIndices</a> ()</pre> <p>Gets the <code>IntBuffer</code> representing the list of mesh triangles.</p>
<pre>public <i>Mesh</i> <a href="#">setTextureCoordinates</a> (FloatBuffer uvCoordinates)</pre> <p>Sets a <code>FloatBuffer</code> representing a list of uv coordinates for the mesh.</p>
<pre>public <i>Mesh</i> <a href="#">setVertexIndices</a> (IntBuffer triangles)</pre> <p>Sets an <code>IntBuffer</code> representing a list of mesh triangles to render.</p>

### Class Details

Represents a base class specifying common mesh data for a `MapGeoModelObject` or `MapLocalModelObject` .

Properties of a mesh include:

- Vertex positions - positions of the mesh vertices (the maximum number of positions is 65536). Note: the number of vertex positions should match the number of vertex texture coordinates, and both should be equal to the number of vertices in the mesh data.
- Vertex texture coordinates - coordinates within the range of [0..1], used to reference the specified texture image (the maximum number of texture coordinates is 65536). Note: the number of vertex texture

coordinates should match the number of vertex positions, and both should be equal to the number of vertices in the mesh data.

- **Triangles** - the triangular faces of the mesh, defined as three indices referencing the corresponding set of vertices.

### Method Details

```
public FloatBuffer getTextureCoordinates ()
```

Gets a `FloatBuffer` containing the list of uv coordinates for the mesh. The buffer contains pairs for each coordinate, where each pair is in the format `uv( u, v )` and within the range of [0..1].

**Returns:**

A `FloatBuffer` with the mesh uv coordinates

```
public IntBuffer getVertexIndices ()
```

Gets the `IntBuffer` representing the list of mesh triangles. The buffer contains triplets for each triangle, where each triplet is in the format `t( v1, v2, v3 )`.

**Returns:**

A `IntBuffer` with mesh triangles

```
public Mesh setTextureCoordinates (FloatBuffer uvCoordinates)
```

Sets a `FloatBuffer` representing a list of uv coordinates for the mesh. The buffer should be in pairs for each coordinate, where each pair is in the format `uv( u, v )` and within the range of [0..1].

**Parameters:**

- **uvCoordinates**

A `FloatBuffer` of desired mesh uv coordinates

**Returns:**

The updated `Mesh`

**Throws:**

- **IllegalArgumentException**  
if `uvCoordinates` is empty
- **IllegalArgumentException**  
if `uvCoordinates` does not contain even number of float values.

**See also:**

[java.nio.FloatBuffer](#)

```
public Mesh setVertexIndices (IntBuffer triangles)
```

Sets an `IntBuffer` representing a list of mesh triangles to render. The buffer should be in triplets for each triangle, where each triplet is in the format `t( v1, v2, v3 )`.

**Parameters:**

- **triangles**  
A `IntBuffer` of desired mesh triangles

**Returns:**

The updated `Mesh`

**Throws:**

- **`IllegalArgumentException`**  
if `triangles` is empty.
- **`IllegalArgumentException`**  
if `triangles` is not containing triplets of integers.

**See also:**

[java.nio.IntBuffer](#)

## OnMapRenderListener

The interface `OnMapRenderListener` is a member of [com.here.android.mpa.mapping](#).

### Interface Summary

public abstract interface **OnMapRenderListener**

Represents an abstract class listener to provide notification upon completion of a `Map` rendering event.

[For complete information, see the section [Interface Details](#)]

**See also:**

[addOnMapRenderListener\(OnMapRenderListener\)](#)

[removeOnMapRenderListener\(OnMapRenderListener\)](#)

[addOnMapRenderListener\(OnMapRenderListener\)](#)

[removeOnMapRenderListener\(OnMapRenderListener\)](#)

### Nested Class Summary

Table 552: Nested Classes in `OnMapRenderListener`

Nested Classes
public static abstract class <a href="#">OnMapRenderListener.OnMapRenderListenerAdapter</a> Default implementation for the <code>OnMapRenderListener</code> interface.

## Method Summary

Table 553: Methods in OnMapRenderListener

Methods
<pre>public abstract void <a href="#">onGraphicsDetached</a> ()</pre> <p>Callback indicating that the map renderer has been cleanly detached from the view.</p>
<pre>public abstract void <a href="#">onPostDraw</a> (boolean invalidated, long renderTime)</pre> <p>Callback indicating that a <i>Map</i> drawing event has ended.</p>
<pre>public abstract void <a href="#">onPreDraw</a> ()</pre> <p>Callback indicating that a <i>Map</i> drawing event is about to occur.</p>
<pre>public abstract void <a href="#">onRenderBufferCreated</a> ()</pre> <p>Callback indicating that the map render buffer has been created.</p>
<pre>public abstract void <a href="#">onSizeChanged</a> (int width, int height)</pre> <p>Callback indicating that a <i>Map</i> size has changed following a rotation.</p>

## Interface Details

Represents an abstract class listener to provide notification upon completion of a *Map* rendering event.

### See also:

[addOnMapRenderListener\(OnMapRenderListener\)](#)

[removeOnMapRenderListener\(OnMapRenderListener\)](#)

[addOnMapRenderListener\(OnMapRenderListener\)](#)

[removeOnMapRenderListener\(OnMapRenderListener\)](#)

## Method Details

```
public abstract void onGraphicsDetached ()
```

Callback indicating that the map renderer has been cleanly detached from the view.

```
public abstract void onPostDraw (boolean invalidated, long renderTime)
```

Callback indicating that a *Map* drawing event has ended. Applications can perform custom rendering when this callback is sent.

Note: This callback is made on the rendering thread.

### Parameters:

- **invalidated**  
A boolean specifying whether the map is invalidated and will redraw
- **renderTime**  
The time taken to render the map

```
public abstract void onPreDraw ()
```

Callback indicating that a *Map* drawing event is about to occur. Applications can perform custom rendering when this callback is sent.

This callback is preferred to *onPostDraw(boolean, long)* when making changes to *MapObjects* as the changes can be made during the upcoming draw and another *Map* invalidation will not need to take place.

Note: This callback is made on the rendering thread.

```
public abstract void onRenderBufferCreated ()
```

Callback indicating that the map render buffer has been created.

Note: This callback is made on the rendering thread.

```
public abstract void onSizeChanged (int width, int height)
```

Callback indicating that a *Map* size has changed following a rotation. Applications can perform custom rendering when this callback is sent.

Note: This callback is made on the UI thread.

#### Parameters:

- **width**  
A post-rotation width
- **height**  
A post-rotation height

## OnMapRenderListenerAdapter

The class *OnMapRenderListenerAdapter* is a member of *com.here.android.mpa.mapping.OnMapRenderListener*.

### Class Summary

```
public static abstract class OnMapRenderListener.OnMapRenderListenerAdapter
```

```
    implements com.here.android.mpa.mapping.OnMapRenderListener
```

```
    extends java.lang.Object
```

Default implementation for the *OnMapRenderListener* interface.

[For complete information, see the section *Class Details*]

#### See also:

[OnMapRenderListener](#)

## Constructor Summary

Table 554: Constructors in OnMapRenderListenerAdapter

Constructors
<a href="#">OnMapRenderListenerAdapter ()</a>

## Method Summary

Table 555: Methods in OnMapRenderListenerAdapter

Methods
public void <a href="#">onGraphicsDetached ()</a>
public void <a href="#">onPostDraw</a> (boolean invalidated, long renderTime)
public void <a href="#">onPreDraw ()</a>
public void <a href="#">onRenderBufferCreated ()</a>
public void <a href="#">onSizeChanged</a> (int width, int height)

## Class Details

Default implementation for the OnMapRenderListener interface. Users may use this abstract class and overload specific methods to have a smaller code footprint.

See also:

[OnMapRenderListener](#)

## Constructor Details

[OnMapRenderListenerAdapter \(\)](#)

## Method Details

```
public void onGraphicsDetached ()
```

```
public void onPostDraw (boolean invalidated, long renderTime)
```

Parameters:

- `invalidated`
- `renderTime`

```
public void onPreDraw ()
```

```
public void onRenderBufferCreated ()
```

```
public void onSizeChanged (int width, int height)
```

Parameters:

- **width**
- **height**

## OperatingHours

The class *OperatingHours* is a member of *com.here.android.mpa.mapping* .

### Class Summary

```
public final class OperatingHours
```

*extends java.lang.Object*

Represents the hours of operation for different days of the week, plus holidays.

[For complete information, see the section [Class Details](#)]

### Method Summary

**Table 556: Methods in OperatingHours**

Methods
<pre>public java.util.List &lt;TimeInterval&gt; <a href="#">getFridaySchedule</a> ()</pre> <p>Friday schedule as a list of TimeInterval TimeInterval .</p>
<pre>public java.util.List &lt;TimeInterval&gt; <a href="#">getHolidaySchedule</a> ()</pre> <p>Holiday schedule as a list of TimeInterval TimeInterval .</p>
<pre>public java.util.List &lt;TimeInterval&gt; <a href="#">getMondaySchedule</a> ()</pre> <p>Monday schedule as a list of TimeInterval TimeInterval .</p>
<pre>public java.util.List &lt;TimeInterval&gt; <a href="#">getSaturdaySchedule</a> ()</pre> <p>Saturday schedule as a list of TimeInterval TimeInterval .</p>
<pre>public java.util.List &lt;TimeInterval&gt; <a href="#">getSundaySchedule</a> ()</pre> <p>Sunday schedule as a list of TimeInterval TimeInterval .</p>
<pre>public java.util.List &lt;TimeInterval&gt; <a href="#">getThursdaySchedule</a> ()</pre> <p>Thursday schedule as a list of TimeInterval TimeInterval .</p>
<pre>public java.util.List &lt;TimeInterval&gt; <a href="#">getTuesdaySchedule</a> ()</pre> <p>Tuesday schedule as a list of TimeInterval TimeInterval .</p>

## Methods

```
public java.util.List <TimeInterval> getWednesdaySchedule ()
```

Wednesday schedule as a list of TimeInterval TimeInterval .

---

## Class Details

Represents the hours of operation for different days of the week, plus holidays. For each day, the operating hours are a non-overlapping sequence of intervals in increasing order of time. Used for specifying hours of operation for services.

## Method Details

```
public java.util.List <TimeInterval> getFridaySchedule ()
```

Friday schedule as a list of TimeInterval TimeInterval .

### Returns:

The array that contains the TimeInterval TimeInterval

```
public java.util.List <TimeInterval> getHolidaySchedule ()
```

Holiday schedule as a list of TimeInterval TimeInterval .

### Returns:

The array that contains the TimeInterval TimeInterval

```
public java.util.List <TimeInterval> getMondaySchedule ()
```

Monday schedule as a list of TimeInterval TimeInterval .

### Returns:

The array that contains the TimeInterval TimeInterval

```
public java.util.List <TimeInterval> getSaturdaySchedule ()
```

Saturday schedule as a list of TimeInterval TimeInterval .

### Returns:

The array that contains the TimeInterval TimeInterval

```
public java.util.List <TimeInterval> getSundaySchedule ()
```

Sunday schedule as a list of TimeInterval TimeInterval .

### Returns:

The array that contains the TimeInterval TimeInterval

```
public java.util.List <TimeInterval> getThursdaySchedule ()
```

Thursday schedule as a list of TimeInterval TimeInterval .

**Returns:**

The array that contains the TimeInterval TimeInterval

```
public java.util.List <TimeInterval> getTuesdaySchedule ()
```

Tuesday schedule as a list of TimeInterval TimeInterval .

**Returns:**

The array that contains the TimeInterval TimeInterval

```
public java.util.List <TimeInterval> getWednesdaySchedule ()
```

Wednesday schedule as a list of TimeInterval TimeInterval .

**Returns:**

The array that contains the TimeInterval TimeInterval

## PositionIndicator

The class *PositionIndicator* is a member of [com.here.android.mpa.mapping](#) .

### Class Summary

```
public final class PositionIndicator
```

```
extends java.lang.Object
```

Represents a class for rendering a map marker to indicate the current position.

[For complete information, see the section [Class Details](#)]

**See also:**

[PositioningManager](#)

### Method Summary

Table 557: Methods in PositionIndicator

**Methods**

```
public int getAccuracyIndicatorColor ()
```

Gets the current color of accuracy indicator circle, returning an ARGB (Alpha/Red/Green/Blue) integer color value.

## Methods

```
public Image getMarker ()
```

Gets the current marker image.

```
public int getZIndex ()
```

Get the Z index of the position indicator.

```
public boolean isAccuracyIndicatorVisible ()
```

Gets the current visibility state of the GPS accuracy indicator.

```
public boolean isVisible ()
```

Gets the boolean indicating whether the `PositionIndicator` instance is visible.

```
public PositionIndicator setAccuracyIndicatorColor (int color)
```

Sets the color of the accuracy indicator circle using an ARGB (Alpha/Red/Green/Blue) integer color value.

```
public PositionIndicator setAccuracyIndicatorVisible (boolean visible)
```

Sets a GPS accuracy indicator for the `PositionIndicator` to be either visible or hidden.

```
public PositionIndicator setMarker (Image marker)
```

Sets a marker image, overriding the default marker image.

```
public PositionIndicator setVisible (boolean visible)
```

Sets a `PositionIndicator` to be either visible or hidden.

```
public PositionIndicator setZIndex (int index)
```

Set the Z index of the position indicator.

## Class Details

Represents a class for rendering a map marker to indicate the current position. The marker is surrounded by a circle, the diameter of which illustrates the accuracy of the marked position.

**See also:**

[PositioningManager](#)

## Method Details

```
public int getAccuracyIndicatorColor ()
```

Gets the current color of accuracy indicator circle, returning an ARGB (Alpha/Red/Green/Blue) integer color value.

**Returns:**

The current ARGB integer color value. The packed integer is made up of 4 bytes: alpha, red, green, blue. Each color component has a value range from [0..255], with 0 meaning no contribution for that component and 255 meaning 100% contribution

**See also:**

[android.graphics.Color](#)

```
public Image getMarker ()
```

Gets the current marker image.

**Returns:**

The marker *Image* used to display the current position on a map

```
public int getZIndex ()
```

Get the Z index of the position indicator.

**Returns:**

int current z index.

```
public boolean isAccuracyIndicatorVisible ()
```

Gets the current visibility state of the GPS accuracy indicator.

**Returns:**

True if the GPS accuracy indicator is visible, false otherwise

```
public boolean isVisible ()
```

Gets the *boolean* indicating whether the *PositionIndicator* instance is visible.

**Returns:**

True if the *PositionIndicator* is visible, false otherwise

```
public PositionIndicator setAccuracyIndicatorColor (int color)
```

Sets the color of the accuracy indicator circle using an ARGB (Alpha/Red/Green/Blue) integer color value. The default line color is *Color.GREEN*.

**Parameters:**

- **color**  
The ARGB integer color value. The packed integer is made up of 4 bytes: alpha, red, green, blue. Each color component has a value range from [0..255] with 0 meaning no contribution for that component, and 255 meaning 100% contribution

**Returns:**

The updated *PositionIndicator* itself.

**See also:**

[android.graphics.Color](#)

```
public PositionIndicator setAccuracyIndicatorVisible (boolean visible)
```

Sets a GPS accuracy indicator for the `PositionIndicator` to be either visible or hidden. Accuracy is represented by a circle surrounding the marked position, with a smaller diameter representing higher accuracy. The default is the GPS accuracy is visible.

Note: if the `PositionIndicator` is hidden, the GPS accuracy indicator will be hidden as well.

**Parameters:**

- **visible**  
A boolean specifying whether the accuracy indicator should be visible

**Returns:**

`PositionIndicator` this object for method chaining.

**See also:**

[\*setVisible\(boolean\)\*](#)

```
public PositionIndicator setMarker (Image marker)
```

Sets a marker image, overriding the default marker image.

**Parameters:**

- **marker**  
An `Image` representing the marker used to display the current position on a map

**Returns:**

`PositionIndicator` this object for method chaining.

```
public PositionIndicator setVisible (boolean visible)
```

Sets a `PositionIndicator` to be either visible or hidden. By default, the position indicator is invisible.

**Parameters:**

- **visible**  
A boolean specifying `PositionIndicator` visibility

**Returns:**

`PositionIndicator` this object for method chaining.

```
public PositionIndicator setZIndex (int index)
```

Set the Z index of the position indicator. The default Z-Index is currently the max value supported.

**Parameters:**

- **index**

A new z-index value for the `MapObject`, a 16-bit `int` within the range of `[0..65535]`

**Returns:**

`PositionIndicator` this object for method chaining.

**See also:**

[setZIndex\(int\)](#)

## SafetySpotInfo

The class `SafetySpotInfo` is a member of `com.here.android.mpa.mapping`.

### Class Summary

public final class **SafetySpotInfo**

*extends* `java.lang.Object`

Contains information about a particular safety spot.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 558: Nested Classes in `SafetySpotInfo`

Nested Classes
public static final enumeration <code>SafetySpotInfo.Type</code>

### Method Summary

Table 559: Methods in `SafetySpotInfo`

Methods
public <code>GeoCoordinate</code> <code>getCoordinate</code> () Gets the position <code>GeoCoordinate</code> for the safety spot.
public int <code>getHeading1Deg</code> () Returns the heading, in degrees, representing the operational direction of the safety spot camera.
public int <code>getHeading2Deg</code> () Returns the heading for the ( possible ) second camera.
public int <code>getSpeedLimit1</code> () Returns the speed limit the camera on heading 1 is triggered.
public int <code>getSpeedLimit2</code> () Returns the speed limit the camera on heading 2 is triggered.

## Methods

```
public Type getType ()
```

Returns the type of this safety spot.

```
public String toString ()
```

For documentation, see *java.lang.Object*

## Class Details

Contains information about a particular safety spot. Common types of safety spots include speed camera and red light camera.

## Method Details

```
public GeoCoordinate getCoordinate ()
```

Gets the position *GeoCoordinate* for the safety spot.

### Returns:

position of the stop.

```
public int getHeading1Deg ()
```

Returns the heading, in degrees, representing the operational direction of the safety spot camera. The operational direction is the direction of travel for vehicles to be detected by the camera, regardless of whether the camera photographs the front or rear of the vehicle. If no heading is returned (the returned value is zero), then this means the camera operates in all directions.

A safety spot may have two cameras, for more information see *getHeading2Deg()*.

### Returns:

The heading, 1 - 359, 1 = north increases clockwise.

```
public int getHeading2Deg ()
```

Returns the heading for the ( possible ) second camera. If heading 1 is not zero, and heading 2 is zero, then there is only one camera, using the heading 1.

### Returns:

The heading, 1 - 359, 1 = north increases clockwise.

```
public int getSpeedLimit1 ()
```

Returns the speed limit the camera on heading 1 is triggered.

### Returns:

The speed limit, in meters per second

```
public int getSpeedLimit2 ()
```

Returns the speed limit the camera on heading 2 is triggered.

**Returns:**

The speed limit, in meters per second

```
public Type getType ()
```

Returns the type of this safety spot.

**Returns:**

the safetyspot type

```
public String toString ()
```

For documentation, see *java.lang.Object*

## Type

The enumeration *Type* is a member of *com.here.android.mpa.mapping.SafetySpotInfo*.

### Enumeration Summary

```
public static final enumeration SafetySpotInfo.Type
```

*extends java.lang.Enum, java.lang.Object*

[For complete information, see the section *Enumeration Details*]

### Enum Constant Summary

Table 560: Enum Constants in Type

Fields
<pre>public static final Type UNDEFINED</pre> <p>Type of safety spot is unknown.</p>
<pre>public static final Type SPEED_CAMERA</pre> <p>Type of safety spot is speed camera.</p>
<pre>public static final Type REDLIGHT_CAMERA</pre> <p>Type of safety spot is red light camera.</p>
<pre>public static final Type SPEED_REDLIGHT_CAMERA</pre> <p>Type of safety spot is a combination of red light camera and speed camera.</p>

## Method Summary

Table 561: Methods in Type

Methods
<pre>public static <i>Type</i> valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>SafetySpotInfo.Type[]</i> values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

### Enum Constant Details

```
public static final Type UNDEFINED
```

Type of safety spot is unknown.

```
public static final Type SPEED_CAMERA
```

Type of safety spot is speed camera.

```
public static final Type REDLIGHT_CAMERA
```

Type of safety spot is red light camera.

```
public static final Type SPEED_REDLIGHT_CAMERA
```

Type of safety spot is a combination of red light camera and speed camera.

### Method Details

```
public static Type valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static SafetySpotInfo.Type[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## SafetySpotObject

The class *SafetySpotObject* is a member of *com.here.android.mpa.mapping* .

### Class Summary

public final class **SafetySpotObject**

extends *com.here.android.mpa.mapping.MapProxyObject*, *com.here.android.mpa.common.ViewObject*,  
*java.lang.Object*

Encapsulates information about a public safety spot on a map.

[For complete information, see the section *Class Details*]

**See also:**

*SafetySpotInfo*

### Method Summary

Table 562: Methods in SafetySpotObject

Methods
public <i>SafetySpotInfo</i> <b>getSafetySpotInfo</b> () Gets the <i>SafetySpotInfo</i> object.

### Class Details

Encapsulates information about a public safety spot on a map.

A *SafetySpotObject* represents a specialized *MapProxyObject*. User can retrieve an instance of this object by calling *getSelectedObjects(PointF)* or *getSelectedObjects(ViewRect)* with the location where a safety spot is located.

**See also:**

*SafetySpotInfo*

### Method Details

public *SafetySpotInfo* **getSafetySpotInfo** ()

Gets the *SafetySpotInfo* object.

**Returns:**

The *SafetySpotInfo*

## TrafficEvent

The class *TrafficEvent* is a member of *com.here.android.mpa.mapping* .

### Class Summary

public final class **TrafficEvent**

*extends java.lang.Object*

Represents information about a traffic event.

[For complete information, see the section *Class Details*]

### Nested Class Summary

Table 563: Nested Classes in TrafficEvent

Nested Classes
public static abstract interface <i>TrafficEvent.Listener</i> Event Listener interface for traffic event
public static final enumeration <i>TrafficEvent.Severity</i> Indicates the servery of the traffic events.

### Field Summary

Table 564: Fields in TrafficEvent

Fields
public static final int <i>DATA_UNAVAILABLE</i> Indicates it was not possible to obtain the requested data.

### Method Summary

Table 565: Methods in TrafficEvent

Methods
public Date <i>getActivationDate</i> () To get date and time when this TrafficEvent will be or has been activated.
public <i>GeoBoundingBox</i> <i>getAffectedArea</i> () Return the bounding box affected by this TrafficEvent .
public int <i>getAffectedLength</i> () Return the length of this TrafficEvent .

**Methods**

```
public java.util.List <RoadElement> getAffectedRoadElements ()
```

Return affected *RoadElements*.

```
public List getAffectedStreets ()
```

The names of the streets that are affected by this *TrafficEvent* .

```
public void getAffectedStreets (Listener<String> listener)
```

Gets the names of the streets that are affected by this *TrafficEvent* asynchronously.

```
public int getDistanceTo (GeoCoordinate geoCoordinates)
```

Calculate distance to the *TrafficEvent* .

```
public int getEstimatedSpeedLimit ()
```

Return the estimated speed that applies on the road elements affected by the traffic event.

```
public String getEventText ()
```

Gets the text of the traffic event.

```
public String getFirstAffectedStreet ()
```

Gets the name of the first street affected by this *TrafficEvent* .

```
public void getFirstAffectedStreet (Listener<String> listener)
```

Gets the name of the first street affected by this *TrafficEvent* asynchronously.

```
public List getFromStreets ()
```

Gets the names of the streets of the intersection where the location of the traffic event starts.

```
public void getFromStreets (Listener<String> listener)
```

Gets the names of the streets of the intersection where the location of the traffic event starts (asynchronously).

```
public Image getIconOffRoute ()
```

Return the off-route icon associated to this *TrafficEvent* .

```
public Image getIconOnRoute ()
```

Return the on-route icon associated to this *TrafficEvent* .

```
public short getPenalty ()
```

Gets the penalty associated with this event where 100 is blocked and 0 is unblocked.

```
public Severity getSeverity ()
```

Gets the *TrafficEvent.Severity* of this event.

```
public String getShortText ()
```

Gets the short text (category) of this event.

```
public int getSpeedLimit ()
```

Return the speed that applies on the road elements affected by the traffic event.

```
public List getToStreets ()
```

Gets the names of the streets of the intersection where the location of the traffic event ends.

## Methods

```
public void getToStreets (Listener<String> listener)
```

Gets the names of the streets of the intersection where the location of the traffic event ends (asynchronously).

```
public Date getUpdateDate ()
```

To get date and time when this `TrafficEvent` has been updated.

```
public boolean isActive ()
```

Check if this `TrafficEvent` is active.

```
public boolean isFlow ()
```

Check if this `TrafficEvent` is a flow event.

```
public boolean isIncident ()
```

Check if this `TrafficEvent` is an incident event.

```
public boolean isOnRoute (Route route)
```

Check if the given `Route` is affected by this `TrafficEvent` .

```
public boolean isReroutable ()
```

Check if this `TrafficEvent` is re-routable.

```
public boolean isVisible ()
```

Check if this `TrafficEvent` is visible.

```
public String toString ()
```

## Class Details

Represents information about a traffic event. Traffic events are displayed on a client device by way of a `TrafficEventObject` object, which encapsulates its map coordinates.

## Field Details

```
public static final int DATA_UNAVAILABLE
```

Indicates it was not possible to obtain the requested data.

## Method Details

```
public Date getActivationDate ()
```

To get date and time when this `TrafficEvent` will be or has been activated.

### Returns:

date and time.

```
public GeoBoundingBox getAffectedArea ()
```

Return the bounding box affected by this `TrafficEvent` .

**Returns:**

The [GeoBoundingBox](#) representing the area affected.

```
public int getAffectedLength ()
```

Return the length of this `TrafficEvent` .

**Returns:**

total length in meters.

```
public java.util.List <RoadElement> getAffectedRoadElements ()
```

Return affected [RoadElements](#).

**Returns:**

array of `RoadElement`.

```
public List getAffectedStreets ()
```

The names of the streets that are affected by this `TrafficEvent` . The order of the street names does not have any significance.

**Returns:**

The List of street names affected by the traffic event. Can be null if not yet processed. Use [getAffectedStreets\(Listener\)](#) to avoid receiving null.

```
public void getAffectedStreets (Listener<String> listener)
```

Gets the names of the streets that are affected by this `TrafficEvent` asynchronously. The order of the street names does not have any significance.

**Parameters:**

- `listener`  
The [TrafficEvent.Listener](#) that receives the result callback.

```
public int getDistanceTo (GeoCoordinate geoCoordinates)
```

Calculate distance to the `TrafficEvent` .

**Parameters:**

- `geoCoordinates`  
coordinates

**Returns:**

distance in meters.

```
public int getEstimatedSpeedLimit ()
```

Return the estimated speed that applies on the road elements affected by the traffic event. Speed in this context refers to how fast traffic is moving.

If it is not possible to obtain an estimated speed `DATA_UNAVAILABLE` will be returned. It is possible a trusted speed may be available instead, this can be checked by way of `getSpeedLimit()`.

**Returns:**

speed limit in km/h or `DATA_UNAVAILABLE` if no estimated speed is available.

```
public String getEventText ()
```

Gets the text of the traffic event.

**Returns:**

The `String` containing traffic event information

```
public String getFirstAffectedStreet ()
```

Gets the name of the first street affected by this `TrafficEvent` .

**Returns:**

the street name. Can be null if not yet processed. Use `getFirstAffectedStreet(Listener)` to avoid receiving null.

```
public void getFirstAffectedStreet (Listener<String> listener)
```

Gets the name of the first street affected by this `TrafficEvent` asynchronously.

**Parameters:**

- **listener**  
The `TrafficEvent.Listener` that receives the result callback.

```
public List getFromStreets ()
```

Gets the names of the streets of the intersection where the location of the traffic event starts.

**Returns:**

A list of streets. Can be null if not yet processed. When null the caller should try again later or use `getFromStreets(Listener)`.

```
public void getFromStreets (Listener<String> listener)
```

Gets the names of the streets of the intersection where the location of the traffic event starts (asynchronously).

**Parameters:**

- **listener**  
The *TrafficEvent.Listener* that receives the result callback.

```
public Image getIconOffRoute ()
```

Return the off-route icon associated to this *TrafficEvent* . Can be null if there is no icon.

**Returns:**

traffic event icon.

```
public Image getIconOnRoute ()
```

Return the on-route icon associated to this *TrafficEvent* . Can be null if there is no icon.

**Returns:**

traffic event icon.

```
public short getPenalty ()
```

Gets the penalty associated with this event where 100 is blocked and 0 is unblocked.

**Returns:**

The penalty associated with this event.

```
public Severity getSeverity ()
```

Gets the *TrafficEvent.Severity* of this event.

**Returns:**

The *Severity* of this event.

```
public String getShortText ()
```

Gets the short text (category) of this event.

**Returns:**

The default possible return values are "CLOSURE", "ROADWORKS", "ACCIDENT", "CONGESTION", "OTHER", "FLOW". The text is NOT localized.

```
public int getSpeedLimit ()
```

Return the speed that applies on the road elements affected by the traffic event. Speed in this context refers to how fast traffic is moving. This value is expected to be accurate, because it reflects field probes.

If it is not possible to obtain a trusted speed `DATA_UNAVAILABLE` will be returned. It is possible an estimated speed may be available instead, this can be checked by way of `getEstimatedSpeedLimit()`.

**Returns:**

speed limit in km/h or `DATA_UNAVAILABLE` if no trusted speed is available.

```
public List getToStreets ()
```

Gets the names of the streets of the intersection where the location of the traffic event ends.

**Returns:**

A list of streets. Can be null if not yet processed. When null the caller should try again later or use `getToStreets(TrafficEvent.Listener)`.

```
public void getToStreets (Listener<String> listener)
```

Gets the names of the streets of the intersection where the location of the traffic event ends (asynchronously).

**Parameters:**

- `listener`  
The `TrafficEvent.Listener` that receives the result callback.

```
public Date getUpdateDate ()
```

To get date and time when this `TrafficEvent` has been updated.

**Returns:**

date and time.

```
public boolean isActive ()
```

Check if this `TrafficEvent` is active.

**Returns:**

true if this `TrafficEvent` is active, false otherwise

```
public boolean isFlow ()
```

Check if this `TrafficEvent` is a flow event.

**Returns:**

true if this `TrafficEvent` is a flow event, false otherwise.

```
public boolean isIncident ()
```

Check if this `TrafficEvent` is an incident event.

**Returns:**

true if this `TrafficEvent` is an incident event, false otherwise.

```
public boolean isOnRoute (Route route)
```

Check if the given *Route* is affected by this `TrafficEvent` .

**Parameters:**

- **route**  
Route to be checked.

**Returns:**

true if affected, otherwise false.

```
public boolean isReroutable ()
```

Check if this `TrafficEvent` is re-routable.

**Returns:**

true if this `TrafficEvent` is re-routable, false otherwise.

```
public boolean isVisible ()
```

Check if this `TrafficEvent` is visible.

**Returns:**

true if this `TrafficEvent` is visible, false otherwise

```
public String toString ()
```

## Listener<T>

The interface `Listener<T>` is a member of `com.here.android.mpa.mapping.TrafficEvent`.

**Type Parameters:**

- **T**

## Interface Summary

public static abstract interface **TrafficEvent.Listener**

Event Listener interface for traffic event

[For complete information, see the section [Interface Details](#)]

## Method Summary

Table 566: Methods in Listener<T>

Methods
<pre>public abstract void <b>onComplete</b> (T result)</pre>
A callback indicating that traffic events information retrieval completed.

## Interface Details

Event Listener interface for traffic event

## Method Details

```
public abstract void onComplete (T result)
```

A callback indicating that traffic events information retrieval completed.

### Parameters:

- **result**  
The object containing result value.

## Severity

The enumeration *Severity* is a member of *com.here.android.mpa.mapping.TrafficEvent*.

## Enumeration Summary

public static final enumeration **TrafficEvent.Severity**

*extends java.lang.Enum, java.lang.Object*

Indicates the serverity of the traffic events.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 567: Enum Constants in Severity

Fields
<pre>public static final Severity UNDEFINED</pre> <p>Undefined.</p>
<pre>public static final Severity NORMAL</pre> <p>Normal.</p>
<pre>public static final Severity HIGH</pre> <p>High.</p>
<pre>public static final Severity VERY_HIGH</pre> <p>Very high.</p>
<pre>public static final Severity BLOCKING</pre> <p>Blocking.</p>

## Method Summary

Table 568: Methods in Severity

Methods
<pre>public int getValue ()</pre>
<pre>public static Severity valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static TrafficEvent.Severity[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Indicates the serverity of the traffic events.

### Enum Constant Details

```
public static final Severity UNDEFINED
```

Undefined.

```
public static final Severity NORMAL
```

Normal.

```
public static final Severity HIGH
```

High.

```
public static final Severity VERY_HIGH
```

Very high.

```
public static final Severity BLOCKING
```

Blocking.

## Method Details

```
public int getValue ()
```

```
public static Severity valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static TrafficEvent.Severity[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## TrafficEventObject

The class *TrafficEventObject* is a member of *com.here.android.mpa.mapping* .

### Class Summary

```
public final class TrafficEventObject
```

```
extends com.here.android.mpa.mapping.MapProxyObject, com.here.android.mpa.common.ViewObject,  
java.lang.Object
```

Encapsulates information about a traffic event on a map.

[For complete information, see the section *Class Details*]

### See also:

*TrafficEvent*

## Method Summary

Table 569: Methods in TrafficEventObject

Methods
<pre>public <i>GeoCoordinate</i> <b>getCoordinate</b> ()</pre> <p>Gets the <i>GeoCoordinate</i> representing the position of the traffic event icon on the map.</p>
<pre>public <i>TrafficEvent</i> <b>getTrafficEvent</b> ()</pre> <p>Gets the <i>TrafficEvent</i> associated with the <i>TrafficEventObject</i> .</p>

## Class Details

Encapsulates information about a traffic event on a map.

A *TrafficEventObject* represents a specialized *MapProxyObject* .User can retrieve an instance of this object by calling *getSelectedObjects(PointF)* or *getSelectedObjects(ViewRect)* with the location where a traffic event is located.

**See also:**

*TrafficEvent*

## Method Details

```
public GeoCoordinate getCoordinate ()
```

Gets the *GeoCoordinate* representing the position of the traffic event icon on the map.

**Returns:**

The *GeoCoordinate*

```
public TrafficEvent getTrafficEvent ()
```

Gets the *TrafficEvent* associated with the *TrafficEventObject* . A *TrafficEvent* instance contains detailed information about a traffic event.

**Returns:**

The *TrafficEvent*.

## TransitAccessInfo

The class *TransitAccessInfo* is a member of *com.here.android.mpa.mapping* .

## Class Summary

```
public final class TransitAccessInfo
```

```
extends java.lang.Object
```

Data structure class containing information about Transit Access locations.

[For complete information, see the section [Class Details](#)]

**See also:**

[TransitAccessObject](#)

## Nested Class Summary

**Table 570: Nested Classes in TransitAccessInfo**

Nested Classes
public static final enumeration <a href="#">TransitAccessInfo.Attribute</a> Represents values describing the attributes of transit access.
public static final enumeration <a href="#">TransitAccessInfo.Method</a> Represents values describing the accessible methods of transit access.

## Method Summary

**Table 571: Methods in TransitAccessInfo**

Methods
public java.util.EnumSet <Attribute> <a href="#">getAttributes</a> () Gets all the Attribute of the transit access.
public <a href="#">GeoCoordinate</a> <a href="#">getCoordinate</a> () Gets the position <a href="#">GeoCoordinate</a> for the transit access.
public java.util.EnumSet <Method> <a href="#">getEntranceMethods</a> () Gets all the entrance Method s provided by the transit access.
public java.util.EnumSet <Method> <a href="#">getExitMethods</a> () Gets all the exit Method s provided by the transit access.
public <a href="#">Identifier</a> <a href="#">getId</a> () Gets the <a href="#">Identifier</a> for the transit access.
public int <a href="#">getLevel</a> () Gets the access level.
public String <a href="#">getName</a> () Gets the name for the transit access.
public <a href="#">OperatingHours</a> <a href="#">getOpeningHours</a> () Gets the opening hours.
public <a href="#">Identifier</a> <a href="#">getStopId</a> () Gets the <a href="#">Identifier</a> for the stop at the transit access.

## Methods

```
public java.util.EnumSet <TransitType> getTransitTypes ()
```

Gets all the *TransitTypes* the transit access supports.

---

## Class Details

Data structure class containing information about Transit Access locations.

**See also:**

[TransitAccessObject](#)

## Method Details

```
public java.util.EnumSet <Attribute> getAttributes ()
```

Gets all the *Attribute* of the transit access.

**Returns:**

A *EnumSet* containing all the *Attributes* of the transit access.

```
public GeoCoordinate getCoordinate ()
```

Gets the position *GeoCoordinate* for the transit access.

**Returns:**

position of the transit access.

```
public java.util.EnumSet <Method> getEntranceMethods ()
```

Gets all the entrance *Method* s provided by the transit access.

**Returns:**

A *EnumSet* containing all the entrance *Methods* provided by the transit access.

```
public java.util.EnumSet <Method> getExitMethods ()
```

Gets all the exit *Method* s provided by the transit access.

**Returns:**

A *EnumSet* containing all the exit *Methods* provided by the transit access.

```
public Identifier getId ()
```

Gets the *Identifier* for the transit access.

**Returns:**

the unique object Identifier.

**See also:**

[TransitDatabase](#)

```
public int getLevel ()
```

Gets the access level.

**Returns:**

the access level.

```
public String getName ()
```

Gets the name for the transit access. This text is localized according to the device's locale.

**Returns:**

name of the transit access.

```
public OperatingHours getOpeningHours ()
```

Gets the opening hours.

**Returns:**

The [OperatingHours](#) representing the opening hours of this transit access.

```
public Identifier getStopId ()
```

Gets the Identifier for the stop at the transit access.

**Returns:**

the unique object Identifier.

**See also:**

[TransitDatabase](#)

```
public java.util.EnumSet <TransitType> getTransitTypes ()
```

Gets all the [TransitTypes](#) the transit access supports.

**Returns:**

A EnumSet containing all the supported TransitTypes.

## Attribute

The enumeration *Attribute* is a member of *com.here.android.mpa.mapping.TransitAccessInfo*.

### Enumeration Summary

public static final enumeration **TransitAccessInfo.Attribute**

extends *java.lang.Enum*, *java.lang.Object*

Represents values describing the attributes of transit access.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 572: Enum Constants in Attribute

Fields
<pre>public static final Attribute <b>ALLOWS_ENTERING</b></pre> <p>Transit access allows to enter.</p>
<pre>public static final Attribute <b>ALLOWS_EXITING</b></pre> <p>Transit access allows to exit.</p>
<pre>public static final Attribute <b>ACCESSIBLE_TO_DISABLED</b></pre> <p>Transit access accessible to disability.</p>
<pre>public static final Attribute <b>LEVEL_DIFFERENT_FROM_GROUND</b></pre> <p>Transit access's level is different from ground.</p>
<pre>public static final Attribute <b>HAS_NAMES</b></pre> <p>Transit access has proper name.</p>

### Method Summary

Table 573: Methods in Attribute

Methods
<pre>public static Attribute <b>valueOf</b> (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static TransitAccessInfo.Attribute[] <b>values</b> ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

### Enumeration Details

Represents values describing the attributes of transit access.

## Enum Constant Details

```
public static final Attribute ALLOWS_ENTERING
```

Transit access allows to enter.

```
public static final Attribute ALLOWS_EXITING
```

Transit access allows to exit.

```
public static final Attribute ACCESSIBLE_TO_DISABLED
```

Transit access accessible to disability.

```
public static final Attribute LEVEL_DIFFERENT_FROM_GROUND
```

Transit access's level is different from ground.

```
public static final Attribute HAS_NAMES
```

Transit access has proper name.

## Method Details

```
public static Attribute valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static TransitAccessInfo.Attribute[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Method

The enumeration *Method* is a member of *com.here.android.mpa.mapping.TransitAccessInfo*.

## Enumeration Summary

```
public static final enumeration TransitAccessInfo.Method
```

*extends java.lang.Enum, java.lang.Object*

Represents values describing the accessible methods of transit access.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 574: Enum Constants in Method

Fields
<pre>public static final Method STAIRS</pre> <p>Transit access has stairs access.</p>
<pre>public static final Method ESCALATOR</pre> <p>Transit access has escalator access.</p>
<pre>public static final Method ELEVATOR</pre> <p>Transit access has elevator access.</p>
<pre>public static final Method PEDESTRIAN_RAMP</pre> <p>Transit access has pedestrian ramp access.</p>

## Method Summary

Table 575: Methods in Method

Methods
<pre>public static Method valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static TransitAccessInfo.Method[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Represents values describing the accessible methods of transit access.

### Enum Constant Details

```
public static final Method STAIRS
```

Transit access has stairs access.

```
public static final Method ESCALATOR
```

Transit access has escalator access.

```
public static final Method ELEVATOR
```

Transit access has elevator access.

```
public static final Method PEDESTRIAN_RAMP
```

Transit access has pedestrian ramp access.

## Method Details

```
public static Method valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static TransitAccessInfo.Method[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## TransitAccessObject

The class *TransitAccessObject* is a member of *com.here.android.mpa.mapping* .

### Class Summary

```
public final class TransitAccessObject
```

*extends* *com.here.android.mpa.mapping.MapProxyObject*, *com.here.android.mpa.common.ViewObject*,  
*java.lang.Object*

Encapsulates information about a public transit access point on a map.

[For complete information, see the section *Class Details*]

### See also:

*getSelectedObjects(PointF)*

*getSelectedObjectsNearby(PointF)*

*getSelectedObjects(ViewRect)*

## Method Summary

Table 576: Methods in TransitAccessObject

### Methods

```
public GeoCoordinate getCoordinate ()
```

Gets the *GeoCoordinate* representing the position of the transit access icon on the map.

```
public java.util.List <Image> getIcons ()
```

Get the list of icons associated with the *TransitAccessObject* .

```
public TransitAccessInfo getTransitAccessInfo ()
```

Gets the *TransitAccessInfo* associated with the *TransitAccessObject* .

## Class Details

Encapsulates information about a public transit access point on a map.

A *TransitAccessObject* represents a specialized *MapProxyObject*. Users can retrieve an instance of this object with a call to either *getSelectedObjects(PointF)* or *getSelectedObjectsNearby(PointF)* or *getSelectedObjects(ViewRect)* at the point or area where a public transit access point exists.

### See also:

[getSelectedObjects\(PointF\)](#)

[getSelectedObjectsNearby\(PointF\)](#)

[getSelectedObjects\(ViewRect\)](#)

## Method Details

```
public GeoCoordinate getCoordinate ()
```

Gets the *GeoCoordinate* representing the position of the transit access icon on the map.

### Returns:

The *GeoCoordinate* where the transit access object is located.

```
public java.util.List <Image> getIcons ()
```

Get the list of icons associated with the *TransitAccessObject* .

### Returns:

List of icon *Images*.

```
public TransitAccessInfo getTransitAccessInfo ()
```

Gets the *TransitAccessInfo* associated with the *TransitAccessObject* . A *TransitAccessInfo* instance contains information about the types of transit that can be accessed at a particular transit access point, as well as the *Identifier* of any transit stop that is associated with the access point.

**Returns:**

The `TransitAccessInfo`

## TransitDatabase

The class `TransitDatabase` is a member of `com.here.android.mpa.mapping`.

### Class Summary

public final class **TransitDatabase**

*extends java.lang.Object*

Represents an interface used to get information about public transit elements.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 577: Nested Classes in TransitDatabase

Nested Classes
<p>public static final enumeration <code>TransitDatabase.Error</code></p> <p>Represents values describing possible kinds of errors that can be encountered while initiating an asynchronous request to a <code>TransitDatabase</code>.</p>
<p>public static abstract interface <code>TransitDatabase.OnGetTransitInfoListener</code></p> <p>Represents a listener to provide information about <code>TransitDatabase</code> events.</p>
<p>public static abstract class <code>TransitDatabase.OnGetTransitInfoListenerAdapter</code></p> <p>Represents a listener to provide information about <code>TransitDatabase</code> events.</p>

### Constructor Summary

Table 578: Constructors in TransitDatabase

Constructors
<p><code>TransitDatabase ()</code></p> <p>Constructor.</p>

### Method Summary

Table 579: Methods in TransitDatabase

Methods
<p>public void <code>cancel ()</code></p> <p>Cancels the current request for transit information.</p>

## Methods

```
public Error getAccessInfo (Identifier id, OnGetTransitInfoListener listener)
```

Initiates an asynchronous request for information about a transit access.

```
public Error getLineInfo (Identifier id, OnGetTransitInfoListener listener)
```

Initiates an asynchronous request for information about a transit line.

```
public Error getStopInfo (Identifier id, OnGetTransitInfoListener listener)
```

Initiates an asynchronous request for information about a transit stop.

```
public Error getSystemInfo (Identifier id, OnGetTransitInfoListener listener)
```

Initiates an asynchronous request for information about a transit system.

## Class Details

Represents an interface used to get information about public transit elements.

## Constructor Details

### TransitDatabase ()

Constructor. Instantiates an instance of the transit database.

## Method Details

```
public void cancel ()
```

Cancels the current request for transit information.

```
public Error getAccessInfo (Identifier id, OnGetTransitInfoListener listener)
```

Initiates an asynchronous request for information about a transit access.

### Parameters:

- **id**  
An unique Identifier for the transit access
- **listener**  
An OnGetTransitInfoListener to provide information about TransitDatabase events

### Returns:

The appropriate Error value, which could be:

- *NONE* if the asynchronous request started successfully
- *INVALID\_OPERATION* if another request operation is already in progress
- *INVALID\_PARAMETERS* if any of the input parameters is invalid

### See also:

[getId\(\)](#)

```
public Error getLineInfo (Identifier id, OnGetTransitInfoListener listener)
```

Initiates an asynchronous request for information about a transit line.

**Parameters:**

- **id**  
An unique Identifier for the transit line
- **listener**  
An OnGetTransitInfoListener to provide information about TransitDatabase events

**Returns:**

The appropriate *Error* value, which could be:

- *NONE* if the asynchronous request started successfully
- *INVALID\_OPERATION* if another request operation is already in progress
- *INVALID\_PARAMETERS* if any of the input parameters is invalid

**See also:**

[getId\(\)](#)

[getLineId\(\)](#)

[getLineId\(\)](#)

[getLines\(\)](#)

```
public Error getStopInfo (Identifier id, OnGetTransitInfoListener listener)
```

Initiates an asynchronous request for information about a transit stop.

**Parameters:**

- **id**  
An unique Identifier for the transit stop
- **listener**  
An OnGetTransitInfoListener to provide information about TransitDatabase events

**Returns:**

The appropriate *Error* value, which could be:

- *NONE* if the asynchronous request started successfully
- *INVALID\_OPERATION* if another request operation is already in progress
- *INVALID\_PARAMETERS* if any of the input parameters is invalid

**See also:**

[getId\(\)](#)

[getStopId\(\)](#)

```
public Error getSystemInfo (Identifier id, OnGetTransitInfoListener listener)
```

Initiates an asynchronous request for information about a transit system.

**Parameters:**

- **id**  
An unique Identifier for the transit system.
- **listener**  
An *OnGetTransitInfoListener* to provide information about *TransitDatabase* events

**Returns:**

The appropriate *Error* value, which could be:

- *NONE* if the asynchronous request started successfully
- *INVALID\_OPERATION* if another request operation is already in progress
- *INVALID\_PARAMETERS* if any of the input parameters is invalid

**See also:**

[getSystemId\(\)](#)

## Error

The enumeration *Error* is a member of *com.here.android.mpa.mapping.TransitDatabase*.

### Enumeration Summary

```
public static final enumeration TransitDatabase.Error
```

```
extends java.lang.Enum, java.lang.Object
```

Represents values describing possible kinds of errors that can be encountered while initiating an asynchronous request to a *TransitDatabase*.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 580: Enum Constants in Error

Fields
<pre>public static final <i>Error</i> <b>NONE</b></pre> <p>There was no error, the request started successfully.</p>
<pre>public static final <i>Error</i> <b>NOT_FOUND</b></pre> <p>There was an error encountered while trying to access the database.</p>

## Fields

```
public static final Error ABORTED
```

The request was aborted.

```
public static final Error INVALID_PARAMETERS
```

One or more parameters accompanying the request is invalid.

```
public static final Error INVALID_OPERATION
```

Another request operation is already in progress.

```
public static final Error UNKNOWN
```

There was an error encountered, cause unknown.

## Method Summary

Table 581: Methods in Error

### Methods

```
public static Error valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static TransitDatabase.Error[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Represents values describing possible kinds of errors that can be encountered while initiating an asynchronous request to a *TransitDatabase*.

### Enum Constant Details

```
public static final Error NONE
```

There was no error, the request started successfully.

```
public static final Error NOT_FOUND
```

There was an error encountered while trying to access the database.

```
public static final Error ABORTED
```

The request was aborted.

```
public static final Error INVALID_PARAMETERS
```

One or more parameters accompanying the request is invalid.

```
public static final Error INVALID_OPERATION
```

Another request operation is already in progress.

```
public static final Error UNKNOWN
```

There was an error encountered, cause unknown.

### Method Details

```
public static Error valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static TransitDatabase.Error[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## OnGetTransitInfoListener

The interface *OnGetTransitInfoListener* is a member of *com.here.android.mpa.mapping.TransitDatabase*.

### Interface Summary

```
public static abstract interface TransitDatabase.OnGetTransitInfoListener
```

Represents a listener to provide information about *TransitDatabase* events.

[For complete information, see the section [Interface Details](#)]

### Method Summary

Table 582: Methods in *OnGetTransitInfoListener*

Methods
<pre>public abstract void <i>onEnd</i> (<i>Error</i> error)</pre> <p>A callback indicating the end of available transit database results or an encountered error.</p>
<pre>public abstract void <i>onTransitAccessInfo</i> (<i>TransitAccessInfo</i> info)</pre> <p>A callback indicating the availability of transit access information.</p>

### Methods

```
public abstract void onTransitLineInfo (TransitLineInfo info)
```

A callback indicating the availability of transit line information.

```
public abstract void onTransitStopInfo (TransitStopInfo info)
```

A callback indicating the availability of transit stop information.

```
public abstract void onTransitSystemInfo (TransitSystemInfo info)
```

A callback indicating the availability of transit system information.

## Interface Details

Represents a listener to provide information about TransitDatabase events.

### Method Details

```
public abstract void onEnd (Error error)
```

A callback indicating the end of available transit database results or an encountered error.

#### Parameters:

- **error**  
A *Error* value

```
public abstract void onTransitAccessInfo (TransitAccessInfo info)
```

A callback indicating the availability of transit access information.

#### Parameters:

- **info**  
A *TransitAccessInfo* for the requested transit access point

```
public abstract void onTransitLineInfo (TransitLineInfo info)
```

A callback indicating the availability of transit line information.

#### Parameters:

- **info**  
A *TransitLineInfo* for the requested transit line

```
public abstract void onTransitStopInfo (TransitStopInfo info)
```

A callback indicating the availability of transit stop information.

#### Parameters:

- **info**

A *TransitStopInfo* for the requested transit stop

```
public abstract void onTransitSystemInfo (TransitSystemInfo info)
```

A callback indicating the availability of transit system information.

**Parameters:**

- **info**  
A *TransitSystemInfo* for the requested transit system

## OnGetTransitInfoListenerAdapter

The class *OnGetTransitInfoListenerAdapter* is a member of *com.here.android.mpa.mapping.TransitDatabase*.

### Class Summary

public static abstract class **TransitDatabase.OnGetTransitInfoListenerAdapter**

*implements* *com.here.android.mpa.mapping.TransitDatabase.OnGetTransitInfoListener*

*extends* *java.lang.Object*

Represents a listener to provide information about *TransitDatabase* events.

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 583: Constructors in *OnGetTransitInfoListenerAdapter*

Constructors
<i>OnGetTransitInfoListenerAdapter</i> ()

### Method Summary

Table 584: Methods in *OnGetTransitInfoListenerAdapter*

Methods
public abstract void <i>onEnd</i> ( <i>Error</i> error) A callback indicating the end of available transit database results or an encountered error.
public void <i>onTransitAccessInfo</i> ( <i>TransitAccessInfo</i> info) A callback indicating the availability of transit access information.
public void <i>onTransitLineInfo</i> ( <i>TransitLineInfo</i> info) A callback indicating the availability of transit line information.

## Methods

```
public void onTransitStopInfo (TransitStopInfo info)
```

A callback indicating the availability of transit stop information.

```
public void onTransitSystemInfo (TransitSystemInfo info)
```

A callback indicating the availability of transit system information.

## Class Details

Represents a listener to provide information about TransitDatabase events.

## Constructor Details

```
OnGetTransitInfoListenerAdapter ()
```

## Method Details

```
public abstract void onEnd (Error error)
```

A callback indicating the end of available transit database results or an encountered error.

### Parameters:

- **error**  
An appropriate *Error* value

```
public void onTransitAccessInfo (TransitAccessInfo info)
```

A callback indicating the availability of transit access information.

### Parameters:

- **info**  
A *TransitAccessInfo* for the requested transit access point

```
public void onTransitLineInfo (TransitLineInfo info)
```

A callback indicating the availability of transit line information.

### Parameters:

- **info**  
A *TransitLineInfo* for the requested transit line

```
public void onTransitStopInfo (TransitStopInfo info)
```

A callback indicating the availability of transit stop information.

**Parameters:**

- **info**  
A *TransitStopInfo* for the requested transit stop

```
public void onTransitSystemInfo (TransitSystemInfo info)
```

A callback indicating the availability of transit system information.

**Parameters:**

- **info**  
A *TransitSystemInfo* for the requested transit system

## TransitLineInfo

The class *TransitLineInfo* is a member of *com.here.android.mpa.mapping*.

### Class Summary

```
public final class TransitLineInfo
```

```
extends java.lang.Object
```

Represents information about a public transit line.

[For complete information, see the section *Class Details*]

### Nested Class Summary

Table 585: Nested Classes in TransitLineInfo

Nested Classes
<pre>public static final enumeration <i>TransitLineInfo.Attribute</i></pre> <p>Represents values describing the attributes of transit line.</p>

### Method Summary

Table 586: Methods in TransitLineInfo

Methods
<pre>public java.util.EnumSet &lt;<i>Attribute</i>&gt; <i>getAttributes</i> ()</pre> <p>Gets all the <i>Attribute</i>s applicable to the transit line.</p>
<pre>public int <i>getColor</i> ()</pre> <p>Gets the current line color for the transit line, an ARGB (Alpha/Red/Green/Blue) value.</p>

## Methods

```
public Identifier getId ()
```

Gets the unique *Identifier* of the transit line.

```
public String getInformalName ()
```

Gets the informal name for the line associated with the transit line.

```
public String getOfficialName ()
```

Gets the official name for the line associated with the transit line.

```
public String getShortName ()
```

Gets the short name for the line associated with the transit line.

```
public Identifier getSystemId ()
```

Gets transit system *Identifier* for the transit line.

```
public TransitType getTransitType ()
```

Gets the *TransitType* of the transit line.

## Class Details

Represents information about a public transit line.

## Method Details

```
public java.util.EnumSet <Attribute> getAttributes ()
```

Gets all the *Attribute* s applicable to the transit line.

### Returns:

A *EnumSet* containing all the applicable *Attributes*.

```
public int getColor ()
```

Gets the current line color for the transit line, an ARGB (Alpha/Red/Green/Blue) value.

### Returns:

The current ARGB integer color value. The packed integer is made up of 4 bytes: alpha, red, green, blue. Each color component has a value range from [0..255] with 0 meaning no contribution for that component, and 255 meaning 100% contribution

### See also:

[android.graphics.Color](#)

```
public Identifier getId ()
```

Gets the unique *Identifier* of the transit line.

### Returns:

The Identifier

**See also:**

[TransitDatabase](#)

```
public String getInformalName ()
```

Gets the informal name for the line associated with the transit line. This text is localized according to the device's locale.

**Returns:**

The informal name

```
public String getOfficialName ()
```

Gets the official name for the line associated with the transit line. This text is localized according to the device's locale.

**Returns:**

The official name

```
public String getShortName ()
```

Gets the short name for the line associated with the transit line. This text is localized according to the device's locale.

**Returns:**

The short name

```
public Identifier getSystemId ()
```

Gets transit system Identifier for the transit line.

**Returns:**

the unique object Identifier.

**See also:**

[TransitDatabase](#)

```
public TransitType getTransitType ()
```

Gets the *TransitType* of the transit line.

**Returns:**

The *TransitType*

## Attribute

The enumeration *Attribute* is a member of *com.here.android.mpa.mapping.TransitLineInfo*.

### Enumeration Summary

public static final enumeration **TransitLineInfo.Attribute**

extends *java.lang.Enum*, *java.lang.Object*

Represents values describing the attributes of transit line.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 587: Enum Constants in Attribute

Fields
<pre>public static final Attribute EXPRESS</pre> <p>Express line.</p>
<pre>public static final Attribute ACCESSIBLE_TO_DISABLED</pre> <p>Accessible to disabled people.</p>
<pre>public static final Attribute LUGGAGE_RACKS</pre> <p>Luggage racks available.</p>
<pre>public static final Attribute ONBOARD_TOILETS</pre> <p>Onboard toilets available.</p>
<pre>public static final Attribute ONBOARD_FOOD</pre> <p>Onboard food available.</p>
<pre>public static final Attribute SMOKING_ALLOWED</pre> <p>Smoking allowed.</p>
<pre>public static final Attribute SLEEPING_CARS</pre> <p>Sleeping cars available.</p>

### Method Summary

Table 588: Methods in Attribute

Methods
<pre>public static Attribute valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>

## Methods

```
public static TransitLineInfo.Attribute[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

---

## Enumeration Details

Represents values describing the attributes of transit line.

### Enum Constant Details

```
public static final Attribute EXPRESS
```

Express line.

```
public static final Attribute ACCESSIBLE_TO_DISABLED
```

Accessible to disabled people.

```
public static final Attribute LUGGAGE_RACKS
```

Luggage racks available.

```
public static final Attribute ONBOARD_TOILETS
```

Onboard toilets available.

```
public static final Attribute ONBOARD_FOOD
```

Onboard food available.

```
public static final Attribute SMOKING_ALLOWED
```

Smoking allowed.

```
public static final Attribute SLEEPING_CARS
```

Sleeping cars available.

### Method Details

```
public static Attribute valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

**Parameters:**

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static TransitLineInfo.Attribute[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## TransitLineObject

The class *TransitLineObject* is a member of *com.here.android.mpa.mapping* .

### Class Summary

```
public final class TransitLineObject
```

```
extends com.here.android.mpa.mapping.MapProxyObject, com.here.android.mpa.common.ViewObject,  
java.lang.Object
```

Encapsulates information about a public transit line on a map.

[For complete information, see the section *Class Details*]

**See also:**

*TransitLineInfo*

### Method Summary

**Table 589: Methods in TransitLineObject**

Methods
<pre>public <i>Identifier</i> <i>getLineId</i> ()</pre> <p>Gets the unique <i>Identifier</i> for the <i>TransitLineObject</i> .</p>

### Class Details

Encapsulates information about a public transit line on a map.

A *TransitLineObject* represents a specialized *MapProxyObject* . User can retrieve an instance of this object by calling *getSelectedObjects(PointF)* or *getSelectedObjects(ViewRect)* with the location where a public transit line is located.

**See also:**

*TransitLineInfo*

## Method Details

```
public Identifier getLineId ()
```

Gets the unique *Identifier* for the `TransitLineObject`. Applications can use this `Identifier` to highlight the transit line and to get information about the line.

### Returns:

The `Identifier`

### See also:

[highlightTransitLines\(List<Identifier>\)](#)

[getLineInfo\(Identifier, OnGetTransitInfoListener\)](#)

## TransitLineSegmentObject

The class `TransitLineSegmentObject` is a member of `com.here.android.mpa.mapping`.

## Class Summary

```
public final class TransitLineSegmentObject
```

*extends* `com.here.android.mpa.mapping.MapProxyObject`, `com.here.android.mpa.common.ViewObject`, `java.lang.Object`

Encapsulates information about a transit line segment on the map.

[For complete information, see the section [Class Details](#)]

### See also:

[getSelectedObjects\(PointF\)](#)

[getSelectedObjectsNearby\(PointF\)](#)

[getSelectedObjects\(ViewRect\)](#)

[onMapObjectsSelected\(List<ViewObject>\)](#)

## Method Summary

Table 590: Methods in `TransitLineSegmentObject`

Methods
<pre>public <i>Identifier</i> <b>getLineId</b> ()</pre> <p>Returns the transit line info <i>Identifier</i>.</p>
<pre>public <i>Identifier</i> <b>getLineSegmentId</b> ()</pre> <p>Returns the transit line segment <code>Identifier</code>.</p>

## Class Details

Encapsulates information about a transit line segment on the map. `TransitLineSegmentObject`s are returned when they are selected on `Map`.

### See also:

[`getSelectedObjects\(PointF\)`](#)

[`getSelectedObjectsNearby\(PointF\)`](#)

[`getSelectedObjects\(ViewRect\)`](#)

[`onMapObjectsSelected\(List<ViewObject>\)`](#)

## Method Details

```
public Identifier getLineId ()
```

Returns the transit line info *Identifier*. The `Identifier` can be used to highlight the transit line and to get transit line info.

### Returns:

the unique object `Identifier`.

### See also:

[`highlightTransitLines\(List<Identifier>\)`](#)

[`getLineInfo\(Identifier, OnGetTransitInfoListener\)`](#)

```
public Identifier getLineSegmentId ()
```

Returns the transit line segment `Identifier`. A transit line segment is a section of a line. The `Identifier` can be used to highlight the transit line segment.

### Returns:

the unique object `Identifier`.

### See also:

[`highlightTransitLineSegments\(List<Identifier>\)`](#)

## TransitStopInfo

The class `TransitStopInfo` is a member of `com.here.android.mpa.mapping`.

## Class Summary

```
public final class TransitStopInfo
```

```
extends java.lang.Object
```

Represents information about a public transit stop.

[For complete information, see the section [Class Details](#)]

## Nested Class Summary

Table 591: Nested Classes in TransitStopInfo

Nested Classes
public static final enumeration <a href="#">TransitStopInfo.Attribute</a> Represents values describing attributes of transit stops
public static final enumeration <a href="#">TransitStopInfo.ParkingSize</a> Number of parking spots available.

## Method Summary

Table 592: Methods in TransitStopInfo

Methods
public java.util.EnumSet <a href="#">&lt;Attribute&gt; getAttributes ()</a> Gets the stop attributes <i>Attributes</i> for the transit stop.
public <a href="#">GeoCoordinate</a> <a href="#">getCoordinate ()</a> Gets the <i>GeoCoordinate</i> position for the transit stop.
public java.util.List <a href="#">&lt;Identifier&gt; getDepartingLines ()</a> Gets the list of departing transit line <i>Identifier</i> s for the transit stop.
public java.util.List <a href="#">&lt;Identifier&gt; getDepartingSystems ()</a> Gets the array of departing transit systems <i>Identifier</i> s for the transit stop.
public <a href="#">Identifier</a> <a href="#">getId ()</a> Gets the unique <i>Identifier</i> for the transit stop.
public String <a href="#">getInformalName ()</a> Gets the informal name for the stop associated with the <i>TransitStopInfo</i> .
public java.util.List <a href="#">&lt;Identifier&gt; getLines ()</a> Gets the list of transit line <i>Identifier</i> s associated with the transit stop.
public String <a href="#">getOfficialName ()</a> Gets the official name for the stop associated with the <i>TransitStopInfo</i> .
public <a href="#">OperatingHours</a> <a href="#">getOperatingHours ()</a> Gets the <i>OperatingHours</i> for the transit stop.
public <a href="#">OperatingHours</a> <a href="#">getParkingHours ()</a> Gets the parking <i>OperatingHours</i> for the transit stop, if a parking lot is present.

## Methods

```
public ParkingSize getParkingSize ()
```

Gets the *ParkingSize* for the transit stop, if a parking lot is present.

```
public java.util.List <Identifier> getSystems ()
```

Gets the list of transit systems *Identifier* s associated with the transit stop.

```
public java.util.List <Identifier> getTerminatingLines ()
```

Gets the list of terminating line *Identifier* s for the transit stop.

```
public java.util.List <Identifier> getTerminatingSystems ()
```

Gets the list of terminating systems *Identifier* s for the transit stop.

```
public java.util.List <Identifier> getTransfers ()
```

Gets the list of transfer stops *Identifier* s for the transit stop.

```
public java.util.EnumSet <TransitType> getTransitTypes ()
```

Gets the *TransitType*(s) for the stop associated with the *TransitStopInfo* .

## Class Details

Represents information about a public transit stop.

## Method Details

```
public java.util.EnumSet <Attribute> getAttributes ()
```

Gets the stop attributes *Attributes* for the transit stop.

### Returns:

A *EnumSet* containing all the *Attributes* associated with the transit stop.

```
public GeoCoordinate getCoordinate ()
```

Gets the *GeoCoordinate* position for the transit stop.

### Returns:

position of the stop.

```
public java.util.List <Identifier> getDepartingLines ()
```

Gets the list of departing transit line *Identifier* s for the transit stop.

### Returns:

The list of *Identifier* of transit lines.

### See also:

[highlightTransitLines\(List<Identifier>\)](#)

[getLineInfo\(Identifier, OnGetTransitInfoListener\)](#)

```
public java.util.List <Identifier> getDepartingSystems ()
```

Gets the array of departing transit systems `Identifier` s for the transit stop.

**Returns:**

The list of `Identifier` of transit systems.

**See also:**

[highlightTransitLines\(List<Identifier>\)](#)

[getLineInfo\(Identifier, OnGetTransitInfoListener\)](#)

```
public Identifier getId ()
```

Gets the unique `Identifier` for the transit stop. Applications can use this `Identifier` to highlight the transit stop using [highlightTransitStops\(List\)](#).

**Returns:**

The `Identifier` of this transit stop.

**See also:**

[getStopInfo\(Identifier, OnGetTransitInfoListener\)](#)

```
public String getInformalName ()
```

Gets the informal name for the stop associated with the `TransitStopInfo` . This text is localized according to the device's locale.

**Returns:**

The informal name

```
public java.util.List <Identifier> getLines ()
```

Gets the list of transit line `Identifier` s associated with the transit stop. Applications can use the `Identifier` s to highlight the transit lines and to get information about the lines.

**Returns:**

The list of transit line `Identifiers`.

**See also:**

[highlightTransitLines\(List<Identifier>\)](#)

[getLineInfo\(Identifier, OnGetTransitInfoListener\)](#)

```
public String getOfficialName ()
```

Gets the official name for the stop associated with the `TransitStopInfo`. This text is localized according to the device's locale.

**Returns:**

The official name

```
public OperatingHours getOperatingHours ()
```

Gets the *OperatingHours* for the transit stop.

**Returns:**

The operating hours.

```
public OperatingHours getParkingHours ()
```

Gets the parking *OperatingHours* for the transit stop, if a parking lot is present.

**Returns:**

parking hours.

```
public ParkingSize getParkingSize ()
```

Gets the *ParkingSize* for the transit stop, if a parking lot is present.

**Returns:**

The *ParkingSize* of the transit stop.

```
public java.util.List <Identifier> getSystems ()
```

Gets the list of transit systems *Identifier*s associated with the transit stop.

**Returns:**

The list of transit system *Identifiers*.

```
public java.util.List <Identifier> getTerminatingLines ()
```

Gets the list of terminating line *Identifier*s for the transit stop.

**Returns:**

The List of *Identifiers*.

**See also:**

[\*highlightTransitLines\(List<Identifier>\)\*](#)

[\*getLineInfo\(Identifier, OnGetTransitInfoListener\)\*](#)

```
public java.util.List <Identifier> getTerminatingSystems ()
```

Gets the list of terminating systems Identifier s for the transit stop.

**Returns:**

The List of Identifiers.

**See also:**

[highlightTransitLines\(List<Identifier>\)](#)

[getLineInfo\(Identifier, OnGetTransitInfoListener\)](#)

```
public java.util.List <Identifier> getTransfers ()
```

Gets the list of transfer stops Identifier s for the transit stop.

**Returns:**

The List of Identifiers.

```
public java.util.EnumSet <TransitType> getTransitTypes ()
```

Gets the *TransitType*(s) for the stop associated with the TransitStopInfo .

**Returns:**

The EnumSet of all TransitType associated with the stop.

## Attribute

The enumeration *Attribute* is a member of *com.here.android.mpa.mapping.TransitStopInfo*.

### Enumeration Summary

```
public static final enumeration TransitStopInfo.Attribute
```

```
extends java.lang.Enum, java.lang.Object
```

Represents values describing attributes of transit stops

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 593: Enum Constants in Attribute

Fields
public static final <i>Attribute</i> <b>CONNECTED_STOP</b>

## Fields

public static final *Attribute* **INTER\_STOPS\_TRANSFER**

public static final *Attribute* **TERMINATING\_STOP**

public static final *Attribute* **DEPARTING\_STOP**

public static final *Attribute* **PAY\_CAR\_PARKING**

public static final *Attribute* **FREE\_CAR\_PARKING**

public static final *Attribute* **BICYCLE\_PARKING**

public static final *Attribute* **SMOKING\_ALLOWED**

public static final *Attribute* **TOILETS**

public static final *Attribute* **WIRELESS\_INTERNET**

public static final *Attribute* **CELLULAR\_SERVICE**

public static final *Attribute* **TICKET\_MACHINES**

public static final *Attribute* **LUGGAGE\_LOCKERS**

public static final *Attribute* **LUGGAGE\_CHECKS**

public static final *Attribute* **ATTENDANT\_BOOTH**

public static final *Attribute* **SHOPS**

public static final *Attribute* **OUTDOOR**

public static final *Attribute* **COVERED**

public static final *Attribute* **PEDESTRIAN\_RAMPS**

public static final *Attribute* **ELEVATORS**

public static final *Attribute* **ESCALATORS**

public static final *Attribute* **STAIRS**

## Method Summary

Table 594: Methods in Attribute

### Methods

public static *Attribute* **valueOf** (String name)

This method retrieves the enumeration value that matches the name specified by the caller.

public static *TransitStopInfo.Attribute[]* **values** ()

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Represents values describing attributes of transit stops

## Enum Constant Details

public static final *Attribute* CONNECTED\_STOP

public static final *Attribute* INTER\_STOPS\_TRANSFER

public static final *Attribute* TERMINATING\_STOP

public static final *Attribute* DEPARTING\_STOP

public static final *Attribute* PAY\_CAR\_PARKING

public static final *Attribute* FREE\_CAR\_PARKING

public static final *Attribute* BICYCLE\_PARKING

public static final *Attribute* SMOKING\_ALLOWED

public static final *Attribute* TOILETS

public static final *Attribute* WIRELESS\_INTERNET

public static final *Attribute* CELLULAR\_SERVICE

public static final *Attribute* TICKET\_MACHINES

public static final *Attribute* LUGGAGE\_LOCKERS

public static final *Attribute* LUGGAGE\_CHECKS

public static final *Attribute* ATTENDANT\_BOOTH

```
public static final Attribute SHOPS
```

```
public static final Attribute OUTDOOR
```

```
public static final Attribute COVERED
```

```
public static final Attribute PEDESTRIAN_RAMPS
```

```
public static final Attribute ELEVATORS
```

```
public static final Attribute ESCALATORS
```

```
public static final Attribute STAIRS
```

## Method Details

```
public static Attribute valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static TransitStopInfo.Attribute[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## ParkingSize

The enumeration *ParkingSize* is a member of *com.here.android.mpa.mapping.TransitStopInfo*.

## Enumeration Summary

```
public static final enumeration TransitStopInfo.ParkingSize
```

*extends java.lang.Enum, java.lang.Object*

Number of parking spots available.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 595: Enum Constants in ParkingSize

Fields
<code>public static final <i>ParkingSize</i> UNKNOWN</code>
<code>public static final <i>ParkingSize</i> FIVE_OR_LESS</code>
<code>public static final <i>ParkingSize</i> TEN_OR_LESS</code>
<code>public static final <i>ParkingSize</i> FIFTY_OR_LESS</code>
<code>public static final <i>ParkingSize</i> TWO_HUNDRED_OR_LESS</code>
<code>public static final <i>ParkingSize</i> MORE_THAN_200</code>

## Method Summary

Table 596: Methods in ParkingSize

Methods
<code>public static <i>ParkingSize</i> valueOf (String name)</code> This method retrieves the enumeration value that matches the name specified by the caller.
<code>public static <i>TransitStopInfo.ParkingSize</i>[] values ()</code> This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Number of parking spots available.

### Enum Constant Details

`public static final ParkingSize UNKNOWN`

`public static final ParkingSize FIVE_OR_LESS`

`public static final ParkingSize TEN_OR_LESS`

`public static final ParkingSize FIFTY_OR_LESS`

`public static final ParkingSize TWO_HUNDRED_OR_LESS`

```
public static final ParkingSize MORE_THAN_200
```

### Method Details

```
public static ParkingSize valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static TransitStopInfo.ParkingSize[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## TransitStopObject

The class *TransitStopObject* is a member of *com.here.android.mpa.mapping*.

### Class Summary

```
public final class TransitStopObject
```

*extends* *com.here.android.mpa.mapping.MapProxyObject*, *com.here.android.mpa.common.ViewObject*, *java.lang.Object*

Encapsulates information about a public transit stop on a map.

[For complete information, see the section *Class Details*]

#### See also:

*TransitStopInfo*

### Method Summary

Table 597: Methods in TransitStopObject

Methods
<pre>public <i>GeoCoordinate</i> <i>getCoordinate</i> ()</pre> <p>Gets the <i>GeoCoordinate</i> representing the position of the transit stop icon on the map.</p>
<pre>public java.util.List &lt;<i>Image</i>&gt; <i>getIcons</i> ()</pre> <p>Get the list of icons associated with the <i>TransitStopObject</i>.</p>

## Methods

```
public TransitStopInfo getTransitStopInfo ()
```

Gets the *TransitStopInfo* associated with the *TransitStopObject* .

## Class Details

Encapsulates information about a public transit stop on a map.

A *TransitStopObject* represents a specialized *MapProxyObject*. User can retrieve an instance of this object by calling *getSelectedObjects(PointF)* or *getSelectedObjects(ViewRect)* with the location where a public transit stop is located.

**See also:**

*TransitStopInfo*

## Method Details

```
public GeoCoordinate getCoordinate ()
```

Gets the *GeoCoordinate* representing the position of the transit stop icon on the map.

**Returns:**

The *GeoCoordinate*

```
public java.util.List <Image> getIcons ()
```

Get the list of icons associated with the *TransitStopObject* .

**Returns:**

List of icon *Images*.

```
public TransitStopInfo getTransitStopInfo ()
```

Gets the *TransitStopInfo* associated with the *TransitStopObject* . A *TransitStopInfo* instance contains information about the name of the stop, the types of transit that use the stop, and the IDs of particular transit lines that stop there.

**Returns:**

The *TransitStopInfo*

## TransitSystemInfo

The class *TransitSystemInfo* is a member of *com.here.android.mpa.mapping* .

## Class Summary

public final class **TransitSystemInfo**

*extends java.lang.Object*

Represents information about a public transit system.

[For complete information, see the section [Class Details](#)]

## Nested Class Summary

Table 598: Nested Classes in TransitSystemInfo

Nested Classes
public static final enumeration <a href="#">TransitSystemInfo.Attribute</a> Attributes or LOGOS of a Transit System.

## Method Summary

Table 599: Methods in TransitSystemInfo

Methods
public java.util.EnumSet <a href="#">&lt;Attribute&gt; getAttributes ()</a> Gets all the Attribute s for the transit system.
public <a href="#">OperatingHours</a> <a href="#">getBicycleHours ()</a> Gets the Bicycle Parking Hours.
public String <a href="#">getCompanyInformalName ()</a> Gets the company informal name for the transit system.
public <a href="#">Image</a> <a href="#">getCompanyLogo ()</a> Gets the Company Logo, if present.
public String <a href="#">getCompanyOfficialName ()</a> Gets the company official name for the transit system.
public String <a href="#">getCompanyPhone ()</a> Gets the company phone number for the transit system.
public String <a href="#">getCompanyRoutePlannerUrl ()</a> Gets the company route planner url for the transit system.
public String <a href="#">getCompanyScheduleUrl ()</a> Gets the company schedule url for the transit system.
public String <a href="#">getCompanyShortName ()</a> Gets the company short name for the transit system.
public String <a href="#">getCompanyWebsiteUrl ()</a> Gets the company website url for the transit system.

## Methods

```
public Identifier getId ()
```

Gets the ID for the transit system.

```
public Image getSystemAccessLogo ()
```

Gets the System Access Logo, if present.

```
public String getSystemInformalName ()
```

Gets the informal name for the transit system.

```
public Image getSystemLogo ()
```

Gets the System Logo, if present.

```
public String getSystemOfficialName ()
```

Gets the official name for the transit system.

```
public String getSystemShortName ()
```

Gets the short name for the transit system.

```
public String getSystemWebsiteUrl ()
```

Gets the website url for the transit system.

## Class Details

Represents information about a public transit system.

## Method Details

```
public java.util.EnumSet <Attribute> getAttributes ()
```

Gets all the `Attribute`s for the transit system.

### Returns:

A `EnumSet` containing all the `Attributes` associated with the transit system.

```
public OperatingHours getBicycleHours ()
```

Gets the Bicycle Parking Hours.

### Returns:

The bicycle parking hours as *OperatingHours* of this transit system.

```
public String getCompanyInformalName ()
```

Gets the company informal name for the transit system. This text is localized according to the device's locale.

### Returns:

company informal name.

```
public Image getCompanyLogo ()
```

Gets the Company Logo, if present.

**Returns:**

The Company Logo as an *Image*.

```
public String getCompanyOfficialName ()
```

Gets the company official name for the transit system. This text is localized according to the device's locale.

**Returns:**

company official name.

```
public String getCompanyPhone ()
```

Gets the company phone number for the transit system. This text is localized according to the device's locale.

**Returns:**

company phone number.

```
public String getCompanyRoutePlannerUrl ()
```

Gets the company route planner url for the transit system.

**Returns:**

company route planner url.

```
public String getCompanyScheduleUrl ()
```

Gets the company schedule url for the transit system.

**Returns:**

company schedule url.

```
public String getCompanyShortName ()
```

Gets the company short name for the transit system. This text is localized according to the device's locale.

**Returns:**

company short name.

```
public String getCompanyWebsiteUrl ()
```

Gets the company website url for the transit system.

**Returns:**

company website url.

```
public Identifier getId ()
```

Gets the ID for the transit system.

**Returns:**

the unique object *Identifier*.

**See also:**

[getSystemInfo\(Identifier, OnGetTransitInfoListener\)](#)

```
public Image getSystemAccessLogo ()
```

Gets the System Access Logo, if present.

**Returns:**

System Access Logo as an *Image*.

```
public String getSystemInformalName ()
```

Gets the informal name for the transit system. This text is localized according to the device's locale.

**Returns:**

informal name.

```
public Image getSystemLogo ()
```

Gets the System Logo, if present.

**Returns:**

System Logo as an *Image*.

```
public String getSystemOfficialName ()
```

Gets the official name for the transit system. This text is localized according to the device's locale.

**Returns:**

official name.

```
public String getSystemShortName ()
```

Gets the short name for the transit system. This text is localized according to the device's locale.

**Returns:**

short name.

```
public String getSystemWebsiteUrl ()
```

Gets the website url for the transit system.

**Returns:**

website url.

## Attribute

The enumeration *Attribute* is a member of *com.here.android.mpa.mapping.TransitSystemInfo*.

### Enumeration Summary

public static final enumeration **TransitSystemInfo.Attribute**

*extends java.lang.Enum, java.lang.Object*

Attributes or LOGOS of a Transit System.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 600: Enum Constants in Attribute

Fields
public static final <i>Attribute</i> <b>COMPANY_LOGO</b>
public static final <i>Attribute</i> <b>SYSTEM_LOGO</b>
public static final <i>Attribute</i> <b>SYSTEM_ACCESS_LOGO</b>

### Method Summary

Table 601: Methods in Attribute

Methods
public static <i>Attribute</i> <b>valueOf</b> (String name) This method retrieves the enumeration value that matches the name specified by the caller.
public static <i>TransitSystemInfo.Attribute[]</i> <b>values</b> () This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Attributes or LOGOS of a Transit System.

## Enum Constant Details

```
public static final Attribute COMPANY_LOGO
```

```
public static final Attribute SYSTEM_LOGO
```

```
public static final Attribute SYSTEM_ACCESS_LOGO
```

## Method Details

```
public static Attribute valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static TransitSystemInfo.Attribute[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## UrlMapRasterTileSourceBase

The class *UrlMapRasterTileSourceBase* is a member of *com.here.android.mpa.mapping*.

## Class Summary

```
public abstract class UrlMapRasterTileSourceBase
```

```
extends com.here.android.mpa.mapping.MapRasterTileSource, java.lang.Object
```

Represents an abstract base class for URL map raster tile sources.

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 602: Constructors in `UrlMapRasterTileSourceBase`

Constructors
<code>UrlMapRasterTileSourceBase ()</code>

## Method Summary

Table 603: Methods in `UrlMapRasterTileSourceBase`

Methods
<p><code>public TileResult <a href="#">getTileWithError</a> (int x, int y, int zoomLevel)</code>  <code>UrlMapRasterTileSourceBase</code> will only retrieve tile data using the source URL.</p>
<p><code>public abstract String <a href="#">getUrl</a> (int x, int y, int zoomLevel)</code>            Gets the URL representing the source of the specified raster tile image.</p>
<p><code>public boolean <a href="#">hasTile</a> (int x, int y, int zoomLevel)</code>  <code>UrlMapRasterTileSourceBase</code> will only retrieve tile data using the source URL.</p>

## Class Details

Represents an abstract base class for URL map raster tile sources. Extend this class and implement the `getUrl(int, int, int)` method to create custom URL raster tile sources.

## Constructor Details

`UrlMapRasterTileSourceBase ()`

## Method Details

`public TileResult getTileWithError (int x, int y, int zoomLevel)`

`UrlMapRasterTileSourceBase` will only retrieve tile data using the source URL. A `TileResult.getData()` always returns `null` and `TileResult.getError()` always returns `NONE`.

### Parameters:

- `x`  
X coordinate
- `y`  
Y coordinate
- `zoomLevel`  
zoom level

### Returns:

A `TileResult` representing tile data and operation error. Check `TileResult#getError()` to check for error. Check `TileResult#getData()` to get `RasterTile`

```
public abstract String getUrl (int x, int y, int zoomLevel)
```

Gets the URL representing the source of the specified raster tile image.

Note: implementations of raster tile sources must override this method to provide a complete URL string pointing to the raster tile image.

**Parameters:**

- **x**  
A current raster tile's X-coordinate
- **y**  
A current raster tile's Y-coordinate
- **zoomLevel**  
A current raster tile's zoom level

**Returns:**

The URL source for the raster tile image. Return `null` if an URL cannot be created.

```
public boolean hasTile (int x, int y, int zoomLevel)
```

`UrlMapRasterTileSourceBase` will only retrieve tile data using the source URL. So `hasTile` always returned `false`.

**Parameters:**

- **x**  
X coordinate
- **y**  
Y coordinate
- **zoomLevel**  
zoom level

**Returns:**

true if the tile exists, false otherwise

## ZoomLevelToTiltFunction

The interface `ZoomLevelToTiltFunction` is a member of `com.here.android.mpa.mapping`.

### Interface Summary

```
public abstract interface ZoomLevelToTiltFunction
```

Defines a interface to implement a function that provides a tilt value output for a zoom level input.

[For complete information, see the section [Interface Details](#)]

**See also:**

[setMaximumTiltFunction\(ZoomLevelToTiltFunction\)](#)

## Method Summary

Table 604: Methods in ZoomLevelToTiltFunction

Methods
<pre>public abstract float <a href="#">getTilt</a> (float zoomLevel)</pre>
Method use to control maximum tilt allowed on a map view at a given zoom level.

## Interface Details

Defines a interface to implement a function that provides a tilt value output for a zoom level input.

**See also:**

[setMaximumTiltFunction\(ZoomLevelToTiltFunction\)](#)

## Method Details

```
public abstract float getTilt (float zoomLevel)
```

Method use to control maximum tilt allowed on a map view at a given zoom level.

The function takes an input zoom level that will be in the range [ [getMaxTilt\(\)](#), [getMinTilt\(\)](#)]. The output should be a tilt value in the range [0, [getMinTilt\(\)](#)].

**Parameters:**

- `zoomLevel`  
Desired fractional zoom level.

**Returns:**

A tilt value in the range [0, [getMinTilt\(\)](#)].

## customization

The package *customization* is a member of [com.here.android.mpa.mapping](#) .

## Package Summary

### customization

This package provides classes, interfaces, and enumerations for map scheme customization, including customizable variables and properties.

## Package Details

This package provides classes, interfaces, and enumerations for map scheme customization, including customizable variables and properties.

## CustomizableScheme

The class *CustomizableScheme* is a member of [com.here.android.mpa.mapping.customization](#).

### Class Summary

public class **CustomizableScheme**

*extends java.lang.Object*

Represent a scheme that can be customize.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 605: Nested Classes in CustomizableScheme

Nested Classes
public static final enumeration <a href="#">CustomizableScheme.ErrorCode</a> Error code specific to configuration scheme or variable

### Method Summary

Table 606: Methods in CustomizableScheme

Methods
public boolean <a href="#">equals</a> (Object obj) For documentation, see <i>java.lang.Object</i>
public String <a href="#">getName</a> () Retrieve name of customizable scheme object.
public int <a href="#">getVariableValue</a> ( <a href="#">SchemeColorProperty</a> variable, double zoomLevel) Retrieve color of an existing variable.
public float <a href="#">getVariableValue</a> ( <a href="#">SchemeFloatProperty</a> variable, double zoomLevel) Retrieve value of an existing variable.
public int <a href="#">getVariableValue</a> ( <a href="#">SchemeIntegerProperty</a> variable, double zoomLevel) Retrieve value to an existent integer variable.
public int <a href="#">hashCode</a> () For documentation, see <i>java.lang.Object</i>

## Methods

```
public boolean isValid ()
```

Returns true if the customizable scheme object is in a valid state, false otherwise.

```
public ErrorCode setVariableValue (SchemeColorProperty variable, int value, ZoomRange range)
```

Sets color for an existing variable.

```
public ErrorCode setVariableValue (SchemeFloatProperty variable, float value, ZoomRange range)
```

Sets value to an existing float variable.

```
public ErrorCode setVariableValue (SchemeIntegerProperty variable, int value, ZoomRange range)
```

Sets value to existing integer variable.

## Class Details

Represent a scheme that can be customize. A customizable scheme cannot be directly constructed, but one can be created through a *Map* object, by using an existing base *Map.Scheme*. Call *getCustomizableScheme(String)* to get Customizable Scheme instance.

## Method Details

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

### Parameters:

- **obj**

```
public String getName ()
```

Retrieve name of customizable scheme object.

### Returns:

name of customizable scheme object OR null if this scheme is not valid.

```
public int getVariableValue (SchemeColorProperty variable, double zoomLevel)
```

Retrieve color of an existing variable.

### Parameters:

- **variable**  
variable name
- **zoomLevel**  
Get value of variable for this zoom level.

### Returns:

color value of variable for given zoom level.

## Throws:

- **IllegalArgumentException**  
if variable is null OR zoomLevel is not valid

```
public float getVariableValue (SchemeFloatProperty variable, double zoomLevel)
```

Retrieve value of an existing variable.

## Parameters:

- **variable**  
variable name
- **zoomLevel**  
Get value of variable for this zoom level.

## Returns:

value of variable for given zoom level.

## Throws:

- **IllegalArgumentException**  
if variable is null OR zoomLevel is not valid

```
public int getVariableValue (SchemeIntegerProperty variable, double zoomLevel)
```

Retrieve value to an existent integer variable.

## Parameters:

- **variable**  
variable name
- **zoomLevel**  
Get value of variable for this zoom level.

## Returns:

value of variable for given zoom level.

## Throws:

- **IllegalArgumentException**  
if variable is null OR zoomLevel is not valid

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public boolean isValid ()
```

Returns true if the customizable scheme object is in a valid state, false otherwise.

A scheme may not be valid either because the scheme was removed or a new configuration has been set.

**Returns:**

true if the scheme is valid, false otherwise.

```
public ErrorCode setVariableValue (SchemeColorProperty variable, int value,  
ZoomRange range)
```

Sets color for an existing variable.

**Parameters:**

- **variable**  
Name of color variable. Can be get from *CustomizableVariables* class.
- **value**  
Value to set.
- **range**  
Zoom range where this variable value will come into effect.

**Returns:**

- *ERROR\_NONE* if operation was successful.
- *ERROR\_INVALID\_PARAMETERS* if there's no variable with that name OR variable is null OR range is null or not valid
- *ERROR\_INVALID\_OPERATION* if this scheme is not valid.
- *ERROR\_OUT\_OF\_MEMORY* if operation failed due to an out of memory error.

```
public ErrorCode setVariableValue (SchemeFloatProperty variable, float value,  
ZoomRange range)
```

Sets value to an existing float variable.

**Parameters:**

- **variable**  
Name of variable. Can be get from *CustomizableVariables* class.
- **value**  
Value to set.
- **range**  
Zoom range where this variable value will come into effect.

**Returns:**

- *ERROR\_NONE* if operation was successful.
- *ERROR\_INVALID\_PARAMETERS* if there's no variable with that name OR variable is null OR range is null or not valid
- *ERROR\_INVALID\_OPERATION* if this scheme is not valid.

- `ERROR_OUT_OF_MEMORY` if operation failed due to an out of memory error.

```
public ErrorCode setVariableValue (SchemeIntegerProperty variable, int value,
ZoomRange range)
```

Sets value to existing integer variable.

#### Parameters:

- **variable**  
Name of variable. Can be get from *CustomizableVariables* class.
- **value**  
Value to set.
- **range**  
Zoom range where this variable value will come into effect.

#### Returns:

- `ERROR_NONE` if operation was successful.
- `ERROR_INVALID_PARAMETERS` if there's no variable with that name OR variable is null OR range is null or not valid
- `ERROR_INVALID_OPERATION` if this scheme is not valid.
- `ERROR_OUT_OF_MEMORY` if operation failed due to an out of memory error.

## ErrorCode

The enumeration *ErrorCode* is a member of *com.here.android.mpa.mapping.customization.CustomizableScheme*.

### Enumeration Summary

```
public static final enumeration CustomizableScheme.ErrorCode
```

```
extends java.lang.Enum, java.lang.Object
```

Error code specific to configuration scheme or variable

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 607: Enum Constants in *ErrorCode*

#### Fields

```
public static final ErrorCode ERROR_NONE
```

No Error

```
public static final ErrorCode ERROR_UNKNOWN
```

Generic error.

## Fields

```
public static final ErrorCode ERROR_OUT_OF_MEMORY
```

Out of memory.

```
public static final ErrorCode ERROR_INVALID_PARAMETERS
```

Invalid parameters received.

```
public static final ErrorCode ERROR_INVALID_OPERATION
```

Operation is not allowed at the time of the call.

## Method Summary

Table 608: Methods in *ErrorCode*

### Methods

```
public static ErrorCode getCode (int value)
```

```
public int getValue ()
```

```
public static ErrorCode valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static CustomizableScheme.ErrorCode[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Error code specific to configuration scheme or variable

### Enum Constant Details

```
public static final ErrorCode ERROR_NONE
```

No Error

```
public static final ErrorCode ERROR_UNKNOWN
```

Generic error.

```
public static final ErrorCode ERROR_OUT_OF_MEMORY
```

Out of memory.

```
public static final ErrorCode ERROR_INVALID_PARAMETERS
```

Invalid parameters received.

```
public static final ErrorCode ERROR_INVALID_OPERATION
```

Operation is not allowed at the time of the call.

### Method Details

```
public static ErrorCode getCode (int value)
```

Parameters:

- `value`

```
public int getValue ()
```

```
public static ErrorCode valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

Parameters:

- `name`

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static CustomizableScheme.ErrorCode[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## CustomizableVariables

The class *CustomizableVariables* is a member of *com.here.android.mpa.mapping.customization*.

### Class Summary

```
public class CustomizableVariables
```

```
extends java.lang.Object
```

[For complete information, see the section *Class Details*]

### Nested Class Summary

Table 609: Nested Classes in CustomizableVariables

#### Nested Classes

```
public static class CustomizableVariables.AirportArea
```

**Nested Classes**

public static class [CustomizableVariables.AirportAreaInfo](#)

public static class [CustomizableVariables.Allotment](#)

public static class [CustomizableVariables.AllotmentInfo](#)

public static class [CustomizableVariables.AmbientLight](#)

public static class [CustomizableVariables.AmusementPark](#)

public static class [CustomizableVariables.AmusementParkInfo](#)

public static class [CustomizableVariables.AnimalPark](#)

public static class [CustomizableVariables.AnimalParkInfo](#)

public static class [CustomizableVariables.Area](#)

public static class [CustomizableVariables.AvoidBlockedRoute](#)

public static class [CustomizableVariables.BayHarbour](#)

public static class [CustomizableVariables.Beach](#)

public static class [CustomizableVariables.BeachInfo](#)

public static class [CustomizableVariables.Billboard](#)

public static class [CustomizableVariables.Building](#)

public static class [CustomizableVariables.Building1](#)

public static class [CustomizableVariables.Building1Outline](#)

public static class [CustomizableVariables.BuildingAddress](#)

public static class [CustomizableVariables.BuildingInfo](#)

public static class [CustomizableVariables.BuildingOutline](#)

public static class [CustomizableVariables.BuiltupArea](#)

public static class [CustomizableVariables.BuiltupBorder](#)

public static class [CustomizableVariables.CanalWaterChannel](#)

public static class [CustomizableVariables.Cemetery](#)

public static class [CustomizableVariables.CemeteryInfo](#)

public static class [CustomizableVariables.CityCenter](#)

public static class [CustomizableVariables.CongestionZone](#)

public static class [CustomizableVariables.CongestionZoneBorder](#)

public static class [CustomizableVariables.CongestionZoneInfo](#)

public static class [CustomizableVariables.ContinentLabel](#)

public static class [CustomizableVariables.CountryBoundary](#)

**Nested Classes**

public static class [CustomizableVariables.CountryBoundaryDisputed](#)

public static class [CustomizableVariables.CountrySideLabel](#)

public static class [CustomizableVariables.DirectionallLight1](#)

public static class [CustomizableVariables.DirectionallLight2](#)

public static class [CustomizableVariables.DirectionallLight3](#)

public static class [CustomizableVariables.ElevationMap](#)

public static class [CustomizableVariables.EnvironmentalZone](#)

public static class [CustomizableVariables.EnvironmentalZoneBorder](#)

public static class [CustomizableVariables.EnvironmentalZoneInfo](#)

public static class [CustomizableVariables.ExitInfo](#)

public static class [CustomizableVariables.ExitInfoSimplified](#)

public static class [CustomizableVariables.ExtrudedBuildings](#)

public static class [CustomizableVariables.FarPlane](#)

public static class [CustomizableVariables.Ferry](#)

public static class [CustomizableVariables.Fog](#)

public static class [CustomizableVariables.GolfCourse](#)

public static class [CustomizableVariables.GolfCourseInfo](#)

public static class [CustomizableVariables.GuidanceArrow](#)

public static class [CustomizableVariables.HarborArea](#)

public static class [CustomizableVariables.HarborAreaInfo](#)

public static class [CustomizableVariables.HospitalCampus](#)

public static class [CustomizableVariables.HospitalCampusInfo](#)

public static class [CustomizableVariables.IndustrialComplex](#)

public static class [CustomizableVariables.IndustrialComplexInfo](#)

public static class [CustomizableVariables.IntermittentRiver](#)

public static class [CustomizableVariables.IslandInfo](#)

public static class [CustomizableVariables.Lake](#)

public static class [CustomizableVariables.Land](#)

public static class [CustomizableVariables.LandCover](#)

public static class [CustomizableVariables.LaneWidthM](#)

public static class [CustomizableVariables.LineOfControl](#)

**Nested Classes**

public static class [CustomizableVariables.MajorCountryLabel](#)

public static class [CustomizableVariables.MarkingDivider](#)

public static class [CustomizableVariables.MarkingLane](#)

public static class [CustomizableVariables.MilitaryBase](#)

public static class [CustomizableVariables.MilitaryBaseInfo](#)

public static class [CustomizableVariables.MinorCountryLabel](#)

public static class [CustomizableVariables.MotorwayJunctionSimplified](#)

public static class [CustomizableVariables.MountainPeak](#)

public static class [CustomizableVariables.MountainPeakHeight](#)

public static class [CustomizableVariables.MountainPeakInfo](#)

public static class [CustomizableVariables.MountainRangeInfo](#)

public static class [CustomizableVariables.NationalForest](#)

public static class [CustomizableVariables.NationalForestInfo](#)

public static class [CustomizableVariables.NationalGrassland](#)

public static class [CustomizableVariables.NationalGrasslandInfo](#)

public static class [CustomizableVariables.NationalHistoricPark](#)

public static class [CustomizableVariables.NationalHistoricParkInfo](#)

public static class [CustomizableVariables.NationalMilitaryPark](#)

public static class [CustomizableVariables.NationalPark](#)

public static class [CustomizableVariables.NationalParkInfo](#)

public static class [CustomizableVariables.NationalRecreationArea](#)

public static class [CustomizableVariables.NationalRecreationAreaInfo](#)

public static class [CustomizableVariables.NationalReserve](#)

public static class [CustomizableVariables.NationalStatePark](#)

public static class [CustomizableVariables.NationalStateParkInfo](#)

public static class [CustomizableVariables.NationalWildlifeRefuge](#)

public static class [CustomizableVariables.NativeReservation](#)

public static class [CustomizableVariables.NativeReservationInfo](#)

public static class [CustomizableVariables.Neighborhood](#)

public static class [CustomizableVariables.NeighborhoodInfo](#)

public static class [CustomizableVariables.Ocean](#)

**Nested Classes**

public static class [CustomizableVariables.Panorama](#)

public static class [CustomizableVariables.Park](#)

public static class [CustomizableVariables.ParkInfo](#)

public static class [CustomizableVariables.PedestrianArea](#)

public static class [CustomizableVariables.PedestrianAreaInfo](#)

public static class [CustomizableVariables.PedestrianPoint](#)

public static class [CustomizableVariables.PointOfInterest](#)

public static class [CustomizableVariables.Rail](#)

public static class [CustomizableVariables.Railway](#)

public static class [CustomizableVariables.Railyard](#)

public static class [CustomizableVariables.RailyardInfo](#)

public static class [CustomizableVariables.RemainingRangeEV](#)

public static class [CustomizableVariables.River](#)

public static class [CustomizableVariables.RoadSign](#)

public static class [CustomizableVariables.RouteStyle](#)

public static class [CustomizableVariables.Runway](#)

public static class [CustomizableVariables.SSAO](#)

public static class [CustomizableVariables.Sea](#)

public static class [CustomizableVariables.ShoppingComplex](#)

public static class [CustomizableVariables.ShoppingComplexInfo](#)

public static class [CustomizableVariables.Sky](#)

public static class [CustomizableVariables.SportsComplex](#)

public static class [CustomizableVariables.SportsComplexInfo](#)

public static class [CustomizableVariables.StateAbbreviationLabel](#)

public static class [CustomizableVariables.StateBoundary](#)

public static class [CustomizableVariables.StateBoundaryDisputed](#)

public static class [CustomizableVariables.StateLabel](#)

public static class [CustomizableVariables.Street](#)

public static class [CustomizableVariables.Transit](#)

public static class [CustomizableVariables.TransitAccess](#)

public static class [CustomizableVariables.TruckIcon](#)

## Nested Classes

public static class [CustomizableVariables.TruckLine](#)

public static class [CustomizableVariables.UniversityCampus](#)

public static class [CustomizableVariables.UniversityCampusInfo](#)

public static class [CustomizableVariables.Water](#)

public static class [CustomizableVariables.Woodland](#)

public static class [CustomizableVariables.WoodlandInfo](#)

public static class [CustomizableVariables.WorldMountains](#)

public static class [CustomizableVariables.ZoneBorder](#)

## Constructor Summary

Table 610: Constructors in CustomizableVariables

### Constructors

[CustomizableVariables](#) ()

## Class Details

### Constructor Details

[CustomizableVariables](#) ()

## AirportArea

The class *AirportArea* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.AirportArea**

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 611: Constructors in AirportArea

### Constructors

[AirportArea](#) ()

## Field Summary

Table 612: Fields in AirportArea

Fields
public static final <i>SchemeColorProperty</i> COLOR

## Class Details

### Constructor Details

AirportArea ()

### Field Details

public static final *SchemeColorProperty* COLOR

## AirportAreaInfo

The class *AirportAreaInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.AirportAreaInfo**

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 613: Constructors in AirportAreaInfo

Constructors
<i>AirportAreaInfo</i> ()

## Field Summary

Table 614: Fields in AirportAreaInfo

Fields
public static final <i>SchemeColorProperty</i> FONTSTYLE_COLOR
public static final <i>SchemeColorProperty</i> FONTSTYLE_OUTLINE_COLOR
public static final <i>SchemeFloatProperty</i> FONTSTYLE_OUTLINE_WIDTH

## Fields

public static final *SchemeFloatProperty* **FONTSTYLE\_SIZE**

---

## Class Details

### Constructor Details

**AirportAreaInfo** ( )

### Field Details

public static final *SchemeColorProperty* **FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **FONTSTYLE\_SIZE**

## Allotment

The class *Allotment* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.Allotment**

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 615: Constructors in Allotment

#### Constructors

*Allotment* ( )

## Field Summary

Table 616: Fields in Allotment

Fields
<code>public static final <i>SchemeColorProperty</i> COLOR</code>

## Class Details

### Constructor Details

Allotment ()

### Field Details

`public static final SchemeColorProperty COLOR`

## AllotmentInfo

The class *AllotmentInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

`public static class CustomizableVariables.AllotmentInfo`

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 617: Constructors in AllotmentInfo

Constructors
<code><i>AllotmentInfo</i> ()</code>

## Field Summary

Table 618: Fields in AllotmentInfo

Fields
<code>public static final <i>SchemeColorProperty</i> FONTSTYLE_COLOR</code>
<code>public static final <i>SchemeColorProperty</i> FONTSTYLE_OUTLINE_COLOR</code>
<code>public static final <i>SchemeFloatProperty</i> FONTSTYLE_OUTLINE_WIDTH</code>

## Fields

```
public static final SchemeFloatProperty FONTSTYLE_SIZE
```

---

## Class Details

### Constructor Details

`AllotmentInfo ()`

### Field Details

```
public static final SchemeColorProperty FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty FONTSTYLE_SIZE
```

## AmbientLight

The class *AmbientLight* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.AmbientLight
```

```
extends java.lang.Object
```

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 619: Constructors in *AmbientLight*

#### Constructors

```
AmbientLight ()
```

## Field Summary

Table 620: Fields in AmbientLight

Fields
<code>public static final <i>SchemeColorProperty</i> COLOR</code>

## Class Details

### Constructor Details

`AmbientLight ()`

### Field Details

`public static final SchemeColorProperty COLOR`

## AmusementPark

The class *AmusementPark* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

`public static class CustomizableVariables.AmusementPark`  
*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 621: Constructors in AmusementPark

Constructors
<code><i>AmusementPark</i> ()</code>

## Field Summary

Table 622: Fields in AmusementPark

Fields
<code>public static final <i>SchemeColorProperty</i> COLOR</code>

## Class Details

### Constructor Details

`AmusementPark ()`

### Field Details

`public static final SchemeColorProperty COLOR`

## AmusementParkInfo

The class *AmusementParkInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

`public static class CustomizableVariables.AmusementParkInfo`

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 623: Constructors in AmusementParkInfo

Constructors
<code>AmusementParkInfo ()</code>

### Field Summary

Table 624: Fields in AmusementParkInfo

Fields
<code>public static final <i>SchemeColorProperty</i> FONTSTYLE_COLOR</code>
<code>public static final <i>SchemeColorProperty</i> FONTSTYLE_OUTLINE_COLOR</code>
<code>public static final <i>SchemeFloatProperty</i> FONTSTYLE_OUTLINE_WIDTH</code>
<code>public static final <i>SchemeFloatProperty</i> FONTSTYLE_SIZE</code>

## Class Details

### Constructor Details

`AmusementParkInfo ()`

### Field Details

`public static final SchemeColorProperty FONTSTYLE_COLOR`

`public static final SchemeColorProperty FONTSTYLE_OUTLINE_COLOR`

`public static final SchemeFloatProperty FONTSTYLE_OUTLINE_WIDTH`

`public static final SchemeFloatProperty FONTSTYLE_SIZE`

## AnimalPark

The class *AnimalPark* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

`public static class CustomizableVariables.AnimalPark`

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 625: Constructors in AnimalPark

Constructors
<code><i>AnimalPark</i> ()</code>

### Field Summary

Table 626: Fields in AnimalPark

Fields
<code>public static final <i>SchemeColorProperty</i> COLOR</code>

## Class Details

### Constructor Details

`AnimalPark ()`

### Field Details

`public static final SchemeColorProperty COLOR`

## AnimalParkInfo

The class *AnimalParkInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

`public static class CustomizableVariables.AnimalParkInfo`

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 627: Constructors in AnimalParkInfo

Constructors
<code>AnimalParkInfo ()</code>

### Field Summary

Table 628: Fields in AnimalParkInfo

Fields
<code>public static final <i>SchemeColorProperty</i> FONTSTYLE_COLOR</code>
<code>public static final <i>SchemeColorProperty</i> FONTSTYLE_OUTLINE_COLOR</code>
<code>public static final <i>SchemeFloatProperty</i> FONTSTYLE_OUTLINE_WIDTH</code>
<code>public static final <i>SchemeFloatProperty</i> FONTSTYLE_SIZE</code>

## Class Details

### Constructor Details

`AnimalParkInfo ()`

### Field Details

`public static final SchemeColorProperty FONTSTYLE_COLOR`

`public static final SchemeColorProperty FONTSTYLE_OUTLINE_COLOR`

`public static final SchemeFloatProperty FONTSTYLE_OUTLINE_WIDTH`

`public static final SchemeFloatProperty FONTSTYLE_SIZE`

## Area

The class `Area` is a member of `com.here.android.mpa.mapping.customization.CustomizableVariables`.

### Class Summary

`public static class CustomizableVariables.Area`

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 629: Constructors in Area

Constructors
<code>Area ()</code>

### Field Summary

Table 630: Fields in Area

Fields
<code>public static final <i>SchemeIntegerProperty</i> ICONSIZE</code>

## Class Details

### Constructor Details

Area ( )

### Field Details

public static final *SchemeIntegerProperty* **ICONSIZE**

## AvoidBlockedRoute

The class *AvoidBlockedRoute* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.AvoidBlockedRoute**

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 631: Constructors in *AvoidBlockedRoute*

Constructors
<i>AvoidBlockedRoute</i> ( )

### Field Summary

Table 632: Fields in *AvoidBlockedRoute*

Fields
public static final <i>SchemeColorProperty</i> <b>DASHCOLOR</b>
public static final <i>SchemeColorProperty</i> <b>GAPCOLOR</b>
public static final <i>SchemeColorProperty</i> <b>OUTLINECOLOR</b>
public static final <i>SchemeFloatProperty</i> <b>OUTLINEWIDTH</b>
public static final <i>SchemeFloatProperty</i> <b>WIDTH</b>

## Class Details

### Constructor Details

`AvoidBlockedRoute ()`

### Field Details

`public static final SchemeColorProperty DASHCOLOR`

`public static final SchemeColorProperty GAPCOLOR`

`public static final SchemeColorProperty OUTLINECOLOR`

`public static final SchemeFloatProperty OUTLINEWIDTH`

`public static final SchemeFloatProperty WIDTH`

## BayHarbour

The class *BayHarbour* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

`public static class CustomizableVariables.BayHarbour`

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 633: Constructors in BayHarbour

Constructors
<i>BayHarbour ()</i>

## Field Summary

Table 634: Fields in BayHarbour

Fields	
<code>public static final SchemeColorProperty</code>	<code>COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>DISPLAYCLASS1_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>DISPLAYCLASS1_FONTSTYLE_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>DISPLAYCLASS1_FONTSTYLE_OUTLINE_COLOR</code>
<code>public static final SchemeFloatProperty</code>	<code>DISPLAYCLASS1_FONTSTYLE_OUTLINE_WIDTH</code>
<code>public static final SchemeFloatProperty</code>	<code>DISPLAYCLASS1_FONTSTYLE_SIZE</code>
<code>public static final SchemeColorProperty</code>	<code>DISPLAYCLASS2_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>DISPLAYCLASS2_FONTSTYLE_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>DISPLAYCLASS2_FONTSTYLE_OUTLINE_COLOR</code>
<code>public static final SchemeFloatProperty</code>	<code>DISPLAYCLASS2_FONTSTYLE_OUTLINE_WIDTH</code>
<code>public static final SchemeFloatProperty</code>	<code>DISPLAYCLASS2_FONTSTYLE_SIZE</code>
<code>public static final SchemeColorProperty</code>	<code>DISPLAYCLASS3_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>DISPLAYCLASS3_FONTSTYLE_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>DISPLAYCLASS3_FONTSTYLE_OUTLINE_COLOR</code>
<code>public static final SchemeFloatProperty</code>	<code>DISPLAYCLASS3_FONTSTYLE_OUTLINE_WIDTH</code>
<code>public static final SchemeFloatProperty</code>	<code>DISPLAYCLASS3_FONTSTYLE_SIZE</code>
<code>public static final SchemeColorProperty</code>	<code>DISPLAYCLASS4_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>DISPLAYCLASS4_FONTSTYLE_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>DISPLAYCLASS4_FONTSTYLE_OUTLINE_COLOR</code>
<code>public static final SchemeFloatProperty</code>	<code>DISPLAYCLASS4_FONTSTYLE_OUTLINE_WIDTH</code>
<code>public static final SchemeFloatProperty</code>	<code>DISPLAYCLASS4_FONTSTYLE_SIZE</code>
<code>public static final SchemeColorProperty</code>	<code>DISPLAYCLASS5_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>DISPLAYCLASS5_FONTSTYLE_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>DISPLAYCLASS5_FONTSTYLE_OUTLINE_COLOR</code>
<code>public static final SchemeFloatProperty</code>	<code>DISPLAYCLASS5_FONTSTYLE_OUTLINE_WIDTH</code>
<code>public static final SchemeFloatProperty</code>	<code>DISPLAYCLASS5_FONTSTYLE_SIZE</code>
<code>public static final SchemeColorProperty</code>	<code>DISPLAYCLASS6_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>DISPLAYCLASS6_FONTSTYLE_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>DISPLAYCLASS6_FONTSTYLE_OUTLINE_COLOR</code>

## Fields

public static final *SchemeFloatProperty* **DISPLAYCLASS6\_FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **DISPLAYCLASS6\_FONTSTYLE\_SIZE**

public static final *SchemeColorProperty* **DISPLAYCLASS7\_COLOR**

public static final *SchemeColorProperty* **DISPLAYCLASS7\_FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **DISPLAYCLASS7\_FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **DISPLAYCLASS7\_FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **DISPLAYCLASS7\_FONTSTYLE\_SIZE**

public static final *SchemeColorProperty* **DISPLAYCLASS8\_COLOR**

public static final *SchemeColorProperty* **DISPLAYCLASS8\_FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **DISPLAYCLASS8\_FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **DISPLAYCLASS8\_FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **DISPLAYCLASS8\_FONTSTYLE\_SIZE**

public static final *SchemeColorProperty* **FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **FONTSTYLE\_SIZE**

## Class Details

### Constructor Details

**BayHarbour** ()

### Field Details

public static final *SchemeColorProperty* **COLOR**

public static final *SchemeColorProperty* **DISPLAYCLASS1\_COLOR**

public static final *SchemeColorProperty* **DISPLAYCLASS1\_FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **DISPLAYCLASS1\_FONTSTYLE\_OUTLINE\_COLOR**

```
public static final SchemeFloatProperty DISPLAYCLASS1_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS1_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty DISPLAYCLASS2_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS2_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS2_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS2_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS2_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty DISPLAYCLASS3_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS3_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS3_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS3_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS3_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty DISPLAYCLASS4_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS4_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS4_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS4_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS4_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty DISPLAYCLASS5_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS5_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS5_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS5_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS5_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty DISPLAYCLASS6_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS6_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS6_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS6_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS6_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty DISPLAYCLASS7_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS7_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS7_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS7_FONTSTYLE_OUTLINE_WIDTH
```

```

public static final SchemeFloatProperty DISPLAYCLASS7_FONTSTYLE_SIZE

public static final SchemeColorProperty DISPLAYCLASS8_COLOR

public static final SchemeColorProperty DISPLAYCLASS8_FONTSTYLE_COLOR

public static final SchemeColorProperty DISPLAYCLASS8_FONTSTYLE_OUTLINE_COLOR

public static final SchemeFloatProperty DISPLAYCLASS8_FONTSTYLE_OUTLINE_WIDTH

public static final SchemeFloatProperty DISPLAYCLASS8_FONTSTYLE_SIZE

public static final SchemeColorProperty FONTSTYLE_COLOR

public static final SchemeColorProperty FONTSTYLE_OUTLINE_COLOR

public static final SchemeFloatProperty FONTSTYLE_OUTLINE_WIDTH

public static final SchemeFloatProperty FONTSTYLE_SIZE

```

## Beach

The class *Beach* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.Beach
```

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 635: Constructors in Beach

Constructors
<i>Beach</i> ()

## Field Summary

Table 636: Fields in Beach

Fields
<code>public static final <i>SchemeColorProperty</i> COLOR</code>

## Class Details

### Constructor Details

Beach ()

### Field Details

`public static final SchemeColorProperty COLOR`

## BeachInfo

The class *BeachInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

`public static class CustomizableVariables.BeachInfo`

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 637: Constructors in BeachInfo

Constructors
<code><i>BeachInfo</i> ()</code>

## Field Summary

Table 638: Fields in BeachInfo

Fields
<code>public static final <i>SchemeColorProperty</i> FONTSTYLE_COLOR</code>
<code>public static final <i>SchemeColorProperty</i> FONTSTYLE_OUTLINE_COLOR</code>
<code>public static final <i>SchemeFloatProperty</i> FONTSTYLE_OUTLINE_WIDTH</code>

## Fields

```
public static final SchemeFloatProperty FONTSTYLE_SIZE
```

---

## Class Details

### Constructor Details

BeachInfo ( )

### Field Details

```
public static final SchemeColorProperty FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty FONTSTYLE_SIZE
```

## Billboard

The class *Billboard* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.Billboard
```

```
extends java.lang.Object
```

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 639: Constructors in Billboard

#### Constructors

```
Billboard ( )
```

## Field Summary

Table 640: Fields in Billboard

Fields	
<code>public static final</code>	<code><i>SchemeColorProperty</i> ADJACENT_COLOR</code>
<code>public static final</code>	<code><i>SchemeColorProperty</i> ADJACENT_FONTSTYLE_COLOR</code>
<code>public static final</code>	<code><i>SchemeColorProperty</i> ADJACENT_FONTSTYLE_OUTLINE_COLOR</code>
<code>public static final</code>	<code><i>SchemeFloatProperty</i> ADJACENT_FONTSTYLE_OUTLINE_WIDTH</code>
<code>public static final</code>	<code><i>SchemeFloatProperty</i> ADJACENT_FONTSTYLE_SIZE</code>
<code>public static final</code>	<code><i>SchemeColorProperty</i> ADJACENT_OUTLINECOLOR</code>
<code>public static final</code>	<code><i>SchemeFloatProperty</i> ADJACENT_OUTLINEWIDTH</code>
<code>public static final</code>	<code><i>SchemeFloatProperty</i> ADJACENT_POINTERHEIGHT</code>
<code>public static final</code>	<code><i>SchemeColorProperty</i> OFFROUTE_COLOR</code>
<code>public static final</code>	<code><i>SchemeColorProperty</i> OFFROUTE_FONTSTYLE_COLOR</code>
<code>public static final</code>	<code><i>SchemeColorProperty</i> OFFROUTE_FONTSTYLE_OUTLINE_COLOR</code>
<code>public static final</code>	<code><i>SchemeFloatProperty</i> OFFROUTE_FONTSTYLE_OUTLINE_WIDTH</code>
<code>public static final</code>	<code><i>SchemeFloatProperty</i> OFFROUTE_FONTSTYLE_SIZE</code>
<code>public static final</code>	<code><i>SchemeColorProperty</i> OFFROUTE_OUTLINECOLOR</code>
<code>public static final</code>	<code><i>SchemeFloatProperty</i> OFFROUTE_OUTLINEWIDTH</code>
<code>public static final</code>	<code><i>SchemeFloatProperty</i> OFFROUTE_POINTERHEIGHT</code>

## Class Details

### Constructor Details

**Billboard** ()

### Field Details

`public static final` `SchemeColorProperty ADJACENT_COLOR`

`public static final` `SchemeColorProperty ADJACENT_FONTSTYLE_COLOR`

`public static final` `SchemeColorProperty ADJACENT_FONTSTYLE_OUTLINE_COLOR`

```
public static final SchemeFloatProperty ADJACENT_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty ADJACENT_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty ADJACENT_OUTLINECOLOR
```

```
public static final SchemeFloatProperty ADJACENT_OUTLINEWIDTH
```

```
public static final SchemeFloatProperty ADJACENT_POINTERHEIGHT
```

```
public static final SchemeColorProperty OFFROUTE_COLOR
```

```
public static final SchemeColorProperty OFFROUTE_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty OFFROUTE_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty OFFROUTE_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty OFFROUTE_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty OFFROUTE_OUTLINECOLOR
```

```
public static final SchemeFloatProperty OFFROUTE_OUTLINEWIDTH
```

```
public static final SchemeFloatProperty OFFROUTE_POINTERHEIGHT
```

## Building

The class *Building* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

## Class Summary

```
public static class CustomizableVariables.Building
```

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 641: Constructors in Building

Constructors
<a href="#">Building</a> ()

## Field Summary

Table 642: Fields in Building

Fields
public static final <a href="#">SchemeColorProperty</a> <b>COLOR</b>

## Class Details

### Constructor Details

**Building** ()

### Field Details

public static final [SchemeColorProperty](#) **COLOR**

## Building1

The class *Building1* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.Building1**

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 643: Constructors in Building1

Constructors
<a href="#">Building1</a> ()

## Field Summary

Table 644: Fields in Building1

Fields
<code>public static final <a href="#">SchemeColorProperty</a> COLOR</code>

## Class Details

### Constructor Details

**Building1** ()

### Field Details

`public static final SchemeColorProperty COLOR`

## Building1Outline

The class *Building1Outline* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

`public static class CustomizableVariables.Building1Outline`

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 645: Constructors in Building1Outline

Constructors
<code><a href="#">Building1Outline</a> ()</code>

## Field Summary

Table 646: Fields in Building1Outline

Fields
<code>public static final <a href="#">SchemeColorProperty</a> COLOR</code>

## Class Details

### Constructor Details

**Building10Outline** ()

### Field Details

public static final *SchemeColorProperty* COLOR

## BuildingAddress

The class *BuildingAddress* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.BuildingAddress**

extends *java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 647: Constructors in BuildingAddress

Constructors
<i>BuildingAddress</i> ()

### Field Summary

Table 648: Fields in BuildingAddress

Fields
public static final <i>SchemeColorProperty</i> FONTSTYLE_COLOR
public static final <i>SchemeColorProperty</i> FONTSTYLE_OUTLINE_COLOR
public static final <i>SchemeFloatProperty</i> FONTSTYLE_OUTLINE_WIDTH
public static final <i>SchemeFloatProperty</i> FONTSTYLE_SIZE

## Class Details

### Constructor Details

**BuildingAddress** ()

### Field Details

public static final *SchemeColorProperty* FONTSTYLE\_COLOR

public static final *SchemeColorProperty* FONTSTYLE\_OUTLINE\_COLOR

public static final *SchemeFloatProperty* FONTSTYLE\_OUTLINE\_WIDTH

public static final *SchemeFloatProperty* FONTSTYLE\_SIZE

## BuildingInfo

The class *BuildingInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.BuildingInfo**

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 649: Constructors in BuildingInfo

Constructors
<i>BuildingInfo</i> ()

### Field Summary

Table 650: Fields in BuildingInfo

Fields
public static final <i>SchemeColorProperty</i> FONTSTYLE_COLOR
public static final <i>SchemeColorProperty</i> FONTSTYLE_OUTLINE_COLOR

## Fields

```
public static final SchemeFloatProperty FONTSTYLE_OUTLINE_WIDTH
public static final SchemeFloatProperty FONTSTYLE_SIZE
```

## Class Details

### Constructor Details

**BuildingInfo** ()

### Field Details

```
public static final SchemeColorProperty FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty FONTSTYLE_SIZE
```

## BuildingOutline

The class *BuildingOutline* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.BuildingOutline
```

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 651: Constructors in BuildingOutline

#### Constructors

```
BuildingOutline ()
```

## Field Summary

Table 652: Fields in BuildingOutline

Fields
<code>public static final <i>SchemeColorProperty</i> COLOR</code>

## Class Details

### Constructor Details

**BuildingOutline** ()

### Field Details

`public static final SchemeColorProperty COLOR`

## BuiltupArea

The class *BuiltupArea* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

`public static class CustomizableVariables.BuiltupArea`

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 653: Constructors in BuiltupArea

Constructors
<i>BuiltupArea</i> ()

## Field Summary

Table 654: Fields in BuiltupArea

Fields
<code>public static final <i>SchemeColorProperty</i> COLOR</code>
<code>public static final <i>SchemeIntegerProperty</i> MINPIXELHEIGHT</code>
<code>public static final <i>SchemeIntegerProperty</i> MINPIXELWIDTH</code>

## Class Details

### Constructor Details

**BuiltupArea** ()

### Field Details

public static final *SchemeColorProperty* **COLOR**

public static final *SchemeIntegerProperty* **MINPIXELHEIGHT**

public static final *SchemeIntegerProperty* **MINPIXELWIDTH**

## BuiltupBorder

The class *BuiltupBorder* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.BuiltupBorder**

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 655: Constructors in BuiltupBorder

Constructors
<i>BuiltupBorder</i> ()

### Field Summary

Table 656: Fields in BuiltupBorder

Fields
public static final <i>SchemeColorProperty</i> <b>BACKGROUNDCOLOR</b>
public static final <i>SchemeFloatProperty</i> <b>BACKGROUNDWIDTH</b>
public static final <i>SchemeColorProperty</i> <b>COLOR</b>
public static final <i>SchemeFloatProperty</i> <b>WIDTH</b>

## Class Details

### Constructor Details

**BuiltupBorder** ( )

### Field Details

public static final *SchemeColorProperty* **BACKGROUNDCOLOR**

public static final *SchemeFloatProperty* **BACKGROUNDWIDTH**

public static final *SchemeColorProperty* **COLOR**

public static final *SchemeFloatProperty* **WIDTH**

## CanalWaterChannel

The class *CanalWaterChannel* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.CanalWaterChannel**

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 657: Constructors in CanalWaterChannel

Constructors
<i>CanalWaterChannel</i> ( )

### Field Summary

Table 658: Fields in CanalWaterChannel

Fields
public static final <i>SchemeColorProperty</i> <b>COLOR</b>

## Fields

```

public static final SchemeColorProperty DISPLAYCLASS1_COLOR
public static final SchemeColorProperty DISPLAYCLASS1_FONTSTYLE_COLOR
public static final SchemeColorProperty DISPLAYCLASS1_FONTSTYLE_OUTLINE_COLOR
public static final SchemeFloatProperty DISPLAYCLASS1_FONTSTYLE_OUTLINE_WIDTH
public static final SchemeFloatProperty DISPLAYCLASS1_FONTSTYLE_SIZE
public static final SchemeFloatProperty DISPLAYCLASS1_WIDTH
public static final SchemeColorProperty DISPLAYCLASS2_COLOR
public static final SchemeColorProperty DISPLAYCLASS2_FONTSTYLE_COLOR
public static final SchemeColorProperty DISPLAYCLASS2_FONTSTYLE_OUTLINE_COLOR
public static final SchemeFloatProperty DISPLAYCLASS2_FONTSTYLE_OUTLINE_WIDTH
public static final SchemeFloatProperty DISPLAYCLASS2_FONTSTYLE_SIZE
public static final SchemeFloatProperty DISPLAYCLASS2_WIDTH
public static final SchemeColorProperty DISPLAYCLASS3_COLOR
public static final SchemeColorProperty DISPLAYCLASS3_FONTSTYLE_COLOR
public static final SchemeColorProperty DISPLAYCLASS3_FONTSTYLE_OUTLINE_COLOR
public static final SchemeFloatProperty DISPLAYCLASS3_FONTSTYLE_OUTLINE_WIDTH
public static final SchemeFloatProperty DISPLAYCLASS3_FONTSTYLE_SIZE
public static final SchemeFloatProperty DISPLAYCLASS3_WIDTH
public static final SchemeColorProperty DISPLAYCLASS4_COLOR
public static final SchemeColorProperty DISPLAYCLASS4_FONTSTYLE_COLOR
public static final SchemeColorProperty DISPLAYCLASS4_FONTSTYLE_OUTLINE_COLOR
public static final SchemeFloatProperty DISPLAYCLASS4_FONTSTYLE_OUTLINE_WIDTH
public static final SchemeFloatProperty DISPLAYCLASS4_FONTSTYLE_SIZE
public static final SchemeFloatProperty DISPLAYCLASS4_WIDTH
public static final SchemeColorProperty DISPLAYCLASS5_COLOR
public static final SchemeColorProperty DISPLAYCLASS5_FONTSTYLE_COLOR
public static final SchemeColorProperty DISPLAYCLASS5_FONTSTYLE_OUTLINE_COLOR
public static final SchemeFloatProperty DISPLAYCLASS5_FONTSTYLE_OUTLINE_WIDTH
public static final SchemeFloatProperty DISPLAYCLASS5_FONTSTYLE_SIZE
public static final SchemeFloatProperty DISPLAYCLASS5_WIDTH
public static final SchemeColorProperty DISPLAYCLASS6_COLOR

```

Fields	
<code>public static final SchemeColorProperty</code>	<code>DISPLAYCLASS6_FONTSTYLE_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>DISPLAYCLASS6_FONTSTYLE_OUTLINE_COLOR</code>
<code>public static final SchemeFloatProperty</code>	<code>DISPLAYCLASS6_FONTSTYLE_OUTLINE_WIDTH</code>
<code>public static final SchemeFloatProperty</code>	<code>DISPLAYCLASS6_FONTSTYLE_SIZE</code>
<code>public static final SchemeFloatProperty</code>	<code>DISPLAYCLASS6_WIDTH</code>
<code>public static final SchemeColorProperty</code>	<code>DISPLAYCLASS7_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>DISPLAYCLASS7_FONTSTYLE_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>DISPLAYCLASS7_FONTSTYLE_OUTLINE_COLOR</code>
<code>public static final SchemeFloatProperty</code>	<code>DISPLAYCLASS7_FONTSTYLE_OUTLINE_WIDTH</code>
<code>public static final SchemeFloatProperty</code>	<code>DISPLAYCLASS7_FONTSTYLE_SIZE</code>
<code>public static final SchemeFloatProperty</code>	<code>DISPLAYCLASS7_WIDTH</code>
<code>public static final SchemeColorProperty</code>	<code>DISPLAYCLASS8_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>DISPLAYCLASS8_FONTSTYLE_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>DISPLAYCLASS8_FONTSTYLE_OUTLINE_COLOR</code>
<code>public static final SchemeFloatProperty</code>	<code>DISPLAYCLASS8_FONTSTYLE_OUTLINE_WIDTH</code>
<code>public static final SchemeFloatProperty</code>	<code>DISPLAYCLASS8_FONTSTYLE_SIZE</code>
<code>public static final SchemeFloatProperty</code>	<code>DISPLAYCLASS8_WIDTH</code>
<code>public static final SchemeColorProperty</code>	<code>FONTSTYLE_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>FONTSTYLE_OUTLINE_COLOR</code>
<code>public static final SchemeFloatProperty</code>	<code>FONTSTYLE_OUTLINE_WIDTH</code>
<code>public static final SchemeFloatProperty</code>	<code>FONTSTYLE_SIZE</code>
<code>public static final SchemeFloatProperty</code>	<code>WIDTH</code>

## Class Details

### Constructor Details

`CanalWaterChannel ()`

### Field Details

`public static final SchemeColorProperty COLOR`

```
public static final SchemeColorProperty DISPLAYCLASS1_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS1_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS1_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS1_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS1_FONTSTYLE_SIZE
```

```
public static final SchemeFloatProperty DISPLAYCLASS1_WIDTH
```

```
public static final SchemeColorProperty DISPLAYCLASS2_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS2_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS2_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS2_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS2_FONTSTYLE_SIZE
```

```
public static final SchemeFloatProperty DISPLAYCLASS2_WIDTH
```

```
public static final SchemeColorProperty DISPLAYCLASS3_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS3_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS3_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS3_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS3_FONTSTYLE_SIZE
```

```
public static final SchemeFloatProperty DISPLAYCLASS3_WIDTH
```

```
public static final SchemeColorProperty DISPLAYCLASS4_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS4_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS4_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS4_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS4_FONTSTYLE_SIZE
```

```
public static final SchemeFloatProperty DISPLAYCLASS4_WIDTH
```

```
public static final SchemeColorProperty DISPLAYCLASS5_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS5_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS5_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS5_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS5_FONTSTYLE_SIZE
```

```
public static final SchemeFloatProperty DISPLAYCLASS5_WIDTH
```

```
public static final SchemeColorProperty DISPLAYCLASS6_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS6_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS6_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS6_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS6_FONTSTYLE_SIZE
```

```
public static final SchemeFloatProperty DISPLAYCLASS6_WIDTH
```

```
public static final SchemeColorProperty DISPLAYCLASS7_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS7_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS7_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS7_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS7_FONTSTYLE_SIZE
```

```
public static final SchemeFloatProperty DISPLAYCLASS7_WIDTH
```

```
public static final SchemeColorProperty DISPLAYCLASS8_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS8_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS8_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS8_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS8_FONTSTYLE_SIZE
```

```
public static final SchemeFloatProperty DISPLAYCLASS8_WIDTH
```

```
public static final SchemeColorProperty FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty FONTSTYLE_SIZE
```

```
public static final SchemeFloatProperty WIDTH
```

## Cemetery

The class *Cemetery* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.Cemetery
```

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 659: Constructors in Cemetery

Constructors
<i>Cemetery</i> ()

### Field Summary

Table 660: Fields in Cemetery

Fields
public static final <i>SchemeColorProperty</i> <b>COLOR</b>

## Class Details

### Constructor Details

Cemetery ( )

### Field Details

public static final *SchemeColorProperty* COLOR

## CemeteryInfo

The class *CemeteryInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.CemeteryInfo**

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 661: Constructors in CemeteryInfo

Constructors
<i>CemeteryInfo</i> ( )

### Field Summary

Table 662: Fields in CemeteryInfo

Fields
public static final <i>SchemeColorProperty</i> FONTSTYLE_COLOR
public static final <i>SchemeColorProperty</i> FONTSTYLE_OUTLINE_COLOR
public static final <i>SchemeFloatProperty</i> FONTSTYLE_OUTLINE_WIDTH
public static final <i>SchemeFloatProperty</i> FONTSTYLE_SIZE

## Class Details

### Constructor Details

CemeteryInfo ( )

## Field Details

public static final [SchemeColorProperty](#) FONTSTYLE\_COLOR

public static final [SchemeColorProperty](#) FONTSTYLE\_OUTLINE\_COLOR

public static final [SchemeFloatProperty](#) FONTSTYLE\_OUTLINE\_WIDTH

public static final [SchemeFloatProperty](#) FONTSTYLE\_SIZE

## CityCenter

The class *CityCenter* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

## Class Summary

public static class **CustomizableVariables.CityCenter**

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 663: Constructors in CityCenter

Constructors
<a href="#">CityCenter</a> ()

## Field Summary

Table 664: Fields in CityCenter

Fields
public static final <a href="#">SchemeColorProperty</a> CLASS1_FONTSTYLE_COLOR
public static final <a href="#">SchemeColorProperty</a> CLASS1_FONTSTYLE_OUTLINE_COLOR
public static final <a href="#">SchemeFloatProperty</a> CLASS1_FONTSTYLE_OUTLINE_WIDTH
public static final <a href="#">SchemeFloatProperty</a> CLASS1_FONTSTYLE_SIZE
public static final <a href="#">SchemeColorProperty</a> CLASS2_FONTSTYLE_COLOR
public static final <a href="#">SchemeColorProperty</a> CLASS2_FONTSTYLE_OUTLINE_COLOR

## Fields

public static final *SchemeFloatProperty* **CLASS2\_FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **CLASS2\_FONTSTYLE\_SIZE**

public static final *SchemeColorProperty* **CLASS3\_FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **CLASS3\_FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **CLASS3\_FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **CLASS3\_FONTSTYLE\_SIZE**

public static final *SchemeColorProperty* **CLASS4\_FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **CLASS4\_FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **CLASS4\_FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **CLASS4\_FONTSTYLE\_SIZE**

public static final *SchemeColorProperty* **CLASS5\_FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **CLASS5\_FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **CLASS5\_FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **CLASS5\_FONTSTYLE\_SIZE**

public static final *SchemeColorProperty* **DISTRICT\_FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **DISTRICT\_FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **DISTRICT\_FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **DISTRICT\_FONTSTYLE\_SIZE**

public static final *SchemeColorProperty* **HAMLET\_FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **HAMLET\_FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **HAMLET\_FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **HAMLET\_FONTSTYLE\_SIZE**

## Class Details

### Constructor Details

**CityCenter** ()

### Field Details

public static final *SchemeColorProperty* **CLASS1\_FONTSTYLE\_COLOR**

```
public static final SchemeColorProperty CLASS1_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty CLASS1_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty CLASS1_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty CLASS2_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty CLASS2_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty CLASS2_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty CLASS2_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty CLASS3_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty CLASS3_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty CLASS3_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty CLASS3_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty CLASS4_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty CLASS4_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty CLASS4_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty CLASS4_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty CLASS5_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty CLASS5_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty CLASS5_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty CLASS5_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty DISTRICT_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISTRICT_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISTRICT_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISTRICT_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty HAMLET_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty HAMLET_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty HAMLET_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty HAMLET_FONTSTYLE_SIZE
```

## CongestionZone

The class *CongestionZone* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.CongestionZone
```

```
extends java.lang.Object
```

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 665: Constructors in CongestionZone

Constructors
<a href="#">CongestionZone</a> ()

## Field Summary

Table 666: Fields in CongestionZone

Fields
<code>public static final <a href="#">SchemeColorProperty</a> COLOR</code>

## Class Details

### Constructor Details

[CongestionZone](#) ()

### Field Details

`public static final SchemeColorProperty COLOR`

## CongestionZoneBorder

The class *CongestionZoneBorder* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

`public static class CustomizableVariables.CongestionZoneBorder`

*extends* `java.lang.Object`

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 667: Constructors in CongestionZoneBorder

Constructors
<a href="#">CongestionZoneBorder</a> ()

## Field Summary

Table 668: Fields in CongestionZoneBorder

Fields
public static final <i>SchemeColorProperty</i> COLOR

## Class Details

### Constructor Details

CongestionZoneBorder ()

### Field Details

public static final *SchemeColorProperty* COLOR

## CongestionZoneInfo

The class *CongestionZoneInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.CongestionZoneInfo**  
*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 669: Constructors in CongestionZoneInfo

Constructors
<i>CongestionZoneInfo</i> ()

## Field Summary

Table 670: Fields in CongestionZoneInfo

Fields
public static final <i>SchemeColorProperty</i> FONTSTYLE_COLOR
public static final <i>SchemeColorProperty</i> FONTSTYLE_OUTLINE_COLOR
public static final <i>SchemeFloatProperty</i> FONTSTYLE_OUTLINE_WIDTH

## Fields

public static final *SchemeFloatProperty* **FONTSTYLE\_SIZE**

---

## Class Details

### Constructor Details

**CongestionZoneInfo** ( )

### Field Details

public static final *SchemeColorProperty* **FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **FONTSTYLE\_SIZE**

## ContinentLabel

The class *ContinentLabel* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.ContinentLabel**

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 671: Constructors in *ContinentLabel*

#### Constructors

*ContinentLabel* ( )

## Field Summary

Table 672: Fields in ContinentLabel

Fields	
<code>public static final</code>	<code><i>SchemeColorProperty</i> FONTSTYLE_COLOR</code>
<code>public static final</code>	<code><i>SchemeColorProperty</i> FONTSTYLE_OUTLINE_COLOR</code>
<code>public static final</code>	<code><i>SchemeFloatProperty</i> FONTSTYLE_OUTLINE_WIDTH</code>
<code>public static final</code>	<code><i>SchemeFloatProperty</i> FONTSTYLE_SIZE</code>

## Class Details

### Constructor Details

`ContinentLabel ()`

### Field Details

`public static final SchemeColorProperty FONTSTYLE_COLOR`

`public static final SchemeColorProperty FONTSTYLE_OUTLINE_COLOR`

`public static final SchemeFloatProperty FONTSTYLE_OUTLINE_WIDTH`

`public static final SchemeFloatProperty FONTSTYLE_SIZE`

## CountryBoundary

The class *CountryBoundary* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

`public static class CustomizableVariables.CountryBoundary`

`extends java.lang.Object`

[For complete information, see the section *Class Details*]

## Constructor Summary

Table 673: Constructors in CountryBoundary

Constructors
<a href="#">CountryBoundary</a> ()

## Field Summary

Table 674: Fields in CountryBoundary

Fields
<code>public static final <i>SchemeColorProperty</i> BACKGROUNDCOLOR</code>
<code>public static final <i>SchemeFloatProperty</i> BACKGROUNDWIDTH</code>
<code>public static final <i>SchemeColorProperty</i> COLOR</code>
<code>public static final <i>SchemeFloatProperty</i> WIDTH</code>

## Class Details

### Constructor Details

[CountryBoundary](#) ()

### Field Details

`public static final SchemeColorProperty BACKGROUNDCOLOR`

`public static final SchemeFloatProperty BACKGROUNDWIDTH`

`public static final SchemeColorProperty COLOR`

`public static final SchemeFloatProperty WIDTH`

## CountryBoundaryDisputed

The class *CountryBoundaryDisputed* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

## Class Summary

public static class **CustomizableVariables.CountryBoundaryDisputed**

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 675: Constructors in CountryBoundaryDisputed

Constructors
<i>CountryBoundaryDisputed</i> ()

## Field Summary

Table 676: Fields in CountryBoundaryDisputed

Fields
public static final <i>SchemeColorProperty</i> <b>BACKGROUND</b> <b>COLOR</b>
public static final <i>SchemeFloatProperty</i> <b>BACKGROUND</b> <b>WIDTH</b>
public static final <i>SchemeColorProperty</i> <b>COLOR</b>
public static final <i>SchemeFloatProperty</i> <b>WIDTH</b>

## Class Details

### Constructor Details

**CountryBoundaryDisputed** ()

### Field Details

public static final *SchemeColorProperty* **BACKGROUND****COLOR**

public static final *SchemeFloatProperty* **BACKGROUND****WIDTH**

public static final *SchemeColorProperty* **COLOR**

public static final *SchemeFloatProperty* **WIDTH**

## CountrySideLabel

The class *CountrySideLabel* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.CountrySideLabel**

extends *java.lang.Object*

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 677: Constructors in CountrySideLabel

Constructors
<i>CountrySideLabel</i> ()

### Field Summary

Table 678: Fields in CountrySideLabel

Fields
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_OUTLINE_WIDTH</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_SIZE</b>

### Class Details

#### Constructor Details

*CountrySideLabel* ()

#### Field Details

public static final *SchemeColorProperty* **FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **FONTSTYLE\_OUTLINE\_WIDTH**

```
public static final SchemeFloatProperty FONTSTYLE_SIZE
```

## DirectionalLight1

The class *DirectionalLight1* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.DirectionLight1
```

```
extends java.lang.Object
```

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 679: Constructors in DirectionalLight1

Constructors
<i>DirectionalLight1</i> ()

### Field Summary

Table 680: Fields in DirectionalLight1

Fields
public static final <i>SchemeColorProperty</i> <b>COLOR</b>

### Class Details

#### Constructor Details

```
DirectionalLight1 ()
```

#### Field Details

```
public static final SchemeColorProperty COLOR
```

## DirectionalLight2

The class *DirectionalLight2* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

## Class Summary

public static class **CustomizableVariables.DirectionallLight2**

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 681: Constructors in DirectionalLight2

Constructors
<a href="#">DirectionalLight2</a> ()

## Field Summary

Table 682: Fields in DirectionalLight2

Fields
public static final <a href="#">SchemeColorProperty</a> <b>COLOR</b>

## Class Details

### Constructor Details

[DirectionalLight2](#) ()

### Field Details

public static final [SchemeColorProperty](#) **COLOR**

## DirectionalLight3

The class *DirectionalLight3* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

## Class Summary

public static class **CustomizableVariables.DirectionallLight3**

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 683: Constructors in DirectionalLight3

Constructors
<a href="#">DirectionalLight3</a> ()

## Field Summary

Table 684: Fields in DirectionalLight3

Fields
<code>public static final <a href="#">SchemeColorProperty</a> COLOR</code>

## Class Details

### Constructor Details

[DirectionalLight3](#) ()

### Field Details

`public static final SchemeColorProperty COLOR`

## ElevationMap

The class *ElevationMap* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

`public static class CustomizableVariables.ElevationMap`

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 685: Constructors in ElevationMap

Constructors
<a href="#">ElevationMap</a> ()

## Field Summary

Table 686: Fields in ElevationMap

Fields
<code>public static final SchemeColorProperty COLOR0</code>
<code>public static final SchemeColorProperty COLOR1</code>
<code>public static final SchemeColorProperty COLOR2</code>
<code>public static final SchemeColorProperty COLOR3</code>
<code>public static final SchemeColorProperty COLOR4</code>
<code>public static final SchemeColorProperty COLOR5</code>
<code>public static final SchemeColorProperty COLOR6</code>
<code>public static final SchemeColorProperty COLOR7</code>
<code>public static final SchemeIntegerProperty HEIGHT0</code>
<code>public static final SchemeIntegerProperty HEIGHT1</code>
<code>public static final SchemeIntegerProperty HEIGHT2</code>
<code>public static final SchemeIntegerProperty HEIGHT3</code>
<code>public static final SchemeIntegerProperty HEIGHT4</code>
<code>public static final SchemeIntegerProperty HEIGHT5</code>
<code>public static final SchemeIntegerProperty HEIGHT6</code>
<code>public static final SchemeIntegerProperty HEIGHT7</code>
<code>public static final SchemeIntegerProperty NUMHEIGHTS</code>
<code>public static final SchemeIntegerProperty RANGEDSCALE0_MAXHEIGHT</code>
<code>public static final SchemeIntegerProperty RANGEDSCALE1_MAXHEIGHT</code>
<code>public static final SchemeIntegerProperty RANGEDSCALE2_MAXHEIGHT</code>
<code>public static final SchemeIntegerProperty RANGEDSCALE3_MAXHEIGHT</code>
<code>public static final SchemeColorProperty SHADER_SHADOW_COLOR</code>
<code>public static final SchemeColorProperty SHADER_SPECULAR_COLOR</code>

## Class Details

### Constructor Details

ElevationMap ( )

## Field Details

public static final *SchemeColorProperty* COLOR0

public static final *SchemeColorProperty* COLOR1

public static final *SchemeColorProperty* COLOR2

public static final *SchemeColorProperty* COLOR3

public static final *SchemeColorProperty* COLOR4

public static final *SchemeColorProperty* COLOR5

public static final *SchemeColorProperty* COLOR6

public static final *SchemeColorProperty* COLOR7

public static final *SchemeIntegerProperty* HEIGHT0

public static final *SchemeIntegerProperty* HEIGHT1

public static final *SchemeIntegerProperty* HEIGHT2

public static final *SchemeIntegerProperty* HEIGHT3

public static final *SchemeIntegerProperty* HEIGHT4

public static final *SchemeIntegerProperty* HEIGHT5

public static final *SchemeIntegerProperty* HEIGHT6

```
public static final SchemeIntegerProperty HEIGHT7
```

```
public static final SchemeIntegerProperty NUMHEIGHTS
```

```
public static final SchemeIntegerProperty RANGEDSCALE0_MAXHEIGHT
```

```
public static final SchemeIntegerProperty RANGEDSCALE1_MAXHEIGHT
```

```
public static final SchemeIntegerProperty RANGEDSCALE2_MAXHEIGHT
```

```
public static final SchemeIntegerProperty RANGEDSCALE3_MAXHEIGHT
```

```
public static final SchemeColorProperty SHADER_SHADOW_COLOR
```

```
public static final SchemeColorProperty SHADER_SPECULAR_COLOR
```

## EnvironmentalZone

The class *EnvironmentalZone* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.EnvironmentalZone
```

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 687: Constructors in *EnvironmentalZone*

Constructors
<i>EnvironmentalZone</i> ()

## Field Summary

Table 688: Fields in EnvironmentalZone

Fields
public static final <i>SchemeColorProperty</i> COLOR

## Class Details

### Constructor Details

EnvironmentalZone ( )

### Field Details

public static final *SchemeColorProperty* COLOR

## EnvironmentalZoneBorder

The class *EnvironmentalZoneBorder* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.EnvironmentalZoneBorder**  
*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 689: Constructors in EnvironmentalZoneBorder

Constructors
<i>EnvironmentalZoneBorder</i> ( )

## Field Summary

Table 690: Fields in EnvironmentalZoneBorder

Fields
public static final <i>SchemeColorProperty</i> COLOR

## Class Details

### Constructor Details

`EnvironmentalZoneBorder ()`

### Field Details

`public static final SchemeColorProperty COLOR`

## EnvironmentalZoneInfo

The class *EnvironmentalZoneInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

`public static class CustomizableVariables.EnvironmentalZoneInfo`

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 691: Constructors in *EnvironmentalZoneInfo*

Constructors
<i>EnvironmentalZoneInfo ()</i>

### Field Summary

Table 692: Fields in *EnvironmentalZoneInfo*

Fields
<code>public static final <i>SchemeColorProperty</i> FONTSTYLE_COLOR</code>
<code>public static final <i>SchemeColorProperty</i> FONTSTYLE_OUTLINE_COLOR</code>
<code>public static final <i>SchemeFloatProperty</i> FONTSTYLE_OUTLINE_WIDTH</code>
<code>public static final <i>SchemeFloatProperty</i> FONTSTYLE_SIZE</code>

## Class Details

### Constructor Details

`EnvironmentalZoneInfo ()`

### Field Details

`public static final SchemeColorProperty FONTSTYLE_COLOR`

`public static final SchemeColorProperty FONTSTYLE_OUTLINE_COLOR`

`public static final SchemeFloatProperty FONTSTYLE_OUTLINE_WIDTH`

`public static final SchemeFloatProperty FONTSTYLE_SIZE`

## ExitInfo

The class *ExitInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

`public static class CustomizableVariables.ExitInfo`

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 693: Constructors in ExitInfo

Constructors
<code>ExitInfo ()</code>

### Field Summary

Table 694: Fields in ExitInfo

Fields
<code>public static final <i>SchemeColorProperty</i> STREETCATEGORY0_COLOR</code>
<code>public static final <i>SchemeColorProperty</i> STREETCATEGORY0_FONTSTYLE_COLOR</code>

Fields	
public static final <i>SchemeColorProperty</i>	<b>STREETCATEGORY0_FONTSTYLE_OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i>	<b>STREETCATEGORY0_FONTSTYLE_OUTLINE_WIDTH</b>
public static final <i>SchemeFloatProperty</i>	<b>STREETCATEGORY0_FONTSTYLE_SIZE</b>
public static final <i>SchemeColorProperty</i>	<b>STREETCATEGORY0_OUTLINECOLOR</b>
public static final <i>SchemeFloatProperty</i>	<b>STREETCATEGORY0_OUTLINEWIDTH</b>
public static final <i>SchemeColorProperty</i>	<b>STREETCATEGORY0_TOLL_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>STREETCATEGORY0_TOLL_FONTSTYLE_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>STREETCATEGORY0_TOLL_FONTSTYLE_OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i>	<b>STREETCATEGORY0_TOLL_FONTSTYLE_OUTLINE_WIDTH</b>
public static final <i>SchemeFloatProperty</i>	<b>STREETCATEGORY0_TOLL_FONTSTYLE_SIZE</b>
public static final <i>SchemeColorProperty</i>	<b>STREETCATEGORY0_TOLL_OUTLINECOLOR</b>
public static final <i>SchemeFloatProperty</i>	<b>STREETCATEGORY0_TOLL_OUTLINEWIDTH</b>
public static final <i>SchemeColorProperty</i>	<b>STREETCATEGORY1_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>STREETCATEGORY1_FONTSTYLE_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>STREETCATEGORY1_FONTSTYLE_OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i>	<b>STREETCATEGORY1_FONTSTYLE_OUTLINE_WIDTH</b>
public static final <i>SchemeFloatProperty</i>	<b>STREETCATEGORY1_FONTSTYLE_SIZE</b>
public static final <i>SchemeColorProperty</i>	<b>STREETCATEGORY1_OUTLINECOLOR</b>
public static final <i>SchemeFloatProperty</i>	<b>STREETCATEGORY1_OUTLINEWIDTH</b>
public static final <i>SchemeColorProperty</i>	<b>STREETCATEGORY1_TOLL_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>STREETCATEGORY1_TOLL_FONTSTYLE_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>STREETCATEGORY1_TOLL_FONTSTYLE_OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i>	<b>STREETCATEGORY1_TOLL_FONTSTYLE_OUTLINE_WIDTH</b>
public static final <i>SchemeFloatProperty</i>	<b>STREETCATEGORY1_TOLL_FONTSTYLE_SIZE</b>
public static final <i>SchemeColorProperty</i>	<b>STREETCATEGORY1_TOLL_OUTLINECOLOR</b>
public static final <i>SchemeFloatProperty</i>	<b>STREETCATEGORY1_TOLL_OUTLINEWIDTH</b>
public static final <i>SchemeColorProperty</i>	<b>STREETCATEGORY2_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>STREETCATEGORY2_FONTSTYLE_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>STREETCATEGORY2_FONTSTYLE_OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i>	<b>STREETCATEGORY2_FONTSTYLE_OUTLINE_WIDTH</b>
public static final <i>SchemeFloatProperty</i>	<b>STREETCATEGORY2_FONTSTYLE_SIZE</b>

## Fields

public static final *SchemeColorProperty* **STREETCATEGORY2\_OUTLINECOLOR**

public static final *SchemeFloatProperty* **STREETCATEGORY2\_OUTLINEWIDTH**

public static final *SchemeColorProperty* **STREETCATEGORY2\_TOLL\_COLOR**

public static final *SchemeColorProperty* **STREETCATEGORY2\_TOLL\_FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **STREETCATEGORY2\_TOLL\_FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **STREETCATEGORY2\_TOLL\_FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **STREETCATEGORY2\_TOLL\_FONTSTYLE\_SIZE**

public static final *SchemeColorProperty* **STREETCATEGORY2\_TOLL\_OUTLINECOLOR**

public static final *SchemeFloatProperty* **STREETCATEGORY2\_TOLL\_OUTLINEWIDTH**

## Class Details

### Constructor Details

**ExitInfo** ()

### Field Details

public static final *SchemeColorProperty* **STREETCATEGORY0\_COLOR**

public static final *SchemeColorProperty* **STREETCATEGORY0\_FONTSTYLE\_COLOR**

public static final *SchemeColorProperty*  
**STREETCATEGORY0\_FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty*  
**STREETCATEGORY0\_FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **STREETCATEGORY0\_FONTSTYLE\_SIZE**

public static final *SchemeColorProperty* **STREETCATEGORY0\_OUTLINECOLOR**

public static final *SchemeFloatProperty* **STREETCATEGORY0\_OUTLINEWIDTH**

```
public static final SchemeColorProperty STREETCATEGORY0_TOLL_COLOR
```

```
public static final SchemeColorProperty STREETCATEGORY0_TOLL_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty  
STREETCATEGORY0_TOLL_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty  
STREETCATEGORY0_TOLL_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty STREETCATEGORY0_TOLL_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty STREETCATEGORY0_TOLL_OUTLINECOLOR
```

```
public static final SchemeFloatProperty STREETCATEGORY0_TOLL_OUTLINEWIDTH
```

```
public static final SchemeColorProperty STREETCATEGORY1_COLOR
```

```
public static final SchemeColorProperty STREETCATEGORY1_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty  
STREETCATEGORY1_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty  
STREETCATEGORY1_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty STREETCATEGORY1_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty STREETCATEGORY1_OUTLINECOLOR
```

```
public static final SchemeFloatProperty STREETCATEGORY1_OUTLINEWIDTH
```

```
public static final SchemeColorProperty STREETCATEGORY1_TOLL_COLOR
```

```
public static final SchemeColorProperty STREETCATEGORY1_TOLL_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty  
STREETCATEGORY1_TOLL_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty  
STREETCATEGORY1_TOLL_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty STREETCATEGORY1_TOLL_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty STREETCATEGORY1_TOLL_OUTLINECOLOR
```

```
public static final SchemeFloatProperty STREETCATEGORY1_TOLL_OUTLINEWIDTH
```

```
public static final SchemeColorProperty STREETCATEGORY2_COLOR
```

```
public static final SchemeColorProperty STREETCATEGORY2_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty  
STREETCATEGORY2_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty  
STREETCATEGORY2_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty STREETCATEGORY2_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty STREETCATEGORY2_OUTLINECOLOR
```

```
public static final SchemeFloatProperty STREETCATEGORY2_OUTLINEWIDTH
```

```
public static final SchemeColorProperty STREETCATEGORY2_TOLL_COLOR
```

```
public static final SchemeColorProperty STREETCATEGORY2_TOLL_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty  
STREETCATEGORY2_TOLL_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty  
STREETCATEGORY2_TOLL_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty STREETCATEGORY2_TOLL_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty STREETCATEGORY2_TOLL_OUTLINECOLOR
```

```
public static final SchemeFloatProperty STREETCATEGORY2_TOLL_OUTLINEWIDTH
```

## ExitInfoSimplified

The class *ExitInfoSimplified* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.ExitInfoSimplified
```

```
extends java.lang.Object
```

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 695: Constructors in *ExitInfoSimplified*

Constructors
<i>ExitInfoSimplified</i> ()

## Field Summary

Table 696: Fields in ExitInfoSimplified

Fields	
<code>public static final <i>SchemeColorProperty</i></code>	<code>STREETCATEGORY0_COLOR</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>STREETCATEGORY0_OUTLINECOLOR</code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code>STREETCATEGORY0_OUTLINEWIDTH</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>STREETCATEGORY0_TOLL_COLOR</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>STREETCATEGORY0_TOLL_OUTLINECOLOR</code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code>STREETCATEGORY0_TOLL_OUTLINEWIDTH</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>STREETCATEGORY1_COLOR</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>STREETCATEGORY1_OUTLINECOLOR</code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code>STREETCATEGORY1_OUTLINEWIDTH</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>STREETCATEGORY1_TOLL_COLOR</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>STREETCATEGORY1_TOLL_OUTLINECOLOR</code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code>STREETCATEGORY1_TOLL_OUTLINEWIDTH</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>STREETCATEGORY2_COLOR</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>STREETCATEGORY2_OUTLINECOLOR</code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code>STREETCATEGORY2_OUTLINEWIDTH</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>STREETCATEGORY2_TOLL_COLOR</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>STREETCATEGORY2_TOLL_OUTLINECOLOR</code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code>STREETCATEGORY2_TOLL_OUTLINEWIDTH</code>

## Class Details

### Constructor Details

`ExitInfoSimplified ()`

### Field Details

`public static final SchemeColorProperty STREETCATEGORY0_COLOR`

`public static final SchemeColorProperty STREETCATEGORY0_OUTLINECOLOR`

```
public static final SchemeFloatProperty STREETCATEGORY0_OUTLINEWIDTH
```

```
public static final SchemeColorProperty STREETCATEGORY0_TOLL_COLOR
```

```
public static final SchemeColorProperty STREETCATEGORY0_TOLL_OUTLINECOLOR
```

```
public static final SchemeFloatProperty STREETCATEGORY0_TOLL_OUTLINEWIDTH
```

```
public static final SchemeColorProperty STREETCATEGORY1_COLOR
```

```
public static final SchemeColorProperty STREETCATEGORY1_OUTLINECOLOR
```

```
public static final SchemeFloatProperty STREETCATEGORY1_OUTLINEWIDTH
```

```
public static final SchemeColorProperty STREETCATEGORY1_TOLL_COLOR
```

```
public static final SchemeColorProperty STREETCATEGORY1_TOLL_OUTLINECOLOR
```

```
public static final SchemeFloatProperty STREETCATEGORY1_TOLL_OUTLINEWIDTH
```

```
public static final SchemeColorProperty STREETCATEGORY2_COLOR
```

```
public static final SchemeColorProperty STREETCATEGORY2_OUTLINECOLOR
```

```
public static final SchemeFloatProperty STREETCATEGORY2_OUTLINEWIDTH
```

```
public static final SchemeColorProperty STREETCATEGORY2_TOLL_COLOR
```

```
public static final SchemeColorProperty STREETCATEGORY2_TOLL_OUTLINECOLOR
```

```
public static final SchemeFloatProperty STREETCATEGORY2_TOLL_OUTLINEWIDTH
```

## ExtrudedBuildings

The class *ExtrudedBuildings* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.ExtrudedBuildings**

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 697: Constructors in ExtrudedBuildings

Constructors
<a href="#">ExtrudedBuildings</a> ()

### Field Summary

Table 698: Fields in ExtrudedBuildings

Fields
public static final <i>SchemeColorProperty</i> <b>COLOR</b>
public static final <i>SchemeColorProperty</i> <b>COLOR_HIGHLIGHT0</b>
public static final <i>SchemeColorProperty</i> <b>COLOR_HIGHLIGHT1</b>
public static final <i>SchemeColorProperty</i> <b>COLOR_HIGHLIGHT2</b>
public static final <i>SchemeColorProperty</i> <b>COLOR_HIGHLIGHT3</b>
public static final <i>SchemeColorProperty</i> <b>COLOR_HIGHLIGHT4</b>
public static final <i>SchemeColorProperty</i> <b>COLOR_HIGHLIGHT5</b>
public static final <i>SchemeColorProperty</i> <b>COLOR_NAMED</b>
public static final <i>SchemeColorProperty</i> <b>COLOR_SELECTED</b>
public static final <i>SchemeFloatProperty</i> <b>DEFAULTHEIGHT</b>
public static final <i>SchemeFloatProperty</i> <b>GRADIENTSTOPHEIGHT</b>

### Class Details

#### Constructor Details

**ExtrudedBuildings** ()

## Field Details

```
public static final SchemeColorProperty COLOR
```

```
public static final SchemeColorProperty COLOR_HIGHLIGHT0
```

```
public static final SchemeColorProperty COLOR_HIGHLIGHT1
```

```
public static final SchemeColorProperty COLOR_HIGHLIGHT2
```

```
public static final SchemeColorProperty COLOR_HIGHLIGHT3
```

```
public static final SchemeColorProperty COLOR_HIGHLIGHT4
```

```
public static final SchemeColorProperty COLOR_HIGHLIGHT5
```

```
public static final SchemeColorProperty COLOR_NAMED
```

```
public static final SchemeColorProperty COLOR_SELECTED
```

```
public static final SchemeFloatProperty DEFAULTHEIGHT
```

```
public static final SchemeFloatProperty GRADIENTSTOPHEIGHT
```

## FarPlane

The class *FarPlane* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

## Class Summary

```
public static class CustomizableVariables.FarPlane
```

```
extends java.lang.Object
```

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 699: Constructors in FarPlane

Constructors
<a href="#">FarPlane</a> ()

## Field Summary

Table 700: Fields in FarPlane

Fields
<code>public static final <a href="#">SchemeFloatProperty</a> <a href="#">HORIZONHEIGHT_PERCENT</a></code>
<code>public static final <a href="#">SchemeFloatProperty</a> <a href="#">HORIZONHEIGHT_TILTRANGE</a></code>
<code>public static final <a href="#">SchemeFloatProperty</a> <a href="#">HORIZONHEIGHT_TILTSTART</a></code>

## Class Details

### Constructor Details

[FarPlane](#) ()

### Field Details

`public static final SchemeFloatProperty HORIZONHEIGHT\_PERCENT`

`public static final SchemeFloatProperty HORIZONHEIGHT\_TILTRANGE`

`public static final SchemeFloatProperty HORIZONHEIGHT\_TILTSTART`

## Ferry

The class *Ferry* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

`public static class CustomizableVariables.Ferry`

`extends java.lang.Object`

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 701: Constructors in Ferry

Constructors
<a href="#">Ferry ()</a>

## Field Summary

Table 702: Fields in Ferry

Fields
<code>public static final <a href="#">SchemeColorProperty</a> <a href="#">FONTSTYLE_COLOR</a></code>
<code>public static final <a href="#">SchemeColorProperty</a> <a href="#">FONTSTYLE_OUTLINE_COLOR</a></code>
<code>public static final <a href="#">SchemeFloatProperty</a> <a href="#">FONTSTYLE_OUTLINE_WIDTH</a></code>
<code>public static final <a href="#">SchemeFloatProperty</a> <a href="#">FONTSTYLE_SIZE</a></code>
<code>public static final <a href="#">SchemeColorProperty</a> <a href="#">TUNNELCOLOR</a></code>

## Class Details

### Constructor Details

[Ferry \(\)](#)

### Field Details

`public static final SchemeColorProperty FONTSTYLE\_COLOR`

`public static final SchemeColorProperty FONTSTYLE\_OUTLINE\_COLOR`

`public static final SchemeFloatProperty FONTSTYLE\_OUTLINE\_WIDTH`

`public static final SchemeFloatProperty FONTSTYLE\_SIZE`

`public static final SchemeColorProperty TUNNELCOLOR`

## Fog

The class *Fog* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.Fog**

extends *java.lang.Object*

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 703: Constructors in Fog

Constructors
<i>Fog</i> ()

### Field Summary

Table 704: Fields in Fog

Fields
public static final <i>SchemeColorProperty</i> <b>DARKCOLOR</b>
public static final <i>SchemeColorProperty</i> <b>DISTANCECOLOR</b>
public static final <i>SchemeIntegerProperty</i> <b>HEIGHT</b>
public static final <i>SchemeColorProperty</i> <b>LIGHTCOLOR</b>

### Class Details

#### Constructor Details

*Fog* ()

#### Field Details

public static final *SchemeColorProperty* **DARKCOLOR**

public static final *SchemeColorProperty* **DISTANCECOLOR**

public static final *SchemeIntegerProperty* **HEIGHT**

```
public static final SchemeColorProperty LIGHTCOLOR
```

## GolfCourse

The class *GolfCourse* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.GolfCourse
```

```
extends java.lang.Object
```

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 705: Constructors in *GolfCourse*

Constructors
<i>GolfCourse</i> ()

### Field Summary

Table 706: Fields in *GolfCourse*

Fields
public static final <i>SchemeColorProperty</i> <b>COLOR</b>

### Class Details

#### Constructor Details

```
GolfCourse ()
```

#### Field Details

```
public static final SchemeColorProperty COLOR
```

## GolfCourseInfo

The class *GolfCourseInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

## Class Summary

public static class **CustomizableVariables.GolfCourseInfo**

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 707: Constructors in GolfCourseInfo

Constructors
<i>GolfCourseInfo</i> ()

## Field Summary

Table 708: Fields in GolfCourseInfo

Fields
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_OUTLINE_WIDTH</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_SIZE</b>

## Class Details

### Constructor Details

**GolfCourseInfo** ()

### Field Details

public static final *SchemeColorProperty* **FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **FONTSTYLE\_SIZE**

## GuidanceArrow

The class *GuidanceArrow* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.GuidanceArrow**

extends *java.lang.Object*

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 709: Constructors in GuidanceArrow

Constructors
<i>GuidanceArrow</i> ()

### Field Summary

Table 710: Fields in GuidanceArrow

Fields
public static final <i>SchemeFloatProperty</i> <b>ARROWTIP_WIDTH_FACTOR</b>
public static final <i>SchemeFloatProperty</i> <b>OUTLINEWIDTH</b>
public static final <i>SchemeFloatProperty</i> <b>WIDTH_FACTOR</b>

### Class Details

#### Constructor Details

**GuidanceArrow** ()

#### Field Details

public static final *SchemeFloatProperty* **ARROWTIP\_WIDTH\_FACTOR**

public static final *SchemeFloatProperty* **OUTLINEWIDTH**

public static final *SchemeFloatProperty* **WIDTH\_FACTOR**

## HarborArea

The class *HarborArea* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.HarborArea**

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 711: Constructors in HarborArea

Constructors
<a href="#">HarborArea ()</a>

### Field Summary

Table 712: Fields in HarborArea

Fields
public static final <a href="#">SchemeColorProperty</a> <b>COLOR</b>

### Class Details

#### Constructor Details

**HarborArea ()**

#### Field Details

public static final [SchemeColorProperty](#) **COLOR**

## HarborAreaInfo

The class *HarborAreaInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.HarborAreaInfo**

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 713: Constructors in HarborAreaInfo

Constructors
<a href="#">HarborAreaInfo</a> ()

## Field Summary

Table 714: Fields in HarborAreaInfo

Fields
public static final <a href="#">SchemeColorProperty</a> <b>FONTSTYLE_COLOR</b>
public static final <a href="#">SchemeColorProperty</a> <b>FONTSTYLE_OUTLINE_COLOR</b>
public static final <a href="#">SchemeFloatProperty</a> <b>FONTSTYLE_OUTLINE_WIDTH</b>
public static final <a href="#">SchemeFloatProperty</a> <b>FONTSTYLE_SIZE</b>

## Class Details

### Constructor Details

[HarborAreaInfo](#) ()

### Field Details

public static final [SchemeColorProperty](#) **FONTSTYLE\_COLOR**

public static final [SchemeColorProperty](#) **FONTSTYLE\_OUTLINE\_COLOR**

public static final [SchemeFloatProperty](#) **FONTSTYLE\_OUTLINE\_WIDTH**

public static final [SchemeFloatProperty](#) **FONTSTYLE\_SIZE**

## HospitalCampus

The class *HospitalCampus* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

## Class Summary

public static class **CustomizableVariables.HospitalCampus**

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 715: Constructors in HospitalCampus

Constructors
<a href="#">HospitalCampus</a> ()

## Field Summary

Table 716: Fields in HospitalCampus

Fields
public static final <a href="#">SchemeColorProperty</a> <b>COLOR</b>

## Class Details

### Constructor Details

[HospitalCampus](#) ()

### Field Details

public static final [SchemeColorProperty](#) **COLOR**

## HospitalCampusInfo

The class *HospitalCampusInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

## Class Summary

public static class **CustomizableVariables.HospitalCampusInfo**

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 717: Constructors in HospitalCampusInfo

Constructors
<a href="#">HospitalCampusInfo</a> ()

## Field Summary

Table 718: Fields in HospitalCampusInfo

Fields
<code>public static final <i>SchemeColorProperty</i> FONTSTYLE_COLOR</code>
<code>public static final <i>SchemeColorProperty</i> FONTSTYLE_OUTLINE_COLOR</code>
<code>public static final <i>SchemeFloatProperty</i> FONTSTYLE_OUTLINE_WIDTH</code>
<code>public static final <i>SchemeFloatProperty</i> FONTSTYLE_SIZE</code>

## Class Details

### Constructor Details

[HospitalCampusInfo](#) ()

### Field Details

`public static final SchemeColorProperty FONTSTYLE_COLOR`

`public static final SchemeColorProperty FONTSTYLE_OUTLINE_COLOR`

`public static final SchemeFloatProperty FONTSTYLE_OUTLINE_WIDTH`

`public static final SchemeFloatProperty FONTSTYLE_SIZE`

## IndustrialComplex

The class *IndustrialComplex* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

## Class Summary

public static class **CustomizableVariables.IndustrialComplex**

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 719: Constructors in IndustrialComplex

Constructors
<a href="#">IndustrialComplex</a> ()

## Field Summary

Table 720: Fields in IndustrialComplex

Fields
public static final <a href="#">SchemeColorProperty</a> <b>COLOR</b>

## Class Details

### Constructor Details

**IndustrialComplex** ()

### Field Details

public static final [SchemeColorProperty](#) **COLOR**

## IndustrialComplexInfo

The class *IndustrialComplexInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

## Class Summary

public static class **CustomizableVariables.IndustrialComplexInfo**

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 721: Constructors in `IndustrialComplexInfo`

Constructors
<code>IndustrialComplexInfo ()</code>

## Field Summary

Table 722: Fields in `IndustrialComplexInfo`

Fields
<code>public static final <i>SchemeColorProperty</i> FONTSTYLE_COLOR</code>
<code>public static final <i>SchemeColorProperty</i> FONTSTYLE_OUTLINE_COLOR</code>
<code>public static final <i>SchemeFloatProperty</i> FONTSTYLE_OUTLINE_WIDTH</code>
<code>public static final <i>SchemeFloatProperty</i> FONTSTYLE_SIZE</code>

## Class Details

### Constructor Details

`IndustrialComplexInfo ()`

### Field Details

`public static final SchemeColorProperty FONTSTYLE_COLOR`

`public static final SchemeColorProperty FONTSTYLE_OUTLINE_COLOR`

`public static final SchemeFloatProperty FONTSTYLE_OUTLINE_WIDTH`

`public static final SchemeFloatProperty FONTSTYLE_SIZE`

## IntermittentRiver

The class `IntermittentRiver` is a member of `com.here.android.mpa.mapping.customization.CustomizableVariables`.

## Class Summary

public static class **CustomizableVariables.IntermittentRiver**

extends *java.lang.Object*

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 723: Constructors in IntermittentRiver

Constructors
<i>IntermittentRiver</i> ()

## Field Summary

Table 724: Fields in IntermittentRiver

Fields
public static final <i>SchemeColorProperty</i> <b>COLOR</b>
public static final <i>SchemeColorProperty</i> <b>DISPLAYCLASS1_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>DISPLAYCLASS1_FONTSTYLE_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>DISPLAYCLASS1_FONTSTYLE_OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i> <b>DISPLAYCLASS1_FONTSTYLE_OUTLINE_WIDTH</b>
public static final <i>SchemeFloatProperty</i> <b>DISPLAYCLASS1_FONTSTYLE_SIZE</b>
public static final <i>SchemeFloatProperty</i> <b>DISPLAYCLASS1_WIDTH</b>
public static final <i>SchemeColorProperty</i> <b>DISPLAYCLASS2_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>DISPLAYCLASS2_FONTSTYLE_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>DISPLAYCLASS2_FONTSTYLE_OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i> <b>DISPLAYCLASS2_FONTSTYLE_OUTLINE_WIDTH</b>
public static final <i>SchemeFloatProperty</i> <b>DISPLAYCLASS2_FONTSTYLE_SIZE</b>
public static final <i>SchemeFloatProperty</i> <b>DISPLAYCLASS2_WIDTH</b>
public static final <i>SchemeColorProperty</i> <b>DISPLAYCLASS3_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>DISPLAYCLASS3_FONTSTYLE_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>DISPLAYCLASS3_FONTSTYLE_OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i> <b>DISPLAYCLASS3_FONTSTYLE_OUTLINE_WIDTH</b>
public static final <i>SchemeFloatProperty</i> <b>DISPLAYCLASS3_FONTSTYLE_SIZE</b>
public static final <i>SchemeFloatProperty</i> <b>DISPLAYCLASS3_WIDTH</b>

## Fields

```

public static final SchemeColorProperty DISPLAYCLASS4_COLOR
public static final SchemeColorProperty DISPLAYCLASS4_FONTSTYLE_COLOR
public static final SchemeColorProperty DISPLAYCLASS4_FONTSTYLE_OUTLINE_COLOR
public static final SchemeFloatProperty DISPLAYCLASS4_FONTSTYLE_OUTLINE_WIDTH
public static final SchemeFloatProperty DISPLAYCLASS4_FONTSTYLE_SIZE
public static final SchemeFloatProperty DISPLAYCLASS4_WIDTH
public static final SchemeColorProperty DISPLAYCLASS5_COLOR
public static final SchemeColorProperty DISPLAYCLASS5_FONTSTYLE_COLOR
public static final SchemeColorProperty DISPLAYCLASS5_FONTSTYLE_OUTLINE_COLOR
public static final SchemeFloatProperty DISPLAYCLASS5_FONTSTYLE_OUTLINE_WIDTH
public static final SchemeFloatProperty DISPLAYCLASS5_FONTSTYLE_SIZE
public static final SchemeFloatProperty DISPLAYCLASS5_WIDTH
public static final SchemeColorProperty DISPLAYCLASS6_COLOR
public static final SchemeColorProperty DISPLAYCLASS6_FONTSTYLE_COLOR
public static final SchemeColorProperty DISPLAYCLASS6_FONTSTYLE_OUTLINE_COLOR
public static final SchemeFloatProperty DISPLAYCLASS6_FONTSTYLE_OUTLINE_WIDTH
public static final SchemeFloatProperty DISPLAYCLASS6_FONTSTYLE_SIZE
public static final SchemeFloatProperty DISPLAYCLASS6_WIDTH
public static final SchemeColorProperty DISPLAYCLASS7_COLOR
public static final SchemeColorProperty DISPLAYCLASS7_FONTSTYLE_COLOR
public static final SchemeColorProperty DISPLAYCLASS7_FONTSTYLE_OUTLINE_COLOR
public static final SchemeFloatProperty DISPLAYCLASS7_FONTSTYLE_OUTLINE_WIDTH
public static final SchemeFloatProperty DISPLAYCLASS7_FONTSTYLE_SIZE
public static final SchemeFloatProperty DISPLAYCLASS7_WIDTH
public static final SchemeColorProperty DISPLAYCLASS8_COLOR
public static final SchemeColorProperty DISPLAYCLASS8_FONTSTYLE_COLOR
public static final SchemeColorProperty DISPLAYCLASS8_FONTSTYLE_OUTLINE_COLOR
public static final SchemeFloatProperty DISPLAYCLASS8_FONTSTYLE_OUTLINE_WIDTH
public static final SchemeFloatProperty DISPLAYCLASS8_FONTSTYLE_SIZE
public static final SchemeFloatProperty DISPLAYCLASS8_WIDTH
public static final SchemeColorProperty FONTSTYLE_COLOR

```

## Fields

```
public static final SchemeColorProperty FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty FONTSTYLE_SIZE
```

```
public static final SchemeFloatProperty WIDTH
```

---

## Class Details

### Constructor Details

**IntermittentRiver** ()

### Field Details

```
public static final SchemeColorProperty COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS1_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS1_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS1_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS1_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS1_FONTSTYLE_SIZE
```

```
public static final SchemeFloatProperty DISPLAYCLASS1_WIDTH
```

```
public static final SchemeColorProperty DISPLAYCLASS2_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS2_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS2_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS2_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS2_FONTSTYLE_SIZE
```

```
public static final SchemeFloatProperty DISPLAYCLASS2_WIDTH
```

```
public static final SchemeColorProperty DISPLAYCLASS3_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS3_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS3_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS3_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS3_FONTSTYLE_SIZE
```

```
public static final SchemeFloatProperty DISPLAYCLASS3_WIDTH
```

```
public static final SchemeColorProperty DISPLAYCLASS4_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS4_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS4_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS4_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS4_FONTSTYLE_SIZE
```

```
public static final SchemeFloatProperty DISPLAYCLASS4_WIDTH
```

```
public static final SchemeColorProperty DISPLAYCLASS5_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS5_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS5_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS5_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS5_FONTSTYLE_SIZE
```

```
public static final SchemeFloatProperty DISPLAYCLASS5_WIDTH
```

```
public static final SchemeColorProperty DISPLAYCLASS6_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS6_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS6_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS6_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS6_FONTSTYLE_SIZE
```

```
public static final SchemeFloatProperty DISPLAYCLASS6_WIDTH
```

```
public static final SchemeColorProperty DISPLAYCLASS7_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS7_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS7_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS7_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS7_FONTSTYLE_SIZE

public static final SchemeFloatProperty DISPLAYCLASS7_WIDTH

public static final SchemeColorProperty DISPLAYCLASS8_COLOR

public static final SchemeColorProperty DISPLAYCLASS8_FONTSTYLE_COLOR

public static final SchemeColorProperty DISPLAYCLASS8_FONTSTYLE_OUTLINE_COLOR

public static final SchemeFloatProperty DISPLAYCLASS8_FONTSTYLE_OUTLINE_WIDTH

public static final SchemeFloatProperty DISPLAYCLASS8_FONTSTYLE_SIZE

public static final SchemeFloatProperty DISPLAYCLASS8_WIDTH

public static final SchemeColorProperty FONTSTYLE_COLOR

public static final SchemeColorProperty FONTSTYLE_OUTLINE_COLOR

public static final SchemeFloatProperty FONTSTYLE_OUTLINE_WIDTH

public static final SchemeFloatProperty FONTSTYLE_SIZE

public static final SchemeFloatProperty WIDTH
```

## IslandInfo

The class *IslandInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.IslandInfo
```

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 725: Constructors in IslandInfo

Constructors
<i>IslandInfo</i> ()

## Field Summary

Table 726: Fields in IslandInfo

Fields
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_OUTLINE_WIDTH</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_SIZE</b>

## Class Details

### Constructor Details

*IslandInfo* ()

### Field Details

public static final *SchemeColorProperty* **FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **FONTSTYLE\_SIZE**

## Lake

The class *Lake* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

## Class Summary

public static class **CustomizableVariables.Lake**

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 727: Constructors in Lake

Constructors
<i>Lake</i> ()

## Field Summary

Table 728: Fields in Lake

Fields
public static final <i>SchemeColorProperty</i> <b>COLOR</b>
public static final <i>SchemeColorProperty</i> <b>DISPLAYCLASS1_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>DISPLAYCLASS1_FONTSTYLE_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>DISPLAYCLASS1_FONTSTYLE_OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i> <b>DISPLAYCLASS1_FONTSTYLE_OUTLINE_WIDTH</b>
public static final <i>SchemeFloatProperty</i> <b>DISPLAYCLASS1_FONTSTYLE_SIZE</b>
public static final <i>SchemeColorProperty</i> <b>DISPLAYCLASS2_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>DISPLAYCLASS2_FONTSTYLE_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>DISPLAYCLASS2_FONTSTYLE_OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i> <b>DISPLAYCLASS2_FONTSTYLE_OUTLINE_WIDTH</b>
public static final <i>SchemeFloatProperty</i> <b>DISPLAYCLASS2_FONTSTYLE_SIZE</b>
public static final <i>SchemeColorProperty</i> <b>DISPLAYCLASS3_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>DISPLAYCLASS3_FONTSTYLE_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>DISPLAYCLASS3_FONTSTYLE_OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i> <b>DISPLAYCLASS3_FONTSTYLE_OUTLINE_WIDTH</b>
public static final <i>SchemeFloatProperty</i> <b>DISPLAYCLASS3_FONTSTYLE_SIZE</b>
public static final <i>SchemeColorProperty</i> <b>DISPLAYCLASS4_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>DISPLAYCLASS4_FONTSTYLE_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>DISPLAYCLASS4_FONTSTYLE_OUTLINE_COLOR</b>

## Fields

public static final *SchemeFloatProperty* **DISPLAYCLASS4\_FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **DISPLAYCLASS4\_FONTSTYLE\_SIZE**

public static final *SchemeColorProperty* **DISPLAYCLASS5\_COLOR**

public static final *SchemeColorProperty* **DISPLAYCLASS5\_FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **DISPLAYCLASS5\_FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **DISPLAYCLASS5\_FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **DISPLAYCLASS5\_FONTSTYLE\_SIZE**

public static final *SchemeColorProperty* **DISPLAYCLASS6\_COLOR**

public static final *SchemeColorProperty* **DISPLAYCLASS6\_FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **DISPLAYCLASS6\_FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **DISPLAYCLASS6\_FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **DISPLAYCLASS6\_FONTSTYLE\_SIZE**

public static final *SchemeColorProperty* **DISPLAYCLASS7\_COLOR**

public static final *SchemeColorProperty* **DISPLAYCLASS7\_FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **DISPLAYCLASS7\_FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **DISPLAYCLASS7\_FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **DISPLAYCLASS7\_FONTSTYLE\_SIZE**

public static final *SchemeColorProperty* **DISPLAYCLASS8\_COLOR**

public static final *SchemeColorProperty* **DISPLAYCLASS8\_FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **DISPLAYCLASS8\_FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **DISPLAYCLASS8\_FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **DISPLAYCLASS8\_FONTSTYLE\_SIZE**

public static final *SchemeColorProperty* **FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **FONTSTYLE\_SIZE**

## Class Details

### Constructor Details

Lake ()

## Field Details

```
public static final SchemeColorProperty COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS1_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS1_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS1_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS1_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS1_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty DISPLAYCLASS2_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS2_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS2_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS2_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS2_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty DISPLAYCLASS3_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS3_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS3_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS3_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS3_FONTSTYLE_SIZE

public static final SchemeColorProperty DISPLAYCLASS4_COLOR

public static final SchemeColorProperty DISPLAYCLASS4_FONTSTYLE_COLOR

public static final SchemeColorProperty DISPLAYCLASS4_FONTSTYLE_OUTLINE_COLOR

public static final SchemeFloatProperty DISPLAYCLASS4_FONTSTYLE_OUTLINE_WIDTH

public static final SchemeFloatProperty DISPLAYCLASS4_FONTSTYLE_SIZE

public static final SchemeColorProperty DISPLAYCLASS5_COLOR

public static final SchemeColorProperty DISPLAYCLASS5_FONTSTYLE_COLOR

public static final SchemeColorProperty DISPLAYCLASS5_FONTSTYLE_OUTLINE_COLOR

public static final SchemeFloatProperty DISPLAYCLASS5_FONTSTYLE_OUTLINE_WIDTH

public static final SchemeFloatProperty DISPLAYCLASS5_FONTSTYLE_SIZE

public static final SchemeColorProperty DISPLAYCLASS6_COLOR

public static final SchemeColorProperty DISPLAYCLASS6_FONTSTYLE_COLOR

public static final SchemeColorProperty DISPLAYCLASS6_FONTSTYLE_OUTLINE_COLOR

public static final SchemeFloatProperty DISPLAYCLASS6_FONTSTYLE_OUTLINE_WIDTH

public static final SchemeFloatProperty DISPLAYCLASS6_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty DISPLAYCLASS7_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS7_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS7_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS7_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS7_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty DISPLAYCLASS8_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS8_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS8_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS8_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS8_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty FONTSTYLE_SIZE
```

## Land

The class *Land* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

## Class Summary

public static class **CustomizableVariables.Land**

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 729: Constructors in Land

Constructors
<a href="#">Land</a> ()

## Field Summary

Table 730: Fields in Land

Fields
public static final <a href="#">SchemeColorProperty</a> <b>COLOR</b>

## Class Details

### Constructor Details

[Land](#) ()

### Field Details

public static final [SchemeColorProperty](#) **COLOR**

## LandCover

The class *LandCover* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

## Class Summary

public static class **CustomizableVariables.LandCover**

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 731: Constructors in LandCover

Constructors
<a href="#">LandCover</a> ()

## Field Summary

Table 732: Fields in LandCover

Fields
<code>public static final <i>SchemeColorProperty</i> DESERT_COLOR</code>
<code>public static final <i>SchemeColorProperty</i> DESERT_FONTSTYLE_COLOR</code>
<code>public static final <i>SchemeColorProperty</i> DESERT_FONTSTYLE_OUTLINE_COLOR</code>
<code>public static final <i>SchemeFloatProperty</i> DESERT_FONTSTYLE_OUTLINE_WIDTH</code>
<code>public static final <i>SchemeFloatProperty</i> DESERT_FONTSTYLE_SIZE</code>
<code>public static final <i>SchemeColorProperty</i> GLACIER_COLOR</code>
<code>public static final <i>SchemeColorProperty</i> GLACIER_FONTSTYLE_COLOR</code>
<code>public static final <i>SchemeColorProperty</i> GLACIER_FONTSTYLE_OUTLINE_COLOR</code>
<code>public static final <i>SchemeFloatProperty</i> GLACIER_FONTSTYLE_OUTLINE_WIDTH</code>
<code>public static final <i>SchemeFloatProperty</i> GLACIER_FONTSTYLE_SIZE</code>

## Class Details

### Constructor Details

[LandCover](#) ()

### Field Details

`public static final SchemeColorProperty DESERT_COLOR`

`public static final SchemeColorProperty DESERT_FONTSTYLE_COLOR`

`public static final SchemeColorProperty DESERT_FONTSTYLE_OUTLINE_COLOR`

`public static final SchemeFloatProperty DESERT_FONTSTYLE_OUTLINE_WIDTH`

```
public static final SchemeFloatProperty DESERT_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty GLACIER_COLOR
```

```
public static final SchemeColorProperty GLACIER_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty GLACIER_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty GLACIER_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty GLACIER_FONTSTYLE_SIZE
```

## LaneWidthM

The class *LaneWidthM* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.LaneWidthM
```

```
extends java.lang.Object
```

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 733: Constructors in LaneWidthM

Constructors
<i>LaneWidthM</i> ()

### Field Summary

Table 734: Fields in LaneWidthM

Fields
public static final <i>SchemeFloatProperty</i> <b>LANEWIDTHM</b>

## Class Details

### Constructor Details

`LaneWidthM ()`

### Field Details

`public static final SchemeFloatProperty LANEWIDTHM`

## LineOfControl

The class *LineOfControl* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

`public static class CustomizableVariables.LineOfControl`

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 735: Constructors in LineOfControl

Constructors
<i>LineOfControl ()</i>

### Field Summary

Table 736: Fields in LineOfControl

Fields
<code>public static final <i>SchemeColorProperty</i> <b>BACKGROUND</b>COLOR</code>
<code>public static final <i>SchemeFloatProperty</i> <b>BACKGROUND</b>WIDTH</code>
<code>public static final <i>SchemeColorProperty</i> <b>COLOR</b></code>
<code>public static final <i>SchemeFloatProperty</i> <b>WIDTH</b></code>

## Class Details

### Constructor Details

`LineOfControl ()`

## Field Details

public static final *SchemeColorProperty* BACKGROUND\_COLOR

public static final *SchemeFloatProperty* BACKGROUND\_WIDTH

public static final *SchemeColorProperty* COLOR

public static final *SchemeFloatProperty* WIDTH

## MajorCountryLabel

The class *MajorCountryLabel* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

## Class Summary

public static class **CustomizableVariables.MajorCountryLabel**

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

## Constructor Summary

Table 737: Constructors in MajorCountryLabel

Constructors
<i>MajorCountryLabel</i> ()

## Field Summary

Table 738: Fields in MajorCountryLabel

Fields
public static final <i>SchemeColorProperty</i> FONTSTYLE_COLOR
public static final <i>SchemeColorProperty</i> FONTSTYLE_OUTLINE_COLOR
public static final <i>SchemeFloatProperty</i> FONTSTYLE_OUTLINE_WIDTH
public static final <i>SchemeFloatProperty</i> FONTSTYLE_SIZE

## Class Details

### Constructor Details

MajorCountryLabel ()

### Field Details

public static final *SchemeColorProperty* FONTSTYLE\_COLOR

public static final *SchemeColorProperty* FONTSTYLE\_OUTLINE\_COLOR

public static final *SchemeFloatProperty* FONTSTYLE\_OUTLINE\_WIDTH

public static final *SchemeFloatProperty* FONTSTYLE\_SIZE

## MarkingDivider

The class *MarkingDivider* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.MarkingDivider**

extends *java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 739: Constructors in MarkingDivider

Constructors
<i>MarkingDivider</i> ()

### Field Summary

Table 740: Fields in MarkingDivider

Fields
public static final <i>SchemeColorProperty</i> <b>CENTERCOLOR</b>

## Class Details

### Constructor Details

MarkingDivider ( )

### Field Details

public static final *SchemeColorProperty* CENTERCOLOR

## MarkingLane

The class *MarkingLane* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.MarkingLane**

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 741: Constructors in MarkingLane

Constructors
<i>MarkingLane</i> ( )

### Field Summary

Table 742: Fields in MarkingLane

Fields
public static final <i>SchemeColorProperty</i> <b>DASHEDCOLOR</b>
public static final <i>SchemeColorProperty</i> <b>SOLIDCOLOR</b>
public static final <i>SchemeFloatProperty</i> <b>WIDTH</b>

## Class Details

### Constructor Details

MarkingLane ( )

## Field Details

```
public static final SchemeColorProperty DASHEDCOLOR
```

```
public static final SchemeColorProperty SOLIDCOLOR
```

```
public static final SchemeFloatProperty WIDTH
```

## MilitaryBase

The class *MilitaryBase* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

## Class Summary

```
public static class CustomizableVariables.MilitaryBase
```

```
extends java.lang.Object
```

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 743: Constructors in MilitaryBase

Constructors
<a href="#">MilitaryBase</a> ()

## Field Summary

Table 744: Fields in MilitaryBase

Fields
public static final <a href="#">SchemeColorProperty</a> <b>COLOR</b>

## Class Details

### Constructor Details

```
MilitaryBase ()
```

### Field Details

```
public static final SchemeColorProperty COLOR
```

## MilitaryBaseInfo

The class *MilitaryBaseInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.MilitaryBaseInfo**

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 745: Constructors in MilitaryBaseInfo

Constructors
<i>MilitaryBaseInfo</i> ()

### Field Summary

Table 746: Fields in MilitaryBaseInfo

Fields
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_OUTLINE_WIDTH</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_SIZE</b>

### Class Details

#### Constructor Details

**MilitaryBaseInfo** ()

#### Field Details

public static final *SchemeColorProperty* **FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **FONTSTYLE\_OUTLINE\_COLOR**

```
public static final SchemeFloatProperty FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty FONTSTYLE_SIZE
```

## MinorCountryLabel

The class *MinorCountryLabel* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.MinorCountryLabel
```

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 747: Constructors in MinorCountryLabel

Constructors
<i>MinorCountryLabel</i> ()

### Field Summary

Table 748: Fields in MinorCountryLabel

Fields
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_OUTLINE_WIDTH</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_SIZE</b>

### Class Details

#### Constructor Details

```
MinorCountryLabel ()
```

#### Field Details

```
public static final SchemeColorProperty FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty FONTSTYLE_SIZE
```

## MotorwayJunctionSimplified

The class *MotorwayJunctionSimplified* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.MotorwayJunctionSimplified**

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 749: Constructors in MotorwayJunctionSimplified

Constructors
<i>MotorwayJunctionSimplified</i> ()

### Field Summary

Table 750: Fields in MotorwayJunctionSimplified

Fields
public static final <i>SchemeColorProperty</i> <b>ICON_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>ICON_OUTLINECOLOR</b>
public static final <i>SchemeFloatProperty</i> <b>ICON_OUTLINEWIDTH</b>

### Class Details

#### Constructor Details

**MotorwayJunctionSimplified** ()

## Field Details

```
public static final SchemeColorProperty ICON_COLOR
```

```
public static final SchemeColorProperty ICON_OUTLINECOLOR
```

```
public static final SchemeFloatProperty ICON_OUTLINEWIDTH
```

## MountainPeak

The class *MountainPeak* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

## Class Summary

```
public static class CustomizableVariables.MountainPeak
```

```
extends java.lang.Object
```

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 751: Constructors in MountainPeak

Constructors
<i>MountainPeak</i> ()

## Field Summary

Table 752: Fields in MountainPeak

Fields
public static final <i>SchemeIntegerProperty</i> <b>ICONSIZE</b>

## Class Details

### Constructor Details

```
MountainPeak ()
```

### Field Details

```
public static final SchemeIntegerProperty ICONSIZE
```

## MountainPeakHeight

The class *MountainPeakHeight* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.MountainPeakHeight**

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 753: Constructors in MountainPeakHeight

Constructors
<i>MountainPeakHeight</i> ()

### Field Summary

Table 754: Fields in MountainPeakHeight

Fields
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_OUTLINE_WIDTH</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_SIZE</b>

### Class Details

#### Constructor Details

**MountainPeakHeight** ()

#### Field Details

public static final *SchemeColorProperty* **FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **FONTSTYLE\_OUTLINE\_COLOR**

```
public static final SchemeFloatProperty FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty FONTSTYLE_SIZE
```

## MountainPeakInfo

The class *MountainPeakInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.MountainPeakInfo
```

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 755: Constructors in MountainPeakInfo

Constructors
<i>MountainPeakInfo</i> ()

### Field Summary

Table 756: Fields in MountainPeakInfo

Fields
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_OUTLINE_WIDTH</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_SIZE</b>

### Class Details

#### Constructor Details

*MountainPeakInfo* ()

#### Field Details

```
public static final SchemeColorProperty FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty FONTSTYLE_SIZE
```

## MountainRangeInfo

The class *MountainRangeInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.MountainRangeInfo
```

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 757: Constructors in MountainRangeInfo

Constructors
<i>MountainRangeInfo</i> ( )

### Field Summary

Table 758: Fields in MountainRangeInfo

Fields
public static final <i>SchemeColorProperty</i> <i>DISPLAYCLASS1_FONTSTYLE_COLOR</i>
public static final <i>SchemeColorProperty</i> <i>DISPLAYCLASS1_FONTSTYLE_OUTLINE_COLOR</i>
public static final <i>SchemeFloatProperty</i> <i>DISPLAYCLASS1_FONTSTYLE_OUTLINE_WIDTH</i>
public static final <i>SchemeFloatProperty</i> <i>DISPLAYCLASS1_FONTSTYLE_SIZE</i>
public static final <i>SchemeColorProperty</i> <i>DISPLAYCLASS2_FONTSTYLE_COLOR</i>
public static final <i>SchemeColorProperty</i> <i>DISPLAYCLASS2_FONTSTYLE_OUTLINE_COLOR</i>
public static final <i>SchemeFloatProperty</i> <i>DISPLAYCLASS2_FONTSTYLE_OUTLINE_WIDTH</i>
public static final <i>SchemeFloatProperty</i> <i>DISPLAYCLASS2_FONTSTYLE_SIZE</i>
public static final <i>SchemeColorProperty</i> <i>DISPLAYCLASS3_FONTSTYLE_COLOR</i>

## Fields

public static final *SchemeColorProperty* **DISPLAYCLASS3\_FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **DISPLAYCLASS3\_FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **DISPLAYCLASS3\_FONTSTYLE\_SIZE**

public static final *SchemeColorProperty* **FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **FONTSTYLE\_SIZE**

## Class Details

### Constructor Details

**MountainRangeInfo** ( )

### Field Details

public static final *SchemeColorProperty* **DISPLAYCLASS1\_FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **DISPLAYCLASS1\_FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **DISPLAYCLASS1\_FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **DISPLAYCLASS1\_FONTSTYLE\_SIZE**

public static final *SchemeColorProperty* **DISPLAYCLASS2\_FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **DISPLAYCLASS2\_FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **DISPLAYCLASS2\_FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **DISPLAYCLASS2\_FONTSTYLE\_SIZE**

public static final *SchemeColorProperty* **DISPLAYCLASS3\_FONTSTYLE\_COLOR**

```
public static final SchemeColorProperty DISPLAYCLASS3_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS3_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS3_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty FONTSTYLE_SIZE
```

## NationalForest

The class *NationalForest* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.NationalForest
```

```
extends java.lang.Object
```

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 759: Constructors in NationalForest

Constructors
<i>NationalForest</i> ()

## Field Summary

Table 760: Fields in NationalForest

Fields
public static final <i>SchemeColorProperty</i> COLOR

## Class Details

### Constructor Details

NationalForest ()

### Field Details

public static final *SchemeColorProperty* COLOR

## NationalForestInfo

The class *NationalForestInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.NationalForestInfo**

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 761: Constructors in NationalForestInfo

Constructors
<i>NationalForestInfo</i> ()

## Field Summary

Table 762: Fields in NationalForestInfo

Fields
public static final <i>SchemeColorProperty</i> FONTSTYLE_COLOR
public static final <i>SchemeColorProperty</i> FONTSTYLE_OUTLINE_COLOR
public static final <i>SchemeFloatProperty</i> FONTSTYLE_OUTLINE_WIDTH

## Fields

```
public static final SchemeFloatProperty FONTSTYLE_SIZE
```

---

## Class Details

### Constructor Details

**NationalForestInfo** ()

### Field Details

```
public static final SchemeColorProperty FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty FONTSTYLE_SIZE
```

## NationalGrassland

The class *NationalGrassland* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.NationalGrassland
```

```
extends java.lang.Object
```

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 763: Constructors in NationalGrassland

#### Constructors

```
NationalGrassland ()
```

## Field Summary

Table 764: Fields in NationalGrassland

Fields
<code>public static final <i>SchemeColorProperty</i> COLOR</code>

## Class Details

### Constructor Details

`NationalGrassland ()`

### Field Details

`public static final SchemeColorProperty COLOR`

## NationalGrasslandInfo

The class *NationalGrasslandInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

`public static class CustomizableVariables.NationalGrasslandInfo`  
*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 765: Constructors in NationalGrasslandInfo

Constructors
<code><i>NationalGrasslandInfo</i> ()</code>

## Field Summary

Table 766: Fields in NationalGrasslandInfo

Fields
<code>public static final <i>SchemeColorProperty</i> FONTSTYLE_COLOR</code>
<code>public static final <i>SchemeColorProperty</i> FONTSTYLE_OUTLINE_COLOR</code>
<code>public static final <i>SchemeFloatProperty</i> FONTSTYLE_OUTLINE_WIDTH</code>

## Fields

public static final *SchemeFloatProperty* **FONTSTYLE\_SIZE**

---

## Class Details

### Constructor Details

**NationalGrasslandInfo** ()

### Field Details

public static final *SchemeColorProperty* **FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **FONTSTYLE\_SIZE**

## NationalHistoricPark

The class *NationalHistoricPark* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.NationalHistoricPark**

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 767: Constructors in NationalHistoricPark

#### Constructors

*NationalHistoricPark* ()

## Field Summary

Table 768: Fields in NationalHistoricPark

Fields
public static final <i>SchemeColorProperty</i> COLOR

## Class Details

### Constructor Details

NationalHistoricPark ()

### Field Details

public static final *SchemeColorProperty* COLOR

## NationalHistoricParkInfo

The class *NationalHistoricParkInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.NationalHistoricParkInfo**

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 769: Constructors in NationalHistoricParkInfo

Constructors
<i>NationalHistoricParkInfo</i> ()

## Field Summary

Table 770: Fields in NationalHistoricParkInfo

Fields
public static final <i>SchemeColorProperty</i> FONTSTYLE_COLOR
public static final <i>SchemeColorProperty</i> FONTSTYLE_OUTLINE_COLOR
public static final <i>SchemeFloatProperty</i> FONTSTYLE_OUTLINE_WIDTH

## Fields

```
public static final SchemeFloatProperty FONTSTYLE_SIZE
```

---

## Class Details

### Constructor Details

**NationalHistoricParkInfo** ()

### Field Details

```
public static final SchemeColorProperty FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty FONTSTYLE_SIZE
```

## NationalMilitaryPark

The class *NationalMilitaryPark* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.NationalMilitaryPark
```

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 771: Constructors in NationalMilitaryPark

#### Constructors

```
NationalMilitaryPark ()
```

## Field Summary

Table 772: Fields in NationalMilitaryPark

Fields
<code>public static final <i>SchemeColorProperty</i> COLOR</code>

## Class Details

### Constructor Details

`NationalMilitaryPark ()`

### Field Details

`public static final SchemeColorProperty COLOR`

## NationalPark

The class *NationalPark* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

`public static class CustomizableVariables.NationalPark`

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 773: Constructors in NationalPark

Constructors
<code><i>NationalPark</i> ()</code>

## Field Summary

Table 774: Fields in NationalPark

Fields
<code>public static final <i>SchemeColorProperty</i> COLOR</code>

## Class Details

### Constructor Details

NationalPark ()

### Field Details

public static final *SchemeColorProperty* COLOR

## NationalParkInfo

The class *NationalParkInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.NationalParkInfo**

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 775: Constructors in NationalParkInfo

Constructors
<i>NationalParkInfo</i> ()

### Field Summary

Table 776: Fields in NationalParkInfo

Fields
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_OUTLINE_WIDTH</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_SIZE</b>

## Class Details

### Constructor Details

`NationalParkInfo` ()

### Field Details

`public static final SchemeColorProperty FONTSTYLE_COLOR`

`public static final SchemeColorProperty FONTSTYLE_OUTLINE_COLOR`

`public static final SchemeFloatProperty FONTSTYLE_OUTLINE_WIDTH`

`public static final SchemeFloatProperty FONTSTYLE_SIZE`

## NationalRecreationArea

The class *NationalRecreationArea* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

`public static class CustomizableVariables.NationalRecreationArea`

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 777: Constructors in *NationalRecreationArea*

Constructors
<code><i>NationalRecreationArea</i> ()</code>

### Field Summary

Table 778: Fields in *NationalRecreationArea*

Fields
<code>public static final <i>SchemeColorProperty</i> COLOR</code>

## Class Details

### Constructor Details

NationalRecreationArea ( )

### Field Details

public static final *SchemeColorProperty* COLOR

## NationalRecreationAreaInfo

The class *NationalRecreationAreaInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.NationalRecreationAreaInfo**

extends *java.lang.Object*

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 779: Constructors in NationalRecreationAreaInfo

Constructors
<i>NationalRecreationAreaInfo</i> ( )

### Field Summary

Table 780: Fields in NationalRecreationAreaInfo

Fields
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_OUTLINE_WIDTH</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_SIZE</b>

## Class Details

### Constructor Details

NationalRecreationAreaInfo ( )

### Field Details

public static final *SchemeColorProperty* FONTSTYLE\_COLOR

public static final *SchemeColorProperty* FONTSTYLE\_OUTLINE\_COLOR

public static final *SchemeFloatProperty* FONTSTYLE\_OUTLINE\_WIDTH

public static final *SchemeFloatProperty* FONTSTYLE\_SIZE

## NationalReserve

The class *NationalReserve* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.NationalReserve**

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 781: Constructors in NationalReserve

Constructors
<i>NationalReserve</i> ( )

### Field Summary

Table 782: Fields in NationalReserve

Fields
public static final <i>SchemeColorProperty</i> <b>COLOR</b>

## Class Details

### Constructor Details

NationalReserve ( )

### Field Details

public static final *SchemeColorProperty* COLOR

## NationalStatePark

The class *NationalStatePark* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.NationalStatePark**

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 783: Constructors in NationalStatePark

Constructors
<i>NationalStatePark</i> ( )

### Field Summary

Table 784: Fields in NationalStatePark

Fields
public static final <i>SchemeColorProperty</i> COLOR

## Class Details

### Constructor Details

NationalStatePark ( )

## Field Details

public static final *SchemeColorProperty* COLOR

## NationalStateParkInfo

The class *NationalStateParkInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

## Class Summary

public static class **CustomizableVariables.NationalStateParkInfo**

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

## Constructor Summary

Table 785: Constructors in NationalStateParkInfo

Constructors
<i>NationalStateParkInfo</i> ()

## Field Summary

Table 786: Fields in NationalStateParkInfo

Fields
public static final <i>SchemeColorProperty</i> FONTSTYLE_COLOR
public static final <i>SchemeColorProperty</i> FONTSTYLE_OUTLINE_COLOR
public static final <i>SchemeFloatProperty</i> FONTSTYLE_OUTLINE_WIDTH
public static final <i>SchemeFloatProperty</i> FONTSTYLE_SIZE

## Class Details

### Constructor Details

*NationalStateParkInfo* ()

### Field Details

public static final *SchemeColorProperty* FONTSTYLE\_COLOR

```
public static final SchemeColorProperty FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty FONTSTYLE_SIZE
```

## NationalWildlifeRefuge

The class *NationalWildlifeRefuge* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.NationalWildlifeRefuge
```

```
extends java.lang.Object
```

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 787: Constructors in NationalWildlifeRefuge

Constructors
<i>NationalWildlifeRefuge</i> ()

### Field Summary

Table 788: Fields in NationalWildlifeRefuge

Fields
public static final <i>SchemeColorProperty</i> <b>COLOR</b>

### Class Details

#### Constructor Details

```
NationalWildlifeRefuge ()
```

#### Field Details

```
public static final SchemeColorProperty COLOR
```

## NativeReservation

The class *NativeReservation* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.NativeReservation**

extends *java.lang.Object*

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 789: Constructors in NativeReservation

Constructors
<i>NativeReservation</i> ()

### Field Summary

Table 790: Fields in NativeReservation

Fields
public static final <i>SchemeColorProperty</i> <b>COLOR</b>

### Class Details

#### Constructor Details

**NativeReservation** ()

#### Field Details

public static final *SchemeColorProperty* **COLOR**

## NativeReservationInfo

The class *NativeReservationInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.NativeReservationInfo**

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 791: Constructors in NativeReservationInfo

Constructors
<i>NativeReservationInfo</i> ()

## Field Summary

Table 792: Fields in NativeReservationInfo

Fields
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_OUTLINE_WIDTH</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_SIZE</b>

## Class Details

### Constructor Details

*NativeReservationInfo* ()

### Field Details

public static final *SchemeColorProperty* **FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **FONTSTYLE\_SIZE**

## Neighborhood

The class *Neighborhood* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.Neighborhood**

extends *java.lang.Object*

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 793: Constructors in Neighborhood

Constructors
<i>Neighborhood</i> ()

### Field Summary

Table 794: Fields in Neighborhood

Fields
public static final <i>SchemeColorProperty</i> <b>COLOR_0</b>
public static final <i>SchemeColorProperty</i> <b>COLOR_1</b>
public static final <i>SchemeColorProperty</i> <b>COLOR_2</b>
public static final <i>SchemeColorProperty</i> <b>COLOR_3</b>
public static final <i>SchemeColorProperty</i> <b>COLOR_4</b>
public static final <i>SchemeColorProperty</i> <b>COLOR_5</b>

### Class Details

#### Constructor Details

**Neighborhood** ()

#### Field Details

public static final *SchemeColorProperty* **COLOR\_0**

public static final *SchemeColorProperty* **COLOR\_1**

```
public static final SchemeColorProperty COLOR_2
```

```
public static final SchemeColorProperty COLOR_3
```

```
public static final SchemeColorProperty COLOR_4
```

```
public static final SchemeColorProperty COLOR_5
```

## NeighborhoodInfo

The class *NeighborhoodInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.NeighborhoodInfo
```

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 795: Constructors in NeighborhoodInfo

Constructors
<i>NeighborhoodInfo</i> ()

### Field Summary

Table 796: Fields in NeighborhoodInfo

Fields
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_0_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_0_OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_0_OUTLINE_WIDTH</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_0_SIZE</b>
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_1_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_1_OUTLINE_COLOR</b>

## Fields

public static final *SchemeFloatProperty* **FONTSTYLE\_1\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **FONTSTYLE\_1\_SIZE**

public static final *SchemeColorProperty* **FONTSTYLE\_2\_COLOR**

public static final *SchemeColorProperty* **FONTSTYLE\_2\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **FONTSTYLE\_2\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **FONTSTYLE\_2\_SIZE**

public static final *SchemeColorProperty* **FONTSTYLE\_3\_COLOR**

public static final *SchemeColorProperty* **FONTSTYLE\_3\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **FONTSTYLE\_3\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **FONTSTYLE\_3\_SIZE**

public static final *SchemeColorProperty* **FONTSTYLE\_4\_COLOR**

public static final *SchemeColorProperty* **FONTSTYLE\_4\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **FONTSTYLE\_4\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **FONTSTYLE\_4\_SIZE**

public static final *SchemeColorProperty* **FONTSTYLE\_5\_COLOR**

public static final *SchemeColorProperty* **FONTSTYLE\_5\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **FONTSTYLE\_5\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **FONTSTYLE\_5\_SIZE**

## Class Details

### Constructor Details

NeighborhoodInfo ()

### Field Details

public static final *SchemeColorProperty* **FONTSTYLE\_0\_COLOR**

public static final *SchemeColorProperty* **FONTSTYLE\_0\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **FONTSTYLE\_0\_OUTLINE\_WIDTH**

```
public static final SchemeFloatProperty FONTSTYLE_0_SIZE
```

```
public static final SchemeColorProperty FONTSTYLE_1_COLOR
```

```
public static final SchemeColorProperty FONTSTYLE_1_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty FONTSTYLE_1_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty FONTSTYLE_1_SIZE
```

```
public static final SchemeColorProperty FONTSTYLE_2_COLOR
```

```
public static final SchemeColorProperty FONTSTYLE_2_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty FONTSTYLE_2_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty FONTSTYLE_2_SIZE
```

```
public static final SchemeColorProperty FONTSTYLE_3_COLOR
```

```
public static final SchemeColorProperty FONTSTYLE_3_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty FONTSTYLE_3_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty FONTSTYLE_3_SIZE
```

```
public static final SchemeColorProperty FONTSTYLE_4_COLOR
```

```
public static final SchemeColorProperty FONTSTYLE_4_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty FONTSTYLE_4_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty FONTSTYLE_4_SIZE
```

```
public static final SchemeColorProperty FONTSTYLE_5_COLOR
```

```
public static final SchemeColorProperty FONTSTYLE_5_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty FONTSTYLE_5_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty FONTSTYLE_5_SIZE
```

## Ocean

The class *Ocean* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.Ocean
```

```
extends java.lang.Object
```

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 797: Constructors in Ocean

Constructors
<i>Ocean</i> ()

### Field Summary

Table 798: Fields in Ocean

Fields
public static final <i>SchemeColorProperty</i> <b>COLOR</b>
public static final <i>SchemeColorProperty</i> <b>DISPLAYCLASS1_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>DISPLAYCLASS1_FONTSTYLE_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>DISPLAYCLASS1_FONTSTYLE_OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i> <b>DISPLAYCLASS1_FONTSTYLE_OUTLINE_WIDTH</b>

## Fields

<code>public static final <i>SchemeFloatProperty</i></code>	<code><i>DISPLAYCLASS1_FONTSTYLE_SIZE</i></code>
<code>public static final <i>SchemeColorProperty</i></code>	<code><i>DISPLAYCLASS2_COLOR</i></code>
<code>public static final <i>SchemeColorProperty</i></code>	<code><i>DISPLAYCLASS2_FONTSTYLE_COLOR</i></code>
<code>public static final <i>SchemeColorProperty</i></code>	<code><i>DISPLAYCLASS2_FONTSTYLE_OUTLINE_COLOR</i></code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code><i>DISPLAYCLASS2_FONTSTYLE_OUTLINE_WIDTH</i></code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code><i>DISPLAYCLASS2_FONTSTYLE_SIZE</i></code>
<code>public static final <i>SchemeColorProperty</i></code>	<code><i>DISPLAYCLASS3_COLOR</i></code>
<code>public static final <i>SchemeColorProperty</i></code>	<code><i>DISPLAYCLASS3_FONTSTYLE_COLOR</i></code>
<code>public static final <i>SchemeColorProperty</i></code>	<code><i>DISPLAYCLASS3_FONTSTYLE_OUTLINE_COLOR</i></code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code><i>DISPLAYCLASS3_FONTSTYLE_OUTLINE_WIDTH</i></code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code><i>DISPLAYCLASS3_FONTSTYLE_SIZE</i></code>
<code>public static final <i>SchemeColorProperty</i></code>	<code><i>DISPLAYCLASS4_COLOR</i></code>
<code>public static final <i>SchemeColorProperty</i></code>	<code><i>DISPLAYCLASS4_FONTSTYLE_COLOR</i></code>
<code>public static final <i>SchemeColorProperty</i></code>	<code><i>DISPLAYCLASS4_FONTSTYLE_OUTLINE_COLOR</i></code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code><i>DISPLAYCLASS4_FONTSTYLE_OUTLINE_WIDTH</i></code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code><i>DISPLAYCLASS4_FONTSTYLE_SIZE</i></code>
<code>public static final <i>SchemeColorProperty</i></code>	<code><i>DISPLAYCLASS5_COLOR</i></code>
<code>public static final <i>SchemeColorProperty</i></code>	<code><i>DISPLAYCLASS5_FONTSTYLE_COLOR</i></code>
<code>public static final <i>SchemeColorProperty</i></code>	<code><i>DISPLAYCLASS5_FONTSTYLE_OUTLINE_COLOR</i></code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code><i>DISPLAYCLASS5_FONTSTYLE_OUTLINE_WIDTH</i></code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code><i>DISPLAYCLASS5_FONTSTYLE_SIZE</i></code>
<code>public static final <i>SchemeColorProperty</i></code>	<code><i>DISPLAYCLASS6_COLOR</i></code>
<code>public static final <i>SchemeColorProperty</i></code>	<code><i>DISPLAYCLASS6_FONTSTYLE_COLOR</i></code>
<code>public static final <i>SchemeColorProperty</i></code>	<code><i>DISPLAYCLASS6_FONTSTYLE_OUTLINE_COLOR</i></code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code><i>DISPLAYCLASS6_FONTSTYLE_OUTLINE_WIDTH</i></code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code><i>DISPLAYCLASS6_FONTSTYLE_SIZE</i></code>
<code>public static final <i>SchemeColorProperty</i></code>	<code><i>DISPLAYCLASS7_COLOR</i></code>
<code>public static final <i>SchemeColorProperty</i></code>	<code><i>DISPLAYCLASS7_FONTSTYLE_COLOR</i></code>
<code>public static final <i>SchemeColorProperty</i></code>	<code><i>DISPLAYCLASS7_FONTSTYLE_OUTLINE_COLOR</i></code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code><i>DISPLAYCLASS7_FONTSTYLE_OUTLINE_WIDTH</i></code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code><i>DISPLAYCLASS7_FONTSTYLE_SIZE</i></code>

## Fields

```
public static final SchemeColorProperty DISPLAYCLASS8_COLOR
public static final SchemeColorProperty DISPLAYCLASS8_FONTSTYLE_COLOR
public static final SchemeColorProperty DISPLAYCLASS8_FONTSTYLE_OUTLINE_COLOR
public static final SchemeFloatProperty DISPLAYCLASS8_FONTSTYLE_OUTLINE_WIDTH
public static final SchemeFloatProperty DISPLAYCLASS8_FONTSTYLE_SIZE
public static final SchemeColorProperty FONTSTYLE_COLOR
public static final SchemeColorProperty FONTSTYLE_OUTLINE_COLOR
public static final SchemeFloatProperty FONTSTYLE_OUTLINE_WIDTH
public static final SchemeFloatProperty FONTSTYLE_SIZE
```

## Class Details

### Constructor Details

Ocean ()

### Field Details

```
public static final SchemeColorProperty COLOR
public static final SchemeColorProperty DISPLAYCLASS1_COLOR
public static final SchemeColorProperty DISPLAYCLASS1_FONTSTYLE_COLOR
public static final SchemeColorProperty DISPLAYCLASS1_FONTSTYLE_OUTLINE_COLOR
public static final SchemeFloatProperty DISPLAYCLASS1_FONTSTYLE_OUTLINE_WIDTH
public static final SchemeFloatProperty DISPLAYCLASS1_FONTSTYLE_SIZE
public static final SchemeColorProperty DISPLAYCLASS2_COLOR
public static final SchemeColorProperty DISPLAYCLASS2_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS2_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS2_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS2_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty DISPLAYCLASS3_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS3_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS3_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS3_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS3_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty DISPLAYCLASS4_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS4_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS4_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS4_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS4_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty DISPLAYCLASS5_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS5_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS5_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS5_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS5_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty DISPLAYCLASS6_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS6_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS6_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS6_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS6_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty DISPLAYCLASS7_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS7_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS7_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS7_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS7_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty DISPLAYCLASS8_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS8_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS8_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS8_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS8_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty FONTSTYLE_SIZE
```

## Panorama

The class *Panorama* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.Panorama
```

```
extends java.lang.Object
```

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 799: Constructors in Panorama

Constructors
<i>Panorama</i> ()

### Field Summary

Table 800: Fields in Panorama

Fields
public static final <i>SchemeColorProperty</i> <b>COVERAGE_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>COVERAGE_OUTLINECOLOR</b>
public static final <i>SchemeIntegerProperty</i> <b>COVERAGE_OUTLINEWIDTH</b>

## Fields

```

public static final SchemeIntegerProperty COVERAGE_WIDTH

public static final SchemeColorProperty HIGHLIGHT_PRIMARYCOLOR

public static final SchemeColorProperty HIGHLIGHT_SECONDARYCOLOR

public static final SchemeFloatProperty RASTERCOVERAGE_BLENDWIDTHFACTOR

public static final SchemeColorProperty RASTERCOVERAGE_COLOR

public static final SchemeColorProperty RASTERCOVERAGE_OUTLINECOLOR

public static final SchemeFloatProperty RASTERCOVERAGE_OUTLINEWIDTHFACTOR

public static final SchemeColorProperty ROUTEARROW_COLOR

public static final SchemeColorProperty ROUTEARROW_HIGHLIGHTCOLOR

public static final SchemeFloatProperty ROUTEARROW_WIDTHM

public static final SchemeColorProperty ROUTE_COLOR

public static final SchemeColorProperty ROUTE_SECONDARYCOLOR

public static final SchemeColorProperty STREET_COLOR

public static final SchemeColorProperty STREET_FONTSTYLE_COLOR

public static final SchemeColorProperty STREET_FONTSTYLE_OUTLINE_COLOR

public static final SchemeFloatProperty STREET_FONTSTYLE_OUTLINE_WIDTH

public static final SchemeFloatProperty STREET_FONTSTYLE_SIZE

public static final SchemeFloatProperty STREET_WIDTHM

```

## Class Details

### Constructor Details

Panorama ( )

### Field Details

```

public static final SchemeColorProperty COVERAGE_COLOR

public static final SchemeColorProperty COVERAGE_OUTLINECOLOR

public static final SchemeIntegerProperty COVERAGE_OUTLINEWIDTH

```

```
public static final SchemeIntegerProperty COVERAGE_WIDTH
```

```
public static final SchemeColorProperty HIGHLIGHT_PRIMARYCOLOR
```

```
public static final SchemeColorProperty HIGHLIGHT_SECONDARYCOLOR
```

```
public static final SchemeFloatProperty RASTERCOVERAGE_BLENDWIDTHFACTOR
```

```
public static final SchemeColorProperty RASTERCOVERAGE_COLOR
```

```
public static final SchemeColorProperty RASTERCOVERAGE_OUTLINECOLOR
```

```
public static final SchemeFloatProperty RASTERCOVERAGE_OUTLINEWIDTHFACTOR
```

```
public static final SchemeColorProperty ROUTEARROW_COLOR
```

```
public static final SchemeColorProperty ROUTEARROW_HIGHLIGHTCOLOR
```

```
public static final SchemeFloatProperty ROUTEARROW_WIDTHM
```

```
public static final SchemeColorProperty ROUTE_COLOR
```

```
public static final SchemeColorProperty ROUTE_SECONDARYCOLOR
```

```
public static final SchemeColorProperty STREET_COLOR
```

```
public static final SchemeColorProperty STREET_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty STREET_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty STREET_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty STREET_FONTSTYLE_SIZE
```

```
public static final SchemeFloatProperty STREET_WIDTHM
```

## Park

The class *Park* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.Park
```

```
extends java.lang.Object
```

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 801: Constructors in Park

Constructors
<a href="#">Park ()</a>

### Field Summary

Table 802: Fields in Park

Fields
<pre>public static final <i>SchemeColorProperty</i> <b>COLOR</b></pre>

### Class Details

#### Constructor Details

```
Park ()
```

#### Field Details

```
public static final SchemeColorProperty COLOR
```

## ParkInfo

The class *ParkInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.ParkInfo**

extends *java.lang.Object*

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 803: Constructors in ParkInfo

Constructors
<i>ParkInfo</i> ()

### Field Summary

Table 804: Fields in ParkInfo

Fields
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_OUTLINE_WIDTH</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_SIZE</b>

### Class Details

#### Constructor Details

*ParkInfo* ()

#### Field Details

public static final *SchemeColorProperty* **FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **FONTSTYLE\_OUTLINE\_WIDTH**

```
public static final SchemeFloatProperty FONTSTYLE_SIZE
```

## PedestrianArea

The class *PedestrianArea* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.PedestrianArea
```

```
extends java.lang.Object
```

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 805: Constructors in PedestrianArea

Constructors
<i>PedestrianArea</i> ()

### Field Summary

Table 806: Fields in PedestrianArea

Fields
public static final <i>SchemeColorProperty</i> <b>COLOR</b>

### Class Details

#### Constructor Details

```
PedestrianArea ()
```

#### Field Details

```
public static final SchemeColorProperty COLOR
```

## PedestrianAreaInfo

The class *PedestrianAreaInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

## Class Summary

public static class **CustomizableVariables.PedestrianAreaInfo**

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 807: Constructors in PedestrianAreaInfo

Constructors
<a href="#">PedestrianAreaInfo</a> ()

## Field Summary

Table 808: Fields in PedestrianAreaInfo

Fields
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_OUTLINE_WIDTH</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_SIZE</b>

## Class Details

### Constructor Details

[PedestrianAreaInfo](#) ()

### Field Details

public static final *SchemeColorProperty* **FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **FONTSTYLE\_SIZE**

## PedestrianPoint

The class *PedestrianPoint* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.PedestrianPoint**

extends *java.lang.Object*

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 809: Constructors in PedestrianPoint

Constructors
<i>PedestrianPoint</i> ()

### Field Summary

Table 810: Fields in PedestrianPoint

Fields
public static final <i>SchemeIntegerProperty</i> <b>ICONSIZE</b>

### Class Details

#### Constructor Details

*PedestrianPoint* ()

#### Field Details

public static final *SchemeIntegerProperty* **ICONSIZE**

## PointOfInterest

The class *PointOfInterest* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.PointOfInterest**

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 811: Constructors in PointOfInterest

Constructors
<a href="#">PointOfInterest</a> ()

## Field Summary

Table 812: Fields in PointOfInterest

Fields
public static final <i>SchemeColorProperty</i> <a href="#">FONTSTYLE_COLOR</a>
public static final <i>SchemeColorProperty</i> <a href="#">FONTSTYLE_OUTLINE_COLOR</a>
public static final <i>SchemeFloatProperty</i> <a href="#">FONTSTYLE_OUTLINE_WIDTH</a>
public static final <i>SchemeFloatProperty</i> <a href="#">FONTSTYLE_SIZE</a>
public static final <i>SchemeColorProperty</i> <a href="#">FUELTYPE_FONTSTYLE_COLOR</a>
public static final <i>SchemeColorProperty</i> <a href="#">FUELTYPE_FONTSTYLE_OUTLINE_COLOR</a>
public static final <i>SchemeFloatProperty</i> <a href="#">FUELTYPE_FONTSTYLE_OUTLINE_WIDTH</a>
public static final <i>SchemeFloatProperty</i> <a href="#">FUELTYPE_FONTSTYLE_SIZE</a>
public static final <i>SchemeIntegerProperty</i> <a href="#">FUELTYPE_ICONSIZ</a>
public static final <i>SchemeIntegerProperty</i> <a href="#">GENERAL_ICONSIZ</a>
public static final <i>SchemeColorProperty</i> <a href="#">POINTOFINTEREST_24HOUR_FONTSTYLE_COLOR</a>
public static final <i>SchemeColorProperty</i> <a href="#">POINTOFINTEREST_24HOUR_FONTSTYLE_OUTLINE_COLOR</a>
public static final <i>SchemeFloatProperty</i> <a href="#">POINTOFINTEREST_24HOUR_FONTSTYLE_OUTLINE_WIDTH</a>
public static final <i>SchemeFloatProperty</i> <a href="#">POINTOFINTEREST_24HOUR_FONTSTYLE_SIZE</a>
public static final <i>SchemeIntegerProperty</i> <a href="#">POINTOFINTEREST_24HOUR_ICONSIZ</a>

## Class Details

### Constructor Details

[PointOfInterest](#) ()

## Field Details

```
public static final SchemeColorProperty FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty FUELTYPE_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty FUELTYPE_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty FUELTYPE_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty FUELTYPE_FONTSTYLE_SIZE
```

```
public static final SchemeIntegerProperty FUELTYPE_ICONSIZ
```

```
public static final SchemeIntegerProperty GENERAL_ICONSIZ
```

```
public static final SchemeColorProperty POINTOFINTEREST_24HOUR_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty  
POINTOFINTEREST_24HOUR_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty  
POINTOFINTEREST_24HOUR_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty POINTOFINTEREST_24HOUR_FONTSTYLE_SIZE
```

```
public static final SchemeIntegerProperty POINTOFINTEREST_24HOUR_ICONSIZ
```

## Rail

The class *Rail* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.Rail
```

```
extends java.lang.Object
```

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 813: Constructors in Rail

Constructors
<i>Rail</i> ()

### Field Summary

Table 814: Fields in Rail

Fields
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_OUTLINE_WIDTH</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_SIZE</b>

### Class Details

#### Constructor Details

```
Rail ()
```

#### Field Details

```
public static final SchemeColorProperty FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty FONTSTYLE_SIZE
```

## Railway

The class *Railway* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.Railway
```

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 815: Constructors in Railway

Constructors
<i>Railway</i> ()

### Field Summary

Table 816: Fields in Railway

Fields
public static final <i>SchemeColorProperty</i> <b>STREETPOLYLINEATTRIBUTE_ARROW_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>STREETPOLYLINEATTRIBUTE_ARROW_TOLL_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>STREETPOLYLINEATTRIBUTE_ARROW_UNPAVED_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>STREETPOLYLINEATTRIBUTE_BRIDGE_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>STREETPOLYLINEATTRIBUTE_TOLL_CENTERLINE_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>STREETPOLYLINEATTRIBUTE_TOLL_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>STREETPOLYLINEATTRIBUTE_TOLL_OUTLINE_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>STREETPOLYLINEATTRIBUTE_TOLL_THIN_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>STREETPOLYLINEATTRIBUTE_TOLL_TUNNEL_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>STREETPOLYLINEATTRIBUTE_UNPAVED_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>STREETPOLYLINEATTRIBUTE_UNPAVED_OUTLINE_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>STREETPOLYLINEATTRIBUTE_UNPAVED_THIN_COLOR</b>

## Class Details

### Constructor Details

Railway ()

### Field Details

```
public static final SchemeColorProperty STREETPOLYLINEATTRIBUTE_ARROW_COLOR
```

```
public static final SchemeColorProperty  
STREETPOLYLINEATTRIBUTE_ARROW_TOLL_COLOR
```

```
public static final SchemeColorProperty  
STREETPOLYLINEATTRIBUTE_ARROW_UNPAVED_COLOR
```

```
public static final SchemeColorProperty STREETPOLYLINEATTRIBUTE_BRIDGE_COLOR
```

```
public static final SchemeColorProperty  
STREETPOLYLINEATTRIBUTE_TOLL_CENTERLINE_COLOR
```

```
public static final SchemeColorProperty STREETPOLYLINEATTRIBUTE_TOLL_COLOR
```

```
public static final SchemeColorProperty  
STREETPOLYLINEATTRIBUTE_TOLL_OUTLINE_COLOR
```

```
public static final SchemeColorProperty  
STREETPOLYLINEATTRIBUTE_TOLL_THIN_COLOR
```

```
public static final SchemeColorProperty  
STREETPOLYLINEATTRIBUTE_TOLL_TUNNEL_COLOR
```

```
public static final SchemeColorProperty STREETPOLYLINEATTRIBUTE_UNPAVED_COLOR
```

```
public static final SchemeColorProperty  
STREETPOLYLINEATTRIBUTE_UNPAVED_OUTLINE_COLOR
```

```
public static final SchemeColorProperty  
STREETPOLYLINEATTRIBUTE_UNPAVED_THIN_COLOR
```

## Railyard

The class *Railyard* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.Railyard
```

```
extends java.lang.Object
```

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 817: Constructors in Railyard

Constructors
<i>Railyard</i> ()

### Field Summary

Table 818: Fields in Railyard

Fields
public static final <i>SchemeColorProperty</i> <b>COLOR</b>

### Class Details

#### Constructor Details

```
Railyard ()
```

#### Field Details

```
public static final SchemeColorProperty COLOR
```

## RailyardInfo

The class *RailyardInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.RailyardInfo**

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 819: Constructors in RailyardInfo

Constructors
<i>RailyardInfo</i> ()

### Field Summary

Table 820: Fields in RailyardInfo

Fields
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_OUTLINE_WIDTH</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_SIZE</b>

### Class Details

#### Constructor Details

**RailyardInfo** ()

#### Field Details

public static final *SchemeColorProperty* **FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **FONTSTYLE\_OUTLINE\_WIDTH**

```
public static final SchemeFloatProperty FONTSTYLE_SIZE
```

## RemainingRangeEV

The class *RemainingRangeEV* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.RemainingRangeEV  
extends java.lang.Object
```

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 821: Constructors in RemainingRangeEV

Constructors
<i>RemainingRangeEV</i> ()

### Field Summary

Table 822: Fields in RemainingRangeEV

Fields
public static final <i>SchemeColorProperty</i> <b>GRADIENT_COLORINNER</b>
public static final <i>SchemeColorProperty</i> <b>GRADIENT_COLORROUTER</b>
public static final <i>SchemeColorProperty</i> <b>LINE_COLOR</b>
public static final <i>SchemeFloatProperty</i> <b>LINE_WIDTH</b>
public static final <i>SchemeColorProperty</i> <b>OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i> <b>OUTLINE_WIDTH</b>

### Class Details

#### Constructor Details

*RemainingRangeEV* ()

## Field Details

public static final *SchemeColorProperty* GRADIENT\_COLORINNER

public static final *SchemeColorProperty* GRADIENT\_COLORROUTER

public static final *SchemeColorProperty* LINE\_COLOR

public static final *SchemeFloatProperty* LINE\_WIDTH

public static final *SchemeColorProperty* OUTLINE\_COLOR

public static final *SchemeFloatProperty* OUTLINE\_WIDTH

## River

The class *River* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

## Class Summary

public static class **CustomizableVariables.River**

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

## Constructor Summary

Table 823: Constructors in River

Constructors
<i>River</i> ()

## Field Summary

Table 824: Fields in River

Fields
public static final <i>SchemeColorProperty</i> <b>COLOR</b>
public static final <i>SchemeColorProperty</i> <b>DISPLAYCLASS1_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>DISPLAYCLASS1_FONTSTYLE_COLOR</b>

## Fields

public static final *SchemeColorProperty* **DISPLAYCLASS1\_FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **DISPLAYCLASS1\_FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **DISPLAYCLASS1\_FONTSTYLE\_SIZE**

public static final *SchemeFloatProperty* **DISPLAYCLASS1\_WIDTH**

public static final *SchemeColorProperty* **DISPLAYCLASS2\_COLOR**

public static final *SchemeColorProperty* **DISPLAYCLASS2\_FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **DISPLAYCLASS2\_FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **DISPLAYCLASS2\_FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **DISPLAYCLASS2\_FONTSTYLE\_SIZE**

public static final *SchemeFloatProperty* **DISPLAYCLASS2\_WIDTH**

public static final *SchemeColorProperty* **DISPLAYCLASS3\_COLOR**

public static final *SchemeColorProperty* **DISPLAYCLASS3\_FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **DISPLAYCLASS3\_FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **DISPLAYCLASS3\_FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **DISPLAYCLASS3\_FONTSTYLE\_SIZE**

public static final *SchemeFloatProperty* **DISPLAYCLASS3\_WIDTH**

public static final *SchemeColorProperty* **DISPLAYCLASS4\_COLOR**

public static final *SchemeColorProperty* **DISPLAYCLASS4\_FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **DISPLAYCLASS4\_FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **DISPLAYCLASS4\_FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **DISPLAYCLASS4\_FONTSTYLE\_SIZE**

public static final *SchemeFloatProperty* **DISPLAYCLASS4\_WIDTH**

public static final *SchemeColorProperty* **DISPLAYCLASS5\_COLOR**

public static final *SchemeColorProperty* **DISPLAYCLASS5\_FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **DISPLAYCLASS5\_FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **DISPLAYCLASS5\_FONTSTYLE\_OUTLINE\_WIDTH**

public static final *SchemeFloatProperty* **DISPLAYCLASS5\_FONTSTYLE\_SIZE**

public static final *SchemeFloatProperty* **DISPLAYCLASS5\_WIDTH**

public static final *SchemeColorProperty* **DISPLAYCLASS6\_COLOR**

public static final *SchemeColorProperty* **DISPLAYCLASS6\_FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **DISPLAYCLASS6\_FONTSTYLE\_OUTLINE\_COLOR**

Fields	
<code>public static final <i>SchemeFloatProperty</i></code>	<code>DISPLAYCLASS6_FONTSTYLE_OUTLINE_WIDTH</code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code>DISPLAYCLASS6_FONTSTYLE_SIZE</code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code>DISPLAYCLASS6_WIDTH</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>DISPLAYCLASS7_COLOR</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>DISPLAYCLASS7_FONTSTYLE_COLOR</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>DISPLAYCLASS7_FONTSTYLE_OUTLINE_COLOR</code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code>DISPLAYCLASS7_FONTSTYLE_OUTLINE_WIDTH</code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code>DISPLAYCLASS7_FONTSTYLE_SIZE</code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code>DISPLAYCLASS7_WIDTH</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>DISPLAYCLASS8_COLOR</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>DISPLAYCLASS8_FONTSTYLE_COLOR</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>DISPLAYCLASS8_FONTSTYLE_OUTLINE_COLOR</code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code>DISPLAYCLASS8_FONTSTYLE_OUTLINE_WIDTH</code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code>DISPLAYCLASS8_FONTSTYLE_SIZE</code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code>DISPLAYCLASS8_WIDTH</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>FONTSTYLE_COLOR</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>FONTSTYLE_OUTLINE_COLOR</code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code>FONTSTYLE_OUTLINE_WIDTH</code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code>FONTSTYLE_SIZE</code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code>WIDTH</code>

## Class Details

### Constructor Details

River ()

### Field Details

`public static final SchemeColorProperty COLOR`

`public static final SchemeColorProperty DISPLAYCLASS1_COLOR`

```
public static final SchemeColorProperty DISPLAYCLASS1_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS1_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS1_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS1_FONTSTYLE_SIZE
```

```
public static final SchemeFloatProperty DISPLAYCLASS1_WIDTH
```

```
public static final SchemeColorProperty DISPLAYCLASS2_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS2_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS2_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS2_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS2_FONTSTYLE_SIZE
```

```
public static final SchemeFloatProperty DISPLAYCLASS2_WIDTH
```

```
public static final SchemeColorProperty DISPLAYCLASS3_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS3_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS3_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS3_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS3_FONTSTYLE_SIZE
```

```
public static final SchemeFloatProperty DISPLAYCLASS3_WIDTH
```

```
public static final SchemeColorProperty DISPLAYCLASS4_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS4_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS4_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS4_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS4_FONTSTYLE_SIZE
```

```
public static final SchemeFloatProperty DISPLAYCLASS4_WIDTH
```

```
public static final SchemeColorProperty DISPLAYCLASS5_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS5_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS5_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS5_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS5_FONTSTYLE_SIZE
```

```
public static final SchemeFloatProperty DISPLAYCLASS5_WIDTH
```

```
public static final SchemeColorProperty DISPLAYCLASS6_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS6_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS6_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS6_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS6_FONTSTYLE_SIZE
```

```
public static final SchemeFloatProperty DISPLAYCLASS6_WIDTH
```

```
public static final SchemeColorProperty DISPLAYCLASS7_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS7_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS7_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS7_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS7_FONTSTYLE_SIZE
```

```
public static final SchemeFloatProperty DISPLAYCLASS7_WIDTH
```

```
public static final SchemeColorProperty DISPLAYCLASS8_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS8_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty DISPLAYCLASS8_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty DISPLAYCLASS8_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty DISPLAYCLASS8_FONTSTYLE_SIZE
```

```
public static final SchemeFloatProperty DISPLAYCLASS8_WIDTH
```

```
public static final SchemeColorProperty FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty FONTSTYLE_SIZE
```

```
public static final SchemeFloatProperty WIDTH
```

## RoadSign

The class *RoadSign* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.RoadSign
```

```
extends java.lang.Object
```

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 825: Constructors in RoadSign

Constructors
<i>RoadSign</i> ()

### Field Summary

Table 826: Fields in RoadSign

Fields
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_OUTLINE_WIDTH</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_SIZE</b>

## Class Details

### Constructor Details

RoadSign ( )

### Field Details

public static final *SchemeColorProperty* FONTSTYLE\_COLOR

public static final *SchemeColorProperty* FONTSTYLE\_OUTLINE\_COLOR

public static final *SchemeFloatProperty* FONTSTYLE\_OUTLINE\_WIDTH

public static final *SchemeFloatProperty* FONTSTYLE\_SIZE

## RouteStyle

The class *RouteStyle* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.RouteStyle**

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 827: Constructors in RouteStyle

Constructors
<i>RouteStyle</i> ( )

### Field Summary

Table 828: Fields in RouteStyle

Fields
public static final <i>SchemeColorProperty</i> ROUTESTYLE_1_BILLBOARD_FONTSTYLE_COLOR
public static final <i>SchemeColorProperty</i> ROUTESTYLE_1_BILLBOARD_FONTSTYLE_OUTLINE_COLOR

### Fields

```
public static final SchemeFloatProperty ROUTESTYLE_1_BILLBOARD_FONTSTYLE_OUTLINE_WIDTH
public static final SchemeFloatProperty ROUTESTYLE_1_BILLBOARD_FONTSTYLE_SIZE
```

## Class Details

### Constructor Details

`RouteStyle ()`

### Field Details

```
public static final SchemeColorProperty ROUTESTYLE_1_BILLBOARD_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty
ROUTESTYLE_1_BILLBOARD_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty
ROUTESTYLE_1_BILLBOARD_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty ROUTESTYLE_1_BILLBOARD_FONTSTYLE_SIZE
```

## Runway

The class *Runway* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.Runway
extends java.lang.Object
```

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 829: Constructors in Runway

#### Constructors

```
Runway ()
```

## Field Summary

Table 830: Fields in Runway

Fields
<code>public static final <a href="#">SchemeColorProperty</a> COLOR</code>

## Class Details

### Constructor Details

Runway ( )

### Field Details

`public static final SchemeColorProperty COLOR`

## SSAO

The class SSAO is a member of `com.here.android.mpa.mapping.customization.CustomizableVariables`.

### Class Summary

`public static class CustomizableVariables.SSAO`

`extends java.lang.Object`

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 831: Constructors in SSAO

Constructors
<code>SSAO ( )</code>

## Field Summary

Table 832: Fields in SSAO

Fields
<code>public static final <a href="#">SchemeColorProperty</a> COLOR</code>

## Class Details

### Constructor Details

SSAO ()

### Field Details

public static final *SchemeColorProperty* COLOR

## Sea

The class *Sea* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.Sea**

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 833: Constructors in Sea

Constructors
<i>Sea</i> ()

### Field Summary

Table 834: Fields in Sea

Fields
public static final <i>SchemeColorProperty</i> FONTSTYLE_COLOR
public static final <i>SchemeColorProperty</i> FONTSTYLE_OUTLINE_COLOR
public static final <i>SchemeFloatProperty</i> FONTSTYLE_OUTLINE_WIDTH
public static final <i>SchemeFloatProperty</i> FONTSTYLE_SIZE

## Class Details

### Constructor Details

Sea ()

## Field Details

public static final [SchemeColorProperty](#) FONTSTYLE\_COLOR

public static final [SchemeColorProperty](#) FONTSTYLE\_OUTLINE\_COLOR

public static final [SchemeFloatProperty](#) FONTSTYLE\_OUTLINE\_WIDTH

public static final [SchemeFloatProperty](#) FONTSTYLE\_SIZE

## ShoppingComplex

The class *ShoppingComplex* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

## Class Summary

public static class **CustomizableVariables.ShoppingComplex**

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 835: Constructors in ShoppingComplex

Constructors
<a href="#">ShoppingComplex</a> ()

## Field Summary

Table 836: Fields in ShoppingComplex

Fields
public static final <a href="#">SchemeColorProperty</a> <b>COLOR</b>

## Class Details

### Constructor Details

**ShoppingComplex** ()

## Field Details

public static final *SchemeColorProperty* COLOR

## ShoppingComplexInfo

The class *ShoppingComplexInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

## Class Summary

public static class **CustomizableVariables.ShoppingComplexInfo**

extends *java.lang.Object*

[For complete information, see the section *Class Details*]

## Constructor Summary

Table 837: Constructors in ShoppingComplexInfo

Constructors
<i>ShoppingComplexInfo</i> ()

## Field Summary

Table 838: Fields in ShoppingComplexInfo

Fields
public static final <i>SchemeColorProperty</i> FONTSTYLE_COLOR
public static final <i>SchemeColorProperty</i> FONTSTYLE_OUTLINE_COLOR
public static final <i>SchemeFloatProperty</i> FONTSTYLE_OUTLINE_WIDTH
public static final <i>SchemeFloatProperty</i> FONTSTYLE_SIZE

## Class Details

### Constructor Details

*ShoppingComplexInfo* ()

## Field Details

```
public static final SchemeColorProperty FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty FONTSTYLE_SIZE
```

## Sky

The class *Sky* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

## Class Summary

```
public static class CustomizableVariables.Sky
```

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

## Constructor Summary

Table 839: Constructors in Sky

Constructors
<i>Sky</i> ()

## Field Summary

Table 840: Fields in Sky

Fields
public static final <i>SchemeColorProperty</i> <b>COLORBOTTOM</b>
public static final <i>SchemeColorProperty</i> <b>COLORINTERMEDIATE</b>
public static final <i>SchemeColorProperty</i> <b>COLORTOP</b>

## Class Details

### Constructor Details

*Sky* ()

## Field Details

```
public static final SchemeColorProperty COLORBOTTOM
```

```
public static final SchemeColorProperty COLORINTERMEDIATE
```

```
public static final SchemeColorProperty COLORTOP
```

## SportsComplex

The class *SportsComplex* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

## Class Summary

```
public static class CustomizableVariables.SportsComplex
```

```
extends java.lang.Object
```

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 841: Constructors in SportsComplex

Constructors
<i>SportsComplex</i> ()

## Field Summary

Table 842: Fields in SportsComplex

Fields
public static final <i>SchemeColorProperty</i> <b>COLOR</b>

## Class Details

### Constructor Details

```
SportsComplex ()
```

## Field Details

public static final *SchemeColorProperty* COLOR

## SportsComplexInfo

The class *SportsComplexInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

## Class Summary

public static class **CustomizableVariables.SportsComplexInfo**

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

## Constructor Summary

Table 843: Constructors in SportsComplexInfo

Constructors
<i>SportsComplexInfo</i> ()

## Field Summary

Table 844: Fields in SportsComplexInfo

Fields
public static final <i>SchemeColorProperty</i> FONTSTYLE_COLOR
public static final <i>SchemeColorProperty</i> FONTSTYLE_OUTLINE_COLOR
public static final <i>SchemeFloatProperty</i> FONTSTYLE_OUTLINE_WIDTH
public static final <i>SchemeFloatProperty</i> FONTSTYLE_SIZE

## Class Details

### Constructor Details

*SportsComplexInfo* ()

### Field Details

public static final *SchemeColorProperty* FONTSTYLE\_COLOR

```
public static final SchemeColorProperty FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty FONTSTYLE_SIZE
```

## StateAbbreviationLabel

The class *StateAbbreviationLabel* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.StateAbbreviationLabel
```

```
extends java.lang.Object
```

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 845: Constructors in StateAbbreviationLabel

Constructors
<i>StateAbbreviationLabel</i> ()

### Field Summary

Table 846: Fields in StateAbbreviationLabel

Fields
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_OUTLINE_WIDTH</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_SIZE</b>

### Class Details

#### Constructor Details

```
StateAbbreviationLabel ()
```

## Field Details

public static final [SchemeColorProperty](#) FONTSTYLE\_COLOR

public static final [SchemeColorProperty](#) FONTSTYLE\_OUTLINE\_COLOR

public static final [SchemeFloatProperty](#) FONTSTYLE\_OUTLINE\_WIDTH

public static final [SchemeFloatProperty](#) FONTSTYLE\_SIZE

## StateBoundary

The class *StateBoundary* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

## Class Summary

public static class **CustomizableVariables.StateBoundary**

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 847: Constructors in StateBoundary

Constructors
<a href="#">StateBoundary</a> ()

## Field Summary

Table 848: Fields in StateBoundary

Fields
public static final <a href="#">SchemeColorProperty</a> <b>BACKGROUND_COLOR</b>
public static final <a href="#">SchemeFloatProperty</a> <b>BACKGROUND_WIDTH</b>
public static final <a href="#">SchemeColorProperty</a> <b>COLOR</b>
public static final <a href="#">SchemeFloatProperty</a> <b>WIDTH</b>

## Class Details

### Constructor Details

`StateBoundary ()`

### Field Details

`public static final SchemeColorProperty BACKGROUNDCOLOR`

`public static final SchemeFloatProperty BACKGROUNDWIDTH`

`public static final SchemeColorProperty COLOR`

`public static final SchemeFloatProperty WIDTH`

## StateBoundaryDisputed

The class *StateBoundaryDisputed* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

`public static class CustomizableVariables.StateBoundaryDisputed`

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 849: Constructors in StateBoundaryDisputed

Constructors
<code>StateBoundaryDisputed ()</code>

### Field Summary

Table 850: Fields in StateBoundaryDisputed

Fields
<code>public static final <i>SchemeColorProperty</i> BACKGROUNDCOLOR</code>

## Fields

```
public static final SchemeFloatProperty BACKGROUNDWIDTH
```

```
public static final SchemeColorProperty COLOR
```

```
public static final SchemeFloatProperty WIDTH
```

## Class Details

### Constructor Details

**StateBoundaryDisputed ()**

### Field Details

```
public static final SchemeColorProperty BACKGROUNDCOLOR
```

```
public static final SchemeFloatProperty BACKGROUNDWIDTH
```

```
public static final SchemeColorProperty COLOR
```

```
public static final SchemeFloatProperty WIDTH
```

## StateLabel

The class *StateLabel* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.StateLabel
```

```
extends java.lang.Object
```

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 851: Constructors in StateLabel

## Constructors

```
StateLabel ()
```

## Field Summary

Table 852: Fields in StateLabel

Fields	
<code>public static final <i>SchemeColorProperty</i></code>	<code>FONTSTYLE_COLOR</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>FONTSTYLE_OUTLINE_COLOR</code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code>FONTSTYLE_OUTLINE_WIDTH</code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code>FONTSTYLE_SIZE</code>

## Class Details

### Constructor Details

StateLabel ()

### Field Details

`public static final SchemeColorProperty FONTSTYLE_COLOR`

`public static final SchemeColorProperty FONTSTYLE_OUTLINE_COLOR`

`public static final SchemeFloatProperty FONTSTYLE_OUTLINE_WIDTH`

`public static final SchemeFloatProperty FONTSTYLE_SIZE`

## Street

The class *Street* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

`public static class CustomizableVariables.Street`

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

## Constructor Summary

Table 853: Constructors in Street

Constructors
<a href="#">Street</a> ()

## Field Summary

Table 854: Fields in Street

Fields
public static final <i>SchemeColorProperty</i> <a href="#">CATEGORY0_CENTERLINE_COLOR</a>
public static final <i>SchemeColorProperty</i> <a href="#">CATEGORY0_CENTERLINE_TUNNELCOLOR</a>
public static final <i>SchemeFloatProperty</i> <a href="#">CATEGORY0_CENTERLINE_WIDTH</a>
public static final <i>SchemeColorProperty</i> <a href="#">CATEGORY0_COLOR</a>
public static final <i>SchemeColorProperty</i> <a href="#">CATEGORY0_FONTSTYLE_COLOR</a>
public static final <i>SchemeColorProperty</i> <a href="#">CATEGORY0_FONTSTYLE_OUTLINE_COLOR</a>
public static final <i>SchemeFloatProperty</i> <a href="#">CATEGORY0_FONTSTYLE_OUTLINE_WIDTH</a>
public static final <i>SchemeFloatProperty</i> <a href="#">CATEGORY0_FONTSTYLE_SIZE</a>
public static final <i>SchemeColorProperty</i> <a href="#">CATEGORY0_OUTLINECOLOR</a>
public static final <i>SchemeFloatProperty</i> <a href="#">CATEGORY0_OUTLINE_WIDTH</a>
public static final <i>SchemeColorProperty</i> <a href="#">CATEGORY0_STREETPOLYLINEATTRIBUTE_ARROW_COLOR</a>
public static final <i>SchemeColorProperty</i> <a href="#">CATEGORY0_STREETPOLYLINEATTRIBUTE_ARROW_TOLL_COLOR</a>
public static final <i>SchemeColorProperty</i> <a href="#">CATEGORY0_STREETPOLYLINEATTRIBUTE_ARROW_UNPAVED_COLOR</a>
public static final <i>SchemeColorProperty</i> <a href="#">CATEGORY0_STREETPOLYLINEATTRIBUTE_BRIDGE_COLOR</a>
public static final <i>SchemeColorProperty</i> <a href="#">CATEGORY0_STREETPOLYLINEATTRIBUTE_TOLL_CENTERLINE_COLOR</a>
public static final <i>SchemeColorProperty</i> <a href="#">CATEGORY0_STREETPOLYLINEATTRIBUTE_TOLL_COLOR</a>
public static final <i>SchemeColorProperty</i> <a href="#">CATEGORY0_STREETPOLYLINEATTRIBUTE_TOLL_OUTLINE_COLOR</a>
public static final <i>SchemeColorProperty</i> <a href="#">CATEGORY0_STREETPOLYLINEATTRIBUTE_TOLL_THIN_COLOR</a>
public static final <i>SchemeColorProperty</i> <a href="#">CATEGORY0_STREETPOLYLINEATTRIBUTE_TOLL_TUNNEL_COLOR</a>
public static final <i>SchemeColorProperty</i> <a href="#">CATEGORY0_STREETPOLYLINEATTRIBUTE_UNPAVED_COLOR</a>
public static final <i>SchemeColorProperty</i> <a href="#">CATEGORY0_STREETPOLYLINEATTRIBUTE_UNPAVED_OUTLINE_COLOR</a>
public static final <i>SchemeColorProperty</i> <a href="#">CATEGORY0_STREETPOLYLINEATTRIBUTE_UNPAVED_THIN_COLOR</a>
public static final <i>SchemeColorProperty</i> <a href="#">CATEGORY0_THINCOLOR</a>
public static final <i>SchemeColorProperty</i> <a href="#">CATEGORY0_TUNNELCOLOR</a>

Fields	
<code>public static final SchemeFloatProperty</code>	<code>CATEGORY0_WIDTH</code>
<code>public static final SchemeColorProperty</code>	<code>CATEGORY1_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>CATEGORY1_FONTSTYLE_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>CATEGORY1_FONTSTYLE_OUTLINE_COLOR</code>
<code>public static final SchemeFloatProperty</code>	<code>CATEGORY1_FONTSTYLE_OUTLINE_WIDTH</code>
<code>public static final SchemeFloatProperty</code>	<code>CATEGORY1_FONTSTYLE_SIZE</code>
<code>public static final SchemeColorProperty</code>	<code>CATEGORY1_OUTLINECOLOR</code>
<code>public static final SchemeFloatProperty</code>	<code>CATEGORY1_OUTLINE_WIDTH</code>
<code>public static final SchemeColorProperty</code>	<code>CATEGORY1_ROADSIGN_FONTSTYLE_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>CATEGORY1_ROADSIGN_FONTSTYLE_OUTLINE_COLOR</code>
<code>public static final SchemeFloatProperty</code>	<code>CATEGORY1_ROADSIGN_FONTSTYLE_OUTLINE_WIDTH</code>
<code>public static final SchemeFloatProperty</code>	<code>CATEGORY1_ROADSIGN_FONTSTYLE_SIZE</code>
<code>public static final SchemeColorProperty</code>	<code>CATEGORY1_STREETPOLYLINEATTRIBUTE_ARROW_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>CATEGORY1_STREETPOLYLINEATTRIBUTE_ARROW_TOLL_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>CATEGORY1_STREETPOLYLINEATTRIBUTE_ARROW_UNPAVED_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>CATEGORY1_STREETPOLYLINEATTRIBUTE_BRIDGE_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>CATEGORY1_STREETPOLYLINEATTRIBUTE_TOLL_CENTERLINE_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>CATEGORY1_STREETPOLYLINEATTRIBUTE_TOLL_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>CATEGORY1_STREETPOLYLINEATTRIBUTE_TOLL_OUTLINE_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>CATEGORY1_STREETPOLYLINEATTRIBUTE_TOLL_THIN_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>CATEGORY1_STREETPOLYLINEATTRIBUTE_TOLL_TUNNEL_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>CATEGORY1_STREETPOLYLINEATTRIBUTE_UNPAVED_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>CATEGORY1_STREETPOLYLINEATTRIBUTE_UNPAVED_OUTLINE_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>CATEGORY1_STREETPOLYLINEATTRIBUTE_UNPAVED_THIN_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>CATEGORY1_THINCOLOR</code>
<code>public static final SchemeColorProperty</code>	<code>CATEGORY1_TUNNELCOLOR</code>
<code>public static final SchemeFloatProperty</code>	<code>CATEGORY1_WIDTH</code>
<code>public static final SchemeColorProperty</code>	<code>CATEGORY2_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>CATEGORY2_FONTSTYLE_COLOR</code>
<code>public static final SchemeColorProperty</code>	<code>CATEGORY2_FONTSTYLE_OUTLINE_COLOR</code>
<code>public static final SchemeFloatProperty</code>	<code>CATEGORY2_FONTSTYLE_OUTLINE_WIDTH</code>

## Fields

<code>public static final <i>SchemeFloatProperty</i></code>	<code>CATEGORY2_FONTSTYLE_SIZE</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>CATEGORY2_OUTLINECOLOR</code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code>CATEGORY2_OUTLINE_WIDTH</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>CATEGORY2_ROADSIGN_FONTSTYLE_COLOR</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>CATEGORY2_ROADSIGN_FONTSTYLE_OUTLINE_COLOR</code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code>CATEGORY2_ROADSIGN_FONTSTYLE_OUTLINE_WIDTH</code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code>CATEGORY2_ROADSIGN_FONTSTYLE_SIZE</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>CATEGORY2_STREETPOLYLINEATTRIBUTE_ARROW_COLOR</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>CATEGORY2_STREETPOLYLINEATTRIBUTE_ARROW_TOLL_COLOR</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>CATEGORY2_STREETPOLYLINEATTRIBUTE_ARROW_UNPAVED_COLOR</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>CATEGORY2_STREETPOLYLINEATTRIBUTE_BRIDGE_COLOR</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>CATEGORY2_STREETPOLYLINEATTRIBUTE_TOLL_CENTERLINE_COLOR</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>CATEGORY2_STREETPOLYLINEATTRIBUTE_TOLL_COLOR</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>CATEGORY2_STREETPOLYLINEATTRIBUTE_TOLL_OUTLINE_COLOR</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>CATEGORY2_STREETPOLYLINEATTRIBUTE_TOLL_THIN_COLOR</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>CATEGORY2_STREETPOLYLINEATTRIBUTE_TOLL_TUNNEL_COLOR</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>CATEGORY2_STREETPOLYLINEATTRIBUTE_UNPAVED_COLOR</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>CATEGORY2_STREETPOLYLINEATTRIBUTE_UNPAVED_OUTLINE_COLOR</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>CATEGORY2_STREETPOLYLINEATTRIBUTE_UNPAVED_THIN_COLOR</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>CATEGORY2_THINCOLOR</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>CATEGORY2_TUNNELCOLOR</code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code>CATEGORY2_WIDTH</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>CATEGORY3_COLOR</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>CATEGORY3_FONTSTYLE_COLOR</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>CATEGORY3_FONTSTYLE_OUTLINE_COLOR</code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code>CATEGORY3_FONTSTYLE_OUTLINE_WIDTH</code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code>CATEGORY3_FONTSTYLE_SIZE</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>CATEGORY3_OUTLINECOLOR</code>
<code>public static final <i>SchemeFloatProperty</i></code>	<code>CATEGORY3_OUTLINE_WIDTH</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>CATEGORY3_ROADSIGN_FONTSTYLE_COLOR</code>
<code>public static final <i>SchemeColorProperty</i></code>	<code>CATEGORY3_ROADSIGN_FONTSTYLE_OUTLINE_COLOR</code>

Fields	
public static final <i>SchemeFloatProperty</i>	<code>CATEGORY3_ROADSIGN_FONTSTYLE_OUTLINE_WIDTH</code>
public static final <i>SchemeFloatProperty</i>	<code>CATEGORY3_ROADSIGN_FONTSTYLE_SIZE</code>
public static final <i>SchemeColorProperty</i>	<code>CATEGORY3_STREETPOLYLINEATTRIBUTE_ARROW_COLOR</code>
public static final <i>SchemeColorProperty</i>	<code>CATEGORY3_STREETPOLYLINEATTRIBUTE_ARROW_TOLL_COLOR</code>
public static final <i>SchemeColorProperty</i>	<code>CATEGORY3_STREETPOLYLINEATTRIBUTE_ARROW_UNPAVED_COLOR</code>
public static final <i>SchemeColorProperty</i>	<code>CATEGORY3_STREETPOLYLINEATTRIBUTE_BRIDGE_COLOR</code>
public static final <i>SchemeColorProperty</i>	<code>CATEGORY3_STREETPOLYLINEATTRIBUTE_TOLL_CENTERLINE_COLOR</code>
public static final <i>SchemeColorProperty</i>	<code>CATEGORY3_STREETPOLYLINEATTRIBUTE_TOLL_COLOR</code>
public static final <i>SchemeColorProperty</i>	<code>CATEGORY3_STREETPOLYLINEATTRIBUTE_TOLL_OUTLINE_COLOR</code>
public static final <i>SchemeColorProperty</i>	<code>CATEGORY3_STREETPOLYLINEATTRIBUTE_TOLL_THIN_COLOR</code>
public static final <i>SchemeColorProperty</i>	<code>CATEGORY3_STREETPOLYLINEATTRIBUTE_TOLL_TUNNEL_COLOR</code>
public static final <i>SchemeColorProperty</i>	<code>CATEGORY3_STREETPOLYLINEATTRIBUTE_UNPAVED_COLOR</code>
public static final <i>SchemeColorProperty</i>	<code>CATEGORY3_STREETPOLYLINEATTRIBUTE_UNPAVED_OUTLINE_COLOR</code>
public static final <i>SchemeColorProperty</i>	<code>CATEGORY3_STREETPOLYLINEATTRIBUTE_UNPAVED_THIN_COLOR</code>
public static final <i>SchemeColorProperty</i>	<code>CATEGORY3_THINCOLOR</code>
public static final <i>SchemeColorProperty</i>	<code>CATEGORY3_TUNNELCOLOR</code>
public static final <i>SchemeFloatProperty</i>	<code>CATEGORY3_WIDTH</code>
public static final <i>SchemeColorProperty</i>	<code>CATEGORY4_COLOR</code>
public static final <i>SchemeColorProperty</i>	<code>CATEGORY4_FONTSTYLE_COLOR</code>
public static final <i>SchemeColorProperty</i>	<code>CATEGORY4_FONTSTYLE_OUTLINE_COLOR</code>
public static final <i>SchemeFloatProperty</i>	<code>CATEGORY4_FONTSTYLE_OUTLINE_WIDTH</code>
public static final <i>SchemeFloatProperty</i>	<code>CATEGORY4_FONTSTYLE_SIZE</code>
public static final <i>SchemeColorProperty</i>	<code>CATEGORY4_OUTLINECOLOR</code>
public static final <i>SchemeFloatProperty</i>	<code>CATEGORY4_OUTLINE_WIDTH</code>
public static final <i>SchemeColorProperty</i>	<code>CATEGORY4_ROADSIGN_FONTSTYLE_COLOR</code>
public static final <i>SchemeColorProperty</i>	<code>CATEGORY4_ROADSIGN_FONTSTYLE_OUTLINE_COLOR</code>
public static final <i>SchemeFloatProperty</i>	<code>CATEGORY4_ROADSIGN_FONTSTYLE_OUTLINE_WIDTH</code>
public static final <i>SchemeFloatProperty</i>	<code>CATEGORY4_ROADSIGN_FONTSTYLE_SIZE</code>
public static final <i>SchemeColorProperty</i>	<code>CATEGORY4_STREETPOLYLINEATTRIBUTE_ARROW_COLOR</code>
public static final <i>SchemeColorProperty</i>	<code>CATEGORY4_STREETPOLYLINEATTRIBUTE_ARROW_TOLL_COLOR</code>
public static final <i>SchemeColorProperty</i>	<code>CATEGORY4_STREETPOLYLINEATTRIBUTE_ARROW_UNPAVED_COLOR</code>

## Fields

public static final <i>SchemeColorProperty</i>	<b>CATEGORY4_STREETPOLYLINEATTRIBUTE_BRIDGE_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>CATEGORY4_STREETPOLYLINEATTRIBUTE_TOLL_CENTERLINE_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>CATEGORY4_STREETPOLYLINEATTRIBUTE_TOLL_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>CATEGORY4_STREETPOLYLINEATTRIBUTE_TOLL_OUTLINE_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>CATEGORY4_STREETPOLYLINEATTRIBUTE_TOLL_THIN_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>CATEGORY4_STREETPOLYLINEATTRIBUTE_TOLL_TUNNEL_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>CATEGORY4_STREETPOLYLINEATTRIBUTE_UNPAVED_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>CATEGORY4_STREETPOLYLINEATTRIBUTE_UNPAVED_OUTLINE_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>CATEGORY4_STREETPOLYLINEATTRIBUTE_UNPAVED_THIN_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>CATEGORY4_THINCOLOR</b>
public static final <i>SchemeColorProperty</i>	<b>CATEGORY4_TUNNELCOLOR</b>
public static final <i>SchemeFloatProperty</i>	<b>CATEGORY4_WIDTH</b>
public static final <i>SchemeColorProperty</i>	<b>PEDESTRIAN_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>PEDESTRIAN_FONTSTYLE_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>PEDESTRIAN_FONTSTYLE_OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i>	<b>PEDESTRIAN_FONTSTYLE_OUTLINE_WIDTH</b>
public static final <i>SchemeFloatProperty</i>	<b>PEDESTRIAN_FONTSTYLE_SIZE</b>
public static final <i>SchemeColorProperty</i>	<b>PEDESTRIAN_OUTLINECOLOR</b>
public static final <i>SchemeFloatProperty</i>	<b>PEDESTRIAN_OUTLINE_WIDTH</b>
public static final <i>SchemeColorProperty</i>	<b>PEDESTRIAN_STREETPOLYLINEATTRIBUTE_ARROW_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>PEDESTRIAN_STREETPOLYLINEATTRIBUTE_ARROW_TOLL_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>PEDESTRIAN_STREETPOLYLINEATTRIBUTE_ARROW_UNPAVED_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>PEDESTRIAN_STREETPOLYLINEATTRIBUTE_BRIDGE_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>PEDESTRIAN_STREETPOLYLINEATTRIBUTE_TOLL_CENTERLINE_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>PEDESTRIAN_STREETPOLYLINEATTRIBUTE_TOLL_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>PEDESTRIAN_STREETPOLYLINEATTRIBUTE_TOLL_OUTLINE_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>PEDESTRIAN_STREETPOLYLINEATTRIBUTE_TOLL_THIN_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>PEDESTRIAN_STREETPOLYLINEATTRIBUTE_TOLL_TUNNEL_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>PEDESTRIAN_STREETPOLYLINEATTRIBUTE_UNPAVED_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>PEDESTRIAN_STREETPOLYLINEATTRIBUTE_UNPAVED_OUTLINE_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>PEDESTRIAN_STREETPOLYLINEATTRIBUTE_UNPAVED_THIN_COLOR</b>

Fields	
public static final <i>SchemeColorProperty</i>	<b>PEDESTRIAN_THINCOLOR</b>
public static final <i>SchemeColorProperty</i>	<b>PEDESTRIAN_TUNNELCOLOR</b>
public static final <i>SchemeFloatProperty</i>	<b>PEDESTRIAN_WIDTH</b>
public static final <i>SchemeColorProperty</i>	<b>WALKWAY_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>WALKWAY_FONTSTYLE_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>WALKWAY_FONTSTYLE_OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i>	<b>WALKWAY_FONTSTYLE_OUTLINE_WIDTH</b>
public static final <i>SchemeFloatProperty</i>	<b>WALKWAY_FONTSTYLE_SIZE</b>
public static final <i>SchemeColorProperty</i>	<b>WALKWAY_OUTLINECOLOR</b>
public static final <i>SchemeFloatProperty</i>	<b>WALKWAY_OUTLINE_WIDTH</b>
public static final <i>SchemeColorProperty</i>	<b>WALKWAY_STREETPOLYLINEATTRIBUTE_ARROW_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>WALKWAY_STREETPOLYLINEATTRIBUTE_ARROW_TOLL_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>WALKWAY_STREETPOLYLINEATTRIBUTE_ARROW_UNPAVED_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>WALKWAY_STREETPOLYLINEATTRIBUTE_BRIDGE_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>WALKWAY_STREETPOLYLINEATTRIBUTE_TOLL_CENTERLINE_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>WALKWAY_STREETPOLYLINEATTRIBUTE_TOLL_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>WALKWAY_STREETPOLYLINEATTRIBUTE_TOLL_OUTLINE_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>WALKWAY_STREETPOLYLINEATTRIBUTE_TOLL_THIN_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>WALKWAY_STREETPOLYLINEATTRIBUTE_TOLL_TUNNEL_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>WALKWAY_STREETPOLYLINEATTRIBUTE_UNPAVED_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>WALKWAY_STREETPOLYLINEATTRIBUTE_UNPAVED_OUTLINE_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>WALKWAY_STREETPOLYLINEATTRIBUTE_UNPAVED_THIN_COLOR</b>
public static final <i>SchemeColorProperty</i>	<b>WALKWAY_THINCOLOR</b>
public static final <i>SchemeColorProperty</i>	<b>WALKWAY_TUNNELCOLOR</b>
public static final <i>SchemeFloatProperty</i>	<b>WALKWAY_WIDTH</b>

## Class Details

### Constructor Details

Street ()

## Field Details

```
public static final SchemeColorProperty CATEGORY0_CENTERLINE_COLOR
```

```
public static final SchemeColorProperty CATEGORY0_CENTERLINE_TUNNELCOLOR
```

```
public static final SchemeFloatProperty CATEGORY0_CENTERLINE_WIDTH
```

```
public static final SchemeColorProperty CATEGORY0_COLOR
```

```
public static final SchemeColorProperty CATEGORY0_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty CATEGORY0_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty CATEGORY0_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty CATEGORY0_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty CATEGORY0_OUTLINECOLOR
```

```
public static final SchemeFloatProperty CATEGORY0_OUTLINE_WIDTH
```

```
public static final SchemeColorProperty  
CATEGORY0_STREETPOLYLINEATTRIBUTE_ARROW_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY0_STREETPOLYLINEATTRIBUTE_ARROW_TOLL_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY0_STREETPOLYLINEATTRIBUTE_ARROW_UNPAVED_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY0_STREETPOLYLINEATTRIBUTE_BRIDGE_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY0_STREETPOLYLINEATTRIBUTE_TOLL_CENTERLINE_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY0_STREETPOLYLINEATTRIBUTE_TOLL_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY0_STREETPOLYLINEATTRIBUTE_TOLL_OUTLINE_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY0_STREETPOLYLINEATTRIBUTE_TOLL_THIN_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY0_STREETPOLYLINEATTRIBUTE_TOLL_TUNNEL_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY0_STREETPOLYLINEATTRIBUTE_UNPAVED_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY0_STREETPOLYLINEATTRIBUTE_UNPAVED_OUTLINE_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY0_STREETPOLYLINEATTRIBUTE_UNPAVED_THIN_COLOR
```

```
public static final SchemeColorProperty CATEGORY0_THINCOLOR
```

```
public static final SchemeColorProperty CATEGORY0_TUNNELCOLOR
```

```
public static final SchemeFloatProperty CATEGORY0_WIDTH
```

```
public static final SchemeColorProperty CATEGORY1_COLOR
```

```
public static final SchemeColorProperty CATEGORY1_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty CATEGORY1_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty CATEGORY1_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty CATEGORY1_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty CATEGORY1_OUTLINECOLOR
```

```
public static final SchemeFloatProperty CATEGORY1_OUTLINE_WIDTH
```

```
public static final SchemeColorProperty CATEGORY1_ROADSIGN_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY1_ROADSIGN_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty  
CATEGORY1_ROADSIGN_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty CATEGORY1_ROADSIGN_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty  
CATEGORY1_STREETPOLYLINEATTRIBUTE_ARROW_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY1_STREETPOLYLINEATTRIBUTE_ARROW_TOLL_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY1_STREETPOLYLINEATTRIBUTE_ARROW_UNPAVED_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY1_STREETPOLYLINEATTRIBUTE_BRIDGE_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY1_STREETPOLYLINEATTRIBUTE_TOLL_CENTERLINE_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY1_STREETPOLYLINEATTRIBUTE_TOLL_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY1_STREETPOLYLINEATTRIBUTE_TOLL_OUTLINE_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY1_STREETPOLYLINEATTRIBUTE_TOLL_THIN_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY1_STREETPOLYLINEATTRIBUTE_TOLL_TUNNEL_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY1_STREETPOLYLINEATTRIBUTE_UNPAVED_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY1_STREETPOLYLINEATTRIBUTE_UNPAVED_OUTLINE_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY1_STREETPOLYLINEATTRIBUTE_UNPAVED_THIN_COLOR
```

```
public static final SchemeColorProperty CATEGORY1_THINCOLOR
```

```
public static final SchemeColorProperty CATEGORY1_TUNNELCOLOR
```

```
public static final SchemeFloatProperty CATEGORY1_WIDTH
```

```
public static final SchemeColorProperty CATEGORY2_COLOR
```

```
public static final SchemeColorProperty CATEGORY2_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty CATEGORY2_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty CATEGORY2_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty CATEGORY2_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty CATEGORY2_OUTLINECOLOR
```

```
public static final SchemeFloatProperty CATEGORY2_OUTLINE_WIDTH
```

```
public static final SchemeColorProperty CATEGORY2_ROADSIGN_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY2_ROADSIGN_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty  
CATEGORY2_ROADSIGN_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty CATEGORY2_ROADSIGN_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty  
CATEGORY2_STREETPOLYLINEATTRIBUTE_ARROW_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY2_STREETPOLYLINEATTRIBUTE_ARROW_TOLL_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY2_STREETPOLYLINEATTRIBUTE_ARROW_UNPAVED_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY2_STREETPOLYLINEATTRIBUTE_BRIDGE_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY2_STREETPOLYLINEATTRIBUTE_TOLL_CENTERLINE_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY2_STREETPOLYLINEATTRIBUTE_TOLL_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY2_STREETPOLYLINEATTRIBUTE_TOLL_OUTLINE_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY2_STREETPOLYLINEATTRIBUTE_TOLL_THIN_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY2_STREETPOLYLINEATTRIBUTE_TOLL_TUNNEL_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY2_STREETPOLYLINEATTRIBUTE_UNPAVED_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY2_STREETPOLYLINEATTRIBUTE_UNPAVED_OUTLINE_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY2_STREETPOLYLINEATTRIBUTE_UNPAVED_THIN_COLOR
```

```
public static final SchemeColorProperty CATEGORY2_THINCOLOR
```

```
public static final SchemeColorProperty CATEGORY2_TUNNELCOLOR
```

```
public static final SchemeFloatProperty CATEGORY2_WIDTH
```

```
public static final SchemeColorProperty CATEGORY3_COLOR
```

```
public static final SchemeColorProperty CATEGORY3_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty CATEGORY3_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty CATEGORY3_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty CATEGORY3_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty CATEGORY3_OUTLINECOLOR
```

```
public static final SchemeFloatProperty CATEGORY3_OUTLINE_WIDTH
```

```
public static final SchemeColorProperty CATEGORY3_ROADSIGN_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY3_ROADSIGN_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty  
CATEGORY3_ROADSIGN_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty CATEGORY3_ROADSIGN_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty  
CATEGORY3_STREETPOLYLINEATTRIBUTE_ARROW_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY3_STREETPOLYLINEATTRIBUTE_ARROW_TOLL_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY3_STREETPOLYLINEATTRIBUTE_ARROW_UNPAVED_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY3_STREETPOLYLINEATTRIBUTE_BRIDGE_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY3_STREETPOLYLINEATTRIBUTE_TOLL_CENTERLINE_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY3_STREETPOLYLINEATTRIBUTE_TOLL_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY3_STREETPOLYLINEATTRIBUTE_TOLL_OUTLINE_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY3_STREETPOLYLINEATTRIBUTE_TOLL_THIN_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY3_STREETPOLYLINEATTRIBUTE_TOLL_TUNNEL_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY3_STREETPOLYLINEATTRIBUTE_UNPAVED_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY3_STREETPOLYLINEATTRIBUTE_UNPAVED_OUTLINE_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY3_STREETPOLYLINEATTRIBUTE_UNPAVED_THIN_COLOR
```

```
public static final SchemeColorProperty CATEGORY3_THINCOLOR
```

```
public static final SchemeColorProperty CATEGORY3_TUNNELCOLOR
```

```
public static final SchemeFloatProperty CATEGORY3_WIDTH
```

```
public static final SchemeColorProperty CATEGORY4_COLOR
```

```
public static final SchemeColorProperty CATEGORY4_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty CATEGORY4_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty CATEGORY4_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty CATEGORY4_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty CATEGORY4_OUTLINECOLOR
```

```
public static final SchemeFloatProperty CATEGORY4_OUTLINE_WIDTH
```

```
public static final SchemeColorProperty CATEGORY4_ROADSIGN_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY4_ROADSIGN_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty  
CATEGORY4_ROADSIGN_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty CATEGORY4_ROADSIGN_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty  
CATEGORY4_STREETPOLYLINEATTRIBUTE_ARROW_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY4_STREETPOLYLINEATTRIBUTE_ARROW_TOLL_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY4_STREETPOLYLINEATTRIBUTE_ARROW_UNPAVED_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY4_STREETPOLYLINEATTRIBUTE_BRIDGE_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY4_STREETPOLYLINEATTRIBUTE_TOLL_CENTERLINE_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY4_STREETPOLYLINEATTRIBUTE_TOLL_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY4_STREETPOLYLINEATTRIBUTE_TOLL_OUTLINE_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY4_STREETPOLYLINEATTRIBUTE_TOLL_THIN_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY4_STREETPOLYLINEATTRIBUTE_TOLL_TUNNEL_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY4_STREETPOLYLINEATTRIBUTE_UNPAVED_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY4_STREETPOLYLINEATTRIBUTE_UNPAVED_OUTLINE_COLOR
```

```
public static final SchemeColorProperty  
CATEGORY4_STREETPOLYLINEATTRIBUTE_UNPAVED_THIN_COLOR
```

```
public static final SchemeColorProperty CATEGORY4_THINCOLOR
```

```
public static final SchemeColorProperty CATEGORY4_TUNNELCOLOR
```

```
public static final SchemeFloatProperty CATEGORY4_WIDTH
```

```
public static final SchemeColorProperty PEDESTRIAN_COLOR
```

```
public static final SchemeColorProperty PEDESTRIAN_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty PEDESTRIAN_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty PEDESTRIAN_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty PEDESTRIAN_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty PEDESTRIAN_OUTLINECOLOR
```

```
public static final SchemeFloatProperty PEDESTRIAN_OUTLINE_WIDTH
```

```
public static final SchemeColorProperty  
PEDESTRIAN_STREETPOLYLINEATTRIBUTE_ARROW_COLOR
```

```
public static final SchemeColorProperty  
PEDESTRIAN_STREETPOLYLINEATTRIBUTE_ARROW_TOLL_COLOR
```

```
public static final SchemeColorProperty  
PEDESTRIAN_STREETPOLYLINEATTRIBUTE_ARROW_UNPAVED_COLOR
```

```
public static final SchemeColorProperty  
PEDESTRIAN_STREETPOLYLINEATTRIBUTE_BRIDGE_COLOR
```

```
public static final SchemeColorProperty  
PEDESTRIAN_STREETPOLYLINEATTRIBUTE_TOLL_CENTERLINE_COLOR
```

```
public static final SchemeColorProperty  
PEDESTRIAN_STREETPOLYLINEATTRIBUTE_TOLL_COLOR
```

```
public static final SchemeColorProperty  
PEDESTRIAN_STREETPOLYLINEATTRIBUTE_TOLL_OUTLINE_COLOR
```

```
public static final SchemeColorProperty  
PEDESTRIAN_STREETPOLYLINEATTRIBUTE_TOLL_THIN_COLOR
```

```
public static final SchemeColorProperty  
PEDESTRIAN_STREETPOLYLINEATTRIBUTE_TOLL_TUNNEL_COLOR
```

```
public static final SchemeColorProperty  
PEDESTRIAN_STREETPOLYLINEATTRIBUTE_UNPAVED_COLOR
```

```
public static final SchemeColorProperty  
PEDESTRIAN_STREETPOLYLINEATTRIBUTE_UNPAVED_OUTLINE_COLOR
```

```
public static final SchemeColorProperty  
PEDESTRIAN_STREETPOLYLINEATTRIBUTE_UNPAVED_THIN_COLOR
```

```
public static final SchemeColorProperty PEDESTRIAN_THINCOLOR
```

```
public static final SchemeColorProperty PEDESTRIAN_TUNNELCOLOR
```

```
public static final SchemeFloatProperty PEDESTRIAN_WIDTH
```

```
public static final SchemeColorProperty WALKWAY_COLOR
```

```
public static final SchemeColorProperty WALKWAY_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty WALKWAY_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty WALKWAY_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty WALKWAY_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty WALKWAY_OUTLINECOLOR
```

```
public static final SchemeFloatProperty WALKWAY_OUTLINE_WIDTH
```

```
public static final SchemeColorProperty  
WALKWAY_STREETPOLYLINEATTRIBUTE_ARROW_COLOR
```

```
public static final SchemeColorProperty  
WALKWAY_STREETPOLYLINEATTRIBUTE_ARROW_TOLL_COLOR
```

```
public static final SchemeColorProperty  
WALKWAY_STREETPOLYLINEATTRIBUTE_ARROW_UNPAVED_COLOR
```

```
public static final SchemeColorProperty  
WALKWAY_STREETPOLYLINEATTRIBUTE_BRIDGE_COLOR
```

```
public static final SchemeColorProperty  
WALKWAY_STREETPOLYLINEATTRIBUTE_TOLL_CENTERLINE_COLOR
```

```
public static final SchemeColorProperty  
WALKWAY_STREETPOLYLINEATTRIBUTE_TOLL_COLOR
```

```
public static final SchemeColorProperty  
WALKWAY_STREETPOLYLINEATTRIBUTE_TOLL_OUTLINE_COLOR
```

```
public static final SchemeColorProperty  
WALKWAY_STREETPOLYLINEATTRIBUTE_TOLL_THIN_COLOR
```

```
public static final SchemeColorProperty  
WALKWAY_STREETPOLYLINEATTRIBUTE_TOLL_TUNNEL_COLOR
```

```
public static final SchemeColorProperty  
WALKWAY_STREETPOLYLINEATTRIBUTE_UNPAVED_COLOR
```

```
public static final SchemeColorProperty
WALKWAY_STREETPOLYLINEATTRIBUTE_UNPAVED_OUTLINE_COLOR
```

```
public static final SchemeColorProperty
WALKWAY_STREETPOLYLINEATTRIBUTE_UNPAVED_THIN_COLOR
```

```
public static final SchemeColorProperty WALKWAY_THINCOLOR
```

```
public static final SchemeColorProperty WALKWAY_TUNNELCOLOR
```

```
public static final SchemeFloatProperty WALKWAY_WIDTH
```

## Transit

The class *Transit* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.Transit
```

```
extends java.lang.Object
```

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 855: Constructors in Transit

Constructors
<a href="#">Transit</a> ()

### Field Summary

Table 856: Fields in Transit

Fields
public static final <a href="#">SchemeColorProperty</a> <a href="#">AERIAL_DEFAULTCOLOR</a>
public static final <a href="#">SchemeIntegerProperty</a> <a href="#">AERIAL_WIDTH</a>
public static final <a href="#">SchemeColorProperty</a> <a href="#">BACKGROUNDCOLOR</a>
public static final <a href="#">SchemeColorProperty</a> <a href="#">BLENDCOLOR</a>
public static final <a href="#">SchemeColorProperty</a> <a href="#">BUS_EXPRESS_DEFAULTCOLOR</a>

## Fields

```

public static final SchemeIntegerProperty BUS_EXPRESS_WIDTH
public static final SchemeColorProperty BUS_INTERCITY_DEFAULTCOLOR
public static final SchemeIntegerProperty BUS_INTERCITY_WIDTH
public static final SchemeColorProperty BUS_PUBLIC_DEFAULTCOLOR
public static final SchemeIntegerProperty BUS_PUBLIC_WIDTH
public static final SchemeColorProperty BUS_TOURISTIC_DEFAULTCOLOR
public static final SchemeIntegerProperty BUS_TOURISTIC_WIDTH
public static final SchemeColorProperty HIGHLIGHTEDBACKGROUNDCOLOR
public static final SchemeColorProperty HIGHLIGHTEDFONTOUTLINECOLOR
public static final SchemeColorProperty INCLINED_DEFAULTCOLOR
public static final SchemeIntegerProperty INCLINED_WIDTH
public static final SchemeColorProperty MONORAIL_DEFAULTCOLOR
public static final SchemeIntegerProperty MONORAIL_WIDTH
public static final SchemeIntegerProperty OUTLINEWIDTH
public static final SchemeColorProperty RAIL_CITYMETRO_DEFAULTCOLOR
public static final SchemeIntegerProperty RAIL_CITYMETRO_WIDTH
public static final SchemeColorProperty RAIL_LIGHT_DEFAULTCOLOR
public static final SchemeIntegerProperty RAIL_LIGHT_WIDTH
public static final SchemeColorProperty RAIL_REGIONAL_DEFAULTCOLOR
public static final SchemeIntegerProperty RAIL_REGIONAL_WIDTH
public static final SchemeColorProperty STOP_FONTSTYLE_COLOR
public static final SchemeColorProperty STOP_FONTSTYLE_OUTLINE_COLOR
public static final SchemeFloatProperty STOP_FONTSTYLE_OUTLINE_WIDTH
public static final SchemeFloatProperty STOP_FONTSTYLE_SIZE
public static final SchemeColorProperty TRAIN_HIGHSPEED_DEFAULTCOLOR
public static final SchemeIntegerProperty TRAIN_HIGHSPEED_WIDTH
public static final SchemeColorProperty TRAIN_INTERCITY_DEFAULTCOLOR
public static final SchemeIntegerProperty TRAIN_INTERCITY_WIDTH
public static final SchemeColorProperty TRAIN_REGIONAL_DEFAULTCOLOR
public static final SchemeIntegerProperty TRAIN_REGIONAL_WIDTH
public static final SchemeColorProperty WATER_BACKGROUNDCOLOR

```

## Fields

```
public static final SchemeColorProperty WATER_DEFAULTCOLOR
```

```
public static final SchemeColorProperty WATER_HIGHLIGHTEDBACKGROUNDCOLOR
```

```
public static final SchemeColorProperty WATER_HIGHLIGHTEDFONTOUTLINECOLOR
```

```
public static final SchemeIntegerProperty WATER_WIDTH
```

---

## Class Details

### Constructor Details

Transit ()

### Field Details

```
public static final SchemeColorProperty AERIAL_DEFAULTCOLOR
```

```
public static final SchemeIntegerProperty AERIAL_WIDTH
```

```
public static final SchemeColorProperty BACKGROUNDCOLOR
```

```
public static final SchemeColorProperty BLENDCOLOR
```

```
public static final SchemeColorProperty BUS_EXPRESS_DEFAULTCOLOR
```

```
public static final SchemeIntegerProperty BUS_EXPRESS_WIDTH
```

```
public static final SchemeColorProperty BUS_INTERCITY_DEFAULTCOLOR
```

```
public static final SchemeIntegerProperty BUS_INTERCITY_WIDTH
```

```
public static final SchemeColorProperty BUS_PUBLIC_DEFAULTCOLOR
```

```
public static final SchemeIntegerProperty BUS_PUBLIC_WIDTH
```

```
public static final SchemeColorProperty BUS_TOURISTIC_DEFAULTCOLOR
```

```
public static final SchemeIntegerProperty BUS_TOURISTIC_WIDTH
```

```
public static final SchemeColorProperty HIGHLIGHTEDBACKGROUNDCOLOR
```

```
public static final SchemeColorProperty HIGHLIGHTEDFONTOUTLINECOLOR
```

```
public static final SchemeColorProperty INCLINED_DEFAULTCOLOR
```

```
public static final SchemeIntegerProperty INCLINED_WIDTH
```

```
public static final SchemeColorProperty MONORAIL_DEFAULTCOLOR
```

```
public static final SchemeIntegerProperty MONORAIL_WIDTH
```

```
public static final SchemeIntegerProperty OUTLINEWIDTH
```

```
public static final SchemeColorProperty RAIL_CITYMETRO_DEFAULTCOLOR
```

```
public static final SchemeIntegerProperty RAIL_CITYMETRO_WIDTH
```

```
public static final SchemeColorProperty RAIL_LIGHT_DEFAULTCOLOR
```

```
public static final SchemeIntegerProperty RAIL_LIGHT_WIDTH
```

```
public static final SchemeColorProperty RAIL_REGIONAL_DEFAULTCOLOR
```

```
public static final SchemeIntegerProperty RAIL_REGIONAL_WIDTH
```

```
public static final SchemeColorProperty STOP_FONTSTYLE_COLOR
```

```
public static final SchemeColorProperty STOP_FONTSTYLE_OUTLINE_COLOR
```

```
public static final SchemeFloatProperty STOP_FONTSTYLE_OUTLINE_WIDTH
```

```
public static final SchemeFloatProperty STOP_FONTSTYLE_SIZE
```

```
public static final SchemeColorProperty TRAIN_HIGHSPEED_DEFAULTCOLOR
```

```
public static final SchemeIntegerProperty TRAIN_HIGHSPEED_WIDTH
```

```
public static final SchemeColorProperty TRAIN_INTERCITY_DEFAULTCOLOR
```

```
public static final SchemeIntegerProperty TRAIN_INTERCITY_WIDTH
```

```
public static final SchemeColorProperty TRAIN_REGIONAL_DEFAULTCOLOR
```

```
public static final SchemeIntegerProperty TRAIN_REGIONAL_WIDTH
```

```
public static final SchemeColorProperty WATER_BACKGROUND_COLOR
```

```
public static final SchemeColorProperty WATER_DEFAULTCOLOR
```

```
public static final SchemeColorProperty WATER_HIGHLIGHTEDBACKGROUND_COLOR
```

```
public static final SchemeColorProperty WATER_HIGHLIGHTEDFONTOUTLINE_COLOR
```

```
public static final SchemeIntegerProperty WATER_WIDTH
```

## TransitAccess

The class *TransitAccess* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

## Class Summary

public static class **CustomizableVariables.TransitAccess**

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 857: Constructors in TransitAccess

Constructors
<a href="#">TransitAccess</a> ()

## Field Summary

Table 858: Fields in TransitAccess

Fields
public static final <i>SchemeIntegerProperty</i> <b>AIRLINE_ICONSIZ</b> E
public static final <i>SchemeIntegerProperty</i> <b>ICONSIZ</b> E

## Class Details

### Constructor Details

**TransitAccess** ()

### Field Details

public static final *SchemeIntegerProperty* **AIRLINE\_ICONSIZ**E

public static final *SchemeIntegerProperty* **ICONSIZ**E

## TruckIcon

The class *TruckIcon* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

## Class Summary

public static class **CustomizableVariables.TruckIcon**

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 859: Constructors in TruckIcon

Constructors
<a href="#">TruckIcon</a> ()

## Field Summary

Table 860: Fields in TruckIcon

Fields
<code>public static final <a href="#">SchemeColorProperty</a> <a href="#">FONTSTYLE_COLOR</a></code>
<code>public static final <a href="#">SchemeColorProperty</a> <a href="#">FONTSTYLE_OUTLINE_COLOR</a></code>
<code>public static final <a href="#">SchemeFloatProperty</a> <a href="#">FONTSTYLE_OUTLINE_WIDTH</a></code>
<code>public static final <a href="#">SchemeFloatProperty</a> <a href="#">FONTSTYLE_SIZE</a></code>

## Class Details

### Constructor Details

[TruckIcon](#) ()

### Field Details

`public static final SchemeColorProperty FONTSTYLE\_COLOR`

`public static final SchemeColorProperty FONTSTYLE\_OUTLINE\_COLOR`

`public static final SchemeFloatProperty FONTSTYLE\_OUTLINE\_WIDTH`

`public static final SchemeFloatProperty FONTSTYLE\_SIZE`

## TruckLine

The class *TruckLine* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

`public static class CustomizableVariables.TruckLine`

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 861: Constructors in TruckLine

Constructors
<code>TruckLine ()</code>

## Field Summary

Table 862: Fields in TruckLine

Fields
<code>public static final SchemeIntegerProperty CATEGORY0_WIDTH</code>
<code>public static final SchemeIntegerProperty CATEGORY1_WIDTH</code>
<code>public static final SchemeIntegerProperty CATEGORY2_WIDTH</code>
<code>public static final SchemeIntegerProperty CATEGORY3_WIDTH</code>
<code>public static final SchemeIntegerProperty CATEGORY4_WIDTH</code>
<code>public static final SchemeColorProperty COLOR</code>

## Class Details

### Constructor Details

`TruckLine ()`

### Field Details

`public static final SchemeIntegerProperty CATEGORY0_WIDTH`

`public static final SchemeIntegerProperty CATEGORY1_WIDTH`

`public static final SchemeIntegerProperty CATEGORY2_WIDTH`

`public static final SchemeIntegerProperty CATEGORY3_WIDTH`

```
public static final SchemeIntegerProperty CATEGORY4_WIDTH
```

```
public static final SchemeColorProperty COLOR
```

## UniversityCampus

The class *UniversityCampus* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.UniversityCampus
```

```
extends java.lang.Object
```

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 863: Constructors in *UniversityCampus*

Constructors
<i>UniversityCampus</i> ()

### Field Summary

Table 864: Fields in *UniversityCampus*

Fields
public static final <i>SchemeColorProperty</i> <b>COLOR</b>

### Class Details

#### Constructor Details

```
UniversityCampus ()
```

#### Field Details

```
public static final SchemeColorProperty COLOR
```

## UniversityCampusInfo

The class *UniversityCampusInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.UniversityCampusInfo**

extends *java.lang.Object*

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 865: Constructors in UniversityCampusInfo

Constructors
<i>UniversityCampusInfo</i> ()

### Field Summary

Table 866: Fields in UniversityCampusInfo

Fields
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_COLOR</b>
public static final <i>SchemeColorProperty</i> <b>FONTSTYLE_OUTLINE_COLOR</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_OUTLINE_WIDTH</b>
public static final <i>SchemeFloatProperty</i> <b>FONTSTYLE_SIZE</b>

### Class Details

#### Constructor Details

*UniversityCampusInfo* ()

#### Field Details

public static final *SchemeColorProperty* **FONTSTYLE\_COLOR**

public static final *SchemeColorProperty* **FONTSTYLE\_OUTLINE\_COLOR**

public static final *SchemeFloatProperty* **FONTSTYLE\_OUTLINE\_WIDTH**

```
public static final SchemeFloatProperty FONTSTYLE_SIZE
```

## Water

The class *Water* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

```
public static class CustomizableVariables.Water
```

*extends java.lang.Object*

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 867: Constructors in Water

Constructors
<i>Water</i> ()

### Field Summary

Table 868: Fields in Water

Fields
public static final <i>SchemeColorProperty</i> <b>COLOR_0M</b>
public static final <i>SchemeColorProperty</i> <b>COLOR_3000M</b>

### Class Details

#### Constructor Details

**Water** ()

#### Field Details

```
public static final SchemeColorProperty COLOR_0M
```

```
public static final SchemeColorProperty COLOR_3000M
```

## Woodland

The class *Woodland* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.Woodland**

extends *java.lang.Object*

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 869: Constructors in Woodland

Constructors
<i>Woodland</i> ()

### Field Summary

Table 870: Fields in Woodland

Fields
public static final <i>SchemeColorProperty</i> <b>COLOR</b>

### Class Details

#### Constructor Details

**Woodland** ()

#### Field Details

public static final *SchemeColorProperty* **COLOR**

## WoodlandInfo

The class *WoodlandInfo* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

### Class Summary

public static class **CustomizableVariables.WoodlandInfo**

extends *java.lang.Object*

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 871: Constructors in WoodlandInfo

Constructors
<a href="#">WoodlandInfo</a> ()

## Field Summary

Table 872: Fields in WoodlandInfo

Fields
public static final <a href="#">SchemeColorProperty</a> <b>FONTSTYLE_COLOR</b>
public static final <a href="#">SchemeColorProperty</a> <b>FONTSTYLE_OUTLINE_COLOR</b>
public static final <a href="#">SchemeFloatProperty</a> <b>FONTSTYLE_OUTLINE_WIDTH</b>
public static final <a href="#">SchemeFloatProperty</a> <b>FONTSTYLE_SIZE</b>

## Class Details

### Constructor Details

[WoodlandInfo](#) ()

### Field Details

public static final [SchemeColorProperty](#) **FONTSTYLE\_COLOR**

public static final [SchemeColorProperty](#) **FONTSTYLE\_OUTLINE\_COLOR**

public static final [SchemeFloatProperty](#) **FONTSTYLE\_OUTLINE\_WIDTH**

public static final [SchemeFloatProperty](#) **FONTSTYLE\_SIZE**

## WorldMountains

The class *WorldMountains* is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

## Class Summary

public static class **CustomizableVariables.WorldMountains**

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 873: Constructors in WorldMountains

Constructors
<a href="#">WorldMountains</a> ()

## Field Summary

Table 874: Fields in WorldMountains

Fields
public static final <a href="#">SchemeColorProperty</a> <b>COLOR_1500M</b>
public static final <a href="#">SchemeColorProperty</a> <b>COLOR_3000M</b>

## Class Details

### Constructor Details

[WorldMountains](#) ()

### Field Details

public static final [SchemeColorProperty](#) **COLOR\_1500M**

public static final [SchemeColorProperty](#) **COLOR\_3000M**

## ZoneBorder

The class [ZoneBorder](#) is a member of *com.here.android.mpa.mapping.customization.CustomizableVariables*.

## Class Summary

public static class **CustomizableVariables.ZoneBorder**

*extends java.lang.Object*

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 875: Constructors in ZoneBorder

Constructors
<a href="#">ZoneBorder ()</a>

## Field Summary

Table 876: Fields in ZoneBorder

Fields
<code>public static final <a href="#">SchemeFloatProperty</a> WIDTH</code>

## Class Details

### Constructor Details

[ZoneBorder \(\)](#)

### Field Details

`public static final SchemeFloatProperty WIDTH`

## SchemeColorProperty

The class [SchemeColorProperty](#) is a member of [com.here.android.mpa.mapping.customization](#).

### Class Summary

`public final class SchemeColorProperty`

`extends java.lang.Object`

Represents a color property that can be set in a customizable scheme.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 877: Methods in SchemeColorProperty

Methods
<code>public String <a href="#">getName ()</a></code> Get name of variable

### Methods

```
public String getTypeName ()
```

Get value type in String form.

### Class Details

Represents a color property that can be set in a customizable scheme. A color property cannot be constructed. Instead, it should be retrieved from *CustomizableVariables* class.

### Method Details

```
public String getName ()
```

Get name of variable

#### Returns:

name of variable

```
public String getTypeName ()
```

Get value type in String form.

#### Returns:

value type in String form.

## SchemeFloatProperty

The class *SchemeFloatProperty* is a member of *com.here.android.mpa.mapping.customization* .

### Class Summary

```
public class SchemeFloatProperty
```

*extends java.lang.Object*

Represents a float property that can be set in a customizable scheme.

[For complete information, see the section *Class Details*]

### Method Summary

Table 878: Methods in SchemeFloatProperty

### Methods

```
public String getName ()
```

Get name of variable

### Methods

```
public String getTypeName ()
```

Get value type in String form.

---

### Class Details

Represents a float property that can be set in a customizable scheme. A float property cannot be constructed. Instead, it should be retrieved from *CustomizableVariables* class.

### Method Details

```
public String getName ()
```

Get name of variable

**Returns:**

name of variable

```
public String getTypeName ()
```

Get value type in String form.

**Returns:**

value type in String form.

## SchemeIntegerProperty

The class *SchemeIntegerProperty* is a member of *com.here.android.mpa.mapping.customization* .

### Class Summary

```
public class SchemeIntegerProperty
```

```
extends java.lang.Object
```

Represents a integer property that can be set in a customizable scheme.

[For complete information, see the section *Class Details*]

### Method Summary

Table 879: Methods in SchemeIntegerProperty

#### Methods

```
public String getName ()
```

Get name of variable

## Methods

```
public String getTypeName ()
```

Get value type in String form.

---

## Class Details

Represents a integer property that can be set in a customizable scheme. A integer property cannot be constructed. Instead, it should be retrieved from *CustomizableVariables* class.

## Method Details

```
public String getName ()
```

Get name of variable

### Returns:

name of variable

```
public String getTypeName ()
```

Get value type in String form.

### Returns:

value type in String form.

## ZoomRange

The class *ZoomRange* is a member of *com.here.android.mpa.mapping.customization* .

## Class Summary

```
public class ZoomRange
```

```
extends java.lang.Object
```

Specify range for zoom level.

[For complete information, see the section *Class Details*]

## Constructor Summary

Table 880: Constructors in ZoomRange

### Constructors

```
ZoomRange (double min, double max)
```

## Method Summary

Table 881: Methods in ZoomRange

Methods
<code>public double <a href="#">getMax</a> ()</code>
<code>public double <a href="#">getMin</a> ()</code>
<code>public void <a href="#">setMax</a> (double max)</code>
<code>public void <a href="#">setMin</a> (double min)</code>

## Class Details

Specify range for zoom level.

## Constructor Details

`ZoomRange (double min, double max)`

Parameters:

- `min`
- `max`

## Method Details

`public double getMax ()`

Returns:

the max

`public double getMin ()`

Returns:

the min

`public void setMax (double max)`

Parameters:

- `max`  
the max to set

`public void setMin (double min)`

**Parameters:**

- `min`  
the min to set

## nlp

---

The package `nlp` is a member of `com.here.android.mpa`.

### Package Summary

#### nlp

The package `nlp` (Natural Language Processing) provides classes, interfaces, and enumerations that allow your application to add natural language processing to your HERE SDK app.

### Package Details

The package `nlp` (Natural Language Processing) provides classes, interfaces, and enumerations that allow your application to add natural language processing to your HERE SDK app. The APIs in this package are considered Beta and are subject to change without notice.

## CollectionProvider

The interface `CollectionProvider` is a member of `com.here.android.mpa.nlp`.

### Interface Summary

public abstract interface **CollectionProvider**

Collection interface for adding, removing, renaming, retrieving collections and/or places.

[For complete information, see the section [Interface Details](#)]

### Method Summary

Table 882: Methods in CollectionProvider

#### Methods

```
public abstract void addCollection (String collectionName, java.lang.ref.WeakReference  
<OnCollectionListener> listener)
```

Add the specified collection.

```
public abstract void addPlace (String collectionName, Place place, java.lang.ref.WeakReference  
<OnCollectionListener> listener)
```

Add the specified place to the specified collection.

## Methods

```
public abstract void clear (java.lang.ref.WeakReference <OnCollectionListener> listener)
```

Remove all collections.

```
public abstract void copyCollection (String sourceCollectionName, String destinationCollectionName, java.lang.ref.WeakReference <OnCollectionListener> listener)
```

Copy a collection.

```
public abstract void copyPlace (String sourceCollectionName, String placeName, String destinationCollectionName, java.lang.ref.WeakReference <OnCollectionListener> listener)
```

Copy the specified place in a collection to another collection.

```
public abstract List getCollectionNames ()
```

Retrieve all collection names.

```
public abstract List getCollectionNames (String placeName)
```

Get all collection names that has a place with the specified name.

```
public abstract Place getPlace (String collectionName, String placeName)
```

Retrieve the place matching the specified name from the specified collection.

```
public abstract java.util.List <Place> getPlaces (String collectionName)
```

Retrieve all places in the specified collection.

```
public abstract void removeCollection (String collectionName, java.lang.ref.WeakReference <OnCollectionListener> listener)
```

Remove the specified collection.

```
public abstract void removePlace (String collectionName, String placeName, java.lang.ref.WeakReference <OnCollectionListener> listener)
```

Remove the specified place from the specified collection.

```
public abstract void renameCollection (String originalCollectionName, String newCollectionName, java.lang.ref.WeakReference <OnCollectionListener> listener)
```

Rename a collection.

```
public abstract void renamePlace (String collectionName, String originalPlaceName, String newPlaceName, java.lang.ref.WeakReference <OnCollectionListener> listener)
```

Rename the specified place in a collection.

## Interface Details

Collection interface for adding, removing, renaming, retrieving collections and/or places. If this interface is not implemented, all collection related utterances will result in feature not supported announcement to the users. If application chooses to implement this interface, be sure to adopt a strategy for handling the use cases where a user does not explicitly specify a collection name, whether to persist collection data and how to persist and synchronize data, whether to support duplicates, and whether to allow any discrepancies in the names to accommodate inaccuracies of speech-to-text or user accents. To achieve better user experience, it's highly recommended that the names used for collections and places be a single word without any punctuation or symbol and they should be case insensitive.

IMPORTANT: Natural language processor is a Beta feature. The related classes are subject to change without notice.

## Method Details

```
public abstract void addCollection (String collectionName,  
java.lang.ref.WeakReference <OnCollectionListener> listener)
```

Add the specified collection.

Here are a few things to consider:

- If your collection provider does not support duplicates, you'll need to validate whether the specified collection already exists and what to do if it is, e.g. will you replace the old one with the new one and inform user through *Error*? Or will you disallow this by informing user to delete the existing one first and then retry?
- If your collection provider supports duplicates, how will you handle *copyCollection(String, String, WeakReference)*, *removeCollection(String, WeakReference)*, *renameCollection(String, String, WeakReference)*, and *getPlaces(String)* when duplicates exist? Will the operation be applied to all instances or just the first one? For 3.5, user will not be prompted to clarify which one nor will user be allowed to iterate through the collection via *USE\_FIRST*, *USE\_LAST*, *USE\_NEXT*, or *USE\_PREV*. Any desired customization requires intercepting *Intention* handling through *Nlp.OnIntentListener*.
- How will your collection provider handle adding a place to an unspecified collection? Will you create a special collection, if so, please make sure the name of this special collection is returned from *getCollectionNames(String)* and *getCollectionNames()* where applicable.
- Does your collection provider support the concept of a collection? If not, what should happen with these collection related utterances? Will you ignore them, or will you inform the user that these features are not supported?

### Parameters:

- **collectionName**  
The name of the collection to be added. null if user does not explicitly specify the name of the collection.
- **listener**  
The *OnCollectionListener* to handle the callback after operation is completed. The error provided in the *onComplete(Error)* should be *NONE* if the specified collection is successfully added; otherwise return *FAILED*. Any message returned from *getMessage()* will be read to the user regardless whether the operation is successful.

### See also:

[addPlace\(String, Place, WeakReference<OnCollectionListener>\)](#)

```
public abstract void addPlace (String collectionName, Place place,  
java.lang.ref.WeakReference <OnCollectionListener> listener)
```

Add the specified place to the specified collection.

Here are a few things to consider:

- If your collection provider does not support duplicates, you'll need to validate whether the specified place is already in the collection and what to do if it is, e.g. will you replace the old one with the new one and inform user through *Error*? Or will you disallow this by informing user to delete the existing one first and then retry?

- If your collection provider supports duplicates, how will you handle `copyPlace(String, String, String, WeakReference)`, `removePlace(String, String, WeakReference)`, `renamePlace(String, String, String, WeakReference)`, and `getPlace(String, String)` when duplicates exist? Will the operation be applied to all instances or just the first one? For 3.5, user will not be prompted to clarify which one nor will user be allowed to iterate through the collection via `USE_FIRST`, `USE_LAST`, `USE_NEXT`, or `USE_PREV`. Any desired customization requires intercepting `Intention` handling through `Nlp.OnIntentListener`.
- How will your collection provider handle adding a place to an unspecified collection? Will you create a special collection, if so, please make sure the name of this special collection is returned from `getCollectionNames(String)` and `getCollectionNames()` where applicable.
- How will your collection provider handle adding a place to a non-existing collection? Will it automatically create it or inform user to create it first?
- Does your collection provider support the concept of a collection? If not, what should happen if user explicitly specify a collection name? Will you ignore the collection name parameter or will you inform the user and have your user to try again without specifying a collection name?

**Parameters:**

- **collectionName**  
The name of the collection. null if user does not explicitly specify the name of the collection.
- **place**  
The `Place` to be added into collection.
- **listener**  
The `OnCollectionListener` to handle the callback after operation is completed. The error provided in the `onComplete(Error)` should be `NONE` if the specified place is successfully added; otherwise return `FAILED`. Any message returned from `getMessage()` will be read to the user regardless whether the operation is successful.

```
public abstract void clear (java.lang.ref.WeakReference <OnCollectionListener>
listener)
```

Remove all collections.

**Parameters:**

- **listener**  
The `OnCollectionListener` to handle the callback after operation is completed. The error provided in the `onComplete(Error)` should be `NONE` if all collections are successfully removed; otherwise return `FAILED`. Any message returned from `getMessage()` will be read to the user regardless whether the operation is successful.

```
public abstract void copyCollection (String sourceCollectionName, String
destinationCollectionName, java.lang.ref.WeakReference <OnCollectionListener>
listener)
```

Copy a collection.

**Parameters:**

- **sourceCollectionName**

The name of the collection to be renamed. null if user does not explicitly specify the name of the collection.

- **destinationCollectionName**

The new name of the collection. null if user does not explicitly specify the name of the collection.

- **listener**

The *OnCollectionListener* to handle the callback after operation is completed. The error provided in the *onComplete(Error)* should be *NONE* if the specified collection is successfully renamed; otherwise return *FAILED*. Any message returned from *getMessage()* will be read to the user regardless whether the operation is successful.

**See also:**

*addPlace(String, Place, WeakReference<OnCollectionListener>)*

*addCollection(String, WeakReference<OnCollectionListener>)*

```
public abstract void copyPlace (String sourceCollectionName, String
placeName, String destinationCollectionName, java.lang.ref.WeakReference
<OnCollectionListener> listener)
```

Copy the specified place in a collection to another collection.

**Parameters:**

- **sourceCollectionName**

The name of the collection. null if user does not explicitly specify the name of the collection.

- **placeName**

The name of the place to be copied.

- **destinationCollectionName**

The name of the collection to copied to. null if user does not explicitly specify the name of the collection.

- **listener**

The *OnCollectionListener* to handle the callback after operation is completed. The error provided in the *onComplete(Error)* should be *NONE* if the specified place is successfully copied; otherwise return *FAILED*. Any message returned from *getMessage()* will be read to the user regardless whether the operation is successful.

**See also:**

*addPlace(String, Place, WeakReference<OnCollectionListener>)*

```
public abstract List getCollectionNames ()
```

Retrieve all collection names. These names may be announced to the users so if you have a special collection to store places whenever user does not explicitly a collection, return the name of that special collection. e.g. A special collection called "unnamed", then return "unnamed" instead of an empty string or null.

## Returns:

A list of collection names. An empty list if there isn't any collection.

## See also:

[addPlace\(String, Place, WeakReference<OnCollectionListener>\)](#)

[addCollection\(String, WeakReference<OnCollectionListener>\)](#)

```
public abstract List getCollectionNames (String placeName)
```

Get all collection names that has a place with the specified name. These names may be announced to the users so if you have a special collection to store places whenever user does not explicitly a collection and the given place is found in that special collection, return the name of that collection. e.g. A special collection called "unnamed", then return "unnamed" instead of an empty string or null.

## Parameters:

- **placeName**

The name of the place.

## Returns:

A list of collection names, or empty list if the specified place exists but does not belong to any collection, or null if the specified place does not exist.

## See also:

[addPlace\(String, Place, WeakReference<OnCollectionListener>\)](#)

[addCollection\(String, WeakReference<OnCollectionListener>\)](#)

```
public abstract Place getPlace (String collectionName, String placeName)
```

Retrieve the place matching the specified name from the specified collection.

## Parameters:

- **collectionName**

The name of the collection. null if user does not explicitly specify the name of the collection.

- **placeName**

The name of the place to retrieve.

## Returns:

*Place* in the specified collection. null if the specified place does not exist in the specified collection.

## See also:

[addPlace\(String, Place, WeakReference<OnCollectionListener>\)](#)

```
public abstract java.util.List <Place> getPlaces (String collectionName)
```

Retrieve all places in the specified collection.

**Parameters:**

- **collectionName**

The name of the collection. null if user does not explicitly specify the name of the collection.

**Returns:**

*Places* in the specified collection. null if the specified collection does not exist; an empty list if the specified collection exists but does not contain any place.

**See also:**

[addPlace\(String, Place, WeakReference<OnCollectionListener>\)](#)

[addCollection\(String, WeakReference<OnCollectionListener>\)](#)

```
public abstract void removeCollection (String collectionName,  
java.lang.ref.WeakReference <OnCollectionListener> listener)
```

Remove the specified collection.

**Parameters:**

- **collectionName**

The name of the collection to be removed. null if user does not explicitly specify the name of the collection.

- **listener**

The [OnCollectionListener](#) to handle the callback after operation is completed. The error provided in the [onComplete\(Error\)](#) should be *NONE* for the following scenarios: 1) if the specified collection is successfully removed. 2) if the specified collection does not exist to begin with. If the specified collection cannot be successfully removed, return *FAILED*. Any message returned from [getMessage\(\)](#) will be read to the user regardless whether the operation is successful.

**See also:**

[addCollection\(String, WeakReference<OnCollectionListener>\)](#)

```
public abstract void removePlace (String collectionName, String placeName,  
java.lang.ref.WeakReference <OnCollectionListener> listener)
```

Remove the specified place from the specified collection.

**Parameters:**

- **collectionName**

The name of the collection. null if user does not explicitly specify the name of the collection.

- **placeName**

The name of the place to be removed from collection.

- **listener**

The *OnCollectionListener* to handle the callback after operation is completed. The error provided in the *onComplete(Error)* should be *NONE* for the following scenarios: 1) if the specified place is successfully removed from the specified collection. 2) if the specified place does not exist in the specified collection to begin with. If the specified place cannot be successfully removed from the specified collection, return *FAILED*. Any message returned from *getMessage()* will be read to the user regardless whether the operation is successful.

**See also:**

[addPlace\(String, Place, WeakReference<OnCollectionListener>\)](#)

```
public abstract void renameCollection (String originalCollectionName,  
String newCollectionName, java.lang.ref.WeakReference <OnCollectionListener>  
listener)
```

Rename a collection.

**Parameters:**

- **originalCollectionName**  
The name of the collection to be renamed. null if user does not explicitly specify the name of the collection.
- **newCollectionName**  
The new name of the collection. null if user does not explicitly specify the name of the collection.
- **listener**  
The *OnCollectionListener* to handle the callback after operation is completed. The error provided in the *onComplete(Error)* should be *NONE* if the specified collection is successfully renamed; otherwise return *FAILED*. Any message returned from *getMessage()* will be read to the user regardless whether the operation is successful.

**See also:**

[addPlace\(String, Place, WeakReference<OnCollectionListener>\)](#)

[addCollection\(String, WeakReference<OnCollectionListener>\)](#)

```
public abstract void renamePlace (String collectionName, String  
originalPlaceName, String newPlaceName, java.lang.ref.WeakReference  
<OnCollectionListener> listener)
```

Rename the specified place in a collection.

**Parameters:**

- **collectionName**  
The name of the collection. null if user does not explicitly specify the name of the collection.
- **originalPlaceName**  
The name of the place to be renamed.

- **newPlaceName**

The new name of the place.

- **listener**

The *OnCollectionListener* to handle the callback after operation is completed. The error provided in the *onComplete(Error)* should be *NONE* if the specified place is successfully renamed; otherwise return *FAILED*. Any message returned from *getMessage()* will be read to the user regardless whether the operation is successful.

**See also:**

*addPlace(String, Place, WeakReference<OnCollectionListener>)*

## Error

The enumeration *Error* is a member of *com.here.android.mpa.nlp*.

### Enumeration Summary

public final enumeration **Error**

*extends java.lang.Enum, java.lang.Object*

Represents the status of a NLP operation.

[For complete information, see the section *Enumeration Details*]

### Enum Constant Summary

Table 883: Enum Constants in Error

Fields
<pre>public static final Error NONE</pre> <p>Operation is successfully performed</p>
<pre>public static final Error FAILED</pre> <p>Operation failed</p>

### Method Summary

Table 884: Methods in Error

Methods
<pre>public static Error create (Error error, String message)</pre> <p>Constructs an error with the specified error code and message</p>
<pre>public String getMessage ()</pre> <p>Retrieve the message</p>

## Methods

```
public static Error valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static Error[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Represents the status of a NLP operation.

IMPORTANT: Natural language processor is a Beta feature. The related classes are subject to change without notice.

## Enum Constant Details

```
public static final Error NONE
```

Operation is successfully performed

```
public static final Error FAILED
```

Operation failed

## Method Details

```
public static Error create (Error error, String message)
```

Constructs an error with the specified error code and message

### Parameters:

- **error**  
*NONE* or *FAILED*
- **message**  
The detailed message about the operation performed

### Returns:

The Error object.

```
public String getMessage ()
```

Retrieve the message

### Returns:

The detailed message about the operation performed

```
public static Error valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

**Parameters:**

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static Error[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Intention

The class *Intention* is a member of *com.here.android.mpa.nlp* .

### Class Summary

```
public final class Intention
```

```
extends java.lang.Object
```

Natural language processor intention object, an abstract description of an operation from voice input.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

**Table 885: Nested Classes in Intention**

Nested Classes
<pre>public static final enumeration <i>Intention.Field</i></pre> <p>Intention parameters names</p>
<pre>public static final enumeration <i>Intention.Function</i></pre> <p>Function values for <i>FUNCTION</i>.</p>
<pre>public static final enumeration <i>Intention.Value</i></pre> <p>values for <i>Intention.Field</i></p>

### Method Summary

**Table 886: Methods in Intention**

Methods
<pre>public boolean <i>containsFieldValue</i> (<i>Field</i> fieldId, String subString)</pre> <p>Check if the intention has the specified <i>Intention.Field</i> with the specified substring value.</p>

**Methods**

```
public boolean equals (Object other)
```

For documentation, see *java.lang.Object*

```
public String getDeducedText ()
```

Get the value for text after deduction, which may be different from the original text from *getOriginalText()*.

```
public String getDomain ()
```

Get knowledge domain

```
public int getFieldCount ()
```

Get number of *Intention.Field* in the intention

```
public List getFieldValues (Field fieldId)
```

Get values for the specified *Intention.Field*.

```
public java.util.Set <Field> getFields ()
```

Get *Intention.Fields* in the intention

```
public java.util.List <Function> getFunctions ()
```

Get the value for *FUNCTION*

```
public String getLanguage ()
```

Get language of the NLP parser applied to the speech

```
public String getOriginalText ()
```

Get value of the original text

```
public String getVendor ()
```

Get the value for *VENDOR* from the deduced intention

```
public String getVersion ()
```

Get the value for *VERSION* from the deduced intention

```
public boolean has (Field fieldId)
```

Check if the intention has the specified *Intention.Field*

```
public boolean has (Field fieldId, String value)
```

Check if the intention has the specified *Intention.Field* with the specified string.

```
public boolean has (Field fieldId, Value valueId)
```

Check if the intention has the specified *Intention.Field* with the specified *Intention.Value*.

```
public boolean has (Function id)
```

Checks whether this intention has contains the specified function.

## Methods

```
public boolean hasOnly (Field target)
```

Check if the intention only has the specified *Intention.Field* aside from the following:

- *VENDOR*
- *VERSION*
- *LANGUAGE*
- *DOMAIN*
- *DURATION*
- *FUNCTION*
- *TEXT*

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## Class Details

Natural language processor intention object, an abstract description of an operation from voice input. This object is represented in a formalized JSON, for example:

```
{
  "vendor":["HERE"],
  "version":["1.0.2"],
  "language":["eng"],
  "duration":["0ms"],
  "text":["Where is Seattle?"],
  "func":["POI"],
  "target":["Seattle"]
}
```

IMPORTANT: Natural language processor is a Beta feature. The related classes are subject to change without notice.

## Method Details

```
public boolean containsFieldValue (Field fieldId, String subString)
```

Check if the intention has the specified *Intention.Field* with the specified substring value. For example, checking "kilometer" against "kilometers" will result in true.

### Parameters:

- **fieldId**  
enum in *Intention.Field*
- **subString**  
Substring to find in the array of values for *Intention.Field*

### Returns:

true if the intention has the specified *Intention.Field* with the specified substring.

```
public boolean equals (Object other)
```

For documentation, see [java.lang.Object](#)

**Parameters:**

- **other**

```
public String getDeducedText ()
```

Get the value for text after deduction, which may be different from the original text from [getOriginalText\(\)](#).

**Returns:**

the value for [TEXT](#), all in lower case.

```
public String getDomain ()
```

Get knowledge domain

**Returns:**

the value for [DOMAIN](#). null if it does not exist.

```
public int getFieldCount ()
```

Get number of [Intention.Field](#) in the intention

**Returns:**

the number of [Intention.Field](#) in the intention

```
public List getFieldValues (Field fieldId)
```

Get values for the specified [Intention.Field](#).

**Parameters:**

- **fieldId**  
[Intention.Field](#) to retrieve

**Returns:**

An array of value corresponding to the specified [Intention.Field](#) name; null if no match found or if it doesn't contain any value.

```
public java.util.Set <Field> getFields ()
```

Get [Intention.Fields](#) in the intention

**Returns:**

a set of enums in [Intention.Field](#)

```
public java.util.List <Function> getFunctions ()
```

Get the value for *FUNCTION*

**Returns:**

an array of enums in *Intention.Function*

```
public String getLanguage ()
```

Get language of the NLP parser applied to the speech

**Returns:**

the value for *LANGUAGE*. null if it does not exist.

```
public String getOriginalText ()
```

Get value of the original text

**Returns:**

the value of the original text. null if it does not exist.

```
public String getVendor ()
```

Get the value for *VENDOR* from the deduced intention

**Returns:**

the value for *VENDOR*. null if it does not exist.

```
public String getVersion ()
```

Get the value for *VERSION* from the deduced intention

**Returns:**

the value for *VERSION*. null if it does not exist.

```
public boolean has (Field fieldId)
```

Check if the intention has the specified *Intention.Field*

**Parameters:**

- **fieldId**  
enum in *Intention.Field*

**Returns:**

true if the intention has the specified *Intention.Field*; otherwise false.

```
public boolean has (Field fieldId, String value)
```

Check if the intention has the specified *Intention.Field* with the specified string.

**Parameters:**

- **fieldId**  
enum in *Intention.Field*
- **value**  
string to be matched

**Returns:**

true if the intention has the specified *Intention.Field* with the specified string.

```
public boolean has (Field fieldId, Value valueId)
```

Check if the intention has the specified *Intention.Field* with the specified *Intention.Value*.

**Parameters:**

- **fieldId**  
enum in *Intention.Field*
- **valueId**  
enum in *Intention.Value*

**Returns:**

true if the intention has the specified *Intention.Field* with the specified *Intention.Value*.

```
public boolean has (Function id)
```

Checks whether this intention has contains the specified function. e.g. intention.has(Function.POI)

**Parameters:**

- **id**  
a *Intention.Function* enum value

**Returns:**

true if this intention has the specified function; otherwise false.

```
public boolean hasOnly (Field target)
```

Check if the intention only has the specified *Intention.Field* aside from the following:

- *VENDOR*
- *VERSION*

- [LANGUAGE](#)
- [DOMAIN](#)
- [DURATION](#)
- [FUNCTION](#)
- [TEXT](#)

**Parameters:**

- **target**  
*Intention.Field* to be checked

**Returns:**

true if this intention has only the specified *Intention.Field* aside from the ones noted; false otherwise.

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## Field

The enumeration *Field* is a member of *com.here.android.mpa.nlp.Intention*.

### Enumeration Summary

```
public static final enumeration Intention.Field
```

*extends java.lang.Enum, java.lang.Object*

Intention parameters names

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 887: Enum Constants in Field

Fields
<pre>public static final Field <b>VENDOR</b></pre> <p>Vendor which generated this intent.</p>
<pre>public static final Field <b>VERSION</b></pre> <p>Version of the deduced intention.</p>
<pre>public static final Field <b>LANGUAGE</b></pre> <p>Language used for deduction.</p>
<pre>public static final Field <b>DOMAIN</b></pre> <p>Knowledge domain.</p>

**Fields**

```
public static final Field DURATION
```

Request processing time for your information only.

```
public static final Field FUNCTION
```

Function of the intent.

```
public static final Field TEXT
```

Sentence that produced this intention.

```
public static final Field OPTIMIZE
```

Optimize the route by reordering stops on the route for the following intents and may not always be present:

- `ADD_STOPOVER`
- `ROUTE_FROM_TO`

```
public static final Field REROUTE
```

Determines whether an alternative route should be requested in in `ROUTE_FROM_TO` intent and may not always be present.

```
public static final Field ARRIVAL_TIME
```

Arrival time for the following intents and may not always be present:

- `TIME_FROM_TO`
- `POI`

```
public static final Field ARRIVAL_TIME_VALUE
```

Arrival time value for the following intents and may not always be present:

- `TIME_FROM_TO`
- `POI`

```
public static final Field TIME_SUFFIX
```

AM/PM time suffix for the following intents and may not always be present:

- `TIME_FROM_TO`
- `POI`

```
public static final Field REPLY
```

Proposed talk back response for the following intents and may not always be present:

- `ELEVATION`
- `NOTHING`
- `POI`
- `Q_A`
- `RELOAD`
- `RESET`
- `ROUTE_FROM_TO`
- `SAVE_PHONE_NUMBER`
- `SET_PARAM`
- `START_TALKING`
- `STOP_TALKING`
- `SYS_BATTERY`

## Fields

```
public static final Field SEARCH_COUNT
```

Search results count for the following intents:

- [POI](#)
- [SEARCH\\_RESULT\\_LIMIT](#)

```
public static final Field RADIUS
```

Search radius for the following intents and may not always be present:

- [POI](#)
- [ROUTE\\_FROM\\_TO](#)

```
public static final Field TYPE
```

Subcategorization of intents.

```
public static final Field ROUTE_TYPE
```

Route type for the following intents and may not always be present:

- [ROUTE\\_FROM\\_TO](#)
- [DISTANCE\\_FROM\\_TO](#)

```
public static final Field RATING
```

Place rating for [POI](#) intent and may not always be present.

```
public static final Field MEASURE
```

Measure system for the following intents and may not always be present:

- [POI](#)
- [ELEVATION](#)
- [ROUTE\\_FROM\\_TO](#)
- [DISTANCE\\_FROM\\_TO](#)
- [TIME\\_FROM\\_TO](#)

```
public static final Field ERROR
```

Error occurred on the deduction server (e.g.

```
public static final Field EXCEPTION
```

Exclusion for the following intents and may not always be present:

- [POI](#)
- [ROUTE\\_FROM\\_TO](#)

```
public static final Field WHERE
```

Search criteria for destination for the following intents and may not always be present:

- [POI](#)
- [ROUTE\\_FROM\\_TO](#)
- [DISTANCE\\_FROM\\_TO](#)
- [TIME\\_FROM\\_TO](#)

## Fields

```
public static final Field NEAR
```

Search criteria for destination for the following intents and may not always be present:

- `POI`
- `ROUTE_FROM_TO`
- `DISTANCE_FROM_TO`
- `TIME_FROM_TO`

```
public static final Field STOPOVER_WHERE
```

Search criteria for stopover for the following intents and may not always be present:

- `POI`
- `ROUTE_FROM_TO`
- `DISTANCE_FROM_TO`
- `TIME_FROM_TO`

```
public static final Field STOPOVER_NEAR
```

Search criteria for stopover for the following intents and may not always be present:

- `POI`
- `ROUTE_FROM_TO`
- `DISTANCE_FROM_TO`
- `TIME_FROM_TO`

```
public static final Field DEPARTURE_WHERE
```

Search criteria for departure for the following intents and may not always be present:

- `POI`
- `ROUTE_FROM_TO`
- `DISTANCE_FROM_TO`
- `TIME_FROM_TO`

```
public static final Field DEPARTURE_NEAR
```

Search criteria for departure for the following intents and may not always be present:

- `POI`
- `ROUTE_FROM_TO`
- `DISTANCE_FROM_TO`
- `TIME_FROM_TO`

```
public static final Field FROM
```

Used to indicate the source for the intent.

```
public static final Field TARGET
```

Use to indicate the target for the intent.

## Fields

```
public static final Field STOPOVER
```

Used to indicate a stopover for the following intents and may not always be present:

- `ADD_STOPOVER`
- `DISTANCE_FROM_TO`
- `ROUTE_FROM_TO`
- `TIME_FROM_TO`

```
public static final Field BY_NUMBER
```

Indicates whether value provided for `TARGET` in `CALL_NUMBER` intent is a phone number to be used for making a call.

```
public static final Field MESSAGE
```

Text of the message for `SEND_MESSAGE` intent.

```
public static final Field TOGGLE
```

To turn a feature on/off for the following intents:

- `COMPASS_MODE`
- `DELAY_NAVIGATION_START`
- `REPEAT_AFTER_ME`
- `SPEED_WARNING`
- `TRACK_GPS`
- `TRAFFIC`

```
public static final Field BY
```

Transport indicator for the following intents and may not always be present:

- `DISTANCE_FROM_TO`
- `ROUTE_FROM_TO`
- `TIME_FROM_TO`

```
public static final Field COLLECTION_NAME
```

Collection name for the following intents and may not always be present:

- `CHECK_COLLECTION`
- `COLLECT_LOCATION`
- `LIST_COLLECTION`
- `REMOVE_FROM_COLLECTION`

```
public static final Field COLLECTION_ITEM
```

Collected item for the following intents and may not always be present:

- `COPY_COLLECTION`
- `RENAME_COLLECTION`

```
public static final Field CONTACT
```

Contact name for the following intents and may not always be present:

- `REMOVE_FROM_CONTACTS`
- `SAVE_PHONE_NUMBER`

## Fields

```
public static final Field CATEGORY
```

Category for the following intents and may not always be present:

- COLLECT\_LOCATION
- POI

```
public static final Field WHEN
```

Time reference for the following intents and may not always be present:

- POI
- ROUTE\_FROM\_TO
- TRAFFIC
- WEATHER

```
public static final Field CONVERSATION
```

Asking user for more info.

```
public static final Field USE_LAST_INTENT
```

Indicates whether to use previous intent for context for POI intent and may not always be present.

```
public static final Field ONLINE_DEDUCTION
```

Indicates whether to use remote backend vs local NLP database for deduction.

```
public static final Field WAKEUP_WORDS
```

Whether to use wakeup words for SET\_PARAM intent and may not always be present.

```
public static final Field DISTANCE_MEASURE
```

Distance measurement for SET\_PARAM intent and may not always be present.

```
public static final Field SHOW_ROUTE_ONLY
```

Indicate whether to just show the route without starting navigation for the following intents and may not always be present:

- ROUTE\_FROM\_TO

```
public static final Field SIMULATE
```

Indicates whether to start guidance simulation for ROUTE\_FROM\_TO intent and may not always be present.

```
public static final Field ALTERNATIVE_ROUTE
```

Indicates whether to calculate a route for ROUTE\_FROM\_TO intent and may not always be present.

```
public static final Field FIRST_OPERAND
```

First operand of an arithmetic expression for MATH intent and it's always present.

```
public static final Field SECOND_OPERAND
```

Second operand of an arithmetic expression for MATH intent and it's always present.

```
public static final Field OPERATOR
```

Operator of an arithmetic expression for MATH intent and it's always present.

## Method Summary

Table 888: Methods in Field

Methods
<pre>public static <i>Field</i> <i>get</i> (String name)</pre> <p>Retrieve enum value from the given string.</p>
<pre>public String <i>getName</i> ()</pre> <p>Retrieve string value for the enum, e.g.</p>
<pre>public static <i>Field</i> <i>valueOf</i> (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>Intention.Field[]</i> <i>values</i> ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Intention parameters names

### Enum Constant Details

```
public static final Field VENDOR
```

Vendor which generated this intent. This is applicable for all intents and is always present. Its value is array with one string. e.g. "vendor":["HERE"]

```
public static final Field VERSION
```

Version of the deduced intention. This is applicable for all intents and is always present. Its value is an array with one string in the format of major.minor.build. e.g. "version":["1.0.2"]

```
public static final Field LANGUAGE
```

Language used for deduction. This is applicable for all intents and is always present. Its value is an array that contains one of the following:

- *ENGLISH*

e.g. "language":["eng"]

```
public static final Field DOMAIN
```

Knowledge domain. e.g. "domain":["map.routing"]. This is not currently returned in any intent.

```
public static final Field DURATION
```

Request processing time for your information only. This is applicable for all intents and is always present. e.g. "duration":["0ms"]

`public static final Field FUNCTION`

Function of the intent. This is applicable for all intents and is always present. Its value is an array that contains at least one of the values defined in *Intention.Function*. e.g. "func":["ROUTE\_FROM\_TO"] e.g. "func":["START\_TALKING","DISTANCE\_FROM\_TO"]

`public static final Field TEXT`

Sentence that produced this intention. This is applicable for all intents and is always present. Its value a array of one string. e.g. "text":["where am i"]

`public static final Field OPTIMIZE`

Optimize the route by reordering stops on the route for the following intents and may not always be present:

- *ADD\_STOPOVER*
- *ROUTE\_FROM\_TO*

Its values is an array that contains one of the following:

- *TRUE*
- *FALSE*

e.g. "optimize":["false\_"]

`public static final Field REROUTE`

Determines whether an alternative route should be requested in in *ROUTE\_FROM\_TO* intent and may not always be present. Its value is an array that contains one of the following values:

- *ON*
- *OFF*

e.g. "reroute":["on\_"]

Note that *REROUTE* means to stop using the existing route and get a new route to the same destination.

On the other hand, *ALTERNATIVE\_ROUTE* means to stop using the existing route and get a new route to an alternative destination.

`public static final Field ARRIVAL_TIME`

Arrival time for the following intents and may not always be present:

- *TIME\_FROM\_TO*
- *POI*

Its value is an array that contains one string.

e.g. "I have to be in seattle by 5" --> "arrival\_time":["5"]

e.g. "I have to be in seattle by 5pm" --> "arrival\_time":["5pm"]

This is the concatenation of the values for [ARRIVAL\\_TIME\\_VALUE](#) and [TIME\\_SUFFIX](#) if [TIME\\_SUFFIX](#) exists.

`public static final Field ARRIVAL_TIME_VALUE`

Arrival time value for the following intents and may not always be present:

- [TIME\\_FROM\\_TO](#)
- [POI](#)

Its value is an array that contains one string that represents the arrival time without am/pm suffix.

e.g. "I have to be in seattle by 5" --> "arrival\_time\_value":["5"]

e.g. "I have to be in seattle by 5pm" --> "arrival\_time\_value":["5"]

`public static final Field TIME_SUFFIX`

AM/PM time suffix for the following intents and may not always be present:

- [TIME\\_FROM\\_TO](#)
- [POI](#)

Its value is an array that contains one of the following:

- [AM](#)
- [PM](#)

e.g. "I have to be in seattle by 5" --> not present

e.g. "I have to be in seattle by 5pm" --> "time\_suffix":["pm"]

`public static final Field REPLY`

Proposed talk back response for the following intents and may not always be present:

- [ELEVATION](#)
- [NOTHING](#)
- [POI](#)
- [Q\\_A](#)
- [RELOAD](#)
- [RESET](#)
- [ROUTE\\_FROM\\_TO](#)
- [SAVE\\_PHONE\\_NUMBER](#)
- [SET\\_PARAM](#)
- [START\\_TALKING](#)
- [STOP\\_TALKING](#)
- [SYS\\_BATTERY](#)

Its value is an array that contains one string. e.g. "reply":["sure"]

```
public static final Field SEARCH_COUNT
```

Search results count for the following intents:

- *POI*
- *SEARCH\_RESULT\_LIMIT*

This may not always be present for *POI* but is always present for *SEARCH\_RESULT\_LIMIT*.

Its value is an array that contains one string, e.g. "search\_count":["5"]

```
public static final Field RADIUS
```

Search radius for the following intents and may not always be present:

- *POI*
- *ROUTE\_FROM\_TO*

Its value is an array that contains one string, e.g. "radius":["5"]

```
public static final Field TYPE
```

Subcategorization of intents.

For the following intents:

- *ROUTE\_FROM\_TO*
- *DISTANCE\_FROM\_TO*

it may not always be present and its value is an array that contains one of the following:

- *FINE*
- *MID*
- *CHEAP*

For *POI* intent, it may not always be present and its value is an array that contains one of the following:

- *FINE*
- *MID*
- *CHEAP*
- *BUS*
- *CAR*
- *WALK*
- *TAXI*
- *FERRY*
- *FLIGHT*

For *PLACE\_INFO* intent, it may not always be present and its value is an array that contains one of the following:

- *HOURS*

For *REPORT\_GEO\_EVENT* intent, it's always present and its value is an array that contains one of the following:

- *EVENT\_CRIME*

- *EVENT\_HEALTH*
- *EVENT\_TRAFFIC*

For *TRAFFIC* intent, it may not always be present and its value is an array that contains one of the following:

- *ROUTE\_OBJ*

For *NUMBER\_OF* intent, it's always present and its value is an array that contains one of the following:

- *COLLECTION\_OBJ*

`public static final Field ROUTE_TYPE`

Route type for the following intents and may not always be present:

- *ROUTE\_FROM\_TO*
- *DISTANCE\_FROM\_TO*

Its value is an array that contains one of the following:

- *FASTEST*
- *SHORTEST*
- *OPTIMAL*

`public static final Field RATING`

Place rating for *POI* intent and may not always be present. Its value is an array that contains one of the following values:

- *GOOD*
- *BAD*
- *POPULAR*
- a numeric string

`public static final Field MEASURE`

Measure system for the following intents and may not always be present:

- *POI*
- *ELEVATION*
- *ROUTE\_FROM\_TO*
- *DISTANCE\_FROM\_TO*
- *TIME\_FROM\_TO*

Its value is an array that contains one of the following:

- *ABBREVIATED\_KILOMETER*
- *KILOMETER*
- *ABBREVIATED\_METER*
- *METER*
- *MILE*
- *YARD*
- *FEET*

- *MINUTES*
- *HOURS*
- *DAYS*

`public static final Field ERROR`

Error occurred on the deduction server (e.g. HTTP request fails as a result of a version mismatch). This field may not always be present.

Its value is an array that contains at least one string.

`public static final Field EXCEPTION`

Exclusion for the following intents and may not always be present:

- *POI*
- *ROUTE\_FROM\_TO*

Its value is an array that contains at least one string.

`public static final Field WHERE`

Search criteria for destination for the following intents and may not always be present:

- *POI*
- *ROUTE\_FROM\_TO*
- *DISTANCE\_FROM\_TO*
- *TIME\_FROM\_TO*

Its value is an array that contains at least one string.

`public static final Field NEAR`

Search criteria for destination for the following intents and may not always be present:

- *POI*
- *ROUTE\_FROM\_TO*
- *DISTANCE\_FROM\_TO*
- *TIME\_FROM\_TO*

Its value is an array that contains at least one string.

`public static final Field STOPOVER_WHERE`

Search criteria for stopover for the following intents and may not always be present:

- *POI*
- *ROUTE\_FROM\_TO*
- *DISTANCE\_FROM\_TO*
- *TIME\_FROM\_TO*

Its value is an array that contains at least one string.

```
public static final Field STOPOVER_NEAR
```

Search criteria for stopover for the following intents and may not always be present:

- *POI*
- *ROUTE\_FROM\_TO*
- *DISTANCE\_FROM\_TO*
- *TIME\_FROM\_TO*

Its value is an array that contains at least one string.

```
public static final Field DEPARTURE_WHERE
```

Search criteria for departure for the following intents and may not always be present:

- *POI*
- *ROUTE\_FROM\_TO*
- *DISTANCE\_FROM\_TO*
- *TIME\_FROM\_TO*

Its value is an array that contains at least one string.

```
public static final Field DEPARTURE_NEAR
```

Search criteria for departure for the following intents and may not always be present:

- *POI*
- *ROUTE\_FROM\_TO*
- *DISTANCE\_FROM\_TO*
- *TIME\_FROM\_TO*

Its value is an array that contains at least one string.

```
public static final Field FROM
```

Used to indicate the source for the intent. For the following intents, it may not always be present:

- *ROUTE\_FROM\_TO*
- *DISTANCE\_FROM\_TO*
- *TIME\_FROM\_TO*

Its value is an array that contains one of the following:

- a string indicating a location
- *COLLECTION\_OBJ*

For the following intents, it's always present:

- *COPY\_COLLECTION*
- *RENAME\_COLLECTION*

Its value is an array that contains one string.

For *POI* intent, it may not always be present and its value is an array that contains *COLLECTION\_OBJ*.

```
public static final Field TARGET
```

Use to indicate the target for the intent.

For *CALL\_NUMBER* intent, it's always present and its value is an array that contains one of the following:

- *HOME*
- *WORK*
- a string that represents a contact name
- a string that contains a phone number
- a string that represents a search category

For *CHANGE\_MAP\_CENTER* intent, it's always present and its value is an array that contains one of the following:

- *ORIGIN*
- a string that indicates a location

For *CHECK\_COLLECTION* intent, it's always present and its value is an array that contains one of the following:

- *HOME*
- *WORK*
- a string that indicates a location

For the following intents, it's always present:

- *COPY\_COLLECTION*
- *RENAME\_COLLECTION*

Its value is an array that contains one string representing the target collection.

For *DOWNLOAD* intent, it's always present and its value is an array that contains one string that indicates a location.

For *REMOVE* intent, it's always present and its value is an array that contains one of the following:

- *IT\_OR\_THERE*
- *DESTINATION\_OBJ*
- *STOPOVER\_OBJ*
- a string that represents the item to be removed

For *REMOVE\_FROM\_CONTACTS* intent, it's always present and its value is an array that contains a string representing the contact to be removed.

For *REMOVE\_FROM\_MAP*, it's always present and its value is an array that contains one of the following:

- *ALL\_OBJ*
- *ROUTE\_OBJ*
- *STOPOVER\_OBJ*
- a string that presents the ordinal of the objects on the map
- a string that presents a category of the objects on the map
- a string that presents the object on the map

For *SEND\_MESSAGE* intent, it's always present and its value is an array that contains one of the following:

- *MYSELF*
- *FACEBOOK*
- *TWITTER*
- a string that represents a contact name

For *TALK\_SPEED* intent, it's always present and its value is an array that contains one of the following:

- *LESS*
- *MORE*
- *NORMAL*
- *MINIMUM*
- *MAXIMUM*

For *VOLUME* intent, it's always present and its value is an array that contains one of the following:

- *LESS*
- *MORE*
- *MINIMUM*
- *MAXIMUM*
- a number string that represents a percentage, e.g. 50 for 50%.

For *WEB\_SEARCH* intent, it's always present and its value is an array that contains a search topic.

For *ZOOM* intent, it's always present and its value is an array that contains one of the following:

- *LESS*
- *MORE*

For *ADD\_STOPOVER* intent, it may not always be present and its value is an array that contains a string that indicates a category for the search.

For *ADDRESS* intent, it may not always be present and its value is an array that contains one of the following:

- *DESTINATION\_OBJ*
- *NEXT\_MANEUVER\_OBJ*
- *STOPOVER\_OBJ*
- *HOME*
- *WORK*

For *ELEVATION* intent, it may not always be present and its value is an array that contains one of the following:

- *HOME*
- *WORK*
- a string that indicates a location

For *COLLECT\_LOCATION* intent, it may not always be present and its value is an array that contains one of the following value:

- *HOME*
- *WORK*
- *CAR*
- a string that indicates the name for the location to be collected.

For *POI* intent, it may not always be present and its value is an array that contains one of the following:

- a string that indicates a category for the search, e.g. restaurant.
- a string that indicates a place name, e.g. starbucks.
- a string that indicates an address.
- *COLLECTION\_OBJ*
- *IT\_OR\_THERE*

For the following intents, it may not always be present:

- *DISTANCE\_FROM\_TO*
- *PLACE\_INFO*
- *ROUTE\_FROM\_TO*
- *TIME\_FROM\_TO*

Its value is an array that contains one of the following value:

- *DESTINATION\_OBJ*
- *STOPOVER\_OBJ*
- *NEXT\_MANEUVER\_OBJ*
- *ORIGIN*
- *IT\_OR\_THERE*
- *HOME*
- *WORK*
- a string that indicates a category, e.g. restaurant.
- a string that indicates a place name, e.g. starbucks.
- a string that indicates an address.

For the following intents, it may not always be present:

- *REMOVE\_FROM\_COLLECTION*
- *REMOVE\_FROM\_ROUTE*

Its value is an array that contains one of the following:

- *ALL\_OBJ*
- *IT\_OR\_THERE*
- a string that indicates the ordinal of the object to be removed.
- a string that indicates a category of objects to be removed.
- a string that indicates the object to be removed.

For *REPORT\_GEO\_EVENT* intent, it may not always be present and its value is an array that contains one string that presents the event, e.g. crime, hear attack, road accident, ...etc.

For *SAVE\_PHONE\_NUMBER* intent, it may not always be present and its value is an array that contains a phone number string.

For *SEND\_LOCATION* intent, it may not always be present and its value is an array that contains one of the following:

- *MYSELF*
- *FACEBOOK*
- *TWITTER*
- a string that represents a contact name
- a string that contains a phone number

For *SYS\_TIME* intent, it may not always be present and its value is an array that contains one of the following:

- *ORIGIN*
- *IT\_OR\_THERE*
- *HOME*
- *WORK*
- a string that indicates a location

For *TRAFFIC* intent, it may not always be present and its value is an array that contains one of the following:

- *ROUTE\_OBJ*
- *ORIGIN*
- *IT\_OR\_THERE*
- *HOME*
- *WORK*
- a string that indicates a location

For the following intents, it may not always be present:

- *USE\_FIRST*
- *USE\_LAST*
- *USE\_NEXT*
- *USE\_PREV*

Its value is an array that contains one of the following:

- *ROUTE\_OBJ*
- a string that indicates a search topic

For *USE\_LANGUAGE* intent, it may not always be present and its value is an array that contains one of the following string:

- *NONE*
- *ENGLISH*
- *FRENCH*
- *GERMAN*

`public static final Field STOPOVER`

Used to indicate a stopover for the following intents and may not always be present:

- *ADD\_STOPOVER*
- *DISTANCE\_FROM\_TO*
- *ROUTE\_FROM\_TO*
- *TIME\_FROM\_TO*

Its value is an array that contains at least one of the following:

- *IT\_OR\_THERE*
- *HOME*
- *WORK*
- a string that indicates a category for the stopover
- a string that represents a location
- a string that represents a collected place

```
public static final Field BY_NUMBER
```

Indicates whether value provided for *TARGET* in *CALL\_NUMBER* intent is a phone number to be used for making a call. Its value is an array of one of the following:

- *TRUE*
- *FALSE*

This may not always be present. When not present, it's assumed that the value provided for *TARGET* is not a phone number.

```
public static final Field MESSAGE
```

Text of the message for *SEND\_MESSAGE* intent. This may not always be present. Its value is an array of one string that indicates the message to be sent.

```
public static final Field TOGGLE
```

To turn a feature on/off for the following intents:

- *COMPASS\_MODE*
- *DELAY\_NAVIGATION\_START*
- *REPEAT\_AFTER\_ME*
- *SPEED\_WARNING*
- *TRACK\_GPS*
- *TRAFFIC*

Its value is an array of one of the following:

- *ON*
- *OFF*

This will always be present except for *TRAFFIC*. For *TRAFFIC* intent, when it's absent, it's assumed to be *ON*.

```
public static final Field BY
```

Transport indicator for the following intents and may not always be present:

- *DISTANCE\_FROM\_TO*
- *ROUTE\_FROM\_TO*
- *TIME\_FROM\_TO*

Its value is an array of one of the following:

- *BUS*
- *CAR*
- *FERRY*
- *FLIGHT*
- *TAXI*
- *TRAIN*
- *TRANSIT*
- *WALK*

```
public static final Field COLLECTION_NAME
```

Collection name for the following intents and may not always be present:

- *CHECK\_COLLECTION*
- *COLLECT\_LOCATION*
- *LIST\_COLLECTION*
- *REMOVE\_FROM\_COLLECTION*

This will always be present for the following intents:

- *CREATE\_COLLECTION*
- *NUMBER\_OF*

Its value is an array that contains one string representing the name of the collection.

```
public static final Field COLLECTION_ITEM
```

Collected item for the following intents and may not always be present:

- *COPY\_COLLECTION*
- *RENAME\_COLLECTION*

Its value is an array that contains one of the following:

- *IT\_OR\_THERE*
- *ALL\_OBJ*
- a string that presents the name of the item in the collection
- a string that presents the ordinal of the item in the collection

```
public static final Field CONTACT
```

Contact name for the following intents and may not always be present:

- *REMOVE\_FROM\_CONTACTS*
- *SAVE\_PHONE\_NUMBER*

Its value is an array that contains one string representing the name of the contact.

```
public static final Field CATEGORY
```

Category for the following intents and may not always be present:

- *COLLECT\_LOCATION*
- *POI*

Its value is an array that contains one string representing a category, e.g. restaurant, parking, hotel, ...etc.

```
public static final Field WHEN
```

Time reference for the following intents and may not always be present:

- *POI*
- *ROUTE\_FROM\_TO*
- *TRAFFIC*
- *WEATHER*

Its value is an array that contains at least one of the following:

- today
- tomorrow
- day after tomorrow
- now
- time, e.g. 5pm
- day of the week, e.g. Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday, weekend
- date, 1st of January, January 1st
- month, e.g. January, February, March, ...etc.

## public static final *Field* CONVERSATION

Asking user for more info. Conversation support for *COLLECT\_LOCATION* intent and may not always be present. Its value is an array that contains one of the following:

- *ON*

When absent, it should be assumed to be *OFF*.

## public static final *Field* USE\_LAST\_INTENT

Indicates whether to use previous intent for context for *POI* intent and may not always be present. Its value is an array that contains one of the following:

- *ON*

When absent, it should be assumed to be *OFF*.

## public static final *Field* ONLINE\_DEDUCTION

Indicates whether to use remote backend vs local NLP database for deduction. This is applicable for *SET\_PARAM* intent and may not always be present. Its value is an array that contains one of the following:

- *ON*
- *OFF*

## public static final *Field* WAKEUP\_WORDS

Whether to use wakeup words for *SET\_PARAM* intent and may not always be present. Its value is an array that contains one of the following:

- *ON*
- *OFF*

```
public static final Field DISTANCE_MEASURE
```

Distance measurement for *SET\_PARAM* intent and may not always be present. Its value is an array that contains one of the following:

- *ABBREVIATED\_KILOMETER*
- *MILE*

```
public static final Field SHOW_ROUTE_ONLY
```

Indicate whether to just show the route without starting navigation for the following intents and may not always be present:

- *ROUTE\_FROM\_TO*

Its value is an array that contains one of the following:

- *TRUE*
- *FALSE*

```
public static final Field SIMULATE
```

Indicates whether to start guidance simulation for *ROUTE\_FROM\_TO* intent and may not always be present. Its value is an array that contains one of the following:

- *ON*
- *OFF*

When absent, it should be assumed to be *OFF*.

```
public static final Field ALTERNATIVE_ROUTE
```

Indicates whether to calculate a route for *ROUTE\_FROM\_TO* intent and may not always be present. Its value is an array that contains one of the following:

- *TRUE*
- *FALSE*

When absent, it should be assumed to be *FALSE*.

Note that *ALTERNATIVE\_ROUTE* means to stop using the existing route and get a new route to an alternative destination. E.g. instead of the current route to the closest Starbucks, show route to a different Starbucks. On the other hand, *REROUTE* means to stop using the existing route and get a new route to the same destination.

```
public static final Field FIRST_OPERAND
```

First operand of an arithmetic expression for *MATH* intent and it's always present. Its value is an array of one numeric string.

```
public static final Field SECOND_OPERAND
```

Second operand of an arithmetic expression for *MATH* intent and it's always present. Its value is an array of one numeric string.

```
public static final Field OPERATOR
```

Operator of an arithmetic expression for *MATH* intent and it's always present. Its value is an array that contains one of the following:

- +
- -
- \*
- /

### Method Details

```
public static Field get (String name)
```

Retrieve enum value from the given string. e.g. `Field.get("vendor");` returns `Field.VENDOR`.

#### Parameters:

- **name**  
string to be matched

#### Returns:

null if there is no enum with the specified name

```
public String getName ()
```

Retrieve string value for the enum, e.g. `Field.VENDOR.getName();` returns "vendor".

#### Returns:

String value for the enum

```
public static Field valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static Intention.Field[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Function

The enumeration *Function* is a member of *com.here.android.mpa.nlp.Intention*.

### Enumeration Summary

public static final enumeration **Intention.Function**

extends *java.lang.Enum*, *java.lang.Object*

Function values for *FUNCTION*.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

**Table 889: Enum Constants in Function**

Fields
public static final <i>Function</i> <b>NO_ACTION</b> No deduction has been attempted.
public static final <i>Function</i> <b>NOTHING</b> A deduction is attempted, but failed.
public static final <i>Function</i> <b>USE_LANGUAGE</b> Set language for navigation.
public static final <i>Function</i> <b>VOLUME</b> Set Text to speech volume.
public static final <i>Function</i> <b>SPEED_WARNING</b> Set speed warning for navigation.
public static final <i>Function</i> <b>CHECK_SPEED</b> Check current speed.
public static final <i>Function</i> <b>CHANGE_MAP_CENTER</b> Change map center.
public static final <i>Function</i> <b>POI</b> Search for the Point of Interest or use the specified Point of Interest to provide context for the next operation.
public static final <i>Function</i> <b>WEB_SEARCH</b> Search google for the subject.
public static final <i>Function</i> <b>WEATHER</b> Weather request.

## Fields

```
public static final Function TIME_FROM_TO
```

Time "from" "to".

```
public static final Function DISTANCE_FROM_TO
```

Distance "from" "to".

```
public static final Function ROUTE_FROM_TO
```

Routing "from" "to".

```
public static final Function ADD_STOPOVER
```

Add location to the route calculation.

```
public static final Function PLACE_INFO
```

Provide info about a POI.

```
public static final Function CREATE_COLLECTION
```

Create collection.

```
public static final Function COLLECT_LOCATION
```

Save the POI into collection.

```
public static final Function COPY_COLLECTION
```

Copy collection places.

```
public static final Function RENAME_COLLECTION
```

Rename collection places.

```
public static final Function LIST_COLLECTION
```

To list the collection places.

```
public static final Function CHECK_COLLECTION
```

Check whether a collection place exists.

```
public static final Function LIST_ROUTE
```

To list route stops.

```
public static final Function LIST_SEARCH_RESULTS
```

To list search results.

```
public static final Function TRAFFIC
```

Traffic report.

```
public static final Function ADDRESS
```

Get current or destination address based on the context.

```
public static final Function GPS_LOCATION
```

Get current GPS coordinates.

```
public static final Function ELEVATION
```

Get current elevation.

## Fields

```
public static final Function SEARCH_RESULT_LIMIT
```

Set maximum number of results.

```
public static final Function SYS_TIME
```

Check system time.

```
public static final Function SYS_BATTERY
```

Check system battery.

```
public static final Function START_TALKING
```

Start talking.

```
public static final Function STOP_TALKING
```

Stop talking.

```
public static final Function REPEAT_AFTER_ME
```

Repeat ASR result.

```
public static final Function REPEAT
```

Playback the last spoken statement.

```
public static final Function ZOOM
```

Zoom in/out the map.

```
public static final Function DOWNLOAD
```

Download map data package(s).

```
public static final Function DAY_MODE
```

Set map to day mode.

```
public static final Function NIGHT_MODE
```

Set map to night mode.

```
public static final Function SAT_MODE
```

Set map to satellite mode.

```
public static final Function TALK_SPEED
```

Set talk back speed to slow, slower, fast, faster, or normal.

```
public static final Function USE_FIRST
```

Scroll to the first item of the search result.

```
public static final Function USE_LAST
```

Scroll to the last item of the search result.

```
public static final Function USE_PREV
```

Scroll to the previous item of the search result.

```
public static final Function USE_NEXT
```

Scroll to the next item of the search result.

**Fields**

```
public static final Function MORE
```

More of previous intent.

```
public static final Function LESS
```

Less of previous intent.

```
public static final Function PAUSE
```

Pause an operation that may have been executed from previous intent.

```
public static final Function RESUME
```

Resume an operation that may have been executed from previous intent.

```
public static final Function STOP
```

Stop an operation that may have been executed from previous intent.

```
public static final Function RESET
```

Reset any cached data.

```
public static final Function DELAY_NAVIGATION_START
```

Delay navigation.

```
public static final Function ACCOUNT_NAME
```

Account name.

```
public static final Function CALL_NUMBER
```

Make a call.

```
public static final Function SAVE_PHONE_NUMBER
```

Save the phone number.

```
public static final Function SEND_LOCATION
```

Send location information to SMS, Facebook, email, etc.

```
public static final Function SEND_MESSAGE
```

Send a text message.

```
public static final Function COMPASS_MODE
```

Enable/disable compass mode.

```
public static final Function TRACK_GPS
```

Enable/disable map tracking.

```
public static final Function REPORT_GEO_EVENT
```

Reporting Geo tagged event: crime, health, traffic.

```
public static final Function REMOVE
```

Remove based on context.

```
public static final Function REMOVE_FROM_MAP
```

Remove object(s) from the map.

## Fields

`public static final Function REMOVE_FROM_COLLECTION`

Remove collection place(s).

`public static final Function REMOVE_FROM_ROUTE`

Remove a stopover from the route.

`public static final Function REMOVE_FROM_CONTACTS`

Remove a contact.

`public static final Function RELOAD`

Reload NLP database.

`public static final Function NUMBER_OF`

Retrieve the number items.

`public static final Function Q_A`

Non-functional related conversation with the end user to keep him/her engaged.

`public static final Function Q_YES`

Positive response to a question.

`public static final Function Q_NO`

Negative response to a question.

`public static final Function SET_PARAM`

Set system-wide parameters for *DISTANCE\_MEASURE*, *WAKEUP\_WORDS*, or *ONLINE\_DEDUCTION*.

`public static final Function MATH`

Evaluate a simple mathematical equation which adds, subtracts, multiplies, or divide 2 numbers.

`public static final Function TEACHING`

Teach the system about oneself for personalization.

`public static final Function NEG_FEEDBACK`

Negative feedback about incorrect NLP deduction or search/routing result does not meet user's expectation.

## Method Summary

Table 890: Methods in Function

### Methods

`public static Function get (String name)`

Retrieve enum value from the given string.

`public String getName ()`

Retrieve string value for the enum, e.g.

`public static Function valueOf (String name)`

This method retrieves the enumeration value that matches the name specified by the caller.

## Methods

```
public static Intention.Function[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

---

## Enumeration Details

Function values for *FUNCTION*.

### Enum Constant Details

```
public static final Function NO_ACTION
```

No deduction has been attempted.

```
public static final Function NOTHING
```

A deduction is attempted, but failed. e.g.

```
{
  "text":["what's the meaning of life"],
  "func":["NOTHING"],
  "reply":["Come again"]
}
```

```
public static final Function USE_LANGUAGE
```

Set language for navigation. e.g.

```
{
  :
  "text":["use english for navigation"],
  "func":["USE_LANGUAGE"],
  "target":["english"]
}
```

```
public static final Function VOLUME
```

Set Text to speech volume. e.g.

```
{
  :
  "text":["turn down the volume"],
  "func":["VOLUME"],
  "target":["less"]
}
```

```
public static final Function SPEED_WARNING
```

Set speed warning for navigation. e.g.

```
    {
      :
      "text":["stop speed warning"],
      "func":["SPEED_WARNING"],
      "toggle":["off_"]
    }
```

public static final *Function* CHECK\_SPEED

Check current speed. e.g.

```
    {
      :
      "text":["what's my speed"],
      "func":["CHECK_SPEED"]
    }
```

public static final *Function* CHANGE\_MAP\_CENTER

Change map center. e.g.

```
    {
      :
      "text":["change map center to seattle"],
      "func":["CHANGE_MAP_CENTER"],
      "target":["seattle"]
    }
```

public static final *Function* POI

Search for the Point of Interest or use the specified Point of Interest to provide context for the next operation. e.g

```
    {
      :
      "text":["Where is Seattle?"],
      "func":["POI"],
      "target":["Seattle"]
    }
```

This is an intent to search for the point of interest specified by *TARGET*.

For another example, assuming there is an intent to search for "Starbucks" prior to user saying "second one".

```
    {
      :
      "text":["second one"],
      "func":["POI"],
      "target":["2"]
    }
```

```
}
```

This is an intent to use the second search result for the next operation.

```
public static final Function WEB_SEARCH
```

Search google for the subject. e.g.

```
    {  
    :  
    "text":["google seattle"],  
    "func":["WEB_SEARCH"],  
    "target":["seattle"]  
    }
```

```
public static final Function WEATHER
```

Weather request. e.g.

```
    {  
    :  
    "text":["what's the weather in seattle today"],  
    "func":["WEATHER"],  
    "when":["today"],  
    "where":["seattle"]  
    }
```

```
public static final Function TIME_FROM_TO
```

Time "from" "to". e.g.

```
    {  
    :  
    "text":["how long does it take to go from vancouver to  
seattle?"],  
    "func":["TIME_FROM_TO"],  
    "from":["vancouver"],  
    "target":["seattle"]  
    }
```

```
public static final Function DISTANCE_FROM_TO
```

Distance "from" "to". e.g.

```
    {  
    :  
    "text":["how far is it from vancouver to seattle?"],  
    "func":["DISTANCE_FROM_TO"],  
    "from":["vancouver"],  
    "target":["seattle"]  
    }
```

```
}
```

public static final *Function* ROUTE\_FROM\_TO

Routing "from" "to". e.g.

```
    {
    :
    "text":["Show me the route from vancouver to seattle."],
    "func":["ROUTE_FROM_TO"],
    "from":["vancouver"],
    "target":["seattle"]
    }
```

public static final *Function* ADD\_STOPOVER

Add location to the route calculation. e.g.

```
    {
    :
    "text":["stop at gas station in seattle"],
    "func":["ADD_STOPOVER"],
    "optimize":["false_"],
    "stopover":["gas station"],
    "where_s":["seattle"]
    }
```

public static final *Function* PLACE\_INFO

Provide info about a POI. e.g.

```
    {
    :
    "text":["tell me about seattle"],
    "func":["PLACE_INFO"],
    "target":["seattle"]
    }
```

public static final *Function* CREATE\_COLLECTION

Create collection. e.g.

```
    {
    :
    "text":["create favorites"],
    "func":["CREATE_COLLECTION"]
    }
```

public static final *Function* COLLECT\_LOCATION

Save the POI into collection. e.g.

```
{
:
"text":["save abc"],
"func":["COLLECT_LOCATION"],
"target":["abc"]
}
```

public static final *Function* COPY\_COLLECTION

Copy collection places. e.g.

```
{
:
"text":["copy collection foo to bar"],
"func":["COPY_COLLECTION"],
"from":["foo"],
"target":["bar"]
}
```

public static final *Function* RENAME\_COLLECTION

Rename collection places. e.g.

```
{
:
"text":["rename collection foo to bar"],
"func":["RENAME_COLLECTION"],
"from":["foo"],
"target":["bar"]
}
```

public static final *Function* LIST\_COLLECTION

To list the collection places. e.g.

```
{
:
"text":["list favorites collection"],
"func":["LIST_COLLECTION"]
}
```

public static final *Function* CHECK\_COLLECTION

Check whether a collection place exists. e.g.

```
    {
      :
      "text":["do i have home in my collection?"],
      "func":["CHECK_COLLECTION"],
      "target":["home"]
    }
```

public static final *Function* LIST\_ROUTE

To list route stops. e.g.

```
    {
      :
      "text":["what are my stops"],
      "func":["LIST_ROUTE"]
    }
```

public static final *Function* LIST\_SEARCH\_RESULTS

To list search results. e.g.

```
    {
      :
      "text":["list all found places"],
      "func":["LIST_SEARCH_RESULTS"]
    }
```

public static final *Function* TRAFFIC

Traffic report. e.g.

```
    {
      :
      "text":["how is the traffic in seattle"],
      "func":["TRAFFIC"],
      "where":["seattle"]
    }
```

public static final *Function* ADDRESS

Get current or destination address based on the context. e.g.

```
    {
      :
      "text":["what is the address of space needle"],
      "func":["ADDRESS"],
      "target":["space needle"]
    }
```

public static final *Function* GPS\_LOCATION

Get current GPS coordinates. e.g.

```
{
:
"text":["what are my coordinates"],
"func":["GPS_LOCATION"]
}
```

public static final *Function* ELEVATION

Get current elevation. e.g.

```
{
:
"text":["what is my current elevation"],
"func":["ELEVATION"]
}
```

public static final *Function* SEARCH\_RESULT\_LIMIT

Set maximum number of results. e.g.

```
{
:
"text":["limit search results to 5"],
"func":["SEARCH_RESULT_LIMIT"],
"search_count":["5"]
}
```

public static final *Function* SYS\_TIME

Check system time. e.g.

```
{
:
"text":["what time is it"],
"func":["SYS_TIME"]
}
```

public static final *Function* SYS\_BATTERY

Check system battery. e.g.

```
{
:
"text":["how much battery left"],
"func":["SYS_BATTERY"]
}
```

```
}
```

public static final *Function* START\_TALKING

Start talking. e.g.

```
    {  
    :  
    "text":["tell me in kilometers"],  
    "func":["START_TALKING","SET_PARAM"],  
    "distance_measure":["km"],  
    "reply":["sure"]  
    }
```

public static final *Function* STOP\_TALKING

Stop talking. e.g.

```
    {  
    :  
    "text":["stop talking"],  
    "func":["STOP_TALKING"],  
    "reply":["sure"]  
    }
```

public static final *Function* REPEAT\_AFTER\_ME

Repeat ASR result. e.g.

```
    {  
    :  
    "text":["repeat what i say"],  
    "func":["REPEAT_AFTER_ME"],  
    "toggle":["on_"]  
    }
```

public static final *Function* REPEAT

Playback the last spoken statement. e.g.

```
    {  
    :  
    "text":["say that again"],  
    "func":["REPEAT"]  
    }
```

public static final *Function* ZOOM

Zoom in/out the map. e.g.

```
    {
      :
      "text":["zoom in"],
      "func":["ZOOM"],
      "target":["more"]
    }
```

public static final *Function* DOWNLOAD

Download map data package(s). e.g.

```
    {
      :
      "text":["download british columbia"],
      "func":["DOWNLOAD"],
      "target":["british columbia"]
    }
```

public static final *Function* DAY\_MODE

Set map to day mode. e.g.

```
    {
      :
      "text":["use day mode"],
      "func":["DAY_MODE"]
    }
```

public static final *Function* NIGHT\_MODE

Set map to night mode. e.g.

```
    {
      :
      "text":["use night mode"],
      "func":["NIGHT_MODE"]
    }
```

public static final *Function* SAT\_MODE

Set map to satellite mode. e.g.

```
    {
      :
      "text":["use satellite mode"],
      "func":["SAT_MODE"]
    }
```

```
}
```

```
public static final Function TALK_SPEED
```

Set talk back speed to slow, slower, fast, faster, or normal. e.g.

```
    {  
    :  
    "text":["talk fast"],  
    "func":["TALK_SPEED"],  
    "target":["max"]  
    }
```

```
public static final Function USE_FIRST
```

Scroll to the first item of the search result. e.g.

```
    {  
    :  
    "text":["use first"],  
    "func":["USE_FIRST"]  
    }
```

```
public static final Function USE_LAST
```

Scroll to the last item of the search result. e.g.

```
    {  
    :  
    "text":["use last"],  
    "func":["USE_LAST"]  
    }
```

```
public static final Function USE_PREV
```

Scroll to the previous item of the search result. e.g.

```
    {  
    :  
    "text":["use previous"],  
    "func":["USE_PREV"]  
    }
```

```
public static final Function USE_NEXT
```

Scroll to the next item of the search result. e.g.

```
    {
      :
      "text":["use next"],
      "func":["USE_NEXT"]
    }
```

`public static final Function MORE`

More of previous intent. e.g. if zoom in was the previous intent, this intent is to zoom in further.

```
    {
      :
      "text":["more"],
      "func":["MORE"]
    }
```

`public static final Function LESS`

Less of previous intent. e.g. if zoom in was the previous intent, this intent is to zoom out a little.

```
    {
      :
      "text":["less"],
      "func":["LESS"]
    }
```

`public static final Function PAUSE`

Pause an operation that may have been executed from previous intent. e.g. if navigation was started prior to this, this intent will be to pause navigation.

```
    {
      :
      "text":["pause"],
      "func":["PAUSE"]
    }
```

`public static final Function RESUME`

Resume an operation that may have been executed from previous intent. e.g. if navigation was paused prior to this, this intent will be to resume navigation.

```
    {
      :
      "text":["continue"],
      "func":["RESUME"]
    }
```

```
}
```

public static final *Function* STOP

Stop an operation that may have been executed from previous intent. e.g. if navigation was started prior to this, this intent will be to stop navigation.

```
{
  :
  "text":["stop"],
  "func":["STOP"]
}
```

public static final *Function* RESET

Reset any cached data. e.g.

```
{
  :
  "text":["reset"],
  "func":["RESET"],
  "reply":["sure"]
}
```

public static final *Function* DELAY\_NAVIGATION\_START

Delay navigation. The intent is not to automatically start navigation for "take me to McDonalds", but to show the route only. e.g.

```
{
  :
  "text":["don't start navigation right away"],
  "func":["DELAY_NAVIGATION_START"],
  "toggle":["on_"]
}
```

public static final *Function* ACCOUNT\_NAME

Account name. e.g.

```
{
  :
  "text":["what is my account name"],
  "func":["ACCOUNT_NAME"]
}
```

public static final *Function* CALL\_NUMBER

Make a call. e.g.

```
{
  :
  "text":["call emergency"],
  "func":["CALL_NUMBER"],
  "by_number":["true"],
  "target":["911"]
}
```

public static final *Function* SAVE\_PHONE\_NUMBER

Save the phone number. e.g.

```
{
  :
  "text":["save 911 as emergency"],
  "func":["SAVE_PHONE_NUMBER"],
  "contact":["emergency"],
  "target":["911"]
}
```

public static final *Function* SEND\_LOCATION

Send location information to SMS, Facebook, email, etc. e.g.

```
{
  :
  "text":["publish my location on facebook"],
  "func":["SEND_LOCATION"],
  "target":["facebook"]
}
```

public static final *Function* SEND\_MESSAGE

Send a text message. e.g.

```
{
  :
  "text":["send a message to my wife that i will be late for
dinner"],
  "func":["SEND_MESSAGE"],
  "message":["i will be late for dinner"],
  "target":["wife"]
}
```

public static final *Function* COMPASS\_MODE

Enable/disable compass mode. When enabled, map will be shown with north up. e.g.

```
{
  :
  "text":["enable compass"],
  "func":["COMPASS_MODE"],
  "toggle":["on_"]
}
```

public static final *Function* TRACK\_GPS

Enable/disable map tracking. When enabled, current location will always be visible at the center of the map. e.g.

```
{
  :
  "text":["center the map to my current location"],
  "func":["TRACK_GPS"],
  "toggle":["on_"]
}
```

public static final *Function* REPORT\_GEO\_EVENT

Reporting Geo tagged event: crime, health, traffic. e.g.

```
{
  :
  "text":["i just saw a car accident here"],
  "func":["REPORT_GEO_EVENT"],
  "target":["accident"],
  "type":["event_traffic"]
}
```

public static final *Function* REMOVE

Remove based on context. Context for this may be provided through previous intent and/or additional parameters of the intent. e.g. if there is a stopover added on the route prior to this, this intent will be to remove the stopover from the route.

```
{
  :
  "text":["remove it"],
  "func":["REMOVE"],
  "target":["it_there"]
}
```

public static final *Function* REMOVE\_FROM\_MAP

Remove object(s) from the map. e.g.

```
{
  :
  "text":["remove markers from the map"],
  "func":["REMOVE_FROM_MAP"],
  "target":["markers"]
}
```

public static final *Function* REMOVE\_FROM\_COLLECTION

Remove collection place(s). e.g.

```
{
  :
  "text":["remove foo from bar collection"],
  "func":["REMOVE_FROM_COLLECTION"],
  "col_name":["bar"],
  "target":["foo"]
}
```

public static final *Function* REMOVE\_FROM\_ROUTE

Remove a stopover from the route. e.g.

```
{
  :
  "text":["remove gas station from the route"],
  "func":["REMOVE_FROM_ROUTE"],
  "target":["gas station"]
}
```

public static final *Function* REMOVE\_FROM\_CONTACTS

Remove a contact. e.g.

```
{
  :
  "text":["remove bob smith from phone list"],
  "func":["REMOVE_FROM_CONTACTS"],
  "target":["bob smith"]
}
```

public static final *Function* RELOAD

Reload NLP database. e.g.

```
{
  "text":["reload database"],
```

```
"func":["RELOAD"],
"reply":["Database reloaded"]
}
```

public static final *Function* NUMBER\_OF

Retrieve the number items. e.g.

```
{
"text":["how many items is in my all collections"],
"func":["NUMBER_OF"],
"col_name":["all_obj"],
"type":["obj_collection"]
}
```

public static final *Function* Q\_A

Non-functional related conversation with the end user to keep him/her engaged. e.g.

```
{
:
"text":["what are you doing"],
"func":["Q_A"],
"reply":["Trying to sleep"]
}
```

public static final *Function* Q\_YES

Positive response to a question. e.g.

```
{
:
"text":["yes"],
"func":["Q_YES"]
}
```

public static final *Function* Q\_NO

Negative response to a question. e.g.

```
{
:
"text":["no"],
"func":["Q_NO"]
}
```

public static final *Function* SET\_PARAM

Set system-wide parameters for *DISTANCE\_MEASURE*, *WAKEUP\_WORDS*, or *ONLINE\_DEDUCTION*. e.g.

```
{
  :
  "text":["use imperial system from now on"],
  "func":["SET_PARAM"],
  "distance_measure":["mile"]
}
```

public static final *Function* MATH

Evaluate a simple mathematical equation which adds, subtracts, multiplies, or divide 2 numbers. e.g.

```
{
  :
  "text":["what is 5 plus 6"],
  "func":["MATH"],
  "arg1":["5"],
  "arg2":["6"],
  "op":["+"]
}
```

public static final *Function* TEACHING

Teach the system about oneself for personalization. e.g.

```
{
  :
  "text":["my name is bob"],
  "func":["TEACHING"],
  "your_name":["bob"]
}
```

public static final *Function* NEG\_FEEDBACK

Negative feedback about incorrect NLP deduction or search/routing result does not meet user's expectation. e.g.

```
{
  :
  "text":["this is not what i meant"],
  "func":["NEG_FEEDBACK"],
  "reply":["Sorry"]
}
```

## Method Details

public static *Function* get (String name)

Retrieve enum value from the given string. e.g. `Function.get("POI");` returns `Function.POI`.

**Parameters:**

- **name**  
string to be matched

**Returns:**

null if there is no enum with the specified name

```
public String getName ()
```

Retrieve string value for the enum, e.g. `Function.POI.getName();` returns "POI".

**Returns:**

String value for the enum

```
public static Function valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

**Parameters:**

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static Intention.Function[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Value

The enumeration *Value* is a member of `com.here.android.mpa.nlp.Intention`.

### Enumeration Summary

```
public static final enumeration Intention.Value
```

```
extends java.lang.Enum, java.lang.Object
```

```
values for Intention.Field
```

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 891: Enum Constants in Value

Fields
<p><code>public static final Value NONE</code> Explicit no value</p>
<p><code>public static final Value HERE</code> Value for <i>VENDOR</i></p>
<p><code>public static final Value MAP</code> Map domain</p>
<p><code>public static final Value ENGLISH</code> English Language</p>
<p><code>public static final Value GERMAN</code> German Language</p>
<p><code>public static final Value FRENCH</code> French Language</p>
<p><code>public static final Value ORIGIN</code> Current geo location</p>
<p><code>public static final Value IT_OR_THERE</code> It or there</p>
<p><code>public static final Value EVENT_TRAFFIC</code> Traffic event for <i>TYPE</i> for <i>REPORT_GEO_EVENT</i> intent.</p>
<p><code>public static final Value EVENT_HEALTH</code> Health event for <i>TYPE</i> for <i>REPORT_GEO_EVENT</i> intent.</p>
<p><code>public static final Value EVENT_CRIME</code> Crime event for <i>TYPE</i> for <i>REPORT_GEO_EVENT</i> intent.</p>
<p><code>public static final Value FASTEST</code> Fastest route type.</p>
<p><code>public static final Value SHORTEST</code> Shortest route type.</p>
<p><code>public static final Value OPTIMAL</code> Optimal route type.</p>
<p><code>public static final Value NORMAL</code> Normal talk speed.</p>
<p><code>public static final Value ON</code> Constant for on.</p>

**Fields**

```
public static final Value OFF
```

Constant for off.

```
public static final Value TRUE
```

Constant for true.

```
public static final Value FALSE
```

Constant for false.

```
public static final Value MORE
```

Increase the value for volume, talk speed, or zoom.

```
public static final Value LESS
```

Decrease the value for volume, talk speed, or zoom.

```
public static final Value MAXIMUM
```

Maximum value

```
public static final Value MINIMUM
```

Minimum value

```
public static final Value ABBREVIATED_KILOMETER
```

Measurement value indicating kilometer or metric measurement system.

```
public static final Value KILOMETER
```

Measurement value indicating kilometer or metric measurement system.

```
public static final Value ABBREVIATED_METER
```

Measurement value for meter or metric measurement system.

```
public static final Value METER
```

Measurement value for meter or metric measurement system.

```
public static final Value FEET
```

Measurement value for feet or imperial measurement system.

```
public static final Value YARD
```

Measurement value for yard or imperial measurement system.

```
public static final Value MILE
```

Measurement value for mile or imperial measurement system.

```
public static final Value MINUTES
```

Time measurement value

```
public static final Value HOURS
```

Time measurement value

```
public static final Value DAYS
```

Time measurement value

## Fields

`public static final Value BUS`

Transportation type

`public static final Value CAR`

Transportation type

`public static final Value WALK`

Transportation type

`public static final Value TAXI`

Transportation type

`public static final Value FERRY`

Transportation type

`public static final Value FLIGHT`

Transportation type

`public static final Value TRAIN`

Transportation type

`public static final Value TRANSIT`

Transportation type

`public static final Value TRANSPORT`

Transportation type

`public static final Value FACEBOOK`

Publish destinations for `SEND_LOCATION` intent.

`public static final Value TWITTER`

Publish destinations for `SEND_LOCATION` intent.

`public static final Value HOME`

Home

`public static final Value WORK`

Work

`public static final Value PLACE_OBJ`

A place

`public static final Value ROUTE_OBJ`

A route

`public static final Value ALTERNATIVE_ROUTE_OBJ`

An alternative route to the same destination

`public static final Value COLLECTION_OBJ`

A collection

## Fields

public static final Value **STOPOVER\_OBJ**

A stopover

public static final Value **DESTINATION\_OBJ**

A destination

public static final Value **NEXT\_MANEUVER\_OBJ**

The next maneuver

public static final Value **PHONE\_OBJ**

A phone number

public static final Value **ALL\_OBJ**

All objects

public static final Value **MYSELF**

Used to indicate the owner.

public static final Value **AM**

AM time suffix

public static final Value **PM**

PM time suffix

public static final Value **FINE**

Subcategorization for search, e.g.

public static final Value **MID**

Subcategorization for search, e.g.

public static final Value **CHEAP**

Subcategorization for search, e.g.

public static final Value **GOOD**

Rating for a place

public static final Value **BAD**

Rating for a place

public static final Value **POPULAR**

Rating for a place

## Method Summary

Table 892: Methods in Value

### Methods

public static Value **get** (String name)

Retrieve enum value from the given string.

## Methods

```
public String getName ()
```

Retrieve string value for the enum, e.g.

```
public static Value valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static Intention.Value[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

values for *Intention.Field*

### Enum Constant Details

```
public static final Value NONE
```

Explicit no value

```
public static final Value HERE
```

Value for *VENDOR*

```
public static final Value MAP
```

Map domain

```
public static final Value ENGLISH
```

English Language

```
public static final Value GERMAN
```

German Language

```
public static final Value FRENCH
```

French Language

```
public static final Value ORIGIN
```

Current geo location

```
public static final Value IT_OR_THERE
```

It or there

```
public static final Value EVENT_TRAFFIC
```

Traffic event for *TYPE* for *REPORT\_GEO\_EVENT* intent.

```
public static final Value EVENT_HEALTH
```

Health event for *TYPE* for *REPORT\_GEO\_EVENT* intent.

```
public static final Value EVENT_CRIME
```

Crime event for *TYPE* for *REPORT\_GEO\_EVENT* intent.

```
public static final Value FASTEST
```

Fastest route type.

```
public static final Value SHORTEST
```

Shortest route type.

```
public static final Value OPTIMAL
```

Optimal route type.

```
public static final Value NORMAL
```

Normal talk speed.

```
public static final Value ON
```

Constant for on.

```
public static final Value OFF
```

Constant for off.

```
public static final Value TRUE
```

Constant for true.

```
public static final Value FALSE
```

Constant for false.

```
public static final Value MORE
```

Increase the value for volume, talk speed, or zoom.

```
public static final Value LESS
```

Decrease the value for volume, talk speed, or zoom.

```
public static final Value MAXIMUM
```

Maximum value

```
public static final Value MINIMUM
```

Minimum value

```
public static final Value ABBREVIATED_KILOMETER
```

Measurement value indicating kilometer or metric measurement system.

```
public static final Value KILOMETER
```

Measurement value indicating kilometer or metric measurement system.

```
public static final Value ABBREVIATED_METER
```

Measurement value for meter or metric measurement system.

```
public static final Value METER
```

Measurement value for meter or metric measurement system.

```
public static final Value FEET
```

Measurement value for feet or imperial measurement system.

```
public static final Value YARD
```

Measurement value for yard or imperial measurement system.

```
public static final Value MILE
```

Measurement value for mile or imperial measurement system.

```
public static final Value MINUTES
```

Time measurement value

```
public static final Value HOURS
```

Time measurement value

```
public static final Value DAYS
```

Time measurement value

```
public static final Value BUS
```

Transportation type

```
public static final Value CAR
```

Transportation type

```
public static final Value WALK
```

Transportation type

```
public static final Value TAXI
```

Transportation type

```
public static final Value FERRY
```

Transportation type

```
public static final Value FLIGHT
```

Transportation type

```
public static final Value TRAIN
```

Transportation type

```
public static final Value TRANSIT
```

Transportation type

```
public static final Value TRANSPORT
```

Transportation type

```
public static final Value FACEBOOK
```

Publish destinations for *SEND\_LOCATION* intent.

```
public static final Value TWITTER
```

Publish destinations for *SEND\_LOCATION* intent.

```
public static final Value HOME
```

Home

```
public static final Value WORK
```

Work

```
public static final Value PLACE_OBJ
```

A place

```
public static final Value ROUTE_OBJ
```

A route

```
public static final Value ALTERNATIVE_ROUTE_OBJ
```

An alternative route to the same destination

```
public static final Value COLLECTION_OBJ
```

A collection

```
public static final Value STOPOVER_OBJ
```

A stopover

```
public static final Value DESTINATION_OBJ
```

A destination

```
public static final Value NEXT_MANEUVER_OBJ
```

The next maneuver

```
public static final Value PHONE_OBJ
```

A phone number

```
public static final Value ALL_OBJ
```

All objects

```
public static final Value MYSELF
```

Used to indicate the owner. Test: send my location to "me"

```
public static final Value AM
```

AM time suffix

```
public static final Value PM
```

PM time suffix

```
public static final Value FINE
```

Subcategorization for search, e.g. fine dining.

```
public static final Value MID
```

Subcategorization for search, e.g. mid priced restaurant

```
public static final Value CHEAP
```

Subcategorization for search, e.g. cheap restaurant

```
public static final Value GOOD
```

Rating for a place

```
public static final Value BAD
```

Rating for a place

```
public static final Value POPULAR
```

Rating for a place

## Method Details

```
public static Value get (String name)
```

Retrieve enum value from the given string. e.g. `Value.get("eng");` returns `Value.ENGLISH`.

### Parameters:

- **name**  
string to be matched

### Returns:

null if there is no enum with the specified name

```
public String getName ()
```

Retrieve string value for the enum, e.g. `Value.ENGLISH.getName();` returns "eng".

### Returns:

String value for the enum

```
public static Value valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static Intention.Value[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Nlp

The class *Nlp* is a member of *com.here.android.mpa.nlp*.

### Class Summary

public final class **Nlp**

*extends java.lang.Object*

This is the Natural Language Processor interface.

[For complete information, see the section *Class Details*]

### Nested Class Summary

Table 893: Nested Classes in Nlp

Nested Classes	
public static abstract interface	<i>Nlp.ListenerBase</i> Base event listener interface
public static abstract interface	<i>Nlp.OnBatteryLevelListener</i> The remaining battery level event listener interface
public static abstract interface	<i>Nlp.OnClearListener</i> Listener interface for clearing objects from the map.
public static abstract interface	<i>Nlp.OnCurrentAddressListener</i> Address at the current geo location is ready event listener interface.
public static abstract interface	<i>Nlp.OnCurrentTimeListener</i> The current time event listener interface
public static abstract interface	<i>Nlp.OnInitializationListener</i> Represents a listener to provide notification of the Nlp status upon completion of initialization.
public static abstract interface	<i>Nlp.OnIntentListener</i> Intention is ready event listener interface.
public static abstract interface	<i>Nlp.OnMapSchemeChangedListener</i> <i>Map.Scheme</i> of the <i>Map</i> object has been changed event listener interface.
public static abstract interface	<i>Nlp.OnNavigationListener</i> Navigation listener interface
public static abstract interface	<i>Nlp.OnParameterListener</i> Parameter event listener interface

## Nested Classes

public static abstract interface [Nlp.OnPlaceFocusChangedListener](#)

Listener for a client focus change to another place

public static abstract interface [Nlp.OnRemoveFromRouteListener](#)

Listener interface to notify user that a stopover is removed from the route

public static abstract interface [Nlp.OnResetListener](#)

Listener interface to notify that user wants to do the reset.

public static abstract interface [Nlp.OnRouteListener](#)

Route object is available event interface.

public static abstract interface [Nlp.OnRouteResultsAddedListener](#)

Listener interface for adding route results from the application to NLP.

public static abstract interface [Nlp.OnSearchListener](#)

Search listener interface.

public static abstract interface [Nlp.OnSendLocationListener](#)

The send location event listener interface

public static abstract interface [Nlp.OnSendSMSListener](#)

The send SMS event listener interface

public static abstract interface [Nlp.OnSpeedListener](#)

The speed value event listener interface

public static abstract interface [Nlp.OnSpeedWarningSwitchListener](#)

The speed warning mode during navigation event listener interface

public static abstract interface [Nlp.OnTrafficModeListener](#)

The traffic mode changed event listener interface

public static abstract interface [Nlp.OnTravelDistanceListener](#)

The travel distance to specified location event listener interface

public static abstract interface [Nlp.OnTravelTimeListener](#)

The travel time to specified location event listener interface

public static final enumeration [Nlp.Reply](#)

Client's responses on the events triggered by NLP

## Method Summary

Table 894: Methods in Nlp

Methods
<pre>public void <b>addListener</b> (<i>ListenerBase</i> listener)</pre> <p>Adds an event listener to <i>Nlp</i>. <i>Nlp.OnBatteryLevelListener</i> <i>Nlp.OnCurrentAddressListener</i> <i>Nlp.OnCurrentTimeListener</i> <i>Nlp.OnIntentListener</i> <i>Nlp.OnMapSchemeChangedListener</i> <i>Nlp.OnNavigationListener</i> <i>Nlp.OnPlaceFocusChangedListener</i> <i>Nlp.OnRouteListener</i> <i>Nlp.OnSearchListener</i> <i>Nlp.OnSendLocationListener</i> <i>Nlp.OnSendSMSListener</i> <i>Nlp.OnSpeedListener</i> <i>Nlp.OnSpeedWarningSwitchListener</i> <i>Nlp.OnTrafficModeListener</i> <i>Nlp.OnTravelDistanceListener</i> <i>Nlp.OnTravelTimeListener</i> <i>Nlp.OnClearListener</i> <i>Nlp.OnRemoveFromRouteListener</i> <i>Nlp.OnParameterListener</i> <i>Nlp.OnResetListener</i></p>
<pre>public static <i>Nlp</i> <b>getInstance</b> ()</pre> <p>Returns the <i>Nlp</i> singleton: creates it or returns the already created one.</p>
<pre>public java.util.List &lt;<i>Place</i>&gt; <b>getRoutePlaces</b> (<i>Route</i> route)</pre> <p>Get the <i>Places</i> of the <i>Route</i>.</p>
<pre>public int <b>getSpeechVolume</b> ()</pre> <p>Get the current speech volume percentage.</p>
<pre>public void <b>init</b> (<i>Context</i> context, <i>MapFragment</i> mapFragment, <i>CollectionProvider</i> collectionProvider, <i>SpeechToTextProvider</i> speechToTextProvider, <i>OnInitializationListener</i> listener)</pre> <p>Asynchronously initialize <i>Nlp</i>.</p>
<pre>public void <b>init</b> (<i>Context</i> context, <i>Map</i> map, <i>MapGesture</i> mapGesture, <i>CollectionProvider</i> collectionProvider, <i>SpeechToTextProvider</i> speechToTextProvider, <i>OnInitializationListener</i> listener)</pre> <p>Asynchronously initialize <i>Nlp</i>.</p>
<pre>public static boolean <b>isInitialized</b> ()</pre> <p>Gets the initialization state of <i>Nlp</i>.</p>
<pre>public boolean <b>isLocationTrackingEnabled</b> ()</pre> <p>Check if automatic location tracking is enabled.</p>
<pre>public boolean <b>isMetricSystemEnabled</b> ()</pre> <p>Check if metric measurement system is enabled.</p>
<pre>public boolean <b>isOnlineDeductionEnabled</b> ()</pre> <p>Check if online deduction is enabled</p>
<pre>public boolean <b>isRepeatAfterMeEnabled</b> ()</pre> <p>Check if repeat-after-me is enabled</p>
<pre>public boolean <b>isTalkBackEnabled</b> ()</pre> <p>Check if talk-back is enabled</p>
<pre>public void <b>pause</b> ()</pre> <p>Pause NLP</p>

## Methods

public void **removeListener** (*ListenerBase* listener)

Removes an event listener from *Nlp* *Nlp.OnBatteryLevelListener* *Nlp.OnCurrentAddressListener* *Nlp.OnCurrentTimeListener* *Nlp.OnIntentListener* *Nlp.OnMapSchemeChangedListener* *Nlp.OnNavigationListener* *Nlp.OnPlaceFocusChangedListener* *Nlp.OnRouteListener* *Nlp.OnSearchListener* *Nlp.OnSendLocationListener* *Nlp.OnSendSMSListener* *Nlp.OnSpeedListener* *Nlp.OnSpeedWarningSwitchListener* *Nlp.OnTrafficModeListener* *Nlp.OnTravelDistanceListener* *Nlp.OnTravelTimeListener* *Nlp.OnClearListener* *Nlp.OnRemoveFromRouteListener* *Nlp.OnParameterListener* *Nlp.OnResetListener*

public void **reset** ()

Resets Nlp cache (search results or route results).

public void **resume** (Context context)

Resume NLP

public void **setFocusToPlace** (int index)

Client application to notify NLP that "it" would refer to the provided *PlaceLink*.

public void **setFocusToPlace** (*PlaceLink* place)

Client application to notify NLP that "it" would refer to the provided *PlaceLink*.

public void **setFocusToPlace** (String name, *GeoCoordinate* coordinate)

Client application tells NLP to focus on place specified by name and *GeoCoordinate*.

public void **setLocationTrackingEnabled** (boolean enabled)

Enable or disable automatic location tracking.

public void **setMap** (*Map* map)

Set *Map* to be associated with this NLP instance if it's changed since initialization.

public void **setMapFragment** (*MapFragment* mapFragment)

Set *MapFragment* to be associated with this NLP instance if it's changed since initialization.

public void **setMapGesture** (*MapGesture* mapGesture)

Sets the *MapGesture* to be associated with this NLP instance if it is instantiated through (*Context*, *Map*)

public void **setMetricSystemEnabled** (boolean enable)

Controls whether NLP should use metric measurement system or imperial.

public void **setOnlineDeductionEnabled** (boolean enable)

Controls whether NLP deduction happens on the back-end server or on the client side.

public void **setPreferredRoute** (*Route* route)

Client application tells NLP to use a preferred *Route* for navigation purposes.

public void **setRepeatAfterMeEnabled** (boolean enable)

Set repeat-after-me to true lets user to hear the results of voice recognition.

public void **setRouteResult** (*Route* route, List waypointNames)

Set the externally-generated *Route* result with an optional list of names and aliases of the waypoints in the route.

public void **setSearchResults** (*CategoryFilter* filter, java.util.ArrayList <*PlaceLink*> results)

Set the search results in NLP

## Methods

```
public void setSearchResults (GeoCoordinate location, Address address)
```

Set the search results in NLP

```
public void setSearchResults (String searchSubject, java.util.ArrayList <PlaceLink> results)
```

Set the search results in NLP

```
public void setSpeechVolume (int percentage)
```

Set speech volume percentage.

```
public void setTalkBackEnabled (boolean enable)
```

Enable/disable talk-back on a spoken user request

```
public void speak (String text)
```

Speaks the text

```
public void startListening ()
```

Inform Nlp to start listening for the voice input using the Speech Recognizer passed in the initialization phase.

```
public void stopListening ()
```

Stop listening for the voice input.

```
public boolean understand (String utterance)
```

"Understand" the text and produce formalized *Intention* through *onIntent(Intention)*.

## Class Details

This is the Natural Language Processor interface. This controls voice operations for the SDK. Note: The application is responsible for downloading voice skins prior to using Navigation features otherwise no voice will be heard during navigation.

IMPORTANT: Natural language processor is a Beta feature. The related classes are subject to change without notice.

## Method Details

```
public void addListener (ListenerBase listener)
```

Adds an event listener to *Nlp* *Nlp.OnBatteryLevelListener* *Nlp.OnCurrentAddressListener* *Nlp.OnCurrentTimeListener* *Nlp.OnIntentListener* *Nlp.OnMapSchemeChangedListener* *Nlp.OnNavigationListener* *Nlp.OnPlaceFocusChangedListener* *Nlp.OnRouteListener* *Nlp.OnSearchListener* *Nlp.OnSendLocationListener* *Nlp.OnSendSMSListener* *Nlp.OnSpeedListener* *Nlp.OnSpeedWarningSwitchListener* *Nlp.OnTrafficModeListener* *Nlp.OnTravelDistanceListener* *Nlp.OnTravelTimeListener* *Nlp.OnClearListener* *Nlp.OnRemoveFromRouteListener* *Nlp.OnParameterListener* *Nlp.OnResetListener*

### Parameters:

- **listener**  
A *Nlp.ListenerBase* to add to the *Nlp*

```
public static Nlp getInstance ()
```

Returns the *Nlp* singleton: creates it or returns the already created one.

Once the *Nlp* instance is available, it must be initialized through one of the following methods before it can be used:

- [Nlp.init\(Context, MapFragment, CollectionProvider, SpeechToTextProvider, OnInitializationListener\)](#)
- [Nlp.init\(Context, Map, MapGesture, CollectionProvider, SpeechToTextProvider, OnInitializationListener\)](#)

**Returns:**

*Nlp* instance

```
public java.util.List <Place> getRoutePlaces (Route route)
```

Get the *Places* of the *Route*.

**Parameters:**

- **route**

The *Route*, either returned by NLP as a result of a voice query via [onComplete\(Error, Route, List, String, List\)](#) or provided externally by the client using [setRouteResult\(Route, List\)](#)

**Returns:**

List of *Places* included into the route in the correct order. Will return null if *Nlp* has not yet been initialized.

```
public int getSpeechVolume ()
```

Get the current speech volume percentage.

Note this value may be subjected to rounding and may not reflect the original percentage set by [setSpeechVolume\(int\)](#)

**Returns:**

*int* representing the volume percentage ranging from 0 to 100. If speech volume has not yet been set using [setSpeechVolume\(int\)](#), current `android.media.AudioManager#STREAM_MUSIC` volume of the device will be returned. If *Nlp* has not yet been initialized, default volume percentage of 10 will be returned.

**See also:**

[setSpeechVolume\(int\)](#)

```
public void init (Context context, MapFragment mapFragment, CollectionProvider collectionProvider, SpeechToTextProvider speechToTextProvider, OnInitializationListener listener)
```

Asynchronously initialize *Nlp*. *Nlp* cannot be used until it has been initialized successfully. Note: multiple calls to this API will only result on a callback saying initialization was successful. New parameters would be ignored.

**Parameters:**

- **context**  
context to be used during initialization. Must not be null.
- **mapFragment**  
*MapFragment* to be associated with this NLP instance. Must not be null.
- **collectionProvider**  
*CollectionProvider* for collection handling. null if application does not support collections.
- **speechToTextProvider**  
*SpeechToTextProvider* for Speech Recognition. If null, some features will not be available (NLP asking questions and automatically listening for answers for example).
- **listener**  
*Nlp.OnInitializationListener* to provide information when Nlp initialization completes. If null, completion callback will not be received.

```
public void init (Context context, Map map, MapGesture mapGesture,
CollectionProvider collectionProvider, SpeechToTextProvider speechToTextProvider,
OnInitializationListener listener)
```

Asynchronously initialize Nlp . Nlp cannot be used until it has been initialized successfully. Note: multiple calls to this API will only result on a callback saying initialization was successful. New parameters would be ignored.

**Parameters:**

- **context**  
context to be used during initialization. Must not be null.
- **map**  
*Map* to be associated with this NLP instance. Must not be null.
- **mapGesture**  
*MapGesture* Gesture handler for the *Map*, if available.
- **collectionProvider**  
*CollectionProvider* for collection handling. Null if application does not support collections.
- **speechToTextProvider**  
*SpeechToTextProvider* for Speech Recognition. If null, some features will not be available (NLP asking questions and automatically listening for answers for example).
- **listener**  
*Nlp.OnInitializationListener* to provide information when Nlp initialization completes. If null, completion callback will not be received.

```
public static boolean isInitialized ()
```

Gets the initialization state of Nlp .

**Returns:**

true if Nlp is initialized and ready for service.

```
public boolean isLocationTrackingEnabled ()
```

Check if automatic location tracking is enabled.

**Returns:**

true if enabled or if *Nlp* has not yet been initialized; false otherwise.

```
public boolean isMetricSystemEnabled ()
```

Check if metric measurement system is enabled.

**Returns:**

true if enabled or if *Nlp* has not yet been initialized; false otherwise.

```
public boolean isOnlineDeductionEnabled ()
```

Check if online deduction is enabled

**Returns:**

true if enabled or if *Nlp* has not yet been initialized; false otherwise.

```
public boolean isRepeatAfterMeEnabled ()
```

Check if repeat-after-me is enabled

**Returns:**

true if enabled, false otherwise or *Nlp* has not yet been initialized. Default value is false.

```
public boolean isTalkBackEnabled ()
```

Check if talk-back is enabled

**Returns:**

true if enabled, false if disabled or *Nlp* has not yet been initialized. Default value is false.

```
public void pause ()
```

Pause NLP

```
public void removeListener (ListenerBase listener)
```

Removes an event listener from *Nlp* *Nlp.OnBatteryLevelListener* *Nlp.OnCurrentAddressListener* *Nlp.OnCurrentTimeListener* *Nlp.OnIntentListener* *Nlp.OnMapSchemeChangedListener* *Nlp.OnNavigationListener* *Nlp.OnPlaceFocusChangedListener* *Nlp.OnRouteListener* *Nlp.OnSearchListener* *Nlp.OnSendLocationListener* *Nlp.OnSendSMSListener* *Nlp.OnSpeedListener* *Nlp.OnSpeedWarningSwitchListener* *Nlp.OnTrafficModeListener* *Nlp.OnTravelDistanceListener* *Nlp.OnTravelTimeListener* *Nlp.OnClearListener* *Nlp.OnRemoveFromRouteListener* *Nlp.OnParameterListener* *Nlp.OnResetListener*

**Parameters:**

- **listener**

A *Nlp.ListenerBase* to remove from the *Nlp*

```
public void reset ()
```

Resets Nlp cache (search results or route results. It will also stop any ongoing navigation.

```
public void resume (Context context)
```

Resume NLP

**Parameters:**

- **context**

Context to be used. This context may be different from the context passed during initialization. Must not be null.

```
public void setFocusToPlace (int index)
```

Client application to notify NLP that "it" would refer to the provided *PlaceLink*. User may browse among searched places using user interface and then say "Take me there". In order to accommodate this functionality NLP needs to know the place your should refer as "it" or "there".

**Parameters:**

- **index**

Index of the place in the last search results that should be referred as "it" or "there". Example: "Take me there"

```
public void setFocusToPlace (PlaceLink place)
```

Client application to notify NLP that "it" would refer to the provided *PlaceLink*. User may browse among searched places using user interface and then say "Take me there". In order to accommodate this functionality NLP needs to know the place your should refer as "it" or "there".

**Parameters:**

- **place**

Place that should be referred as "it" or "there". Example: "Take me there"

```
public void setFocusToPlace (String name, GeoCoordinate coordinate)
```

Client application tells NLP to focus on place specified by name and *GeoCoordinate*. User may refer to that place as "it" or "there".

**Parameters:**

- **name**  
Place's name
- **coordinate**  
Place's *GeoCoordinate*

```
public void setLocationTrackingEnabled (boolean enabled)
```

Enable or disable automatic location tracking.

**Parameters:**

- **enabled**  
If true, the map will be automatically centered on the user's location. Default is true.

```
public void setMap (Map map)
```

Set *Map* to be associated with this NLP instance if it's changed since initialization. *setMapGesture(MapGesture)* should also be called after *Map* is changed.

**Parameters:**

- **map**  
*Map* to be associated with this NLP instance.

**See also:**

*init(Context, Map, MapGesture, CollectionProvider, SpeechToTextProvider, OnInitializationListener)*  
*setMapGesture(MapGesture)*

```
public void setMapFragment (MapFragment mapFragment)
```

Set *MapFragment* to be associated with this NLP instance if it's changed since initialization.

**Parameters:**

- **mapFragment**  
*MapFragment* to be associated with this NLP instance.

**See also:**

*init(Context, MapFragment, CollectionProvider, SpeechToTextProvider, OnInitializationListener)*

```
public void setMapGesture (MapGesture mapGesture)
```

Sets the MapGesture to be associated with this NLP instance if it is instantiated through (*Context, Map*)

**Parameters:**

- **mapGesture**  
Gesture handler for the *Map*.

```
public void setMetricSystemEnabled (boolean enable)
```

Controls whether NLP should use metric measurement system or imperial.

This may be set by user, please refer to the following for more information: *onParameterChanged(Error, Intention.Field, Intention.Value)*

**Parameters:**

- **enable**  
When true, metric system will be used; when false, imperial system will be used. Default is true.

```
public void setOnlineDeductionEnabled (boolean enable)
```

Controls whether NLP deduction happens on the back-end server or on the client side. This may be set by user, please refer to the following for more information: *onParameterChanged(Error, Intention.Field, Intention.Value)*

**Parameters:**

- **enable**  
When true, NLP deduction happens on the back-end server. When false, NLP deduction happens on the device. Default is true.

```
public void setPreferredRoute (Route route)
```

Client application tells NLP to use a preferred *Route* for navigation purposes. Only one *Route* can be chosen at a time. By default, the preferred route is the route returned in *onComplete(Error, Route, List, String, List)*

**Parameters:**

- **route**  
The preferred *Route*, either returned by NLP as a result of a voice query via *onComplete(Error, Route, List, String, List)* or provided externally by the client using *setRouteResult(Route, List)*

```
public void setRepeatAfterMeEnabled (boolean enable)
```

Set repeat-after-me to true lets user to hear the results of voice recognition. When talk-back is enabled, user will hear the voice statement back, before processing the request. See *#setTalkBackEnabled*.

**Parameters:**

- **enable**

If true, user will hear back the result of the voice recognition. If false, user spoken request will be processed immediately.

```
public void setRouteResult (Route route, List waypointNames)
```

Set the externally-generated *Route* result with an optional list of names and aliases of the waypoints in the route. If the waypoint name array does not match the waypoints in the route, the route place names are resolved internally by NLP, if possible.

The application will receive a *onRouteResultsAdded(Error, Route)* callback when the *Route* has been added to NLP or when there is an error. If there is no error, the application can choose to call *setPreferredRoute(Route)* to set the *Route* as the preferred route in NLP.

The waypoint name aliases allow the application to specify the alias in a voice query (e.g. instead of saying "remove stopover", voice query can be "remove Starbucks", if "Starbucks" is the alias)

**Parameters:**

- **route**

*Route* generated externally by the application

- **waypointNames**

A list of the names and aliases of the waypoints in the route, including the start

```
public void setSearchResults (CategoryFilter filter, java.util.ArrayList  
<PlaceLink> results)
```

Set the search results in NLP

**Parameters:**

- **filter**

Search category. See *CategoryFilter*

- **results**

List of discovered places generated externally by the application

```
public void setSearchResults (GeoCoordinate location, Address address)
```

Set the search results in NLP

**Parameters:**

- **location**

Search center *GeoCoordinate*

- **address**

Address of discovered place *Address* provided by the application

```
public void setSearchResults (String searchSubject, java.util.ArrayList  
<PlaceLink> results)
```

Set the search results in NLP

**Parameters:**

- **searchSubject**  
Search subject name. Example: "hotels"
- **results**  
List of discovered places generated externally by the application

```
public void setSpeechVolume (int percentage)
```

Set speech volume percentage.

**Parameters:**

- **percentage**  
Volume percentage [0..100]. If less than 0, a default minimum volume percentage will be used instead. If greater than 100, it's clipped to 100.

```
public void setTalkBackEnabled (boolean enable)
```

Enable/disable talk-back on a spoken user request

**Parameters:**

- **enable**  
If true, user will hear back all the responses on the spoken request. If false, the responses will be shown as toast messages.

```
public void speak (String text)
```

Speaks the text

**Parameters:**

- **text**  
Text to speak

```
public void startListening ()
```

Inform Nlp to start listening for the voice input using the Speech Recognizer passed in the initialization phase. Using that API to start the ASR is recommended because it allows Nlp to interrupt any other voice/ instructions being spoken (from Navigation instructions for example). If other voices are not stopped, the ASR might pick them up and misunderstand the utterance.

```
public void stopListening ()
```

Stop listening for the voice input.

```
public boolean understand (String utterance)
```

"Understand" the text and produce formalized *Intention* through *onIntent(Intention)*.

Typically, this is done automatically after *startListening()* is called; thereafter, user can speak and his/her speech is processed by automatic speech recognizer (ASR) and the output from ASR is fed into this function. Moreover, if application has a different source for the text, this API can be used to pass ASR. When deduction is complete, application will receive *onIntent(Intention)* callback and application can chose to handle the *Intention* by replying *CONSUMED* or instruct SDK to handle the *Intention* by replying *PROCEED*.

**Parameters:**

- **utterance**  
input for deduction

**Returns:**

true if it can proceed with deduction; false otherwise or if *Nlp* has not yet been initialized.

## ListenerBase

The interface *ListenerBase* is a member of *com.here.android.mpa.nlp.Nlp*.

### Interface Summary

```
public static abstract interface Nlp.ListenerBase
```

Base event listener interface

[For complete information, see the section *Interface Details*]

### Interface Details

Base event listener interface

## OnBatteryLevelListener

The interface *OnBatteryLevelListener* is a member of *com.here.android.mpa.nlp.Nlp*.

### Interface Summary

```
public static abstract interface Nlp.OnBatteryLevelListener
```

*extends* *com.here.android.mpa.nlp.Nlp.ListenerBase*

The remaining battery level event listener interface

[For complete information, see the section [Interface Details](#)]

## Method Summary

Table 895: Methods in OnBatteryLevelListener

Methods
<pre>public abstract void <b>onBatteryLevel</b> (<i>Error</i> error, int level)</pre> <p>A callback with the device battery level in percentage.</p>

## Interface Details

The remaining battery level event listener interface

## Method Details

```
public abstract void onBatteryLevel (Error error, int level)
```

A callback with the device battery level in percentage. e.g. "What is my battery level"

### Parameters:

- **error**  
*NONE* if battery level can be determined; otherwise *FAILED*
- **level**  
The battery level percentage of the remaining charge, [0..100] if error is *NONE*; otherwise -1.

## OnClearListener

The interface *OnClearListener* is a member of *com.here.android.mpa.nlp.Nlp*.

## Interface Summary

```
public static abstract interface Nlp.OnClearListener
```

*extends* *com.here.android.mpa.nlp.Nlp.ListenerBase*

Listener interface for clearing objects from the map.

[For complete information, see the section [Interface Details](#)]

## Method Summary

Table 896: Methods in OnClearListener

Methods
<pre>public abstract void <b>onClear</b> (<i>Route</i> route)</pre> <p>A callback for clearing the current route.</p>

## Methods

```
public abstract void onClear (java.util.List <PlaceLink> places)
```

A callback for clearing the current search results.

```
public abstract void onClear ()
```

A callback for a generic clear request without specifying specific target.

## Interface Details

Listener interface for clearing objects from the map. When a particular callback is received, the application is responsible for clearing the map objects, if desired.

## Method Details

```
public abstract void onClear (Route route)
```

A callback for clearing the current route. e.g. "Clear current route"

### Parameters:

- **route**  
The Route object to clear from the map.

```
public abstract void onClear (java.util.List <PlaceLink> places)
```

A callback for clearing the current search results. e.g. "Clear search"

### Parameters:

- **places**  
The search result PlaceLink objects to clear from the map.

```
public abstract void onClear ()
```

A callback for a generic clear request without specifying specific target. e.g. "Clear everything"

## OnCurrentAddressListener

The interface *OnCurrentAddressListener* is a member of *com.here.android.mpa.nlp.Nlp*.

## Interface Summary

```
public static abstract interface Nlp.OnCurrentAddressListener
```

```
    extends com.here.android.mpa.nlp.Nlp.ListenerBase
```

Address at the current geo location is ready event listener interface.

[For complete information, see the section [Interface Details](#)]

## Method Summary

Table 897: Methods in OnCurrentAddressListener

Methods
<pre>public abstract void <i>onCurrentAddress</i> (<i>Error</i> error, <i>Address</i> address)</pre> <p>A callback indicating that the current address is ready.</p>

## Interface Details

Address at the current geo location is ready event listener interface.

## Method Details

```
public abstract void onCurrentAddress (Error error, Address address)
```

A callback indicating that the current address is ready. e.g. "Where am I"

### Parameters:

- **error**  
*Error* status getting the current address
- **address**  
The current *Address*

## OnCurrentTimeListener

The interface *OnCurrentTimeListener* is a member of *com.here.android.mpa.nlp.Nlp*.

## Interface Summary

```
public static abstract interface Nlp.OnCurrentTimeListener
```

*extends* *com.here.android.mpa.nlp.Nlp.ListenerBase*

The current time event listener interface

[For complete information, see the section [Interface Details](#)]

## Method Summary

Table 898: Methods in OnCurrentTimeListener

Methods
<pre>public abstract void <i>onCurrentTime</i> (<i>Error</i> error, String time)</pre> <p>A callback with the current system time.</p>

## Interface Details

The current time event listener interface

## Method Details

```
public abstract void onCurrentTime (Error error, String time)
```

A callback with the current system time. e.g. "What time is it"

### Parameters:

- **error**  
*NONE* if current time can be determined; otherwise *FAILED*
- **time**  
Current device time in "hh:mm aa" format, e.g. "12:00 AM", "08:05 AM" or "12:00 PM", "01:00 PM" if error is *NONE*; otherwise null;

### See also:

java.text.SimpleDateFormat

## OnInitializationListener

The interface *OnInitializationListener* is a member of *com.here.android.mpa.nlp.Nlp*.

## Interface Summary

```
public static abstract interface Nlp.OnInitializationListener
```

Represents a listener to provide notification of the Nlp status upon completion of initialization.

[For complete information, see the section *Interface Details*]

### See also:

*init(Context, MapFragment, CollectionProvider, SpeechToTextProvider, OnInitializationListener)*

*init(Context, Map, MapGesture, CollectionProvider, SpeechToTextProvider, OnInitializationListener)*

## Method Summary

Table 899: Methods in OnInitializationListener

### Methods

```
public abstract void onComplete (Error error)
```

A callback indicating that that Nlp initialization has completed.

## Interface Details

Represents a listener to provide notification of the Nlp status upon completion of initialization.

**See also:**

[init\(Context, MapFragment, CollectionProvider, SpeechToTextProvider, OnInitializationListener\)](#)

[init\(Context, Map, MapGesture, CollectionProvider, SpeechToTextProvider, OnInitializationListener\)](#)

**Method Details**

```
public abstract void onComplete (Error error)
```

A callback indicating that that Nlp initialization has completed.

**Parameters:**

- **error**

If Nlp initialized successfully, returns *NONE*. Otherwise, *FAILED* with a message indicating the reason of initialization failure.

## OnIntentListener

The interface *OnIntentListener* is a member of *com.here.android.mpa.nlp.Nlp*.

**Interface Summary**

```
public static abstract interface Nlp.OnIntentListener
```

```
    extends com.here.android.mpa.nlp.Nlp.ListenerBase
```

Intention is ready event listener interface.

[For complete information, see the section [Interface Details](#)]

**Method Summary**

**Table 900: Methods in OnIntentListener**

Methods
<pre>public abstract <i>Reply</i> <b>onIntent</b> (<i>Intention</i> intention)</pre> <p>A callback indicating that <i>Intention</i> is ready</p>

**Interface Details**

Intention is ready event listener interface.

**Method Details**

```
public abstract Reply onIntent (Intention intention)
```

A callback indicating that *Intention* is ready

**Parameters:**

- **intention**

*Intention* object, the result of the voice input deduction.

**Returns:**

Application should return *PROCEED* to instruct SDK to act on the *Intention*. Application should return *CONSUMED* to indicate that the *Intention* was consumed.

## OnMapSchemeChangeListener

The interface *OnMapSchemeChangeListener* is a member of *com.here.android.mpa.nlp.Nlp*.

### Interface Summary

public static abstract interface **Nlp.OnMapSchemeChangeListener**

extends *com.here.android.mpa.nlp.Nlp.ListenerBase*

*Map.Scheme* of the *Map* object has been changed event listener interface.

[For complete information, see the section *Interface Details*]

### Method Summary

Table 901: Methods in *OnMapSchemeChangeListener*

Methods
public abstract void <i>onMapSchemeChanged</i> ( <b>String scheme</b> ) A callback indicating that the <i>Map</i> scheme has been changed.

### Interface Details

*Map.Scheme* of the *Map* object has been changed event listener interface.

### Method Details

public abstract void **onMapSchemeChanged** (**String scheme**)

A callback indicating that the *Map* scheme has been changed. e.g. "Use satellite"

**Parameters:**

- **scheme**

The *Map.Scheme*

## OnNavigationListener

The interface *OnNavigationListener* is a member of *com.here.android.mpa.nlp.Nlp*.

## Interface Summary

public static abstract interface **Nlp.OnNavigationListener**

extends *com.here.android.mpa.nlp.Nlp.ListenerBase*

Navigation listener interface

[For complete information, see the section *Interface Details*]

## Method Summary

Table 902: Methods in OnNavigationListener

Methods
<pre>public abstract void <b>onStart</b> (<i>Error</i> error, java.util.List &lt;<i>Route</i>&gt; routes, String startingPointName, java.util.List &lt;<i>Place</i>&gt; routePlaces)</pre>
A callback with the calculated route and the list of <i>Places</i> .
<pre>public abstract void <b>onStop</b> ()</pre>
A callback for notifying user to stop navigation.

## Interface Details

Navigation listener interface

## Method Details

```
public abstract void onStart (Error error, java.util.List <Route> routes, String startingPointName, java.util.List <Place> routePlaces)
```

A callback with the calculated route and the list of *Places*. e.g. "Start navigation"

### Parameters:

- **error**  
*Error* information for starting navigation
- **routes**  
The list of *Routes*
- **startingPointName**  
The starting point name
- **routePlaces**  
Array of *Places* included into the route, excluding the starting point.

```
public abstract void onStop ()
```

A callback for notifying user to stop navigation. e.g. "Stop navigation"

## OnParameterListener

The interface *OnParameterListener* is a member of *com.here.android.mpa.nlp.Nlp*.

### Interface Summary

public static abstract interface **Nlp.OnParameterListener**

*extends* *com.here.android.mpa.nlp.Nlp.ListenerBase*

Parameter event listener interface

[For complete information, see the section *Interface Details*]

### Method Summary

Table 903: Methods in OnParameterListener

Methods
public abstract void <i>onParameterChanged</i> ( <i>Error</i> error, <i>Field</i> parameter, <i>Value</i> value) A callback with the parameter and its value set by the user.

### Interface Details

Parameter event listener interface

### Method Details

public abstract void *onParameterChanged* (*Error* error, *Field* parameter, *Value* value)

A callback with the parameter and its value set by the user. Supported values are as follow:

- *ONLINE\_DEDUCTION*:
  - if *ON*, NLP will process deduction online. e.g. "use backend"
  - if *OFF*, NLP will process deduction offline. e.g. "don't use backend"
 See also *setOnlineDeductionEnabled(boolean)* and *isOnlineDeductionEnabled()*.
- *DISTANCE\_MEASURE*:
  - if *KILOMETER*, NLP will use metric measurement system. e.g. "use metric system", "use kilometers", "tell me in meters".
  - if *MILE*, NLP will use imperial measurement system. e.g. "use imperial system", "use miles", "tell me in yards", "tell me in feet".

Please note that user may temporarily override the measurement system by explicitly specifying the measurement in the utterance.

e.g. "Tell me how far McDonalds is in metric".

See also *setMetricSystemEnabled(boolean)* and *isMetricSystemEnabled()*

Parameters:

- **error**  
*NONE* if user requested parameter is successfully set to the requested value; otherwise *FAILED*
- **parameter**  
 The parameter that has been changed if error is *NONE*; otherwise this represents the parameter user wants to change.
- **value**  
 The new value of the parameter if error is *NONE*; otherwise this represents the value user wants to change the parameter to.

## OnPlaceFocusChangeListener

The interface *OnPlaceFocusChangeListener* is a member of *com.here.android.mpa.nlp.Nlp*.

### Interface Summary

public static abstract interface **Nlp.OnPlaceFocusChangeListener**

*extends* *com.here.android.mpa.nlp.Nlp.ListenerBase*

Listener for a client focus change to another place

[For complete information, see the section *Interface Details*]

### Method Summary

Table 904: Methods in *OnPlaceFocusChangeListener*

Methods
public abstract void <i>onPlaceFocusChanged</i> ( <i>PlaceLink</i> place) A callback with the <i>PlaceLink</i> to notify application that focus is moved to this place.

### Interface Details

Listener for a client focus change to another place

### Method Details

public abstract void **onPlaceFocusChanged** (*PlaceLink* place)

A callback with the *PlaceLink* to notify application that focus is moved to this place. e.g. "Next location"

**Parameters:**

- **place**  
*PlaceLink* object currently in focus

## OnRemoveFromRouteListener

The interface *OnRemoveFromRouteListener* is a member of *com.here.android.mpa.nlp.Nlp*.

### Interface Summary

public static abstract interface **Nlp.OnRemoveFromRouteListener**

*extends* *com.here.android.mpa.nlp.Nlp.ListenerBase*

Listener interface to notify user that a stopover is removed from the route

[For complete information, see the section *Interface Details*]

### Method Summary

Table 905: Methods in OnRemoveFromRouteListener

Methods
public abstract void <i>onRemovedFromRoute</i> ( <i>Error</i> error, <i>PlaceLink</i> stopover) A callback after a stopover is removed from the preferred route.

### Interface Details

Listener interface to notify user that a stopover is removed from the route

### Method Details

public abstract void **onRemovedFromRoute** (*Error* error, *PlaceLink* stopover)

A callback after a stopover is removed from the preferred route. e.g. "Remove stopover" When the callback is received, the application is responsible for removing the stopover from the route display, if desired.

#### Parameters:

- **error**  
*Error* status for removing the stopover from the route
- **stopover**  
*PlaceLink* object of the stopover removed from the route

## OnResetListener

The interface *OnResetListener* is a member of *com.here.android.mpa.nlp.Nlp*.

### Interface Summary

public static abstract interface **Nlp.OnResetListener**

extends *com.here.android.mpa.nlp.Nlp.ListenerBase*

Listener interface to notify that user wants to do the reset.

[For complete information, see the section [Interface Details](#)]

## Method Summary

Table 906: Methods in OnResetListener

Methods
<pre>public abstract void <i>onComplete</i> ()</pre> <p>A callback indicates nlp reset is completed.</p>

## Interface Details

Listener interface to notify that user wants to do the reset. Reset operation implies cleaning the short term memory and stopping all pending map operations (routing, navigation, ...etc.)

## Method Details

```
public abstract void onComplete ()
```

A callback indicates nlp reset is completed. e.g. "Reset"

## OnRouteListener

The interface *OnRouteListener* is a member of *com.here.android.mpa.nlp.Nlp*.

## Interface Summary

```
public static abstract interface Nlp.OnRouteListener
```

extends *com.here.android.mpa.nlp.Nlp.ListenerBase*

Route object is available event interface.

[For complete information, see the section [Interface Details](#)]

## Method Summary

Table 907: Methods in OnRouteListener

Methods
<pre>public abstract void <i>onComplete</i> (<i>Error</i> error, <i>Route</i> preferredRoute, java.util.List &lt;<i>Place</i>&gt; preferredRoutePlaces, String startingPointName, java.util.List &lt;<i>Route</i>&gt; routes)</pre> <p>A callback with the preferred calculated route, the list of <i>Routes</i> to all destinations, and the list of <i>Places</i>.</p>

## Methods

```
public abstract void onStart ()
```

A callback when start calculating route.

---

## Interface Details

Route object is available event interface.

## Method Details

```
public abstract void onComplete (Error error, Route preferredRoute,  
java.util.List <Place> preferredRoutePlaces, String startingPointName,  
java.util.List <Route> routes)
```

A callback with the preferred calculated route, the list of *Routes* to all destinations, and the list of *Places*. e.g. "Create a route from Vancouver to Seattle" When the callback is received, the application is responsible for displaying the route results, if desired.

### Parameters:

- **error**  
*Error* status for routing
- **preferredRoute**  
The preferred *Route* from among the list of *Routes* to all found destinations
- **preferredRoutePlaces**  
Array of *Places* included into the preferred route, excluding the starting point.
- **startingPointName**  
The starting point name
- **routes**  
The list of *Routes* to all found destinations, including the preferred route.

```
public abstract void onStart ()
```

A callback when start calculating route. e.g. "Create a route from Vancouver to Seattle"

## OnRouteResultsAddedListener

The interface *OnRouteResultsAddedListener* is a member of *com.here.android.mpa.nlp.Nlp*.

## Interface Summary

```
public static abstract interface Nlp.OnRouteResultsAddedListener  
extends com.here.android.mpa.nlp.Nlp.ListenerBase
```

Listener interface for adding route results from the application to NLP.

[For complete information, see the section [Interface Details](#)]

## Method Summary

Table 908: Methods in OnRouteResultsAddedListener

Methods
public abstract void <a href="#">onRouteResultsAdded</a> ( <a href="#">Error</a> error, <a href="#">Route</a> route)

## Interface Details

Listener interface for adding route results from the application to NLP.

## Method Details

```
public abstract void onRouteResultsAdded (Error error, Route route)
```

Parameters:

- **error**
- **route**

## OnSearchListener

The interface *OnSearchListener* is a member of *com.here.android.mpa.nlp.Nlp*.

## Interface Summary

```
public static abstract interface Nlp.OnSearchListener
```

```
    extends com.here.android.mpa.nlp.Nlp.ListenerBase
```

Search listener interface.

[For complete information, see the section [Interface Details](#)]

## Method Summary

Table 909: Methods in OnSearchListener

Methods
public abstract void <a href="#">onComplete</a> ( <a href="#">Error</a> error, String searchString, String whereString, String nearString, java.util.List <a href="#">PlaceLink</a> places)
A callback with the resulting list of <a href="#">PlaceLink</a> when a particular search request is complete.
public abstract void <a href="#">onStart</a> ( <a href="#">CategoryFilter</a> filter, <a href="#">GeoBoundingBox</a> box)
A callback with the requested category filter for the specified bounding box area

## Methods

```
public abstract void onStart (GeoCoordinate location)
```

A callback with requested reverse geocoding search location *GeoCoordinate*.

```
public abstract void onStart (String subject, GeoBoundingBox box)
```

A callback with the requested search string for the specified bounding box area.

## Interface Details

Search listener interface.

## Method Details

```
public abstract void onComplete (Error error, String searchString, String whereString, String nearString, java.util.List <PlaceLink> places)
```

A callback with the resulting list of *PlaceLink* when a particular search request is complete. e.g. "Find a coffee shop" When the callback is received, the application is responsible for displaying the search results, if desired.

### Parameters:

- **error**  
Error status for search request
- **searchString**  
The searched string
- **whereString**  
The whereabouts of the searched string. Example: "in Seattle"
- **nearString**  
The whereabouts of the searched string. Example: "close to the Space Needle"
- **places**  
List of *PlaceLink* objects, the result of the voice search.

```
public abstract void onStart (CategoryFilter filter, GeoBoundingBox box)
```

A callback with the requested category filter for the specified bounding box area

### Parameters:

- **filter**  
Search category filter
- **box**  
Bounding box for the search

```
public abstract void onStart (GeoCoordinate location)
```

A callback with requested reverse geocoding search location *GeoCoordinate*. e.g. "Where am I"

**Parameters:**

- **location**  
The *GeoCoordinate* of the place we need to get address for.

```
public abstract void onStart (String subject, GeoBoundingBox box)
```

A callback with the requested search string for the specified bounding box area. e.g. "Find a coffee shop"

**Parameters:**

- **subject**  
Search subject
- **box**  
Bounding box for the search

## OnSendLocationListener

The interface *OnSendLocationListener* is a member of *com.here.android.mpa.nlp.Nlp*.

### Interface Summary

```
public static abstract interface Nlp.OnSendLocationListener
```

*extends* *com.here.android.mpa.nlp.Nlp.ListenerBase*

The send location event listener interface

[For complete information, see the section *Interface Details*]

### Method Summary

Table 910: Methods in OnSendLocationListener

Methods
<pre>public abstract void <i>onSendLocation</i> (<i>Error</i> error, <i>GeoCoordinate</i> location, String recipient)</pre> <p>A callback with the current location to be sent to the specified recipient or requesting the specified recipient for his/her current location through SMS.</p>

### Interface Details

The send location event listener interface

## Method Details

public abstract void **onSendLocation** (*Error* error, *GeoCoordinate* location, **String** recipient)

A callback with the current location to be sent to the specified recipient or requesting the specified recipient for his/her current location through SMS. e.g. "Send my location to mom", "where is my mom" Notes:

- This feature requires Contacts, Location, and SMS permissions from the users.
- Contacts are loaded once during NLP initialization into memory. Any changes made thereafter will not be reflected until the next startup.
- Contact's display name and nickname are used for recipient lookup. For example, for "send my location to mom" use case to work, user needs have a contact with display name "mom" or nickname "mom".
- Levenshtein distance is used for recipient lookup with fault tolerance of 1 character. For example, if a contact has nickname, "mum", it will be matched to recipient "mom".
- If the specified recipient is matched to multiple contacts, the first matched contact will be used and the first match may not be the best match. For example, first match is "mum" and second match is "mom" and the specified recipient is "mom", the first match will be used even though it's not the best match.
- Recipient lookup is limited to contacts on the device. For utterances like "publish my location to facebook" or "publish my location to twitter" will result in an attempt to send location through SMS to a contact named "facebook" or "twitter" respectively. For another example, "send my location to myself" will result in an attempt to send a SMS to a contact named "myself".

### Parameters:

- **error**  
*NONE* if location information is successfully sent/requested; otherwise *FAILED*
- **location**  
The current location for sending request; otherwise null.
- **recipient**  
Recipient of the SMS.

## OnSendSMSListener

The interface *OnSendSMSListener* is a member of *com.here.android.mpa.nlp.Nlp*.

### Interface Summary

public static abstract interface **Nlp.OnSendSMSListener**

*extends* *com.here.android.mpa.nlp.Nlp.ListenerBase*

The send SMS event listener interface

[For complete information, see the section *Interface Details*]

## Method Summary

Table 911: Methods in OnSendSMSListener

Methods
<pre>public abstract void onSendSMS (Error error, String message, String recipient)</pre> <p>A callback with the message to be sent to the specified recipient through SMS.</p>

## Interface Details

The send SMS event listener interface

### Method Details

```
public abstract void onSendSMS (Error error, String message, String recipient)
```

A callback with the message to be sent to the specified recipient through SMS. Notes:

- This feature requires Contacts, and SMS permissions from the users.
- Contacts are loaded once during NLP initialization into memory. Any changes made thereafter will not be reflected until the next startup.
- Contact's display name and nickname are used for recipient lookup. For example, for "send my location to mom" use case to work, user needs have a contact with display name "mom" or nickname "mom".
- Levenshtein distance is used for recipient lookup with fault tolerance of 1 character. For example, if a contact has nickname, "mum", it will be matched to recipient "mom".
- If the specified recipient is matched to multiple contacts, the first matched contact will be used and the first match may not be the best match. For example, first match is "mum" and second match is "mom" and the specified recipient is "mom", the first match will be used even though it's not the best match.

#### Parameters:

- **error**  
*NONE* if SMS is successfully sent; otherwise *FAILED*
- **message**  
The message for sending request; otherwise null.
- **recipient**  
Recipient of the SMS.

## OnSpeedListener

The interface *OnSpeedListener* is a member of *com.here.android.mpa.nlp.Nlp*.

### Interface Summary

```
public static abstract interface Nlp.OnSpeedListener
    extends com.here.android.mpa.nlp.Nlp.ListenerBase
```

The speed value event listener interface

[For complete information, see the section [Interface Details](#)]

## Method Summary

Table 912: Methods in OnSpeedListener

Methods
<pre>public abstract void <b>onSpeed</b> (<i>Error</i> error, int kph)</pre> <p>A callback with the average speed.</p>

## Interface Details

The speed value event listener interface

### Method Details

```
public abstract void onSpeed (Error error, int kph)
```

A callback with the average speed. e.g. "What is my speed"

#### Parameters:

- **error**  
*Error* information for calculating average speed. If *FAILED*, speed value of less than 0 will be returned.
- **kph**  
Kilometers per hour

## OnSpeedWarningSwitchListener

The interface *OnSpeedWarningSwitchListener* is a member of *com.here.android.mpa.nlp.Nlp*.

### Interface Summary

```
public static abstract interface Nlp.OnSpeedWarningSwitchListener
```

```
extends com.here.android.mpa.nlp.Nlp.ListenerBase
```

The speed warning mode during navigation event listener interface

[For complete information, see the section [Interface Details](#)]

## Method Summary

Table 913: Methods in OnSpeedWarningSwitchListener

Methods
<pre>public abstract void <i>onSpeedWarningSwitch</i> (<i>Error</i> error, boolean on)</pre> <p>A callback indicating that the speed warning was switched on or off.</p>

## Interface Details

The speed warning mode during navigation event listener interface

## Method Details

```
public abstract void onSpeedWarningSwitch (Error error, boolean on)
```

A callback indicating that the speed warning was switched on or off. e.g. "Turn on/off speed warning"

### Parameters:

- **error**  
*Error* information for switching speed warning. If *FAILED*, speed warning will not be switched.
- **on**  
If true, speed warning is enabled

## OnTrafficModeListener

The interface *OnTrafficModeListener* is a member of *com.here.android.mpa.nlp.Nlp*.

## Interface Summary

```
public static abstract interface Nlp.OnTrafficModeListener
```

*extends* *com.here.android.mpa.nlp.Nlp.ListenerBase*

The traffic mode changed event listener interface

[For complete information, see the section [Interface Details](#)]

## Method Summary

Table 914: Methods in OnTrafficModeListener

Methods
<pre>public abstract void <i>onTrafficMode</i> (<i>Error</i> error, boolean on, String whereLocation)</pre> <p>A callback indicating that the traffic mode was switched on or off.</p>

## Interface Details

The traffic mode changed event listener interface

## Method Details

```
public abstract void onTrafficMode (Error error, boolean on, String whereLocation)
```

A callback indicating that the traffic mode was switched on or off. e.g. "Turn on/off traffic"

### Parameters:

- **error**  
*Error* status of retrieving traffic mode, *FAILED* if traffic request fails or permission is not allowed.
- **on**  
If true, traffic mode is enabled
- **whereLocation**  
The string location where to check the traffic

## OnTravelDistanceListener

The interface *OnTravelDistanceListener* is a member of *com.here.android.mpa.nlp.Nlp*.

## Interface Summary

```
public static abstract interface Nlp.OnTravelDistanceListener
```

*extends* *com.here.android.mpa.nlp.Nlp.ListenerBase*

The travel distance to specified location event listener interface

[For complete information, see the section *Interface Details*]

## Method Summary

Table 915: Methods in OnTravelDistanceListener

### Methods

```
public abstract void onTravelDistance (Error error, Place from, Place to, int distanceM)
```

A callback with the travel distance in meters to the specified location.

## Interface Details

The travel distance to specified location event listener interface

## Method Details

public abstract void **onTravelDistance** (*Error* error, *Place* from, *Place* to, int distanceM)

A callback with the travel distance in meters to the specified location. e.g. "What is the distance between Vancouver and Seattle".

### Parameters:

- **error**  
*Error* information for calculating travel distance. If *FAILED*, distance of less than 0 will be returned.
- **from**  
"From" *Place*. If null, current position is implied
- **to**  
"To" *Place*.
- **distanceM**  
Distance in meters

## OnTravelTimeListener

The interface *OnTravelTimeListener* is a member of *com.here.android.mpa.nlp.Nlp*.

### Interface Summary

public static abstract interface **Nlp.OnTravelTimeListener**

*extends* *com.here.android.mpa.nlp.Nlp.ListenerBase*

The travel time to specified location event listener interface

[For complete information, see the section *Interface Details*]

### Method Summary

Table 916: Methods in OnTravelTimeListener

#### Methods

public abstract void **onTravelTime** (*Error* error, *Place* from, *Place* to, int timeSec)

A callback with the travel time in seconds to the specified location.

### Interface Details

The travel time to specified location event listener interface

## Method Details

```
public abstract void onTravelTime (Error error, Place from, Place to, int timeSec)
```

A callback with the travel time in seconds to the specified location. e.g. "How long does it take to drive from Vancouver to Seattle".

### Parameters:

- **error**  
*Error* information for calculating travel time
- **from**  
"From" *Place*. If null, current position is implied
- **to**  
"To" *Place*.
- **timeSec**  
Time in seconds. If traffic is enabled on *Map*, the calculated travel time will reflect the current traffic.

## Reply

The enumeration *Reply* is a member of *com.here.android.mpa.nlp.Nlp*.

### Enumeration Summary

```
public static final enumeration Nlp.Reply
```

```
extends java.lang.Enum, java.lang.Object
```

Client's responses on the events triggered by NLP

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 917: Enum Constants in Reply

Fields
<pre>public static final Reply PROCEED</pre> <p>Client ignores event, default NLP actions will be performed.</p>
<pre>public static final Reply CONSUMED</pre> <p>Client consumed event, no further actions will be performed by NLP.</p>

## Method Summary

Table 918: Methods in Reply

Methods
<pre>public static Reply valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static Nlp.Reply[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Client's responses on the events triggered by NLP

### Enum Constant Details

```
public static final Reply PROCEED
```

Client ignores event, default NLP actions will be performed.

```
public static final Reply CONSUMED
```

Client consumed event, no further actions will be performed by NLP.

### Method Details

```
public static Reply valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static Nlp.Reply[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## OnCollectionListener

The interface *OnCollectionListener* is a member of *com.here.android.mpa.nlp*.

## Interface Summary

public abstract interface **OnCollectionListener**

Collection listener for the following operations: 1) Adding, removing, or renaming a collection.

[For complete information, see the section [Interface Details](#)]

**See also:**

[CollectionProvider](#)

## Method Summary

**Table 919: Methods in OnCollectionListener**

Methods
<pre>public abstract void <b>onComplete</b> (<i>Error</i> error)</pre> <p>A callback when a collection operation is completed.</p>

## Interface Details

Collection listener for the following operations: 1) Adding, removing, or renaming a collection. 2) Adding or removing a place to/from a collection.

**IMPORTANT:** Natural language processor is a Beta feature. The related classes are subject to change without notice.

**See also:**

[CollectionProvider](#)

## Method Details

```
public abstract void onComplete (Error error)
```

A callback when a collection operation is completed.

**Parameters:**

- **error**  
*Error* indicating whether the operation is successful.

## Place

The class *Place* is a member of [com.here.android.mpa.nlp](#) .

## Class Summary

public final class **Place**

*implements java.io.Serializable*

*extends java.lang.Object*

Information about a place required by NLP.

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 920: Constructors in Place

Constructors
<b><i>Place</i></b> ( <i>String</i> name, <i>GeoCoordinate</i> coordinate) Constructor
<b><i>Place</i></b> ( <i>Place</i> other) Copy constructor

## Method Summary

Table 921: Methods in Place

Methods
public boolean <i>equals</i> ( <i>Object</i> other) For documentation, see <i>java.lang.Object</i>
public <i>Address</i> <i>getAddress</i> () Get address of the place
public <i>GeoCoordinate</i> <i>getCoordinate</i> () Get coordinate of the place
public <i>String</i> <i>getName</i> () Get name of the place
public <i>PlaceLink</i> <i>getPlaceLink</i> () Get PlaceLink of the place
public int <i>hashCode</i> () For documentation, see <i>java.lang.Object</i>
public <i>Place</i> <i>setAddress</i> ( <i>Address</i> address) Set address of the place
public <i>Place</i> <i>setCoordinate</i> ( <i>GeoCoordinate</i> coordinate) Set coordinates of the place
public <i>Place</i> <i>setName</i> ( <i>String</i> name) Set name of the place
public <i>Place</i> <i>setPlaceLink</i> ( <i>PlaceLink</i> placeLink) Set PlaceLink of the place

## Class Details

Information about a place required by NLP. Information may be obtained from search or other sources and transformed into this by application.

IMPORTANT: Natural language processor is a Beta feature. The related classes are subject to change without notice.

## Constructor Details

### Place (String name, *GeoCoordinate* coordinate)

Constructor

#### Parameters:

- **name**  
The place name, must not be null or empty
- **coordinate**  
The Geo-Coordinates of the place, must not null and must be valid

### Place (*Place* other)

Copy constructor

#### Parameters:

- **other**  
*Place* to copy from

## Method Details

```
public boolean equals (Object other)
```

For documentation, see *java.lang.Object*

#### Parameters:

- **other**

```
public Address getAddress ()
```

Get address of the place

#### Returns:

The place address

```
public GeoCoordinate getCoordinate ()
```

Get coordinate of the place

**Returns:**

The coordinate of the place

```
public String getName ()
```

Get name of the place

**Returns:**

The place name

```
public PlaceLink getPlaceLink ()
```

Get PlaceLink of the place

**Returns:**

The place PlaceLink

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public Place setAddress (Address address)
```

Set address of the place

**Parameters:**

- **address**  
address of the place

**Returns:**

Place

```
public Place setCoordinate (GeoCoordinate coordinate)
```

Set coordinates of the place

**Parameters:**

- **coordinate**  
[GeoCoordinate](#) of the place

**Returns:**

Place

```
public Place setName (String name)
```

Set name of the place

**Parameters:**

- **name**  
The place name

**Returns:**

Place

```
public Place setPlaceLink (PlaceLink placeLink)
```

Set PlaceLink of the place

**Parameters:**

- **placeLink**  
*PlaceLink* of the place

**Returns:**

Place

## SpeechToTextProvider

The interface *SpeechToTextProvider* is a member of *com.here.android.mpa.nlp* .

### Interface Summary

```
public abstract interface SpeechToTextProvider
```

Speech to text interface for start or stop listening for voice commands, cancel, pause, resume or destroy the Speech recognition service.

[For complete information, see the section [Interface Details](#)]

### Method Summary

Table 922: Methods in *SpeechToTextProvider*

#### Methods

```
public abstract void cancel ()
```

Cancel the speech recognition.

```
public abstract void destroy ()
```

Destroy the speech recognizer object.

## Methods

```
public abstract boolean isListening ()
```

Return whether the ASR is currently listening to speech.

```
public abstract void pause ()
```

Pause ASR functionality (when Activity onPause event is called and *pause()* is used).

```
public abstract void resume (Context context)
```

Resume ASR functionality (when Activity onResume event is called) and *resume(Context)* is used.

```
public abstract void start ()
```

Start listening for speech.

```
public abstract boolean stop ()
```

Stop listening for speech.

## Interface Details

Speech to text interface for start or stop listening for voice commands, cancel, pause, resume or destroy the Speech recognition service. If this interface is not implemented, the speech recognition service is entirely the responsibility of the application. Calling Speech recognition service APIs like *startListening()* or *stopListening()* would not do anything and Nlp would not be able to make sure no other voice is playing (e.g. navigation instructions) while the ASR is listening. To achieve better user experience, it's highly recommended that the application implements this interface and uses Nlp APIs: *startListening()*, *stopListening()*, *resume(Context)*, *pause()*.

IMPORTANT: Natural language processor is a Beta feature. The related classes are subject to change without notice.

## Method Details

```
public abstract void cancel ()
```

Cancel the speech recognition.

```
public abstract void destroy ()
```

Destroy the speech recognizer object.

```
public abstract boolean isListening ()
```

Return whether the ASR is currently listening to speech. It is listening if ASR was started and results haven't been received yet.

### Returns:

boolean: true if the ASR is currently listening to speech false otherwise.

```
public abstract void pause ()
```

Pause ASR functionality (when Activity onPause event is called and [pause\(\)](#) is used.

```
public abstract void resume (Context context)
```

Resume ASR functionality (when Activity onResume event is called) and [resume\(Context\)](#) is used.

#### Parameters:

- **context**

The application context set via [init\(Context, MapFragment, CollectionProvider, SpeechToTextProvider, Nlp.OnInitializationListener\)](#) or [init\(Context, Map, MapGesture, CollectionProvider, SpeechToTextProvider, Nlp.OnInitializationListener\)](#)

```
public abstract void start ()
```

Start listening for speech.

```
public abstract boolean stop ()
```

Stop listening for speech.

## odml

---

The package *odml* is a member of *com.here.android.mpa*.

### Package Summary

#### odml

The ODML (On Device Map Loader) package provides classes, interfaces and enumerations which facilitate the download of map data for offline use.

### Package Details

The ODML (On Device Map Loader) package provides classes, interfaces and enumerations which facilitate the download of map data for offline use.

Some key classes and interfaces in this package are:

- [MapLoader](#)
- [MapPackage](#)

MapLoader

The *MapLoader* class is a singleton which provides access to all of the operations required to view, download, uninstall and update offline map data packages.

## MapPackage

The *MapPackage* class serves as a model object for map packages managed by the MapLoader. The identifiers provided by the *getId()* API are used to uniquely identify a particular package for use with MapLoader.

For more information on using this feature, please consult the "Offline Maps" section in the HERE SDK for Android Developer's Guide.

## MapLoader

The class *MapLoader* is a member of *com.here.android.mpa.odml*.

### Class Summary

public final class **MapLoader**

*extends java.lang.Object*

Facilitates the use of offline map data.

[For complete information, see the section *Class Details*]

### Nested Class Summary

Table 923: Nested Classes in MapLoader

Nested Classes
<p>public static abstract interface <i>MapLoader.Listener</i></p> <p>Represents a listener interface for receiving notifications from the <i>MapLoader</i>.</p>
<p>public static abstract interface <i>MapLoader.MapPackageAtCoordinateListener</i></p> <p>Represents a listener interface with a callback which gets invoked upon package retrieval.</p>
<p>public static final enumeration <i>MapLoader.ResultCode</i></p> <p>Represents values describing the status of a <i>MapLoader</i> operation.</p>

### Method Summary

Table 924: Methods in MapLoader

Methods
<p>public void <i>addListener</i> (<i>Listener</i> listener)</p> <p>Adds a <i>MapLoader.Listener</i> for the <i>MapLoader</i>.</p>
<p>public void <i>addMapPackageAtCoordinateListener</i> (<i>MapPackageAtCoordinateListener</i> listener)</p> <p>Adds a <i>MapLoader.MapPackageAtCoordinateListener</i> for the <i>MapLoader</i>.</p>

## Methods

```
public boolean cancelCurrentOperation ()
```

Cancels the current `MapLoader` operation.

```
public boolean checkForMapDataUpdate ()
```

Checks for the availability of an updated version of map data.

```
public void deselectDataGroup (SelectableDataGroup dataGroup)
```

Deselects a map data group for installation when using an isolated disk cache.

```
public static MapLoader getInstance ()
```

Gets the `MapLoader` shared instance.

```
public boolean getMapPackageAtCoordinate (GeoCoordinate coordinate)
```

This method will try to find a map package based on a map location.

```
public boolean getMapPackages ()
```

Returns the list of available `MapPackage` hierarchies.

```
public boolean installMapPackages (List packageIdList)
```

Installs the `MapPackage` hierarchies whose IDs are contained within the specified `List` of `Integer` objects.

```
public boolean performMapDataUpdate ()
```

Updates the version of map data if an update is available.

```
public void removeListener (Listener listener)
```

Removes a `MapLoader.Listener` for the `MapLoader`.

```
public void removeMapPackageAtCoordinateListener (MapPackageAtCoordinateListener listener)
```

Removes a `MapLoader.MapPackageAtCoordinateListener` for the `MapLoader`.

```
public void selectDataGroup (SelectableDataGroup dataGroup)
```

Selects a map data group for installation when using an isolated disk cache.

```
public boolean uninstallMapPackages (List packageIdList)
```

Uninstalls the `MapPackage` hierarchies whose IDs are contained within the specified `List` of `Integer` objects.

## Class Details

Facilitates the use of offline map data.

`MapLoader` is a singleton which must be obtained by calling `getInstance()`. Method calls are asynchronous, returning results by way of the `MapLoader.Listener` interface.

All operations of a `MapLoader` are mutually exclusive. If, for example, method XYZ is called before the callback for method ABC has returned a result, method XYZ will return false to indicate that the `MapLoader` is busy with another operation.

`MapLoader` requires an internet connection to perform operations (with the exception of `getMapPackages()` and `uninstallMapPackages(List)`). If a `MapLoader` operation is attempted when no internet connection is available, `NO_CONNECTIVITY` will be returned.

### Incremental Updates

`MapLoader` exposes the ability to update the version of the map and provide the user with the freshest map data available. The map version applies not only to map data pre-installed using the `MapLoader` , but also to data which are retrieved dynamically by browsing the map in areas where map data has not been pre-installed.

The map version is consistent for all map data, downloaded or not, across the entire system. It is not possible to have some data from one map version and other data from another map version concurrent in the database. It is important, therefore, to keep the map version of the system up to date, which fortunately does not require re-downloading everything. Only incremental changes need to be downloaded, making typical updates small and quick. Map version updating is exposed through the [checkForMapDataUpdate\(\)](#) and [performMapDataUpdate\(\)](#) methods.

## Method Details

```
public void addListener (Listener listener)
```

Adds a `MapLoader.Listener` for the `MapLoader` .

### Parameters:

- `listener`  
A `MapLoader.Listener` for returning results from `MapLoader` operations

```
public void addMapPackageAtCoordinateListener (MapPackageAtCoordinateListener listener)
```

Adds a `MapLoader.MapPackageAtCoordinateListener` for the `MapLoader` .

### Parameters:

- `listener`  
A `MapLoader.MapPackageAtCoordinateListener` for returning results from `MapLoader` operations

```
public boolean cancelCurrentOperation ()
```

Cancels the current `MapLoader` operation.

Note: cancellation is deemed complete once the `onComplete` callback for the current operation has been made. If `false` is returned from this method, no callback will be made.

### Returns:

True if the request has been made successfully (an operation was requested to cancel), false if there is no ongoing `MapLoader` operation to cancel.

```
public boolean checkForMapDataUpdate ()
```

Checks for the availability of an updated version of map data. The result is obtained by way of the [MapLoader.Listener.onCheckForUpdateComplete\(boolean, String, String, ResultCode\)](#) callback.

For more information about updating map data versions, refer to the Incremental Updates section of the detailed description for this interface.

**Returns:**

True if the request has been made successfully, false if the `MapLoader` is busy processing another request

**public void `deselectDataGroup` (*SelectableDataGroup* `dataGroup`)**

Deselects a map data group for installation when using an isolated disk cache. This method will not perform any action when using a shared disk cache.

As with `MapLoader#selectDataGroup(SelectableDataGroup)`, changes will not take place until the map data is updated. Furthermore, note that if you are deselecting a data group that is already installed, you must uninstall the preloaded map packages prior to removing an existing data group to ensure the unneeded data group is removed from storage.

**Parameters:**

- **`dataGroup`**  
*com.here.android.mpa.MapPackage.SelectableDataGroup* to deselect.

**See also:**

*setIsolatedDiskCacheRootPath(String, String)*

**public static *MapLoader* `getInstance` ()**

Gets the *MapLoader* shared instance.

**Returns:**

The shared `MapLoader`

**public boolean `getMapPackageAtCoordinate` (*GeoCoordinate* `coordinate`)**

This method will try to find a map package based on a map location. If it can be identified, the smallest package containing the point is returned. For some input coordinates a larger package will be returned, but it should never be higher than country level (i.e. continental packages will not be returned).

**Parameters:**

- **`coordinate`**  
The coordinates used to locate the package.

**Returns:**

True if the request has been made successfully, false if the `MapLoader` is busy processing another request or given coordinate was not valid.

## public boolean `getMapPackages` ()

Returns the list of available *MapPackage* hierarchies. The list of available packages is returned in the *MapLoader.Listener.onGetMapPackagesComplete(MapPackage, ResultCode)* callback.

This operation can be performed offline if it has been performed online at least once before. Otherwise, when trying to perform this operation offline *NO\_CONNECTIVITY* will be returned by way of the *Listener* .

Note: the returned list of *MapPackage* hierarchies only represents a snapshot of the current map data state. State information is not updated dynamically for a *MapPackage* instance, so any operation which modifies the map data (install/uninstall/update) will invalidate pre-existing *MapPackage* instances.

### Returns:

True if the request has been made successfully, false if the *MapLoader* is busy processing another request

## public boolean `installMapPackages` (List `packageIdList`)

Installs the *MapPackage* hierarchies whose IDs are contained within the specified *List* of *Integer* objects.

Notes on installing map packages:

- When installation starts, a summary of package sizes can be obtained through the *onInstallationSize(long, long)* callback.
- During installation, progress can be monitored via *onProgress(int)* callbacks.
- When installation is complete, notification will be sent by way of the *onInstallMapPackagesComplete(MapPackage, MapLoader.ResultCode)* callback.
- If device connectivity is lost during installation, installation will halt and resume once connectivity is restored. No callback will be produced until installation has finished.

### Parameters:

- **`packageIdList`**

A *List* of *MapPackage* IDs to install (if an invalid ID value is contained within the list, or the list is empty, or `null` is passed, *INVALID\_PARAMETERS* will be returned in the callback)

### Returns:

True if the request has been made successfully, false if the *MapLoader* is busy processing another request

### See also:

[getId\(\)](#)

## public boolean `performMapDataUpdate` ()

Updates the version of map data if an update is available. An application might check first for available updates by calling *checkForMapDataUpdate()*.

Notes on updating map data:

- When the update starts, a summary of the update's size can be obtained through the *onInstallationSize(long, long)* callback.
- During the update, progress can be monitored via *onProgress(int)* callbacks.

- When the update is complete, notification will be sent by way of the `onPerformMapDataUpdateComplete(MapPackage, MapLoader.ResultCode)` callback.
- If device connectivity is lost while updating, updating will halt and resume once connectivity is restored. No callback will be produced until updating has finished.

For more information about updating map data versions, refer to the Incremental Updates section of the detailed description for this interface.

**Returns:**

True if the request has been made successfully, false if the `MapLoader` is busy processing another request

```
public void removeListener (Listener listener)
```

Removes a `MapLoader.Listener` for the `MapLoader`.

**Parameters:**

- `listener`  
A `MapLoader.Listener` to be removed

```
public void removeMapPackageAtCoordinateListener  
(MapPackageAtCoordinateListener listener)
```

Removes a `MapLoader.MapPackageAtCoordinateListener` for the `MapLoader`.

**Parameters:**

- `listener`  
A `MapLoader.MapPackageAtCoordinateListener` to be removed

```
public void selectDataGroup (SelectableDataGroup dataGroup)
```

Selects a map data group for installation when using an isolated disk cache. This method will not perform any action when using a shared disk cache. Each map package is divided into several data groups. When using an isolated disk cache, some of these groups may be optionally selected for installation if needed by the application. Conversely, data groups which may be selected by default can be deselected by the application if not needed, saving disk space.

Changes to the data group selection are only reflected in subsequent installations. To add data groups to previously installed packages, call `performMapDataUpdate()` after changing the group selection.

**Parameters:**

- `dataGroup`  
`com.here.android.mpa.MapPackage.SelectableDataGroup` to select.

**See also:**

[setIsolatedDiskCacheRootPath\(String, String\)](#)

```
public boolean uninstallMapPackages (List packageIdList)
```

Uninstalls the `MapPackage` hierarchies whose IDs are contained within the specified `List` of `Integer` objects.

Notes on uninstalling map packages:

- Uninstalling `MapPackage` s can be done while offline.
- During uninstallation, progress can be monitored via `onProgress(int)` callbacks.
- When uninstallation is complete, notification will be sent by way of the `onUninstallMapPackagesComplete(MapPackage, MapLoader.ResultCode)` callback.

**Parameters:**

- **packageIdList**

A `List` of `MapPackage` IDs to uninstall (if an invalid ID value is contained within the list, or the list is empty, or `null` is passed, `INVALID_PARAMETERS` will be returned in the callback)

**Returns:**

True if the request has been made successfully, false if the `MapLoader` is busy processing another request

**See also:**

[getId\(\)](#)

## Listener

The interface `Listener` is a member of `com.here.android.mpa.odml.MapLoader`.

### Interface Summary

```
public static abstract interface MapLoader.Listener
```

Represents a listener interface for receiving notifications from the `MapLoader`.

[For complete information, see the section [Interface Details](#)]

### Nested Class Summary

Table 925: Nested Classes in Listener

#### Nested Classes

```
public static abstract class MapLoader.Listener.Adapter
```

Default implementation for the `MapLoader.Listener` interface.

## Method Summary

Table 926: Methods in Listener

Methods
<pre>public abstract void <b>onCheckForUpdateComplete</b> (boolean updateAvailable, String currentMapVersion, String newestMapVersion, <b>ResultCode</b> resultCode)</pre> <p>A callback indicating that the <code>checkForMapDataUpdate()</code> method has completed its operation.</p>
<pre>public abstract void <b>onGetMapPackagesComplete</b> (<b>MapPackage</b> rootMapPackage, <b>ResultCode</b> resultCode)</pre> <p>A callback indicating that the <code>getMapPackages()</code> method has completed its operation.</p>
<pre>public abstract void <b>onInstallMapPackagesComplete</b> (<b>MapPackage</b> rootMapPackage, <b>ResultCode</b> resultCode)</pre> <p>A callback indicating that the <code>installMapPackages(List)</code> method has completed its operation.</p>
<pre>public abstract void <b>onInstallationSize</b> (long diskSize, long networkSize)</pre> <p>A callback triggered during certain <code>MapLoader</code> operations to indicate the size, in KB, of the map data which is to be downloaded and stored for that particular operation.</p>
<pre>public abstract void <b>onPerformMapDataUpdateComplete</b> (<b>MapPackage</b> rootMapPackage, <b>ResultCode</b> resultCode)</pre> <p>A callback indicating that the <code>performMapDataUpdate()</code> method has completed its operation.</p>
<pre>public abstract void <b>onProgress</b> (int progress)</pre> <p>A callback triggered during certain <code>MapLoader</code> operations to indicate the progress for that particular operation, a percentage value in the [0..100] range.</p>
<pre>public abstract void <b>onUninstallMapPackagesComplete</b> (<b>MapPackage</b> rootMapPackage, <b>ResultCode</b> resultCode)</pre> <p>A callback indicating that the <code>uninstallMapPackages(List)</code> method has completed its operation.</p>

## Interface Details

Represents a listener interface for receiving notifications from the `MapLoader`.

## Method Details

```
public abstract void onCheckForUpdateComplete (boolean updateAvailable, String currentMapVersion, String newestMapVersion, ResultCode resultCode)
```

A callback indicating that the `checkForMapDataUpdate()` method has completed its operation.

### Parameters:

- **updateAvailable**  
A boolean specifying whether an update is available
- **currentMapVersion**  
The current map data version, in the form "Major.Minor.Feature.Build" where each section is an unsigned integer
- **newestMapVersion**

The newest map data version, in the form "Major.Minor.Feature.Build" where each section is an unsigned integer

- **resultCode**

A `ResultCode` for the operation

```
public abstract void onGetMapPackagesComplete (MapPackage rootMapPackage,  
ResultCode resultCode)
```

A callback indicating that the *getMapPackages()* method has completed its operation.

**Parameters:**

- **rootMapPackage**

A root `MapPackage` (other map packages can be obtained by accessing its children). Can be null if the `ResultCode` does not indicate success.

- **resultCode**

A `ResultCode` for the operation

```
public abstract void onInstallMapPackagesComplete (MapPackage  
rootMapPackage, ResultCode resultCode)
```

A callback indicating that the *installMapPackages(List)* method has completed its operation.

**Parameters:**

- **rootMapPackage**

A root `MapPackage` (other map packages can be obtained by accessing its children). Can be null if the `ResultCode` does not indicate success.

- **resultCode**

A `ResultCode` for the operation

```
public abstract void onInstallationSize (long diskSize, long networkSize)
```

A callback triggered during certain *MapLoader* operations to indicate the size, in KB, of the map data which is to be downloaded and stored for that particular operation.

**Parameters:**

- **diskSize**

Amount of disk storage needed for the current operation

- **networkSize**

Amount of network traffic to be used for the current operation

```
public abstract void onPerformMapDataUpdateComplete (MapPackage  
rootMapPackage, ResultCode resultCode)
```

A callback indicating that the `performMapDataUpdate()` method has completed its operation.

**Parameters:**

- **rootMapPackage**  
A root `MapPackage` (other map packages can be obtained by accessing its children). Can be null if the `resultCode` does not indicate success.
- **resultCode**  
A `resultCode` for the operation

```
public abstract void onProgress (int progress)
```

A callback triggered during certain `MapLoader` operations to indicate the progress for that particular operation, a percentage value in the [0..100] range.

**Parameters:**

- **progress**  
Progress completion percentage

```
public abstract void onUninstallMapPackagesComplete (MapPackage  
rootMapPackage, resultCode resultCode)
```

A callback indicating that the `uninstallMapPackages(List)` method has completed its operation.

**Parameters:**

- **rootMapPackage**  
A root `MapPackage` (other map packages can be obtained by accessing its children). Can be null if the `resultCode` does not indicate success.
- **resultCode**  
A `resultCode` for the operation

## Adapter

The class `Adapter` is a member of `com.here.android.mpa.odml.MapLoader.Listener`.

### Class Summary

```
public static abstract class MapLoader.Listener.Adapter  
    implements com.here.android.mpa.odml.MapLoader.Listener  
    extends java.lang.Object
```

Default implementation for the `MapLoader.Listener` interface.

[For complete information, see the section [Class Details](#)]

**See also:**

*MapLoader.Listener*

## Constructor Summary

Table 927: Constructors in Adapter

Constructors
<i>Adapter</i> ()

## Method Summary

Table 928: Methods in Adapter

Methods
<p>public void <b><i>onCheckForUpdateComplete</i></b> (boolean updateAvailable, String currentMapVersion, String newestMapVersion, <b><i>ResultCode</i></b> resultCode)</p> <p>A callback indicating that the <i>checkForMapDataUpdate()</i> method has completed its operation.</p> <p>This method overrides <i>odml.MapLoader.Listener.onCheckForUpdateComplete(boolean, String, String, MapLoader, ResultCode)</i></p>
<p>public void <b><i>onGetMapPackagesComplete</i></b> (<b><i>MapPackage</i></b> rootMapPackage, <b><i>ResultCode</i></b> resultCode)</p> <p>A callback indicating that the <i>getMapPackages()</i> method has completed its operation.</p> <p>This method overrides <i>odml.MapLoader.Listener.onGetMapPackagesComplete(MapPackage, MapLoader, ResultCode)</i></p>
<p>public void <b><i>onInstallMapPackagesComplete</i></b> (<b><i>MapPackage</i></b> rootMapPackage, <b><i>ResultCode</i></b> resultCode)</p> <p>A callback indicating that the <i>installMapPackages(List)</i> method has completed its operation.</p> <p>This method overrides <i>odml.MapLoader.Listener.onInstallMapPackagesComplete(MapPackage, MapLoader, ResultCode)</i></p>
<p>public void <b><i>onInstallationSize</i></b> (long diskSize, long networkSize)</p> <p>A callback triggered during certain <i>MapLoader</i> operations to indicate the size, in KB, of the map data which is to be downloaded and stored for that particular operation.</p> <p>This method overrides <i>odml.MapLoader.Listener.onInstallationSize(long, long)</i></p>
<p>public void <b><i>onPerformMapDataUpdateComplete</i></b> (<b><i>MapPackage</i></b> rootMapPackage, <b><i>ResultCode</i></b> resultCode)</p> <p>A callback indicating that the <i>performMapDataUpdate()</i> method has completed its operation.</p> <p>This method overrides <i>odml.MapLoader.Listener.onPerformMapDataUpdateComplete(MapPackage, MapLoader, ResultCode)</i></p>
<p>public void <b><i>onProgress</i></b> (int progress)</p> <p>A callback triggered during certain <i>MapLoader</i> operations to indicate the progress for that particular operation, a percentage value in the [0..100] range.</p> <p>This method overrides <i>odml.MapLoader.Listener.onProgress(int)</i></p>
<p>public void <b><i>onUninstallMapPackagesComplete</i></b> (<b><i>MapPackage</i></b> rootMapPackage, <b><i>ResultCode</i></b> resultCode)</p> <p>A callback indicating that the <i>uninstallMapPackages(List)</i> method has completed its operation.</p> <p>This method overrides <i>odml.MapLoader.Listener.onUninstallMapPackagesComplete(MapPackage, MapLoader, ResultCode)</i></p>

## Class Details

Default implementation for the [MapLoader.Listener](#) interface. Clients may use this abstract class and overload specific methods to have a smaller code footprint.

See also:

[MapLoader.Listener](#)

## Constructor Details

Adapter ( )

## Method Details

```
public void onCheckForUpdateComplete (boolean updateAvailable, String currentMapVersion, String newestMapVersion, ResultCode resultCode)
```

A callback indicating that the [checkForMapDataUpdate\(\)](#) method has completed its operation.

This method overrides [odml.MapLoader.Listener.onCheckForUpdateComplete\(boolean, String, String, MapLoader, ResultCode\)](#)

Parameters:

- `updateAvailable`
- `currentMapVersion`
- `newestMapVersion`
- `resultCode`

```
public void onGetMapPackagesComplete (MapPackage rootMapPackage, ResultCode resultCode)
```

A callback indicating that the [getMapPackages\(\)](#) method has completed its operation.

This method overrides [odml.MapLoader.Listener.onGetMapPackagesComplete\(MapPackage, MapLoader, ResultCode\)](#)

Parameters:

- `rootMapPackage`
- `resultCode`

```
public void onInstallMapPackagesComplete (MapPackage rootMapPackage, ResultCode resultCode)
```

A callback indicating that the [installMapPackages\(List\)](#) method has completed its operation.

This method overrides [odml.MapLoader.Listener.onInstallMapPackagesComplete\(MapPackage, MapLoader, ResultCode\)](#)

**Parameters:**

- `rootMapPackage`
- `resultCode`

```
public void onInstallationSize (long diskSize, long networkSize)
```

A callback triggered during certain *MapLoader* operations to indicate the size, in KB, of the map data which is to be downloaded and stored for that particular operation.

This method overrides *odml.MapLoader.Listener.onInstallationSize(long, long)*

**Parameters:**

- `diskSize`
- `networkSize`

```
public void onPerformMapDataUpdateComplete (MapPackage rootMapPackage, ResultCode resultCode)
```

A callback indicating that the *performMapDataUpdate()* method has completed its operation.

This method overrides *odml.MapLoader.Listener.onPerformMapDataUpdateComplete(MapPackage, MapLoader, ResultCode)*

**Parameters:**

- `rootMapPackage`
- `resultCode`

```
public void onProgress (int progress)
```

A callback triggered during certain *MapLoader* operations to indicate the progress for that particular operation, a percentage value in the [0..100] range.

This method overrides *odml.MapLoader.Listener.onProgress(int)*

**Parameters:**

- `progress`

```
public void onUninstallMapPackagesComplete (MapPackage rootMapPackage, ResultCode resultCode)
```

A callback indicating that the *uninstallMapPackages(List)* method has completed its operation.

This method overrides *odml.MapLoader.Listener.onUninstallMapPackagesComplete(MapPackage, MapLoader, ResultCode)*

**Parameters:**

- `rootMapPackage`
- `resultCode`

## MapPackageAtCoordinateListener

The interface *MapPackageAtCoordinateListener* is a member of *com.here.android.mpa.odml.MapLoader*.

### Interface Summary

public static abstract interface **MapLoader.MapPackageAtCoordinateListener**

Represents a listener interface with a callback which gets invoked upon package retrieval.

[For complete information, see the section *Interface Details*]

### Method Summary

Table 929: Methods in MapPackageAtCoordinateListener

Methods
<pre>public abstract void <b>onGetMapPackageAtCoordinateComplete</b> (<i>MapPackage</i> mapPackage, <i>GeoCoordinate</i> coordinate, <i>ResultCode</i> resultCode)</pre>
A callback indicating that the <i>getMapPackageAtCoordinate(GeoCoordinate)</i> method has completed its operation.

### Interface Details

Represents a listener interface with a callback which gets invoked upon package retrieval.

### Method Details

```
public abstract void onGetMapPackageAtCoordinateComplete (MapPackage mapPackage, GeoCoordinate coordinate, ResultCode resultCode)
```

A callback indicating that the *getMapPackageAtCoordinate(GeoCoordinate)* method has completed its operation.

#### Parameters:

- **mapPackage**  
The found MapPackage. Can be null if the ResultCode does not indicate success.
- **coordinate**  
The coordinates used to locate the package.
- **resultCode**  
A ResultCode for the operation

## ResultCode

The enumeration *ResultCode* is a member of *com.here.android.mpa.odml.MapLoader*.

## Enumeration Summary

public static final enumeration **MapLoader.ResultCode**

extends *java.lang.Enum*, *java.lang.Object*

Represents values describing the status of a *MapLoader* operation.

[For complete information, see the section *Enumeration Details*]

## Enum Constant Summary

Table 930: Enum Constants in ResultCode

Fields
<pre>public static final ResultCode OPERATION_SUCCESSFUL</pre> <p>The <i>MapLoader</i> operation completed without error.</p>
<pre>public static final ResultCode INVALID_PARAMETERS</pre> <p>The <i>MapLoader</i> operation was called with invalid parameters.</p>
<pre>public static final ResultCode NO_CONNECTIVITY</pre> <p>The <i>MapLoader</i> operation could not be performed due to lack of Internet connectivity.</p>
<pre>public static final ResultCode NO_UPDATE_TO_PERFORM</pre> <p>The <i>performMapDataUpdate()</i> operation was invoked but there is no update to perform.</p>
<pre>public static final ResultCode NOT_ENOUGH_DISK_SPACE</pre> <p>The disk does not have the space required to perform the requested <i>MapLoader</i> operation.</p>
<pre>public static final ResultCode OPERATION_CANCELLED</pre> <p>The <i>MapLoader</i> operation was cancelled by a call to <i>cancelCurrentOperation()</i>.</p>
<pre>public static final ResultCode SERVER_NOT_RESPONDING</pre> <p>The <i>MapLoader</i> operation could not be completed because the map data server is not responding.</p>
<pre>public static final ResultCode UNEXPECTED_ERROR</pre> <p>An unexpected error occurred while processing the <i>MapLoader</i> request.</p>
<pre>public static final ResultCode FATAL_ERROR</pre> <p>An error which is non-recoverable in the current process instance has occurred.</p>
<pre>public static final ResultCode OPERATION_BUSY</pre> <p>The <i>MapLoader</i> operation could not be completed because either the map data server or the <i>MapLoader</i> is busy with an operation in another process.</p>
<pre>public static final ResultCode OPERATION_NOT_ALLOWED</pre> <p>Access to this operation is denied.</p>

## Method Summary

Table 931: Methods in `ResultCode`

Methods
<pre>public static <i>ResultCode</i> valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>MapLoader.ResultCode</i>[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Represents values describing the status of a *MapLoader* operation. Each status is returned through the *MapLoader.Listener* interface.

### Enum Constant Details

```
public static final ResultCode OPERATION_SUCCESSFUL
```

The *MapLoader* operation completed without error.

```
public static final ResultCode INVALID_PARAMETERS
```

The *MapLoader* operation was called with invalid parameters.

```
public static final ResultCode NO_CONNECTIVITY
```

The *MapLoader* operation could not be performed due to lack of Internet connectivity.

```
public static final ResultCode NO_UPDATE_TO_PERFORM
```

The *performMapDataUpdate()* operation was invoked but there is no update to perform.

```
public static final ResultCode NOT_ENOUGH_DISK_SPACE
```

The disk does not have the space required to perform the requested *MapLoader* operation.

```
public static final ResultCode OPERATION_CANCELLED
```

The *MapLoader* operation was cancelled by a call to *cancelCurrentOperation()*.

```
public static final ResultCode SERVER_NOT_RESPONDING
```

The *MapLoader* operation could not be completed because the map data server is not responding. The user should verify internet connectivity (e.g. by browsing to a webpage) and try again later.

```
public static final ResultCode UNEXPECTED_ERROR
```

An unexpected error occurred while processing the *MapLoader* request.

```
public static final ResultCode FATAL_ERROR
```

An error which is non-recoverable in the current process instance has occurred. To recover it may be necessary to have the user restart the process (swipe, force quit, ...)

```
public static final ResultCode OPERATION_BUSY
```

The *MapLoader* operation could not be completed because either the map data server or the *MapLoader* is busy with an operation in another process. Please retry the operation.

```
public static final ResultCode OPERATION_NOT_ALLOWED
```

Access to this operation is denied. Contact your HERE representative for more information.

### Method Details

```
public static ResultCode valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static MapLoader.ResultCode[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## MapPackage

The class *MapPackage* is a member of *com.here.android.mpa.odml* .

### Class Summary

```
public final class MapPackage
```

*extends java.lang.Object*

Represents a model for obtaining information about offline map packages that can be installed using a [MapLoader](#).

[For complete information, see the section [Class Details](#)]

## Nested Class Summary

Table 932: Nested Classes in MapPackage

Nested Classes
public static final enumeration <a href="#">MapPackage.InstallationState</a> Represents values describing the installation state of the MapPackage
public static final enumeration <a href="#">MapPackage.SelectableDataGroup</a> The data groups which may be optionally selected for offline map downloads.

## Method Summary

Table 933: Methods in MapPackage

Methods
public java.util.List < <a href="#">MapPackage</a> > <a href="#">getChildren</a> () Gets the children of the MapPackage , if it has any.
public String <a href="#">getEnglishTitle</a> () Gets the English title of the MapPackage .
public int <a href="#">getId</a> () Gets the unique identifier for the MapPackage , used for <a href="#">MapLoader</a> operations involving installation or uninstallation.
public <a href="#">InstallationState</a> <a href="#">getInstallationState</a> () Gets the current installation state of the MapPackage on the device
public <a href="#">MapPackage</a> <a href="#">getParent</a> () Gets the parent of the MapPackage , if it has one.
public long <a href="#">getSize</a> () Gets the maximum size, in KB, of the MapPackage , representing the maximum amount of space it will take up on disk.
public String <a href="#">getTitle</a> () Gets the title of the MapPackage .

## Class Details

Represents a model for obtaining information about offline map packages that can be installed using a [MapLoader](#). Map packages are arranged in a tree hierarchy, which is represented in the parent and children data of the MapPackage model.

Note: the root map package is the world map. If a `MapPackage` having children is installed, each child will also be installed, allowing the installation of entire regions.

## Method Details

```
public java.util.List <MapPackage> getChildren ()
```

Gets the children of the `MapPackage` , if it has any. The returned `List` is unmodifiable.

### Returns:

The `java.util.Collections#unmodifiableList(List)` of `MapPackage` children if any exist, an empty list otherwise.

```
public String getEnglishTitle ()
```

Gets the English title of the `MapPackage` .

### Returns:

The title in English.

```
public int getId ()
```

Gets the unique identifier for the `MapPackage` , used for `MapLoader` operations involving installation or uninstallation.

### Returns:

The ID for the `MapPackage`

### See also:

[`installMapPackages\(List<Integer>\)`](#)

[`uninstallMapPackages\(List<Integer>\)`](#)

```
public InstallationState getInstallationState ()
```

Gets the current installation state of the `MapPackage` on the device

### Returns:

[`MapPackage.InstallationState`](#)

```
public MapPackage getParent ()
```

Gets the parent of the `MapPackage` , if it has one.

### Returns:

The `MapPackage` parent if one exists, null otherwise

```
public long getSize ()
```

Gets the maximum size, in KB, of the `MapPackage`, representing the maximum amount of space it will take up on disk.

**Note:** If this is the first `MapPackage` installed, it will take up the amount of disk space returned by this method. However, if other `MapPackage`s have already been installed, the amount of disk space this package will take up is considerably less than the size value returned by this method. This is because there is common data between `MapPackage`s which will be installed upon first installation. To get an accurate representation of the disk space which will be used for a given installation operation use the [onInstallationSize\(long, long\)](#) callback.

**Returns:**

The `MapPackage` size

```
public String getTitle ()
```

Gets the title of the `MapPackage`.

**Returns:**

The title (the specific language depends on the device [Locale](#))

## InstallationState

The enumeration `InstallationState` is a member of `com.here.android.mpa.odml.MapPackage`.

### Enumeration Summary

```
public static final enumeration MapPackage.InstallationState
```

```
extends java.lang.Enum, java.lang.Object
```

Represents values describing the installation state of the `MapPackage`

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 934: Enum Constants in `InstallationState`

Fields
<pre>public static final <i>InstallationState</i> <b>INSTALLED</b></pre> <p>The <code>MapPackage</code> is installed</p>
<pre>public static final <i>InstallationState</i> <b>PARTIALLY_INSTALLED</b></pre> <p>The <code>MapPackage</code> is partially installed when not all the required data is present.</p>

### Fields

```
public static final InstallationState NOT_INSTALLED
```

The MapPackage is not installed

## Method Summary

Table 935: Methods in InstallationState

### Methods

```
public static InstallationState valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static MapPackage.InstallationState[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Represents values describing the installation state of the MapPackage

### Enum Constant Details

```
public static final InstallationState INSTALLED
```

The MapPackage is installed

```
public static final InstallationState PARTIALLY_INSTALLED
```

The MapPackage is partially installed when not all the required data is present. Installing the missing data can be achieved by way of the [performMapDataUpdate\(\)](#) or [installMapPackages\(List\)](#) APIs.

```
public static final InstallationState NOT_INSTALLED
```

The MapPackage is not installed

### Method Details

```
public static InstallationState valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static MapPackage.InstallationState[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## SelectableDataGroup

The enumeration *SelectableDataGroup* is a member of *com.here.android.mpa.odml.MapPackage*.

### Enumeration Summary

```
public static final enumeration MapPackage.SelectableDataGroup
```

```
extends java.lang.Enum, java.lang.Object
```

The data groups which may be optionally selected for offline map downloads.

[For complete information, see the section *Enumeration Details*]

See also:

```
selectDataGroup(SelectableDataGroup)
```

### Enum Constant Summary

Table 936: Enum Constants in *SelectableDataGroup*

Fields
<pre>public static final <i>SelectableDataGroup</i> <b>LinkGDBIdPvid</b></pre> <p>Mapping between GDBId and PVID.</p>
<pre>public static final <i>SelectableDataGroup</i> <b>PhoneticNames</b></pre> <p>Phonemes used for TTS guidance.</p>
<pre>public static final <i>SelectableDataGroup</i> <b>RealisticViews16x9</b></pre> <p>Images for used with the navigation realistic view feature, with 16x9 aspect ratio.</p>
<pre>public static final <i>SelectableDataGroup</i> <b>RealisticViews3x5</b></pre> <p>Images for used with the navigation realistic view feature, with 3x5 aspect ratio.</p>
<pre>public static final <i>SelectableDataGroup</i> <b>RealisticViews4x3</b></pre> <p>Images for used with the navigation realistic view feature, with 4x3 aspect ratio.</p>
<pre>public static final <i>SelectableDataGroup</i> <b>RealisticViews5x3</b></pre> <p>Images for used with the navigation realistic view feature, with 5x3 aspect ratio.</p>
<pre>public static final <i>SelectableDataGroup</i> <b>ADAS</b></pre> <p>Height curvature and slope of shape points.</p>

## Method Summary

Table 937: Methods in SelectableDataGroup

Methods
<pre>public int <i>getId</i> ()</pre> <p>Unique identifier of the data group guaranteed to stay the same throughout map updates.</p>
<pre>public static <i>SelectableDataGroup</i> <i>valueOf</i> (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>MapPackage.SelectableDataGroup</i>[] <i>values</i> ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

The data groups which may be optionally selected for offline map downloads. The default data group selection state is: Group Selected PhoneticNames yes RealisticViews16x9 yes RealisticViews3x5 yes RealisticViews4x3 yes RealisticViews5x3 yes LinkGDBIdPvid yes ADAS no Data groups not selected if access to this operation is denied. Contact your HERE representative for more information.

See also:

[selectDataGroup\(SelectableDataGroup\)](#)

## Enum Constant Details

```
public static final SelectableDataGroup LinkGDBIdPvid
```

Mapping between GDBId and PVID.

```
public static final SelectableDataGroup PhoneticNames
```

Phonemes used for TTS guidance.

```
public static final SelectableDataGroup RealisticViews16x9
```

Images for used with the navigation realistic view feature, with 16x9 aspect ratio.

```
public static final SelectableDataGroup RealisticViews3x5
```

Images for used with the navigation realistic view feature, with 3x5 aspect ratio.

```
public static final SelectableDataGroup RealisticViews4x3
```

Images for used with the navigation realistic view feature, with 4x3 aspect ratio.

```
public static final SelectableDataGroup RealisticViews5x3
```

Images for used with the navigation realistic view feature, with 5x3 aspect ratio.

```
public static final SelectableDataGroup ADAS
```

Height curvature and slope of shape points.

### Method Details

```
public int getId ()
```

Unique identifier of the data group guaranteed to stay the same throughout map updates.

#### Returns:

id of the *MapPackage.SelectableDataGroup*

```
public static SelectableDataGroup valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static MapPackage.SelectableDataGroup[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## pde

---

The package *pde* is a member of *com.here.android.mpa*.

### Package Summary

#### pde

The package *pde* (Platform Data Extension) provides classes, interfaces, and enumerations that allow your application to easily access Platform Data Extension REST API.

### Package Details

The package `pde` (Platform Data Extension) provides classes, interfaces, and enumerations that allow your application to easily access Platform Data Extension REST API.

## PlatformDataItem

The class `PlatformDataItem` is a member of `com.here.android.mpa.pde`.

### Class Summary

public class **PlatformDataItem**

*implements* `java.util.Map`

*extends* `java.lang.Object`

Single record from the Platform Data Extension request for a given layer.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 938: Nested Classes in PlatformDataItem

Nested Classes
public static final enumeration <code>PlatformDataItem.ConditionType</code> Type of the condition entity as described by the <code>CONDITION_TYPE</code> field.
public static final enumeration <code>PlatformDataItem.VehicleType</code> The possible vehicle types that are allowed on a link as described by the <code>VEHICLE_TYPES</code> field.

### Method Summary

Table 939: Methods in PlatformDataItem

Methods
public void <code>clear ()</code> Since this class is immutable, this method only throws <code>UnsupportedOperationException</code> and does not do anything else.
public boolean <code>containsKey (Object key)</code> Returns whether this <code>PlatformDataItem</code> contains the specified key.
public boolean <code>containsValue (Object value)</code> Returns whether this <code>PlatformDataItem</code> contains the specified value.
public Set <code>entrySet ()</code> Returns a <code>Set</code> containing all of the mappings in this <code>PlatformDataItem</code> .
public boolean <code>equals (Object o)</code> Compares the argument to the receiver, and returns <code>true</code> if the specified object is a <code>PlatformDataItem</code> and both <code>PlatformDataItem</code> s contain the same mappings.

**Methods**

```
public Map extract ()
```

Extracts the underlying raw data to a regular Map object.

```
public String get (Object key)
```

Returns the value of the mapping with the specified key.

```
public int getAverageHeight ()
```

DTM\_AVG\_HEIGHT data.

```
public ConditionType getConditionType ()
```

CONDITION\_TYPE data.

```
public java.util.List <GeoCoordinate> getCoordinates ()
```

LAT and LON data.

```
public String getLinkId ()
```

LINK\_ID data.

```
public String[] getLinkIds ()
```

LINK\_IDS data.

```
public float getLinkLength ()
```

LINK\_LENGTH data.

```
public java.util.EnumSet <VehicleType> getVehicleTypes ()
```

VEHICLE\_TYPES data.

```
public int hashCode ()
```

Returns an integer hash code for the receiver.

```
public boolean isEmpty ()
```

Returns whether this item is empty.

```
public Set keySet ()
```

Returns a set of the keys contained in this PlatformDataItem .

```
public String put (String key, String value)
```

Since this class is immutable, this method only throws UnsupportedOperationException and does not do anything else.

```
public void putAll (Map map)
```

Since this class is immutable, this method only throws UnsupportedOperationException and does not do anything else.

```
public String remove (Object key)
```

Since this class is immutable, this method only throws UnsupportedOperationException and does not do anything else.

```
public int size ()
```

Returns the number of mappings in this PlatformDataItem .

## Methods

```
public Collection values ()
```

Returns a Collection of the values contained in this PlatformDataItem.

---

## Class Details

Single record from the Platform Data Extension request for a given layer. Implements Map interface, where the key is the attribute name and the value is the value of that attribute. This class is immutable.

To avoid overhead when dealing with large data sets, all the items returned by this class are dynamically created on demand. Due to that fact this object keeps reference to its parent object. If you require normal Java behavior, you can obtain regular Java collection of underlying data with [extract\(\)](#) method.

## Method Details

```
public void clear ()
```

Since this class is immutable, this method only throws UnsupportedOperationException and does not do anything else.

```
public boolean containsKey (Object key)
```

Returns whether this PlatformDataItem contains the specified key.

### Parameters:

- **key**  
the key to search for.

### Returns:

true if this item contains the specified key, false otherwise.

```
public boolean containsValue (Object value)
```

Returns whether this PlatformDataItem contains the specified value.

### Parameters:

- **value**  
the value to search for.

### Returns:

true if this item contains the specified value, false otherwise.

```
public Set entrySet ()
```

Returns a Set containing all of the mappings in this PlatformDataItem. Each mapping is an instance of Map.Entry.

**Returns:**

a set of the mappings

**public boolean equals (Object o)**

Compares the argument to the receiver, and returns `true` if the specified object is a `PlatformDataItem` and both `PlatformDataItem`s contain the same mappings.

**Parameters:**

- `o`  
the Object to compare with this Object.

**Returns:**

boolean `true` if the Object is the same as this Object `false` if it is different from this Object.

**See also:**

[hashCode\(\)](#)

[entrySet\(\)](#)

**public Map extract ()**

Extracts the underlying raw data to a regular Map object.

All the items returned by this class are dynamically created on demand. Due to that fact this object keeps reference to its parent object. If you require normal Java behavior, you can convert this class to regular Java collection with this method.

**Returns:**

Content of the [PlatformDataItem](#) converted to regular Java collection.

**public String get (Object key)**

Returns the value of the mapping with the specified key.

**Parameters:**

- `key`  
the key.

**Returns:**

the value of the mapping with the specified key, or `null` if no mapping for the specified key is found.

**public int getAverageHeight ()**

DTM\_AVG\_HEIGHT data.

The average height [centimeters above WGS84 ellipsoid] along the link.

**Returns:**

Average height in centimeters. Integer.`.MIN_VALUE` if not available.

```
public ConditionType getConditionType ()
```

CONDITION\_TYPE data.

Returns traffic sign condition type. Valid only for TRAFFIC\_SIGN\_FCx layer data.

**Returns:**

ConditionType instance.

```
public java.util.List <GeoCoordinate> getCoordinates ()
```

LAT and LON data.

Latitude and longitude coordinates [10<sup>-5</sup> degree WGS84] along the polyline or of the reference node and the non reference node. Comma separated. Each value is relative to the previous.

**Returns:**

List containing parsed coordinates.

```
public String getLinkId ()
```

LINK\_ID data.

Positive 64 bit Integer that globally identifies the road link, also across map releases. Link IDs are never reused.

**Returns:**

String value of the link ID.

```
public String[] getLinkIds ()
```

LINK\_IDS data.

Comma separated list of Permanent link IDs that describe a route path. A negative sign means that this link was driven towards reference node. If the list contains only one link, then a 'B' prefix tells that it applies for both driving directions. Each link ID is a positive 64 bit Integer that globally identifies the road link, also across map releases. Link IDs are never reused.

**Returns:**

Array of link IDS or null if not available.

```
public float getLinkLength ()
```

LINK\_LENGTH data.

The link length in meters. This method returns the whole link length, no matter whether the link spans across several tiles. The link length is computed by straight lines between subsequent shape points, no splines or other smoothing functions or geodesic computations are used.

**Returns:**

Link length in meters. `Float.MIN_VALUE` if not available.

```
public java.util.EnumSet <VehicleType> getVehicleTypes ()
```

VEHICLE\_TYPES data.

Access Characteristics that identify the vehicle types that are allowed on a link, allowed on a lane or to which condition applies.

**Returns:**

Set of allowed vehicle types, null if not available.

```
public int hashCode ()
```

Returns an integer hash code for the receiver. Object s which are equal return the same value for this method.

**Returns:**

the receiver's hash.

**See also:**

[equals\(Object\)](#)

```
public boolean isEmpty ()
```

Returns whether this item is empty.

**Returns:**

true if this item has no elements, false otherwise.

**See also:**

[size\(\)](#)

```
public Set keySet ()
```

Returns a set of the keys contained in this PlatformDataItem .

**Returns:**

a set of the keys.

```
public String put (String key, String value)
```

Since this class is immutable, this method only throws `UnsupportedOperationException` and does not do anything else.

**Parameters:**

- **key**  
ignored
- **value**  
ignored

```
public void putAll (Map map)
```

Since this class is immutable, this method only throws `UnsupportedOperationException` and does not do anything else.

**Parameters:**

- **map**  
ignored

```
public String remove (Object key)
```

Since this class is immutable, this method only throws `UnsupportedOperationException` and does not do anything else.

**Parameters:**

- **key**  
ignored

```
public int size ()
```

Returns the number of mappings in this `PlatformDataItem`.

**Returns:**

the number of mappings in this `PlatformDataItem`.

```
public Collection values ()
```

Returns a `Collection` of the values contained in this `PlatformDataItem`.

**Returns:**

a collection of the values contained in this item.

## ConditionType

The enumeration *ConditionType* is a member of *com.here.android.mpa.pde.PlatformDataItem*.

### Enumeration Summary

public static final enumeration **PlatformDataItem.ConditionType**

extends *java.lang.Enum*, *java.lang.Object*

Type of the condition entity as described by the `CONDITION_TYPE` field.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 940: Enum Constants in ConditionType

Fields
<pre>public static final ConditionType UNDEFINED</pre> <p>Condition type is undefined.</p>
<pre>public static final ConditionType TOLL_STRUCTURE</pre> <p>Indicates toll structure (applicable to TOLL_BOOTH_FCx and TURN_RESTR_FCx layers).</p>
<pre>public static final ConditionType CONSTRUCTION_STATUS_CLOSED</pre> <p>Indicates construction status closed (applicable to TURN_RESTR_FCx layer).</p>
<pre>public static final ConditionType GATES</pre> <p>Indicates gates (applicable to TURN_RESTR_FCx layer).</p>
<pre>public static final ConditionType DIRECTION_OF_TRAVEL</pre> <p>Indicates direction of travel (applicable to TURN_RESTR_FCx layer).</p>
<pre>public static final ConditionType RESTRICTED_DRIVING_MANOEUVRE</pre> <p>Indicates restricted driving manoeuvre (applicable to TURN_RESTR_FCx layer).</p>
<pre>public static final ConditionType ACCESS_RESTRICTION</pre> <p>Indicates access restriction (applicable to TURN_RESTR_FCx layer).</p>
<pre>public static final ConditionType SPECIAL_EXPLICATION</pre> <p>Indicates special explication (applicable to TURN_RESTR_FCx layer).</p>
<pre>public static final ConditionType SPECIAL_SPEED_SITUATION</pre> <p>Indicates special speed situation (applicable to TURN_RESTR_FCx layer).</p>
<pre>public static final ConditionType VARIABLE_SPEED_SIGN</pre> <p>Indicates variable speed sign (applicable to TRAFFIC_SIGN_FCx and TURN_RESTR_FCx layers).</p>
<pre>public static final ConditionType USAGE_FEE_REQUIRED</pre> <p>Indicates usage fee required (applicable to TOLL_LINK_FCx and TURN_RESTR_FCx layers).</p>

**Fields**

```
public static final ConditionType LANE_TRAVERSAL
```

Indicates lane traversal (applicable to TURN\_RESTR\_FCx layer).

```
public static final ConditionType THROUGH_ROUTE
```

Indicates through route (applicable to TURN\_RESTR\_FCx layer).

```
public static final ConditionType TRAFFIC_SIGNAL
```

Indicates traffic signal (applicable to TRAFFIC\_SIGN\_FCx and TURN\_RESTR\_FCx layers).

```
public static final ConditionType TRAFFIC_SIGN
```

Indicates traffic sign (applicable to TRAFFIC\_SIGN\_FCx and TURN\_RESTR\_FCx layers).

```
public static final ConditionType RAILWAY_CROSSING
```

Indicates railway crossing (applicable to TRAFFIC\_SIGN\_FCx and TURN\_RESTR\_FCx layers).

```
public static final ConditionType NO_OVERTAKING
```

Indicates no overtaking (applicable to TRAFFIC\_SIGN\_FCx and TURN\_RESTR\_FCx layers).

```
public static final ConditionType JUNCTION_VIEW
```

Indicates junction view (applicable to TURN\_RESTR\_FCx layer).

```
public static final ConditionType PROTECTED_OVERTAKING
```

Indicates protected overtaking (applicable to TRAFFIC\_SIGN\_FCx and TURN\_RESTR\_FCx layers).

```
public static final ConditionType EVACUATION_ROUTE
```

Indicates evacuation route (applicable to TURN\_RESTR\_FCx layer).

```
public static final ConditionType TRANSPORT_ACCESS_RESTRICTION
```

Indicates transport access restriction (applicable to TRUCK\_RESTR\_FCx and TURN\_RESTR\_FCx layers).

```
public static final ConditionType TRANSPORT_SPECIAL_SPEED_SITUATION
```

Indicates transport special speed situation (applicable to TRUCK\_RESTR\_FCx and TURN\_RESTR\_FCx layers).

```
public static final ConditionType TRANSPORT_RDM
```

Indicates transport RDM (applicable to TRUCK\_RESTR\_FCx and TURN\_RESTR\_FCx layers).

```
public static final ConditionType TRANSPORT_PREFERRED_ROUTE
```

Indicates transport preferred route (applicable to TRUCK\_RESTR\_FCx and TURN\_RESTR\_FCx layers).

```
public static final ConditionType CALCULATED_RESTRICTED_DRIVING_MANOEUVRE
```

Indicates calculated restricted driving manoeuvre (applicable to TURN\_RESTR\_FCx layer).

```
public static final ConditionType PARKING_INFORMATION
```

Indicates parking information (applicable to TURN\_RESTR\_FCx layer).

```
public static final ConditionType ENVIRONMENTAL_ZONE
```

Indicates environmental zone (applicable to TURN\_RESTR\_FCx layer).

```
public static final ConditionType BLACKSPOT
```

Indicates blackspot (applicable to TRAFFIC\_SIGN\_FCx and TURN\_RESTR\_FCx layers).

### Fields

```
public static final ConditionType PERMITTED_DRIVING_MANOEUVRE
```

Indicates permitted driving manoeuvre (applicable to TURN\_RESTR\_FCx layer).

```
public static final ConditionType VARIABLE_SPEED_LIMIT
```

Indicates variable speed limit (applicable to TURN\_RESTR\_FCx layer).

```
public static final ConditionType SHORT_CONSTRUCTION_WARNING
```

Indicates short construction warning (applicable to TURN\_RESTR\_FCx layer).

## Method Summary

Table 941: Methods in *ConditionType*

### Methods

```
public static ConditionType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static PlatformDataItem.ConditionType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Type of the condition entity as described by the *CONDITION\_TYPE* field.

### Enum Constant Details

```
public static final ConditionType UNDEFINED
```

Condition type is undefined.

```
public static final ConditionType TOLL_STRUCTURE
```

Indicates toll structure (applicable to TOLL\_BOOTH\_FCx and TURN\_RESTR\_FCx layers).

```
public static final ConditionType CONSTRUCTION_STATUS_CLOSED
```

Indicates construction status closed (applicable to TURN\_RESTR\_FCx layer).

```
public static final ConditionType GATES
```

Indicates gates (applicable to TURN\_RESTR\_FCx layer).

```
public static final ConditionType DIRECTION_OF_TRAVEL
```

Indicates direction of travel (applicable to TURN\_RESTR\_FCx layer).

```
public static final ConditionType RESTRICTED_DRIVING_MANOEUVRE
```

Indicates restricted driving manoeuvre (applicable to TURN\_RESTR\_FCx layer).

```
public static final ConditionType ACCESS_RESTRICTION
```

Indicates access restriction (applicable to TURN\_RESTR\_FCx layer).

```
public static final ConditionType SPECIAL_EXPLICATION
```

Indicates special explication (applicable to TURN\_RESTR\_FCx layer).

```
public static final ConditionType SPECIAL_SPEED_SITUATION
```

Indicates special speed situation (applicable to TURN\_RESTR\_FCx layer).

```
public static final ConditionType VARIABLE_SPEED_SIGN
```

Indicates variable speed sign (applicable to TRAFFIC\_SIGN\_FCx and TURN\_RESTR\_FCx layers).

```
public static final ConditionType USAGE_FEE_REQUIRED
```

Indicates usage fee required (applicable to TOLL\_LINK\_FCx and TURN\_RESTR\_FCx layers).

```
public static final ConditionType LANE_TRAVERSAL
```

Indicates lane traversal (applicable to TURN\_RESTR\_FCx layer).

```
public static final ConditionType THROUGH_ROUTE
```

Indicates through route (applicable to TURN\_RESTR\_FCx layer).

```
public static final ConditionType TRAFFIC_SIGNAL
```

Indicates traffic signal (applicable to TRAFFIC\_SIGN\_FCx and TURN\_RESTR\_FCx layers).

```
public static final ConditionType TRAFFIC_SIGN
```

Indicates traffic sign (applicable to TRAFFIC\_SIGN\_FCx and TURN\_RESTR\_FCx layers).

```
public static final ConditionType RAILWAY_CROSSING
```

Indicates railway crossing (applicable to TRAFFIC\_SIGN\_FCx and TURN\_RESTR\_FCx layers).

```
public static final ConditionType NO_OVERTAKING
```

Indicates no overtaking (applicable to TRAFFIC\_SIGN\_FCx and TURN\_RESTR\_FCx layers).

```
public static final ConditionType JUNCTION_VIEW
```

Indicates junction view (applicable to TURN\_RESTR\_FCx layer).

```
public static final ConditionType PROTECTED_OVERTAKING
```

Indicates protected overtaking (applicable to TRAFFIC\_SIGN\_FCx and TURN\_RESTR\_FCx layers).

```
public static final ConditionType EVACUATION_ROUTE
```

Indicates evacuation route (applicable to TURN\_RESTR\_FCx layer).

```
public static final ConditionType TRANSPORT_ACCESS_RESTRICTION
```

Indicates transport access restriction (applicable to TRUCK\_RESTR\_FCx and TURN\_RESTR\_FCx layers).

```
public static final ConditionType TRANSPORT_SPECIAL_SPEED_SITUATION
```

Indicates transport special speed situation (applicable to TRUCK\_RESTR\_FCx and TURN\_RESTR\_FCx layers).

```
public static final ConditionType TRANSPORT_RDM
```

Indicates transport RDM (applicable to TRUCK\_RESTR\_FCx and TURN\_RESTR\_FCx layers).

```
public static final ConditionType TRANSPORT_PREFERRED_ROUTE
```

Indicates transport preferred route (applicable to TRUCK\_RESTR\_FCx and TURN\_RESTR\_FCx layers).

```
public static final ConditionType CALCULATED_RESTRICTED_DRIVING_MANOEUVRE
```

Indicates calculated restricted driving manoeuvre (applicable to TURN\_RESTR\_FCx layer).

```
public static final ConditionType PARKING_INFORMATION
```

Indicates parking information (applicable to TURN\_RESTR\_FCx layer).

```
public static final ConditionType ENVIRONMENTAL_ZONE
```

Indicates environmental zone (applicable to TURN\_RESTR\_FCx layer).

```
public static final ConditionType BLACKSPOT
```

Indicates blackspot (applicable to TRAFFIC\_SIGN\_FCx and TURN\_RESTR\_FCx layers).

```
public static final ConditionType PERMITTED_DRIVING_MANOEUVRE
```

Indicates permitted driving manoeuvre (applicable to TURN\_RESTR\_FCx layer).

```
public static final ConditionType VARIABLE_SPEED_LIMIT
```

Indicates variable speed limit (applicable to TURN\_RESTR\_FCx layer).

```
public static final ConditionType SHORT_CONSTRUCTION_WARNING
```

Indicates short construction warning (applicable to TURN\_RESTR\_FCx layer).

## Method Details

```
public static ConditionType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static PlatformDataItem.ConditionType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## VehicleType

The enumeration *VehicleType* is a member of *com.here.android.mpa.pde.PlatformDataItem*.

## Enumeration Summary

```
public static final enumeration PlatformDataItem.VehicleType
```

```
extends java.lang.Enum, java.lang.Object
```

The possible vehicle types that are allowed on a link as described by the `VEHICLE_TYPES` field.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 942: Enum Constants in `VehicleType`

Fields
<pre>public static final VehicleType UNDEFINED</pre> <p>Undefined.</p>
<pre>public static final VehicleType AUTOMOBILES</pre> <p>Automobiles (aka cars).</p>
<pre>public static final VehicleType BUSES</pre> <p>Buses.</p>
<pre>public static final VehicleType TAXIS</pre> <p>Taxis (aka cabs).</p>
<pre>public static final VehicleType CARPOOLS</pre> <p>Carpools (as in car sharing, not pools in cars).</p>
<pre>public static final VehicleType PEDESTRIANS</pre> <p>Pedestrians (aka human beings).</p>
<pre>public static final VehicleType TRUCKS</pre> <p>Trucks.</p>
<pre>public static final VehicleType DELIVERIES</pre> <p>Deliveries (aka vehicles that deliver stuff).</p>
<pre>public static final VehicleType EMERGENCY_VEHICLES</pre> <p>Emergency vehicles.</p>
<pre>public static final VehicleType THROUGH_TRAFFIC</pre> <p>Through traffic.</p>
<pre>public static final VehicleType MOTORCYCLES</pre> <p>Motorcycles.</p>
<pre>public static final VehicleType ROAD_TRAINS</pre> <p>Road trains (aka not actual trains).</p>

## Method Summary

Table 943: Methods in `VehicleType`

Methods
<pre>public static <i>VehicleType</i> <i>valueOf</i> (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>PlatformDataItem.VehicleType</i>[] <i>values</i> ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

The possible vehicle types that are allowed on a link as described by the `VEHICLE_TYPES` field.

### Enum Constant Details

```
public static final VehicleType UNDEFINED
```

Undefined.

```
public static final VehicleType AUTOMOBILES
```

Automobiles (aka cars).

```
public static final VehicleType BUSES
```

Buses.

```
public static final VehicleType TAXIS
```

Taxis (aka cabs).

```
public static final VehicleType CARPOOLS
```

Carpools (as in car sharing, not pools in cars).

```
public static final VehicleType PEDESTRIANS
```

Pedestrians (aka human beings).

```
public static final VehicleType TRUCKS
```

Trucks.

```
public static final VehicleType DELIVERIES
```

Deliveries (aka vehicles that deliver stuff).

```
public static final VehicleType EMERGENCY_VEHICLES
```

Emergency vehicles.

```
public static final VehicleType THROUGH_TRAFFIC
```

Through traffic.

```
public static final VehicleType MOTORCYCLES
```

Motorcycles.

```
public static final VehicleType ROAD_TRAINS
```

Road trains (aka not actual trains).

## Method Details

```
public static VehicleType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static PlatformDataItem.VehicleType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## PlatformDataItemCollection

The class *PlatformDataItemCollection* is a member of [com.here.android.mpa.pde](http://com.here.android.mpa.pde).

## Class Summary

```
public class PlatformDataItemCollection
```

```
    implements java.util.List
```

*extends java.lang.Object*

Collection of PlatformDataItem items.

[For complete information, see the section [Class Details](#)]

## Method Summary

Table 944: Methods in PlatformDataItemCollection

Methods
<pre>public void <b>add</b> (int location, PlatformDataItem object)</pre> <p>Since this class is immutable, this method only throws UnsupportedOperationException and does not do anything else.</p>
<pre>public boolean <b>add</b> (PlatformDataItem object)</pre> <p>Since this class is immutable, this method only throws UnsupportedOperationException and does not do anything else.</p>
<pre>public boolean <b>addAll</b> (int location, java.util.Collection &lt;? extends com.here.android.mpa.pde.PlatformDataItem&gt; collection)</pre> <p>Since this class is immutable, this method only throws UnsupportedOperationException and does not do anything else.</p>
<pre>public boolean <b>addAll</b> (java.util.Collection &lt;? extends com.here.android.mpa.pde.PlatformDataItem&gt; collection)</pre> <p>Since this class is immutable, this method only throws UnsupportedOperationException and does not do anything else.</p>
<pre>public void <b>clear</b> ()</pre> <p>Since this class is immutable, this method only throws UnsupportedOperationException and does not do anything else.</p>
<pre>public boolean <b>contains</b> (Object object)</pre> <p>Tests whether this PlatformDataItemCollection contains the specified object.</p>
<pre>public boolean <b>containsAll</b> (Collection collection)</pre> <p>Tests whether this PlatformDataItemCollection contains all objects contained in the specified collection.</p>
<pre>public boolean <b>equals</b> (Object o)</pre> <p>Compares the argument to the receiver, and returns true if the specified object is a PlatformDataItemCollection and both PlatformDataItemCollection s contain the same mappings.</p>
<pre>public List <b>extract</b> ()</pre> <p>Extracts the underlying raw data to a List of Map objects, each of which corresponds to a single record returned by Platform Data Extension request, which maps attribute name to its value.</p>
<pre>public PlatformDataItem <b>get</b> (int location)</pre> <p>Returns the element at the specified location in this PlatformDataItemCollection .</p>
<pre>public int <b>hashCode</b> ()</pre> <p>Returns an integer hash code for the receiver.</p>

**Methods**

```
public int indexOf (Object object)
```

Searches this PlatformDataItemCollection for the specified object and returns the index of the first occurrence.

```
public boolean isEmpty ()
```

Returns whether this PlatformDataItemCollection contains no elements.

```
public java.util.Iterator <PlatformDataItem> iterator ()
```

Returns an iterator on the elements of this PlatformDataItemCollection .

```
public int lastIndexOf (Object object)
```

Searches this PlatformDataItemCollection for the specified object and returns the index of the last occurrence.

```
public java.util.ListIterator <PlatformDataItem> listIterator ()
```

Returns a PlatformDataItemCollection iterator on the elements of this PlatformDataItemCollection .

```
public java.util.ListIterator <PlatformDataItem> listIterator (int location)
```

Returns a list iterator on the elements of this PlatformDataItemCollection .

```
public PlatformDataItem remove (int location)
```

Since this class is immutable, this method only throws UnsupportedOperationException and does not do anything else.

```
public boolean remove (Object object)
```

Since this class is immutable, this method only throws UnsupportedOperationException and does not do anything else.

```
public boolean removeAll (Collection collection)
```

Since this class is immutable, this method only throws UnsupportedOperationException and does not do anything else.

```
public boolean retainAll (Collection collection)
```

Since this class is immutable, this method only throws UnsupportedOperationException and does not do anything else.

```
public PlatformDataItem set (int location, PlatformDataItem object)
```

Since this class is immutable, this method only throws UnsupportedOperationException and does not do anything else.

```
public int size ()
```

Returns the number of elements in this PlatformDataItemCollection .

```
public java.util.List <PlatformDataItem> subList (int start, int end)
```

Returns a PlatformDataItemCollection of the specified portion of this PlatformDataItemCollection from the given start index to the end index minus one.

```
public Object[] toArray ()
```

Returns an array containing all elements contained in this PlatformDataItemCollection .

```
public T[] toArray (T[] array)
```

Returns an array containing all elements contained in this PlatformDataItemCollection .

## Class Details

Collection of `PlatformDataItem` items. This class implements `List` interface. Additionally contains methods useful for manipulating the data (filtering, combining etc.).

To avoid overhead when dealing with large data sets, all the items returned by this class and its children are dynamically created on demand. Due to that fact this object and the child objects keep references to their parent object. If you require normal Java behavior, you can obtain regular Java collection of underlying data with [extract\(\)](#) method.

## Method Details

```
public void add (int location, PlatformDataItem object)
```

Since this class is immutable, this method only throws `UnsupportedOperationException` and does not do anything else.

### Parameters:

- `location`  
ignored
- `object`  
ignored

```
public boolean add (PlatformDataItem object)
```

Since this class is immutable, this method only throws `UnsupportedOperationException` and does not do anything else.

### Parameters:

- `object`  
ignored

```
public boolean addAll (int location, java.util.Collection <? extends  
com.here.android.mpa.pde.PlatformDataItem> collection)
```

Since this class is immutable, this method only throws `UnsupportedOperationException` and does not do anything else.

### Parameters:

- `location`  
ignored
- `collection`  
ignored

```
public boolean addAll (java.util.Collection <? extends  
com.here.android.mpa.pde.PlatformDataItem> collection)
```

Since this class is immutable, this method only throws `UnsupportedOperationException` and does not do anything else.

**Parameters:**

- **collection**  
ignored

```
public void clear ()
```

Since this class is immutable, this method only throws `UnsupportedOperationException` and does not do anything else.

```
public boolean contains (Object object)
```

Tests whether this `PlatformDataItemCollection` contains the specified object.

**Parameters:**

- **object**  
the object to search for.

**Returns:**

true if object is an element of this `PlatformDataItemCollection`, false otherwise

```
public boolean containsAll (Collection collection)
```

Tests whether this `PlatformDataItemCollection` contains all objects contained in the specified collection.

**Parameters:**

- **collection**  
the collection of objects

**Returns:**

true if all objects in the specified collection are elements of this `PlatformDataItemCollection`, false otherwise.

```
public boolean equals (Object o)
```

Compares the argument to the receiver, and returns true if the specified object is a `PlatformDataItemCollection` and both `PlatformDataItemCollection` s contain the same mappings.

**Parameters:**

- **o**

the `Object` to compare with this `Object`.

**Returns:**

boolean `true` if the `Object` is the same as this `Object` `false` if it is different from this `Object`.

**See also:**

[hashCode\(\)](#)

## `public List extract ()`

Extracts the underlying raw data to a `List` of `Map` objects, each of which corresponds to a single record returned by Platform Data Extension request, which maps attribute name to its value.

All the items returned by this class and its children are dynamically created on demand. Due to that fact this object and the child objects keep references to their parent object. If you require normal Java behavior, you can convert this class to regular Java collection with this method.

**Returns:**

Content of the [PlatformDataItemCollection](#) converted to regular Java collection.

## `public PlatformDataItem get (int location)`

Returns the element at the specified location in this `PlatformDataItemCollection`.

**Parameters:**

- `location`  
the index of the element to return.

**Returns:**

the element at the specified location.

**Throws:**

- `IndexOutOfBoundsException`  
if `location` is smaller than 0 or `location` is greater or equal to `size()`

## `public int hashCode ()`

Returns an integer hash code for the receiver. `Object` s which are equal return the same value for this method.

**Returns:**

the receiver's hash.

**See also:**

[equals\(Object\)](#)

```
public int indexOf (Object object)
```

Searches this `PlatformDataItemCollection` for the specified object and returns the index of the first occurrence.

**Parameters:**

- **object**  
the object to search for.

**Returns:**

the index of the first occurrence of the object or -1 if the object was not found.

```
public boolean isEmpty ()
```

Returns whether this `PlatformDataItemCollection` contains no elements.

**Returns:**

true if this `PlatformDataItemCollection` has no elements, false otherwise.

**See also:**

[size\(\)](#)

```
public java.util.Iterator <PlatformDataItem> iterator ()
```

Returns an iterator on the elements of this `PlatformDataItemCollection`. The elements are iterated in the same order as they occur in the `PlatformDataItemCollection`.

**Returns:**

an iterator on the elements of this `PlatformDataItemCollection`.

**See also:**

`java.util.Iterator`

```
public int lastIndexOf (Object object)
```

Searches this `PlatformDataItemCollection` for the specified object and returns the index of the last occurrence.

**Parameters:**

- **object**  
the object to search for.

**Returns:**

the index of the last occurrence of the object, or -1 if the object was not found.

```
public java.util.ListIterator <PlatformDataItem> listIterator ()
```

Returns a PlatformDataItemCollection iterator on the elements of this PlatformDataItemCollection . The elements are iterated in the same order that they occur in the PlatformDataItemCollection .

**Returns:**

a PlatformDataItemCollection iterator on the elements of this PlatformDataItemCollection

**See also:**

java.util.ListIterator

```
public java.util.ListIterator <PlatformDataItem> listIterator (int location)
```

Returns a list iterator on the elements of this PlatformDataItemCollection . The elements are iterated in the same order as they occur in the PlatformDataItemCollection . The iteration starts at the specified location.

**Parameters:**

- **location**  
the index at which to start the iteration.

**Returns:**

a list iterator on the elements of this PlatformDataItemCollection.

**Throws:**

- **IndexOutOfBoundsException**  
if location is less than 0 or greater than list size.

**See also:**

java.util.ListIterator

```
public PlatformDataItem remove (int location)
```

Since this class is immutable, this method only throws UnsupportedOperationException and does not do anything else.

**Parameters:**

- **location**  
ignored

```
public boolean remove (Object object)
```

Since this class is immutable, this method only throws UnsupportedOperationException and does not do anything else.

**Parameters:**

- **object**  
ignored

```
public boolean removeAll (Collection collection)
```

Since this class is immutable, this method only throws `UnsupportedOperationException` and does not do anything else.

**Parameters:**

- **collection**  
ignored

```
public boolean retainAll (Collection collection)
```

Since this class is immutable, this method only throws `UnsupportedOperationException` and does not do anything else.

**Parameters:**

- **collection**  
ignored

```
public PlatformDataItem set (int location, PlatformDataItem object)
```

Since this class is immutable, this method only throws `UnsupportedOperationException` and does not do anything else.

**Parameters:**

- **location**  
ignored
- **object**  
ignored

**Throws:**

- **UnsupportedOperationException**

```
public int size ()
```

Returns the number of elements in this `PlatformDataItemCollection`.

**Returns:**

the number of elements in this `PlatformDataItemCollection`.

```
public java.util.List <PlatformDataItem> subList (int start, int end)
```

Returns a PlatformDataItemCollection of the specified portion of this PlatformDataItemCollection from the given start index to the end index minus one.

**Parameters:**

- **start**  
the index at which to start the sublist.
- **end**  
the index one past the end of the sublist.

**Returns:**

a list of a portion of this PlatformDataItemCollection.

**Throws:**

- **IndexOutOfBoundsException**  
if **start** is smaller than 0 and **start** is greater than **end**, or if **end** greater than **size()**

```
public Object[] toArray ()
```

Returns an array containing all elements contained in this PlatformDataItemCollection .

**Returns:**

an array of the elements from this PlatformDataItemCollection.

```
public T[] toArray (T[] array)
```

Returns an array containing all elements contained in this PlatformDataItemCollection . If the specified array is large enough to hold the elements, the specified array is used, otherwise an array of the same type is created. If the specified array is used and is larger than this PlatformDataItemCollection , the array element following the collection elements is set to null.

**Parameters:**

- **array**  
the array.

**Returns:**

an array of the elements from this PlatformDataItemCollection.

**Throws:**

- **ArrayStoreException**  
if the type of an element in this PlatformDataItemCollection cannot be stored in the type of the specified array.

## PlatformDataRequest

The class `PlatformDataRequest` is a member of `com.here.android.mpa.pde`.

### Class Summary

public final class **PlatformDataRequest**

*extends java.lang.Object*

Runs the Platform Data Extension request with the given parameters.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 945: Nested Classes in PlatformDataRequest

Nested Classes
public static class <code>PlatformDataRequest.Error</code> Represents error reported by the Platform Data Extension server.
public static abstract interface <code>PlatformDataRequest.Listener</code> Represents an event listener that reports information about the completion of a request.

### Method Summary

Table 946: Methods in PlatformDataRequest

Methods
public static <code>PlatformDataRequest createBoundingBoxRequest</code> (Set layers, <code>GeoBoundingBox geoBoundingBox</code> ) Creates a data request with the specified layers and <code>GeoBoundingBox</code> instance.
public static <code>PlatformDataRequest createLinkIdsRequest</code> (Set layers, Set linkIds) Creates a data request with the specified layers and permanent link ids (see <code>RoadElement</code> ).
public static <code>PlatformDataRequest createStaticLayerRequest</code> (String layer) Creates a data request with the specified static layer.
public void <code>execute</code> ( <code>Listener&lt;PlatformDataResult&gt;</code> listener) Invokes the data request with the specified listener.

### Class Details

Runs the Platform Data Extension request with the given parameters.

## Method Details

```
public static PlatformDataRequest createBoundingBoxRequest (Set layers,
GeoBoundingBox geoBoundingBox)
```

Creates a data request with the specified layers and *GeoBoundingBox* instance.

### Parameters:

- **layers**  
Names of layers from which the data should be fetched.
- **geoBoundingBox**  
Area for which the data should be fetched.

### Returns:

*PlatformDataRequest* instance.

### Throws:

- ***IllegalArgumentException***  
in case of invalid arguments.

```
public static PlatformDataRequest createLinkIdsRequest (Set layers, Set
linkIds)
```

Creates a data request with the specified layers and permanent link ids (see *RoadElement*).

### Parameters:

- **layers**  
Names of layers from which the data should be fetched.
- **linkIds**  
The permanent link ids to be searched in the layers specified.

### Returns:

*PlatformDataRequest* instance.

### Throws:

- ***IllegalArgumentException***  
in case of invalid arguments.

```
public static PlatformDataRequest createStaticLayerRequest (String layer)
```

Creates a data request with the specified static layer. Note that a static layer doesn't require any bounding box or link ids to collect data.

### Parameters:

- **layer**

The name of the static layer.

**Returns:**

If the parameter is valid, an `PlatformDataRequest` object configured with the parameter and null otherwise.

**Throws:**

- `IllegalArgumentException`  
in case of invalid arguments.

```
public void execute (Listener<PlatformDataResult> listener)
```

Invokes the data request with the specified listener.

**Parameters:**

- `listener`  
Listener to which the result will be passed.

## Error

The class `Error` is a member of `com.here.android.mpa.pde.PlatformDataRequest`.

### Class Summary

```
public static class PlatformDataRequest.Error
```

```
extends java.lang.Object
```

Represents error reported by the Platform Data Extension server.

[For complete information, see the section [Class Details](#)]

**See also:**

[PlatformDataRequest](#)

### Nested Class Summary

Table 947: Nested Classes in Error

Nested Classes
public static final enumeration <code>PlatformDataRequest.Error.Type</code>

## Method Summary

Table 948: Methods in Error

Methods
<code>public String <a href="#">getFaultCode</a> ()</code>
<code>public String <a href="#">getMessage</a> ()</code>
<code>public String <a href="#">getResponseCode</a> ()</code>
<code>public <i>Type</i> <a href="#">getType</a> ()</code>

## Class Details

Represents error reported by the Platform Data Extension server.

**See also:**

[PlatformDataRequest](#)

## Method Details

`public String getFaultCode ()`

**Returns:**

fault code for this error.

`public String getMessage ()`

**Returns:**

human readable description of this error.

`public String getResponseCode ()`

**Returns:**

server's response code.

`public Type getType ()`

**Returns:**

type of this error.

## Type

The enumeration *Type* is a member of *com.here.android.mpa.pde.PlatformDataRequest.Error*.

## Enumeration Summary

public static final enumeration **PlatformDataRequest.Error.Type**

extends *java.lang.Enum*, *java.lang.Object*

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 949: Enum Constants in Type

Fields
<pre>public static final Type INVALID_PARAMETERS</pre> <p>Invalid parameters were provided.</p>
<pre>public static final Type NO_PERMISSION</pre> <p>No permission to use the API.</p>
<pre>public static final Type CONNECTION_ERROR</pre> <p>Could not reach the server.</p>
<pre>public static final Type SERVER_ERROR</pre> <p>Successfully connected to the server, but server responded with error.</p>

## Method Summary

Table 950: Methods in Type

Methods
<pre>public static Type valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static PlatformDataRequest.Error.Type[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

### Enum Constant Details

public static final *Type* **INVALID\_PARAMETERS**

Invalid parameters were provided.

public static final *Type* **NO\_PERMISSION**

No permission to use the API.

```
public static final Type CONNECTION_ERROR
```

Could not reach the server.

```
public static final Type SERVER_ERROR
```

Successfully connected to the server, but server responded with error.

### Method Details

```
public static Type valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static PlatformDataRequest.Error.Type[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Listener<T>

The interface *Listener<T>* is a member of *com.here.android.mpa.pde.PlatformDataRequest*.

#### Type Parameters:

- **T**  
Listener data type

### Interface Summary

```
public static abstract interface PlatformDataRequest.Listener
```

Represents an event listener that reports information about the completion of a request.

[For complete information, see the section *Interface Details*]

### Method Summary

Table 951: Methods in Listener<T>

#### Methods

```
public abstract void onCompleted (T data, Error error)
```

A callback indicating that a request operation has completed.

## Interface Details

Represents an event listener that reports information about the completion of a request.

## Method Details

```
public abstract void onCompleted (T data, Error error)
```

A callback indicating that a request operation has completed.

### Parameters:

- **data**  
Search results (can be `null` if no results were found or an error was encountered). E.g. if there is no map data due to working offline, `null` is returned.
- **error**  
An `PlatformDataError` representing an appropriate error.

# PlatformDataResult

The class `PlatformDataResult` is a member of `com.here.android.mpa.pde`.

## Class Summary

```
public final class PlatformDataResult
```

```
    implements java.util.Map
```

```
    extends java.lang.Object
```

Result of the Platform Data Extension request.

[For complete information, see the section [Class Details](#)]

### See also:

[PlatformDataItemCollection](#)

## Method Summary

Table 952: Methods in PlatformDataResult

### Methods

```
public void clear ()
```

Since this class is immutable, this method only throws `UnsupportedOperationException` and does not do anything else.

```
public boolean containsKey (Object key)
```

Returns whether this `Map` contains the specified key.

## Methods

```
public boolean containsValue (Object value)
```

Returns whether this Map contains the specified value.

```
public java.util.Set <java.util.Map.Entry<java.lang.String,<br>com.here.android.mpa.pde.PlatformDataItemCollection>> entrySet ()
```

Returns a Set containing all of the mappings in this Map .

```
public boolean equals (Object o)
```

Compares the argument to the receiver, and returns true if the specified object is a PlatformDataResult and both PlatformDataResult s contain the same mappings.

```
public Map extract ()
```

All the items returned by this class and its children are dynamically created on demand.

```
public PlatformDataItemCollection get (Object key)
```

Returns the value of the mapping with the specified key.

```
public int hashCode ()
```

Returns an integer hash code for the receiver.

```
public boolean isEmpty ()
```

Returns whether this map is empty.

```
public Set keySet ()
```

Returns a set of the keys contained in this Map .

```
public PlatformDataItemCollection put (String key, PlatformDataItemCollection value)
```

Since this class is immutable, this method only throws UnsupportedOperationException and does not do anything else.

```
public void putAll (java.util.Map <? extends java.lang.String, ? extends<br>com.here.android.mpa.pde.PlatformDataItemCollection> map)
```

Since this class is immutable, this method only throws UnsupportedOperationException and does not do anything else.

```
public PlatformDataItemCollection remove (Object key)
```

Since this class is immutable, this method only throws UnsupportedOperationException and does not do anything else.

```
public int size ()
```

Returns the number of mappings in this Map .

```
public java.util.Collection <PlatformDataItemCollection> values ()
```

Returns a Collection of the values contained in this Map .

## Class Details

Result of the Platform Data Extension request. Implements Map interface, where the key is the layer name and the value is the PlatformDataItemCollection object, which is a collection of the retrieved items ( PlatformDataItem ) for the given layer. This class is immutable.

The *PlatformDataItemCollection* objects returned by this class keep reference to *PlatformDataResult* instance.

**See also:**

*PlatformDataItemCollection*

## Method Details

```
public void clear ()
```

Since this class is immutable, this method only throws *UnsupportedOperationException* and does not do anything else.

```
public boolean containsKey (Object key)
```

Returns whether this Map contains the specified key.

**Parameters:**

- **key**  
the key to search for.

**Returns:**

true if this map contains the specified key, false otherwise.

```
public boolean containsValue (Object value)
```

Returns whether this Map contains the specified value.

**Parameters:**

- **value**  
the value to search for.

**Returns:**

true if this map contains the specified value, false otherwise.

```
public java.util.Set <java.util.Map.Entry<java.lang.String<,  
com.here.android.mpa.pde.PlatformDataItemCollection>> entrySet ()
```

Returns a Set containing all of the mappings in this Map . Each mapping is an instance of *Map.Entry*.

**Returns:**

a set of the mappings

```
public boolean equals (Object o)
```

Compares the argument to the receiver, and returns `true` if the specified object is a `PlatformDataResult` and both `PlatformDataResult` s contain the same mappings.

**Parameters:**

- `o`  
the Object to compare with this Object.

**Returns:**

boolean `true` if the Object is the same as this Object `false` if it is different from this Object.

**See also:**

[hashCode\(\)](#)

[entrySet\(\)](#)

```
public Map extract ()
```

All the items returned by this class and its children are dynamically created on demand. Due to that fact the child objects keep references to their parent object. If you require normal Java behavior, you can convert this class to regular Java collection with this method.

**Returns:**

Content of the `@{code PlatformDataResult` converted to regular Java collection.

```
public PlatformDataItemCollection get (Object key)
```

Returns the value of the mapping with the specified key.

**Parameters:**

- `key`  
the key.

**Returns:**

the value of the mapping with the specified key, or `null` if no mapping for the specified key is found.

```
public int hashCode ()
```

Returns an integer hash code for the receiver. Object s which are equal return the same value for this method.

**Returns:**

the receiver's hash.

**See also:**

[equals\(Object\)](#)

```
public boolean isEmpty ()
```

Returns whether this map is empty.

**Returns:**

true if this map has no elements, false otherwise.

**See also:**

[size\(\)](#)

```
public Set keySet ()
```

Returns a set of the keys contained in this Map .

**Returns:**

a set of the keys.

```
public PlatformDataItemCollection put (String key, PlatformDataItemCollection value)
```

Since this class is immutable, this method only throws UnsupportedOperationException and does not do anything else.

**Parameters:**

- **key**  
ignored
- **value**  
ignored

```
public void putAll (java.util.Map <? extends java.lang.String, ? extends com.here.android.mpa.pde.PlatformDataItemCollection> map)
```

Since this class is immutable, this method only throws UnsupportedOperationException and does not do anything else.

**Parameters:**

- **map**  
ignored

```
public PlatformDataItemCollection remove (Object key)
```

Since this class is immutable, this method only throws UnsupportedOperationException and does not do anything else.

**Parameters:**

- **key**

ignored

```
public int size ()
```

Returns the number of mappings in this Map .

**Returns:**

the number of mappings in this Map.

```
public java.util.Collection <PlatformDataItemCollection> values ()
```

Returns a Collection of the values contained in this Map .

**Returns:**

a collection of the values contained in this map.

## routing

---

The package *routing* is a member of *com.here.android.mpa*.

### Package Summary

#### routing

This package provides classes, interfaces, and enumerations for route calculation and route description (directions).

### Package Details

This package provides classes, interfaces, and enumerations for route calculation and route description (directions).

Note: the *CoreRouter* class provides access to the route calculation functionality.

To calculate a route, you need:

- a parameter list containing at least two waypoints for the start and end of the route - this is an instance of *RoutePlan*
- a set of routing options to control route calculation features - this is an instance of *RouteOptions*
- an event listener for listening to *CoreRouter* events - this is an instance of *CoreRouter.Listener*

Note that to use transit and truck route calculation feature, your application must include the google-gson library (release 2.2.4 or a compatible version) on its class path. This library can be downloaded from the google-gson project website at <http://code.google.com/p/google-gson/>. Attempting to use to use transit and truck route calculation features without adding this library will cause runtime errors.

For more information on how to use the [CoreRouter](#), please see the "Directions" section in the HERE SDK for Android Developer's Guide

## ConsumptionParameters

The class `ConsumptionParameters` is a member of `com.here.android.mpa.routing`.

### Class Summary

public final class **ConsumptionParameters**

*extends java.lang.Object*

Stores information about consumption parameters of vehicle.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 953: Nested Classes in ConsumptionParameters

Nested Classes
<pre>public static final class <a href="#">ConsumptionParameters.ConsumptionForSpeed</a></pre> <p>Specifies consumption per meter for different travel speeds.</p>
<pre>public static final class <a href="#">ConsumptionParameters.TrafficScale</a></pre> <p>Defines the traffic speed/free-flow speed adjustment scale.</p>

### Constructor Summary

Table 954: Constructors in ConsumptionParameters

Constructors
<pre><a href="#">ConsumptionParameters</a> ()</pre> <p>Default Constructor</p>

### Method Summary

Table 955: Methods in ConsumptionParameters

Methods
<pre>public static <a href="#">ConsumptionParameters</a> <a href="#">createDefaultConsumptionParameters</a> ()</pre> <p>Creates consumption parameters with default values.</p>
<pre>public double <a href="#">getAccelerationMultiplier</a> ()</pre> <p>Gets the acceleration multiplier.</p>
<pre>public double <a href="#">getAscentMultiplier</a> ()</pre> <p>Gets the ascent multiplier.</p>

**Methods**

```
public double getAuxiliaryConsumption ()
```

Gets the auxiliary consumption.

```
public double getDecelerationMultiplier ()
```

Gets the deceleration multiplier.

```
public double getDescentMultiplier ()
```

Gets the descent multiplier.

```
public boolean getHighSpeedConsumptionEnabled ()
```

Gets "high speed consumption" mode state.

```
public int getHighSpeedConsumptionThresholdKmh ()
```

Gets free flow speed threshold [kmh] for a link to satisfy "high speed consumption" conditions.

```
public java.util.List <ConsumptionForSpeed> getSpeedParameters ()
```

Gets consumption per meter for different travel speeds.

```
public java.util.List <TrafficScale> getTrafficScales ()
```

Gets the traffic scaling coefficients.

```
public java.util.List <ConsumptionForSpeed> getTrafficSpeedParameters ()
```

Gets consumption per meter for different travel speeds for heavy traffic.

```
public double getTurnTimeMultiplier ()
```

Gets the turn time multiplier.

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public void setAccelerationMultiplier (double multiplier)
```

Sets acceleration multiplier.

```
public void setAscentMultiplier (double multiplier)
```

Sets the ascent multiplier.

```
public void setAuxiliaryConsumption (double auxiliaryConsumption)
```

Sets auxiliary consumption per second.

```
public void setDecelerationMultiplier (double multiplier)
```

Sets deceleration multiplier.

```
public void setDescentMultiplier (double multiplier)
```

Sets descent multiplier.

```
public void setHighSpeedConsumptionEnabled (boolean enabled)
```

Enables/disables "high speed consumption" mode.

```
public void setHighSpeedConsumptionThresholdKmh (int speedConsumptionThresholdKmh)
```

Sets free flow speed threshold [kmh] for a link to satisfy "high speed consumption" conditions.

### Methods

```
public void setSpeedParameters (java.util.List <ConsumptionForSpeed> consumptionForSpeedList)
```

Sets consumption per meter according to travel speeds.

```
public void setTrafficScale (java.util.List <TrafficScale> trafficScales)
```

Sets the traffic scaling coefficients.

```
public void setTrafficSpeedParameters (java.util.List <ConsumptionForSpeed>  
consumptionForSpeedList)
```

Sets consumption per meter for different travel speeds for heavy traffic.

```
public void setTurnTimeMultiplier (double multiplier)
```

Sets turn time multiplier.

## Class Details

Stores information about consumption parameters of vehicle. Consumption parameters are used for consumption calculation (See [Route](#) and [RouteConsumption](#)).

Consumption describes the usage rate of a resource that is used by the vehicle, such as electrical energy, over a period of time.

IMPORTANT: Consumption calculation is a Beta feature. The related classes are subject to change without notice.

## Constructor Details

### ConsumptionParameters ()

Default Constructor

## Method Details

```
public static ConsumptionParameters createDefaultConsumptionParameters ()
```

Creates consumption parameters with default values.

#### Returns:

ConsumptionParameters object.

```
public double getAccelerationMultiplier ()
```

Gets the acceleration multiplier.

#### Returns:

The multiplier

```
public double getAscentMultiplier ()
```

Gets the ascent multiplier.

**Returns:**

The multiplier

```
public double getAuxiliaryConsumption ()
```

Gets the auxiliary consumption.

**Returns:**

The consumption value

```
public double getDecelerationMultiplier ()
```

Gets the deceleration multiplier.

**Returns:**

The multiplier

```
public double getDescentMultiplier ()
```

Gets the descent multiplier.

**Returns:**

The multiplier

```
public boolean getHighSpeedConsumptionEnabled ()
```

Gets "high speed consumption" mode state.

**Returns:**

True if "high speed consumption" mode is on, false otherwise.

```
public int getHighSpeedConsumptionThresholdKmh ()
```

Gets free flow speed threshold [kmh] for a link to satisfy "high speed consumption" conditions. See [setHighSpeedConsumptionEnabled\(boolean\)](#)

**Returns:**

High speed consumption threshold.

```
public java.util.List <ConsumptionForSpeed> getSpeedParameters ()
```

Gets consumption per meter for different travel speeds.

**Returns:**

List of *ConsumptionParameters.ConsumptionForSpeed* instances or null if none are available.

```
public java.util.List <TrafficScale> getTrafficScales ()
```

Gets the traffic scaling coefficients.

**Returns:**

List of *ConsumptionParameters.TrafficScale* instances or null if none are available.

```
public java.util.List <ConsumptionForSpeed> getTrafficSpeedParameters ()
```

Gets consumption per meter for different travel speeds for heavy traffic.

**Returns:**

List of *ConsumptionParameters.ConsumptionForSpeed* instances or null if none are available.

```
public double getTurnTimeMultiplier ()
```

Gets the turn time multiplier.

**Returns:**

The multiplier

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public void setAccelerationMultiplier (double multiplier)
```

Sets acceleration multiplier.

During speed up, this parameter is used to model capacity expenditure in capacity units per km/h<sup>2</sup> of acceleration. A higher value corresponds to greater capacity expenditure while the vehicle is accelerating.

**Parameters:**

- **multiplier**  
The acceleration multiplier

```
public void setAscentMultiplier (double multiplier)
```

Sets the ascent multiplier. Ascent multiplier models capacity expenditure during ascent in capacity units per meter of ascent. A higher value corresponds to greater capacity expenditure while driving up-hill.

**Parameters:**

- **multiplier**

The ascent multiplier

```
public void setAuxiliaryConsumption (double auxiliaryConsumption)
```

Sets auxiliary consumption per second.

Auxiliary consumption is used to account for the consumption by items such as lights, air conditioner, or stereo. A higher value corresponds to greater capacity expenditure over time.

**Parameters:**

- **auxiliaryConsumption**  
The combined auxiliary consumption value

```
public void setDecelerationMultiplier (double multiplier)
```

Sets deceleration multiplier.

During slowdown, this parameter is used to model capacity gain in capacity units per  $\text{km/h}^2$  of deceleration. A higher value corresponds to greater capacity gain while the vehicle is decelerating.

**Parameters:**

- **multiplier**  
The deceleration multiplier

```
public void setDescentMultiplier (double multiplier)
```

Sets descent multiplier.

Descent multiplier is the model's capacity gained during descent, in capacity units per meter of descent. A higher value corresponds to greater capacity gain while driving down-hill.

**Parameters:**

- **multiplier**  
The descent multiplier

```
public void setHighSpeedConsumptionEnabled (boolean enabled)
```

Enables/disables "high speed consumption" mode.

Link satisfies "high speed consumption" mode conditions when it:

- is a highway;
- has no speed limit;
- has no time-aware speed limit;
- has no dynamic speed limit;
- has free flow speed above threshold `get_high_speed_consumption_threshold_kmh`.

When "high speed consumption" mode is enabled and link satisfies its conditions, then consumption for this link is calculated not based on its free flow speed, but based on the highest consumption provided by `get_speed_parameters`.

The idea is to better predict consumption for drivers going on considerably higher speed than free flow values, eg. in sport mode.

**Parameters:**

- **enabled**

If true, "high speed consumption" mode is enabled.

**public void setHighSpeedConsumptionThresholdKmh (int speedConsumptionThresholdKmh)**

Sets free flow speed threshold [kmh] for a link to satisfy "high speed consumption" conditions. See [setHighSpeedConsumptionEnabled\(boolean\)](#)

**Parameters:**

- **speedConsumptionThresholdKmh**

The speed consumption threshold.

**public void setSpeedParameters (java.util.List <ConsumptionForSpeed> consumptionForSpeedList)**

Sets consumption per meter according to travel speeds.

Setting only this value is sufficient to perform basic consumption calculation.

This list is made up of pairs of values representing the speed (in km/h) and the consumption per meter in the capacity unit.

Consider a simple consumption table for a sample electric vehicle where the consumption unit is kilowatt hours (kWh):

- 0 - 30 km/h - 38.82 kWh
- 31 - 90 km/h - 18.20 kWh
- More than 90 km/h - 27.41 kWh

The speeds should be set with the upper bound of each speed range:

```
List<ConsumptionParameters.ConsumptionForSpeed>
speedParameters = Arrays.asList(
    new ConsumptionParameters.ConsumptionForSpeed(30, 38.82),
    new ConsumptionParameters.ConsumptionForSpeed(90, 18.20),
    new ConsumptionParameters.ConsumptionForSpeed(250,
27.41));
```

Note: Default values are assigned when the object is instantiated.

**Parameters:**

- **consumptionForSpeedList**

List of *ConsumptionParameters.ConsumptionForSpeed* instances.

**Throws:**

- **IllegalArgumentException**  
if *consumptionForSpeedList* is null or empty.

```
public void setTrafficScale (java.util.List <TrafficScale> trafficScales)
```

Sets the traffic scaling coefficients. Traffic Scale coefficients specifies a piece-wise linear scaling between the traffic speed parameters and the speed parameters. For a given traffic value (calculated as 1 - traffic speed/free-flow speed) this mapping is applied to determine the interpolation point between free-flow consumption and traffic consumption for the traffic speed defined by the speed parameters (see *getSpeedParameters()*) and traffic speed parameters (see *getTrafficSpeedParameters()*).

**Parameters:**

- **trafficScales**  
List of *ConsumptionParameters.TrafficScale* instances.

**Throws:**

- **IllegalArgumentException**  
if *trafficScales* is null or empty.

```
public void setTrafficSpeedParameters (java.util.List <ConsumptionForSpeed>  
consumptionForSpeedList)
```

Sets consumption per meter for different travel speeds for heavy traffic. The exact consumption per meter that is used will be an interpolated value between the standard consumption for speed and the traffic consumption for speed, depending on the amount of traffic along each part of the route. The interpolation can be configured with *setTrafficScale(List)*.

Note: This is an advanced consumption calculation feature. For more information, please contact your HERE representative.

This list is made up of pairs of values representing the speed (in km/h) and the consumption per meter in the capacity unit. See *setSpeedParameters(List)* for more details on how the values should be filled in.

**Parameters:**

- **consumptionForSpeedList**  
List of *ConsumptionParameters.ConsumptionForSpeed* instances.

**Throws:**

- **IllegalArgumentException**  
if *consumptionForSpeedList* is null or empty.

```
public void setTurnTimeMultiplier (double multiplier)
```

Sets turn time multiplier.

Capacity expenditure while turning, in capacity units per second of travel time. A higher value corresponds to greater capacity expenditure while the vehicle is turning.

#### Parameters:

- **multiplier**  
The turn time multiplier

## ConsumptionForSpeed

The class *ConsumptionForSpeed* is a member of *com.here.android.mpa.routing.ConsumptionParameters*.

### Class Summary

public static final class **ConsumptionParameters.ConsumptionForSpeed**

*extends java.lang.Object*

Specifies consumption per meter for different travel speeds.

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 956: Constructors in ConsumptionForSpeed

Constructors
<i>ConsumptionForSpeed</i> (int speedInKmH, double consumptionPerMeter) Default constructor.

### Method Summary

Table 957: Methods in ConsumptionForSpeed

Methods
public boolean <i>equals</i> (Object o) For documentation, see <i>java.lang.Object</i>
public double <i>getConsumptionPerMeter</i> () Gets the consumption per meter value.
public int <i>getSpeedInKmH</i> () Gets the speed in Kh per hour.
public int <i>hashCode</i> () For documentation, see <i>java.lang.Object</i>

## Class Details

Specifies consumption per meter for different travel speeds.

## Constructor Details

**ConsumptionForSpeed (int speedInKmH, double consumptionPerMeter)**

Default constructor.

### Parameters:

- **speedInKmH**  
The speed in Km per hour
- **consumptionPerMeter**  
The consumption per meter

## Method Details

**public boolean equals (Object o)**

For documentation, see *java.lang.Object*

### Parameters:

- **o**

**public double getConsumptionPerMeter ()**

Gets the consumption per meter value.

### Returns:

The consumption value

**public int getSpeedInKmH ()**

Gets the speed in Kh per hour.

### Returns:

The speed value

**public int hashCode ()**

For documentation, see *java.lang.Object*

## TrafficScale

The class *TrafficScale* is a member of *com.here.android.mpa.routing.ConsumptionParameters*.

### Class Summary

public static final class **ConsumptionParameters.TrafficScale**

extends *java.lang.Object*

Defines the traffic speed/free-flow speed adjustment scale.

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 958: Constructors in TrafficScale

Constructors
<i>TrafficScale</i> (double ratio, double coefficient)

### Method Summary

Table 959: Methods in TrafficScale

Methods	
public boolean <i>equals</i> (Object o)	
public double <i>getCoefficient</i> ()	Gets coefficient that will be used to adjust consumption according to the traffic_speed/free_flow_speed ratio
public double <i>getRatio</i> ()	Gets the ratio between traffic_speed and free_flow_speed
public int <i>hashCode</i> ()	

### Class Details

Defines the traffic speed/free-flow speed adjustment scale. Scale will be used when calculating consumption for a segment that contains traffic information. Setting this scale allows the definition of how the ratio between the speed parameters (see [getSpeedParameters\(\)](#)) and traffic speed parameters (see [getTrafficSpeedParameters\(\)](#)) influence the consumption.

### Constructor Details

**TrafficScale (double ratio, double coefficient)**

Parameters:

- **ratio**

- `coefficient`

### Method Details

```
public boolean equals (Object o)
```

Parameters:

- `o`

```
public double getCoefficient ()
```

Gets coefficient that will be used to adjust consumption according to the `traffic_speed/free_flow_speed` ratio

Returns:

coefficient

```
public double getRatio ()
```

Gets the ratio between `traffic_speed` and `free_flow_speed`

Returns:

ratio between `traffic_speed` and `free_flow_speed`

```
public int hashCode ()
```

## CoreRouter

The class `CoreRouter` is a member of [com.here.android.mpa.routing](#) .

### Class Summary

```
public final class CoreRouter
```

```
    implements com.here.android.mpa.routing.Router
```

```
    extends java.lang.Object
```

Route calculation executor handling core routing types (Car, Truck, Pedestrian).

[For complete information, see the section [Class Details](#)]

## Nested Class Summary

Table 960: Nested Classes in CoreRouter

Nested Classes
<p>public static final enumeration <a href="#">CoreRouter.Connectivity</a></p> <p>The possible types of connectivity for route calculation</p>
<p>public static abstract interface <a href="#">CoreRouter.Listener</a></p> <p>Represents a listener to provide information about route calculation events.</p>

## Constructor Summary

Table 961: Constructors in CoreRouter

Constructors
<p><a href="#">CoreRouter</a> ()</p> <p>Default constructor with <i>DEFAULT</i>.</p>

## Method Summary

Table 962: Methods in CoreRouter

Methods
<p>public void <a href="#">calculateRoute</a> (<a href="#">RoutePlan</a> routePlan, <a href="#">Listener&lt;RouteResult, RoutingError&gt;</a> listener)</p> <p>Invokes an asynchronous route calculation.</p>
<p>public void <a href="#">cancel</a> ()</p>
<p>public <a href="#">Connectivity</a> <a href="#">getConnectivity</a> ()</p> <p>Gets the connectivity to be used for route calculation.</p>
<p>public <a href="#">DynamicPenalty</a> <a href="#">getDynamicPenalty</a> ()</p> <p>Get the different penalties which is responsible to change the routing conditions.</p>
<p>public boolean <a href="#">isBusy</a> ()</p>
<p>public <a href="#">CoreRouter</a> <a href="#">setConnectivity</a> (<a href="#">Connectivity</a> connectivity)</p> <p>Determines whether route is calculated online or offline.</p>
<p>public <a href="#">CoreRouter</a> <a href="#">setDynamicPenalty</a> (<a href="#">DynamicPenalty</a> penalty)</p> <p>Sets the dynamic penalty that should be applied to route calculations.</p>

## Class Details

Route calculation executor handling core routing types (Car, Truck, Pedestrian). Defines concrete calculation method and response listener for core routing types.

## Constructor Details

### CoreRouter ()

Default constructor with *DEFAULT*. Multiple *CoreRouter* s can be created to calculate multiple routes in parallel.

## Method Details

```
public void calculateRoute (RoutePlan routePlan, Listener<RouteResult, RoutingError> listener)
```

Invokes an asynchronous route calculation. Upon completion of the request, the *Listener* will be invoked regardless if the request is completed successfully or not.

#### Parameters:

- **routePlan**
- **listener**

A *Listener* for the *CoreRouter*. As of 3.2.2, This method will notify listeners with *INVALID\_PARAMETERS* and a route will not be calculated if calculating a route with *TRACK* since calculating a route in track mode is no longer supported. This method returns *INVALID\_PARAMETERS* and a route will not be calculated if calculating a route with *PUBLIC\_TRANSPORT* and *routePlan* contains more than 2 waypoints.

```
public void cancel ()
```

```
public Connectivity getConnectivity ()
```

Gets the connectivity to be used for route calculation.

#### Returns:

*CoreRouter.Connectivity* to be used for route calculation

```
public DynamicPenalty getDynamicPenalty ()
```

Get the different penalties which is responsible to change the routing conditions.

#### Returns:

*DynamicPenalty* used for route calculation

```
public boolean isBusy ()
```

```
public CoreRouter setConnectivity (Connectivity connectivity)
```

Determines whether route is calculated online or offline. Default is *DEFAULT*. If set to offline, it will attempt to calculate the route offline regardless of the routing type and regardless of whether there is enough map data for the route calculation, if fails, it will not make another attempt online. If set to online, it will attempt to calculate the route online regardless of the routing type and regardless of the current device connectivity. If it fails, it will not make another attempt offline. If this is changed after calling `calculateRoute`, the change will not take effect for the current route calculation. \note An example of the usage is as follows: e.g. An app wishes to try online first and falls back to offline if online fails. Such app will set connectivity to *ONLINE* before calculating a route, if this fails, it will change connectivity to *OFFLINE* before another route calculation attempt.

#### Parameters:

- **connectivity**  
The *CoreRouter.Connectivity* to set

#### Returns:

This *CoreRouter* to be used for route calculation

```
public CoreRouter setDynamicPenalty (DynamicPenalty penalty)
```

Sets the dynamic penalty that should be applied to route calculations. Penalties can be applied in the form of restricting roads, areas and setting different traffic modes.

Note: Passing `null` will set the default penalties.

#### Parameters:

- **penalty**  
*DynamicPenalty* penalty used for route calculation

#### Returns:

This *CoreRouter*

## Connectivity

The enumeration *Connectivity* is a member of *com.here.android.mpa.routing.CoreRouter*.

### Enumeration Summary

```
public static final enumeration CoreRouter.Connectivity
```

```
extends java.lang.Enum, java.lang.Object
```

The possible types of connectivity for route calculation

[For complete information, see the section *Enumeration Details*]

## Enum Constant Summary

Table 963: Enum Constants in Connectivity

Fields
<pre>public static final Connectivity DEFAULT</pre> <p>Route is calculated based on the current <i>MapEngine</i> online status, which depends on the current network access and could be forced to offline using <i>setOnline(boolean)</i>.</p>
<pre>public static final Connectivity OFFLINE</pre> <p>Attempts offline routing regardless whether there is enough map data on the device.</p>
<pre>public static final Connectivity ONLINE</pre> <p>Attempts online routing regardless whether device is online or whether the HERE SDK is allowed to access network.</p>

## Method Summary

Table 964: Methods in Connectivity

Methods
<pre>public int getValue ()</pre>
<pre>public static Connectivity valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static CoreRouter.Connectivity[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

The possible types of connectivity for route calculation

### Enum Constant Details

```
public static final Connectivity DEFAULT
```

Route is calculated based on the current *MapEngine* online status, which depends on the current network access and could be forced to offline using *setOnline(boolean)*. If the MapEngine status is set to online, then an online routing will be made. If the MapEngine status is offline, then an offline route calculation is performed.

```
public static final Connectivity OFFLINE
```

Attempts offline routing regardless whether there is enough map data on the device. If there is not enough map data the request might fail. If it fails, it will not try online.

```
public static final Connectivity ONLINE
```

Attempts online routing regardless whether device is online or whether the HERE SDK is allowed to access network. If the device is offline, the request will fail. If it fails, it will not try offline.

## Method Details

```
public int getValue ()
```

```
public static Connectivity valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static CoreRouter.Connectivity[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Listener

The interface *Listener* is a member of *com.here.android.mpa.routing.CoreRouter*.

## Interface Summary

```
public static abstract interface CoreRouter.Listener  
    extends com.here.android.mpa.routing.Router.Listener
```

Represents a listener to provide information about route calculation events.

[For complete information, see the section [Interface Details](#)]

### See also:

```
calculateRoute(RoutePlan, Listener<List<RouteResult>, RoutingError>)
```

## Method Summary

Table 965: Methods in Listener

Methods
<pre>public abstract void <i>onCalculateRouteFinished</i> (java.util.List &lt;<i>RouteResult</i>&gt; results, <i>RoutingError</i> error)</pre> <p>A callback indicating that a route calculation operation has finished.</p>

## Interface Details

Represents a listener to provide information about route calculation events.

See also:

*calculateRoute(RoutePlan, Listener<List<RouteResult>, RoutingError>)*

## Method Details

```
public abstract void onCalculateRouteFinished (java.util.List <RouteResult>
results, RoutingError error)
```

A callback indicating that a route calculation operation has finished. In the case of *VIOLATES\_OPTIONS*, one or more *RouteResult* in the returned list contains a list of violated *RouteOptions*. For other *RoutingError*, the list size of *RouteResult* will be 0. You may also receive an error in the offline case where only cached data (not downloaded map data) is available. There is no guarantee that a route is returned in this case. Only one result will be returned for routes with more than two *RouteWaypoint*.

Parameters:

- **results**  
A List of *RouteResult*
- **error**  
A *RoutingError* indicating the error code for the route calculation (could be *NONE*).

See also:

*getViolatedOptions()*

## DrivingDirection

The enumeration *DrivingDirection* is a member of *com.here.android.mpa.routing* .

### Enumeration Summary

```
public final enumeration DrivingDirection
```

```
extends java.lang.Enum, java.lang.Object
```

Enumeration for driving direction.

[For complete information, see the section *Enumeration Details*]

See also:

*addRoadPenalty(RoadElement, DrivingDirection, int)*

## Enum Constant Summary

Table 966: Enum Constants in `DrivingDirection`

Fields
<pre>public static final <i>DrivingDirection</i> DIR_BOTH</pre> <p>Both direction.</p>
<pre>public static final <i>DrivingDirection</i> DIR_FORWARD</pre> <p>Forward direction</p>
<pre>public static final <i>DrivingDirection</i> DIR_BACKWARD</pre> <p>Backward direction.</p>

## Method Summary

Table 967: Methods in `DrivingDirection`

Methods
<pre>public int value ()</pre>
<pre>public static <i>DrivingDirection</i> valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>DrivingDirection</i>[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Enumeration for driving direction. This can be used to specify the direction of driving.

### See also:

[`addRoadPenalty\(RoadElement, DrivingDirection, int\)`](#)

## Enum Constant Details

```
public static final DrivingDirection DIR_BOTH
```

Both direction. Forward as well as backward

```
public static final DrivingDirection DIR_FORWARD
```

Forward direction

```
public static final DrivingDirection DIR_BACKWARD
```

Backward direction.

## Method Details

```
public int value ()
```

```
public static DrivingDirection valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static DrivingDirection[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## DynamicPenalty

The class *DynamicPenalty* is a member of [com.here.android.mpa.routing](#) .

### Class Summary

```
public final class DynamicPenalty
```

```
extends java.lang.Object
```

This class represents a policy containing road, area, and traffic restriction factors that are taken into account while calculating routes.

[For complete information, see the section [Class Details](#)]

### See also:

[Route.TrafficPenaltyMode](#)

### Constructor Summary

Table 968: Constructors in DynamicPenalty

#### Constructors

```
DynamicPenalty ()
```

Default constructor.

## Method Summary

Table 969: Methods in DynamicPenalty

Methods
<pre>public void <a href="#">addBannedArea</a> (<a href="#">GeoPolygon</a> area)</pre> <p>Sets a banned area which is excluded from the routing calculation.</p>
<pre>public void <a href="#">addRoadPenalty</a> (<a href="#">RoadElement</a> element, <a href="#">DrivingDirection</a> direction, int newSpeed)</pre> <p>Sets a penalty for a road segment.</p>
<pre>public void <a href="#">clearAllAreaPenalties</a> ()</pre> <p>Removes all previously-added areas and their penalty from this policy.</p>
<pre>public void <a href="#">clearAllRoadPenalties</a> ()</pre> <p>Removes all previously-added road penalties.</p>
<pre>public <a href="#">TrafficPenaltyMode</a> <a href="#">getTrafficPenaltyMode</a> ()</pre> <p>Retrieves the traffic penalty mode for route calculations.</p>
<pre>public void <a href="#">removeBannedArea</a> (<a href="#">GeoPolygon</a> area)</pre> <p>Removes a banned area, if added previously.</p>
<pre>public void <a href="#">removeRoadPenalty</a> (<a href="#">RoadElement</a> element)</pre> <p>Remove a road segment from the penalty policy.</p>
<pre>public void <a href="#">setTrafficPenaltyMode</a> (<a href="#">TrafficPenaltyMode</a> mode)</pre> <p>Sets whether route calculation should take traffic into account.</p>

## Class Details

This class represents a policy containing road, area, and traffic restriction factors that are taken into account while calculating routes. These restriction factors are also known as penalties. For example, you can use this class to set an area penalty to indicate that the travel speed in an area is 50% slower than the legal speed limit.

DynamicPenalty must be set with [setDynamicPenalty\(DynamicPenalty\)](#) for its restrictions to be in effect.

See also:

[Route.TrafficPenaltyMode](#)

## Constructor Details

### DynamicPenalty ()

Default constructor.

## Method Details

```
public void addBannedArea (GeoPolygon area)
```

Sets a banned area which is excluded from the routing calculation.

A banned area is defined in terms of [GeoPolygon](#).

#### Parameters:

- **area**  
area to which penalty is being added.

#### Throws:

- **NullPointerException**  
if area is null

```
public void addRoadPenalty (RoadElement element, DrivingDirection direction,  
int newSpeed)
```

Sets a penalty for a road segment. Road penalties are defined as a speed that overrides the original speed of the road segment.

Road penalties are in kilometers per hour and must be between 0 and 254. A penalty of 0 blocks the road segment from route calculations altogether.

Segments can be blocked in the forward, backward, or both directions. If a road segment is excluded in the backward direction, it can still be accessed in the forward direction. If you want to completely exclude the segment, block both directions.

#### Parameters:

- **element**  
RoadElement to identify the road segment.
- **direction**  
The road's direction represented by DrivingDirection to be used to apply penalty.
- **newSpeed**  
New Speed for the segment in kilometers per hour. Must be in between 0 to 254.

#### Throws:

- **IllegalArgumentException**  
if newSpeed is less than 0 or greater than 254
- **NullPointerException**  
if the RoadElement is null

```
public void clearAllAreaPenalties ()
```

Removes all previously-added areas and their penalty from this policy.

```
public void clearAllRoadPenalties ()
```

Removes all previously-added road penalties.

```
public TrafficPenaltyMode getTrafficPenaltyMode ()
```

Retrieves the traffic penalty mode for route calculations.

**Returns:**

The *Route.TrafficPenaltyMode* used for calculations

```
public void removeBannedArea (GeoPolygon area)
```

Removes a banned area, if added previously.

Area is defined in terms of *GeoPolygon*.

**Parameters:**

- **area**  
area to be removed from penalty policy

```
public void removeRoadPenalty (RoadElement element)
```

Remove a road segment from the penalty policy. This will remove penalties for every *DrivingDirection*

**Parameters:**

- **element**  
*RoadElement* to identify the road segment.

```
public void setTrafficPenaltyMode (TrafficPenaltyMode mode)
```

Sets whether route calculation should take traffic into account. By default, traffic penalty mode is *DISABLED*.

**Parameters:**

- **mode**  
A *TrafficPenaltyMode* indicating whether to take traffic into account.

## Maneuver

The class *Maneuver* is a member of *com.here.android.mpa.routing*.

### Class Summary

```
public class Maneuver
```

```
extends java.lang.Object
```

Represents the action required to leave one street segment and enter the next in the chain of directions that comprises a calculated *Route*.

[For complete information, see the section *Class Details*]

## Nested Class Summary

Table 970: Nested Classes in Maneuver

Nested Classes
public static final enumeration <i>Maneuver.Action</i> Represents values describing the possible actions of a <i>Maneuver</i> .
public static final enumeration <i>Maneuver.Icon</i> Represents values describing types of <i>Maneuver</i> icons.
public static final enumeration <i>Maneuver.TrafficDirection</i> Represents values describing possible traffic directions, the side of road on which one must drive.
public static final enumeration <i>Maneuver.Turn</i> Represents values describing possible turns within a <i>Maneuver</i> .

## Method Summary

Table 971: Methods in Maneuver

Methods
public <i>Action</i> <i>getAction</i> () Gets the <i>Maneuver.Action</i> required to complete the maneuver.
public int <i>getAngle</i> () Gets the angle of the maneuver.
public <i>GeoBoundingBox</i> <i>getBoundingBox</i> () Gets the <i>GeoBoundingBox</i> of the maneuver, which is a group of <i>GeoCoordinates</i> forming a polygon
public <i>GeoCoordinate</i> <i>getCoordinate</i> () Gets the <i>GeoCoordinate</i> of the maneuver.
public int <i>getDistanceFromPreviousManeuver</i> () Gets the distance from the previous maneuver to the current maneuver, in meters.
public int <i>getDistanceFromStart</i> () Gets the distance from the start of the route to the maneuver, in meters.
public int <i>getDistanceToNextManeuver</i> () Gets the distance to the next maneuver from the current maneuver, in meters.
public <i>Icon</i> <i>getIcon</i> () Gets the <i>Maneuver.Icon</i> enum that represents the icon that should be displayed for this maneuver.

## Methods

```
public java.util.List <GeoCoordinate> getManeuverGeometry ()
```

Puts all points of the maneuvers polyline in the right order into the given collection.

```
public int getMapOrientation ()
```

Gets the map orientation at the start of the maneuver, in degrees.

```
public Image getNextRoadImage ()
```

Gets the image of the road this maneuver leads to.

```
public String getNextRoadName ()
```

Gets the name of the road to which the maneuver leads.

```
public String getNextRoadNumber ()
```

Gets the road number to which the maneuver leads.

```
public java.util.List <RoadElement> getRoadElements ()
```

Returns a list of *RoadElements* within the maneuver.

```
public String getRoadName ()
```

Gets the name of the road on which the maneuver takes place.

```
public String getRoadNumber ()
```

Gets the road number on which the maneuver takes place.

```
public java.util.List <RouteElement> getRouteElements ()
```

Returns a list of *RouteElement* within the maneuver

```
public Signpost getSignpost ()
```

Gets the *Signpost* for this maneuver.

```
public Date getStartTime ()
```

Gets the (estimated) time at which the maneuver starts.

```
public TrafficDirection getTrafficDirection ()
```

Return traffic direction.

```
public TransportMode getTransportMode ()
```

Gets the *RouteOptions.TransportMode* used for the maneuver.

```
public Turn getTurn ()
```

Gets the *Maneuver.Turn* required to complete the maneuver.

## Class Details

Represents the action required to leave one street segment and enter the next in the chain of directions that comprises a calculated *Route*.

## Method Details

```
public Action getAction ()
```

Gets the *Maneuver.Action* required to complete the maneuver.

**Returns:**

The *Maneuver.Action*

```
public int getAngle ()
```

Gets the angle of the maneuver.

**Returns:**

The angle in degrees from end of the start road to the start of the end road. Angle has a value from 0, 360, north is up, clockwise. For some roundabouts, this angle is an approximation from the entry to the exit point of the roundabout, which may be used for customization of the roundabout icon.

```
public GeoBoundingBox getBoundingBox ()
```

Gets the *GeoBoundingBox* of the maneuver, which is a group of *GeoCoordinates* forming a polygon

**Returns:**

The *GeoBoundingBox*

```
public GeoCoordinate getCoordinate ()
```

Gets the *GeoCoordinate* of the maneuver.

**Returns:**

The *GeoCoordinate*

```
public int getDistanceFromPreviousManeuver ()
```

Gets the distance from the previous maneuver to the current maneuver, in meters.

**Returns:**

The distance

```
public int getDistanceFromStart ()
```

Gets the distance from the start of the route to the maneuver, in meters.

**Returns:**

The distance

```
public int getDistanceToNextManeuver ()
```

Gets the distance to the next maneuver from the current maneuver, in meters.

**Returns:**

The distance

```
public Icon getIcon ()
```

Gets the *Maneuver.Icon* enum that represents the icon that should be displayed for this maneuver.

**Returns:**

The *Maneuver.Icon*

```
public java.util.List <GeoCoordinate> getManeuverGeometry ()
```

Puts all points of the maneuvers polyline in the right order into the given collection.

**Returns:**

a collection of *GeoCoordinates*.

```
public int getMapOrientation ()
```

Gets the map orientation at the start of the maneuver, in degrees.

Note: a returned value of zero represents true-north, with increasing values representing a clockwise progression of map orientation.

**Returns:**

The orientation

```
public Image getNextRoadImage ()
```

Gets the image of the road this maneuver leads to.

**Returns:**

The *Image* for the next road (may be null).

```
public String getNextRoadName ()
```

Gets the name of the road to which the maneuver leads.

Next road name is provided if available for a given *Maneuver* . If not provided, it should be left blank. It's erroneous to assume that it is the same as prior maneuvers.

**Returns:**

The next road name

```
public String getNextRoadNumber ()
```

Gets the road number to which the maneuver leads.

**Returns:**

The road number of the next road element

```
public java.util.List <RoadElement> getRoadElements ()
```

Returns a list of *RoadElements* within the maneuver.

**Returns:**

a collection of *RoadElements*.

```
public String getRoadName ()
```

Gets the name of the road on which the maneuver takes place.

Road name is provided if available for a given *Maneuver* . If not provided, it should be left blank. It's erroneous to assume that it is the same as prior maneuvers.

**Returns:**

The road name

```
public String getRoadNumber ()
```

Gets the road number on which the maneuver takes place. The road number is a short label for the road or highway, such as "5" for Interstate 5.

If the road number is unknown, this method will return an empty string.

**Returns:**

The road number

```
public java.util.List <RouteElement> getRouteElements ()
```

Returns a list of *RouteElement* within the maneuver

**Returns:**

a collection of *RouteElement*.

```
public Signpost getSignpost ()
```

Gets the *Signpost* for this maneuver. If the signpost is not valid, `null` is returned.

**Returns:**

A *Signpost* object if a valid one exists. Otherwise, returns `null`.

```
public Date getStartTime ()
```

Gets the (estimated) time at which the maneuver starts.

If no departure time was set for the *RouteOptions* associated with the maneuver, then the time is relative to the system time when the route calculation took place. Otherwise, the times are relative to the specified departure time.

**Returns:**

The start time, or null if not available

**See also:**

[setTime\(Date, TimeType\)](#)

```
public TrafficDirection getTrafficDirection ()
```

Return traffic direction.

**Returns:**

LEFT, if left side traffic, RIGHT if right side traffic.

```
public TransportMode getTransportMode ()
```

Gets the *RouteOptions.TransportMode* used for the maneuver. This might differ from the *RouteOptions.TransportMode* used when calculating the *Route* with which the particular maneuver is associated. For example, in the case where a *Route* is calculated using *PUBLIC\_TRANSPORT*, the overall route is a public transport route, but some individual maneuvers may be pedestrian (for example, walking to a bus stop, or transfers which involve walking to a new stop).

**Returns:**

The *RouteOptions.TransportMode*

```
public Turn getTurn ()
```

Gets the *Maneuver.Turn* required to complete the maneuver.

**Returns:**

The *Maneuver.Turn*

## Action

The enumeration *Action* is a member of *com.here.android.mpa.routing.Maneuver*.

### Enumeration Summary

```
public static final enumeration Maneuver.Action
```

*extends java.lang.Enum, java.lang.Object*

Represents values describing the possible actions of a *Maneuver*.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 972: Enum Constants in Action

Fields
<pre>public static final Action UNDEFINED</pre> <p>An undefined action (the default), avoided for real maneuvers.</p>
<pre>public static final Action NO_ACTION</pre> <p>An indication that there is no action associated with the maneuver.</p>
<pre>public static final Action END</pre> <p>An action that indicates the end of a route.</p>
<pre>public static final Action STOPOVER</pre> <p>An action that indicates a stopover.</p>
<pre>public static final Action JUNCTION</pre> <p>An action that indicates a junction.</p>
<pre>public static final Action ROUNDABOUT</pre> <p>An action that indicates a roundabout.</p>
<pre>public static final Action UTURN</pre> <p>An action that indicates a u-turn.</p>
<pre>public static final Action ENTER_HIGHWAY_FROM_RIGHT</pre> <p>An action that indicates entering a highway from the right.</p>
<pre>public static final Action ENTER_HIGHWAY_FROM_LEFT</pre> <p>An action that indicates entering a highway from the left.</p>
<pre>public static final Action ENTER_HIGHWAY</pre> <p>An action that indicates entering a highway.</p>
<pre>public static final Action LEAVE_HIGHWAY</pre> <p>An action that indicates leaving a highway.</p>
<pre>public static final Action CHANGE_HIGHWAY</pre> <p>An action that indicates changing from one highway to another.</p>
<pre>public static final Action CONTINUE_HIGHWAY</pre> <p>An action that indicates continuing along a highway.</p>
<pre>public static final Action FERRY</pre> <p>An action that indicates boarding a ferry.</p>

## Fields

```
public static final Action PASS_JUNCTION
```

An action that indicates passing a junction.

```
public static final Action HEAD_TO
```

An action that indicates heading.

```
public static final Action PASS_STATION
```

An action that indicates passing a station.

```
public static final Action CHANGE_LINE
```

An action that indicates transit line change.

```
public static final Action INVALID
```

An invalid action.

## Method Summary

Table 973: Methods in Action

### Methods

```
public int value ()
```

```
public static Action valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static Maneuver.Action[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Represents values describing the possible actions of a *Maneuver*.

### Enum Constant Details

```
public static final Action UNDEFINED
```

An undefined action (the default), avoided for real maneuvers.

```
public static final Action NO_ACTION
```

An indication that there is no action associated with the maneuver.

```
public static final Action END
```

An action that indicates the end of a route.

```
public static final Action STOPOVER
```

An action that indicates a stopover.

```
public static final Action JUNCTION
```

An action that indicates a junction.

```
public static final Action ROUNDABOUT
```

An action that indicates a roundabout.

```
public static final Action UTURN
```

An action that indicates a u-turn.

```
public static final Action ENTER_HIGHWAY_FROM_RIGHT
```

An action that indicates entering a highway from the right.

```
public static final Action ENTER_HIGHWAY_FROM_LEFT
```

An action that indicates entering a highway from the left.

```
public static final Action ENTER_HIGHWAY
```

An action that indicates entering a highway.

```
public static final Action LEAVE_HIGHWAY
```

An action that indicates leaving a highway.

```
public static final Action CHANGE_HIGHWAY
```

An action that indicates changing from one highway to another.

```
public static final Action CONTINUE_HIGHWAY
```

An action that indicates continuing along a highway.

```
public static final Action FERRY
```

An action that indicates boarding a ferry.

```
public static final Action PASS_JUNCTION
```

An action that indicates passing a junction.

```
public static final Action HEAD_TO
```

An action that indicates heading.

```
public static final Action PASS_STATION
```

An action that indicates passing a station.

```
public static final Action CHANGE_LINE
```

An action that indicates transit line change.

```
public static final Action INVALID
```

An invalid action.

## Method Details

```
public int value ()
```

```
public static Action valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static Maneuver.Action[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Icon

The enumeration *Icon* is a member of *com.here.android.mpa.routing.Maneuver*.

## Enumeration Summary

public static final enumeration **Maneuver.Icon**

extends *java.lang.Enum*, *java.lang.Object*

Represents values describing types of *Maneuver* icons.

[For complete information, see the section *Enumeration Details*]

## Enum Constant Summary

Table 974: Enum Constants in Icon

Fields
<pre>public static final Icon UNDEFINED</pre> <p>An undefined icon.</p>
<pre>public static final Icon GO_STRAIGHT</pre> <p>An icon that indicates a straight course.</p>
<pre>public static final Icon UTURN_RIGHT</pre> <p>An icon that indicates a right u-turn.</p>
<pre>public static final Icon UTURN_LEFT</pre> <p>An icon that indicates a left u-turn.</p>
<pre>public static final Icon KEEP_RIGHT</pre> <p>An icon that indicates keeping to the right.</p>
<pre>public static final Icon LIGHT_RIGHT</pre> <p>An icon that indicates a light right turn.</p>
<pre>public static final Icon QUITE_RIGHT</pre> <p>An icon that indicates a normal right turn.</p>
<pre>public static final Icon HEAVY_RIGHT</pre> <p>An icon that indicates a heavy right turn.</p>
<pre>public static final Icon KEEP_MIDDLE</pre> <p>Keep middle line.</p>
<pre>public static final Icon KEEP_LEFT</pre> <p>An icon that indicates keeping to the left.</p>
<pre>public static final Icon LIGHT_LEFT</pre> <p>An icon that indicates a light left turn.</p>
<pre>public static final Icon QUITE_LEFT</pre> <p>An icon that indicates a normal left turn.</p>
<pre>public static final Icon HEAVY_LEFT</pre> <p>An icon that indicates a heavy left turn.</p>

**Fields**

```
public static final Icon ENTER_HIGHWAY_RIGHT_LANE
```

An icon that indicates entering a highway into the right lane.

```
public static final Icon ENTER_HIGHWAY_LEFT_LANE
```

An icon that indicates entering a highway into the left lane.

```
public static final Icon LEAVE_HIGHWAY_RIGHT_LANE
```

An icon that indicates leaving a highway from the right lane.

```
public static final Icon LEAVE_HIGHWAY_LEFT_LANE
```

An icon that indicates leaving a highway from the left lane.

```
public static final Icon HIGHWAY_KEEP_RIGHT
```

An icon that indicates keeping to the right-hand lane of a highway.

```
public static final Icon HIGHWAY_KEEP_LEFT
```

An icon that indicates keeping to the left-hand lane of a highway.

```
public static final Icon ROUNDABOUT_1
```

An icon that indicates using the first exit encountered while navigating a roundabout in a counter-clockwise direction.

```
public static final Icon ROUNDABOUT_2
```

An icon that indicates using the second exit encountered while navigating a roundabout in a counter-clockwise direction.

```
public static final Icon ROUNDABOUT_3
```

An icon that indicates using the third exit encountered while navigating a roundabout in a counter-clockwise direction.

```
public static final Icon ROUNDABOUT_4
```

An icon that indicates using the fourth exit encountered while navigating a roundabout in a counter-clockwise direction.

```
public static final Icon ROUNDABOUT_5
```

An icon that indicates using the fifth exit encountered while navigating a roundabout in a counter-clockwise direction.

```
public static final Icon ROUNDABOUT_6
```

An icon that indicates using the sixth exit encountered while navigating a roundabout in a counter-clockwise direction.

```
public static final Icon ROUNDABOUT_7
```

An icon that indicates using the seventh exit encountered while navigating a roundabout in a counter-clockwise direction.

```
public static final Icon ROUNDABOUT_8
```

An icon that indicates using the eighth exit encountered while navigating a roundabout in a counter-clockwise direction.

```
public static final Icon ROUNDABOUT_9
```

An icon that indicates using the ninth exit encountered while navigating a roundabout in a counter-clockwise direction.

```
public static final Icon ROUNDABOUT_10
```

An icon that indicates using the tenth exit encountered while navigating a roundabout in a counter-clockwise direction.

```
public static final Icon ROUNDABOUT_11
```

An icon that indicates using the eleventh exit encountered while navigating a roundabout in a counter-clockwise direction.

**Fields**

```
public static final Icon ROUNDABOUT_12
```

An icon that indicates using the twelfth exit encountered while navigating a roundabout in a counter-clockwise direction.

```
public static final Icon ROUNDABOUT_1_LH
```

An icon that indicates using the first exit encountered while navigating a roundabout in a clockwise direction.

```
public static final Icon ROUNDABOUT_2_LH
```

An icon that indicates using the second exit encountered while navigating a roundabout in a clockwise direction.

```
public static final Icon ROUNDABOUT_3_LH
```

An icon that indicates using the third exit encountered while navigating a roundabout in a clockwise direction.

```
public static final Icon ROUNDABOUT_4_LH
```

An icon that indicates using the fourth exit encountered while navigating a roundabout in a clockwise direction.

```
public static final Icon ROUNDABOUT_5_LH
```

An icon that indicates using the fifth exit encountered while navigating a roundabout in a clockwise direction.

```
public static final Icon ROUNDABOUT_6_LH
```

An icon that indicates using the sixth exit encountered while navigating a roundabout in a clockwise direction.

```
public static final Icon ROUNDABOUT_7_LH
```

An icon that indicates using the seventh exit encountered while navigating a roundabout in a clockwise direction.

```
public static final Icon ROUNDABOUT_8_LH
```

An icon that indicates using the eighth exit encountered while navigating a roundabout in a clockwise direction.

```
public static final Icon ROUNDABOUT_9_LH
```

An icon that indicates using the ninth exit encountered while navigating a roundabout in a clockwise direction.

```
public static final Icon ROUNDABOUT_10_LH
```

An icon that indicates using the tenth exit encountered while navigating a roundabout in a clockwise direction.

```
public static final Icon ROUNDABOUT_11_LH
```

An icon that indicates using the eleventh exit encountered while navigating a roundabout in a clockwise direction.

```
public static final Icon ROUNDABOUT_12_LH
```

An icon that indicates using the twelfth exit encountered while navigating a roundabout in a clockwise direction.

```
public static final Icon START
```

An icon that indicates the start point (displayed when route navigation has not yet begun).

```
public static final Icon END
```

An icon that indicates the destination point.

```
public static final Icon FERRY
```

An icon that indicates boarding a ferry.

```
public static final Icon PASS_STATION
```

An icon that indicates passing a station.

## Fields

```
public static final Icon HEAD_TO
```

Leaving public transit station.

```
public static final Icon CHANGE_LINE
```

Changing public transit line.

## Method Summary

Table 975: Methods in *Icon*

### Methods

```
public int value ()
```

```
public static Icon valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static Maneuver.Icon[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Represents values describing types of *Maneuver* icons.

Note that this enum is only provided as a convenience to easily retrieve the maneuver instruction. You must provide your own icon images and implement your own icon-drawing code.

### Enum Constant Details

```
public static final Icon UNDEFINED
```

An undefined icon.

```
public static final Icon GO_STRAIGHT
```

An icon that indicates a straight course.

```
public static final Icon UTURN_RIGHT
```

An icon that indicates a right u-turn.

```
public static final Icon UTURN_LEFT
```

An icon that indicates a left u-turn.

```
public static final Icon KEEP_RIGHT
```

An icon that indicates keeping to the right.

```
public static final Icon LIGHT_RIGHT
```

An icon that indicates a light right turn.

```
public static final Icon QUITE_RIGHT
```

An icon that indicates a normal right turn.

```
public static final Icon HEAVY_RIGHT
```

An icon that indicates a heavy right turn.

```
public static final Icon KEEP_MIDDLE
```

Keep middle line.

```
public static final Icon KEEP_LEFT
```

An icon that indicates keeping to the left.

```
public static final Icon LIGHT_LEFT
```

An icon that indicates a light left turn.

```
public static final Icon QUITE_LEFT
```

An icon that indicates a normal left turn.

```
public static final Icon HEAVY_LEFT
```

An icon that indicates a heavy left turn.

```
public static final Icon ENTER_HIGHWAY_RIGHT_LANE
```

An icon that indicates entering a highway into the right lane.

```
public static final Icon ENTER_HIGHWAY_LEFT_LANE
```

An icon that indicates entering a highway into the left lane.

```
public static final Icon LEAVE_HIGHWAY_RIGHT_LANE
```

An icon that indicates leaving a highway from the right lane.

```
public static final Icon LEAVE_HIGHWAY_LEFT_LANE
```

An icon that indicates leaving a highway from the left lane.

```
public static final Icon HIGHWAY_KEEP_RIGHT
```

An icon that indicates keeping to the right-hand lane of a highway.

```
public static final Icon HIGHWAY_KEEP_LEFT
```

An icon that indicates keeping to the left-hand lane of a highway.

```
public static final Icon ROUNDABOUT_1
```

An icon that indicates using the first exit encountered while navigating a roundabout in a counter-clockwise direction.

```
public static final Icon ROUNDABOUT_2
```

An icon that indicates using the second exit encountered while navigating a roundabout in a counter-clockwise direction.

```
public static final Icon ROUNDABOUT_3
```

An icon that indicates using the third exit encountered while navigating a roundabout in a counter-clockwise direction.

```
public static final Icon ROUNDABOUT_4
```

An icon that indicates using the fourth exit encountered while navigating a roundabout in a counter-clockwise direction.

```
public static final Icon ROUNDABOUT_5
```

An icon that indicates using the fifth exit encountered while navigating a roundabout in a counter-clockwise direction.

```
public static final Icon ROUNDABOUT_6
```

An icon that indicates using the sixth exit encountered while navigating a roundabout in a counter-clockwise direction.

```
public static final Icon ROUNDABOUT_7
```

An icon that indicates using the seventh exit encountered while navigating a roundabout in a counter-clockwise direction.

```
public static final Icon ROUNDABOUT_8
```

An icon that indicates using the eighth exit encountered while navigating a roundabout in a counter-clockwise direction.

```
public static final Icon ROUNDABOUT_9
```

An icon that indicates using the ninth exit encountered while navigating a roundabout in a counter-clockwise direction.

```
public static final Icon ROUNDABOUT_10
```

An icon that indicates using the tenth exit encountered while navigating a roundabout in a counter-clockwise direction.

```
public static final Icon ROUNDABOUT_11
```

An icon that indicates using the eleventh exit encountered while navigating a roundabout in a counter-clockwise direction.

```
public static final Icon ROUNDABOUT_12
```

An icon that indicates using the twelfth exit encountered while navigating a roundabout in a counter-clockwise direction.

```
public static final Icon ROUNDABOUT_1_LH
```

An icon that indicates using the first exit encountered while navigating a roundabout in a clockwise direction.

```
public static final Icon ROUNDABOUT_2_LH
```

An icon that indicates using the second exit encountered while navigating a roundabout in a clockwise direction.

```
public static final Icon ROUNDABOUT_3_LH
```

An icon that indicates using the third exit encountered while navigating a roundabout in a clockwise direction.

```
public static final Icon ROUNDABOUT_4_LH
```

An icon that indicates using the fourth exit encountered while navigating a roundabout in a clockwise direction.

```
public static final Icon ROUNDABOUT_5_LH
```

An icon that indicates using the fifth exit encountered while navigating a roundabout in a clockwise direction.

```
public static final Icon ROUNDABOUT_6_LH
```

An icon that indicates using the sixth exit encountered while navigating a roundabout in a clockwise direction.

```
public static final Icon ROUNDABOUT_7_LH
```

An icon that indicates using the seventh exit encountered while navigating a roundabout in a clockwise direction.

```
public static final Icon ROUNDABOUT_8_LH
```

An icon that indicates using the eighth exit encountered while navigating a roundabout in a clockwise direction.

```
public static final Icon ROUNDABOUT_9_LH
```

An icon that indicates using the ninth exit encountered while navigating a roundabout in a clockwise direction.

```
public static final Icon ROUNDABOUT_10_LH
```

An icon that indicates using the tenth exit encountered while navigating a roundabout in a clockwise direction.

```
public static final Icon ROUNDABOUT_11_LH
```

An icon that indicates using the eleventh exit encountered while navigating a roundabout in a clockwise direction.

```
public static final Icon ROUNDABOUT_12_LH
```

An icon that indicates using the twelfth exit encountered while navigating a roundabout in a clockwise direction.

```
public static final Icon START
```

An icon that indicates the start point (displayed when route navigation has not yet begun).

```
public static final Icon END
```

An icon that indicates the destination point.

```
public static final Icon FERRY
```

An icon that indicates boarding a ferry.

```
public static final Icon PASS_STATION
```

An icon that indicates passing a station.

```
public static final Icon HEAD_TO
```

Leaving public transit station.

```
public static final Icon CHANGE_LINE
```

Changing public transit line.

## Method Details

```
public int value ()
```

```
public static Icon valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static Maneuver.Icon[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## TrafficDirection

The enumeration *TrafficDirection* is a member of *com.here.android.mpa.routing.Maneuver*.

### Enumeration Summary

```
public static final enumeration Maneuver.TrafficDirection
```

```
extends java.lang.Enum, java.lang.Object
```

Represents values describing possible traffic directions, the side of road on which one must drive.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 976: Enum Constants in TrafficDirection

Fields
<pre>public static final <i>TrafficDirection</i> <b>LEFT</b></pre> <p>Traffic flows on the left side of the road, as in the UK.</p>
<pre>public static final <i>TrafficDirection</i> <b>RIGHT</b></pre> <p>Traffic flows on the right side of the road, as in the USA.</p>

### Method Summary

Table 977: Methods in TrafficDirection

Methods
<pre>public int <i>value</i> ()</pre>
<pre>public static <i>TrafficDirection</i> <i>valueOf</i> (<i>String</i> name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>Maneuver.TrafficDirection[]</i> <i>values</i> ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

### Enumeration Details

Represents values describing possible traffic directions, the side of road on which one must drive.

### Enum Constant Details

```
public static final TrafficDirection LEFT
```

Traffic flows on the left side of the road, as in the UK.

```
public static final TrafficDirection RIGHT
```

Traffic flows on the right side of the road, as in the USA.

### Method Details

```
public int value ()
```

```
public static TrafficDirection valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static Maneuver.TrafficDirection[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Turn

The enumeration *Turn* is a member of *com.here.android.mpa.routing.Maneuver*.

### Enumeration Summary

```
public static final enumeration Maneuver.Turn
```

*extends java.lang.Enum, java.lang.Object*

Represents values describing possible turns within a *Maneuver*.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 978: Enum Constants in Turn

Fields
<pre>public static final <i>Turn</i> UNDEFINED</pre> <p>An undefined turn.</p>

**Fields**

```
public static final Turn NO_TURN
```

Indicates that no turn is necessary.

```
public static final Turn KEEP_MIDDLE
```

A turn that indicates keeping to the middle when a road forks.

```
public static final Turn KEEP_RIGHT
```

A turn that indicates keeping to the right when a road forks.

```
public static final Turn LIGHT_RIGHT
```

A turn that indicates making a light right turn.

```
public static final Turn QUITE_RIGHT
```

A turn that indicates making a normal right turn.

```
public static final Turn HEAVY_RIGHT
```

A turn that indicates making a heavy right turn.

```
public static final Turn KEEP_LEFT
```

A turn that indicates keeping to the left when a road forks.

```
public static final Turn LIGHT_LEFT
```

A turn that indicates making a light left turn.

```
public static final Turn QUITE_LEFT
```

A turn that indicates making a normal left turn.

```
public static final Turn HEAVY_LEFT
```

A turn that indicates making a heavy left turn.

```
public static final Turn RETURN
```

A turn that indicates turning around or making a U-turn.

```
public static final Turn ROUNDABOUT_1
```

A turn that indicates taking the first exit in a roundabout.

```
public static final Turn ROUNDABOUT_2
```

A turn that indicates taking the second exit in a roundabout.

```
public static final Turn ROUNDABOUT_3
```

A turn that indicates taking the third exit in a roundabout.

```
public static final Turn ROUNDABOUT_4
```

A turn that indicates taking the fourth exit in a roundabout.

```
public static final Turn ROUNDABOUT_5
```

A turn that indicates taking the fifth exit in a roundabout.

```
public static final Turn ROUNDABOUT_6
```

A turn that indicates taking the sixth exit in a roundabout.

**Fields**

```
public static final Turn ROUNDABOUT_7
```

A turn that indicates taking the seventh exit in a roundabout.

```
public static final Turn ROUNDABOUT_8
```

A turn that indicates taking the eighth exit in a roundabout.

```
public static final Turn ROUNDABOUT_9
```

A turn that indicates taking the ninth exit in a roundabout.

```
public static final Turn ROUNDABOUT_10
```

A turn that indicates taking the tenth exit in a roundabout.

```
public static final Turn ROUNDABOUT_11
```

A turn that indicates taking the eleventh exit in a roundabout.

```
public static final Turn ROUNDABOUT_12
```

A turn that indicates taking the twelfth exit in a roundabout.

**Method Summary****Table 979: Methods in Turn****Methods**

```
public int value ()
```

```
public static Turn valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static Maneuver.Turn[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

**Enumeration Details**

Represents values describing possible turns within a *Maneuver*.

**Enum Constant Details**

```
public static final Turn UNDEFINED
```

An undefined turn.

```
public static final Turn NO_TURN
```

Indicates that no turn is necessary.

```
public static final Turn KEEP_MIDDLE
```

A turn that indicates keeping to the middle when a road forks.

```
public static final Turn KEEP_RIGHT
```

A turn that indicates keeping to the right when a road forks.

```
public static final Turn LIGHT_RIGHT
```

A turn that indicates making a light right turn.

```
public static final Turn QUITE_RIGHT
```

A turn that indicates making a normal right turn.

```
public static final Turn HEAVY_RIGHT
```

A turn that indicates making a heavy right turn.

```
public static final Turn KEEP_LEFT
```

A turn that indicates keeping to the left when a road forks.

```
public static final Turn LIGHT_LEFT
```

A turn that indicates making a light left turn.

```
public static final Turn QUITE_LEFT
```

A turn that indicates making a normal left turn.

```
public static final Turn HEAVY_LEFT
```

A turn that indicates making a heavy left turn.

```
public static final Turn RETURN
```

A turn that indicates turning around or making a U-turn.

```
public static final Turn ROUNDABOUT_1
```

A turn that indicates taking the first exit in a roundabout.

```
public static final Turn ROUNDABOUT_2
```

A turn that indicates taking the second exit in a roundabout.

```
public static final Turn ROUNDABOUT_3
```

A turn that indicates taking the third exit in a roundabout.

```
public static final Turn ROUNDABOUT_4
```

A turn that indicates taking the fourth exit in a roundabout.

```
public static final Turn ROUNDABOUT_5
```

A turn that indicates taking the fifth exit in a roundabout.

```
public static final Turn ROUNDABOUT_6
```

A turn that indicates taking the sixth exit in a roundabout.

```
public static final Turn ROUNDABOUT_7
```

A turn that indicates taking the seventh exit in a roundabout.

```
public static final Turn ROUNDABOUT_8
```

A turn that indicates taking the eighth exit in a roundabout.

```
public static final Turn ROUNDABOUT_9
```

A turn that indicates taking the ninth exit in a roundabout.

```
public static final Turn ROUNDABOUT_10
```

A turn that indicates taking the tenth exit in a roundabout.

```
public static final Turn ROUNDABOUT_11
```

A turn that indicates taking the eleventh exit in a roundabout.

```
public static final Turn ROUNDABOUT_12
```

A turn that indicates taking the twelfth exit in a roundabout.

## Method Details

```
public int value ()
```

```
public static Turn valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static Maneuver.Turn[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Route

The class *Route* is a member of *com.here.android.mpa.routing*.

### Class Summary

```
public class Route
```

```
extends java.lang.Object
```

Represents a distinct path connecting two or more waypoints *GeoCoordinate*.

[For complete information, see the section *Class Details*]

### See also:

*RouteResult*

### Nested Class Summary

Table 980: Nested Classes in Route

#### Nested Classes

```
public static abstract interface Route.DeserializationCallback
```

Callback interface for when deserialization is done, passed to *deserializeAsync*.

```
public static class Route.DeserializationResult
```

Represents the result of a Route de-serialization

```
public static final enumeration Route.EtaValidity
```

Enumeration used for calculating the estimated time of arrival(ETA).

**Nested Classes**

public static abstract interface [Route.SerializationCallback](#)

Callback interface for when serialization is done, passed to `serializeAsync`.

public static class [Route.SerializationResult](#)

Represents the result of a Route serialization

public static final enumeration [Route.SerializerError](#)

Represents values describing possible route serialization errors.

public static final enumeration [Route.TrafficPenaltyMode](#)

Defines the possible traffic penalty modes used for route calculation and traffic event handling.

**Field Summary**

Table 981: Fields in Route

**Fields**

public static final int [WHOLE\\_ROUTE](#)

See [Route.getTta\(TrafficPenaltyMode, int\)](#).

**Method Summary**

Table 982: Methods in Route

**Methods**

public static [DeserializationResult](#) [deserialize](#) (byte[] buffer)

**Deprecated:** **Deprecated as of release 3.4.**

Deserialize a route given a byte buffer

public static void [deserializeAsync](#) (byte[] buffer, [DeserializationCallback](#) callback)

Asynchronously serialize a Route data structure to a data buffer

public boolean [equals](#) (Object obj)

Compare with other Route using hash code

public java.util.List [RouteIntersection](#)> [getAllIntersectionsAfter](#) ([RoadElement](#) roadElement, int minDistance, int maxDistance)

This function returns all intersections found after the road element.

public [GeoBoundingBox](#) [getBoundingBox](#) ()

Gets the smallest [GeoBoundingBox](#) that contains the entire route.

public [RouteConsumption](#) [getConsumption](#) ([ConsumptionParameters](#) consumptionParameters, [DynamicPenalty](#) dynamicPenalty)

Return the anticipated energy consumption for driving this route

public [GeoCoordinate](#) [getDestination](#) ()

Gets the destination coordinate for the route.

**Methods**

```
public RouteIntersection getFirstIntersectionAfter (RoadElement roadElement, int minDistance, int maxDistance)
```

This function returns the first intersection found after the road element.

```
public Maneuver getFirstManeuver ()
```

Returns the first *Maneuver*.

```
public GeoCoordinate getLastReachablePosition (RouteConsumption routeConsumption, int energyCapacity)
```

The last reachable waypoint given a specific consumption model The *RouteConsumption* passed to this method should have been previously obtained from the *getConsumption* method.

```
public int getLength ()
```

Gets the length of the route, in meters.

```
public java.util.List <Maneuver> getManeuvers ()
```

Gets the list of all maneuvers that travelers will encounter along the route.

```
public List getPermanentDirectedLinkIds ()
```

Returns list of permanent link ids of the *RouteElement* objects contained in this route with their travel directions.

```
public List getPermanentLinkIds ()
```

Returns list of permanent link ids of the *RouteElement* objects contained in this route.

```
public RouteElements getRouteElements ()
```

Returns all *RouteElements* in this route.

```
public RouteElements getRouteElements (Maneuver maneuver)
```

Gets the *RouteElements* belonging to this *Maneuver*.

```
public RouteElements getRouteElementsFromDuration (long duration)
```

Gets the *RouteElements* for a given duration (in seconds) from the start of the route.

```
public RouteElements getRouteElementsFromDuration (long start, long duration)
```

Gets the *RouteElements* for a given duration (in seconds) within the route.

```
public RouteElements getRouteElementsFromLength (int length)
```

Gets the *RouteElements* for a given distance (in meters) within the route.

```
public RouteElements getRouteElementsFromLength (int start, int length)
```

Gets the *RouteElements* for a given distance (in meters) within the route.

```
public java.util.List <GeoCoordinate> getRouteGeometry ()
```

Gets the list of all *GeoCoordinate* values representing, in order, the polyline of the route.

```
public java.util.List <GeoCoordinate> getRouteGeometryWithElevationData ()
```

Gets the list of all *GeoCoordinate* values representing, in order, the polyline of the route with elevation data (if available).

```
public RoutePlan getRoutePlan ()
```

Returns the route plan for defining a route with one or more route legs.

## Methods

```
public java.util.List <RouteWaypoint> getRouteWaypoints ()
```

Gets the list of all waypoints for the route.

```
public GeoCoordinate getStart ()
```

Gets the starting coordinate for the route.

```
public int getSublegCount ()
```

Returns the number of sub-legs the route has.

```
public TransitRouteSourceAttribution getTransitRouteSourceAttribution ()
```

In certain cases, data provided by Transit Agencies cannot be used without displaying copyright notices to the end user.

```
public RouteTta getTta (TrafficPenaltyMode mode, int subleg)
```

Gets the estimated time to arrival with current traffic conditions.

```
public java.util.List <GeoCoordinate> getWaypoints ()
```

Gets the list of all waypoints for the route.

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public static SerializationResult serialize (Route route)
```

**Deprecated:** Deprecated as of release 3.4.

Serialize a Route data structure to a data buffer

```
public static void serializeAsync (Route route, SerializationCallback callback)
```

Asynchronously serialize a Route data structure to a data buffer

## Class Details

Represents a distinct path connecting two or more waypoints `GeoCoordinate`. A Route consists of a list of maneuvers and route links.

### See also:

[RouteResult](#)

## Field Details

```
public static final int WHOLE_ROUTE
```

See `Route.getTta(TrafficPenaltyMode, int)`.

## Method Details

```
public static DeserializationResult deserialize (byte[] buffer)
```

**Deprecated:** Deprecated as of release 3.4.

Use `deserializeAsync(byte[], Route.DeserializationCallback)` instead.

Deserialize a route given a byte buffer

When deserializing a route with many waypoints, use an `android.os.AsyncTask` to avoid blockage on the main thread

IMPORTANT: Route serialization is a Beta feature. The related classes are subject to change without notice.

**Parameters:**

- **buffer**  
Data buffer containing the route.

**Returns:**

[Route.DeserializationResult](#) object.

```
public static void deserializeAsync (byte[] buffer, DeserializationCallback callback)
```

Asynchronously serialize a Route data structure to a data buffer

IMPORTANT: Route serialization is a Beta feature. The related classes are subject to change without notice.

**Parameters:**

- **buffer**  
Data buffer containing the route.
- **callback**  
[DeserializationCallback](#) callback which runs on the GUI thread when route deserialization is done.

```
public boolean equals (Object obj)
```

Compare with other Route using hash code

**Parameters:**

- **obj**

```
public java.util.List <RouteIntersection> getAllIntersectionsAfter (RoadElement roadElement, int minDistance, int maxDistance)
```

This function returns all intersections found after the road element. This API is not supported for reset route, e.g. truck routing, online timetable routing.

**Parameters:**

- **roadElement**  
road element on the route from which search should be started
- **minDistance**  
The minimum distance from the given roadElement to the intersection
- **maxDistance**

The maximum distance from the given roadElement to the intersection

**Returns:**

a List of RouteIntersections.

```
public GeoBoundingBox getBoundingBox ()
```

Gets the smallest *GeoBoundingBox* that contains the entire route.

**Returns:**

The GeoBoundingBox

```
public RouteConsumption getConsumption (ConsumptionParameters  
consumptionParameters, DynamicPenalty dynamicPenalty)
```

Return the anticipated energy consumption for driving this route

IMPORTANT: Consumption calculation is a Beta feature. The related classes and methods are subject to change without notice.

**Parameters:**

- **consumptionParameters**  
Consumption parameters specific to the vehicle that is to drive the route
- **dynamicPenalty**  
Restriction factors for a given area that will influence consumption

**Returns:**

a RouteConsumption instance containing data about the route consumption, or null if the route type doesn't support consumption information (e.g. a transit route)

```
public GeoCoordinate getDestination ()
```

Gets the destination coordinate for the route.

**Returns:**

The destination GeoCoordinate

```
public RouteIntersection getFirstIntersectionAfter (RoadElement roadElement,  
int minDistance, int maxDistance)
```

This function returns the first intersection found after the road element. If the road element provided ends on the intersection this intersection will be returned. This API is not supported for reset route, e.g. truck routing, online timetable routing.

**Parameters:**

- **roadElement**  
road element on the route from which search should be started
- **minDistance**  
The minimum distance from the given roadElement to the intersection
- **maxDistance**  
The maximum distance from the given roadElement to the intersection

**Returns:**

a `RouteIntersection` if found, otherwise `null` if no intersection is found

```
public Maneuver getFirstManeuver ()
```

Returns the first *Maneuver*.

**Returns:**

the first *Maneuver*, `null` if there are no maneuvers

```
public GeoCoordinate getLastReachablePosition (RouteConsumption  
routeConsumption, int energyCapacity)
```

The last reachable waypoint given a specific consumption model. The `RouteConsumption` passed to this method should have been previously obtained from the `getConsumption` method. In the case that `getConsumption` was called with the default values provided by `ConsumptionParameters`, an appropriate value for `energyCapacity` would be 300000. This would represent a vehicle with maximum capacity. A lower value would correspond to a vehicle with lower remaining capacity which would not be able to travel as far.

IMPORTANT: Consumption calculation is a Beta feature. The related classes and methods are subject to change without notice.

**Parameters:**

- **routeConsumption**  
Specifies the parameters of consumption for a given vehicle.
- **energyCapacity**  
Available capacity at the beginning of the route

**Returns:**

the coordinates of the last reachable position.

```
public int getLength ()
```

Gets the length of the route, in meters.

**Returns:**

The route length in meters

```
public java.util.List <Maneuver> getManeuvers ()
```

Gets the list of all maneuvers that travelers will encounter along the route. If the *RouteOptions.TransportMode* of the route is *PUBLIC\_TRANSPORT*, cast the *Maneuver* objects to *TransitManeuver* objects to get additional data about the transit route.

**Returns:**

The list of *Maneuver* objects

```
public List getPermanentDirectedLinkIds ()
```

Returns list of permanent link ids of the *RouteElement* objects contained in this route with their travel directions. Will return empty list for offline calculated route or for public transport route.

**Returns:**

all permanent link ids

**See also:**

[getPermanentLinkId\(\)](#)

[getPermanentDirectedLinkId\(\)](#)

[getPermanentLinkIds\(\)](#)

```
public List getPermanentLinkIds ()
```

Returns list of permanent link ids of the *RouteElement* objects contained in this route. Will return empty list for offline calculated route or for public transport route.

**Returns:**

all permanent link ids

**See also:**

[getPermanentLinkId\(\)](#)

[getPermanentDirectedLinkId\(\)](#)

[getPermanentDirectedLinkIds\(\)](#)

[createLinkIdsRequest\(Set<String>, Set<Long>\)](#)

```
public RouteElements getRouteElements ()
```

Returns all *RouteElements* in this route.

**Returns:**

all *RouteElements*

```
public RouteElements getRouteElements (Maneuver maneuver)
```

Gets the *RouteElements* belonging to this *Maneuver*.

**Parameters:**

- **maneuver**  
The *Maneuver* to get the *RouteElements* for.

**Returns:**

The *RouteElements* belonging to this *Maneuver*.

```
public RouteElements getRouteElementsFromDuration (long duration)
```

Gets the *RouteElements* for a given duration (in seconds) from the start of the route.

**Parameters:**

- **duration**  
The number of seconds from the beginning of the route.

**Returns:**

The *RouteElements* within the given duration.

```
public RouteElements getRouteElementsFromDuration (long start, long duration)
```

Gets the *RouteElements* for a given duration (in seconds) within the route.

**Parameters:**

- **start**  
The number of seconds into the route to start getting *RouteElements*.
- **duration**  
The number of seconds from the given start of the route.

**Returns:**

The *RouteElements* within the given duration.

```
public RouteElements getRouteElementsFromLength (int length)
```

Gets the *RouteElements* for a given distance (in meters) within the route.

**Parameters:**

- **length**  
The number of meters from the beginning of the route.

**Returns:**

The *RouteElements* within the given distance.

```
public RouteElements getRouteElementsFromLength (int start, int length)
```

Gets the *RouteElements* for a given distance (in meters) within the route.

**Parameters:**

- **start**  
The number of meters into the route to start getting *RouteElements*.
- **length**  
The number of meters from the start parameter within this route.

**Returns:**

The *RouteElements* within the given distance.

```
public java.util.List <GeoCoordinate> getRouteGeometry ()
```

Gets the list of all *GeoCoordinate* values representing, in order, the polyline of the route. No elevation profile of the route is returned. The *getAltitude()* always returns *UNKNOWN\_ALTITUDE*.

**Returns:**

A list of *GeoCoordinate* values without elevation data

**See also:**

[MapPolyline](#)

```
public java.util.List <GeoCoordinate> getRouteGeometryWithElevationData ()
```

Gets the list of all *GeoCoordinate* values representing, in order, the polyline of the route with elevation data (if available). An elevation profile of the route can be determined if the *getAltitude()* does not return *UNKNOWN\_ALTITUDE*.

**Returns:**

A list of *GeoCoordinate* values

**See also:**

[MapPolyline](#)

```
public RoutePlan getRoutePlan ()
```

Returns the route plan for defining a route with one or more route legs. Route legs are formed by a list of stop overs in the route plan. Each route leg has its own route options.

**Returns:**

The *RoutePlan*

```
public java.util.List <RouteWaypoint> getRouteWaypoints ()
```

Gets the list of all waypoints for the route.

**Returns:**

The list of *RouteWaypoint* objects.

```
public GeoCoordinate getStart ()
```

Gets the starting coordinate for the route.

**Returns:**

The starting GeoCoordinate

```
public int getSublegCount ()
```

Returns the number of sub-legs the route has. A sub leg is the part of a route between two stop waypoints

**Returns:**

number of sublegs

```
public TransitRouteSourceAttribution getTransitRouteSourceAttribution ()
```

In certain cases, data provided by Transit Agencies cannot be used without displaying copyright notices to the end user. The copyright information is provided in the source attribution objects and must be displayed together with a route. This requirement forms part of the terms and conditions of the API. This field will be null for non transit routes.

**Returns:**

SourceAttribution Copyright info that must be displayed along with the route.

```
public RouteTta getTta (TrafficPenaltyMode mode, int subleg)
```

Gets the estimated time to arrival with current traffic conditions. If traffic is to be used, the caller is recommended to obtain a traffic update for the route first (and wait for it to complete) to populate the traffic database.

**Parameters:**

- **mode**  
The *Route.TrafficPenaltyMode* to be used for this calculation.
- **subleg**  
The subleg number to use or *WHOLE\_ROUTE* for the whole route.

**Returns:**

The RouteTta of the subleg.

## Throws:

- **IllegalArgumentException**  
if `subleg` is less than 0 or greater than or equal to `getSublegCount()`.
- **AccessControlException**  
Access to this operation is denied. Contact your HERE representative for more information.

```
public java.util.List <GeoCoordinate> getWaypoints ()
```

Gets the list of all waypoints for the route.

## Returns:

The list of *GeoCoordinate* objects

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public static SerializationResult serialize (Route route)
```

**Deprecated:** Deprecated as of release 3.4.

Use `serializeAsync(Route, Route.SerializationCallback)` instead.

Serialize a *Route* data structure to a data buffer

**IMPORTANT:** Route serialization is a Beta feature. The related classes are subject to change without notice.

## Parameters:

- **route**  
Route object to serialize.

## Returns:

*Route.SerializationResult* object.

```
public static void serializeAsync (Route route, SerializationCallback callback)
```

Asynchronously serialize a *Route* data structure to a data buffer

**IMPORTANT:** Route serialization is a Beta feature. The related classes are subject to change without notice.

## Parameters:

- **route**  
Route object to serialize.
- **callback**  
*SerializationCallback* callback which runs on the GUI thread when route serialization is done.

## DeserializationCallback

The interface *DeserializationCallback* is a member of *com.here.android.mpa.routing.Route*.

### Interface Summary

public static abstract interface **Route.DeserializationCallback**

Callback interface for when deserialization is done, passed to *deserializeAsync*.

[For complete information, see the section [Interface Details](#)]

### Method Summary

Table 983: Methods in *DeserializationCallback*

Methods
<pre>public abstract void <i>onDeserializationComplete</i> (<i>DeserializationResult</i> result)</pre>
Method called when deserialization is done.

### Interface Details

Callback interface for when deserialization is done, passed to *deserializeAsync*.

IMPORTANT: Route serialization is a Beta feature. The related classes are subject to change without notice.

### Method Details

```
public abstract void onDeserializationComplete (DeserializationResult result)
```

Method called when deserialization is done.

#### Parameters:

- **result**  
DeserializationResult results from deserialization.

## DeserializationResult

The class *DeserializationResult* is a member of *com.here.android.mpa.routing.Route*.

### Class Summary

public static class **Route.DeserializationResult**

*extends java.lang.Object*

Represents the result of a Route de-serialization

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 984: Constructors in DeserializationResult

Constructors
<code>DeserializationResult ()</code>

## Field Summary

Table 985: Fields in DeserializationResult

Fields
<p><code>public SerializerError error</code>  <i>Route.SerializerError</i> indicating the failure reason, if a failure occurred.</p>
<p><code>public Route route</code>            A valid Route object or null if the deserialization fails.</p>

## Class Details

Represents the result of a Route de-serialization

IMPORTANT: Route serialization is a Beta feature. The related classes are subject to change without notice.

## Constructor Details

### DeserializationResult ()

## Field Details

`public SerializerError error`

*Route.SerializerError* indicating the failure reason, if a failure occurred.

`public Route route`

A valid Route object or null if the deserialization fails. The deserialization fails when the map version from which the route was serialized does not match current map version, the SDK version from which the route was serialized is not compatible with current SDK version, or when the input data is empty or corrupted.

## EtaValidity

The enumeration *EtaValidity* is a member of *com.here.android.mpa.routing.Route*.

## Enumeration Summary

public static final enumeration **Route.EtaValidity**

*extends* `java.lang.Enum`, `java.lang.Object`

Enumeration used for calculating the estimated time of arrival(ETA).

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 986: Enum Constants in EtaValidity

Fields
<pre>public static final <i>EtaValidity</i> <b>INVALID</b></pre> <p>Given route is not calculated or otherwise invalid.</p>
<pre>public static final <i>EtaValidity</i> <b>VALID</b></pre> <p>Estimated time of Arrival(ETA) is OK, route plan did not have Desired time of arrival(DTA).</p>
<pre>public static final <i>EtaValidity</i> <b>DTA_VALID</b></pre> <p>Desired time of arrival(DTA) is valid.</p>
<pre>public static final <i>EtaValidity</i> <b>DTA_LATE</b></pre> <p>Desired time of arrival(DTA) cannot be reached.</p>
<pre>public static final <i>EtaValidity</i> <b>DTA_IN_PAST</b></pre> <p>Desired time of arrival(DTA) is in the past.</p>

## Method Summary

Table 987: Methods in EtaValidity

Methods
<pre>public int <i>value</i> ()</pre>
<pre>public static <i>EtaValidity</i> <i>valueOf</i> (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>Route.EtaValidity</i>[] <i>values</i> ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Enumeration used for calculating the estimated time of arrival(ETA).

## Enum Constant Details

public static final *EtaValidity* **INVALID**

Given route is not calculated or otherwise invalid.

```
public static final EtaValidity VALID
```

Estimated time of Arrival(ETA) is OK, route plan did not have Desired time of arrival(DTA).

```
public static final EtaValidity DTA_VALID
```

Desired time of arrival(DTA) is valid.

```
public static final EtaValidity DTA_LATE
```

Desired time of arrival(DTA) cannot be reached.

```
public static final EtaValidity DTA_IN_PAST
```

Desired time of arrival(DTA) is in the past.

## Method Details

```
public int value ()
```

```
public static EtaValidity valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static Route.EtaValidity[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## SerializationCallback

The interface *SerializationCallback* is a member of *com.here.android.mpa.routing.Route*.

### Interface Summary

```
public static abstract interface Route.SerializationCallback
```

Callback interface for when serialization is done, passed to *serializeAsync*.

[For complete information, see the section [Interface Details](#)]

## Method Summary

Table 988: Methods in `SerializationCallback`

Methods
<pre>public abstract void <a href="#">onSerializationComplete</a> (<a href="#">SerializationResult</a> result)</pre> <p>Method called when serialization is done.</p>

## Interface Details

Callback interface for when serialization is done, passed to `serializeAsync`.

IMPORTANT: Route serialization is a Beta feature. The related classes are subject to change without notice.

## Method Details

```
public abstract void onSerializationComplete (SerializationResult result)
```

Method called when serialization is done.

### Parameters:

- **result**  
`SerializationResult` results from serialization.

## SerializationResult

The class `SerializationResult` is a member of `com.here.android.mpa.routing.Route`.

## Class Summary

```
public static class Route.SerializationResult
```

```
extends java.lang.Object
```

Represents the result of a Route serialization

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 989: Constructors in `SerializationResult`

Constructors
<pre><a href="#">SerializationResult</a> ()</pre>

## Field Summary

Table 990: Fields in `SerializationResult`

Fields
<code>public byte[] <i>data</i></code> A byte array representing the serialized route or null if the operation failed
<code>public <i>SerializerError</i> <i>error</i></code> A <code>Route.SerializerError</code> indicating the failure reason, if a failure occurred.

## Class Details

Represents the result of a Route serialization

When serializing a route with many waypoints, use an `android.os.AsyncTask` to avoid blockage on the main thread

IMPORTANT: Route serialization is a Beta feature. The related classes are subject to change without notice.

## Constructor Details

### `SerializationResult ()`

## Field Details

`public byte[] data`

A byte array representing the serialized route or null if the operation failed

`public SerializerError error`

A `Route.SerializerError` indicating the failure reason, if a failure occurred.

## SerializerError

The enumeration `SerializerError` is a member of `com.here.android.mpa.routing.Route`.

## Enumeration Summary

`public static final enumeration Route.SerializerError`

`extends java.lang.Enum, java.lang.Object`

Represents values describing possible route serialization errors.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 991: Enum Constants in `SerializerError`

Fields
<pre>public static final <i>SerializerError</i> NONE</pre>
<pre>public static final <i>SerializerError</i> INVALID_PARAMETER</pre> <p>Parameter provided is invalid.</p>
<pre>public static final <i>SerializerError</i> MAP_VERSION_MISMATCH</pre> <p>Map version from serialized route does not match current map version.</p>
<pre>public static final <i>SerializerError</i> DATA_CORRUPTED</pre> <p>Data provided for de-serialization is corrupted.</p>
<pre>public static final <i>SerializerError</i> TRANSPORT_MODE_NOT_SUPPORTED</pre> <p>Transport mode is not supported.</p>
<pre>public static final <i>SerializerError</i> UNKNOWN</pre> <p>Generic error</p>

## Method Summary

Table 992: Methods in `SerializerError`

Methods
<pre>public int value ()</pre>
<pre>public static <i>SerializerError</i> valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>Route.SerializerError</i>[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Represents values describing possible route serialization errors.

IMPORTANT: Route serialization is a Beta feature. The related classes are subject to change without notice.

## Enum Constant Details

```
public static final SerializerError NONE
```

```
public static final SerializerError INVALID_PARAMETER
```

Parameter provided is invalid.

```
public static final SerializerError MAP_VERSION_MISMATCH
```

Map version from serialized route does not match current map version.

```
public static final SerializerError DATA_CORRUPTED
```

Data provided for de-serialization is corrupted.

```
public static final SerializerError TRANSPORT_MODE_NOT_SUPPORTED
```

Transport mode is not supported. Note: *PUBLIC\_TRANSPORT* is currently not supported for route serialization.

```
public static final SerializerError UNKNOWN
```

Generic error

## Method Details

```
public int value ()
```

```
public static SerializerError valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static Route.SerializerError[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## TrafficPenaltyMode

The enumeration *TrafficPenaltyMode* is a member of *com.here.android.mpa.routing.Route*.

### Enumeration Summary

```
public static final enumeration Route.TrafficPenaltyMode
```

```
extends java.lang.Enum, java.lang.Object
```

Defines the possible traffic penalty modes used for route calculation and traffic event handling.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 993: Enum Constants in TrafficPenaltyMode

Fields
<pre>public static final TrafficPenaltyMode DISABLED</pre> <p>Do not consider real time traffic flow or long term road closures (usually due to construction work) when calculating a route.</p>
<pre>public static final TrafficPenaltyMode OPTIMAL</pre> <p>Create a single traffic optimized route that considers all available traffic information including real time traffic flow and long term closures coming from real time traffic information.</p>
<pre>public static final TrafficPenaltyMode AVOID_LONG_TERM_CLOSURES</pre> <p>Do NOT consider real time traffic flow but do consider long term closures coming from real time traffic information when calculating a route.</p>

## Method Summary

Table 994: Methods in TrafficPenaltyMode

Methods
<pre>public int value ()</pre>
<pre>public static TrafficPenaltyMode valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static Route.TrafficPenaltyMode[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Defines the possible traffic penalty modes used for route calculation and traffic event handling. Time awareness (e.g. avoiding bridges that are closed for certain portion of a day) is not affected by traffic penalty modes. See [getTta\(Route.TrafficPenaltyMode, int\)](#).

### Enum Constant Details

```
public static final TrafficPenaltyMode DISABLED
```

Do not consider real time traffic flow or long term road closures (usually due to construction work) when calculating a route.

```
public static final TrafficPenaltyMode OPTIMAL
```

Create a single traffic optimized route that considers all available traffic information including real time traffic flow and long term closures coming from real time traffic information.

```
public static final TrafficPenaltyMode AVOID_LONG_TERM_CLOSURES
```

Do NOT consider real time traffic flow but do consider long term closures coming from real time traffic information when calculating a route.

### Method Details

```
public int value ()
```

```
public static TrafficPenaltyMode valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static Route.TrafficPenaltyMode[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## RouteConsumption

The class *RouteConsumption* is a member of *com.here.android.mpa.routing* .

### Class Summary

```
public final class RouteConsumption
```

```
extends java.lang.Object
```

Route consumptions.

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 995: Constructors in *RouteConsumption*

Constructors
<i>RouteConsumption</i> ( <i>List</i> consumptionList, int firstAvailableConsumptionIndex)
Public constructor

## Method Summary

Table 996: Methods in RouteConsumption

Methods
<pre>public int <a href="#">getConsumption</a> (int elementIndex)</pre> <p>Provides the consumption for a route element.</p>
<pre>public int <a href="#">getFirstAvailableConsumptionIndex</a> ()</pre> <p>Provides the index of the first element with consumption available.</p>
<pre>public int <a href="#">hashCode</a> ()</pre> <p>For documentation, see <i>java.lang.Object</i></p>

## Class Details

Route consumptions. Consumption describes the usage rate of a resource that is used by the vehicle, such as electrical energy, over a period of time.

IMPORTANT: Consumption calculation is a Beta feature. The related classes are subject to change without notice.

## Constructor Details

### RouteConsumption (List consumptionList, int firstAvailableConsumptionIndex)

Public constructor

#### Parameters:

- **consumptionList**  
The first element provides consumption for route element at `first_available_consumption_index`.
- **firstAvailableConsumptionIndex**  
First element for which consumption was calculated

#### Throws:

- **IllegalArgumentException**  
if `consumptionList` is null or empty.

## Method Details

### public int [getConsumption](#) (int elementIndex)

Provides the consumption for a route element. Returns zero when `element_index` is out of range or less than first available consumption index [getFirstAvailableConsumptionIndex\(\)](#)

#### Parameters:

- **elementIndex**  
Index of the route element

**Returns:**

Consumption value if available or '0' otherwise.

```
public int getFirstAvailableConsumptionIndex ()
```

Provides the index of the first element with consumption available. This index corresponds to the indexes in the array of route elements returned by [getRouteElements\(\)](#).

**Returns:**

Index of the route element

```
public int hashCode ()
```

For documentation, see [java.lang.Object](#)

## RouteElement

The class *RouteElement* is a member of [com.here.android.mpa.routing](#) .

### Class Summary

```
public final class RouteElement
```

```
extends java.lang.Object
```

Represents an element within a [Route](#).

[For complete information, see the section [Class Details](#)]

**See also:**

[Route](#)

[Maneuver](#)

### Nested Class Summary

Table 997: Nested Classes in RouteElement

**Nested Classes**

```
public static final enumeration RouteElement.Type
```

Represents values describing the possible types of a [RouteElement](#).

## Method Summary

Table 998: Methods in RouteElement

Methods
<pre>public java.util.List &lt;GeoCoordinate&gt; <a href="#">getGeometry</a> ()</pre> <p>Returns the geometry of the route element.</p>
<pre>public <a href="#">RoadElement</a> <a href="#">getRoadElement</a> ()</pre> <p>Returns the <a href="#">RoadElement</a> associated with this <a href="#">RouteElement</a>.</p>
<pre>public <a href="#">TransitRouteElement</a> <a href="#">getTransitElement</a> ()</pre> <p>Returns the <a href="#">TransitRouteElement</a> associated with this <a href="#">RouteElement</a></p>
<pre>public <a href="#">Type</a> <a href="#">getType</a> ()</pre> <p>Gets the type of the <a href="#">RouteElement</a></p>

## Class Details

Represents an element within a [Route](#). Please note that [RouteElement](#)s are also associated with [Maneuver](#) instances within a [Route](#) .

### See also:

[Route](#)

[Maneuver](#)

## Method Details

```
public java.util.List <GeoCoordinate> getGeometry ()
```

Returns the geometry of the route element. The geometry is returned as a list of [GeoCoordinate](#) that can be used to create a polyline.

### Returns:

a list of [GeoCoordinate](#)

```
public RoadElement getRoadElement ()
```

Returns the [RoadElement](#) associated with this [RouteElement](#). Each route element has an associated road element.

### Returns:

the associated [RoadElement](#).

```
public TransitRouteElement getTransitElement ()
```

Returns the [TransitRouteElement](#) associated with this [RouteElement](#)

**Returns:**

the associated *TransitRouteElement*. null if *getType()* is not *TRANSIT*

```
public Type getType ()
```

Gets the type of the *RouteElement*

**Returns:**

type of the *RouteElement*

## Type

The enumeration *Type* is a member of *com.here.android.mpa.routing.RouteElement*.

### Enumeration Summary

public static final enumeration **RouteElement.Type**

*extends java.lang.Enum, java.lang.Object*

Represents values describing the possible types of a *RouteElement*.

[For complete information, see the section *Enumeration Details*]

### Enum Constant Summary

Table 999: Enum Constants in Type

Fields
<pre>public static final Type TRANSIT</pre> <p>Type of <i>RouteElement</i> is transit.</p>
<pre>public static final Type ROAD</pre> <p>Type of <i>RouteElement</i> is road.</p>
<pre>public static final Type INVALID</pre> <p>Type of <i>RouteElement</i> is invalid.</p>

### Method Summary

Table 1000: Methods in Type

Methods
<pre>public int value ()</pre>
<pre>public static Type valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>

### Methods

```
public static RouteElement.Type[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

### Enumeration Details

Represents values describing the possible types of a *RouteElement*.

#### Enum Constant Details

```
public static final Type TRANSIT
```

Type of *RouteElement* is transit.

```
public static final Type ROAD
```

Type of *RouteElement* is road.

```
public static final Type INVALID
```

Type of *RouteElement* is invalid.

### Method Details

```
public int value ()
```

```
public static Type valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static RouteElement.Type[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## RouteElements

The class *RouteElements* is a member of [com.here.android.mpa.routing](http://com.here.android.mpa.routing).

## Class Summary

public final class **RouteElements**

extends *java.lang.Object*

Holds the list of *RouteElement* objects obtained from the *Route* class.

[For complete information, see the section *Class Details*]

**See also:**

*getRouteElements()*

*getRouteElements(Maneuver)*

*getRouteElementsFromDuration(long)*

*getRouteElementsFromDuration(long, long)*

*getRouteElementsFromLength(int)*

*getRouteElementsFromLength(int, int)*

## Method Summary

Table 1001: Methods in RouteElements

Methods
<pre>public java.util.List &lt;RouteElement&gt; <b>getElements</b> ()</pre> <p>Returns the list of <i>RouteElement</i>.</p>
<pre>public <i>GeoPolyline</i> <b>getGeometry</b> ()</pre> <p>Returns the <i>GeoPolyline</i>.</p>

## Class Details

Holds the list of *RouteElement* objects obtained from the *Route* class.

**See also:**

*getRouteElements()*

*getRouteElements(Maneuver)*

*getRouteElementsFromDuration(long)*

*getRouteElementsFromDuration(long, long)*

*getRouteElementsFromLength(int)*

*getRouteElementsFromLength(int, int)*

## Method Details

```
public java.util.List <RouteElement> getElements ()
```

Returns the list of *RouteElement*.

**Returns:**

The list of `RouteElement` objects contained in this `RouteElements` object.

```
public GeoPolyline getGeometry ()
```

Returns the *GeoPolyline*. The points on the polyline represent the elements contained in this `RouteElements`.

**Returns:**

The `GeoPolyline` associated with this `RouteElements` object.

## RouteIntersection

The class *RouteIntersection* is a member of *com.here.android.mpa.routing*.

### Class Summary

```
public final class RouteIntersection
```

```
extends java.lang.Object
```

This is the definition of the *RouteIntersection* class.

[For complete information, see the section *Class Details*]

### Method Summary

Table 1002: Methods in `RouteIntersection`

#### Methods

```
public int getDistance ()
```

Gets the distance from the segment search started from to the intersection.

```
public GeoCoordinate getPosition ()
```

Gets the position of this intersection.

```
public int getRouteElementIndex ()
```

Gets the index of the route element before intersection

```
public java.util.List <RoadElement> getStreets ()
```

List of streets of the intersection.

### Class Details

This is the definition of the *RouteIntersection* class. This class contains intersection on a route.

## Method Details

```
public int getDistance ()
```

Gets the distance from the segment search started from to the intersection. The length of the first segment is included.

**Returns:**

The distance

```
public GeoCoordinate getPosition ()
```

Gets the position of this intersection.

**Returns:**

The position

```
public int getRouteElementIndex ()
```

Gets the index of the route element before intersection

**Returns:**

The index of the route element

```
public java.util.List RoadElement getStreets ()
```

List of streets of the intersection. Streets which belongs to the route are not included.

**Returns:**

The list of *RoadElement* objects

## RouteOptions

The class *RouteOptions* is a member of *com.here.android.mpa.routing* .

### Class Summary

```
public class RouteOptions
```

```
extends java.lang.Object
```

This is the definition of the *RouteOptions* class.

[For complete information, see the section *Class Details*]

## Nested Class Summary

Table 1003: Nested Classes in RouteOptions

Nested Classes
<p>public static final enumeration <a href="#">RouteOptions.HazardousGoodType</a>            Defines names for different types of hazardous goods that can be transported by a truck.</p>
<p>public static final enumeration <a href="#">RouteOptions.PublicTransportLinkFlag</a>            Public Transport Link Flag.</p>
<p>public static final enumeration <a href="#">RouteOptions.TimeType</a>            Ways that the time can be specified.</p>
<p>public static final enumeration <a href="#">RouteOptions.TransportMode</a>            Represents values describing different mode of transportation a person will be using.</p>
<p>public static final enumeration <a href="#">RouteOptions.TruckRestrictionsMode</a>            Defines way of handling road segments on which violated static truck restriction applies.</p>
<p>public static final enumeration <a href="#">RouteOptions.TruckType</a>            Defines names for different types of trucks.</p>
<p>public static final enumeration <a href="#">RouteOptions.TunnelCategory</a>            Specify the ADR tunnel category to restrict the truck route to.</p>
<p>public static final enumeration <a href="#">RouteOptions.Type</a>            Represents different types of routing, such as by speed or by distance.</p>

## Constructor Summary

Table 1004: Constructors in RouteOptions

Constructors
<p><a href="#">RouteOptions</a> ()            Public Constructor</p>
<p><a href="#">RouteOptions</a> (<a href="#">RouteOptions</a> other)            Copy Constructor</p>
<p><a href="#">RouteOptions</a> (<a href="#">RouteOptionsImpl</a> pimpl)            Private Constructor</p>

## Field Summary

Table 1005: Fields in RouteOptions

Fields
<p>public static final int <a href="#">START_DIRECTION_ANY</a>            Defines the value used to indicate routing may start in any direction</p>

## Fields

protected RouteOptionsImpl *m\_pimpl*

## Method Summary

Table 1006: Methods in RouteOptions

### Methods

public boolean *areCarShuttleTrainsAllowed* ()

Checks whether Car Shuttle Trains are allowed.

public boolean *areDirtRoadsAllowed* ()

Checks whether Dirt Roads are allowed.

public boolean *areFerriesAllowed* ()

Checks whether Ferries are allowed.

public boolean *areHighwaysAllowed* ()

Checks whether Highways are allowed.

public boolean *areParksAllowed* ()

Checks whether Parks are allowed.

public boolean *areTollRoadsAllowed* ()

Checks whether Toll Roads are allowed.

public boolean *areTunnelsAllowed* ()

Checks whether Tunnels are allowed.

public boolean *equals* (Object obj)

public boolean *getPublicTransportLinkFlag* (PublicTransportLinkFlag flag)

Gets the given Public Transport Link Flag.

public int *getRouteCount* ()

Gets the current desired number of route

public Type *getRouteType* ()

Gets the Route Type, see *RouteOptions.Type* for valid values

public int *getStartDirection* ()

Returns the start direction.

public TimeType *getTime* (Date date)

Gets the arrival or departure time that has been set.

public int *getTransitMaximumChanges* ()

Gets the maximum number of vehicle changes allowed during the trip.

public int *getTransitMinimumChangeTime* ()

Gets transit minimum change time.

**Methods**

```
public float getTransitWalkTimeMultiplier ()
```

Gets a multiplier to use for walking times.

```
public TransportMode getTransportMode ()
```

Gets the Transport Mode, see *RouteOptions.TransportMode* for valid values

```
public float getTruckHeight ()
```

Gets the truck height in meters.

```
public float getTruckLength ()
```

Gets the truck length in meters.

```
public float getTruckLimitedWeight ()
```

Gets the limited truck weight in metric tons.

```
public TruckRestrictionsMode getTruckRestrictionsMode ()
```

Retrieves currently set *RouteOptions.TruckRestrictionsMode*.

```
public java.util.EnumSet <HazardousGoodType> getTruckShippedHazardousGoods ()
```

Gets the list of hazardous goods transported in the truck.

```
public int getTruckTrailersCount ()
```

Returns the number of trailers attached to the truck.

```
public TunnelCategory getTruckTunnelCategory ()
```

Gets the tunnel restrictions when calculating the truck route.

```
public TruckType getTruckType ()
```

Returns the truck type when calculating the truck route.

```
public float getTruckWeightPerAxle ()
```

Gets the truck weight per axle in metric tons.

```
public float getTruckWidth ()
```

Gets the truck width in meters.

```
public int hashCode ()
```

```
public boolean isCarpoolAllowed ()
```

Check if usage of HOV/Carpool roads is allowed.

```
public boolean isPublicTransportTypeAllowed (TransitType type)
```

Checks whether a Public Transport type is allowed.

```
public boolean isTruckDifficultTurnsAllowed ()
```

Checks whether a difficult turns are allowed.

```
public RouteOptions setCarShuttleTrainsAllowed (boolean value)
```

Sets whether Car Shuttle Trains are allowed.

```
public RouteOptions setCarpoolAllowed (boolean value)
```

Allow or disallow usage of HOV/Carpool roads.

**Methods**

```
public RouteOptions setDirtRoadsAllowed (boolean value)
```

Sets whether Dirt Roads are allowed.

```
public RouteOptions setFerriesAllowed (boolean value)
```

Sets whether Ferries are allowed.

```
public void setFetchElevationData (boolean fetchElevation)
```

**Deprecated:** As of SDK 3.3, this feature will no longer be supported.

When set, elevation data is returned with the route request.

```
public RouteOptions setHighwaysAllowed (boolean value)
```

Sets whether Highways are allowed.

```
public RouteOptions setParksAllowed (boolean value)
```

Sets whether Parks are allowed.

```
public RouteOptions setPublicTransportLinkFlag (PublicTransportLinkFlag flag, boolean value)
```

Sets the given Public Transport Link Flag.

```
public RouteOptions setPublicTransportTypeAllowed (TransitType type, boolean allow)
```

Sets whether a Public Transport Type is allowed.

```
public RouteOptions setRouteCount (int count)
```

Sets the desired number of route.

```
public RouteOptions setRouteType (Type routeType)
```

Sets the Route Type, see *RouteOptions.Type* for valid values

```
public RouteOptions setStartDirection (int dirInDegrees)
```

The direction that routing should start in.

```
public RouteOptions setTime (Date time, TimeType type)
```

Sets the arrival or departure time.

```
public RouteOptions setTollRoadsAllowed (boolean value)
```

Sets whether Toll Roads are allowed.

```
public RouteOptions setTransitMaximumChanges (int changes)
```

Sets the maximum number of vehicle changes allowed during the trip.

```
public RouteOptions setTransitMinimumChangeTime (int minutes)
```

Sets transit minimum change time.

```
public RouteOptions setTransitWalkTimeMultiplier (float value)
```

Sets a multiplier to use for walking times.

```
public RouteOptions setTransportMode (TransportMode mode)
```

Sets the Transport Mode.

```
public RouteOptions setTruckDifficultTurnsAllowed (boolean allow)
```

Sets whether difficult turns are allowed in result route.

## Methods

```
public RouteOptions setTruckHeight (float meters)
```

Sets the truck height in meters.

```
public RouteOptions setTruckLength (float value)
```

Sets the truck length in meters.

```
public RouteOptions setTruckLimitedWeight (float tonnes)
```

Sets the limited truck weight in metric tons.

```
public void setTruckRestrictionsMode (TruckRestrictionsMode mode)
```

Sets truck restrictions handling mode.

```
public RouteOptions setTruckShippedHazardousGoods (java.util.EnumSet <HazardousGoodType> types)
```

Sets the list of hazardous goods transported in the truck.

```
public RouteOptions setTruckTrailersCount (int count)
```

Sets the number of trailers attached to the truck.

```
public RouteOptions setTruckTunnelCategory (TunnelCategory category)
```

Sets the ADR tunnel restrictions when calculating the truck route.

```
public RouteOptions setTruckType (TruckType truckType)
```

Truck type when calculating the truck route.

```
public RouteOptions setTruckWeightPerAxle (float tonnes)
```

Sets the truck weight per axle in metric tons.

```
public RouteOptions setTruckWidth (float value)
```

Sets the truck width in meters.

```
public RouteOptions setTunnelsAllowed (boolean value)
```

Sets whether Tunnels are allowed.

## Class Details

This is the definition of the *RouteOptions* class. The class contains options for route calculation.

## Constructor Details

### *RouteOptions* ()

Public Constructor

### *RouteOptions* (*RouteOptions* other)

Copy Constructor

#### Parameters:

- **other**

RouteOptions to be copy from.

## RouteOptions (RouteOptionsImpl pimpl)

Private Constructor

### Parameters:

- **pimpl**

The impl object to be constructed of.

## Field Details

```
public static final int START_DIRECTION_ANY
```

Defines the value used to indicate routing may start in any direction

```
protected RouteOptionsImpl m_pimpl
```

## Method Details

```
public boolean areCarShuttleTrainsAllowed ()
```

Checks whether Car Shuttle Trains are allowed.

### Returns:

true if allowed otherwise false.

```
public boolean areDirtRoadsAllowed ()
```

Checks whether Dirt Roads are allowed.

### Returns:

true if allowed otherwise false.

```
public boolean areFerriesAllowed ()
```

Checks whether Ferries are allowed.

### Returns:

true if allowed otherwise false.

```
public boolean areHighwaysAllowed ()
```

Checks whether Highways are allowed.

**Returns:**

true if allowed otherwise false.

```
public boolean areParksAllowed ()
```

Checks whether Parks are allowed.

**Returns:**

true if allowed otherwise false.

```
public boolean areTollRoadsAllowed ()
```

Checks whether Toll Roads are allowed.

**Returns:**

true if allowed otherwise false.

```
public boolean areTunnelsAllowed ()
```

Checks whether Tunnels are allowed.

**Returns:**

true if allowed otherwise false.

```
public boolean equals (Object obj)
```

**Parameters:**

- **obj**

```
public boolean getPublicTransportLinkFlag (PublicTransportLinkFlag flag)
```

Gets the given Public Transport Link Flag.

**Parameters:**

- **flag**  
one of *RouteOptions.PublicTransportLinkFlag*

**Returns:**

true if set, otherwise false.

```
public int getRouteCount ()
```

Gets the current desired number of route

**Returns:**

current desired number of route

```
public Type getRouteType ()
```

Gets the Route Type, see [RouteOptions.Type](#) for valid values

**Returns:**

The current Type.

```
public int getStartDirection ()
```

Returns the start direction. Defaults to `RouteOptions::START_DIRECTION_ANY` which means route in any direction in order to obtain the shortest/fastest possible route.

**Returns:**

The start direction in degrees, in the range 0..359, or `RouteOptions::START_DIRECTION_ANY` to route in any direction.

```
public TimeType getTime (Date date)
```

Gets the arrival or departure time that has been set.

**Parameters:**

- **date**  
Output parameter where the date will be set. This may be null if the caller is only interested in the [RouteOptions.TimeType](#).

**Returns:**

The `TimeType` of the parameter upon completion.

```
public int getTransitMaximumChanges ()
```

Gets the maximum number of vehicle changes allowed during the trip.

**Returns:**

number of vehicle changes

```
public int getTransitMinimumChangeTime ()
```

Gets transit minimum change time. Any connection time below this value will be bumped up to the minimum. The default is zero.

**Returns:**

time in minutes

```
public float getTransitWalkTimeMultiplier ()
```

Gets a multiplier to use for walking times. A higher number means a slower walking speed. The default is 1.0.

**Returns:**

multiplier

```
public TransportMode getTransportMode ()
```

Gets the Transport Mode, see [RouteOptions.TransportMode](#) for valid values

**Returns:**

The TransportMode to be used for this RouteOptions.

```
public float getTruckHeight ()
```

Gets the truck height in meters. Applicable to truck routing only.

**Returns:**

The truck height in meters ( `java.lang.Float#NaN` if undefined).

```
public float getTruckLength ()
```

Gets the truck length in meters. Applicable to truck routing only.

**Returns:**

The truck length in meters ( `java.lang.Float#NaN` if undefined).

```
public float getTruckLimitedWeight ()
```

Gets the limited truck weight in metric tons. Applicable to truck routing only.

**Returns:**

The limited truck weight in metric tons ( `java.lang.Float#NaN` if undefined).

```
public TruckRestrictionsMode getTruckRestrictionsMode ()
```

Retrieves currently set [RouteOptions.TruckRestrictionsMode](#).

**Returns:**

Truck restrictions mode.

```
public java.util.EnumSet <HazardousGoodType> getTruckShippedHazardousGoods  
( )
```

Gets the list of hazardous goods transported in the truck. Applicable to truck routing only.

**Returns:**

Set of *RouteOptions.HazardousGoodTypes* transported by the truck.

```
public int getTruckTrailersCount ( )
```

Returns the number of trailers attached to the truck. Applicable to truck routing only.

**Returns:**

number of trailers attached to the truck.

```
public TunnelCategory getTruckTunnelCategory ( )
```

Gets the tunnel restrictions when calculating the truck route. Applicable to truck routing only.

**Returns:**

ADR tunnel category.

```
public TruckType getTruckType ( )
```

Returns the truck type when calculating the truck route. Applicable to truck routing only.

**Returns:**

truck type.

```
public float getTruckWeightPerAxle ( )
```

Gets the truck weight per axle in metric tons. Applicable to truck routing only.

**Returns:**

The truck weight per axle in metric tons ( `java.lang.Float#NaN` if undefined).

```
public float getTruckWidth ( )
```

Gets the truck width in meters. Applicable to truck routing only.

**Returns:**

The truck width in meters ( `java.lang.Float#NaN` if undefined).

```
public int hashCode ( )
```

```
public boolean isCarpoolAllowed ()
```

Check if usage of HOV/Carpool roads is allowed.

**Returns:**

true if allowed, otherwise false.

```
public boolean isPublicTransportTypeAllowed (TransitType type)
```

Checks whether a Public Transport type is allowed.

**Parameters:**

- **type**

One of the public transport *TransitType* values to check if it is allowed.

**Returns:**

true if allowed, otherwise false.

```
public boolean isTruckDifficultTurnsAllowed ()
```

Checks whether a difficult turns are allowed.

**Returns:**

true if allowed, otherwise false.

```
public RouteOptions setCarShuttleTrainsAllowed (boolean value)
```

Sets whether Car Shuttle Trains are allowed.

**Parameters:**

- **value**

true if allowed otherwise false.

**Returns:**

The modified *RouteOptions* itself.

```
public RouteOptions setCarpoolAllowed (boolean value)
```

Allow or disallow usage of HOV/Carpool roads.

**Parameters:**

- **value**

Use true if allowed, otherwise false.

**Returns:**

The modified RouteOptions itself.

```
public RouteOptions setDirtRoadsAllowed (boolean value)
```

Sets whether Dirt Roads are allowed.

**Parameters:**

- **value**  
true if allowed otherwise false.

**Returns:**

The modified RouteOptions itself.

```
public RouteOptions setFerriesAllowed (boolean value)
```

Sets whether Ferries are allowed.

**Parameters:**

- **value**  
true if allowed otherwise false.

**Returns:**

The modified RouteOptions itself.

```
public void setFetchElevationData (boolean fetchElevation)
```

**Deprecated:** As of SDK 3.3, this feature will no longer be supported.

Elevation data will be requested for all routes automatically in online/offline modes. The data will be returned in the Route geometry, when available.

When set, elevation data is returned with the route request. Elevation data returned as altitude and a part of route geometry.

**Parameters:**

- **fetchElevation**  
true if data should be fetched

```
public RouteOptions setHighwaysAllowed (boolean value)
```

Sets whether Highways are allowed.

**Parameters:**

- **value**  
true if allowed otherwise false.

**Returns:**

The modified RouteOptions itself.

```
public RouteOptions setParksAllowed (boolean value)
```

Sets whether Parks are allowed.

**Parameters:**

- **value**  
Use true if allowed, otherwise false.

**Returns:**

The modified RouteOptions itself.

```
public RouteOptions setPublicTransportLinkFlag (PublicTransportLinkFlag flag,  
boolean value)
```

Sets the given Public Transport Link Flag.

**Parameters:**

- **flag**  
one of *RouteOptions.PublicTransportLinkFlag*
- **value**  
true if set, otherwise false.

**Returns:**

The modified RouteOptions itself.

```
public RouteOptions setPublicTransportTypeAllowed (TransitType type, boolean  
allow)
```

Sets whether a Public Transport Type is allowed. By default all types are allowed.

**Parameters:**

- **type**  
public transport type, see *TransitType* for valid values.
- **allow**  
a boolean to allow/disallow a transit type

**Returns:**

The modified RouteOptions itself.

```
public RouteOptions setRouteCount (int count)
```

Sets the desired number of route. The default is 1.

Values greater than 10 are ignored if *RouteOptions.TransportMode* is set to public transport and online timetables are enabled. Only one route will be returned for routes with more than two *RouteWaypoint*.

NOTE: If *UMRouter* is used, then allowed range is [1, 6]. Using unsupported value will result error response in route calculation.

**Parameters:**

- **count**  
route count

**Returns:**

The modified *RouteOptions* itself.

```
public RouteOptions setRouteType (Type routeType)
```

Sets the Route Type, see *RouteOptions.Type* for valid values

**Parameters:**

- **routeType**  
Type

**Returns:**

The modified *RouteOptions* itself.

```
public RouteOptions setStartDirection (int dirInDegrees)
```

The direction that routing should start in. Use values between 0..359. If a value greater than 359 is specified, the modulus of 360 is used. Specify *RouteOptions::START\_DIRECTION\_ANY* (or greater) to route in any direction.

**Parameters:**

- **dirInDegrees**  
Start direction in degrees. 0 is north, increases clockwise (ie. 90 is east).

**Returns:**

The modified *RouteOptions* itself.

```
public RouteOptions setTime (Date time, TimeType type)
```

Sets the arrival or departure time.

**Parameters:**

- **time**  
The time to set.
- **type**  
The type of time to set.

**Returns:**

The modified `RouteOptions` itself.

```
public RouteOptions setTollRoadsAllowed (boolean value)
```

Sets whether Toll Roads are allowed.

**Parameters:**

- **value**  
true if allowed otherwise false.

**Returns:**

The modified `RouteOptions` itself.

```
public RouteOptions setTransitMaximumChanges (int changes)
```

Sets the maximum number of vehicle changes allowed during the trip.

Note: For *UMRouteOptions* case maximum supported changes is 6.

**Parameters:**

- **changes**  
number of vehicle changes

**Returns:**

The modified `RouteOptions` itself.

```
public RouteOptions setTransitMinimumChangeTime (int minutes)
```

Sets transit minimum change time. Any connection time below this value will be bumped up to the minimum. The default is zero.

**Parameters:**

- **minutes**  
time in minutes

**Returns:**

The modified `RouteOptions` itself.

```
public RouteOptions setTransitWalkTimeMultiplier (float value)
```

Sets a multiplier to use for walking times. A higher number means a slower walking speed. The default is 1.0.

Note: For *UMRouteOptions* case supported range is [0.5, 2.0].

**Parameters:**

- **value**  
multiplier

**Returns:**

The modified `RouteOptions` itself.

```
public RouteOptions setTransportMode (TransportMode mode)
```

Sets the Transport Mode.

**Parameters:**

- **mode**  
The desired `RouteOptions.TransportMode` to use.

**Returns:**

The modified `RouteOptions` itself.

```
public RouteOptions setTruckDifficultTurnsAllowed (boolean allow)
```

Sets whether difficult turns are allowed in result route. By default difficult turns are allowed.

**Parameters:**

- **allow**  
a boolean to allow/disallow difficult turns.

**Returns:**

The modified `RouteOptions` itself.

```
public RouteOptions setTruckHeight (float meters)
```

Sets the truck height in meters. Applicable to truck routing only.

**Parameters:**

- **meters**  
The truck height in meters. A value of `Float.NaN` will unset this option.

**Returns:**

The modified `RouteOptions` itself.

**Throws:**

- `IllegalArgumentException`  
if height is not greater than zero.

```
public RouteOptions setTruckLength (float value)
```

Sets the truck length in meters. Applicable to truck routing only.

**Parameters:**

- **value**  
The truck length in meters. A value of `Float.NaN` will unset this option.

**Returns:**

The modified `RouteOptions` itself.

**Throws:**

- `IllegalArgumentException`  
if length is not greater than zero.

```
public RouteOptions setTruckLimitedWeight (float tonnes)
```

Sets the limited truck weight in metric tons. Applicable to truck routing only.

**Parameters:**

- **tonnes**  
The limited truck weight in metric tons. A value of `Float.NaN` will unset this option.

**Returns:**

The modified `RouteOptions` itself.

**Throws:**

- `IllegalArgumentException`  
if weight is not greater than zero.

```
public void setTruckRestrictionsMode (TruckRestrictionsMode mode)
```

Sets truck restrictions handling mode. If no mode is explicitly set then `NO_VIOLATIONS` option will be used.

**Parameters:**

- **mode**  
The truck restrictions mode.

```
public RouteOptions setTruckShippedHazardousGoods (java.util.EnumSet  
<HazardousGoodType> types)
```

Sets the list of hazardous goods transported in the truck. Applicable to truck routing only.

**Parameters:**

- **types**  
Set of `RouteOptions.HazardousGoodTypes` transported by the truck.

**Returns:**

The modified `RouteOptions` itself.

**Throws:**

- `IllegalArgumentException`  
if value is null.

```
public RouteOptions setTruckTrailersCount (int count)
```

Sets the number of trailers attached to the truck. Applicable to truck routing only.

**Parameters:**

- `count`  
The number of trailers attached to the truck.

**Returns:**

The modified `RouteOptions` itself.

**Throws:**

- `IllegalArgumentException`  
if the count is negative.

```
public RouteOptions setTruckTunnelCategory (TunnelCategory category)
```

Sets the ADR tunnel restrictions when calculating the truck route. Applicable to truck routing only.

**Parameters:**

- `category`  
The ADR tunnel category.

**Returns:**

The modified `RouteOptions` itself.

```
public RouteOptions setTruckType (TruckType truckType)
```

Truck type when calculating the truck route. Applicable to truck routing only.

**Parameters:**

- `truckType`  
The truck type.

**Returns:**

The modified `RouteOptions` itself.

```
public RouteOptions setTruckWeightPerAxle (float tonnes)
```

Sets the truck weight per axle in metric tons. Applicable to truck routing only.

**Parameters:**

- **tonnes**

The truck weight per axle in metric tons. A value of `Float.NaN` will unset this option.

**Returns:**

The modified `RouteOptions` itself.

**Throws:**

- `IllegalArgumentException`  
if weight is not greater than zero.

```
public RouteOptions setTruckWidth (float value)
```

Sets the truck width in meters. Applicable to truck routing only.

**Parameters:**

- **value**

The truck width in meters. A value of `Float.NaN` will unset this option.

**Returns:**

The modified `RouteOptions` itself.

**Throws:**

- `IllegalArgumentException`  
if width is not greater than zero.

```
public RouteOptions setTunnelsAllowed (boolean value)
```

Sets whether Tunnels are allowed.

**Parameters:**

- **value**

true if allowed otherwise false.

**Returns:**

The modified `RouteOptions` itself.

## HazardousGoodType

The enumeration `HazardousGoodType` is a member of `com.here.android.mpa.routing.RouteOptions`.

## Enumeration Summary

public static final enumeration **RouteOptions.HazardousGoodType**

extends *java.lang.Enum*, *java.lang.Object*

Defines names for different types of hazardous goods that can be transported by a truck.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 1007: Enum Constants in HazardousGoodType

Fields
public static final <i>HazardousGoodType</i> <b>EXPLOSIVE</b> Explosive material
public static final <i>HazardousGoodType</i> <b>GAS</b> Gas
public static final <i>HazardousGoodType</i> <b>FLAMMABLE</b> Flammable material
public static final <i>HazardousGoodType</i> <b>COMBUSTIBLE</b> Combustible material
public static final <i>HazardousGoodType</i> <b>ORGANIC</b> Organic material
public static final <i>HazardousGoodType</i> <b>POISON</b> Poison
public static final <i>HazardousGoodType</i> <b>RADIOACTIVE</b> Radio-active material
public static final <i>HazardousGoodType</i> <b>CORROSIVE</b> Corrosive material
public static final <i>HazardousGoodType</i> <b>POISONOUS_INHALATION</b> Goods which are poisonous upon inhalation
public static final <i>HazardousGoodType</i> <b>HARMFUL_TO_WATER</b> Goods which are harmful to water
public static final <i>HazardousGoodType</i> <b>OTHER</b> Other types of hazardous goods

## Method Summary

Table 1008: Methods in HazardousGoodType

Methods
<pre>public static <i>HazardousGoodType</i> <i>getType</i> (int value)</pre>
<pre>public int <i>toInt</i> ()</pre>
<pre>public static <i>HazardousGoodType</i> <i>valueOf</i> (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>RouteOptions.HazardousGoodType</i>[] <i>values</i> ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Defines names for different types of hazardous goods that can be transported by a truck.

### Enum Constant Details

```
public static final HazardousGoodType EXPLOSIVE
```

Explosive material

```
public static final HazardousGoodType GAS
```

Gas

```
public static final HazardousGoodType FLAMMABLE
```

Flammable material

```
public static final HazardousGoodType COMBUSTIBLE
```

Combustible material

```
public static final HazardousGoodType ORGANIC
```

Organic material

```
public static final HazardousGoodType POISON
```

Poison

```
public static final HazardousGoodType RADIOACTIVE
```

Radio-active material

```
public static final HazardousGoodType CORROSIVE
```

Corrosive material

```
public static final HazardousGoodType POISONOUS_INHALATION
```

Goods which are poisonous upon inhalation

```
public static final HazardousGoodType HARMFUL_TO_WATER
```

Goods which are harmful to water

```
public static final HazardousGoodType OTHER
```

Other types of hazardous goods

## Method Details

```
public static HazardousGoodType getType (int value)
```

Parameters:

- **value**

```
public int toInt ()
```

```
public static HazardousGoodType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static RouteOptions.HazardousGoodType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## PublicTransportLinkFlag

The enumeration *PublicTransportLinkFlag* is a member of *com.here.android.mpa.routing.RouteOptions*.

### Enumeration Summary

public static final enumeration **RouteOptions.PublicTransportLinkFlag**

extends *java.lang.Enum*, *java.lang.Object*

Public Transport Link Flag.

[For complete information, see the section *Enumeration Details*]

### Enum Constant Summary

Table 1009: Enum Constants in PublicTransportLinkFlag

Fields
public static final <i>PublicTransportLinkFlag</i> <b>ONLY_SLEEPER</b> Only return connections using sleeper wagon
public static final <i>PublicTransportLinkFlag</i> <b>ONLY_BARRIER_FREE</b> Only return barrier-free connections

### Method Summary

Table 1010: Methods in PublicTransportLinkFlag

Methods
public static <i>PublicTransportLinkFlag</i> <b>valueOf</b> (String name) This method retrieves the enumeration value that matches the name specified by the caller.
public static <i>RouteOptions.PublicTransportLinkFlag[]</i> <b>values</b> () This method retrieves an array of constants of the given enum type in the order in which they are declared.

### Enumeration Details

Public Transport Link Flag.

### Enum Constant Details

public static final *PublicTransportLinkFlag* **ONLY\_SLEEPER**

Only return connections using sleeper wagon

public static final *PublicTransportLinkFlag* **ONLY\_BARRIER\_FREE**

Only return barrier-free connections

### Method Details

```
public static PublicTransportLinkFlag valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static RouteOptions.PublicTransportLinkFlag[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## TimeType

The enumeration *TimeType* is a member of *com.here.android.mpa.routing.RouteOptions*.

### Enumeration Summary

```
public static final enumeration RouteOptions.TimeType
```

```
extends java.lang.Enum, java.lang.Object
```

Ways that the time can be specified.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 1011: Enum Constants in *TimeType*

Fields
<pre>public static final <i>TimeType</i> <b>DEPARTURE</b></pre> <p>Departure time.</p>
<pre>public static final <i>TimeType</i> <b>ARRIVAL</b></pre> <p>Arrival time.</p>

## Method Summary

Table 1012: Methods in `TimeType`

Methods
<pre>public int value ()</pre>
<pre>public static TimeType valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static RouteOptions.TimeType[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Ways that the time can be specified.

### Enum Constant Details

```
public static final TimeType DEPARTURE
```

Departure time.

```
public static final TimeType ARRIVAL
```

Arrival time.

NOTE: ARRIVAL time type option is supported only for *UMRouteOptions*. Using this value in *RouteOptions.setTime(Date, TimeType)*, with unsupported *RouteOptions*, will result in *INVALID\_PARAMETERS* when requesting a route.

## Method Details

```
public int value ()
```

```
public static TimeType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static RouteOptions.TimeType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## TransportMode

The enumeration *TransportMode* is a member of *com.here.android.mpa.routing.RouteOptions*.

### Enumeration Summary

public static final enumeration **RouteOptions.TransportMode**

extends *java.lang.Enum*, *java.lang.Object*

Represents values describing different mode of transportation a person will be using.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 1013: Enum Constants in TransportMode

Fields
<pre>public static final TransportMode CAR</pre> <p>A car is being used as the mode of transportation.</p>
<pre>public static final TransportMode PEDESTRIAN</pre> <p>Walking is being used as the mode of transportation.</p>
<pre>public static final TransportMode PUBLIC_TRANSPORT</pre> <p>Public transport is being used as the mode of transportation.</p>
<pre>public static final TransportMode TRACK</pre> <p><b>Deprecated:</b> As of SDK 3.3 TRACK mode is no longer supported and a route will not be calculated if using this mode.</p> <p>Straight line connecting the waypoints of a route.</p>
<pre>public static final TransportMode TRUCK</pre> <p>Enterprise truck routing mode.</p>
<pre>public static final TransportMode BICYCLE</pre> <p>A bicycle is being used as the mode of transportation.</p>
<pre>public static final TransportMode UNDEFINED</pre> <p>Routing mode unknown or unsupported</p>

### Method Summary

Table 1014: Methods in TransportMode

Methods
<pre>public static TransportMode getMode (int value)</pre>
<pre>public int value ()</pre>

## Methods

```
public static TransportMode valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static RouteOptions.TransportMode[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Represents values describing different mode of transportation a person will be using. (for example, Car, or Public Transit).

### Enum Constant Details

```
public static final TransportMode CAR
```

A car is being used as the mode of transportation.

```
public static final TransportMode PEDESTRIAN
```

Walking is being used as the mode of transportation. When calculating a *Route* using *PEDESTRIAN*, Type will be reset to *FASTEST*

```
public static final TransportMode PUBLIC_TRANSPORT
```

Public transport is being used as the mode of transportation. When calculating a *Route* using *PUBLIC\_TRANSPORT*, Type will be reset to *FASTEST*

**Note:** a transit route may not be found if the walking distance from the start to the first transit station, or from the final transit station to the end, is greater than 3 kilometers.

To use this feature, your application must include the google-gson library (release 2.2.4 or a compatible version) on its class path. This library can be downloaded from the google-gson project website at <http://code.google.com/p/google-gson/>. Attempting to use this feature without adding this library will cause runtime errors.

```
public static final TransportMode TRACK
```

**Deprecated:** As of SDK 3.3 TRACK mode is no longer supported and a route will not be calculated if using this mode.

Please see [CoreRouter.calculateRoute](#) for more information.

Straight line connecting the waypoints of a route.

```
public static final TransportMode TRUCK
```

Enterprise truck routing mode. When calculating a route using *TRUCK* mode, only *FASTEST* will be supported.

```
public static final TransportMode BICYCLE
```

A bicycle is being used as the mode of transportation. This is a BETA feature.

```
public static final TransportMode UNDEFINED
```

Routing mode unknown or unsupported

### Method Details

```
public static TransportMode getMode (int value)
```

Parameters:

- `value`

```
public int value ()
```

```
public static TransportMode valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

Parameters:

- `name`

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static RouteOptions.TransportMode[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## TruckRestrictionsMode

The enumeration *TruckRestrictionsMode* is a member of *com.here.android.mpa.routing.RouteOptions*.

### Enumeration Summary

```
public static final enumeration RouteOptions.TruckRestrictionsMode
```

*extends java.lang.Enum, java.lang.Object*

Defines way of handling road segments on which violated static truck restriction applies.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 1015: Enum Constants in `TruckRestrictionsMode`

Fields
<pre>public static final <i>TruckRestrictionsMode</i> NO_VIOLATIONS</pre> <p>In those mode violating road segments will not be part of the route.</p>
<pre>public static final <i>TruckRestrictionsMode</i> PENALIZE_VIOLATIONS</pre> <p>In those mode violating road segments can be part of the route, if no other route can be calculated.</p>

## Method Summary

Table 1016: Methods in `TruckRestrictionsMode`

Methods
<pre>public static <i>TruckRestrictionsMode</i> valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>RouteOptions.TruckRestrictionsMode</i>[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Defines way of handling road segments on which violated static truck restriction applies. When mode is set to `NO_VIOLATIONS` then such segments will not be part of the route. `PENALIZE_VIOLATIONS` is relaxed way of handling restrictions. Streets where truck restrictions are violated will be avoided, but if there is no way around route will go through restricted streets. WARNING: Route calculated with this option cannot be used for navigation. Typical use case is route calculation with imprecise start/destination for planning purpose when user wants to know some statistics data like estimated length, countries crossed. With this option route will be calculated even if it starts/ends in restricted areas. When no mode is explicitly set `NO_VIOLATIONS` mode is used for route calculation. This option does not affect time dependent truck restrictions.

## Enum Constant Details

```
public static final TruckRestrictionsMode NO_VIOLATIONS
```

In those mode violating road segments will not be part of the route.

```
public static final TruckRestrictionsMode PENALIZE_VIOLATIONS
```

In those mode violating road segments can be part of the route, if no other route can be calculated.

## Method Details

```
public static TruckRestrictionsMode valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

**Parameters:**

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static RouteOptions.TruckRestrictionsMode[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## TruckType

The enumeration *TruckType* is a member of *com.here.android.mpa.routing.RouteOptions*.

### Enumeration Summary

public static final enumeration **RouteOptions.TruckType**

*extends java.lang.Enum, java.lang.Object*

Defines names for different types of trucks.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 1017: Enum Constants in TruckType

Fields
public static final <i>TruckType</i> <b>TRUCK</b> TRUCK TYPE
public static final <i>TruckType</i> <b>TRACTOR_TRUCK</b> TRACTOR TYPE

### Method Summary

Table 1018: Methods in TruckType

Methods
public static <i>TruckType</i> <b>getType</b> (int value)
public int <b>toInt</b> ()
public static <i>TruckType</i> <b>valueOf</b> (String name) This method retrieves the enumeration value that matches the name specified by the caller.

## Methods

```
public static RouteOptions.TruckType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

---

## Enumeration Details

Defines names for different types of trucks.

## Enum Constant Details

```
public static final TruckType TRUCK
```

TRUCK TYPE

```
public static final TruckType TRACTOR_TRUCK
```

TRACTOR TYPE

## Method Details

```
public static TruckType getType (int value)
```

Parameters:

- **value**

```
public int toInt ()
```

```
public static TruckType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static RouteOptions.TruckType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## TunnelCategory

The enumeration *TunnelCategory* is a member of *com.here.android.mpa.routing.RouteOptions*.

## Enumeration Summary

public static final enumeration **RouteOptions.TunnelCategory**

extends *java.lang.Enum*, *java.lang.Object*

Specify the ADR tunnel category to restrict the truck route to.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 1019: Enum Constants in TunnelCategory

Fields
<pre>public static final TunnelCategory B</pre> <p>ADR tunnel category B</p>
<pre>public static final TunnelCategory C</pre> <p>ADR tunnel category C</p>
<pre>public static final TunnelCategory D</pre> <p>ADR tunnel category D</p>
<pre>public static final TunnelCategory E</pre> <p>ADR tunnel category D</p>
<pre>public static final TunnelCategory UNDEFINED</pre> <p>Undefined tunnel category</p>

## Method Summary

Table 1020: Methods in TunnelCategory

Methods
<pre>public static TunnelCategory getCategory (int value)</pre>
<pre>public int toInt ()</pre>
<pre>public static TunnelCategory valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static RouteOptions.TunnelCategory[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Specify the ADR tunnel category to restrict the truck route to.

## Enum Constant Details

public static final *TunnelCategory* **B**

ADR tunnel category B

```
public static final TunnelCategory C
```

ADR tunnel category C

```
public static final TunnelCategory D
```

ADR tunnel category D

```
public static final TunnelCategory E
```

ADR tunnel category D

```
public static final TunnelCategory UNDEFINED
```

Undefined tunnel category

## Method Details

```
public static TunnelCategory getCategory (int value)
```

### Parameters:

- **value**

```
public int toInt ()
```

```
public static TunnelCategory valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static RouteOptions.TunnelCategory[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Type

The enumeration *Type* is a member of *com.here.android.mpa.routing.RouteOptions*.

### Enumeration Summary

public static final enumeration **RouteOptions.Type**

extends *java.lang.Enum*, *java.lang.Object*

Represents different types of routing, such as by speed or by distance.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 1021: Enum Constants in Type

Fields
<pre>public static final Type FASTEST</pre> <p>Search for the fastest route (minimizes travel time).</p>
<pre>public static final Type SHORTEST</pre> <p>Search for the shortest route (minimizes travel distance).</p>
<pre>public static final Type BALANCED</pre> <p>Search for balanced route, some travel time may be sacrificed in order to reduce the distance traveled.</p>

### Method Summary

Table 1022: Methods in Type

Methods
<pre>public int value ()</pre>
<pre>public static Type valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static RouteOptions.Type[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

### Enumeration Details

Represents different types of routing, such as by speed or by distance.

Note: a *Type* has no effect on *PEDESTRIAN* or *PUBLIC\_TRANSPORT* transport modes, since they always use *FASTEST* (if *SHORTEST* is set as the *Type* when one of these *TransportMode* types is selected, it will be reset to *FASTEST* when a *Route* is calculated). For *TRUCK*, however, using any *Type* other than *FASTEST* will result in *INVALID\_PARAMETERS* being returned when calculating a route.

### Enum Constant Details

```
public static final Type FASTEST
```

Search for the fastest route (minimizes travel time).

```
public static final Type SHORTEST
```

Search for the shortest route (minimizes travel distance). Car Mode Only.

```
public static final Type BALANCED
```

Search for balanced route, some travel time may be sacrificed in order to reduce the distance traveled. It calculates the optimal route based on time and distance combination. Car Mode Only.

### Method Details

```
public int value ()
```

```
public static Type valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static RouteOptions.Type[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## RoutePlan

The class *RoutePlan* is a member of [com.here.android.mpa.routing](#) .

### Class Summary

```
public final class RoutePlan
```

```
extends java.lang.Object
```

*RoutePlan* contains all information needed to calculate a *Route*.

[For complete information, see the section [Class Details](#)]

See also:

[RouteWaypoint](#)

[Router](#)

## Constructor Summary

Table 1023: Constructors in RoutePlan

Constructors
<p><code>RoutePlan ()</code> Public Constructor</p>
<p><code>RoutePlan (RoutePlan other)</code> Copy Constructor</p>

## Method Summary

Table 1024: Methods in RoutePlan

Methods
<p><code>public RoutePlan addWaypoint (RouteWaypoint point)</code> Adds a waypoint to the plan.</p>
<p><code>public boolean equals (Object obj)</code></p>
<p><code>public RouteOptions getRouteOptions ()</code> Gets a copy of the current route options used with this RoutePlan .</p>
<p><code>public RouteWaypoint getWaypoint (int index)</code> Gets a waypoint at a specified index.</p>
<p><code>public int getWaypointCount ()</code> Gets the number of waypoints of the route plan.</p>
<p><code>public int hashCode ()</code></p>
<p><code>public RoutePlan insertWaypoint (RouteWaypoint point, int index)</code> Inserts a waypoint into a list of existing waypoints.</p>
<p><code>public RoutePlan removeAllWaypoints ()</code> Removes all waypoints of the route plan.</p>
<p><code>public RoutePlan removeWaypoint (int index)</code> Removes a waypoint at a specified index.</p>
<p><code>public RoutePlan setRouteOptions (RouteOptions options)</code> Sets the route options.</p>

## Class Details

RoutePlan contains all information needed to calculate a *Route*.

However, the first and last waypoints used for route calculation must be of `RouteWaypoint.Type.STOP_WAYPOINT` type, otherwise, the error `INVALID_PARAMETERS` will be returned. While there is no maximum limit imposed on how many waypoints is allowed for a route, increasing the number of waypoints increases the probability that the route request will fail and a safe upper limit of 128 is recommended.

**See also:**

[RouteWaypoint](#)

[Router](#)

## Constructor Details

### RoutePlan ()

Public Constructor

### RoutePlan (*RoutePlan* other)

Copy Constructor

**Parameters:**

- **other**  
RoutePlan object to copy from.

## Method Details

```
public RoutePlan addWaypoint (RouteWaypoint point)
```

Adds a waypoint to the plan.

The first and last waypoints used for route calculation must be of `RouteWaypoint.Type.STOP_WAYPOINT` type.

NOTE: Urban Mobility supports only 2 waypoints. If *UMRouter* is used, then adding more than 2 waypoints will result in getting an estimated Public Transport routes.

**Parameters:**

- **point**  
The `RouteWaypoint` representing the waypoint to add.

**Returns:**

This `RoutePlan` object

```
public boolean equals (Object obj)
```

**Parameters:**

- **obj**

```
public RouteOptions getRouteOptions ()
```

Gets a copy of the current route options used with this `RoutePlan`. Any changes made to the `RouteOptions` object returned by this method must be used to call `setRouteOptions(RouteOptions)` again for the changes to be in effect.

**Returns:**

`RouteOptions` options associated with this plan.

```
public RouteWaypoint getWaypoint (int index)
```

Gets a waypoint at a specified index.

**Parameters:**

- **index**

The zero-based index.

**Returns:**

the waypoint, null if the index submitted is out of bounds.

```
public int getWaypointCount ()
```

Gets the number of waypoints of the route plan.

**Returns:**

the number of waypoints.

```
public int hashCode ()
```

```
public RoutePlan insertWaypoint (RouteWaypoint point, int index)
```

Inserts a waypoint into a list of existing waypoints. The position of the new waypoint is according to the specified index.

The first and last waypoints used for route calculation must be of `RouteWaypoint.Type.STOP_WAYPOINT` type.

NOTE: Urban Mobility supports only 2 waypoints. If `UMRouter` is used, then adding more than 2 waypoints will result in getting an estimated Public Transport routes.

**Parameters:**

- **point**

The waypoint to insert

- **index**

The index in the range from 0 to the number of already existing waypoints.

**Returns:**

This `RoutePlan` object

```
public RoutePlan removeAllWaypoints ()
```

Removes all waypoints of the route plan.

**Returns:**

This `RoutePlan` object

```
public RoutePlan removeWaypoint (int index)
```

Removes a waypoint at a specified index.

The first and last waypoints used for route calculation must of be `RouteWaypoint.Type.STOP_WAYPOINT` type.

**Parameters:**

- **index**

The zero-based index.

**Returns:**

This `RoutePlan` object

```
public RoutePlan setRouteOptions (RouteOptions options)
```

Sets the route options. This method does not retain a reference to `options` . If the `options` object is updated, then this method must be called again for the changes to be in effect.

**Parameters:**

- **options**

The `RouteOptions` to set.

**Returns:**

This `RoutePlan` object

## RouteResult

The class `RouteResult` is a member of `com.here.android.mpa.routing` .

## Class Summary

public class **RouteResult**

*extends java.lang.Object*

This is the definition of the RouteResult class.

[For complete information, see the section [Class Details](#)]

## Nested Class Summary

Table 1025: Nested Classes in RouteResult

Nested Classes
<p>public static final enumeration <i>RouteResult.ViolatedOption</i></p> <p>These are options which may be ignored by the routing engine; in such cases a list of violated options is returned in the listener's <code>on_end()</code> method.</p>

## Method Summary

Table 1026: Methods in RouteResult

Methods
<p>public <i>Route</i> <b>getRoute</b> ()</p> <p>Returns the <i>Route</i> in the RouteResult.</p>
<p>public java.util.EnumSet <i>&lt;ViolatedOption&gt;</i> <b>getViolatedOptions</b> ()</p> <p>Gets the violated options.</p>

## Class Details

This is the definition of the RouteResult class. It contains a *Route* as a result of route calculation and a list of possible *RouteResult.ViolatedOption*

## Method Details

public *Route* **getRoute** ()

Returns the *Route* in the RouteResult.

### Returns:

The Route

public java.util.EnumSet *<ViolatedOption>* **getViolatedOptions** ()

Gets the violated options.

### Returns:

Set of *RouteResult.ViolatedOption*

## ViolatedOption

The enumeration *ViolatedOption* is a member of *com.here.android.mpa.routing.RouteResult*.

### Enumeration Summary

public static final enumeration **RouteResult.ViolatedOption**

*extends java.lang.Enum, java.lang.Object*

These are options which may be ignored by the routing engine; in such cases a list of violated options is returned in the listener's `on_end()` method.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 1027: Enum Constants in ViolatedOption

Fields
<pre>public static final ViolatedOption AVOID_HIGHWAYS</pre> <p>The route uses highways although ALLOW_HIGHWAYS was false.</p>
<pre>public static final ViolatedOption AVOID_TOLL_ROADS</pre> <p>The route uses toll roads although ALLOW_TOLLROADS was false.</p>
<pre>public static final ViolatedOption AVOID_FERRIES</pre> <p>The route uses ferries although ALLOW_FERRIES was false.</p>
<pre>public static final ViolatedOption AVOID_TUNNELS</pre> <p>The route uses tunnels although ALLOW_TUNNELS was false.</p>
<pre>public static final ViolatedOption AVOID_DIRT_ROADS</pre> <p>The route uses dirt roads although ALLOW_DIRTROADS was false.</p>
<pre>public static final ViolatedOption AVOID_CAR_SHUTTLE_TRAINS</pre> <p>The route uses rail ferries although AVOID_CARSHUTTLETRAINS was false.</p>
<pre>public static final ViolatedOption AVOID_PARKS</pre> <p>The route uses paths through parks although ALLOW_PARKS was false.</p>
<pre>public static final ViolatedOption BLOCKED_ROADS</pre> <p>The route uses roads which were blocked by dynamic penalties.</p>
<pre>public static final ViolatedOption START_DIRECTION</pre> <p>The route's start direction is not as requested.</p>
<pre>public static final ViolatedOption CARPOOL</pre> <p>The route uses CARPOOL streets even though it is disabled in the options</p>

## Fields

```
public static final ViolatedOption TIME_RESTRICTED_TURN
```

The route uses a time-restricted turn

```
public static final ViolatedOption PERMANENT_TRUCK_RESTRICTION
```

The route uses roads or turns which are permanently forbidden for given truck

## Method Summary

Table 1028: Methods in *ViolatedOption*

### Methods

```
public int value ()
```

```
public static ViolatedOption valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static RouteResult.ViolatedOption[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

These are options which may be ignored by the routing engine; in such cases a list of violated options is returned in the listener's `on_end()` method.

### Enum Constant Details

```
public static final ViolatedOption AVOID_HIGHWAYS
```

The route uses highways although `ALLOW_HIGHWAYS` was false.

```
public static final ViolatedOption AVOID_TOLL_ROADS
```

The route uses toll roads although `ALLOW_TOLLROADS` was false.

```
public static final ViolatedOption AVOID_FERRIES
```

The route uses ferries although `ALLOW_FERRIES` was false.

```
public static final ViolatedOption AVOID_TUNNELS
```

The route uses tunnels although `ALLOW_TUNNELS` was false.

```
public static final ViolatedOption AVOID_DIRT_ROADS
```

The route uses dirt roads although `ALLOW_DIRTROADS` was false.

```
public static final ViolatedOption AVOID_CAR_SHUTTLE_TRAINS
```

The route uses rail ferries although AVOID\_CARSHUTTLETRAINS was false.

```
public static final ViolatedOption AVOID_PARKS
```

The route uses paths through parks although ALLOW\_PARKS was false.

```
public static final ViolatedOption BLOCKED_ROADS
```

The route uses roads which were blocked by dynamic penalties.

```
public static final ViolatedOption START_DIRECTION
```

The route's start direction is not as requested.

```
public static final ViolatedOption CARPOOL
```

The route uses CARPOOL streets even though it is disabled in the options

```
public static final ViolatedOption TIME_RESTRICTED_TURN
```

The route uses a time-restricted turn

```
public static final ViolatedOption PERMANENT_TRUCK_RESTRICTION
```

The route uses roads or turns which are permanently forbidden for given truck

## Method Details

```
public int value ()
```

```
public static ViolatedOption valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static RouteResult.ViolatedOption\[\] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## RouteTta

The class *RouteTta* is a member of *com.here.android.mpa.routing*.

### Class Summary

```
public final class RouteTta
```

```
extends java.lang.Object
```

Describes Time To Arrival details for a given route.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 1029: Nested Classes in RouteTta

Nested Classes
<pre>public static final enumeration <a href="#">RouteTta.Detail</a></pre> <p>Additional Time To Arrival Details</p>

### Method Summary

Table 1030: Methods in RouteTta

Methods
<pre>public java.util.EnumSet &lt;<i>Detail</i>&gt; <a href="#">getDetails</a> ()</pre> <p>Details of the blockage (if any).</p>
<pre>public int <a href="#">getDuration</a> ()</pre> <p>Gets the duration in seconds.</p>
<pre>public boolean <a href="#">isBlocked</a> ()</pre> <p>Whether this time to arrival is blocked.</p>

### Class Details

Describes Time To Arrival details for a given route.

### Method Details

```
public java.util.EnumSet <Detail> getDetails ()
```

Details of the blockage (if any).

**Returns:**

The set of all blockage details.

```
public int getDuration ()
```

Gets the duration in seconds.

**Returns:**

The duration in seconds.

```
public boolean isBlocked ()
```

Whether this time to arrival is blocked. Note that it is possible to get a valid duration when the route is blocked. See [getDetails\(\)](#) for more information.

**Returns:**

Whether this time to arrival is blocked.

## Detail

The enumeration *Detail* is a member of *com.here.android.mpa.routing.RouteTta*.

### Enumeration Summary

```
public static final enumeration RouteTta.Detail
```

*extends java.lang.Enum, java.lang.Object*

Additional Time To Arrival Details

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 1031: Enum Constants in Detail

Fields
<pre>public static final Detail <b>BLOCKED_ROAD</b></pre> <p>A blocked road is present.</p>
<pre>public static final Detail <b>CARPOOL</b></pre> <p>A carpool restricted lane is present.</p>
<pre>public static final Detail <b>RESTRICTED_TURN</b></pre> <p>A restricted turn is present.</p>

## Method Summary

Table 1032: Methods in Detail

Methods
<pre>public int <i>getValue</i> ()</pre>
<pre>public static <i>Detail</i> <i>valueOf</i> (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>RouteTta.Detail</i>[] <i>values</i> ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Additional Time To Arrival Details

### Enum Constant Details

```
public static final Detail BLOCKED_ROAD
```

A blocked road is present.

```
public static final Detail CARPOOL
```

A carpool restricted lane is present.

```
public static final Detail RESTRICTED_TURN
```

A restricted turn is present.

## Method Details

```
public int getValue ()
```

```
public static Detail valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static RouteTta.Detail[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## RouteWaypoint

The class *RouteWaypoint* is a member of *com.here.android.mpa.routing*.

### Class Summary

public final class **RouteWaypoint**

*extends java.lang.Object*

Represents a waypoint to be used in a route calculation.

[For complete information, see the section *Class Details*]

### Nested Class Summary

Table 1033: Nested Classes in RouteWaypoint

Nested Classes
public static class <i>RouteWaypoint.RoadInfo</i> Exposes additional information about RouteWaypoint, mainly the side of the road it's on.
public static final enumeration <i>RouteWaypoint.Type</i> Represents different types of waypoints.
public static final enumeration <i>RouteWaypoint.WaypointDirection</i> Represents different waypoint direction.

### Constructor Summary

Table 1034: Constructors in RouteWaypoint

Constructors
<i>RouteWaypoint</i> ( <i>GeoCoordinate</i> coordinate) The specified location coordinate is used to set the original position of this waypoint.
<i>RouteWaypoint</i> ( <i>GeoCoordinate</i> coordinate, <i>Type</i> waypointType)
<i>RouteWaypoint</i> ( <i>GeoCoordinate</i> coordinate, String identifier, <i>WaypointDirection</i> direction, <i>Type</i> waypointType) The specified location coordinate is used to set the original position of this waypoint.

## Method Summary

Table 1035: Methods in RouteWaypoint

Methods
<pre>public boolean equals (Object obj)</pre>
<pre>public String getIdentifier ()</pre> <p>Gets the identifier.</p>
<pre>public GeoCoordinate getNavigablePosition ()</pre> <p>Gets the navigable position.</p>
<pre>public GeoCoordinate getOriginalPosition ()</pre> <p>Gets the original position of this waypoint.</p>
<pre>public RoadInfo getRoadInfo ()</pre> <p>Gets additional information about this waypoint.</p>
<pre>public WaypointDirection getWaypointDirection ()</pre> <p>Gets the direction for waypoint.</p>
<pre>public Type getWaypointType ()</pre> <p>Gets the Waypoint Type, see <a href="#">RouteWaypoint.Type</a> for valid values.</p>
<pre>public int hashCode ()</pre>
<pre>public void setIdentifier (String identifier, WaypointDirection direction)</pre> <p>Sets the route identifier and direction for waypoint.</p>
<pre>public RouteWaypoint setNavigablePosition (GeoCoordinate position)</pre> <p>Sets the waypoint's road position to be used for route calculation.</p>
<pre>public RouteWaypoint setOriginalPosition (GeoCoordinate position)</pre> <p>Sets the original position, which identifies the off-the-road position of this waypoint, such as the exact location of a building.</p>
<pre>public RouteWaypoint setWaypointType (Type type)</pre> <p>Sets the waypoint type.</p>

## Class Details

Represents a waypoint to be used in a route calculation. A `RouteWaypoint` contains the [GeoCoordinate](#) location, as well as additional information, such as the actual road position and whether it is a stop in the route.

## Constructor Details

### `RouteWaypoint (GeoCoordinate coordinate)`

The specified location coordinate is used to set the original position of this waypoint.

**Parameters:**

- **coordinate**

The original position.

See also:

[getOriginalPosition\(\)](#)

**RouteWaypoint** (*GeoCoordinate* coordinate, *Type* waypointType)

Parameters:

- **coordinate**
- **waypointType**

**RouteWaypoint** (*GeoCoordinate* coordinate, *String* identifier, *WaypointDirection* direction, *Type* waypointType)

The specified location coordinate is used to set the original position of this waypoint. You can specify waypoint direction to affect route calculation.

Parameters:

- **coordinate**  
The original position.
- **identifier**  
Identifier of road element.
- **direction**  
Direction of waypoint.
- **waypointType**

See also:

[getOriginalPosition\(\)](#)

[setIdentifier\(String, WaypointDirection\)](#)

## Method Details

```
public boolean equals (Object obj)
```

Parameters:

- **obj**

```
public String getIdentifier ()
```

Gets the identifier.

Returns:

identifier as String.

```
public GeoCoordinate getNavigablePosition ()
```

Gets the navigable position. The navigable position is used for route calculation.

**Returns:**

The navigable position

```
public GeoCoordinate getOriginalPosition ()
```

Gets the original position of this waypoint.

**Returns:**

The original position

```
public RoadInfo getRoadInfo ()
```

Gets additional information about this waypoint.

This is only available for waypoints that were matched to the route as part of route calculation. Which means for waypoints obtained through a *Route* object, either by calling *getRouteWaypoints()* or by getting them from a *RoutePlan* obtained by calling *getRoutePlan()*.

**Returns:**

additional information about this waypoint, or null if none is available

```
public WaypointDirection getWaypointDirection ()
```

Gets the direction for waypoint.

**Returns:**

waypoint direction.

```
public Type getWaypointType ()
```

Gets the Waypoint Type, see *RouteWaypoint.Type* for valid values. By default, a *RouteWaypoint* is of *STOP\_WAYPOINT* type.

**Returns:**

The current Type.

```
public int hashCode ()
```

```
public void setIdentifier (String identifier, WaypointDirection direction)
```

Sets the route identifier and direction for waypoint. By default the waypoint direction is of *ANY* type.

**Parameters:**

- **identifier**  
Identifier of road element.
- **direction**  
Direction of waypoint.

```
public RouteWaypoint setNavigablePosition (GeoCoordinate position)
```

Sets the waypoint's road position to be used for route calculation.

For a waypoint that is not on a road, the navigable position acts as a road location hint for a route calculation. However, there's no guarantee that any location can work as a navigable position. It is best to only use a navigable position when you have a trusted source, such as from search results.

Working together with the navigable position, the original position is used by the HERE SDK for determining the side of street during arrival, and to let the calculated route approach the correct side of street, especially when there there is a physical or logical lane divider on the road.

By default, the navigable position is set to be the same as the geocoordinates provided to the *RouteWaypoint* constructor.

**Parameters:**

- **position**  
to be set as the navigable position

**Returns:**

The modified *RouteWaypoint* itself.

**See also:**

[Location](#)

```
public RouteWaypoint setOriginalPosition (GeoCoordinate position)
```

Sets the original position, which identifies the off-the-road position of this waypoint, such as the exact location of a building.

The original position is required for a route calculation. By default, it is set to be the same as the geocoordinates provided to the *RouteWaypoint* constructor.

Working together with the navigable position, the original position is used by the HERE SDK for determining the side of street during arrival, and to let the calculated route approach the correct side of street, especially when there there is a physical or logical lane divider on the road.

**Parameters:**

- **position**

to be set as the original position

**Returns:**

The modified `RouteWaypoint` itself.

**See also:**

[Location](#)

```
public RouteWaypoint setWaypointType (Type type)
```

Sets the waypoint type. By default the waypoint is of `STOP_WAYPOINT` type.

**Parameters:**

- **type**  
waypoint type, see [RouteWaypoint.Type](#) for valid values.

**Returns:**

The modified `RouteWaypoint` itself.

## RoadInfo

The class `RoadInfo` is a member of `com.here.android.mpa.routing.RouteWaypoint`.

### Class Summary

```
public static class RouteWaypoint.RoadInfo
```

```
extends java.lang.Object
```

Exposes additional information about `RouteWaypoint`, mainly the side of the road it's on.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 1036: Nested Classes in `RoadInfo`

Nested Classes
<pre>public static final enumeration <a href="#">RouteWaypoint.RoadInfo.RoadSide</a></pre> <p>Represents side of the road, used to indicate position relative to a road, according to travel direction.</p>

## Method Summary

Table 1037: Methods in RoadInfo

Methods
<pre>public <i>GeoCoordinate</i> <b>getMatchedCoordinate</b> ()</pre> <p>Gets waypoint coordinates matched to the route.</p>
<pre>public <i>RoadSide</i> <b>getRoadSide</b> ()</pre> <p>Gets road side of associated route waypoint.</p>

## Class Details

Exposes additional information about RouteWaypoint, mainly the side of the road it's on. This information is populated during route calculation.

### Method Details

```
public GeoCoordinate getMatchedCoordinate ()
```

Gets waypoint coordinates matched to the route.

**Returns:**

matched position

```
public RoadSide getRoadSide ()
```

Gets road side of associated route waypoint.

**Returns:**

which side of the road the waypoint is on

## RoadSide

The enumeration *RoadSide* is a member of *com.here.android.mpa.routing.RouteWaypoint.RoadInfo*.

### Enumeration Summary

```
public static final enumeration RouteWaypoint.RoadInfo.RoadSide
```

```
extends java.lang.Enum, java.lang.Object
```

Represents side of the road, used to indicate position relative to a road, according to travel direction.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 1038: Enum Constants in RoadSide

Fields
<pre>public static final RoadSide UNKNOWN_LEFT</pre> <p>Indicates location that is geometrically on the left side of the road geometry, but whose distance from it is so small or so large that the distinction might not be so obvious.</p>
<pre>public static final RoadSide UNKNOWN_RIGHT</pre> <p>Indicates location that is geometrically on the right side of the road geometry, but whose distance from it is so small or so large that the distinction might not be so obvious.</p>
<pre>public static final RoadSide LEFT</pre> <p>Indicates location on the left side of the road, according to direction of travel.</p>
<pre>public static final RoadSide RIGHT</pre> <p>Indicates location on the right side of the road, according to direction of travel.</p>
<pre>public static final RoadSide UNDEFINED</pre> <p>Indicates that a position relative to the road is undefined.</p>

## Method Summary

Table 1039: Methods in RoadSide

Methods
<pre>public static RoadSide valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static RouteWaypoint.RoadInfo.RoadSide[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Represents side of the road, used to indicate position relative to a road, according to travel direction.

### Enum Constant Details

```
public static final RoadSide UNKNOWN_LEFT
```

Indicates location that is geometrically on the left side of the road geometry, but whose distance from it is so small or so large that the distinction might not be so obvious.

```
public static final RoadSide UNKNOWN_RIGHT
```

Indicates location that is geometrically on the right side of the road geometry, but whose distance from it is so small or so large that the distinction might not be so obvious.

```
public static final RoadSide LEFT
```

Indicates location on the left side of the road, according to direction of travel.

```
public static final RoadSide RIGHT
```

Indicates location on the right side of the road, according to direction of travel.

```
public static final RoadSide UNDEFINED
```

Indicates that a position relative to the road is undefined.

## Method Details

```
public static RoadSide valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static RouteWaypoint.RoadInfo.RoadSide[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Type

The enumeration *Type* is a member of *com.here.android.mpa.routing.RouteWaypoint*.

## Enumeration Summary

```
public static final enumeration RouteWaypoint.Type
```

*extends java.lang.Enum, java.lang.Object*

Represents different types of waypoints.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 1040: Enum Constants in Type

Fields
<pre>public static final Type STOP_WAYPOINT</pre> <p>A maneuver is generated for a STOP waypoint.</p>
<pre>public static final Type VIA_WAYPOINT</pre> <p>No maneuver is generated for a VIA waypoint.</p>

## Method Summary

Table 1041: Methods in Type

Methods
<pre>public int value ()</pre>
<pre>public static Type valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static RouteWaypoint.Type[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Represents different types of waypoints.

### Enum Constant Details

```
public static final Type STOP_WAYPOINT
```

A maneuver is generated for a STOP waypoint. After the STOP waypoint, route is allowed to continue in the opposite direction, i.e. to turn back.

During Guidance, "You have reached your stop-over" will be announced if supported by the selected voice skin. Furthermore, this will trigger the following callbacks: `NavigationManager.ManeuverEventListener#onManeuverEvent` and `NavigationManager.NavigationManagerEventListener#onStopoverReached`.

The first and the last waypoint to be used for route calculation must be of `RouteWaypoint.Type.STOP_WAYPOINT` type.

```
public static final Type VIA_WAYPOINT
```

No maneuver is generated for a VIA waypoint. After the VIA waypoint, route will continue in the same direction as when it's approached.

Via waypoints will "force" the route to pass through them, but they will not cause any guidance, announcement or maneuvers.

VIA waypoints are not considered during Guidance triggered re-routing nor do they trigger any callbacks upon arrival at the waypoint.

This is only supported by `RouteOptions.TransportMode.CAR`. It's ignored for other transport modes.

## Method Details

```
public int value ()
```

```
public static Type valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static RouteWaypoint.Type[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## WaypointDirection

The enumeration `WaypointDirection` is a member of `com.here.android.mpa.routing.RouteWaypoint`.

### Enumeration Summary

```
public static final enumeration RouteWaypoint.WaypointDirection
```

```
extends java.lang.Enum, java.lang.Object
```

Represents different waypoint direction.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 1042: Enum Constants in `WaypointDirection`

Fields
<pre>public static final WaypointDirection ANY</pre> <p>Do not enforce direction, pick any.</p>
<pre>public static final WaypointDirection POSITIVE</pre> <p>Enforce positive direction.</p>

### Fields

```
public static final WaypointDirection NEGATIVE
```

Enforce negative direction.

## Method Summary

Table 1043: Methods in *WaypointDirection*

### Methods

```
public static WaypointDirection valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static RouteWaypoint.WaypointDirection[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Represents different waypoint direction.

### Enum Constant Details

```
public static final WaypointDirection ANY
```

Do not enforce direction, pick any.

```
public static final WaypointDirection POSITIVE
```

Enforce positive direction.

```
public static final WaypointDirection NEGATIVE
```

Enforce negative direction.

## Method Details

```
public static WaypointDirection valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static RouteWaypoint.WaypointDirection[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Router<T, S extends Enum<?>>

The interface `Router<T, S extends Enum<?>>` is a member of `com.here.android.mpa.routing`.

### Type Parameters:

- T
- S

### Interface Summary

public abstract interface **Router**

Base interface for route calculation class.

[For complete information, see the section [Interface Details](#)]

### Nested Class Summary

Table 1044: Nested Classes in Router<T, S extends Enum<?>>

Nested Classes
public static abstract interface <code>Router.Listener</code>

### Method Summary

Table 1045: Methods in Router<T, S extends Enum<?>>

Methods
public abstract void <code>calculateRoute</code> ( <code>RoutePlan</code> routePlan, <code>Listener&lt;T,&gt;</code> listener)
Invokes an asynchronous route calculation.
public abstract void <code>cancel</code> ()
Cancels the current route calculation.
public abstract boolean <code>isBusy</code> ()
Query whether the route calculation is ongoing.

### Interface Details

Base interface for route calculation class. Represents controls for performing a type of routing request. It defines routing type specific operations and listeners.

### Method Details

public abstract void `calculateRoute` (`RoutePlan` routePlan, `Listener<T,>` listener)

Invokes an asynchronous route calculation.

**Parameters:**

- **routePlan**  
The routePlan object used for calculation.
- **listener**  
A Listener for the route calculation request.

```
public abstract void cancel ()
```

Cancels the current route calculation. Note that this API is asynchronous as it takes some time cancel all underlying operations. Use `#isBusy()` to check whether calculation is still ongoing or not.

```
public abstract boolean isBusy ()
```

Query whether the route calculation is ongoing.

**Returns:**

true if a route calculation is ongoing, false otherwise.

## Listener<T, S extends Enum<?>>

The interface *Listener<T, S extends Enum<?>>* is a member of *com.here.android.mpa.routing.Router*.

**Type Parameters:**

- T
- S

### Interface Summary

```
public static abstract interface Router.Listener
```

[For complete information, see the section [Interface Details](#)]

### Method Summary

Table 1046: Methods in Listener<T, S extends Enum<?>>

Methods
<pre>public abstract void <i>onCalculateRouteFinished</i> (T response, S error)</pre> <p>A callback indicating that the route calculation operation has finished.</p>
<pre>public abstract void <i>onProgress</i> (int percentage)</pre> <p>A callback indicating the progress level of the current route calculation operation, a percentage value within the range of [0..100].</p>

## Interface Details

### Method Details

```
public abstract void onCalculateRouteFinished (T response, S error)
```

A callback indicating that the route calculation operation has finished. You are free to re-use the Router to perform another route calculation once this callback has been received.

#### Parameters:

- **response**  
The result of the route calculation operation
- **error**  
A response code indicating any issues encountered during route calculation

```
public abstract void onProgress (int percentage)
```

A callback indicating the progress level of the current route calculation operation, a percentage value within the range of [0..100]. Note that in certain circumstances a recalculation is required and this percentage will go from 100 to 0.

#### Parameters:

- **percentage**  
Progress completion percentage

## RoutingError

The enumeration *RoutingError* is a member of *com.here.android.mpa.routing* .

### Enumeration Summary

```
public final enumeration RoutingError
extends java.lang.Enum, java.lang.Object
```

Represents values describing possible route calculation errors.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 1047: Enum Constants in RoutingError

Fields
<pre>public static final RoutingError NONE</pre> <p>There was no calculation error.</p>

**Fields**

```
public static final RoutingError UNKNOWN
```

There was an unknown error preventing calculation.

```
public static final RoutingError OUT_OF_MEMORY
```

An out-of-memory error prevented calculation.

```
public static final RoutingError INVALID_PARAMETERS
```

Parameters passed were invalid.

```
public static final RoutingError INVALID_OPERATION
```

The operation is not allowed at this time because another request is in progress.

```
public static final RoutingError GRAPH_DISCONNECTED
```

No route was found.

```
public static final RoutingError GRAPH_DISCONNECTED_CHECK_OPTIONS
```

No route was found, one of the *RouteOptions* might be preventing calculation.

```
public static final RoutingError NO_START_POINT
```

No start point was found.

```
public static final RoutingError NO_END_POINT
```

No end point was found.

```
public static final RoutingError NO_END_POINT_CHECK_OPTIONS
```

The end point is unreachable, possibly due to one of the *RouteOptions*.

```
public static final RoutingError CANNOT_DO_PEDESTRIAN
```

A *PEDESTRIAN* transport mode was set but was not practical (possibly the route is too long).

```
public static final RoutingError ROUTING_CANCELLED
```

An application user cancelled the calculation.

```
public static final RoutingError VIOLATES_OPTIONS
```

A route was found but is invalid because it makes use of roads that were disabled by *RouteOptions*.

```
public static final RoutingError ROUTE_CORRUPTED
```

Could not decode the route as received from the server.

```
public static final RoutingError INVALID_CREDENTIALS
```

The route cannot be calculated because the HERE Developer credentials are invalid or were not provided.

```
public static final RoutingError REQUEST_TIMEOUT
```

**Deprecated: As of SDK 3.3.**

The online route calculation request has timed out because the server has not responded or the device system resources have been exhausted.

```
public static final RoutingError OPERATION_NOT_ALLOWED
```

Access to this operation is denied.

## Fields

```
public static final RoutingError NO_CONNECTIVITY
```

No internet connection is available.

```
public static final RoutingError INSUFFICIENT_MAP_DATA
```

The route cannot be calculated because there is not enough local map data to perform route calculation.

```
public static final RoutingError NETWORK_COMMUNICATION
```

The online route calculation request failed because of a networking error.

```
public static final RoutingError UNSUPPORTED_MAP_VERSION
```

The online routing server does not support the device downloaded map version as specified in the route request.

## Method Summary

Table 1048: Methods in RoutingError

### Methods

```
public int value ()
```

```
public static RoutingError valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static RoutingError[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Represents values describing possible route calculation errors.

### Enum Constant Details

```
public static final RoutingError NONE
```

There was no calculation error. NOTE: do not rename; there is code that refers to "NONE" as a hard-coded literal

```
public static final RoutingError UNKNOWN
```

There was an unknown error preventing calculation.

```
public static final RoutingError OUT_OF_MEMORY
```

An out-of-memory error prevented calculation.

```
public static final RoutingError INVALID_PARAMETERS
```

Parameters passed were invalid.

```
public static final RoutingError INVALID_OPERATION
```

The operation is not allowed at this time because another request is in progress.

```
public static final RoutingError GRAPH_DISCONNECTED
```

No route was found.

```
public static final RoutingError GRAPH_DISCONNECTED_CHECK_OPTIONS
```

No route was found, one of the *RouteOptions* might be preventing calculation.

```
public static final RoutingError NO_START_POINT
```

No start point was found.

```
public static final RoutingError NO_END_POINT
```

No end point was found.

```
public static final RoutingError NO_END_POINT_CHECK_OPTIONS
```

The end point is unreachable, possibly due to one of the *RouteOptions*.

```
public static final RoutingError CANNOT_DO_PEDESTRIAN
```

A *PEDESTRIAN* transport mode was set but was not practical (possibly the route is too long).

```
public static final RoutingError ROUTING_CANCELLED
```

An application user cancelled the calculation.

```
public static final RoutingError VIOLATES_OPTIONS
```

A route was found but is invalid because it makes use of roads that were disabled by *RouteOptions*.

```
public static final RoutingError ROUTE_CORRUPTED
```

Could not decode the route as received from the server.

```
public static final RoutingError INVALID_CREDENTIALS
```

The route cannot be calculated because the HERE Developer credentials are invalid or were not provided.

```
public static final RoutingError REQUEST_TIMEOUT
```

Deprecated: As of SDK 3.3.

Use *NETWORK\_COMMUNICATION*.

The online route calculation request has timed out because the server has not responded or the device system resources have been exhausted. The route calculation request should be retried.

```
public static final RoutingError OPERATION_NOT_ALLOWED
```

Access to this operation is denied. Contact your HERE representative for more information.

```
public static final RoutingError NO_CONNECTIVITY
```

No internet connection is available.

```
public static final RoutingError INSUFFICIENT_MAP_DATA
```

The route cannot be calculated because there is not enough local map data to perform route calculation. Client can re-download map data and calculate route again.

```
public static final RoutingError NETWORK_COMMUNICATION
```

The online route calculation request failed because of a networking error. The route calculation request should be retried.

```
public static final RoutingError UNSUPPORTED_MAP_VERSION
```

The online routing server does not support the device downloaded map version as specified in the route request. Clients must update the map version installed on the device.

## Method Details

```
public int value ()
```

```
public static RoutingError valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

**Parameters:**

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static RoutingError\[\] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Signpost

The class *Signpost* is a member of [com.here.android.mpa.routing](#) .

### Class Summary

```
public final class Signpost
```

```
extends java.lang.Object
```

This class stores signpost information along the *Route*.

[For complete information, see the section [Class Details](#)]

**See also:**

[Maneuver](#)

### Nested Class Summary

Table 1049: Nested Classes in Signpost

#### Nested Classes

```
public static final class Signpost.LocalizedLabel
```

Signpost information can be used for navigation (both audible and graphical/textual navigation) and map display.

### Method Summary

Table 1050: Methods in Signpost

#### Methods

```
public int getBackgroundColor ()
```

Return the background color of this signpost using ARGB (Alpha/Red/Green/Blue)

```
public java.util.List getExitDirections ()
```

Returns the directions on the *Signpost*.

```
public Image getExitIcon ()
```

Returns the exit *Signpost* icon.

## Methods

```
public String getExitNumber ()
```

Returns the exit number on the *Signpost*

```
public String getExitText ()
```

Returns the exit text on the *Signpost*

```
public int getForegroundColor ()
```

Return the foreground/text color of this signpost using ARGB (Alpha/Red/Green/Blue)

---

## Class Details

This class stores signpost information along the *Route*.

**See also:**

*Maneuver*

## Method Details

```
public int getBackgroundColor ()
```

Return the background color of this signpost using ARGB (Alpha/Red/Green/Blue)

**Returns:**

The background color of this signpost

**See also:**

android.graphics.Color

```
public java.util.List <LocalizedLabel> getExitDirections ()
```

Returns the directions on the *Signpost*.

**Returns:**

a list of directions (empty list if none available).

```
public Image getExitIcon ()
```

Returns the exit *Signpost* icon.

**Returns:**

*Image*

```
public String getExitNumber ()
```

Returns the exit number on the *Signpost*

**Returns:**

string presentation of the exit number

```
public String getExitText ()
```

Returns the exit text on the *Signpost*

**Returns:**

exit text

```
public int getForegroundColor ()
```

Return the foreground/text color of this signpost using ARGB (Alpha/Red/Green/Blue)

**Returns:**

The foreground/text color of this signpost

**See also:**

android.graphics.Color

## LocalizedLabel

The class *LocalizedLabel* is a member of *com.here.android.mpa.routing.Signpost*.

### Class Summary

```
public static final class Signpost.LocalizedLabel
```

```
extends java.lang.Object
```

Signpost information can be used for navigation (both audible and graphical/textual navigation) and map display.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 1051: Methods in LocalizedLabel

**Methods**

```
public String getLanguage ()
```

Three letter MARC language tag.

```
public String getRouteDirection ()
```

Contains the cardinal direction.

### Methods

```
public String getRouteName ()
```

Contains the route name/route number of the label.

```
public String getText ()
```

Usually it contains auxiliary information like city name or characteristic place (for example: "airport").

```
public String toString ()
```

For documentation, see *java.lang.Object*

## Class Details

Signpost information can be used for navigation (both audible and graphical/textual navigation) and map display. In Europe, the label Text is most relevant for guidance, while in the North America, both Route Name and Direction information are most relevant.

## Method Details

```
public String getLanguage ()
```

Three letter MARC language tag.

### Returns:

A string representing the language.

```
public String getRouteDirection ()
```

Contains the cardinal direction.

### Returns:

String with the direction.

```
public String getRouteName ()
```

Contains the route name/route number of the label. Since the origin data is not always consistent it is advisable to concatenate the route name and route direction fields There are for example cases in which the direction is already contained in the route name.

### Returns:

String with the route name.

### See also:

[\*getRouteName\(\)\*](#)

[\*getRouteDirection\(\)\*](#)

```
public String getText ()
```

Usually it contains auxiliary information like city name or characteristic place (for example: "airport").

**Returns:**

String with auxiliary information.

```
public String toString ()
```

For documentation, see *java.lang.Object*

## TransitManeuver

The class *TransitManeuver* is a member of *com.here.android.mpa.routing* .

### Class Summary

```
public final class TransitManeuver
```

*extends* *com.here.android.mpa.routing.Maneuver*, *java.lang.Object*

Represents the transit specific action required to leave one street segment and enter the next in the chain of directions that comprises a calculated Transit *Route* .

[For complete information, see the section *Class Details*]

### Nested Class Summary

Table 1052: Nested Classes in TransitManeuver

Nested Classes
<pre>public static final enumeration TransitManeuver.TransitLineStyle</pre> <p>Represents values describing different line styles.</p>

### Method Summary

Table 1053: Methods in TransitManeuver

Methods
<pre>public String getArrivalStopName ()</pre> <p>Gets the arrival stop name for the TransitManeuver .</p>
<pre>public String getDepartureStopName ()</pre> <p>Gets the departure stop name for the TransitManeuver .</p>
<pre>public String getLineName ()</pre> <p>Gets the line name for the TransitManeuver .</p>

## Methods

```
public TransitLineStyle getLineStyle ()
```

Gets the *TransitLineStyle* that is typical of the way in which *TransitManeuver* lines are drawn on maps of the local operator.

```
public int getPrimaryLineColor ()
```

Gets the primary color of the *TransitManeuver* in the local public transit operator's color scheme.

```
public int getSecondaryLineColor ()
```

Gets the secondary color of the *TransitManeuver* in the local public transit operator's color scheme.

```
public String getSystemInformalName ()
```

Gets the informal name of the system operating the *TransitManeuver* .

```
public String getSystemOfficialName ()
```

Gets the name of the system operating the *TransitManeuver* .

```
public String getSystemShortName ()
```

Gets the name, in a shorter or abbreviated version if available, of the system operating the *TransitManeuver* .

```
public String getTerminusStopName ()
```

Gets the terminus stop name for the *TransitManeuver* .

```
public java.util.List <TransitRouteElement> getTransitRouteElements ()
```

Gets a list of *TransitRouteElement* of the *TransitManeuver* .

```
public int getTransitTravelTime ()
```

Gets the transit travel time.

```
public TransitType getTransitType ()
```

Gets the *TransitType* of the transit system offering service for the *TransitManeuver* .

```
public String getTransitTypeName ()
```

Gets the transit type of the transit system offering service for the *TransitManeuver* , as a *String* in the transit operator's local vocabulary.

```
public boolean hasPrimaryLineColor ()
```

Returns whether element's primary line color is available.

```
public boolean hasSecondaryLineColor ()
```

Returns whether element's secondary line color is available.

## Class Details

Represents the transit specific action required to leave one street segment and enter the next in the chain of directions that comprises a calculated *Transit Route* .

## Method Details

```
public String getArrivalStopName ()
```

Gets the arrival stop name for the *TransitManeuver* .

**Returns:**

The arrival stop name

```
public String getDepartureStopName ()
```

Gets the departure stop name for the `TransitManeuver`.

**Returns:**

The departure stop name

```
public String getLineName ()
```

Gets the line name for the `TransitManeuver`.

**Returns:**

The line name

```
public TransitLineStyle getLineStyle ()
```

Gets the `TransitLineStyle` that is typical of the way in which `TransitManeuver` lines are drawn on maps of the local operator.

**Returns:**

The `TransitLineStyle`

```
public int getPrimaryLineColor ()
```

Gets the primary color of the `TransitManeuver` in the local public transit operator's color scheme.

**Returns:**

The ARGB integer color value. The packed integer is made up of 4 bytes: alpha, red, green, blue. Each color component has a value range from [0..255] with 0 meaning no contribution for that component, and 255 meaning 100% contribution

**See also:**

[getPrimaryLineColor\(\)](#)

```
public int getSecondaryLineColor ()
```

Gets the secondary color of the `TransitManeuver` in the local public transit operator's color scheme.

**Returns:**

The ARGB integer color value. The packed integer is made up of 4 bytes: alpha, red, green, blue. Each color component has a value range from [0..255] with 0 meaning no contribution for that component, and 255 meaning 100% contribution

**See also:**

[getSecondaryLineColor\(\)](#)

```
public String getSystemInformalName ()
```

Gets the informal name of the system operating the `TransitManeuver` . if available

**Returns:**

The informal transit system name, e.g. "SMGN".

**See also:**

[getSystemInformalName\(\)](#)

```
public String getSystemOfficialName ()
```

Gets the name of the system operating the `TransitManeuver` .

**Returns:**

The transit system name

**See also:**

[getSystemOfficialName\(\)](#)

```
public String getSystemShortName ()
```

Gets the name, in a shorter or abbreviated version if available, of the system operating the `TransitManeuver` .

**Returns:**

The transit system name in shortened form

**See also:**

[getSystemShortName\(\)](#)

```
public String getTerminusStopName ()
```

Gets the terminus stop name for the `TransitManeuver` .

**Returns:**

The terminus stop name

```
public java.util.List <TransitRouteElement> getTransitRouteElements ()
```

Gets a list of [TransitRouteElement](#) of the `TransitManeuver` .

**Returns:**

a list of [TransitRouteElement](#)

```
public int getTransitTravelTime ()
```

Gets the transit travel time. Unit is seconds.

**Returns:**

transit travel time in seconds

```
public TransitType getTransitType ()
```

Gets the [TransitType](#) of the transit system offering service for the [TransitManeuver](#) .

**Returns:**

The [TransitType](#)

```
public String getTransitTypeName ()
```

Gets the transit type of the transit system offering service for the [TransitManeuver](#) , as a [String](#) in the transit operator's local vocabulary.

**Returns:**

The transit type name

**See also:**

[getTransitType\(\)](#)

```
public boolean hasPrimaryLineColor ()
```

Returns whether element's primary line color is available.

**Returns:**

true if color is available, false - otherwise

```
public boolean hasSecondaryLineColor ()
```

Returns whether element's secondary line color is available.

**Returns:**

true if color is available, false - otherwise

## TransitLineStyle

The enumeration [TransitLineStyle](#) is a member of [com.here.android.mpa.routing.TransitManeuver](#).

## Enumeration Summary

public static final enumeration `TransitManeuver.TransitLineStyle`

extends `java.lang.Enum`, `java.lang.Object`

Represents values describing different line styles.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 1054: Enum Constants in `TransitLineStyle`

Fields
<pre>public static final <i>TransitLineStyle</i> <b>SOLID</b></pre> <p>A solid line.</p>
<pre>public static final <i>TransitLineStyle</i> <b>DOTTED</b></pre> <p>A dotted line.</p>
<pre>public static final <i>TransitLineStyle</i> <b>DASHED</b></pre> <p>A dashed line.</p>
<pre>public static final <i>TransitLineStyle</i> <b>UNDEFINED</b></pre> <p>An undefined line style.</p>

## Method Summary

Table 1055: Methods in `TransitLineStyle`

Methods
<pre>public int <i>value</i> ()</pre>
<pre>public static <i>TransitLineStyle</i> <i>valueOf</i> (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>TransitManeuver.TransitLineStyle</i>[] <i>values</i> ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Represents values describing different line styles. Used for expressing transit line styling information as provided by the operator.

## Enum Constant Details

public static final `TransitLineStyle` **SOLID**

A solid line.

```
public static final TransitLineStyle DOTTED
```

A dotted line.

```
public static final TransitLineStyle DASHED
```

A dashed line.

```
public static final TransitLineStyle UNDEFINED
```

An undefined line style.

### Method Details

```
public int value ()
```

```
public static TransitLineStyle valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static TransitManeuver.TransitLineStyle[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## TransitRouteElement

The class *TransitRouteElement* is a member of *com.here.android.mpa.routing* .

### Class Summary

```
public final class TransitRouteElement
```

```
extends java.lang.Object
```

Represents an element within a transit-specific *Route*.

[For complete information, see the section [Class Details](#)]

#### See also:

[Route](#)

[getTransitElement\(\)](#)

[getTransitRouteElements\(\)](#)

## Method Summary

Table 1056: Methods in TransitRouteElement

Methods
<p><code>public <i>TransitRouteStop</i> <a href="#">getArrivalStop</a> ()</code></p> <p>Gets the arrival station.</p>
<p><code>public Date <a href="#">getArrivalTime</a> ()</code></p> <p>Gets time of arrival at the station for the <i>TransitRouteElement</i>.</p>
<p><code>public <i>TransitRouteStop</i> <a href="#">getDepartureStop</a> ()</code></p> <p>Gets the departure station.</p>
<p><code>public Date <a href="#">getDepartureTime</a> ()</code></p> <p>Gets the time of departure from the station for the <i>TransitRouteElement</i>.</p>
<p><code>public String <a href="#">getDestination</a> ()</code></p> <p>Gets the destination name for the <i>TransitRouteElement</i>.</p>
<p><code>public int <a href="#">getDuration</a> ()</code></p> <p>Gets the total duration.</p>
<p><code>public java.util.List &lt;<i>GeoCoordinate</i>&gt; <a href="#">getGeometry</a> ()</code></p> <p>Gets the geometry of the <i>TransitRouteElement</i>.</p>
<p><code>public <i>Identifier</i> <a href="#">getId</a> ()</code></p> <p>Returns the transit route element identifier.</p>
<p><code>public java.util.List &lt;<i>GeoCoordinate</i>&gt; <a href="#">getLineGeometry</a> ()</code></p> <p>Gets the geometry of only the line part of the <i>TransitRouteElement</i>, excluding any positions of entrances.</p>
<p><code>public String <a href="#">getLineName</a> ()</code></p> <p>Gets the line name for the <i>TransitRouteElement</i>.</p>
<p><code>public <i>TransitLineStyle</i> <a href="#">getLineStyle</a> ()</code></p> <p>Gets the <i>TransitManeuver.TransitLineStyle</i> that is typical of the way in which <i>TransitRouteElement</i> lines are drawn on maps of the local operator.</p>
<p><code>public int <a href="#">getPrimaryLineColor</a> ()</code></p> <p>Gets the primary color of the <i>TransitRouteElement</i> in the local public transit operator's color scheme.</p>
<p><code>public int <a href="#">getSecondaryLineColor</a> ()</code></p> <p>Gets the secondary color of the <i>TransitRouteElement</i> in the local public transit operator's color scheme.</p>
<p><code>public <i>Image</i> <a href="#">getSystemAccessLogo</a> ()</code></p> <p>Gets the transit system access logo if available, otherwise returns an invalid image.</p>

## Methods

```
public String getSystemInformalName ()
```

Gets the informal name of the system operating the *TransitRouteElement*.

```
public Image getSystemLogo ()
```

Gets the transit system logo if available, otherwise returns an invalid image.

```
public String getSystemOfficialName ()
```

Gets the name of the system operating the *TransitRouteElement*.

```
public String getSystemShortName ()
```

Gets the name, in a shorter or abbreviated version if available, of the system operating the *TransitRouteElement*.

```
public TransitType getTransitType ()
```

Gets the *TransitType* of the transit system offering service for the *TransitRouteElement*.

```
public String getTransitTypeName ()
```

Gets the transit type of the transit system offering service for the *TransitRouteElement*, as a *String* in the transit operator's local vocabulary.

```
public int getVehicleTravelTime ()
```

Gets the vehicle travel time.

```
public boolean hasPrimaryLineColor ()
```

Returns whether element's primary line color is available.

```
public boolean hasSecondaryLineColor ()
```

Returns whether element's secondary line color is available.

## Class Details

Represents an element within a transit-specific *Route*.

### See also:

[Route](#)

[getTransitElement\(\)](#)

[getTransitRouteElements\(\)](#)

## Method Details

```
public TransitRouteStop getArrivalStop ()
```

Gets the arrival station.

### Returns:

arrival station

### See also:

[TransitRouteStop](#)

```
public Date getArrivalTime ()
```

Gets time of arrival at the station for the *TransitRouteElement*.

Note: If no departure time was set for the *RouteOptions* associated with this *TransitRouteElement*, than the time is relative to the system time when the route calculation took place. Otherwise, the times are relative to the specified departure time.

**Returns:**

The arrival time, or null if unavailable

**See also:**

[setTime\(Date, TimeType\)](#)

```
public TransitRouteStop getDepartureStop ()
```

Gets the departure station.

**Returns:**

departure station

**See also:**

[TransitRouteStop](#)

```
public Date getDepartureTime ()
```

Gets the time of departure from the station for the *TransitRouteElement*.

Note: If no departure time was set for the *RouteOptions* associated with this *TransitRouteElement*, than the time is relative to the system time when the route calculation took place. Otherwise, the times are relative to the specified departure time.

**Returns:**

The departure time, or null if unavailable

**See also:**

[setTime\(Date, TimeType\)](#)

```
public String getDestination ()
```

Gets the destination name for the *TransitRouteElement*.

**Returns:**

The destination name

```
public int getDuration ()
```

Gets the total duration. Unit is seconds.

**Note:** when calculating transportation travel times for display to the user, this is generally the value to be used.

**Returns:**

total duration in seconds

**See also:**

[getVehicleTravelTime\(\)](#)

```
public java.util.List <GeoCoordinate> getGeometry ()
```

Gets the geometry of the [TransitRouteElement](#). The geometry includes the line part of a [TransitRouteElement](#) , plus positions of entrances.

**Returns:**

A List of [GeoCoordinate](#) objects

**See also:**

[getLineGeometry\(\)](#)

```
public Identifier getId ()
```

Returns the transit route element identifier. [TransitRouteElement](#). The id can be used to highlight the transit line on a transit route.

**Returns:**

the unique *object identifier*.

**See also:**

[highlightTransitLines\(List<Identifier>\)](#)

```
public java.util.List <GeoCoordinate> getLineGeometry ()
```

Gets the geometry of only the line part of the [TransitRouteElement](#), excluding any positions of entrances.

**Returns:**

A List of [GeoCoordinate](#) objects

**See also:**

[getGeometry\(\)](#)

```
public String getLineName ()
```

Gets the line name for the [TransitRouteElement](#).

**Returns:**

The line name

```
public TransitLineStyle getLineStyle ()
```

Gets the *TransitManeuver.TransitLineStyle* that is typical of the way in which *TransitRouteElement* lines are drawn on maps of the local operator.

**Returns:**

The *TransitLineStyle*

```
public int getPrimaryLineColor ()
```

Gets the primary color of the *TransitRouteElement* in the local public transit operator's color scheme.

**Returns:**

The ARGB integer color value. The packed integer is made up of 4 bytes: alpha, red, green, blue. Each color component has a value range from [0..255] with 0 meaning no contribution for that component, and 255 meaning 100% contribution

**See also:**

[getPrimaryLineColor\(\)](#)

```
public int getSecondaryLineColor ()
```

Gets the secondary color of the *TransitRouteElement* in the local public transit operator's color scheme.

**Returns:**

The ARGB integer color value. The packed integer is made up of 4 bytes: alpha, red, green, blue. Each color component has a value range from [0..255] with 0 meaning no contribution for that component, and 255 meaning 100% contribution

**See also:**

[getSecondaryLineColor\(\)](#)

```
public Image getSystemAccessLogo ()
```

Gets the transit system access logo if available, otherwise returns an invalid image.

**Returns:**

An *Image* representing the transit system access logo

**See also:**

[getSystemLogo\(\)](#)

```
public String getSystemInformalName ()
```

Gets the informal name of the system operating the *TransitRouteElement*. if available

**Returns:**

The informal transit system name, e.g. "SMGN".

**See also:**

[getSystemInformalName\(\)](#)

```
public Image getSystemLogo ()
```

Gets the transit system logo if available, otherwise returns an invalid image.

**Returns:**

An *Image*, including letters next to it, representing the transit system logo

**See also:**

[getSystemAccessLogo\(\)](#)

```
public String getSystemOfficialName ()
```

Gets the name of the system operating the *TransitRouteElement*.

**Returns:**

The transit system name

**See also:**

[getSystemOfficialName\(\)](#)

```
public String getSystemShortName ()
```

Gets the name, in a shorter or abbreviated version if available, of the system operating the *TransitRouteElement*.

**Returns:**

The transit system name in shortened form

**See also:**

[getSystemShortName\(\)](#)

```
public TransitType getTransitType ()
```

Gets the *TransitType* of the transit system offering service for the *TransitRouteElement*.

**Returns:**

The *TransitType*

```
public String getTransitTypeName ()
```

Gets the transit type of the transit system offering service for the *TransitRouteElement*, as a `String` in the transit operator's local vocabulary.

**Returns:**

The transit type name

**See also:**

[getTransitType\(\)](#)

```
public int getVehicleTravelTime ()
```

Gets the vehicle travel time. Unit is seconds.

**Note:** Generally, when calculating transportation travel times for display to the user, use the value given by [getDuration\(\)](#) instead.

**Returns:**

vehicle travel time in seconds

**See also:**

[getDuration\(\)](#)

```
public boolean hasPrimaryLineColor ()
```

Returns whether element's primary line color is available.

**Returns:**

true if color is available, false - otherwise

```
public boolean hasSecondaryLineColor ()
```

Returns whether element's secondary line color is available.

**Returns:**

true if color is available, false - otherwise

## TransitRouteSourceAttribution

The class *TransitRouteSourceAttribution* is a member of `com.here.android.mpa.routing` .

### Class Summary

```
public class TransitRouteSourceAttribution
```

*extends java.lang.Object*

This class contains copyright notices that must be displayed to the end user.

[For complete information, see the section [Class Details](#)]

**See also:**

[Route](#)

[getTransitRouteSourceAttribution\(\)](#)

## Method Summary

**Table 1057: Methods in TransitRouteSourceAttribution**

Methods
public String <a href="#">getAttribution</a> () Gets the source attribution information as a html formatted string.
public java.util.List < <a href="#">TransitRouteSupplier</a> > <a href="#">getSuppliers</a> () Gets the structured information about source data suppliers

## Class Details

This class contains copyright notices that must be displayed to the end user. Source attribution must be displayed together with a route. This requirement forms part of the terms and conditions of the API.

**See also:**

[Route](#)

[getTransitRouteSourceAttribution\(\)](#)

## Method Details

**public String [getAttribution](#) ()**

Gets the source attribution information as a html formatted string. The code snippet below demonstrates how to display the string in an Android TextView

```
TextView textView = (TextView)
findViewById(R.id.attributionText);textView.setText(Html.fromHtml(route.getTransitRouteSourceAttribution().getA
```

**Returns:**

Html formatted attribution string

**public java.util.List <[TransitRouteSupplier](#)> [getSuppliers](#) ()**

Gets the structured information about source data suppliers

**Returns:**

List of transit route suppliers

## TransitRouteStop

The class *TransitRouteStop* is a member of *com.here.android.mpa.routing*.

### Class Summary

public final class **TransitRouteStop**

*extends java.lang.Object*

This is a public transit stop within a calculated transit *Route*.

[For complete information, see the section *Class Details*]

**See also:**

*TransitManeuver*

### Nested Class Summary

Table 1058: Nested Classes in TransitRouteStop

Nested Classes
public static final enumeration <i>TransitRouteStop.Attribute</i> Represents values describing different attributes for a <i>TransitRouteStop</i> .

### Method Summary

Table 1059: Methods in TransitRouteStop

Methods
public java.util.EnumSet < <i>Attribute</i> > <i>getAttributes</i> () Gets the <i>TransitRouteStop.Attribute</i> values for the <i>TransitRouteStop</i> .
public <i>GeoCoordinate</i> <i>getCoordinate</i> () Gets the <i>GeoCoordinate</i> of the <i>TransitRouteStop</i> .
public <i>GeoCoordinate</i> <i>getEgressCoordinate</i> () Gets the <i>GeoCoordinate</i> representing the coordinates of the entry/exit for the <i>TransitRouteStop</i> .
public <i>Identifier</i> <i>getId</i> () Gets the <i>Identifier</i> of the <i>TransitRouteStop</i> .
public String <i>getName</i> () Gets the name for the <i>TransitRouteStop</i> .
public <i>GeoCoordinate</i> <i>getPlatformCoordinate</i> () Gets the <i>GeoCoordinate</i> representing the coordinates of the platform for the <i>TransitRouteStop</i> .

## Methods

```
public int getPlatformLevel ()
```

Gets the platform level for the `TransitRouteStop`, where 0 represents the ground level, -1 the first underground level, 1 the first elevated level, and so on.

## Class Details

This is a public transit stop within a calculated transit *Route*.

**See also:**

*TransitManeuver*

## Method Details

```
public java.util.EnumSet <Attribute> getAttributes ()
```

Gets the *TransitRouteStop.Attribute* values for the `TransitRouteStop`.

**Returns:**

The set of *TransitRouteStop.Attribute* values

```
public GeoCoordinate getCoordinate ()
```

Gets the *GeoCoordinate* of the `TransitRouteStop`.

**Returns:**

The *GeoCoordinate*

```
public GeoCoordinate getEgressCoordinate ()
```

Gets the *GeoCoordinate* representing the coordinates of the entry/exit for the `TransitRouteStop`.

Note: this method might return the same coordinates as the platform coordinates whenever:

- the stop is part of a platform-to-platform change
- there is no differentiation between platform and entrance (e.g. typical public bus stops along a street)

**Returns:**

The *GeoCoordinate*

**See also:**

*getPlatformCoordinate()*

```
public Identifier getId ()
```

Gets the *Identifier* of the `TransitRouteStop`. *Identifier* is not supported for public transport timetable route stops

**Returns:**

The *Identifier*

```
public String getName ()
```

Gets the name for the `TransitRouteStop` .

**Returns:**

name

```
public GeoCoordinate getPlatformCoordinate ()
```

Gets the `GeoCoordinate` representing the coordinates of the platform for the `TransitRouteStop` .

**Returns:**

The `GeoCoordinate`

**See also:**

[getEgressCoordinate\(\)](#)

```
public int getPlatformLevel ()
```

Gets the platform level for the `TransitRouteStop` , where 0 represents the ground level, -1 the first underground level, 1 the first elevated level, and so on.

**Returns:**

The platform level

## Attribute

The enumeration `Attribute` is a member of `com.here.android.mpa.routing.TransitRouteStop`.

### Enumeration Summary

```
public static final enumeration TransitRouteStop.Attribute
```

```
extends java.lang.Enum, java.lang.Object
```

Represents values describing different attributes for a `TransitRouteStop`.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 1060: Enum Constants in Attribute

Fields
<pre>public static final <i>Attribute</i> ELEVATOR</pre> <p>The stop features an elevator.</p>
<pre>public static final <i>Attribute</i> ESCALATOR</pre> <p>The stop features an escalator.</p>
<pre>public static final <i>Attribute</i> STAIRS</pre> <p>The stop features a set of stairs.</p>

## Method Summary

Table 1061: Methods in Attribute

Methods
<pre>public int <i>value</i> ()</pre>
<pre>public static <i>Attribute</i> <i>valueOf</i> (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>TransitRouteStop.Attribute</i>[] <i>values</i> ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Represents values describing different attributes for a *TransitRouteStop*.

### Enum Constant Details

```
public static final Attribute ELEVATOR
```

The stop features an elevator.

```
public static final Attribute ESCALATOR
```

The stop features an escalator.

```
public static final Attribute STAIRS
```

The stop features a set of stairs.

## Method Details

```
public int value ()
```

```
public static Attribute valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static TransitRouteStop.Attribute[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## TransitRouteSupplier

The class *TransitRouteSupplier* is a member of *com.here.android.mpa.routing* .

### Class Summary

```
public class TransitRouteSupplier
```

```
extends java.lang.Object
```

This class contains structured information about a source data supplier.

[For complete information, see the section *Class Details*]

### See also:

*Route*

*getTransitRouteSourceAttribution()*

*getSuppliers()*

### Method Summary

Table 1062: Methods in TransitRouteSupplier

Methods
<pre>public java.util.List &lt;<i>TransitRouteSupplierNote</i>&gt; <i>getNotes</i> ()</pre> <p>Gets the notes giving additional information about the supplier This information has to be displayed to the user</p>
<pre>public String <i>getTitle</i> ()</pre> <p>Gets the source data supplier's title</p>

## Methods

```
public String getUrl ()
```

Gets the link to the source data supplier's website

## Class Details

This class contains structured information about a source data supplier. This additional information about data supplier has to be exposed in the client application

### See also:

[Route](#)

[getTransitRouteSourceAttribution\(\)](#)

[getSuppliers\(\)](#)

## Method Details

```
public java.util.List <TransitRouteSupplierNote> getNotes ()
```

Gets the notes giving additional information about the supplier This information has to be displayed to the user

### Returns:

An array of [TransitRouteSupplierNote](#) objects

```
public String getTitle ()
```

Gets the source data supplier's title

### Returns:

String representing the supplier title

```
public String getUrl ()
```

Gets the link to the source data supplier's website

### Returns:

Supplier's website

## TransitRouteSupplierNote

The class [TransitRouteSupplierNote](#) is a member of [com.here.android.mpa.routing](#).

## Class Summary

public class **TransitRouteSupplierNote**

*extends java.lang.Object*

This class contains giving additional information about the supplier.

[For complete information, see the section [Class Details](#)]

**See also:**

[Route](#)

[getTransitRouteSourceAttribution\(\)](#)

[getSuppliers\(\)](#)

[getNotes\(\)](#)

## Method Summary

Table 1063: Methods in TransitRouteSupplierNote

Methods
<pre>public String <a href="#">getText</a> ()</pre> <p>Gets the note text.The text may contain HTML text and markup, including hyperlink elements.</p>
<pre>public String <a href="#">getType</a> ()</pre> <p>Gets the type of source supplier note</p>
<pre>public String <a href="#">getUrl</a> ()</pre> <p>Gets the URL, to which note is referring, if any</p>
<pre>public String <a href="#">getUrlText</a> ()</pre> <p>Gets the text, displayed with URL, to which note is referring, if any.</p>

## Class Details

This class contains giving additional information about the supplier. This additional information about data supplier has to be exposed in the client application

**See also:**

[Route](#)

[getTransitRouteSourceAttribution\(\)](#)

[getSuppliers\(\)](#)

[getNotes\(\)](#)

## Method Details

```
public String getText ()
```

Gets the note text. The text may contain HTML text and markup, including hyperlink elements. The text will be localized. The code snippet below demonstrates how to display the string in an Android TextView

```
TextView textView = (TextView) findViewById(R.id.noteText);
textView.setText(Html.fromHtml(note.getText()));
textView.setMovementMethod(LinkMovementMethod.getInstance());
```

**Returns:**

Note text

## public String **getType** ()

Gets the type of source supplier note

**Returns:**

Supplier note type

## public String **getUrl** ()

Gets the URL, to which note is referring, if any

**Returns:**

Note url

## public String **getUrlText** ()

Gets the text, displayed with URL, to which note is referring, if any.

**Returns:**

Url text

## UMCalculateResult

The class *UMCalculateResult* is a member of [com.here.android.mpa.routing](#) .

### Class Summary

```
public class UMCalculateResult
```

```
extends java.lang.Object
```

Represents result of Urban Mobility route calculation.

[For complete information, see the section [Class Details](#)]

## Nested Class Summary

Table 1064: Nested Classes in `UMCalculateResult`

Nested Classes
<p>public static final enumeration <code>UMCalculateResult.ViolatedOption</code></p> <p>These are options which might not be taken into account when calculating the <code>UMCalculateResult</code>.</p>

## Method Summary

Table 1065: Methods in `UMCalculateResult`

Methods
<p>public java.util.Collection <code>&lt;Alert&gt; getAlerts ()</code></p> <p>Get alerts and disruptions associated with found connections.</p>
<p>public <code>ErrorCode</code> <code>getError ()</code></p> <p>Gets error code.</p>
<p>public String <code>getErrorMessage ()</code></p> <p>Gets error message string.</p>
<p>public java.util.Collection <code>&lt;Link&gt; getOperatorDisclaimers ()</code></p> <p>Gets collection of associated operator disclaimer <code>Links</code>.</p>
<p>public java.util.Collection <code>&lt;Operator&gt; getOperators ()</code></p> <p>Get the operators serving the found connections.</p>
<p>public java.util.List <code>&lt;UMRouteResult&gt; getResults ()</code></p> <p>Gets list of <code>UMRouteResult</code>.</p>
<p>public java.util.EnumSet <code>&lt;ViolatedOption&gt; getViolatedOptions ()</code></p> <p>Gets the violated options.</p>
<p>public boolean <code>isSubsequentRouteSupported ()</code></p> <p>Indicates if it's possible to calculate subsequent route for given result.</p>

## Class Details

Represents result of Urban Mobility route calculation.

## Method Details

public java.util.Collection `<Alert> getAlerts ()`

Get alerts and disruptions associated with found connections.

### Returns:

A Collection of `Alerts`.

```
public ErrorCode getError ()
```

Gets error code.

**Returns:**

A *ErrorCode* indicating the routing error.

```
public String getErrorMessage ()
```

Gets error message string.

**Returns:**

Error message, empty string or null.

```
public java.util.Collection <Link> getOperatorDisclaimers ()
```

Gets collection of associated operator disclaimer *Links*.

**Returns:**

collection of *Links*

```
public java.util.Collection <Operator> getOperators ()
```

Get the operators serving the found connections.

**Returns:**

A Collection of *Operators*.

```
public java.util.List <UMRouteResult> getResults ()
```

Gets list of *UMRouteResult*. In the case of *VIOLATES\_OPTIONS*, one or more *RouteResult* in the returned list contains a list of violated *RouteOptions*.

**Returns:**

A List of *UMRouteResult*.

```
public java.util.EnumSet <ViolatedOption> getViolatedOptions ()
```

Gets the violated options.

**Returns:**

Set of *UMCalculateResult.ViolatedOptions*, or empty set if no options violated.

```
public boolean isSubsequentRouteSupported ()
```

Indicates if it's possible to calculate subsequent route for given result.

**Returns:**

True if result can be used to calculate subsequent routes, false otherwise.

**See also:**

[calculateSubsequentRoute\(UMCalculateResult, SubsequentRouteType, int, Listener<UMCalculateResult, ErrorCode>\)](#)

## ViolatedOption

The enumeration *ViolatedOption* is a member of *com.here.android.mpa.routing.UMCalculateResult*.

### Enumeration Summary

public static final enumeration **UMCalculateResult.ViolatedOption**

extends *java.lang.Enum*, *java.lang.Object*

These are options which might not be taken into account when calculating the *UMCalculateResult*.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 1066: Enum Constants in *ViolatedOption*

Fields
<pre>public static final <i>ViolatedOption</i> <b>MAXIMUM_WALKING_DISTANCE</b></pre> <p>Indicates if setting maximum walking distance was considered.</p>
<pre>public static final <i>ViolatedOption</i> <b>WALKING_SPEED</b></pre> <p>Indicates if setting walking speed was considered.</p>
<pre>public static final <i>ViolatedOption</i> <b>MAXIMUM_CHANGES_COUNT</b></pre> <p>Indicates if setting maximum number of changes was considered.</p>
<pre>public static final <i>ViolatedOption</i> <b>RESTRICT_TRANSIT_TYPES</b></pre> <p>Indicates if restricting the <i>TransitType</i> was considered.</p>
<pre>public static final <i>ViolatedOption</i> <b>ESTIMATED_ROUTING</b></pre> <p>Indicates if response contains only estimated routing data, due to license limitation.</p>

## Method Summary

Table 1067: Methods in `ViolatedOption`

Methods
<pre>public static <i>ViolatedOption</i> valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>UMCalculateResult.ViolatedOption[]</i> values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

These are options which might not be taken into account when calculating the *UMCalculateResult*. In other words, route calculations may give results that violate the following options. Usually it depends on particular regions/countries. By default all options are considered to be supported.

### Enum Constant Details

```
public static final ViolatedOption MAXIMUM_WALKING_DISTANCE
```

Indicates if setting maximum walking distance was considered.

```
public static final ViolatedOption WALKING_SPEED
```

Indicates if setting walking speed was considered.

```
public static final ViolatedOption MAXIMUM_CHANGES_COUNT
```

Indicates if setting maximum number of changes was considered.

```
public static final ViolatedOption RESTRICT_TRANSIT_TYPES
```

Indicates if restricting the *TransitType* was considered.

```
public static final ViolatedOption ESTIMATED_ROUTING
```

Indicates if response contains only estimated routing data, due to license limitation.

## Method Details

```
public static ViolatedOption valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

**Parameters:**

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static UMCalculateResult.ViolatedOption[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## UMRoute

The class *UMRoute* is a member of *com.here.android.mpa.routing* .

### Class Summary

```
public final class UMRoute
```

```
extends com.here.android.mpa.routing.Route, java.lang.Object
```

Route extension with Urban Mobility specifics like ticketing information or real-time data.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 1068: Methods in *UMRoute*

#### Methods

```
public Arrival getArrival ()
```

Get information about this route's arrival.

```
public int getChangesCount ()
```

Get number of public transport changes (transfers) to make along this route.

```
public Departure getDeparture ()
```

Get information about this route's departure.

```
public long getDuration ()
```

Get the expected duration of this route in seconds.

```
public String getId ()
```

Get route ID which is unique within same *UMCalculateResult*.

```
public java.util.List <Maneuver> getManeuvers ()
```

Returns an empty list in an Urban Mobility route calculation.

```
public java.util.List <RouteSection> getSections ()
```

Get List of *RouteSection* objects which represent parts of this route with different means of transit.

```
public java.util.List <Tariff> getTariffs ()
```

Get List of *Tariff* objects each of which represent a different collection/alternative of *Fares* to cover this route.

## Class Details

Route extension with Urban Mobility specifics like ticketing information or real-time data. Represents a single route/connection within *UMRouteResult*.

IMPORTANT: Urban Mobility routing is a Beta feature. The related classes are subject to change without notice.

## Method Details

```
public Arrival getArrival ()
```

Get information about this route's arrival. See *Arrival* for details.

**Returns:**

information about arrival

```
public int getChangesCount ()
```

Get number of public transport changes (transfers) to make along this route.

**Returns:**

number of changes, or -1 if not available

```
public Departure getDeparture ()
```

Get information about this route's departure. See *Departure* for details.

**Returns:**

information about departure

```
public long getDuration ()
```

Get the expected duration of this route in seconds.

**Returns:**

duration in seconds, or -1 if not available

```
public String getId ()
```

Get route ID which is unique within same *UMCalculateResult*.

**Returns:**

route ID, or null if not available

```
public java.util.List <Maneuver> getManeuvers ()
```

Returns an empty list in an Urban Mobility route calculation. Use [getManeuvers\(\)](#) instead.

```
public java.util.List <RouteSection> getSections ()
```

Get List of [RouteSection](#) objects which represent parts of this route with different means of transit.

**Returns:**

list of route sections

```
public java.util.List <Tariff> getTariffs ()
```

Get List of [Tariff](#) objects each of which represent a different collection/alternative of [Fares](#) to cover this route.

**Returns:**

list of alternative tariffs

## UMRouteOptions

The class [UMRouteOptions](#) is a member of [com.here.android.mpa.routing](#) .

### Class Summary

```
public class UMRouteOptions
```

extends [com.here.android.mpa.routing.RouteOptions](#), [java.lang.Object](#)

The class contains Urban Mobility specific options for route calculation.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 1069: Nested Classes in [UMRouteOptions](#)

Nested Classes
<pre>public static final enumeration <a href="#">UMRouteOptions.FilteringProfile</a></pre> <p>Specifies which filtering profile to use.</p>

### Constructor Summary

Table 1070: Constructors in [UMRouteOptions](#)

Constructors
<pre><a href="#">UMRouteOptions</a> ()</pre> <p>Public Constructor</p>

**Constructors***UMRouteOptions* (*RouteOptions* other)

Copy Constructor

*UMRouteOptions* (*UMRouteOptions* other)

Copy Constructor

**Method Summary**Table 1071: Methods in *UMRouteOptions***Methods**public boolean *equals* (Object obj)public int *getTransitWalkMaxDistance* ()

Gets maximum allowed walk distance in meters or -1 if not set.

public int *hashCode* ()public boolean *isStrictRouteCountEnabled* ()

Checks whether specified route count is strict.

public *UMRouteOptions* *setStrictRouteCountEnabled* (boolean value)

Sets whether specified route count is strict.

public *UMRouteOptions* *setTransitWalkMaxDistance* (int value)

Sets maximum allowed walk distance in meters.

public String *toString* ()**Class Details**

The class contains Urban Mobility specific options for route calculation.

IMPORTANT: Urban Mobility routing is a Beta feature. The related classes are subject to change without notice.

**Constructor Details*****UMRouteOptions* ()**

Public Constructor

***UMRouteOptions* (*RouteOptions* other)**

Copy Constructor

**Parameters:**

- **other**  
options to copy from.

## UMRouteOptions (*UMRouteOptions* other)

Copy Constructor

### Parameters:

- **other**  
options to copy from.

## Method Details

```
public boolean equals (Object obj)
```

### Parameters:

- **obj**

```
public int getTransitWalkMaxDistance ()
```

Gets maximum allowed walk distance in meters or -1 if not set.

### Returns:

maximum allowed walk distance in meters, or -1 if not set

```
public int hashCode ()
```

```
public boolean isStrictRouteCountEnabled ()
```

Checks whether specified route count is strict. The default is false.

### Returns:

true if strict otherwise false

```
public UMRouteOptions setStrictRouteCountEnabled (boolean value)
```

Sets whether specified route count is strict. If route count is strict then result contains specified number of routes or less; otherwise, the number of routes returned is not guaranteed. The default is false. NOTE: Do not enable strict route count if you plan to use subsequent route requests.

**Parameters:**

- **value**  
true if strict otherwise false.

**Returns:**

The modified `UMRouteOptions` itself.

```
public UMRouteOptions setTransitWalkMaxDistance (int value)
```

Sets maximum allowed walk distance in meters. Allowed range is [0, 6000], or -1 to use default value. Using unsupported value will result error response in route calculation. The default is 2000.

**Parameters:**

- **value**  
maximum allowed walk distance in meters

**Returns:**

The modified `UMRouteOptions` itself.

```
public String toString ()
```

## FilteringProfile

The enumeration *FilteringProfile* is a member of *com.here.android.mpa.routing.UMRouteOptions*.

### Enumeration Summary

```
public static final enumeration UMRouteOptions.FilteringProfile
```

```
extends java.lang.Enum, java.lang.Object
```

Specifies which filtering profile to use.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 1072: Enum Constants in FilteringProfile

Fields
<pre>public static final FilteringProfile DEFAULT</pre> <p>All transports and operators are allowed by default.</p>
<pre>public static final FilteringProfile RESTRICTED</pre> <p>All transports and operators are disabled except for ones explicitly allowed in request.</p>

## Method Summary

Table 1073: Methods in FilteringProfile

Methods
<pre>public static FilteringProfile valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static UMRouteOptions.FilteringProfile[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Specifies which filtering profile to use.

## Enum Constant Details

```
public static final FilteringProfile DEFAULT
```

All transports and operators are allowed by default.

```
public static final FilteringProfile RESTRICTED
```

All transports and operators are disabled except for ones explicitly allowed in request. Supported only by Smart Mobility API.

## Method Details

```
public static FilteringProfile valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static UMRouteOptions.FilteringProfile[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## UMRouteResult

The class *UMRouteResult* is a member of *com.here.android.mpa.routing*.

### Class Summary

```
public final class UMRouteResult
```

```
extends com.here.android.mpa.routing.RouteResult, java.lang.Object
```

Route result extension with Urban Mobility specifics.

[For complete information, see the section *Class Details*]

### Method Summary

Table 1074: Methods in *UMRouteResult*

Methods
<pre>public <i>UMRoute</i> <b>getUMRoute</b> ()</pre>
Returns the <i>UMRoute</i> in the <i>UMRouteResult</i> if available.

### Class Details

Route result extension with Urban Mobility specifics.

IMPORTANT: Urban Mobility routing is a Beta feature. The related classes are subject to change without notice.

### Method Details

```
public UMRoute getUMRoute ()
```

Returns the *UMRoute* in the *UMRouteResult* if available. In other words *UMRoute* is available if result represents online calculations. If instance represents offline fallback result, this method returns null (Use *getRoute()* instead then).

#### Returns:

The *UMRoute*, or null if not available.

## UMRouter

The class `UMRouter` is a member of `com.here.android.mpa.routing`.

### Class Summary

public final class **UMRouter**

implements `com.here.android.mpa.routing.Router`

extends `java.lang.Object`

Urban Mobility-specific route calculation executor.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 1075: Nested Classes in UMRouter

Nested Classes
public static abstract interface <code>UMRouter.Listener</code> Represents a listener to provide information about route calculation events.
public static final enumeration <code>UMRouter.SubsequentRouteType</code> Defines if earlier or later routes should be requested.

### Constructor Summary

Table 1076: Constructors in UMRouter

Constructors
<code>UMRouter ()</code> Default constructor.

### Method Summary

Table 1077: Methods in UMRouter

Methods
public void <code>calculateParkAndRideRoute</code> ( <code>RoutePlan</code> routePlan, <code>Listener&lt;UMCalculateResult, ErrorCode&gt;</code> listener)
public void <code>calculateRoute</code> ( <code>RoutePlan</code> routePlan, <code>Listener&lt;UMCalculateResult, ErrorCode&gt;</code> listener) Invokes an asynchronous route calculation.
public void <code>calculateSubsequentRoute</code> ( <code>UMCalculateResult</code> result, <code>SubsequentRouteType</code> type, int routeCount, <code>Listener&lt;UMCalculateResult, ErrorCode&gt;</code> listener) Invokes subsequent route calculation with respect to given <code>UMCalculateResult</code> .

## Methods

```
public void cancel ()
```

```
public boolean isBusy ()
```

## Class Details

Urban Mobility-specific route calculation executor. Defines Urban Mobility specific calculation methods and response listener.

Urban Mobility provides Inter-modal and Multi-modal routes including Public Transit.

To use this feature, your application must include the google-gson library (release 2.2.4 or a compatible version) on its class path. This library can be downloaded from the google-gson project website at <http://code.google.com/p/google-gson/>. Attempting to use this feature without adding this library will cause *INVALID\_OPERATION*.

IMPORTANT: Urban Mobility routing is a Beta feature. The related classes are subject to change without notice.

## Constructor Details

### UMRouter ()

Default constructor. Multiple *UMRouter* s can be created to calculate multiple routes in parallel.

## Method Details

```
public void calculateParkAndRideRoute (RoutePlan routePlan,  
Listener<UMCalculateResult, ErrorCode> listener)
```

Parameters:

- *routePlan*
- *listener*

```
public void calculateRoute (RoutePlan routePlan, Listener<UMCalculateResult,  
ErrorCode> listener)
```

Invokes an asynchronous route calculation. Upon completion of the request, the *Listener* will be invoked regardless if the request is completed successfully or not.

Parameters:

- *routePlan*  
A *RoutePlan* used to calculate the route. NOTE: Urban Mobility supports only 2 waypoints. If *RoutePlan* contains more than 2 waypoints, error *INVALID\_PARAMETERS* is returned.
- *listener*  
A *Listener* for the *UMRouter*

```
public void calculateSubsequentRoute (UMCalculateResult result,  
SubsequentRouteType type, int routeCount, Listener<UMCalculateResult, ErrorCode>  
listener)
```

Invokes subsequent route calculation with respect to given *UMCalculateResult*. Upon completion of the request, the *Listener* will be invoked regardless if the request is completed successfully or not.

The *UMCalculateResult* stores all of the state necessary to perform the subsequent route request (e.g. the *RoutePlan*). No state is stored in the *UMRouter* instance. Therefore it is not required to use the same *UMRouter* instance to perform the initial request and subsequent request. Because of this, it is possible to issue multiple subsequent route requests in parallel by creating multiple instances of *UMRouter*.

NOTE: Do not enable strict route count if you plan to use subsequent route requests. See [setStrictRouteCountEnabled\(boolean\)](#) for more details.

#### Parameters:

- **result**  
*UMCalculateResult* for which subsequent route should be calculated.
- **type**  
Type of subsequent route.
- **routeCount**  
Number of desired route. Given number is just suggestion and the number of route returned is not guaranteed. Allowed range is [1, 6]. Using unsupported value will result error response in route calculation.
- **listener**  
A *Listener* for the *UMRouter*.

```
public void cancel ()
```

```
public boolean isBusy ()
```

## Listener

The interface *Listener* is a member of *com.here.android.mpa.routing.UMRouter*.

### Interface Summary

```
public static abstract interface UMRouter.Listener
```

```
    extends com.here.android.mpa.routing.Router.Listener
```

Represents a listener to provide information about route calculation events.

[For complete information, see the section [Interface Details](#)]

See also:

[calculateRoute\(RoutePlan, Listener<UMCalculateResult, ErrorCode>\)](#)

## Method Summary

Table 1078: Methods in Listener

Methods
<pre>public abstract void <b>onCalculateRouteFinished</b> (<i>UMCalculateResult</i> response, <i>ErrorCode</i> error)</pre> <p>A callback indicating that Urban Mobility route calculation operation has finished.</p>

## Interface Details

Represents a listener to provide information about route calculation events.

See also:

[calculateRoute\(RoutePlan, Listener<UMCalculateResult, ErrorCode>\)](#)

## Method Details

```
public abstract void onCalculateRouteFinished (UMCalculateResult response, ErrorCode error)
```

A callback indicating that Urban Mobility route calculation operation has finished.

Parameters:

- **response**  
A *UMCalculateResult* contains Urban Mobility specific result and/or errors.
- **error**

## SubsequentRouteType

The enumeration *SubsequentRouteType* is a member of *com.here.android.mpa.routing.UMRouter*.

## Enumeration Summary

```
public static final enumeration UMRouter.SubsequentRouteType
```

```
extends java.lang.Enum, java.lang.Object
```

Defines if earlier or later routes should be requested.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 1079: Enum Constants in `SubsequentRouteType`

Fields
<code>public static final <i>SubsequentRouteType</i> EARLIER</code>
<code>public static final <i>SubsequentRouteType</i> LATER</code>

## Method Summary

Table 1080: Methods in `SubsequentRouteType`

Methods
<code>public static <i>SubsequentRouteType</i> valueOf (String name)</code> This method retrieves the enumeration value that matches the name specified by the caller.
<code>public static <i>UMRouter.SubsequentRouteType</i>[] values ()</code> This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Defines if earlier or later routes should be requested.

## Enum Constant Details

```
public static final SubsequentRouteType EARLIER
```

```
public static final SubsequentRouteType LATER
```

## Method Details

```
public static SubsequentRouteType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- name**  
 A string containing the name of the enumeration member whose value is to be retrieved.

```
public static UMRouter.SubsequentRouteType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## search

---

The package *search* is a member of *com.here.android.mpa*.

### Package Summary

#### search

The search package provides classes for performing places and geocoder searches.

### Package Details

The search package provides classes for performing places and geocoder searches.

- `com.here.android.mpa.search.RequestCreator.Places` provides methods to create new requests to search and explore places near a given position.
- `com.here.android.mpa.search.RequestCreator.Geocoder` provides methods to create new requests to perform address and reverse geocode searches.

The typical steps when perform a search are:

- Implement the `ResultListener` interface to handle the completion of the search
- Create a request using `RequestCreator.Places` or `RequestCreator.Geocoder`
- Start the search by invoking `execute(ResultListener)`
- When the search completes, the data returned in the `ResultListener.onCompleted()` callback is triggered

To use this feature, your application must include the google-gson library (release 2.2.4 or a compatible version) on its class path. This library can be downloaded from the google-gson project website at <http://code.google.com/p/google-gson/>. Attempting to use this feature without adding this library will cause runtime errors.

For more details on performing searches, please consult the "Places" section in the HERE SDK for Android Developer's Guide.

## Address

The class *Address* is a member of *com.here.android.mpa.search* .

### Class Summary

public class **Address**

*extends java.lang.Object*

Provides textual address information for a *Location*.

[For complete information, see the section *Class Details*]

## Constructor Summary

Table 1081: Constructors in Address

Constructors
<b><code>Address ()</code></b> Default constructor.
<b><code>Address (Address other)</code></b> Copy constructor.

## Method Summary

Table 1082: Methods in Address

Methods
<b><code>public void addAdditionalData (String key, String value)</code></b> Adds additional address data, one key-value pair per call.
<b><code>public boolean equals (Object obj)</code></b> For documentation, see <i>java.lang.Object</i>
<b><code>public Map getAdditionalData ()</code></b> Gets additional address data.
<b><code>public String getCity ()</code></b> Gets the current city name for the Address .
<b><code>public String getCountryCode ()</code></b> Gets the current ISO 3166-1 (3-letter) country code for the Address .
<b><code>public String getCountryName ()</code></b> Gets the current country name for the Address .
<b><code>public String getCounty ()</code></b> Gets the current county name for the Address .
<b><code>public String getDistrict ()</code></b> Gets the current district name for the Address .
<b><code>public String getFloorNumber ()</code></b> Gets the current floor number (in a multi-story building) for the Address .
<b><code>public String getHouseNumber ()</code></b> Gets the current house number for the Address .
<b><code>public String getPostalCode ()</code></b> Gets the current postal code for the Address .
<b><code>public String getState ()</code></b> Gets the current state name for the Address .

**Methods**

```
public String getStateCode ()
```

Gets the current state code (state abbreviation) for the Address .

```
public String getStreet ()
```

Gets the current street name for the Address .

```
public String getSuiteNumberOrName ()
```

Gets the current suite number or suite name for the Address .

```
public String getText ()
```

Gets a displayable, formatted rich text for the entire Address .

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public Address setCity (String city)
```

Sets a city name for the Address .

```
public Address setCountryCode (String countryCode)
```

Sets an ISO 3166-1 (3-letter) country code for the Address .

```
public Address setCountryName (String countryName)
```

Sets a country name for the Address .

```
public Address setCounty (String county)
```

Sets a county name for the Address .

```
public Address setDistrict (String district)
```

Sets a district name for the Address .

```
public Address setFloorNumber (String floorNumber)
```

Sets a floor number (in a multi-story building) for the Address .

```
public Address setHouseNumber (String houseNumber)
```

Sets a house number for the Address .

```
public Address setPostalCode (String postalCode)
```

Sets a postal code for the Address .

```
public Address setState (String state)
```

Sets a state name for the Address .

```
public Address setStateCode (String state)
```

Sets a state code (abbreviation) for the Address .

```
public Address setStreet (String street)
```

Sets a street name for the Address .

```
public Address setSuiteNumberOrName (String suiteNumberOrName)
```

Sets a suite number or suite name for the Address .

## Methods

```
public Address setText (String text)
```

Sets text for the Address .

```
public String toString ()
```

For documentation, see *java.lang.Object*

## Class Details

Provides textual address information for a *Location*. The information is divided among fields such as country, street, postal code, and so on.

To retrieve a combined, formatted string of this address, use the `getText()` method.

## Constructor Details

### Address ()

Default constructor.

### Address (*Address* other)

Copy constructor.

#### Parameters:

- **other**  
The other Address to copy.

## Method Details

```
public void addAdditionalData (String key, String value)
```

Adds additional address data, one key-value pair per call.

#### Parameters:

- **key**  
The key for additional data (key-value pair).
- **value**  
The value for additional data (key-value pair).

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

#### Parameters:

- **obj**

```
public Map getAdditionalData ()
```

Gets additional address data.

**Returns:**

The `java.util.Map` of the additional data in key-value notation.

```
public String getCity ()
```

Gets the current city name for the Address .

**Returns:**

The current city name (could be empty)

```
public String getCountryCode ()
```

Gets the current ISO 3166-1 (3-letter) country code for the Address .

**Returns:**

The current country code (could be empty)

```
public String getCountryName ()
```

Gets the current country name for the Address .

**Returns:**

The current country name (could be empty)

```
public String getCounty ()
```

Gets the current county name for the Address .

**Returns:**

The current county name (could be empty)

```
public String getDistrict ()
```

Gets the current district name for the Address .

**Returns:**

The current district name (could be empty)

```
public String getFloorNumber ()
```

Gets the current floor number (in a multi-story building) for the Address .

**Returns:**

The current floor number (could be empty)

```
public String getHouseNumber ()
```

Gets the current house number for the Address .

**Returns:**

The current house number (could be empty)

```
public String getPostalCode ()
```

Gets the current postal code for the Address .

**Returns:**

The current postal code (could be empty)

```
public String getState ()
```

Gets the current state name for the Address .

**Returns:**

The current state name or abbreviation (could be empty)

```
public String getStateCode ()
```

Gets the current state code (state abbreviation) for the Address .

**Returns:**

The current state name or abbreviation (could be empty)

```
public String getStreet ()
```

Gets the current street name for the Address .

**Returns:**

The current street name (could be empty)

```
public String getSuiteNumberOrName ()
```

Gets the current suite number or suite name for the Address .

**Returns:**

The current suite number or name (could be empty)

```
public String getText ()
```

Gets a displayable, formatted rich text for the entire `Address`. For example, "22 Rue du Grenier Saint-Lazare\n75003 Paris\nFrance"

**Returns:**

The current text (could be empty)

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public Address setCity (String city)
```

Sets a city name for the `Address`.

**Parameters:**

- `city`  
Desired city name

**Returns:**

The updated `Address` object itself.

**Throws:**

- `NullPointerException`  
Passed argument is null

```
public Address setCountryCode (String countryCode)
```

Sets an ISO 3166-1 (3-letter) country code for the `Address`.

**Parameters:**

- `countryCode`  
Desired ISO 3166-1 country code

**Returns:**

The updated `Address` object itself.

**Throws:**

- `NullPointerException`  
Passed argument is null
- `IllegalArgumentException`  
Country code is not 3-letters

```
public Address setCountryName (String countryName)
```

Sets a country name for the Address .

**Parameters:**

- **countryName**  
Desired country name

**Returns:**

The updated Address object itself.

**Throws:**

- **NullPointerException**  
Passed argument is null

```
public Address setCounty (String county)
```

Sets a county name for the Address .

**Parameters:**

- **county**  
Desired county name

**Returns:**

The updated Address object itself.

**Throws:**

- **NullPointerException**  
Passed argument is null

```
public Address setDistrict (String district)
```

Sets a district name for the Address .

**Parameters:**

- **district**  
Desired district name

**Returns:**

The updated Address object itself.

**Throws:**

- **NullPointerException**  
Passed argument is null

```
public Address setFloorNumber (String floorNumber)
```

Sets a floor number (in a multi-story building) for the *Address* .

**Parameters:**

- **floorNumber**  
Desired floor number

**Returns:**

The updated *Address* object itself.

**Throws:**

- **NullPointerException**  
Passed argument is null

```
public Address setHouseNumber (String houseNumber)
```

Sets a house number for the *Address* .

**Parameters:**

- **houseNumber**  
Desired house number

**Returns:**

The updated *Address* object itself.

**Throws:**

- **NullPointerException**  
Passed argument is null

```
public Address setPostalCode (String postalCode)
```

Sets a postal code for the *Address* .

**Parameters:**

- **postalCode**  
Desired postal code

**Returns:**

The updated *Address* object itself.

**Throws:**

- **NullPointerException**  
Passed argument is null

```
public Address setState (String state)
```

Sets a state name for the *Address* .

**Parameters:**

- **state**  
Desired state name

**Returns:**

The updated *Address* object itself.

**Throws:**

- **NullPointerException**  
Passed argument is null

```
public Address setStateCode (String state)
```

Sets a state code (abbreviation) for the *Address* .

**Parameters:**

- **state**  
Desired state name or abbreviation

**Returns:**

The updated *Address* object itself.

**Throws:**

- **NullPointerException**  
Passed argument is null

```
public Address setStreet (String street)
```

Sets a street name for the *Address* .

**Parameters:**

- **street**  
Desired street name

**Returns:**

The updated *Address* object itself.

**Throws:**

- **NullPointerException**  
Passed argument is null

```
public Address setSuiteNumberOrName (String suiteNumberOrName)
```

Sets a suite number or suite name for the *Address* .

**Parameters:**

- **suiteNumberOrName**  
Desired suite number or name

**Returns:**

The updated *Address* object itself.

**Throws:**

- **NullPointerException**  
Passed argument is null

```
public Address setText (String text)
```

Sets text for the *Address* .

**Parameters:**

- **text**  
Desired text for the address

**Returns:**

The updated *Address* object itself.

**Throws:**

- **NullPointerException**  
Passed argument is null

```
public String toString ()
```

For documentation, see *java.lang.Object*

## AroundRequest

The class *AroundRequest* is a member of *com.here.android.mpa.search* .

### Class Summary

```
public class AroundRequest
```

```
extends com.here.android.mpa.search.DiscoveryRequest, com.here.android.mpa.search.Request,  
java.lang.Object
```

The `AroundRequest` represents sets of places within a specific location context, usually the location of the user.

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 1083: Constructors in `AroundRequest`

Constructors
<p><code>AroundRequest</code> ()</p> <p>Default constructor.</p>

## Method Summary

Table 1084: Methods in `AroundRequest`

Methods
<p>public <code>ErrorCode</code> <code>execute</code> (<code>ResultListener&lt;DiscoveryResultPage&gt;</code> listener)</p> <p>Executes an asynchronous request.</p>
<p>public <code>AroundRequest</code> <code>setCategoryFilter</code> (<code>CategoryFilter</code> filter)</p> <p>Sets a search filter based on categories.</p>
<p>public <code>AroundRequest</code> <code>setSearchArea</code> (<code>GeoCoordinate</code> center, <code>int</code> radius)</p> <p>Sets the search area using a center location and radius.</p>
<p>public <code>AroundRequest</code> <code>setSearchArea</code> (<code>GeoBoundingBox</code> boundingArea)</p> <p>Sets the search area using a <code>GeoBoundingBox</code> .</p>
<p>public <code>AroundRequest</code> <code>setSearchCenter</code> (<code>GeoCoordinate</code> center)</p> <p>Sets the search center.</p>

## Class Details

The `AroundRequest` represents sets of places within a specific location context, usually the location of the user. This request is intended for applications that employ features such as augmented reality, where places around the user's location are displayed on a device. It is intended to provide places that are likely to be visible to the user as well as important places that are further away.

The `AroundRequest` allows users to request places near to a given location or area. The places around the location context are returned in order of proximity.

A search location context must be provided by setting either a search center using `setSearchCenter(GeoCoordinate)`, a search area using `setSearchArea(GeoCoordinate, int)` or `setSearchArea(GeoBoundingBox)` or a bounding map viewport using `setMapViewport(GeoBoundingBox)`. Failing to set a map viewport will result in an `INVALID_PARAMETER` when executing the request.

## Constructor Details

### `AroundRequest` ()

Default constructor.

A search location context must be provided by setting either a search center using `setSearchCenter(GeoCoordinate)`, a search area using `setSearchArea(GeoCoordinate, int)` or `setSearchArea(GeoBoundingBox)` or a bounding map viewport using `setMapViewport(GeoBoundingBox)`. Failing to set a map viewport will result in an `INVALID_PARAMETER` when executing the request.

## Method Details

```
public ErrorCode execute (ResultListener<DiscoveryResultPage> listener)
```

Executes an asynchronous request.

#### Parameters:

- **listener**  
A `ResultListener` passed along with the request to monitor progress

#### Returns:

The `ErrorCode` representing an appropriate result

```
public AroundRequest setCategoryFilter (CategoryFilter filter)
```

Sets a search filter based on categories.

#### Parameters:

- **filter**  
A `CategoryFilter` representing the category filter. When a `CategoryFilter` is specified, the result items will be limited to the categories defined in the filter.

#### Returns:

The `AroundRequest`.

```
public AroundRequest setSearchArea (GeoCoordinate center, int radius)
```

Sets the search area using a center location and radius.

#### Parameters:

- **center**  
The `GeoCoordinate` representing the search area center location.
- **radius**  
The search area circle radius in meters.

#### Returns:

The `AroundRequest`.

```
public AroundRequest setSearchArea (GeoBoundingBox boundingArea)
```

Sets the search area using a `GeoBoundingBox`.

**Parameters:**

- **boundingArea**  
The `GeoBoundingBox` representing the search area.

**Returns:**

The `AroundRequest`.

```
public AroundRequest setSearchCenter (GeoCoordinate center)
```

Sets the search center.

**Parameters:**

- **center**  
The `GeoCoordinate` representing the location context used to search for nearby places.

**Returns:**

The `AroundRequest`.

## AutoSuggest

The class `AutoSuggest` is a member of `com.here.android.mpa.search`.

### Class Summary

```
public abstract class AutoSuggest
```

```
extends java.lang.Object
```

Represents the base class for suggested places and searches.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 1085: Nested Classes in `AutoSuggest`

#### Nested Classes

```
public static final enumeration AutoSuggest.Type
```

Represents values describing supported `AutoSuggest` types for a text suggestion.

## Method Summary

Table 1086: Methods in AutoSuggest

Methods
<pre>public boolean equals (Object obj)</pre> <p>For documentation, see <i>java.lang.Object</i></p>
<pre>public String getHighlightedTitle ()</pre> <p>Gets the display title for this place, with HTML markup highlighting the parts of the string that were matched.</p>
<pre>public String getTitle ()</pre> <p>Gets the display title for this place.</p>
<pre>public Type getType ()</pre> <p>Gets the specialized AutoSuggest type.</p>
<pre>public int hashCode ()</pre> <p>For documentation, see <i>java.lang.Object</i></p>

## Class Details

Represents the base class for suggested places and searches.

The following specialized types might be available:

- AutoSuggestPlace
- AutoSuggestSearch
- AutoSuggestQuery

## Method Details

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

### Parameters:

- **obj**

```
public String getHighlightedTitle ()
```

Gets the display title for this place, with HTML markup highlighting the parts of the string that were matched.

For example, if the user performs an AutoSuggest search with "Rest", the API will return the following:

- title:Joey Restaurant
- highlightedTitle:Joey **R**estaurant

### Returns:

The hightlightedTitle

```
public String getTitle ()
```

Gets the display title for this place.

**Returns:**

The title

```
public Type getType ()
```

Gets the specialized `AutoSuggest` type.

**Returns:**

The type

```
public int hashCode ()
```

For documentation, see `java.lang.Object`

## Type

The enumeration `Type` is a member of `com.here.android.mpa.search.AutoSuggest`.

### Enumeration Summary

```
public static final enumeration AutoSuggest.Type
```

*extends* `java.lang.Enum`, `java.lang.Object`

Represents values describing supported `AutoSuggest` types for a text suggestion.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 1087: Enum Constants in `Type`

Fields
<pre>public static final Type UNKNOWN</pre> <p>Unknown type.</p>
<pre>public static final Type PLACE</pre> <p>Suggested Place.</p>
<pre>public static final Type SEARCH</pre> <p>Suggested Search.</p>
<pre>public static final Type QUERY</pre> <p>Suggested Query.</p>

## Method Summary

Table 1088: Methods in Type

Methods
<pre>public static <i>Type</i> valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>AutoSuggest.Type</i>[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Represents values describing supported *AutoSuggest* types for a text suggestion.

### Enum Constant Details

```
public static final Type UNKNOWN
```

Unknown type.

```
public static final Type PLACE
```

Suggested Place.

```
public static final Type SEARCH
```

Suggested Search.

```
public static final Type QUERY
```

Suggested Query.

### Method Details

```
public static Type valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static AutoSuggest.Type[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## AutoSuggestPlace

The class *AutoSuggestPlace* is a member of *com.here.android.mpa.search*.

### Class Summary

public class **AutoSuggestPlace**

extends *com.here.android.mpa.search.AutoSuggest*, *java.lang.Object*

Represents an *AutoSuggestPlace* which contains information about a suggested *Place*.

[For complete information, see the section *Class Details*]

### Method Summary

Table 1089: Methods in AutoSuggestPlace

Methods
public boolean <i>equals</i> (Object obj) For documentation, see <i>java.lang.Object</i>
public <i>GeoBoundingBox</i> <i>getBoundingBox</i> () Gets the <i>GeoBoundingBox</i> describing a range of coordinates that correspond to the <i>Place</i> .
public String <i>getCategory</i> () Gets the category for the <i>Place</i> .
public <i>PlaceRequest</i> <i>getPlaceDetailsRequest</i> () Gets the request to retrieve the <i>Place</i> details.
public <i>GeoCoordinate</i> <i>getPosition</i> () Gets the <i>GeoCoordinate</i> representing the geographical position of the <i>Place</i> .
public String <i>getVicinity</i> () Gets the String description for the vicinity of the <i>Place</i> .
public int <i>hashCode</i> () For documentation, see <i>java.lang.Object</i>

### Class Details

Represents an *AutoSuggestPlace* which contains information about a suggested *Place*.

Note: detailed *Place* information is retrieved by way of the *PlaceRequest* returned from a call to the *getPlaceDetailsRequest()* method.

## Method Details

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

### Parameters:

- `obj`

```
public GeoBoundingBox getBoundingBox ()
```

Gets the *GeoBoundingBox* describing a range of coordinates that correspond to the *Place*. Typically, bounding boxes are associated with places such as cities and countries.

Note: bounding box information for a *Place* is optional, so a call to this method could return `null`.

### Returns:

The *GeoBoundingBox* containing the *Place* (could be `null`)

```
public String getCategory ()
```

Gets the category for the *Place*.

As category information for a suggested search is optional, so a call to this method could return an empty string.

### Returns:

The *Category*.

```
public PlaceRequest getPlaceDetailsRequest ()
```

Gets the request to retrieve the *Place* details.

### Returns:

The *PlaceRequest* to retrieve the *Place* details

```
public GeoCoordinate getPosition ()
```

Gets the *GeoCoordinate* representing the geographical position of the *Place*.

### Returns:

The *GeoCoordinate*

```
public String getVicinity ()
```

Gets the `String` description for the vicinity of the [Place](#). Typically, this description is derived from the [Address](#), but could also contain any other description that helps a user understand where the `Place` is located.

Note: vicinity information for a `Place` is optional, so a call to this method could return an empty string.

**Returns:**

The vicinity description (could be empty)

```
public int hashCode ()
```

For documentation, see [java.lang.Object](#)

## AutoSuggestQuery

The class `AutoSuggestQuery` is a member of [com.here.android.mpa.search](#).

### Class Summary

```
public final class AutoSuggestQuery
```

extends [com.here.android.mpa.search.AutoSuggest](#), [java.lang.Object](#)

Represents an [AutoSuggest](#) with suggested completion of the given string

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 1090: Methods in `AutoSuggestQuery`

Methods
<pre>public boolean <a href="#">equals</a> (Object obj)</pre> <p>For documentation, see <a href="#">java.lang.Object</a></p>
<pre>public String <a href="#">getQueryCompletion</a> ()</pre> <p>Gets the completion for the query.</p>
<pre>public <a href="#">TextAutoSuggestionRequest</a> <a href="#">getRequest</a> ()</pre> <p>Gets the request to retrieve the <a href="#">AutoSuggest</a> list.</p>
<pre>public int <a href="#">hashCode</a> ()</pre> <p>For documentation, see <a href="#">java.lang.Object</a></p>

### Class Details

Represents an [AutoSuggest](#) with suggested completion of the given string

Note: List of `AutoSuggest` can be retrieved by call to the [getRequest\(\)](#) method.

## Method Details

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

### Parameters:

- `obj`

```
public String getQueryCompletion ()
```

Gets the completion for the query.

### Returns:

completion

```
public TextAutoSuggestionRequest getRequest ()
```

Gets the request to retrieve the *AutoSuggest* list.

### Returns:

The *TextAutoSuggestionRequest* to retrieve the AutoSuggest list

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## AutoSuggestSearch

The class *AutoSuggestSearch* is a member of *com.here.android.mpa.search* .

### Class Summary

```
public class AutoSuggestSearch
```

```
extends com.here.android.mpa.search.AutoSuggest, java.lang.Object
```

Represents an *AutoSuggestSearch* which contains information about a refined search link.

[For complete information, see the section *Class Details*]

## Method Summary

Table 1091: Methods in `AutoSuggestSearch`

### Methods

```
public boolean equals (Object obj)
```

For documentation, see `java.lang.Object`

```
public GeoBoundingBox getBoundingBox ()
```

Gets the `GeoBoundingBox` describing a range of coordinates that correspond to the `Place`.

```
public String getCategory ()
```

Gets the category for the suggested search.

```
public GeoCoordinate getPosition ()
```

Gets the `GeoCoordinate` representing the geographical position of the suggested search.

```
public DiscoveryRequest getSuggestedSearchRequest ()
```

Gets the request to perform a suggested search.

```
public int hashCode ()
```

For documentation, see `java.lang.Object`

## Class Details

Represents an `AutoSuggestSearch` which contains information about a refined search link.

Note: `DiscoveryResultPage` is retrieved by way of the `DiscoveryRequest` returned from a call to the `getSuggestedSearchRequest()` method.

## Method Details

```
public boolean equals (Object obj)
```

For documentation, see `java.lang.Object`

### Parameters:

- `obj`

```
public GeoBoundingBox getBoundingBox ()
```

Gets the `GeoBoundingBox` describing a range of coordinates that correspond to the `Place`. Typically, bounding boxes are associated with places such as cities and countries.

Note: bounding box information for a suggested search is optional, so a call to this method could return `null`.

### Returns:

The `GeoBoundingBox`

```
public String getCategory ()
```

Gets the category for the suggested search.

As category information for a suggested search is optional, so a call to this method could return an empty string.

**Returns:**

The Category

```
public GeoCoordinate getPosition ()
```

Gets the *GeoCoordinate* representing the geographical position of the suggested search.

Note: position information for a suggested search is optional, so a call to this method could return null .

**Returns:**

The *GeoCoordinate*

```
public DiscoveryRequest getSuggestedSearchRequest ()
```

Gets the request to perform a suggested search.

**Returns:**

The *DiscoveryRequest* to retrieve the *DiscoveryResultPage*

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## Category

The class *Category* is a member of *com.here.android.mpa.search* .

### Class Summary

```
public class Category
```

```
extends java.lang.Object
```

Represents a category with which a *Place* can be associated.

[For complete information, see the section *Class Details*]

## Nested Class Summary

Table 1092: Nested Classes in Category

Nested Classes
public static final enumeration <a href="#">Category.Global</a> Represents a set of fixed category filters on the resources of the Places search service.

## Method Summary

Table 1093: Methods in Category

Methods
public boolean <a href="#">equals</a> (Object obj) For documentation, see <a href="#">java.lang.Object</a>
public String <a href="#">getIconUrl</a> () Gets the URL to retrieve the icon for the Category .
public String <a href="#">getId</a> () Gets the unique identifier for the Category .
public String <a href="#">getName</a> () Gets the localized display name for the Category .
public <a href="#">Category</a> <a href="#">getParent</a> () Gets the parent Category for the Category .
public java.util.List < <a href="#">Category</a> > <a href="#">getSubCategories</a> () Gets the list of subcategories for the Category .
public static java.util.List < <a href="#">Category</a> > <a href="#">globalCategories</a> () Return the localized Global categories for Places search.
public static <a href="#">Category</a> <a href="#">globalCategory</a> ( <a href="#">Global</a> type) Return the localized Global category for Places search.
public int <a href="#">hashCode</a> () For documentation, see <a href="#">java.lang.Object</a>

## Class Details

Represents a category with which a [Place](#) can be associated.

## Method Details

public boolean [equals](#) (Object obj)

For documentation, see [java.lang.Object](#)

Parameters:

- `obj`

```
public String getIconUrl ()
```

Gets the URL to retrieve the icon for the `Category` .

**Returns:**

The icon URL

```
public String getId ()
```

Gets the unique identifier for the `Category` .

**Returns:**

The unique ID

```
public String getName ()
```

Gets the localized display name for the `Category` .

**Returns:**

Localized display name

```
public Category getParent ()
```

Gets the parent `Category` for the `Category` .

Note: The category can already be a parent `Category` , in which case this method would return itself.

**Returns:**

Parent `Category`

```
public java.util.List <Category> getSubCategories ()
```

Gets the list of subcategories for the `Category` .

Note: a `Category` might have no subcategories, in which case this method would return `empty` .

**Returns:**

The list of `Category` objects representing the subcategories (could be `empty`)

```
public static java.util.List <Category> globalCategories ()
```

Return the localized Global categories for Places search. Note: The list of categories is cached. The update request to Places backend is made periodically and when device locale is changed. If there is no cache or cache is being updated, an empty list is returned. User should try again later.

## Returns:

A list of localized global Category instances if available, empty otherwise.

```
public static Category globalCategory (Global type)
```

Return the localized Global category for Places search. Note: The list of categories is cached. The update request to Places backend is made periodically and when device locale is changed. If there is no cache or cache is being updated, an empty list is returned. User should try again later.

## Parameters:

- **type**  
The Global type.

## Returns:

The localized Global Category instances.

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## Global

The enumeration *Global* is a member of *com.here.android.mpa.search.Category*.

### Enumeration Summary

```
public static final enumeration Category.Global
```

```
extends java.lang.Enum, java.lang.Object
```

Represents a set of fixed category filters on the resources of the Places search service.

[For complete information, see the section [Enumeration Details](#)]

### See also:

[globalCategories\(\)](#)

[globalCategory\(Global\)](#)

[add\(Global\)](#)

## Enum Constant Summary

Table 1094: Enum Constants in Global

Fields
<pre>public static final Global ACCOMMODATION</pre> <p>The accommodation category.</p>
<pre>public static final Global ADMINISTRATIVE_AREAS_BUILDINGS</pre> <p>The administrative-areas-buildings category.</p>
<pre>public static final Global BUSINESS_SERVICES</pre> <p>The business-services category.</p>
<pre>public static final Global EAT_DRINK</pre> <p>The eat-drink category.</p>
<pre>public static final Global FACILITIES</pre> <p>The facilities category.</p>
<pre>public static final Global GOING_OUT</pre> <p>The going-out category.</p>
<pre>public static final Global LEISURE_OUTDOOR</pre> <p>The leisure-outdoor category.</p>
<pre>public static final Global NATURAL_GEOGRAPHICAL</pre> <p>The natural-geographical category.</p>
<pre>public static final Global SHOPPING</pre> <p>The shopping category.</p>
<pre>public static final Global SIGHTS_MUSEUMS</pre> <p>The sights-museums category.</p>
<pre>public static final Global TRANSPORT</pre> <p>The transport category.</p>

## Method Summary

Table 1095: Methods in Global

Methods
<pre>public String toString ()</pre> <p>Returns a stringified Category .</p>
<pre>public static Global valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static Category.Global[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Represents a set of fixed category filters on the resources of the Places search service.

**See also:**

[\*globalCategories\(\)\*](#)

[\*globalCategory\(Global\)\*](#)

[\*add\(Global\)\*](#)

## Enum Constant Details

```
public static final Global ACCOMMODATION
```

The accommodation category.

```
public static final Global ADMINISTRATIVE_AREAS_BUILDINGS
```

The administrative-areas-buildings category.

```
public static final Global BUSINESS_SERVICES
```

The business-services category.

```
public static final Global EAT_DRINK
```

The eat-drink category.

```
public static final Global FACILITIES
```

The facilities category.

```
public static final Global GOING_OUT
```

The going-out category.

```
public static final Global LEISURE_OUTDOOR
```

The leisure-outdoor category.

```
public static final Global NATURAL_GEOGRAPHICAL
```

The natural-geographical category.

```
public static final Global SHOPPING
```

The shopping category.

```
public static final Global SIGHTS_MUSEUMS
```

The sights-museums category.

```
public static final Global TRANSPORT
```

The transport category.

## Method Details

```
public String toString ()
```

Returns a stringified Category .

### Returns:

The stringified Category

```
public static Global valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static Category.Global[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## CategoryFilter

The class *CategoryFilter* is a member of [com.here.android.mpa.search](#) .

### Class Summary

```
public class CategoryFilter
```

*extends java.lang.Object*

Represents a filter used when performing a search for popular places within a specific geographic area.

[For complete information, see the section [Class Details](#)]

See also:

[Category](#)

[Category.Global](#)

## Constructor Summary

Table 1096: Constructors in `CategoryFilter`

Constructors
<p><code>CategoryFilter ()</code></p> <p>Default constructor.</p>

## Method Summary

Table 1097: Methods in `CategoryFilter`

Methods
<p>public <code>CategoryFilter add (Global filter)</code></p> <p>Adds a <code>Category.Global</code> to the <code>CategoryFilter</code> .</p>
<p>public <code>CategoryFilter add (Category filter)</code></p> <p>Adds a <code>Category</code> (retrieved from the results of a previous request) to the <code>CategoryFilter</code> .</p>
<p>public <code>CategoryFilter add (String filter)</code></p> <p>Adds a known category to the <code>CategoryFilter</code> as a <code>String</code> .</p>
<p>public boolean <code>equals (Object obj)</code></p> <p>For documentation, see <code>java.lang.Object</code></p>
<p>public int <code>hashCode ()</code></p> <p>For documentation, see <code>java.lang.Object</code></p>
<p>public <code>String toString ()</code></p> <p>Returns a stringified <code>CategoryFilter</code> , within which individual categories are separated by commas.</p>

## Class Details

Represents a filter used when performing a search for popular places within a specific geographic area. (This type of search is otherwise known as "explore".) The filter limits search results to the specified categories.

A filter can include one or more of:

- A `Category`
- A `Category.Global`
- A `String` indicating a known category

See also:

[Category](#)

*Category.Global*

## Constructor Details

### CategoryFilter ()

Default constructor.

## Method Details

```
public CategoryFilter add (Global filter)
```

Adds a *Category.Global* to the *CategoryFilter* .

#### Parameters:

- **filter**  
A *Category.Global* filter

#### Returns:

The updated *CategoryFilter* object itself.

```
public CategoryFilter add (Category filter)
```

Adds a *Category* (retrieved from the results of a previous request) to the *CategoryFilter* .

#### Parameters:

- **filter**  
A *Category* filter

#### Returns:

The updated *CategoryFilter* object itself.

```
public CategoryFilter add (String filter)
```

Adds a known category to the *CategoryFilter* as a *String* .

#### Parameters:

- **filter**  
A *String* filter

#### Returns:

The updated *CategoryFilter* object itself.

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

**Parameters:**

- `obj`

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public String toString ()
```

Returns a stringified `CategoryFilter`, within which individual categories are separated by commas.

**Returns:**

The stringified `CategoryFilter`

## ContactDetail

The class *ContactDetail* is a member of *com.here.android.mpa.search*.

### Class Summary

```
public class ContactDetail
```

*extends java.lang.Object*

Represents detailed information about a contact for a *Place*.

[For complete information, see the section *Class Details*]

### Method Summary

Table 1098: Methods in ContactDetail

#### Methods

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

```
public String getLabel ()
```

Gets the localized label for the `ContactDetail`, describing the mechanism by which application users can contact the *Place*.

```
public String getType ()
```

Gets the type (email, fax, phone, website, etc.) for the `ContactDetail`.

```
public String getValue ()
```

Gets the value corresponding to an associated contact mechanism label for the `ContactDetail`.

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## Class Details

Represents detailed information about a contact for a *Place*.

For example, if a *Place* has among its known contacts the phone number 555-1234, use this class to access details about that particular contact's type ("phone") and value ("555-1234").

## Method Details

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

### Parameters:

- `obj`

```
public String getLabel ()
```

Gets the localized label for the *ContactDetail*, describing the mechanism by which application users can contact the *Place*. (e.g. by "Phone").

### Returns:

The label

### See also:

[getValue\(\)](#)

```
public String getType ()
```

Gets the type (email, fax, phone, website, etc.) for the *ContactDetail*.

### Returns:

The type

```
public String getValue ()
```

Gets the value corresponding to an associated contact mechanism label for the *ContactDetail*.

For example, if the mechanism for contacting a *Place* is "phone" then a call to this method might return "555-1234" as the corresponding value.

### Returns:

The value

### See also:

[getLabel\(\)](#)

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## DiscoveryLink

The class *DiscoveryLink* is a member of *com.here.android.mpa.search* .

### Class Summary

public class **DiscoveryLink**

extends *com.here.android.mpa.search.DiscoveryResult*, *com.here.android.mpa.search.Link*, *java.lang.Object*

Represents a discovery-related API link, used to retrieve a *DiscoveryResultPage* .

[For complete information, see the section *Class Details*]

### Method Summary

Table 1099: Methods in *DiscoveryLink*

Methods
public boolean <i>equals</i> ( <i>Object</i> obj) For documentation, see <i>java.lang.Object</i>
public String <i>getIconUrl</i> () Gets the URL to retrieve the icon for the resource to which the <i>Link</i> refers.
public String <i>getId</i> () Gets the unique identifier for the resource to which the <i>Link</i> refers.
public <i>DiscoveryRequest</i> <i>getRequest</i> () Gets the <i>DiscoveryRequest</i> to perform the next discovery search.
public String <i>getTitle</i> () Gets the localized title for the resource to which the <i>Link</i> refers.
public int <i>hashCode</i> () For documentation, see <i>java.lang.Object</i>

### Class Details

Represents a discovery-related API link, used to retrieve a *DiscoveryResultPage* .

### Method Details

public boolean *equals* (*Object* obj)

For documentation, see *java.lang.Object*

**Parameters:**

- `obj`

```
public String getIconUrl ()
```

Gets the URL to retrieve the icon for the resource to which the `Link` refers.

Note: an icon URL for a linked object is optional, so a call to this method could return empty .

**Returns:**

The icon URL (could be empty)

```
public String getId ()
```

Gets the unique identifier for the resource to which the `Link` refers.

Note: an ID for a linked object is optional, so a call to this method could return empty .

**Returns:**

The ID (could be empty)

```
public DiscoveryRequest getRequest ()
```

Gets the `DiscoveryRequest` to perform the next discovery search.

**Returns:**

The `DiscoveryRequest`

```
public String getTitle ()
```

Gets the localized title for the resource to which the `Link` refers. Client devices can display this title within an application.

Note: a title for a linked object is optional, so a call to this method could return empty .

**Returns:**

The title (could be empty)

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## DiscoveryRequest

The class *DiscoveryRequest* is a member of [com.here.android.mpa.search](#) .

## Class Summary

public class **DiscoveryRequest**

extends *com.here.android.mpa.search.Request*, *java.lang.Object*

Represents an extended Request used to retrieve a *DiscoveryResultPage* object by way of Places search services.

[For complete information, see the section [Class Details](#)]

**See also:**

[ExploreRequest](#)

[HereRequest](#)

[SearchRequest](#)

## Constructor Summary

Table 1100: Constructors in DiscoveryRequest

Constructors
<a href="#">DiscoveryRequest</a> ()
<a href="#">DiscoveryRequest</a> ( <i>PlacesDiscoveryRequest</i> impl)

## Field Summary

Table 1101: Fields in DiscoveryRequest

Fields
protected <i>CategoryFilter</i> <a href="#">m_categoryFilter</a>
protected List< <i>android.util.Pair</i> < <i>java.lang.Integer</i> , <i>java.lang.Integer</i> >> <a href="#">m_imageDimensions</a>
protected <i>GeoBoundingBox</i> <a href="#">m_searchArea</a>
protected <i>GeoCoordinate</i> <a href="#">m_searchCenter</a>
protected int <a href="#">m_searchRadius</a>

## Method Summary

Table 1102: Methods in DiscoveryRequest

Methods
public void <a href="#">addImageDimensions</a> (int width, int height) Request Image Media with specific dimensions.
public <i>DiscoveryRequest</i> <a href="#">addReference</a> (String name) This function adds the name of a requested reference identifiers to be returned in the results.

**Methods**

```
public ErrorCode execute (ResultListener<DiscoveryResultPage> eventListener)
```

Executes an asynchronous request.

This method overrides `search.Request.execute(ResultListener)`

```
public int getCollectionSize ()
```

Gets the current collection size being used for request responses.

```
public List getReferences ()
```

This function returns the names of requested reference identifiers to be returned in the results.

```
public RichTextFormatting getRichTextFormatting ()
```

Gets the current RichTextFormatting type being used in request responses.

```
protected DiscoveryRequest setCategoryFilter (CategoryFilter filter)
```

```
public DiscoveryRequest setCollectionSize (int value)
```

Sets a collection size to be used for request responses.

```
public DiscoveryRequest setMapViewport (GeoBoundingBox mapViewport)
```

The map viewport is a bounding box of the map area currently visible to the user.

```
public DiscoveryRequest setRichTextFormatting (RichTextFormatting value)
```

Sets a RichTextFormatting to be used in request responses.

```
protected DiscoveryRequest setSearchArea (GeoCoordinate coordinate, int radius)
```

```
protected DiscoveryRequest setSearchArea (GeoBoundingBox area)
```

```
protected DiscoveryRequest setSearchCenter (GeoCoordinate coordinate)
```

**Class Details**

Represents an extended Request used to retrieve a DiscoveryResultPage object by way of Places search services.

**See also:**

[ExploreRequest](#)

[HereRequest](#)

[SearchRequest](#)

**Constructor Details**

**DiscoveryRequest** ()

**DiscoveryRequest** (*PlacesDiscoveryRequest* impl)

**Parameters:**

- `impl`

## Field Details

protected [CategoryFilter](#) m\_categoryFilter

protected List<android.util.Pair<java.lang.Integer, java.lang.Integer>>  
m\_imageDimensions

protected [GeoBoundingBox](#) m\_searchArea

protected [GeoCoordinate](#) m\_searchCenter

protected int m\_searchRadius

## Method Details

public void addImageDimensions (int width, int height)

Request Image Media with specific dimensions. At least one of the sizes (width or height) needs to be valid (greater than 0).

### Parameters:

- **width**  
Image width (pass 0 for any width)
- **height**  
Image height (pass 0 for any height)

public [DiscoveryRequest](#) addReference (String name)

This function adds the name of a requested reference identifiers to be returned in the results.

For example, to retrieve an POI identifier (pvid), set this value to [PVID\\_ID\\_REFERENCE\\_NAME](#).

### Parameters:

- **name**  
Name of reference identifier to retrieve.

### Returns:

True if name added, false otherwise.

### See also:

*PVID\_ID\_REFERENCE\_NAME*

*VENUES\_ID\_REFERENCE\_NAME*

*VENUES\_CONTENT\_ID\_REFERENCE\_NAME*

*VENUES\_DESTINATION\_ID\_REFERENCE\_NAME*

*VENUES\_VENUE\_ID\_REFERENCE\_NAME*

```
public ErrorCode execute (ResultListener<DiscoveryResultPage> eventListener)
```

Executes an asynchronous request.

This method overrides *search.Request.execute(ResultListener)*

**Parameters:**

- **eventListener**

```
public int getCollectionSize ()
```

Gets the current collection size being used for request responses.

**Returns:**

The current response collection size

```
public List getReferences ()
```

This function returns the names of requested reference identifiers to be returned in the results.

**Returns:**

List of the names of reference identifiers to be returned in the result.

```
public RichTextFormatting getRichTextFormatting ()
```

Gets the current RichTextFormatting type being used in request responses.

**Returns:**

The current RichTextFormatting type

```
protected DiscoveryRequest setCategoryFilter (CategoryFilter filter)
```

**Parameters:**

- **filter**

```
public DiscoveryRequest setCollectionSize (int value)
```

Sets a collection size to be used for request responses. The maximum number of result items in each collection will be limited to this value. The valid value range is [1..100]. The default collection size is 20.

**Parameters:**

- **value**  
Desired response collection size per request.

**Returns:**

This *Request* object

**Throws:**

- **IllegalArgumentException**  
if size is out of range.

```
public DiscoveryRequest setMapViewport (GeoBoundingBox mapViewport)
```

The map viewport is a bounding box of the map area currently visible to the user. The viewport can act as an implicit location context in the absence of an explicit location context. To ensure you get the best results possible, you should always set a viewport if there is a map visible to the user.

**Parameters:**

- **mapViewport**  
The bounding box of the map area currently visible.

```
public DiscoveryRequest setRichTextFormatting (RichTextFormatting value)
```

Sets a *RichTextFormatting* to be used in request responses. The default formatting is *HTML*.

**Parameters:**

- **value**  
Desired *RichTextFormatting*

**Returns:**

This *DiscoveryRequest* object

```
protected DiscoveryRequest setSearchArea (GeoCoordinate coordinate, int radius)
```

**Parameters:**

- **coordinate**
- **radius**

```
protected DiscoveryRequest setSearchArea (GeoBoundingBox area)
```

**Parameters:**

- `area`

protected *DiscoveryRequest* `setSearchCenter` (*GeoCoordinate* coordinate)

Parameters:

- `coordinate`

## DiscoveryResult

The class *DiscoveryResult* is a member of *com.here.android.mpa.search*.

### Class Summary

public class **DiscoveryResult**

extends *com.here.android.mpa.search.Link*, *java.lang.Object*

Represents a base class for a *DiscoveryResult* found in a *DiscoveryResultPage*.

[For complete information, see the section *Class Details*]

See also:

*DiscoveryLink*

*PlaceLink*

### Nested Class Summary

Table 1103: Nested Classes in *DiscoveryResult*

Nested Classes
public static final enumeration <i>DiscoveryResult.ResultType</i> Represents values describing possible <i>DiscoveryResult</i> types.

### Constructor Summary

Table 1104: Constructors in *DiscoveryResult*

Constructors
<i>DiscoveryResult</i> ( <i>PlacesLink</i> impl)

## Method Summary

Table 1105: Methods in `DiscoveryResult`

Methods
<pre>public boolean equals (Object obj)</pre> <p>For documentation, see <i>java.lang.Object</i></p>
<pre>public String getIconUrl ()</pre> <p>Gets the URL to retrieve the icon for the resource to which the Link refers.</p>
<pre>public String getId ()</pre> <p>Gets the unique identifier for the resource to which the Link refers.</p>
<pre>public ResultType getResultType ()</pre> <p>Gets the <code>ResultType</code> for the <code>DiscoveryResult</code>.</p>
<pre>public String getTitle ()</pre> <p>Gets the localized title for the resource to which the Link refers.</p>
<pre>public String getVicinity ()</pre> <p>Gets the <code>String</code> description for the vicinity of the <i>Place</i>.</p>
<pre>public int hashCode ()</pre> <p>For documentation, see <i>java.lang.Object</i></p>

## Class Details

Represents a base class for a *DiscoveryResult* found in a *DiscoveryResultPage*.

See also:

[DiscoveryLink](#)

[PlaceLink](#)

## Constructor Details

`DiscoveryResult (PlacesLink impl)`

Parameters:

- `impl`

## Method Details

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

Parameters:

- `obj`

```
public String getIconUrl ()
```

Gets the URL to retrieve the icon for the resource to which the `Link` refers.

Note: an icon URL for a linked object is optional, so a call to this method could return empty .

**Returns:**

The icon URL (could be empty)

```
public String getId ()
```

Gets the unique identifier for the resource to which the `Link` refers.

Note: an ID for a linked object is optional, so a call to this method could return empty .

**Returns:**

The ID (could be empty)

```
public ResultType getResultType ()
```

Gets the `ResultType` for the `DiscoveryResult` .

**Returns:**

The `ResultType`

```
public String getTitle ()
```

Gets the localized title for the resource to which the `Link` refers. Client devices can display this title within an application.

Note: a title for a linked object is optional, so a call to this method could return empty .

**Returns:**

The title (could be empty)

```
public String getVicinity ()
```

Gets the `String` description for the vicinity of the `Place`. Typically, this description is derived from the `Address`, but could also contain any other description that helps a user understand where the `Place` is located.

**Returns:**

The vicinity description (could be empty)

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## ResultType

The enumeration *ResultType* is a member of *com.here.android.mpa.search.DiscoveryResult*.

### Enumeration Summary

public static final enumeration **DiscoveryResult.ResultType**

extends *java.lang.Enum*, *java.lang.Object*

Represents values describing possible *DiscoveryResult* types.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 1106: Enum Constants in *ResultType*

Fields
public static final <i>ResultType</i> <b>UNKNOWN</b> The result type is unknown.
public static final <i>ResultType</i> <b>PLACE</b> The <i>DiscoveryResult</i> represents a <i>PlaceLink</i> .
public static final <i>ResultType</i> <b>DISCOVERY</b> The <i>DiscoveryResult</i> represents a <i>DiscoveryLink</i> .

### Method Summary

Table 1107: Methods in *ResultType*

Methods
public static <i>ResultType</i> <b>valueOf</b> ( <i>String</i> name) This method retrieves the enumeration value that matches the name specified by the caller.
public static <i>DiscoveryResult.ResultType</i> [] <b>values</b> () This method retrieves an array of constants of the given enum type in the order in which they are declared.

### Enumeration Details

Represents values describing possible *DiscoveryResult* types.

### Enum Constant Details

public static final *ResultType* **UNKNOWN**

The result type is unknown. The `DiscoveryResult` does not represent a specialized result.

```
public static final ResultType PLACE
```

The `DiscoveryResult` represents a [PlaceLink](#).

```
public static final ResultType DISCOVERY
```

The `DiscoveryResult` represents a [DiscoveryLink](#).

## Method Details

```
public static ResultType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static DiscoveryResult.ResultType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## DiscoveryResultPage

The class `DiscoveryResultPage` is a member of [com.here.android.mpa.search](#) .

## Class Summary

```
public class DiscoveryResultPage
```

```
extends java.lang.Object
```

Represents a paginated collection of results from a [DiscoveryRequest](#) search, explore, or here request.

[For complete information, see the section [Class Details](#)]

### See also:

[ExploreRequest](#)

[HereRequest](#)

[SearchRequest](#)

## Method Summary

Table 1108: Methods in `DiscoveryResultPage`

Methods
<pre>public boolean equals (Object obj)</pre> <p>For documentation, see <a href="#">java.lang.Object</a></p>
<pre>public java.util.List &lt;DiscoveryLink&gt; getDiscoveryLinks ()</pre> <p>Gets the list of <code>DiscoveryLink</code> items for the <code>DiscoveryResultPage</code>.</p>
<pre>public java.util.List &lt;DiscoveryResult&gt; getItems ()</pre> <p>Gets the list of <code>DiscoveryResult</code> items for the <code>DiscoveryResultPage</code>.</p>
<pre>public DiscoveryRequest getNextPageRequest ()</pre> <p>Gets the <code>DiscoveryRequest</code> for requesting the next page of the <code>DiscoveryResultPage</code>.</p>
<pre>public int getOffsetCount ()</pre> <p>Gets the result offset count for the current page of the <code>DiscoveryResultPage</code>.</p>
<pre>public java.util.List &lt;PlaceLink&gt; getPlaceLinks ()</pre> <p>Gets the list of <code>PlaceLink</code> items for the <code>DiscoveryResultPage</code>.</p>
<pre>public DiscoveryRequest getPreviousPageRequest ()</pre> <p>Gets the <code>DiscoveryRequest</code> for requesting the previous page of the <code>DiscoveryResultPage</code>.</p>
<pre>public int hashCode ()</pre> <p>For documentation, see <a href="#">java.lang.Object</a></p>

## Class Details

Represents a paginated collection of results from a `DiscoveryRequest` search, explore, or here request. The collection contains `DiscoveryResult` objects, each of which represents either a `PlaceLink` or another `DiscoveryLink`.

### See also:

[ExploreRequest](#)

[HereRequest](#)

[SearchRequest](#)

## Method Details

```
public boolean equals (Object obj)
```

For documentation, see [java.lang.Object](#)

### Parameters:

- `obj`

```
public java.util.List <DiscoveryLink> getDiscoveryLinks ()
```

Gets the list of DiscoveryLink items for the DiscoveryResultPage .

**Returns:**

The list of DiscoveryLink objects (could be empty)

```
public java.util.List <DiscoveryResult> getItems ()
```

Gets the list of DiscoveryResult items for the DiscoveryResultPage .

**Returns:**

The list of DiscoveryResult objects (could be empty)

```
public DiscoveryRequest getNextPageRequest ()
```

Gets the DiscoveryRequest for requesting the next page of the DiscoveryResultPage .

**Returns:**

The DiscoveryRequest

```
public int getOffsetCount ()
```

Gets the result offset count for the current page of the DiscoveryResultPage .

For the first page of results, the offset count is 0. Following any call to [getNextPageRequest\(\)](#), the offset count will be greater than 0.

**Returns:**

The result offset count

```
public java.util.List <PlaceLink> getPlaceLinks ()
```

Gets the list of PlaceLink items for the DiscoveryResultPage .

**Returns:**

The list of PlaceLink objects (could be empty)

```
public DiscoveryRequest getPreviousPageRequest ()
```

Gets the DiscoveryRequest for requesting the previous page of the DiscoveryResultPage .

**Returns:**

The DiscoveryRequest

```
public int hashCode ()
```

For documentation, see [java.lang.Object](#)

## EditorialMedia

The class *EditorialMedia* is a member of [com.here.android.mpa.search](#) .

### Class Summary

```
public class EditorialMedia
```

*extends* [com.here.android.mpa.search.Media](#), [java.lang.Object](#)

Represents editorial content about a *Place*.

[For complete information, see the section [Class Details](#)]

**See also:**

[getEditorials\(\)](#)

### Method Summary

Table 1109: Methods in EditorialMedia

Methods
<pre>public boolean equals (Object obj)</pre> <p>For documentation, see <a href="#">java.lang.Object</a></p>
<pre>public String getDescription ()</pre> <p>Gets the String representation of the description for the editorial.</p>
<pre>public String getIsoLanguageCode ()</pre> <p>Gets the ISO language code for the editorial content.</p>
<pre>public int hashCode ()</pre> <p>For documentation, see <a href="#">java.lang.Object</a></p>

### Class Details

Represents editorial content about a *Place*.

**See also:**

[getEditorials\(\)](#)

### Method Details

```
public boolean equals (Object obj)
```

For documentation, see [java.lang.Object](#)

**Parameters:**

- `obj`

```
public String getDescription ()
```

Gets the `String` representation of the description for the editorial.

**Returns:**

The description

```
public String getIsoLanguageCode ()
```

Gets the ISO language code for the editorial content.

Note: a language code for an editorial content type is optional, so a call to this method could return empty .

**Returns:**

The language code (could be empty)

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## ErrorCode

The enumeration *ErrorCode* is a member of *com.here.android.mpa.search* .

### Enumeration Summary

```
public final enumeration ErrorCode
```

*extends java.lang.Enum, java.lang.Object*

Represents values describing possible search request errors.

[For complete information, see the section *Enumeration Details*]

### Enum Constant Summary

Table 1110: Enum Constants in *ErrorCode*

Fields
<pre>public static final ErrorCode NONE</pre> <p>No error was encountered.</p>
<pre>public static final ErrorCode GENERAL</pre> <p>There was a general error.</p>

**Fields**

```
public static final ErrorCode NOT_FOUND
```

No appropriate response to the query request could be found.

```
public static final ErrorCode NOT_INITIALIZED
```

The search service was not properly initialized.

```
public static final ErrorCode INCOMPLETE
```

The results of the query request were incomplete.

```
public static final ErrorCode NETWORK_REQUIRED
```

The query request could not be completed while offline.

```
public static final ErrorCode OUT_OF_MEMORY
```

There was insufficient memory to complete the query request.

```
public static final ErrorCode UNKNOWN
```

There was an unknown error.

```
public static final ErrorCode INVALID_PARAMETERS
```

The request contains invalid parameters.

```
public static final ErrorCode CANCEL
```

The query request was cancelled.

```
public static final ErrorCode BUSY
```

The search service was busy with another request.

```
public static final ErrorCode INVALID_STATE
```

The search service was in an invalid state.

```
public static final ErrorCode SERVER_CONNECTION
```

There was a problem with the server connection.

```
public static final ErrorCode INVALID_OPERATION
```

The query request triggered an invalid operation.

```
public static final ErrorCode BAD_LOCATION
```

The query request contained bad location data.

```
public static final ErrorCode INDEX_FAILURE
```

There was an search service index failure.

```
public static final ErrorCode CANCELLED
```

The query request was cancelled.

```
public static final ErrorCode CREATED
```

The response to the query request was created.

```
public static final ErrorCode ACCEPTED
```

The query request was accepted, though not yet processed.

## Fields

```
public static final ErrorCode NO_CONTENT
```

The response to the query request contained no content.

```
public static final ErrorCode SERVER_INTERNAL
```

There was an internal server error.

```
public static final ErrorCode SERVICE_UNAVAILABLE
```

The search service was unavailable.

```
public static final ErrorCode MOVED_PERMANENTLY
```

The requested resource has moved permanently.

```
public static final ErrorCode BAD_REQUEST
```

The query request was malformed and will not be processed.

```
public static final ErrorCode UNAUTHORIZED
```

The query request did not contain necessary authentication information.

```
public static final ErrorCode FORBIDDEN
```

Access to the requested resource was forbidden.

```
public static final ErrorCode OPERATION_NOT_ALLOWED
```

Access to this operation is denied.

```
public static final ErrorCode NOT_ACCEPTABLE
```

The response to the query request was not in a format that is acceptable to the client.

```
public static final ErrorCode RESOURCE_GONE
```

The resource no longer exists at the requested server location.

```
public static final ErrorCode QUERY_ADDRESS_MISSING
```

The query request was missing an address parameter.

```
public static final ErrorCode QUERY_LOCATION_CONTEXT_INVALID
```

The query location context was invalid.

```
public static final ErrorCode QUERY_LOCATION_CONTEXT_MISSING
```

The query request was missing a location context parameter.

```
public static final ErrorCode QUERY_NO_NEXT_PAGE
```

No further paginated results exist.

```
public static final ErrorCode QUERY_TEXT_MISSING
```

The query request was missing a search text parameter.

```
public static final ErrorCode QUERY_URI_MISSING
```

The query request was missing a link URI.

```
public static final ErrorCode SEARCH_RESULT_ITEM_MISSING
```

The place details query was missing a search result item parameter.

## Fields

```
public static final ErrorCode INVALID_PARAMETER
```

A query request parameter was invalid.

```
public static final ErrorCode NETWORK_COMMUNICATION
```

There was a network communications error.

```
public static final ErrorCode NETWORK_BAD_URI
```

The HTTP request URI was invalid or malformed.

```
public static final ErrorCode NETWORK_SERVER
```

The backend server was unreachable.

```
public static final ErrorCode NETWORK_REQUEST_CONTENT
```

The query request content was invalid.

```
public static final ErrorCode NETWORK_EMPTY_INPUT
```

The query request input was missing.

```
public static final ErrorCode INVALID_CREDENTIALS
```

The HERE application ID and application code were missing or invalid.

```
public static final ErrorCode HTTP
```

The query request failed due to an HTTP error.

```
public static final ErrorCode NETWORK_UNKNOWN
```

There was an unknown network error.

## Method Summary

Table 1111: Methods in `ErrorCode`

### Methods

```
public static ErrorCode valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static ErrorCode[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Represents values describing possible search request errors.

### Enum Constant Details

```
public static final ErrorCode NONE
```

No error was encountered.

```
public static final ErrorCode GENERAL
```

There was a general error.

```
public static final ErrorCode NOT_FOUND
```

No appropriate response to the query request could be found.

```
public static final ErrorCode NOT_INITIALIZED
```

The search service was not properly initialized.

```
public static final ErrorCode INCOMPLETE
```

The results of the query request were incomplete.

```
public static final ErrorCode NETWORK_REQUIRED
```

The query request could not be completed while offline.

```
public static final ErrorCode OUT_OF_MEMORY
```

There was insufficient memory to complete the query request.

```
public static final ErrorCode UNKNOWN
```

There was an unknown error.

```
public static final ErrorCode INVALID_PARAMETERS
```

The request contains invalid parameters.

```
public static final ErrorCode CANCEL
```

The query request was cancelled.

```
public static final ErrorCode BUSY
```

The search service was busy with another request.

```
public static final ErrorCode INVALID_STATE
```

The search service was in an invalid state.

```
public static final ErrorCode SERVER_CONNECTION
```

There was a problem with the server connection.

```
public static final ErrorCode INVALID_OPERATION
```

The query request triggered an invalid operation.

```
public static final ErrorCode BAD_LOCATION
```

The query request contained bad location data.

```
public static final ErrorCode INDEX_FAILURE
```

There was an search service index failure.

```
public static final ErrorCode CANCELLED
```

The query request was cancelled.

```
public static final ErrorCode CREATED
```

The response to the query request was created.

```
public static final ErrorCode ACCEPTED
```

The query request was accepted, though not yet processed.

```
public static final ErrorCode NO_CONTENT
```

The response to the query request contained no content.

```
public static final ErrorCode SERVER_INTERNAL
```

There was an internal server error.

```
public static final ErrorCode SERVICE_UNAVAILABLE
```

The search service was unavailable.

```
public static final ErrorCode MOVED_PERMANENTLY
```

The requested resource has moved permanently.

```
public static final ErrorCode BAD_REQUEST
```

The query request was malformed and will not be processed.

```
public static final ErrorCode UNAUTHORIZED
```

The query request did not contain necessary authentication information.

```
public static final ErrorCode FORBIDDEN
```

Access to the requested resource was forbidden.

```
public static final ErrorCode OPERATION_NOT_ALLOWED
```

Access to this operation is denied. Contact your HERE representative for more information.

```
public static final ErrorCode NOT_ACCEPTABLE
```

The response to the query request was not in a format that is acceptable to the client.

```
public static final ErrorCode RESOURCE_GONE
```

The resource no longer exists at the requested server location.

```
public static final ErrorCode QUERY_ADDRESS_MISSING
```

The query request was missing an address parameter.

```
public static final ErrorCode QUERY_LOCATION_CONTEXT_INVALID
```

The query location context was invalid.

```
public static final ErrorCode QUERY_LOCATION_CONTEXT_MISSING
```

The query request was missing a location context parameter.

```
public static final ErrorCode QUERY_NO_NEXT_PAGE
```

No further paginated results exist.

```
public static final ErrorCode QUERY_TEXT_MISSING
```

The query request was missing a search text parameter.

```
public static final ErrorCode QUERY_URI_MISSING
```

The query request was missing a link URI.

```
public static final ErrorCode SEARCH_RESULT_ITEM_MISSING
```

The place details query was missing a search result item parameter.

```
public static final ErrorCode INVALID_PARAMETER
```

A query request parameter was invalid.

```
public static final ErrorCode NETWORK_COMMUNICATION
```

There was a network communications error.

```
public static final ErrorCode NETWORK_BAD_URI
```

The HTTP request URI was invalid or malformed.

```
public static final ErrorCode NETWORK_SERVER
```

The backend server was unreachable.

```
public static final ErrorCode NETWORK_REQUEST_CONTENT
```

The query request content was invalid.

```
public static final ErrorCode NETWORK_EMPTY_INPUT
```

The query request input was missing.

```
public static final ErrorCode INVALID_CREDENTIALS
```

The HERE application ID and application code were missing or invalid.

```
public static final ErrorCode HTTP
```

The query request failed due to an HTTP error.

```
public static final ErrorCode NETWORK_UNKNOWN
```

There was an unknown network error.

## Method Details

```
public static ErrorCode valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static ErrorCode[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## ExploreRequest

The class *ExploreRequest* is a member of *com.here.android.mpa.search* .

### Class Summary

```
public class ExploreRequest
```

*extends* *com.here.android.mpa.search.DiscoveryRequest*, *com.here.android.mpa.search.Request*,  
*java.lang.Object*

Creates a *ExploreRequest* using a specified location context and category filter.

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 1112: Constructors in ExploreRequest

Constructors
<i>ExploreRequest</i> () Default constructor.

## Method Summary

Table 1113: Methods in ExploreRequest

Methods
<pre>public <i>ErrorCode</i> execute (<i>ResultListener</i>&lt;<i>DiscoveryResultPage</i>&gt; listener)</pre> <p>Executes an asynchronous request.</p>
<pre>public <i>ExploreRequest</i> setCategoryFilter (<i>CategoryFilter</i> filter)</pre> <p>Sets a search filter based on categories.</p>
<pre>public <i>ExploreRequest</i> setSearchArea (<i>GeoCoordinate</i> center, int radius)</pre> <p>Sets the search area using a center location and radius.</p>
<pre>public <i>ExploreRequest</i> setSearchArea (<i>GeoBoundingBox</i> boundingArea)</pre> <p>Sets the search area using a GeoBoundingBox .</p>
<pre>public <i>ExploreRequest</i> setSearchCenter (<i>GeoCoordinate</i> center)</pre> <p>Sets the search center.</p>

## Class Details

Creates a *ExploreRequest* using a specified location context and category filter. An explore request is used for retrieving a list of nearby relevant places for a given position. It answers the question "What interesting places are near a location?" The results returned are confined to those located in the current search area and are ordered by popularity. If a category filter is provided, the created request will limit results to include only items with the specified categories.

A search location context must be provided by setting either a search center using *setSearchCenter(GeoCoordinate)*, a search area using *setSearchArea(GeoCoordinate, int)* or *setSearchArea(GeoBoundingBox)* or a bounding map viewport using *setMapViewport(GeoBoundingBox)*. Failing to set a map viewport will result in an *INVALID\_PARAMETER* when executing the request.

## Constructor Details

### ExploreRequest ()

Default constructor.

A search location context must be provided by setting either a search center using *setSearchCenter(GeoCoordinate)*, a search area using *setSearchArea(GeoCoordinate, int)* or *setSearchArea(GeoBoundingBox)* or a bounding map viewport using *setMapViewport(GeoBoundingBox)*. Failing to set a map viewport will result in an *INVALID\_PARAMETER* when executing the request.

## Method Details

```
public ErrorCode execute (ResultListener<DiscoveryResultPage> listener)
```

Executes an asynchronous request.

**Parameters:**

- **listener**

A `ResultListener` passed along with the request to monitor progress

**Returns:**

The `ErrorCode` representing an appropriate result

```
public ExploreRequest setCategoryFilter (CategoryFilter filter)
```

Sets a search filter based on categories.

**Parameters:**

- **filter**

A `CategoryFilter` representing the category filter. When a `CategoryFilter` is specified, the result items will be limited to the categories defined in the filter.

**Returns:**

The `ExploreRequest`.

```
public ExploreRequest setSearchArea (GeoCoordinate center, int radius)
```

Sets the search area using a center location and radius.

**Parameters:**

- **center**

The `GeoCoordinate` representing the search area center location.

- **radius**

The search area circle radius in meters.

**Returns:**

The `ExploreRequest`.

```
public ExploreRequest setSearchArea (GeoBoundingBox boundingArea)
```

Sets the search area using a `GeoBoundingBox`.

**Parameters:**

- **boundingArea**

The `GeoBoundingBox` representing the search area.

**Returns:**

The `ExploreRequest`.

```
public ExploreRequest setSearchCenter (GeoCoordinate center)
```

Sets the search center.

**Parameters:**

- **center**

The `GeoCoordinate` representing the location context used to search for nearby places.

**Returns:**

The `ExploreRequest`.

## ExtendedAttribute

The class `ExtendedAttribute` is a member of `com.here.android.mpa.search`.

### Class Summary

public class **ExtendedAttribute**

*extends* `java.lang.Object`

Represents additional detailed information about a `Place`.

[For complete information, see the section [Class Details](#)]

### Field Summary

Table 1114: Fields in `ExtendedAttribute`

Fields
<pre>public static final String TRANSIT_DEPARTURES_EXTENDED_ATTRIBUTE_ID</pre> <p>Constant that defines the public transit departures extended identifier.</p>
<pre>public static final String TRANSIT_LINES_EXTENDED_ATTRIBUTE_ID</pre> <p>Constant that defines the public transit lines extended identifier.</p>

### Method Summary

Table 1115: Methods in `ExtendedAttribute`

Methods
<pre>public boolean equals (Object obj)</pre> <p>For documentation, see <code>java.lang.Object</code></p>
<pre>public String getAttribution ()</pre> <p>Gets a ready-to-display (HTML formatted) string containing the source attribution text for this place.</p>
<pre>public String getId ()</pre> <p>Gets the identifier for the <code>ExtendedAttribute</code>.</p>

## Methods

```
public String getLabel ()
```

Gets the localized display label for the `ExtendedAttribute` .

```
public String getText ()
```

Gets the `String` representation of `ExtendedAttribute` information, which can be displayed directly on the client device.

```
public Link getVia ()
```

Gets a `Link` object to the external website of the supplier of the information.

```
public int hashCode ()
```

For documentation, see `java.lang.Object`

## Class Details

Represents additional detailed information about a *Place*.

This extensible collection of attributes that can include the following items with these identifier values:

- `payment` - A list of available payment methods (such as cash, credit card, direct debit, etc.)
- `openingHours` - A list of hours during which the place is open for business
- `annualClosings` - A description of annual closing dates such as holidays or other special occasions
- `price` - A price list
- `nearestLandmark` - A description of the nearest landmark
- `languagesSpoken` - A list of the languages that are spoken at the place
- `availableParking` - A list of parking options available nearby
- `smoking` - Whether smoking is allowed
- `disabledAccess` - Whether disabled access is available
- `transitLines` - A list of available public transport transit lines
- `departures` - A list of next departures for available public transport transit lines
- `blindGuide` - Whether a public transport stop has blind guides ('tactile paving').
- `elevator` - Whether a public transport stop has elevator
- `escalator` - Whether a public transport stop has escalator

## Field Details

```
public static final String TRANSIT_DEPARTURES_EXTENDED_ATTRIBUTE_ID
```

Constant that defines the public transit departures extended identifier.

```
public static final String TRANSIT_LINES_EXTENDED_ATTRIBUTE_ID
```

Constant that defines the public transit lines extended identifier.

## Method Details

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

### Parameters:

- `obj`

```
public String getAttribution ()
```

Gets a ready-to-display (HTML formatted) string containing the source attribution text for this place.

The Places API gives access to content that is provided by a number of sources. Client applications must display the source attribution next to the content. This requirement forms part of the terms and conditions of the API.

The code snippet below demonstrates how to display the string in an Android `TextView`

```
TextView textView = (TextView) findViewById(R.id.attributionText);
textView.setText(Html.fromHtml(route.getTransitRouteSourceAttribution().getAttribution()));
textView.setMovementMethod(LinkMovementMethod.getInstance());
```

### Returns:

The HTML formatted attribution string

```
public String getId ()
```

Gets the identifier for the `ExtendedAttribute` .

### Returns:

The attribute identifier

```
public String getLabel ()
```

Gets the localized display label for the `ExtendedAttribute` .

### Returns:

The display label

```
public String getText ()
```

Gets the `String` representation of `ExtendedAttribute` information, which can be displayed directly on the client device.

Note: if the text represents a list of items, the items are separated by a line break entity ( `<br/>` if the text format is HTML-encoded or `newLine` if the text format is plain).

## Returns:

The RichText display text

```
public Link getVia ()
```

Gets a [Link](#) object to the external website of the supplier of the information. This link must be used for attribution when rich text attribution is not being used.

## Returns:

The [Link](#) object to the external website of the supplier of the information

```
public int hashCode ()
```

For documentation, see [java.lang.Object](#)

## GeocodeRequest

The class [GeocodeRequest](#) is a member of [com.here.android.mpa.search](#) .

### Class Summary

```
public class GeocodeRequest
```

```
extends com.here.android.mpa.search.Request, java.lang.Object
```

The [GeocodeRequest](#) represents an extended [Request](#) used to retrieve [Location](#) data by way of Geocoder search services.

**Deprecated:** As of release 3.6.

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 1116: Constructors in [GeocodeRequest](#)

Constructors
<a href="#">GeocodeRequest</a> (String query) Creates a geocoder request that resolves a free text query into a <a href="#">Location</a> .

## Method Summary

Table 1117: Methods in GeocodeRequest

Methods
<pre>public <i>ErrorCode</i> execute (<i>ResultListener</i>&lt;<i>Location</i>&gt; listener)</pre> <p>Executes an asynchronous request.</p>
<pre>public int getCollectionSize ()</pre> <p>Gets the current collection size being used for request responses.</p>
<pre>public <i>GeocodeRequest</i> setCollectionSize (int value)</pre> <p>Sets a collection size to be used for request responses.</p>
<pre>public <i>GeocodeRequest</i> setMapViewport (<i>GeoBoundingBox</i> mapViewport)</pre> <p>The map viewport is a bounding box of the map area currently visible to the user.</p>
<pre>public <i>GeocodeRequest</i> setSearchArea (<i>GeoCoordinate</i> center, int radius)</pre> <p>Sets the suggested search area using a center location and radius.</p>
<pre>public <i>GeocodeRequest</i> setSearchArea (<i>GeoBoundingBox</i> boundingArea)</pre> <p>Sets the suggested search area using a <i>GeoBoundingBox</i> .</p>

## Class Details

Deprecated: As of release 3.6.

Use [GeocodeRequest2](#) instead.

The *GeocodeRequest* represents an extended *Request* used to retrieve *Location* data by way of Geocoder search services.

Note: the response to a *GeocodeRequest* is a list of *Location* objects.

## Constructor Details

### GeocodeRequest (String query)

Creates a geocoder request that resolves a free text query into a *Location*.

Please note that if this free text query contains search area information, such as a state, then the search area set through *setSearchArea(GeoBoundingBox)* or *setSearchArea(GeoCoordinate, int)* is ignored. For example, a search for "Main St, Ohio" with a search area of New York City will return results outside of New York City. However, a search for "Park Ave" with New York City as the search area will return results in that area.

#### Parameters:

- **query**  
Query text specifying the address to locate

#### Throws:

- **IllegalArgumentException**  
Upon a failure to handle a passed argument

## Method Details

```
public ErrorCode execute (ResultListener<Location> listener)
```

Executes an asynchronous request.

### Parameters:

- **listener**  
A *ResultListener* passed along with the request to monitor progress

### Returns:

The *ErrorCode* representing an appropriate result

```
public int getCollectionSize ()
```

Gets the current collection size being used for request responses.

### Returns:

The current response collection size

```
public GeocodeRequest setCollectionSize (int value)
```

Sets a collection size to be used for request responses. The maximum number of result items in each collection will be limited to this value. The valid value range is [1..100]. The default collection size is 20.

### Parameters:

- **value**  
Desired response collection size per request.

### Returns:

This *Request* object

### Throws:

- **IllegalArgumentException**  
if size is out of range.

```
public GeocodeRequest setMapViewport (GeoBoundingBox mapViewport)
```

The map viewport is a bounding box of the map area currently visible to the user. The viewport can act as an implicit location context in the absence of an explicit location context. To ensure you get the best results possible, you should always set a viewport if there is a map visible to the user.

Please note that the Map Viewport is only used for online geocode requests.

### Parameters:

- **mapViewport**

The bounding box of the map area currently visible.

```
public GeocodeRequest setSearchArea (GeoCoordinate center, int radius)
```

Sets the suggested search area using a center location and radius.

Please note that the Search Area is only used for online geocode requests.

**Parameters:**

- **center**

The *GeoCoordinate* representing the search area center location.

- **radius**

The search area circle radius in meters (greater-equal than 0).

**Returns:**

The *GeocodeRequest*.

```
public GeocodeRequest setSearchArea (GeoBoundingBox boundingArea)
```

Sets the suggested search area using a *GeoBoundingBox* .

Please note that the Search Area is only used for online geocode requests.

**Parameters:**

- **boundingArea**

The *GeoBoundingBox* representing the search area.

**Returns:**

The *GeocodeRequest*.

## GeocodeRequest2

The class *GeocodeRequest2* is a member of [com.here.android.mpa.search](#) .

### Class Summary

```
public class GeocodeRequest2
```

```
extends com.here.android.mpa.search.Request, java.lang.Object
```

The *GeocodeRequest2* represents an extended *Request* used to retrieve *GeocodeResult* data by way of *Geocoder* search services.

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 1118: Constructors in GeocodeRequest2

Constructors
<p><b><i>GeocodeRequest2</i></b> (String query)</p> <p>Creates a geocoder request that resolves a free text query into a <i>GeocodeResult</i>.</p>

## Method Summary

Table 1119: Methods in GeocodeRequest2

Methods
<p>public <i>ErrorCode</i> <b>execute</b> (<i>ResultListener&lt;GeocodeResult&gt;</i> listener)</p> <p>Executes an asynchronous request.</p>
<p>public int <b>getCollectionSize</b> ()</p> <p>Gets the current collection size being used for request responses.</p>
<p>public <i>GeocodeRequest2</i> <b>setCollectionSize</b> (int value)</p> <p>Sets a collection size to be used for request responses.</p>
<p>public <i>GeocodeRequest2</i> <b>setMapViewport</b> (<i>GeoBoundingBox</i> mapViewport)</p> <p>The map viewport is a bounding box of the map area currently visible to the user.</p>
<p>public <i>GeocodeRequest2</i> <b>setSearchArea</b> (<i>GeoCoordinate</i> center, int radius)</p> <p>Sets the suggested search area using a center location and radius.</p>
<p>public <i>GeocodeRequest2</i> <b>setSearchArea</b> (<i>GeoBoundingBox</i> boundingArea)</p> <p>Sets the suggested search area using a <i>GeoBoundingBox</i> .</p>

## Class Details

The *GeocodeRequest2* represents an extended *Request* used to retrieve *GeocodeResult* data by way of *Geocoder* search services.

Note: the response to a *GeocodeRequest2* is a list of *GeocodeResult* objects.

## Constructor Details

### *GeocodeRequest2* (String query)

Creates a geocoder request that resolves a free text query into a *GeocodeResult*.

Please note that if this free text query contains search area information, such as a state, then the search area set through *setSearchArea(GeoBoundingBox)* or *setSearchArea(GeoCoordinate, int)* is ignored. For example, a search for "Main St, Ohio" with a search area of New York City will return results outside of New York City. However, a search for "Park Ave" with New York City as the search area will return results in that area.

#### Parameters:

- **query**

Query text specifying the address to locate.

**Throws:**

- **IllegalArgumentException**  
Upon a failure to handle a passed argument.

## Method Details

```
public ErrorCode execute (ResultListener<GeocodeResult> listener)
```

Executes an asynchronous request.

**Parameters:**

- **listener**  
A *ResultListener* passed along with the request to monitor progress.

**Returns:**

The *ErrorCode* representing an appropriate result.

```
public int getCollectionSize ()
```

Gets the current collection size being used for request responses.

**Returns:**

The current response collection size.

```
public GeocodeRequest2 setCollectionSize (int value)
```

Sets a collection size to be used for request responses. The maximum number of result items in each collection will be limited to this value. The valid value range is [1..100]. The default collection size is 20.

**Parameters:**

- **value**  
Desired response collection size per request.

**Returns:**

This *Request* object.

**Throws:**

- **IllegalArgumentException**  
if size is out of range.

```
public GeocodeRequest2 setMapViewport (GeoBoundingBox mapViewport)
```

The map viewport is a bounding box of the map area currently visible to the user. The viewport can act as an implicit location context in the absence of an explicit location context. To ensure you get the best results possible, you should always set a viewport if there is a map visible to the user.

Please note that the Map Viewport is only used for online geocode requests.

#### Parameters:

- **mapViewport**

The bounding box of the map area currently visible.

```
public GeocodeRequest2 setSearchArea (GeoCoordinate center, int radius)
```

Sets the suggested search area using a center location and radius.

Please note that the Search Area is only used for online geocode requests.

#### Parameters:

- **center**

The *GeoCoordinate* representing the search area center location.

- **radius**

The search area circle radius in meters (greater-equal than 0).

#### Returns:

The *GeocodeRequest2*.

```
public GeocodeRequest2 setSearchArea (GeoBoundingBox boundingArea)
```

Sets the suggested search area using a *GeoBoundingBox* .

Please note that the Search Area is only used for online geocode requests.

#### Parameters:

- **boundingArea**

The *GeoBoundingBox* representing the search area.

#### Returns:

The *GeocodeRequest2*.

## GeocodeResult

The class *GeocodeResult* is a member of [com.here.android.mpa.search](http://com.here.android.mpa.search) .

### Class Summary

```
public class GeocodeResult
```

```
extends java.lang.Object
```

Represents the result of a geocode request.

[For complete information, see the section [Class Details](#)]

## Method Summary

Table 1120: Methods in GeocodeResult

Methods
<code>public boolean equals (Object obj)</code>
<code>public Location getLocation ()</code> The location data of the geocode result.
<code>public String getMatchLevel ()</code> Shows the level of the most precise area information for the match, district, city or a higher administrative level.
<code>public Map getMatchQuality ()</code> Details about the quality of the result.
<code>public float getRelevance ()</code> The relevance of the result location to the original search parameters.
<code>public int hashCode ()</code>

## Class Details

Represents the result of a geocode request. The data of a geocode result is represented by an instance of [Location](#), accessed through the location property. The quality of the result can be assessed in a broad sense with the relevance property, or in more detail using the matchQuality dictionary.

## Method Details

```
public boolean equals (Object obj)
```

### Parameters:

- `obj`

```
public Location getLocation ()
```

The location data of the geocode result.

### Returns:

The [Location](#) of this geocode result.

```
public String getMatchLevel ()
```

Shows the level of the most precise area information for the match, district, city or a higher administrative level. The possible values are: "country", "state", "county", "city", "district", "street", "intersection", "houseNumber", "postalCode" and "landmark".

**Returns:**

The level of the most precise area information for the match, district, city or a higher administrative level.

**public Map `getMatchQuality` ()**

Details about the quality of the result. Additional information about the accuracy of the result is available in the `matchQuality` dictionary. It contains one or more float values representing how well each individual search parameter was matched. The values will be in the range [0, 1] with a value of 1 indicating a perfect match. The possible keys are "State", "County", "City", "District", "Street", "SecondaryStreet", "HouseNumber", and "PostalCode". The "SecondaryStreet" key will be present if an intersection was specified in the geocode request. For example, if the request contained "1st St at 2nd Ave", the "Street" key would access the match value for "1st St" and the "SecondaryStreet" key would access the match value for "2nd Ave".

**Returns:**

Details about the quality of the result.

**public float `getRelevance` ()**

The relevance of the result location to the original search parameters. The relevance of a result provides a measure of how accurate or reliable it is. The valid range is [0, 1], with a value of 1 representing a perfect match.

**Returns:**

The relevance of the result location to the original search parameters.

**public int `hashCode` ()**

## HereRequest

The class *HereRequest* is a member of [com.here.android.mpa.search](#) .

### Class Summary

```
public class HereRequest
```

```
extends com.here.android.mpa.search.DiscoveryRequest, com.here.android.mpa.search.Request,  
java.lang.Object
```

The *HereRequest* answers the questions "Where am I?" and "What's right here where I am standing?" The search results consist of a list of places with addresses that lie within the vicinity of the search location.

[For complete information, see the section [Class Details](#)]

## Nested Class Summary

Table 1121: Nested Classes in HereRequest

Nested Classes
<pre>public static class <a href="#">HereRequest.UnsupportedFilterException</a></pre> <p>Thrown when a building filter is unsupported because the building identifier is missing or malformed.</p>

## Constructor Summary

Table 1122: Constructors in HereRequest

Constructors
<pre><a href="#">HereRequest</a> ()</pre> <p>Default constructor.</p>

## Method Summary

Table 1123: Methods in HereRequest

Methods
<pre>public <a href="#">HereRequest</a> <a href="#">addBuildingFilter</a> (<a href="#">Identifier</a> buildingId)</pre> <p>Add a search filter based on building identifier.</p>
<pre>public <a href="#">HereRequest</a> <a href="#">addBuildingFilter</a> (String buildingId)</pre> <p>Sets a search filter based on building identifier.</p>
<pre>public <a href="#">ErrorCode</a> <a href="#">execute</a> (<a href="#">ResultListener&lt;DiscoveryResultPage&gt;</a> listener)</pre> <p>Executes an asynchronous request.</p>
<pre>public <a href="#">HereRequest</a> <a href="#">setCategoryFilter</a> (<a href="#">CategoryFilter</a> filter)</pre> <p>Sets a search filter based on categories.</p>
<pre>public <a href="#">HereRequest</a> <a href="#">setSearchCenter</a> (<a href="#">GeoCoordinate</a> center)</pre> <p>Sets the search center.</p>

## Class Details

The [HereRequest](#) answers the questions "Where am I?" and "What's right here where I am standing?" The search results consist of a list of places with addresses that lie within the vicinity of the search location. The feature is typically used by applications that include "check-in" or "click on map to get more information" options.

A search location context must be provided by setting either a search center using [setSearchCenter\(GeoCoordinate\)](#) or a bounding map viewport using [setMapViewport\(GeoBoundingBox\)](#). Failing to set a map viewport will result in an [INVALID\\_PARAMETER](#) when executing the request.

## Constructor Details

### HereRequest ()

Default constructor.

A search location context must be provided by setting either a search center using [setSearchCenter\(GeoCoordinate\)](#) or a bounding map viewport using [setMapViewport\(GeoBoundingBox\)](#). Failing to set a map viewport will result in an `INVALID_PARAMETER` when executing the request.

## Method Details

```
public HereRequest addBuildingFilter (Identifier buildingId)
```

Add a search filter based on building identifier. More than one building *Identifier* filter can be applied per request.

#### Parameters:

- **buildingId**

A building *Identifier*. When a filter is specified, the result items will be limited to the buildings with identifiers defined in the filter. The *Identifiers* from [ARBuildingInfo](#) and [MapBuildingObject](#) are supported.

#### Returns:

The `HereRequest`.

#### Throws:

- **HereRequest.UnsupportedFilterException**

Filter not applied because *Identifier* does not contain a building ID.

#### See also:

[getIdentifier\(\)](#)

[getIdentifier\(\)](#)

```
public HereRequest addBuildingFilter (String buildingId)
```

Sets a search filter based on building identifier. More than one building identifier filter can be applied per request.

The building identifier can also be retrieved using [addReference\(String\)](#) and [getReference\(String\)](#) (or [addReference\(String\)](#) and [getReference\(String\)](#)).

#### Parameters:

- **buildingId**

A building identifier. When a filter is specified, the result items will be limited to the buildings with identifiers defined in the filter.

#### Returns:

The HereRequest.

**See also:**

*BUILDING\_ID\_REFERENCE\_NAME*

*addReference(String)*

*getReference(String)*

*addReference(String)*

*getReference(String)*

```
public ErrorCode execute (ResultListener<DiscoveryResultPage> listener)
```

Executes an asynchronous request.

**Parameters:**

- **listener**  
A *ResultListener* passed along with the request to monitor progress

**Returns:**

The *ErrorCode* representing an appropriate result

```
public HereRequest setCategoryFilter (CategoryFilter filter)
```

Sets a search filter based on categories.

**Parameters:**

- **filter**  
A *CategoryFilter* representing the category filter. When a *CategoryFilter* is specified, the result items will be limited to the categories defined in the filter.

**Returns:**

The *HereRequest*.

```
public HereRequest setSearchCenter (GeoCoordinate center)
```

Sets the search center.

**Parameters:**

- **center**  
The *GeoCoordinate* representing the location context used to search for nearby places.

**Returns:**

The *HereRequest*.

## UnsupportedFilterException

The class *UnsupportedFilterException* is a member of *com.here.android.mpa.search.HereRequest*.

### Class Summary

public static class **HereRequest.UnsupportedFilterException**

extends *java.lang.Exception*, *java.lang.Throwable*, *java.lang.Object*

Thrown when a building filter is unsupported because the building identifier is missing or malformed.

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 1124: Constructors in *UnsupportedFilterException*

Constructors
<i>UnsupportedFilterException</i> (String detailMessage)

### Class Details

Thrown when a building filter is unsupported because the building identifier is missing or malformed.

### Constructor Details

**UnsupportedFilterException** (String detailMessage)

Parameters:

- detailMessage

## ImageMedia

The class *ImageMedia* is a member of *com.here.android.mpa.search* .

### Class Summary

public final class **ImageMedia**

extends *com.here.android.mpa.search.Media*, *java.lang.Object*

Represents image content related to a *Place*.

[For complete information, see the section [Class Details](#)]

See also:

[getImages\(\)](#)

## Method Summary

Table 1125: Methods in ImageMedia

Methods
<code>public boolean equals (Object obj)</code>
<code>public String getDimensionHref (int width, int height)</code> Get the HREF to retrieve an image with specific width-height dimensions.
<code>public String getId ()</code> Gets the unique identifier for the Image .
<code>public String getUrl ()</code> Gets the String representation of the URL for the source of the image file.
<code>public UserLink getUser ()</code> Gets the details of the User who contributed the Image .
<code>public int hashCode ()</code>

## Class Details

Represents image content related to a [Place](#).

See also:

[getImages\(\)](#)

## Method Details

`public boolean equals (Object obj)`

Parameters:

- `obj`

`public String getDimensionHref (int width, int height)`

Get the HREF to retrieve an image with specific width-height dimensions. A HTTP request using this HREF will return the image data.

Parameters:

- `width`  
The image width.
- `height`  
The image height.

Returns:

The HREF to retrieve the image with the specified width-height dimensions. Can be null if an image with the specified dimensions is unavailable.

**See also:**

[\*addImageDimensions\(int, int\)\*](#)

```
public String getId ()
```

Gets the unique identifier for the `Image` .

Note: an ID for an `Image` is optional, so a call to this method could return `null` .

**Returns:**

The ID (could be `null`)

```
public String getUrl ()
```

Gets the `String` representation of the URL for the source of the image file.

**Returns:**

The URL

```
public UserLink getUser ()
```

Gets the details of the `User` who contributed the `Image` .

Note: user contribution for an `Image` is optional, so a call to this method could return `null` .

**Returns:**

The `User` who contributed the `Image` (could be `null`)

```
public int hashCode ()
```

## Link

The class `Link` is a member of `com.here.android.mpa.search` .

### Class Summary

```
public class Link
```

```
extends java.lang.Object
```

Represents a `Link` indicating that the application must make another request to retrieve the desired resource.

[For complete information, see the section [Class Details](#)]

## Method Summary

Table 1126: Methods in Link

Methods
<pre>public boolean equals (Object obj)</pre> <p>For documentation, see <i>java.lang.Object</i></p>
<pre>public String getIconUrl ()</pre> <p>Gets the URL to retrieve the icon for the resource to which the Link refers.</p>
<pre>public String getId ()</pre> <p>Gets the unique identifier for the resource to which the Link refers.</p>
<pre>public String getTitle ()</pre> <p>Gets the localized title for the resource to which the Link refers.</p>
<pre>public int hashCode ()</pre> <p>For documentation, see <i>java.lang.Object</i></p>

## Class Details

Represents a Link indicating that the application must make another request to retrieve the desired resource.

Note: a Link contains metadata about the linked resource.

## Method Details

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

### Parameters:

- `obj`

```
public String getIconUrl ()
```

Gets the URL to retrieve the icon for the resource to which the Link refers.

Note: an icon URL for a linked object is optional, so a call to this method could return empty .

### Returns:

The icon URL (could be empty)

```
public String getId ()
```

Gets the unique identifier for the resource to which the Link refers.

Note: an ID for a linked object is optional, so a call to this method could return empty .

**Returns:**

The ID (could be empty)

```
public String getTitle ()
```

Gets the localized title for the resource to which the [Link](#) refers. Client devices can display this title within an application.

Note: a title for a linked object is optional, so a call to this method could return `empty` .

**Returns:**

The title (could be empty)

```
public int hashCode ()
```

For documentation, see [java.lang.Object](#)

## Location

The class *Location* is a member of [com.here.android.mpa.search](#) .

### Class Summary

```
public class Location
```

```
extends java.lang.Object
```

Represents the physical location of a [Place](#).

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 1127: Constructors in Location

Constructors
<p><a href="#">Location</a> (<a href="#">GeoCoordinate</a> coordinate)</p> <p>Construct a <a href="#">Location</a> with a initial <a href="#">GeoCoordinate</a> .</p>

### Method Summary

Table 1128: Methods in Location

Methods
<p>public boolean <a href="#">equals</a> (Object obj)</p>

## Methods

```
public java.util.List <NavigationPosition> getAccessPoints ()
```

Get an array of *NavigationPosition* objects representing access points to the location.

```
public Address getAddress ()
```

Gets the *Address* for the *Location* .

```
public GeoBoundingBox getBoundingBox ()
```

Gets the *GeoBoundingBox* representing the map view bounding box for the *Location*.

```
public GeoCoordinate getCoordinate ()
```

Gets the *GeoCoordinate* indicating where the map marker for the *Location* is rendered.

```
public String getId ()
```

**Deprecated:** As of SDK 3.3, this method is deprecated and always returns null.

Gets the `java.lang.String` representation of the unique ID for the *Location*.

```
public String getReference (String name)
```

Get the reference identifier for a specific domain.

```
public TimeZone getTimeZone ()
```

Get the time zone for the *Location* .

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public String toString ()
```

## Class Details

Represents the physical location of a *Place*.

## Constructor Details

### Location (*GeoCoordinate* coordinate)

Construct a *Location* with a initial *GeoCoordinate* .

#### Parameters:

- **coordinate**  
Initial location coordinate.

## Method Details

```
public boolean equals (Object obj)
```

#### Parameters:

- **obj**

```
public java.util.List <NavigationPosition> getAccessPoints ()
```

Get an array of *NavigationPosition* objects representing access points to the location. The *NavigationPosition* object should be used as navigablePosition of a *RouteWaypoint* when calculating route to the location. For example, An airport might have road access point for car routing and public transport access points for public transport routing.

**Returns:**

The array of *NavigationPosition*.

```
public Address getAddress ()
```

Gets the *Address* for the Location .

**Returns:**

The *Address*, or null if unavailable

```
public GeoBoundingBox getBoundingBox ()
```

Gets the *GeoBoundingBox* representing the map view bounding box for the *Location*.

**Returns:**

The *GeoBoundingBox*, or null if unavailable

```
public GeoCoordinate getCoordinate ()
```

Gets the *GeoCoordinate* indicating where the map marker for the *Location* is rendered. If you want to create a route to this location please use this property for *RouteWaypoint* creation. This is referred to as originalPosition in *RouteWaypoint*.

**Returns:**

The *GeoCoordinate*, or null if unavailable

```
public String getId ()
```

**Deprecated:** As of SDK 3.3, this method is deprecated and always returns null.

Gets the java.lang.String representation of the unique ID for the *Location*.

**Returns:**

The Location ID. As of 3.3, returns null.

```
public String getReference (String name)
```

Get the reference identifier for a specific domain. For example, a place can have a reference to an extruded building object in the map. The reference identifier can be retrieved by calling this method with name `BUILDING_ID_REFERENCE_NAME`.

NOTE: A reference will not be returned if it has not been added to the request using `PlaceRequest#addReference(String)`.

**Parameters:**

- **name**  
The reference name.

**Returns:**

The reference identifier. If the reference identifier does not exist, an empty String is returned.

```
public TimeZone getTimeZone ()
```

Get the time zone for the Location.

**Returns:**

TimeZone or null if unavailable

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public String toString ()
```

## Media

The class *Media* is a member of [com.here.android.mpa.search](#).

### Class Summary

```
public abstract class Media
```

```
extends java.lang.Object
```

Represents the base class for additional rich content about a *Place*.

[For complete information, see the section [Class Details](#)]

## Nested Class Summary

Table 1129: Nested Classes in Media

Nested Classes
<p>public static final enumeration <a href="#">Media.Type</a></p> <p>Represents values describing supported <a href="#">Media</a> types for a <a href="#">Place</a>.</p>

## Method Summary

Table 1130: Methods in Media

Methods
<p>public boolean <a href="#">equals</a> (Object obj)</p> <p>For documentation, see <a href="#">java.lang.Object</a></p>
<p>public String <a href="#">getAttributionText</a> ()</p> <p>Gets the String representation of the attribution text for the <a href="#">Media</a> , according to the terms and conditions of the originating source.</p>
<p>public <a href="#">SupplierLink</a> <a href="#">getSupplier</a> ()</p> <p>Gets the <a href="#">Link</a> to a resource representing the supplier of the <a href="#">Media</a> (the object provides details about the origin of the information).</p>
<p>public <a href="#">Type</a> <a href="#">getType</a> ()</p> <p>Gets the specialized <a href="#">Type</a> for the <a href="#">Media</a> .</p>
<p>protected String <a href="#">getUrl</a> ()</p>
<p>public <a href="#">ViaLink</a> <a href="#">getVia</a> ()</p> <p>Gets the <a href="#">Link</a> to the origin of the <a href="#">Media</a> , typically a website of the supplier.</p>
<p>public int <a href="#">hashCode</a> ()</p> <p>For documentation, see <a href="#">java.lang.Object</a></p>

## Class Details

Represents the base class for additional rich content about a [Place](#).

The following specialized content types might be available:

- Editorial content
- Image content
- Review content

## Method Details

public boolean [equals](#) (Object obj)

For documentation, see [java.lang.Object](#)

Parameters:

- `obj`

```
public String getAttributionText ()
```

Gets the `String` representation of the attribution text for the `Media` , according to the terms and conditions of the originating source.

**Returns:**

The attribution text

```
public SupplierLink getSupplier ()
```

Gets the `Link` to a resource representing the supplier of the `Media` (the object provides details about the origin of the information).

**Returns:**

The supplier `Link`

```
public Type getType ()
```

Gets the specialized `Type` for the `Media` .

**Returns:**

The `Type`

```
protected String getUrl ()
```

```
public ViaLink getVia ()
```

Gets the `Link` to the origin of the `Media` , typically a website of the supplier.

**Returns:**

The via `Link`

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## Type

The enumeration `Type` is a member of *com.here.android.mpa.search.Media*.

## Enumeration Summary

public static final enumeration **Media.Type**

*extends* *java.lang.Enum*, *java.lang.Object*

Represents values describing supported *Media* types for a *Place*.

[For complete information, see the section *Enumeration Details*]

## Enum Constant Summary

Table 1131: Enum Constants in Type

Fields
<p>public static final <i>Type</i> <b>UNKNOWN</b></p> <p>Unknown content.</p>
<p>public static final <i>Type</i> <b>EDITORIAL</b></p> <p>Editorial content.</p>
<p>public static final <i>Type</i> <b>IMAGE</b></p> <p>Image content.</p>
<p>public static final <i>Type</i> <b>RATING</b></p> <p>Rating content.</p>
<p>public static final <i>Type</i> <b>REVIEW</b></p> <p>Review content.</p>

## Method Summary

Table 1132: Methods in Type

Methods
<p>public static <i>Type</i> <b>valueOf</b> (String name)</p> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<p>public static <i>Media.Type[]</i> <b>values</b> ()</p> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Represents values describing supported *Media* types for a *Place*.

## Enum Constant Details

public static final *Type* **UNKNOWN**

Unknown content.

```
public static final Type EDITORIAL
```

Editorial content.

```
public static final Type IMAGE
```

Image content.

```
public static final Type RATING
```

Rating content.

```
public static final Type REVIEW
```

Review content.

## Method Details

```
public static Type valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static Media.Type[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## MediaCollectionPage<T>

The class *MediaCollectionPage<T>* is a member of [com.here.android.mpa.search](#) .

### Type Parameters:

- **T**

## Class Summary

```
public final class MediaCollectionPage
```

```
extends java.lang.Object
```

Represents a base class for a paginateable collection of *Media* objects of a specific type.

[For complete information, see the section [Class Details](#)]

## Method Summary

Table 1133: Methods in `MediaCollectionPage<T>`

Methods
<pre>public boolean equals (Object obj)</pre> <p>For documentation, see <i>java.lang.Object</i></p>
<pre>public int getAvailable ()</pre> <p>Gets the total number of available <i>Media</i> items within the <code>MediaCollectionPage</code> .</p>
<pre>public java.util.List &lt;Media&gt; getItems ()</pre> <p>Gets the list of <i>Media</i> items from the current page of the collection.</p>
<pre>public MediaCollectionPageRequest&lt;T&gt; getNextPageRequest ()</pre> <p>Gets the <i>MediaCollectionPageRequest</i> for requesting the next page of the <code>MediaCollectionPage</code> .</p>
<pre>public int getOffsetCount ()</pre> <p>Gets the collection offset count for the current page of the <code>MediaCollectionPage</code> .</p>
<pre>public Type getType ()</pre> <p>Gets the specialized <i>Media.Type</i> for the <i>Media</i> objects contained within the <code>MediaCollectionPage</code> .</p>
<pre>public int hashCode ()</pre> <p>For documentation, see <i>java.lang.Object</i></p>
<pre>public boolean removeItem (Media item)</pre> <p>Remove <i>Media</i> items from the current page of the collection.</p>

## Class Details

Represents a base class for a paginateable collection of *Media* objects of a specific type.

Note: each collection contains objects of one *Media.Type*.

## Method Details

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

**Parameters:**

- `obj`

```
public int getAvailable ()
```

Gets the total number of available *Media* items within the `MediaCollectionPage` .

**Returns:**

The number of available items

```
public java.util.List <Media> getItems ()
```

Gets the list of *Media* items from the current page of the collection. The type of each object in the list depends on the *MediaCollectionPage*.

Note: if a collection is empty, the items attribute is not present and this method will return empty.

**Returns:**

The list of *Media* objects (could be empty)

```
public MediaCollectionPageRequest<T> getNextPageRequest ()
```

Gets the *MediaCollectionPageRequest* for requesting the next page of the *MediaCollectionPage*.

**Returns:**

The *MediaCollectionPageRequest*

```
public int getOffsetCount ()
```

Gets the collection offset count for the current page of the *MediaCollectionPage*.

For the first page of results, the offset count is 0. Following any call to *getNextPageRequest()*, the offset count will be greater than 0.

**Returns:**

The collection offset count

```
public Type getType ()
```

Gets the specialized *Media.Type* for the *Media* objects contained within the *MediaCollectionPage*.

**Returns:**

The *Media.Type*

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public boolean removeItem (Media item)
```

Remove *Media* items from the current page of the collection.

**Parameters:**

- **item**

The `Media` item to be removed from the current collection page.

**Returns:**

Returns `true` if the `Media` object is successfully removed from the page.

## MediaCollectionPageRequest<T>

The class `MediaCollectionPageRequest<T>` is a member of `com.here.android.mpa.search`.

**Type Parameters:**

- `T`

### Class Summary

public class **MediaCollectionPageRequest**

extends `com.here.android.mpa.search.Request`, `java.lang.Object`

Represents an extended `Request` used to retrieve `MediaCollectionPage` information for a specific type of `Media` associated with a `Place`, by way of Places search services.

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 1134: Constructors in `MediaCollectionPageRequest<T>`

#### Constructors

`MediaCollectionPageRequest` (<any> impl)

### Method Summary

Table 1135: Methods in `MediaCollectionPageRequest<T>`

#### Methods

public `ErrorCode` `execute` (`ResultListener<MediaCollectionPage<T>` `eventListener`)

Executes an asynchronous request.

This method overrides `search.Request.execute(ResultListener)`

### Class Details

Represents an extended `Request` used to retrieve `MediaCollectionPage` information for a specific type of `Media` associated with a `Place`, by way of Places search services.

Note: the response to a `MediaCollectionPageRequest` is a `MediaCollectionPage` object.

## Constructor Details

`MediaCollectionPageRequest` (<any> impl)

Parameters:

- `impl`

## Method Details

`public ErrorCode execute (ResultListener<MediaCollectionPage<T> eventListener)`

Executes an asynchronous request.

This method overrides `search.Request.execute(ResultListener)`

Parameters:

- `eventListener`

# NavigationPosition

The class `NavigationPosition` is a member of `com.here.android.mpa.search`.

## Class Summary

public class **NavigationPosition**

extends `java.lang.Object`

Represents a position that should be used when calculating routes for navigation.

[For complete information, see the section [Class Details](#)]

## Method Summary

Table 1136: Methods in `NavigationPosition`

Methods
<p>public boolean <code>equals</code> (Object obj)</p> <p>For documentation, see <code>java.lang.Object</code></p>
<p>public String <code>getAccessType</code> ()</p> <p>Returns the type of access as a String.</p>
<p>public <code>GeoCoordinate</code> <code>getCoordinate</code> ()</p> <p>Returns the <code>GeoCoordinate</code> of the location This coordinate should be used as <code>navigablePosition</code> of a <code>RouteWaypoint</code> when calculating route.</p>
<p>public int <code>hashCode</code> ()</p> <p>For documentation, see <code>java.lang.Object</code></p>

## Class Details

Represents a position that should be used when calculating routes for navigation.

## Method Details

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

### Parameters:

- `obj`

```
public String getAccessType ()
```

Returns the type of access as a `String`. The access type 'road' is used for car routing. It is important to match the `accessType` with the type of routing you are performing. For example, use objects with an `accessType` of "road" for car routing.

### Returns:

The type of access as a `String`.

### See also:

```
public GeoCoordinate getCoordinate ()
```

Returns the [GeoCoordinate](#) of the location. This coordinate should be used as `navigablePosition` of a [RouteWaypoint](#) when calculating route.

### Returns:

The [GeoCoordinate](#) of the location.

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## Place

The class *Place* is a member of [com.here.android.mpa.search](#).

## Class Summary

```
public class Place
```

```
extends java.lang.Object
```

Represents a set of data about a physical place.

[For complete information, see the section [Class Details](#)]

See also:

[Location](#)

## Field Summary

Table 1137: Fields in Place

Fields
<pre>public static final String PUBLIC_TRANSPORT_RELATED_LINK_NAME</pre> <p>Key name to get the public-transport <a href="#">DiscoveryLink</a> (from the related attributes) for this <a href="#">Place</a> .</p>
<pre>public static final String RECOMMENDED_RELATED_LINK_NAME</pre> <p>Key name to get the recommended <a href="#">DiscoveryLink</a> (from the related attributes) for this <a href="#">Place</a> .</p>

## Method Summary

Table 1138: Methods in Place

Methods
<pre>public boolean equals (Object obj)</pre> <p>For documentation, see <a href="#">java.lang.Object</a></p>
<pre>public Map getAlternativeNames ()</pre> <p>Gets the alternative names for the <a href="#">Place</a> .</p>
<pre>public List getAlternativeReferenceIds (String name)</pre> <p>Get a list of alternative identifiers of the same reference identifier for a specific domain.</p>
<pre>public String getAttributionText ()</pre> <p>Gets the <a href="#">String</a> representation of the attribution text for the <a href="#">Place</a> .</p>
<pre>public java.util.List &lt;Category&gt; getCategories ()</pre> <p>Gets the list of <a href="#">Category</a> objects assigned to the <a href="#">Place</a> .</p>
<pre>public java.util.List &lt;ContactDetail&gt; getContacts ()</pre> <p>Gets the list of <a href="#">Contact</a> objects for the <a href="#">Place</a> .</p>
<pre>public MediaCollectionPage&lt;EditorialMedia&gt; getEditorials ()</pre> <p>Gets the <a href="#">MediaCollectionPage</a> containing <a href="#">EditorialMedia</a> content for the <a href="#">Place</a> .</p>

## Methods

```
public java.util.List <ExtendedAttribute> getExtendedAttributes ()
```

Gets additional information about a `Place`, a list of `ExtendedAttribute` objects that can include information such as:

- `payment` - A list of available payment methods (such as cash, credit card, direct debit, etc.)
- `openingHours` - A list of hours during which the place is open for business
- `annualClosings` - A description of annual closing dates such as holidays or other special occasions
- `price` - A price list
- `nearestLandmark` - A description of the nearest landmark
- `languagesSpoken` - A list of the languages that are spoken at the place
- `availableParking` - A list of parking options available nearby
- `smoking` - Whether smoking is allowed
- `disabledAccess` - Whether disabled access is available
- `transitLines` - A list of available public transport transit lines
- `departures` - A list of next departures for available public transport transit lines
- `blindGuide` - Whether a public transport stop has blind guides ('tactile paving').
- `elevator` - Whether a public transport stop has elevator
- `escalator` - Whether a public transport stop has escalator

```
public String getIconUrl ()
```

Gets the URL to retrieve the icon that best represents the `Place`.

```
public String getId ()
```

Gets the unique identifier for the `Place`.

```
public MediaCollectionPage<ImageMedia> getImages ()
```

Gets the `MediaCollectionPage` containing `ImageMedia` content for the `Place`.

```
public Location getLocation ()
```

Gets the physical `Location` of the `Place`.

```
public String getName ()
```

Gets the display name for the `Place`.

```
public MediaCollectionPage<RatingMedia> getRatings ()
```

Gets the `MediaCollectionPage` containing `RatingMedia` content for the `Place`.

```
public String getReference (String name)
```

Get the reference identifier for a specific domain.

```
public java.util.Map <java.lang.String, com.here.android.mpa.search.DiscoveryLink> getRelated ()
```

Gets the related places (where available) that might also interest an application user viewing information for the `Place`.

```
public ReportingLink getReportingLink ()
```

Gets the link for getting options for reporting an place because, for example, if it contains inappropriate content or the place does not exist.

```
public PlaceLink getResidingVenue ()
```

Gets the venue (if available) where the `Place` resides.

## Methods

```
public MediaCollectionPage<ReviewMedia> getReviews ()
```

Gets the *MediaCollectionPage* containing *ReviewMedia* content for the *Place* .

```
public SupplierLink getSupplier ()
```

Gets the *Link* for the *Place* supplier.

```
public Ratings getUserRatings ()
```

Gets the HERE.com user-supplied *Ratings* for the *Place* .

```
public String getViewUri ()
```

Gets the *String* representation of the URI for a user-viewable representation of the *Place* .

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## Class Details

Represents a set of data about a physical place.

A *Place* acts as a container for various information about a place, which itself is a point of interest such as a popular restaurant, a park, or someone's home.

Note: a *Place* can contain attributes, collections of media about the place, and key-value pairs of related places.

**See also:**

[Location](#)

## Field Details

```
public static final String PUBLIC_TRANSPORT_RELATED_LINK_NAME
```

Key name to get the public-transport *DiscoveryLink* (from the related attributes) for this *Place* .

```
public static final String RECOMMENDED_RELATED_LINK_NAME
```

Key name to get the recommended *DiscoveryLink* (from the related attributes) for this *Place* .

## Method Details

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

**Parameters:**

- `obj`

```
public Map getAlternativeNames ()
```

Gets the alternative names for the `Place`. The returned `Map` collection is keyed using a language code (eg. "en").

Note: an alternative name is optional, so a call to this method could return empty.

**Returns:**

The alternative names (could be empty) collection keyed using a language code (eg. "en").

```
public List getAlternativeReferenceIds (String name)
```

Get a list of alternative identifiers of the same reference identifier for a specific domain. For example, a venue content identifier reference can have alternative identifiers. The list of alternative identifiers can be retrieved by calling this method with name "venues.content".

NOTE: A reference will not be returned if it has not been queried with the `PlaceRequest#addReference(String)` function.

**Parameters:**

- **name**  
The reference name.

**Returns:**

The list of alternative identifiers. If alternative identifiers are not defined, an empty list is returned.

```
public String getAttributionText ()
```

Gets the `String` representation of the attribution text for the `Place`.

Note: attribution text for a `Place` is optional, so a call to this method could return empty.

**Returns:**

The attribution text (could be empty)

```
public java.util.List <Category> getCategories ()
```

Gets the list of `Category` objects assigned to the `Place`.

Note: categories maybe optional (especially when offline), so a call to this method could return empty.

**Returns:**

The list of `Category` objects

```
public java.util.List <ContactDetail> getContacts ()
```

Gets the list of `Contact` objects for the `Place`.

Note: contact information for a `Place` is optional, so a call to this method could return empty.

**Returns:**

The list of Contact objects (could be empty)

```
public MediaCollectionPage<EditorialMedia> getEditorials ()
```

Gets the *MediaCollectionPage* containing *EditorialMedia* content for the Place .

Note: editorial content for a Place is optional, so a call to this method could return null .

**Returns:**

The *MediaCollectionPage* (could be null)

```
public java.util.List <ExtendedAttribute> getExtendedAttributes ()
```

Gets additional information about a Place , a list of *ExtendedAttribute* objects that can include information such as:

- payment - A list of available payment methods (such as cash, credit card, direct debit, etc.)
- openingHours - A list of hours during which the place is open for business
- annualClosings - A description of annual closing dates such as holidays or other special occasions
- price - A price list
- nearestLandmark - A description of the nearest landmark
- languagesSpoken - A list of the languages that are spoken at the place
- availableParking - A list of parking options available nearby
- smoking - Whether smoking is allowed
- disabledAccess - Whether disabled access is available
- transitLines - A list of available public transport transit lines
- departures - A list of next departures for available public transport transit lines
- blindGuide - Whether a public transport stop has blind guides ('tactile paving').
- elevator - Whether a public transport stop has elevator
- escalator - Whether a public transport stop has escalator

For transitLines *TRANSIT\_LINES\_EXTENDED\_ATTRIBUTE\_ID* and departures *TRANSIT\_DEPARTURES\_EXTENDED\_ATTRIBUTE\_ID* attributes, the returned object can be cast to *TransitLinesAttribute* and *TransitDeparturesAttribute* respectively. Which will allow further related attributes to be retrieved.

Transit lines and departures information may not always be available in all transit station/stop locations. However, this information is available using the PUBLIC\_TRANSPORT\_RELATED\_LINK\_NAME *DiscoveryLink* from *getRelated()*.

**Returns:**

The list of *ExtendedAttribute* objects

**See also:**

[TransitLinesAttribute](#)

[TransitDeparturesAttribute](#)

```
public String getIconUrl ()
```

Gets the URL to retrieve the icon that best represents the Place .

**Returns:**

The icon URL.

```
public String getId ()
```

Gets the unique identifier for the Place . Applications that want to keep a reference to a place should store the ID for subsequent linking to additional resources.

**Returns:**

The ID

```
public MediaCollectionPage<ImageMedia> getImages ()
```

Gets the *MediaCollectionPage* containing *ImageMedia* content for the Place .

Note: image content for a Place is optional, so a call to this method could return null .

**Returns:**

The *MediaCollectionPage* (could be null)

```
public Location getLocation ()
```

Gets the physical Location of the Place .

**Returns:**

The Location

```
public String getName ()
```

Gets the display name for the Place .

**Returns:**

The Place name

```
public MediaCollectionPage<RatingMedia> getRatings ()
```

Gets the *MediaCollectionPage* containing *RatingMedia* content for the Place .

Note: rating content for a Place is optional, so a call to this method could return null .

**Returns:**

The *MediaCollectionPage* (could be null)

```
public String getReference (String name)
```

Get the reference identifier for a specific domain. For example, a place can have a reference to an extruded building object in the map. The reference identifier can be retrieved by calling this method with name 'building'.

NOTE: A reference will not be returned if it has not been queried with the `PlaceRequest#addReference(String)` function.

**Parameters:**

- **name**  
The reference name.

**Returns:**

The reference identifier. If the reference identifier does not exist, an empty String is returned.

```
public java.util.Map <java.lang.String,  
com.here.android.mpa.search.DiscoveryLink> getRelated ()
```

Gets the related places (where available) that might also interest an application user viewing information for the `Place`. The returned `Map` is keyed by a title for the related places (e.g. `PUBLIC_TRANSPORT_RELATED_LINK_NAME`), while the associated value is a link to a page of related places.

Note: if there are no related places, the attribute is not present and this method will return an empty `Map`.

**Returns:**

The `java.util.Map` of key-value elements representing the collection of links to places related to the `Place` (could be empty)

```
public ReportingLink getReportingLink ()
```

Gets the link for getting options for reporting an place because, for example, if it contains inappropriate content or the place does not exists.

**Returns:**

The report link, can be null.

```
public PlaceLink getResidingVenue ()
```

Gets the venue (if available) where the `Place` resides. This might be of interest to an application user viewing information for the `Place`.

**Returns:**

The `PlaceLink` (could be null)

```
public MediaCollectionPage<ReviewMedia> getReviews ()
```

Gets the *MediaCollectionPage* containing *ReviewMedia* content for the *Place* .

Note: review content for a *Place* is optional, so a call to this method could return `null` .

**Returns:**

The *MediaCollectionPage* (could be `null`)

```
public SupplierLink getSupplier ()
```

Gets the *Link* for the *Place* supplier. A supplier link extends the standard link object with an optional icon link pointing to the supplier's brand icon.

Note: a *Link* for a *Place* supplier is optional, so a call to this method could return `null` .

**Returns:**

The supplier *Link* (could be `null`)

```
public Ratings getUserRatings ()
```

Gets the HERE.com user-supplied *Ratings* for the *Place* .

**Returns:**

The HERE.com user-supplied *Ratings* for the *Place*.

```
public String getViewUri ()
```

Gets the *String* representation of the URI for a user-viewable representation of the *Place* . Applications must provide at least one such URI for every *Place* they fetch.

**Returns:**

The URI to a viewable site for the *Place*

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## PlaceLink

The class *PlaceLink* is a member of [com.here.android.mpa.search](http://com.here.android.mpa.search) .

## Class Summary

public class **PlaceLink**

extends *com.here.android.mpa.search.DiscoveryResult*, *com.here.android.mpa.search.Link*, *java.lang.Object*

Represents discovery information about a Place .

[For complete information, see the section [Class Details](#)]

## Method Summary

Table 1139: Methods in PlaceLink

Methods
<p>public boolean <b>equals</b> (Object obj)</p> <p>For documentation, see <i>java.lang.Object</i></p>
<p>public List <b>getAlternativeReferencelds</b> (String name)</p> <p>Get a list of alternative identifiers of the same reference identifier for a specific domain.</p>
<p>public double <b>getAverageRating</b> ()</p> <p>Gets the average rating for a <i>Place</i>.</p>
<p>public <i>GeoBoundingBox</i> <b>getBoundingBox</b> ()</p> <p>Gets the <i>GeoBoundingBox</i> describing a range of coordinates that correspond to the <i>Place</i>.</p>
<p>public <i>Category</i> <b>getCategory</b> ()</p> <p>Gets the <i>Category</i> for the <i>Place</i>.</p>
<p>public <i>PlaceRequest</i> <b>getDetailsRequest</b> ()</p> <p>Creates a request to retrieve the <i>Place</i> details.</p>
<p>public double <b>getDistance</b> ()</p> <p>Gets the distance to the <i>Place</i>, in meters.</p>
<p>public <i>GeoCoordinate</i> <b>getPosition</b> ()</p> <p>Gets the <i>GeoCoordinate</i> representing the geographical position of the <i>Place</i>.</p>
<p>public String <b>getReference</b> (String name)</p> <p>Get the reference identifier for a specific domain.</p>
<p>public int <b>hashCode</b> ()</p> <p>For documentation, see <i>java.lang.Object</i></p>
<p>public boolean <b>isSponsored</b> ()</p> <p>Determines whether the search result is sponsored.</p>

## Class Details

Represents discovery information about a Place .

Note: detailed Place information is retrieved by way of the [PlaceRequest](#) returned from a call to the [getDetailsRequest\(\)](#) method.

### Method Details

```
public boolean equals (Object obj)
```

For documentation, see [java.lang.Object](#)

#### Parameters:

- **obj**

```
public List getAlternativeReferenceIds (String name)
```

Get a list of alternative identifiers of the same reference identifier for a specific domain. For example, a venue content identifier reference can have alternative identifiers. The list of alternative identifiers can be retrieved by calling this method with name "venues.content".

NOTE: A reference will not be returned if it has not been queried with the [DiscoveryRequest#addReference\(String\)](#) function.

#### Parameters:

- **name**  
The reference name.

#### Returns:

The list of alternative identifiers. If alternative identifiers are not

```
public double getAverageRating ()
```

Gets the average rating for a [Place](#).

Note: the average rating is set to zero for places with no ratings.

#### Returns:

The average rating

```
public GeoBoundingBox getBoundingBox ()
```

Gets the [GeoBoundingBox](#) describing a range of coordinates that correspond to the [Place](#). Typically, bounding boxes are associated with places such as cities and countries.

This bounding box does not necessarily have the location from [getPosition\(\)](#) as its center. For example, if the search was performed with a street name, this bounding box may be one that contains the entire street, while [getPosition\(\)](#) can be any point along the street.

Note: bounding box information for a Place is optional, so a call to this method could return null .

#### Returns:

The `GeoBoundingBox` containing the `Place` (could be `null`)

```
public Category getCategory ()
```

Gets the `Category` for the `Place`.

Note: a category is optional (especially when offline), so a call to this method could return `null` .

**Returns:**

The `Category`

```
public PlaceRequest getDetailsRequest ()
```

Creates a request to retrieve the `Place` details. Each call to this method creates a new request object.

**Returns:**

The `PlaceRequest` to retrieve the `Place` details

```
public double getDistance ()
```

Gets the distance to the `Place`, in meters.

Note: When the distance is set to zero, no distance value is available. The application is expected to perform the calculation if a distance is required (use `distanceTo(GeoCoordinate)` along with the user current position via `getPosition()`).

**Returns:**

The distance

```
public GeoCoordinate getPosition ()
```

Gets the `GeoCoordinate` representing the geographical position of the `Place`.

**Returns:**

The `GeoCoordinate`

```
public String getReference (String name)
```

Get the reference identifier for a specific domain. For example, a place can have a reference to an extruded building object in the map. The reference identifier can be retrieved by calling this method with name `BUILDING_ID_REFERENCE_NAME` .

NOTE: A reference will not be returned if it has not been added to the request using `DiscoveryRequest#addReference(String)` .

**Parameters:**

- `name`

The reference name.

**Returns:**

The reference identifier. If the reference identifier does not exist, an empty String is returned.

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public boolean isSponsored ()
```

Determines whether the search result is sponsored. Applications must provide some visual differentiation between sponsored search results and regular search results.

**Returns:**

True if the search result is sponsored, false otherwise

## PlaceRequest

The class *PlaceRequest* is a member of [com.here.android.mpa.search](#).

### Class Summary

```
public class PlaceRequest
```

extends [com.here.android.mpa.search.Request](#), [java.lang.Object](#)

Represents an extended Request used to retrieve a Place object by way of Places search services.

[For complete information, see the section [Class Details](#)]

**See also:**

[ExploreRequest](#)

[HereRequest](#)

[SearchRequest](#)

### Constructor Summary

Table 1140: Constructors in PlaceRequest

Constructors
<p><a href="#">PlaceRequest</a> (<a href="#">PlaceLink</a> placeLink)</p> <p>Default constructor.</p>
<p><a href="#">PlaceRequest</a> (String source, String id)</p> <p>Creates a PlaceRequest based on an external reference source and identifier.</p>

## Method Summary

Table 1141: Methods in PlaceRequest

Methods
<pre>public void <b>addContent</b> (String placeContent)</pre> <p>Requests specific <i>EditorialMedia</i> by providing one of the available place content sources.</p>
<pre>public void <b>addImageDimensions</b> (int width, int height)</pre> <p>Request Image Media with specific dimensions.</p>
<pre>public <i>PlaceRequest</i> <b>addReference</b> (String name)</pre> <p>This function adds the name of a requested reference identifiers to be returned in the results.</p>
<pre>public <i>ErrorCode</i> <b>execute</b> (<i>ResultListener</i>&lt;<i>Place</i>&gt; listener)</pre> <p>Executes an asynchronous request.</p>
<pre>public Set <b>getContent</b> ()</pre> <p>Returns the names of requested place content sources that was added using <i>addContent(String)</i>.</p>
<pre>public List <b>getReferences</b> ()</pre> <p>This function returns the names of requested reference identifiers to be returned in the results.</p>
<pre>public <i>RichTextFormatting</i> <b>getRichTextFormatting</b> ()</pre> <p>Gets the current <i>RichTextFormatting</i> type being used in request responses.</p>
<pre>public <i>PlaceRequest</i> <b>setRichTextFormatting</b> (<i>RichTextFormatting</i> value)</pre> <p>Sets a <i>RichTextFormatting</i> to be used in request responses.</p>

## Class Details

Represents an extended *Request* used to retrieve a *Place* object by way of Places search services.

**See also:**

[ExploreRequest](#)

[HereRequest](#)

[SearchRequest](#)

## Constructor Details

**PlaceRequest** (*PlaceLink* placeLink)

Default constructor.

**Parameters:**

- **placeLink**  
A selected *PlaceLink* found using a discovery request.

**PlaceRequest** (String source, String id)

Creates a `PlaceRequest` based on an external reference source and identifier.

## Parameters:

- **source**  
Name of the external reference source.
- **id**  
The identifier of the requested place in external system.

## See also:

[\*addReference\(String\)\*](#)

[\*PVID\\_ID\\_REFERENCE\\_NAME\*](#)

[\*VENUES\\_ID\\_REFERENCE\\_NAME\*](#)

[\*VENUES\\_CONTENT\\_ID\\_REFERENCE\\_NAME\*](#)

[\*VENUES\\_DESTINATION\\_ID\\_REFERENCE\\_NAME\*](#)

[\*VENUES\\_VENUE\\_ID\\_REFERENCE\\_NAME\*](#)

[\*getReference\(String\)\*](#)

[\*getReference\(String\)\*](#)

## Method Details

```
public void addContent (String placeContent)
```

Requests specific [\*EditorialMedia\*](#) by providing one of the available place content sources. Currently only [\*PLACE\\_CONTENT\\_WIKIPEDIA\*](#) is available.

## Parameters:

- **placeContent**  
non-empty name for place content source.

## See also:

[\*PLACE\\_CONTENT\\_WIKIPEDIA\*](#)

[\*getEditorials\(\)\*](#)

[\*EditorialMedia\*](#)

```
public void addImageDimensions (int width, int height)
```

Request Image Media with specific dimensions. At least one of the sizes (width or height) needs to be valid (greater than 0).

## Parameters:

- **width**

Image width (pass 0 for any width)

- **height**

Image height (pass 0 for any height)

```
public PlaceRequest addReference (String name)
```

This function adds the name of a requested reference identifiers to be returned in the results.

For example, to retrieve an POI identifier (pvid), set this value to Request#PVID\_ID\_REFERENCE\_NAME .

**Parameters:**

- **name**

Name of reference identifier to retrieve.

**Returns:**

True if name added, false otherwise.

**See also:**

[PVID\\_ID\\_REFERENCE\\_NAME](#)

[VENUES\\_ID\\_REFERENCE\\_NAME](#)

[VENUES\\_CONTENT\\_ID\\_REFERENCE\\_NAME](#)

[VENUES\\_DESTINATION\\_ID\\_REFERENCE\\_NAME](#)

[VENUES\\_VENUE\\_ID\\_REFERENCE\\_NAME](#)

```
public ErrorCode execute (ResultListener<Place> listener)
```

Executes an asynchronous request.

**Parameters:**

- **listener**

A *ResultListener* passed along with the request to monitor progress

**Returns:**

The *ErrorCode* representing an appropriate result

```
public Set getContent ()
```

Returns the names of requested place content sources that was added using *addContent(String)*.

**Returns:**

non-null list of the content source names.

```
public List getReferences ()
```

This function returns the names of requested reference identifiers to be returned in the results.

**Returns:**

List of the names of reference identifiers to be returned in the result.

```
public RichTextFormatting getRichTextFormatting ()
```

Gets the current *RichTextFormatting* type being used in request responses. The default formatting is *HTML*.

**Returns:**

The current *RichTextFormatting* type

```
public PlaceRequest setRichTextFormatting (RichTextFormatting value)
```

Sets a *RichTextFormatting* to be used in request responses.

**Parameters:**

- **value**  
Desired *RichTextFormatting*

**Returns:**

This *PlaceRequest* object

## RatingMedia

The class *RatingMedia* is a member of [com.here.android.mpa.search](#) .

### Class Summary

```
public class RatingMedia
```

```
extends com.here.android.mpa.search.Media, java.lang.Object
```

Represents rating content about a *Place*.

[For complete information, see the section [Class Details](#)]

**See also:**

[getRatings\(\)](#)

## Method Summary

Table 1142: Methods in RatingMedia

Methods
<pre>public boolean equals (Object obj)</pre> <p>For documentation, see <i>java.lang.Object</i></p>
<pre>public double getAverage ()</pre> <p>Gets the average rating for the <i>Place</i>.</p>
<pre>public int getCount ()</pre> <p>Gets the count of individual contributions that users provided for rating the <i>Place</i>.</p>
<pre>public int hashCode ()</pre> <p>For documentation, see <i>java.lang.Object</i></p>

## Class Details

Represents rating content about a *Place*. Each individual *Rating* contains information about the rating itself, the user who contributed the rating, and a rating that the user offered for the place.

**See also:**

[getRatings\(\)](#)

## Method Details

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

**Parameters:**

- `obj`

```
public double getAverage ()
```

Gets the average rating for the *Place*.

**Returns:**

The average rating

```
public int getCount ()
```

Gets the count of individual contributions that users provided for rating the *Place*.

**Returns:**

The total ratings count

```
public int hashCode ()
```

For documentation, see [java.lang.Object](#)

## Ratings

The class *Ratings* is a member of [com.here.android.mpa.search](#) .

### Class Summary

```
public class Ratings
```

```
extends java.lang.Object
```

Represents a summary of user-supplied ratings for a *Place*.

[For complete information, see the section [Class Details](#)]

**See also:**

[getUserRatings\(\)](#)

### Method Summary

Table 1143: Methods in Ratings

Methods
<pre>public boolean <a href="#">equals</a> (Object obj)</pre> <p>For documentation, see <a href="#">java.lang.Object</a></p>
<pre>public double <a href="#">getAverage</a> ()</pre> <p>Gets the average rating for the <i>Place</i>.</p>
<pre>public int <a href="#">getCount</a> ()</pre> <p>Gets the count of individual contributions that users provided for rating the <i>Place</i>.</p>
<pre>public int <a href="#">hashCode</a> ()</pre> <p>For documentation, see <a href="#">java.lang.Object</a></p>

### Class Details

Represents a summary of user-supplied ratings for a *Place*.

Note: ratings are normalized to values from [0..5], to compensate for potential differences between supplier ratings systems.

**See also:**

[getUserRatings\(\)](#)

## Method Details

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

### Parameters:

- `obj`

```
public double getAverage ()
```

Gets the average rating for the *Place*.

### Returns:

The average rating

```
public int getCount ()
```

Gets the count of individual contributions that users provided for rating the *Place*.

### Returns:

The total ratings count

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## ReportingLink

The class *ReportingLink* is a member of *com.here.android.mpa.search* .

### Class Summary

```
public class ReportingLink
```

```
extends com.here.android.mpa.search.Link, java.lang.Object
```

Represents a *ReportingLink* for getting options for reporting on content if it contains inappropriate content.

[For complete information, see the section *Class Details*]

## Method Summary

Table 1144: Methods in ReportingLink

Methods
<pre>public boolean equals (Object obj)</pre> <p>For documentation, see <i>java.lang.Object</i></p>
<pre>public String getTitle ()</pre> <p>Gets the localized title for the resource to which the Link refers.</p>
<pre>public String getUrl ()</pre> <p>Gets the String representation of the reporting URL</p>
<pre>public int hashCode ()</pre>

## Class Details

Represents a [ReportingLink](#) for getting options for reporting on content if it contains inappropriate content.

## Method Details

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

### Parameters:

- `obj`

```
public String getTitle ()
```

Gets the localized title for the resource to which the Link refers. Client devices can display this title within an application.

Note: a title for a linked object is optional, so a call to this method could return empty .

### Returns:

The title (could be empty)

```
public String getUrl ()
```

Gets the String representation of the reporting URL

### Returns:

The URL

```
public int hashCode ()
```

## Request<T>

The class `Request<T>` is a member of `com.here.android.mpa.search`.

### Type Parameters:

- `T`  
Data type for results

### Class Summary

public abstract class **Request**

*extends java.lang.Object*

Represents a base class for a search request.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 1145: Nested Classes in Request<T>

Nested Classes
public static final enumeration <code>Request.Connectivity</code> Represents values describing possible types of connectivity that the request is performed.

### Field Summary

Table 1146: Fields in Request<T>

Fields
public static final String <code>BUILDING_ID_REFERENCE_NAME</code> Name used to get building identifier references.
public static final String <code>PLACE_CONTENT_WIKIPEDIA</code> Name used to get editorial wikipedia content in place details response.
public static final String <code>PVID_ID_REFERENCE_NAME</code> Name used to get core POI identifier references.
public static final String <code>VENUES_CONTENT_ID_REFERENCE_NAME</code> Name used to get only venues.content identifier references.
public static final String <code>VENUES_DESTINATION_ID_REFERENCE_NAME</code> Name used to get only venues.destination identifier references.
public static final String <code>VENUES_ID_REFERENCE_NAME</code> Name used to get all venues identifier references.

## Fields

public static final String `VENUES_VENUE_ID_REFERENCE_NAME`

Name used to get only venues.venue identifier references.

protected ConnectivityMode `m_connectivityMode`

## Method Summary

Table 1147: Methods in Request<T>

### Methods

protected Request<T> `addReference` (String name)

This function adds the name of a requested reference identifiers to be returned in the results.

public boolean `cancel` ()

Cancels any pending results from an invoked request.

public ErrorCode `execute` (ResultListener<T> eventListener)

Executes an asynchronous request.

protected int `getCollectionSize` ()

Gets the current collection size being used for request responses.

public Connectivity `getConnectivity` ()

This function returns the connectivity of request.

protected List `getReferences` ()

This function returns the names of requested reference identifiers to be returned in the results.

protected Request<T> `setCollectionSize` (int value)

Sets a collection size to be used for request responses.

public void `setConnectivity` (Connectivity connectivity)

Sets the connectivity of request.

protected Request<T> `setMapViewport` (GeoBoundingBox mapViewport)

The map viewport is a bounding box of the map area currently visible to the user.

public Request<T> `setUserAuthentication` (String token)

Some requests, such as when posting images or reviews, applications must provide an OAuth 2.0 bearer token (obtained from HERE Account) to authenticate the user performing the action.

## Class Details

Represents a base class for a search request.

## Field Details

public static final String `BUILDING_ID_REFERENCE_NAME`

Name used to get building identifier references.

Use [addReference\(String\)](#) to be able to retrieve the building identifier from the returned PlaceLink (using [getReference\(String\)](#) ).

The building identifier can also be retrieved using [addReference\(String\)](#) and [getReference\(String\)](#) (or [addReference\(String\)](#) and [getReference\(String\)](#)).

**See also:**

[addReference\(String\)](#)

[getReference\(String\)](#)

[addReference\(String\)](#)

[getReference\(String\)](#)

`public static final String PLACE_CONTENT_WIKIPEDIA`

Name used to get editorial wikipedia content in place details response.

Use [addContent\(String\)](#) to specify `PLACE_CONTENT_WIKIPEDIA` content source in [PlaceRequest](#).

**See also:**

[getContent\(\)](#)

[getEditorials\(\)](#)

[EditorialMedia](#)

`public static final String PVID_ID_REFERENCE_NAME`

Name used to get core POI identifier references.

Use [addReference\(String\)](#) to be able to retrieve the POI identifier from the returned PlaceLink (using [getReference\(String\)](#)).

The POI identifier can also be retrieved using [addReference\(String\)](#) and [getReference\(String\)](#) (or [addReference\(String\)](#) and [getReference\(String\)](#)).

**See also:**

[addReference\(String\)](#)

[getReference\(String\)](#)

[addReference\(String\)](#)

[getReference\(String\)](#)

`public static final String VENUES_CONTENT_ID_REFERENCE_NAME`

Name used to get only venues.content identifier references.

Use [addReference\(String\)](#) to be able to retrieve the venues.content identifier from the returned PlaceLink (using [getReference\(String\)](#) ).

The venues.content identifier can also be retrieved using [addReference\(String\)](#) and [getReference\(String\)](#) (or [addReference\(String\)](#) and [getReference\(String\)](#)).

**See also:**

[addReference\(String\)](#)

[getReference\(String\)](#)

[addReference\(String\)](#)

[getReference\(String\)](#)

**public static final String VENUES\_DESTINATION\_ID\_REFERENCE\_NAME**

Name used to get only venues.destination identifier references.

Use [addReference\(String\)](#) to be able to retrieve the venues.destination identifier from the returned PlaceLink (using [getReference\(String\)](#)).

The venues.destination identifier can also be retrieved using [addReference\(String\)](#) and [getReference\(String\)](#) (or [addReference\(String\)](#) and [getReference\(String\)](#)).

**See also:**

[addReference\(String\)](#)

[getReference\(String\)](#)

[addReference\(String\)](#)

[getReference\(String\)](#)

**public static final String VENUES\_ID\_REFERENCE\_NAME**

Name used to get all venues identifier references.

Use [addReference\(String\)](#) to be able to retrieve all venues identifier from the returned PlaceLink (using [getReference\(String\)](#) ).

The venues identifier can also be retrieved [addReference\(String\)](#) and [getReference\(String\)](#) (or [addReference\(String\)](#) and [getReference\(String\)](#)).

This reference name can be used retrieve all the different venues identifiers, namely:

[VENUES\\_CONTENT\\_ID\\_REFERENCE\\_NAME](#), [VENUES\\_DESTINATION\\_ID\\_REFERENCE\\_NAME](#) and [VENUES\\_VENUE\\_ID\\_REFERENCE\\_NAME](#).

**See also:**

[addReference\(String\)](#)

[getReference\(String\)](#)

[addReference\(String\)](#)

[getReference\(String\)](#)

```
public static final String VENUES_VENUE_ID_REFERENCE_NAME
```

Name used to get only venues.venue identifier references.

Use [addReference\(String\)](#) to be able to retrieve the venues.venue identifier from the returned PlaceLink (using [getReference\(String\)](#)).

The venues.venue identifier can also be retrieved using [addReference\(String\)](#) and [getReference\(String\)](#) (or [addReference\(String\)](#) and [getReference\(String\)](#)).

**See also:**

[addReference\(String\)](#)

[getReference\(String\)](#)

[addReference\(String\)](#)

[getReference\(String\)](#)

```
protected ConnectivityMode m_connectivityMode
```

## Method Details

```
protected Request<T> addReference (String name)
```

This function adds the name of a requested reference identifiers to be returned in the results. For example, to retrieve an extruded building identifier, set this value to BUILDING\_ID\_REFERENCE\_NAME .

**Parameters:**

- **name**  
Name of reference identifier to retrieve.

**Returns:**

True if name added, false otherwise.

**See also:**

[SearchRequest](#)

[ExploreRequest](#)

[HereRequest](#)

[PlaceRequest](#)

```
public boolean cancel ()
```

Cancels any pending results from an invoked request.

**Returns:**

True if the request was canceled successfully, false otherwise

```
public ErrorCode execute (ResultListener<T> eventListener)
```

Executes an asynchronous request.

**Parameters:**

- **eventListener**  
A [ResultListener](#) passed along with the request to monitor progress

**Returns:**

The [ErrorCode](#) representing an appropriate result

```
protected int getCollectionSize ()
```

Gets the current collection size being used for request responses.

**Returns:**

The current response collection size

**See also:**

[SearchRequest](#)

[ExploreRequest](#)

[HereRequest](#)

[TextSuggestionRequest](#)

[TextAutoSuggestionRequest](#)

[GeocodeRequest](#)

```
public Connectivity getConnectivity ()
```

This function returns the connectivity of request.

**Returns:**

The request connectivity.

```
protected List getReferences ()
```

This function returns the names of requested reference identifiers to be returned in the results.

**Returns:**

List of the names of reference identifiers to be returned in the result.

**See also:**

[SearchRequest](#)

[ExploreRequest](#)

[HereRequest](#)

[PlaceRequest](#)

```
protected Request<T> setCollectionSize (int value)
```

Sets a collection size to be used for request responses. The maximum number of result items in each collection will be limited to this value. The valid value range is [1..100]. The default collection size is 20.

**Parameters:**

- **value**  
Desired response collection size size per request.

**Returns:**

This *Request* object

**Throws:**

- **IllegalArgumentException**  
if size is out of range.

**See also:**

[SearchRequest](#)

[ExploreRequest](#)

[HereRequest](#)

[TextSuggestionRequest](#)

[TextAutoSuggestionRequest](#)

### *GeocodeRequest*

```
public void setConnectivity (Connectivity connectivity)
```

Sets the connectivity of request. By default, the connectivity of request is controlled by the SDK. If the SDK is online then an online request will be made. If the SDK is offline then an offline request will be made. Be aware, OFFLINE request can return limited result details. Results from ONLINE request will provide the best information available.

#### Parameters:

- **connectivity**  
Desired request connectivity.

```
protected Request<T> setMapViewport (GeoBoundingBox mapViewport)
```

The map viewport is a bounding box of the map area currently visible to the user. The viewport can act as an implicit location context in the absence of an explicit location context. To ensure you get the best results possible, you should always set a viewport if there is a map visible to the user.

#### Parameters:

- **mapViewport**  
The bounding box of the map area currently visible.

#### Returns:

The updated Request object itself.

#### See also:

[SearchRequest](#)

[ExploreRequest](#)

[HereRequest](#)

[TextSuggestionRequest](#)

[TextAutoSuggestionRequest](#)

[GeocodeRequest](#)

```
public Request<T> setUserAuthentication (String token)
```

Some requests, such as when posting images or reviews, applications must provide an OAuth 2.0 bearer token (obtained from HERE Account) to authenticate the user performing the action. The procedure for obtaining a token is outside of the scope of this documentation. Please refer to the HERE Account Single Sign On (SSO) API documentation for more information.

#### Parameters:

- **token**

The User authentication bearer token.

**Returns:**

The updated `Request` object itself.

## Connectivity

The enumeration `Connectivity` is a member of `com.here.android.mpa.search.Request`.

### Enumeration Summary

public static final enumeration **Request.Connectivity**

extends `java.lang.Enum`, `java.lang.Object`

Represents values describing possible types of connectivity that the request is performed.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 1148: Enum Constants in Connectivity

Fields
<pre>public static final Connectivity DEFAULT</pre> <p>The request will be executed based on the current <code>MapEngine</code> online status, which depends on the current network access and could be forced to offline using <code>setOnline(boolean)</code>.</p>
<pre>public static final Connectivity OFFLINE</pre> <p>The request will be executed in offline mode regardless whether there is enough map data on the device.</p>
<pre>public static final Connectivity ONLINE</pre> <p>The request will be executed in online mode regardless whether device is online or not.</p>

### Method Summary

Table 1149: Methods in Connectivity

Methods
<pre>public static Connectivity valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static Request.Connectivity[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

### Enumeration Details

Represents values describing possible types of connectivity that the request is performed.

## Enum Constant Details

```
public static final Connectivity DEFAULT
```

The request will be executed based on the current *MapEngine* online status, which depends on the current network access and could be forced to offline using *setOnline(boolean)*. If the MapEngine status is set to online, then an online request will be made. If the MapEngine status is offline, then an offline request will be made.

```
public static final Connectivity OFFLINE
```

The request will be executed in offline mode regardless whether there is enough map data on the device. If there is not enough map data the request might fail or return zero results. If it fails, it will not try online.

```
public static final Connectivity ONLINE
```

The request will be executed in online mode regardless whether device is online or not. If the device is offline the request will fail. If it fails, it will not try offline.

## Method Details

```
public static Connectivity valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static Request.Connectivity[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## ResultListener<T>

The interface *ResultListener<T>* is a member of *com.here.android.mpa.search* .

### Type Parameters:

- **T**  
Listener data type

## Interface Summary

```
public abstract interface ResultListener
```

Represents an event listener that reports information about the completion of a request.

[For complete information, see the section [Interface Details](#)]

## Method Summary

Table 1150: Methods in ResultListener<T>

Methods
<pre>public abstract void <b>onCompleted</b> (T data, <b>ErrorCode</b> error)</pre>
A callback indicating that a request operation has completed.

## Interface Details

Represents an event listener that reports information about the completion of a request.

## Method Details

```
public abstract void onCompleted (T data, ErrorCode error)
```

A callback indicating that a request operation has completed.

### Parameters:

- **data**  
Search results (can be null if no results were found or an error was encountered). E.g. if there is no map data due to working offline, null is returned.
- **error**  
An **ErrorCode** representing an appropriate result. **ErrorCode.NOT\_FOUND** is returned if there are no search results.

## ReverseGeocodeMode

The enumeration *ReverseGeocodeMode* is a member of [com.here.android.mpa.search](#) .

## Enumeration Summary

```
public final enumeration ReverseGeocodeMode
```

```
extends java.lang.Enum, java.lang.Object
```

Enumeration for [ReverseGeocodeRequest2](#) customisation.

[For complete information, see the section [Enumeration Details](#)]

### See also:

[ReverseGeocodeRequest2\(GeoCoordinate, Locale, ReverseGeocodeMode, float\)](#)

## Enum Constant Summary

Table 1151: Enum Constants in ReverseGeocodeMode

Fields
<pre>public static final ReverseGeocodeMode RETRIEVE_ADDRESSES</pre> <p>Retrieve addresses near the specified position (default mode).</p>
<pre>public static final ReverseGeocodeMode RETRIEVE_AREAS</pre> <p>Retrieve the administrative area information for the position provided in the request.</p>
<pre>public static final ReverseGeocodeMode RETRIEVE_LANDMARKS</pre> <p>Retrieve landmarks like parks and lakes in the proximity provided in the request.</p>
<pre>public static final ReverseGeocodeMode RETRIEVE_ALL</pre> <p>Retrieve streets, administrative areas and landmarks.</p>
<pre>public static final ReverseGeocodeMode TRACK_POSITION</pre> <p>Retrieve street information based on a position and bearing.</p>

## Method Summary

Table 1152: Methods in ReverseGeocodeMode

Methods
<pre>public String toString ()</pre>
<pre>public static ReverseGeocodeMode valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static ReverseGeocodeMode[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Enumeration for *ReverseGeocodeRequest2* customisation.

See also:

*ReverseGeocodeRequest2(GeoCoordinate, Locale, ReverseGeocodeMode, float)*

## Enum Constant Details

```
public static final ReverseGeocodeMode RETRIEVE_ADDRESSES
```

Retrieve addresses near the specified position (default mode).

```
public static final ReverseGeocodeMode RETRIEVE_AREAS
```

Retrieve the administrative area information for the position provided in the request.

```
public static final ReverseGeocodeMode RETRIEVE_LANDMARKS
```

Retrieve landmarks like parks and lakes in the proximity provided in the request.

```
public static final ReverseGeocodeMode RETRIEVE_ALL
```

Retrieve streets, administrative areas and landmarks. This mode aggregates the results of three different modes in one call.

```
public static final ReverseGeocodeMode TRACK_POSITION
```

Retrieve street information based on a position and bearing.

### Method Details

```
public String toString ()
```

```
public static ReverseGeocodeMode valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static ReverseGeocodeMode[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## ReverseGeocodeRequest2

The class *ReverseGeocodeRequest2* is a member of [com.here.android.mpa.search](#) .

### Class Summary

```
public class ReverseGeocodeRequest2
```

```
extends com.here.android.mpa.search.Request, java.lang.Object
```

The *ReverseGeocodeRequest2* represents an extended Request used to retrieve Location data by way of Geocoder search services.

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 1153: Constructors in ReverseGeocodeRequest2

Constructors
<b><code>ReverseGeocodeRequest2</code></b> ( <i>GeoCoordinate</i> location) Creates a reverse geocode request that resolves a <i>GeoCoordinate</i> into an <i>Location</i> .
<b><code>ReverseGeocodeRequest2</code></b> ( <i>GeoCoordinate</i> location, <i>Locale</i> locale) Creates a reverse geocode request that resolves a <i>GeoCoordinate</i> into an <i>Location</i> .
<b><code>ReverseGeocodeRequest2</code></b> ( <i>GeoCoordinate</i> location, <i>Locale</i> locale, <i>ReverseGeocodeMode</i> mode, float bearing) Creates a reverse geocode request that resolves a <i>GeoCoordinate</i> into an <i>Location</i> .

## Method Summary

Table 1154: Methods in ReverseGeocodeRequest2

Methods
<b><code>public ErrorCode execute</code></b> ( <i>ResultListener</i> < <i>Location</i> > listener) Executes an asynchronous request.

## Class Details

The *ReverseGeocodeRequest2* represents an extended *Request* used to retrieve *Location* data by way of Geocoder search services.

Note: the response to a *ReverseGeocodeRequest2* is a single *Location* object.

## Constructor Details

### **`ReverseGeocodeRequest2`** (*GeoCoordinate* location)

Creates a reverse geocode request that resolves a *GeoCoordinate* into an *Location*.

#### Parameters:

- **location**  
A *GeoCoordinate* representing the query location context.

#### Throws:

- **`IllegalArgumentException`**  
Upon a failure to handle a passed argument.

### **`ReverseGeocodeRequest2`** (*GeoCoordinate* location, *Locale* locale)

Creates a reverse geocode request that resolves a *GeoCoordinate* into an *Location*.

#### Parameters:

- **location**  
A `GeoCoordinate` representing the query location context.
- **locale**  
A `Locale` locale in which the response should be returned.

**Throws:**

- **`IllegalArgumentException`**  
Upon a failure to handle a passed argument.

## **ReverseGeocodeRequest2** (*`GeoCoordinate`* location, `Locale` locale, *`ReverseGeocodeMode`* mode, float bearing)

Creates a reverse geocode request that resolves a `GeoCoordinate` into an *`Location`*.

**Parameters:**

- **location**  
A `GeoCoordinate` representing the query location context.
- **locale**  
A `Locale` locale in which the response should be returned.
- **mode**  
A *`ReverseGeocodeMode`* mode in which the response should be filtered.
- **bearing**  
A bearing expresses the direction in which the vehicle is heading in degrees starting at true North and continuing clockwise around the compass. Ignored if `mode` is not equal to *`TRACK_POSITION`*.

**Throws:**

- **`IllegalArgumentException`**  
Upon a failure to handle a passed argument.

### Method Details

```
public ErrorCode execute (ResultListener<Location> listener)
```

Executes an asynchronous request.

**Parameters:**

- **listener**  
A `ResultListener` passed along with the request to monitor progress

**Returns:**

The `ErrorCode` representing an appropriate result

## ReviewMedia

The class *ReviewMedia* is a member of [com.here.android.mpa.search](#) .

### Class Summary

```
public class ReviewMedia
```

```
extends com.here.android.mpa.search.Media, java.lang.Object
```

Represents review content about a [Place](#).

[For complete information, see the section [Class Details](#)]

**See also:**

[getReviews\(\)](#)

### Method Summary

Table 1155: Methods in ReviewMedia

Methods
<pre>public boolean <a href="#">equals</a> (Object obj)</pre> <p>For documentation, see <a href="#">java.lang.Object</a></p>
<pre>public String <a href="#">getDate</a> ()</pre> <p>Gets the date when the user contributed the review.</p>
<pre>public String <a href="#">getDescription</a> ()</pre> <p>Gets the review content for the <a href="#">Place</a>.</p>
<pre>public String <a href="#">getId</a> ()</pre> <p>Get the review identifier.</p>
<pre>public String <a href="#">getIsoLanguageCode</a> ()</pre> <p>Gets the ISO language code identifying the language in which the review is available.</p>
<pre>public double <a href="#">getRating</a> ()</pre> <p>Gets the rating that the contributor of the review gave to the <a href="#">Place</a>.</p>
<pre>public String <a href="#">getTitle</a> ()</pre> <p>Gets the title of the review that the user contributed.</p>
<pre>public <a href="#">UserLink</a> <a href="#">getUser</a> ()</pre> <p>Gets the Link to details about the user who contributed the review.</p>
<pre>public int <a href="#">hashCode</a> ()</pre> <p>For documentation, see <a href="#">java.lang.Object</a></p>

## Class Details

Represents review content about a *Place*. Each individual *Review* contains information about the review itself, the user who contributed the review, and a rating that the user offered for the place.

**See also:**

[getReviews\(\)](#)

## Method Details

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

**Parameters:**

- `obj`

```
public String getDate ()
```

Gets the date when the user contributed the review.

**Returns:**

The date

```
public String getDescription ()
```

Gets the review content for the *Place*. Depending on the supplier, the full description might not be displayed and the full review might be available only within the resource to which the optional `via` attribute links.

**Returns:**

The content description

**See also:**

[getVia\(\)](#)

```
public String getId ()
```

Get the review identifier.

**Returns:**

The review identifier.

```
public String getIsoLanguageCode ()
```

Gets the ISO language code identifying the language in which the review is available.

Note: a language code for a review is optional, so a call to this method could return `null`.

**Returns:**

The language code (could be null).

```
public double getRating ()
```

Gets the rating that the contributor of the review gave to the *Place*.

**Returns:**

The rating as estimated by the review contributor

**See also:**

[Ratings](#)

```
public String getTitle ()
```

Gets the title of the review that the user contributed.

Note: a title for a review is optional, so a call to this method could return null .

**Returns:**

The title (could be null).

```
public UserLink getUser ()
```

Gets the [Link](#) to details about the user who contributed the review.

**Returns:**

The user [Link](#)

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## RichTextFormatting

The enumeration *RichTextFormatting* is a member of *com.here.android.mpa.search* .

### Enumeration Summary

```
public final enumeration RichTextFormatting
```

*extends* *java.lang.Enum*, *java.lang.Object*

Represents values describing possible formats for rich text content.

[For complete information, see the section [Enumeration Details](#)]

See also:

[setRichTextFormatting\(RichTextFormatting\)](#)

## Enum Constant Summary

Table 1156: Enum Constants in RichTextFormatting

Fields
<pre>public static final RichTextFormatting HTML</pre> <p>HTML-encoded text.</p>
<pre>public static final RichTextFormatting PLAIN</pre> <p>Plain text.</p>

## Method Summary

Table 1157: Methods in RichTextFormatting

Methods
<pre>public static RichTextFormatting valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static RichTextFormatting[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Represents values describing possible formats for rich text content.

See also:

[setRichTextFormatting\(RichTextFormatting\)](#)

## Enum Constant Details

```
public static final RichTextFormatting HTML
```

HTML-encoded text.

```
public static final RichTextFormatting PLAIN
```

Plain text.

## Method Details

```
public static RichTextFormatting valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

**Parameters:**

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static RichTextFormatting[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## SearchRequest

The class *SearchRequest* is a member of *com.here.android.mpa.search* .

### Class Summary

```
public class SearchRequest
```

```
extends com.here.android.mpa.search.DiscoveryRequest, com.here.android.mpa.search.Request,  
java.lang.Object
```

The *SearchRequest* processes text string queries based on the user's input to find specific places.

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 1158: Constructors in *SearchRequest*

Constructors
<pre><i>SearchRequest</i> (<b>String</b> query)</pre> <p><i>SearchRequest</i> constructor</p>

### Method Summary

Table 1159: Methods in *SearchRequest*

Methods
<pre>public <i>ErrorCode</i> <i>execute</i> (<i>ResultListener</i>&lt;<i>DiscoveryResultPage</i>&gt; listener)</pre> <p>Executes an asynchronous request.</p>
<pre>public <i>SearchRequest</i> <i>setQueryText</i> (<b>String</b> query)</pre> <p>Set the search query text.</p>
<pre>public <i>SearchRequest</i> <i>setSearchArea</i> (<i>GeoCoordinate</i> center, <b>int</b> radius)</pre> <p>Sets the search area using a center location and radius.</p>

## Methods

```
public SearchRequest setSearchCenter (GeoCoordinate center)
```

Sets a *GeoCoordinate* representing the location context used to search for results that are appropriate to the query parameter.

---

## Class Details

The *SearchRequest* processes text string queries based on the user's input to find specific places. It answers questions of "what" and "where" for an online search of POI or address.

The results of the *SearchRequest* are sets of places that match a user's search term in a specific location context (such as near a given location, around a user's current position or on the currently visible map).

A search location context must be provided by setting a search center location using *setSearchCenter(GeoCoordinate)* or a bounding map viewport using *setMapViewport(GeoBoundingBox)* or both. Failing to set a location context will result in an *INVALID\_PARAMETER* when executing the request.

## Constructor Details

### *SearchRequest* (String query)

*SearchRequest* constructor

#### Parameters:

- **query**  
Query text specifying the kind of places to locate

## Method Details

```
public ErrorCode execute (ResultListener<DiscoveryResultPage> listener)
```

Executes an asynchronous request.

#### Parameters:

- **listener**  
A *ResultListener* passed along with the request to monitor progress

#### Returns:

The *ErrorCode* representing an appropriate result

```
public SearchRequest setQueryText (String query)
```

Set the search query text.

#### Parameters:

- **query**  
Query text specifying the kind of places to locate

**Returns:**

The `SearchRequest`

```
public SearchRequest setSearchArea (GeoCoordinate center, int radius)
```

Sets the search area using a center location and radius. Use this method to localize search.

**Parameters:**

- **center**  
The `GeoCoordinate` representing the search area center location.
- **radius**  
The search area circle radius in meters. In online mode, valid value for radius is (0, 21000000). In offline mode, it is (0, 100000).

**Returns:**

The `SearchRequest`.

**Throws:**

- `IllegalArgumentException`  
if radius is less or equal to 0.

```
public SearchRequest setSearchCenter (GeoCoordinate center)
```

Sets a `GeoCoordinate` representing the location context used to search for results that are appropriate to the query parameter. Use this method to do worldwide search.

**Parameters:**

- **center**  
A `GeoCoordinate` representing the location context used to search for results that are appropriate to the query parameter.

**Returns:**

The `SearchRequest`

## SupplierLink

The class `SupplierLink` is a member of `com.here.android.mpa.search`.

### Class Summary

```
public class SupplierLink
```

```
extends com.here.android.mpa.search.Link, java.lang.Object
```

Represents a `SupplierLink` which contains meta-information about a supplier.

[For complete information, see the section [Class Details](#)]

See also:

[getSupplier\(\)](#)

[getSupplier\(\)](#)

## Method Summary

Table 1160: Methods in SupplierLink

Methods
<code>public boolean equals (Object obj)</code>
<code>public String getIconUrl ()</code> Gets the URL to retrieve the icon for the resource to which the Link refers.
<code>public String getId ()</code> Gets the unique identifier for the resource to which the Link refers.
<code>public String getName ()</code> Gets the name of the supplier that provided the Link .
<code>public String getUrl ()</code> Gets the String representation of the URL to the supplier's profile
<code>public int hashCode ()</code>

## Class Details

Represents a [SupplierLink](#) which contains meta-information about a supplier.

See also:

[getSupplier\(\)](#)

[getSupplier\(\)](#)

## Method Details

`public boolean equals (Object obj)`

Parameters:

- `obj`

`public String getIconUrl ()`

Gets the URL to retrieve the icon for the resource to which the Link refers.

Note: an icon URL for a linked object is optional, so a call to this method could return empty .

Returns:

The icon URL (could be empty)

```
public String getId ()
```

Gets the unique identifier for the resource to which the `Link` refers.

Note: an ID for a linked object is optional, so a call to this method could return empty .

**Returns:**

The ID (could be empty)

```
public String getName ()
```

Gets the name of the supplier that provided the `Link` .

Note: a supplier name for a linked object is optional, so a call to this method could return empty .

**Returns:**

The name of the supplier

```
public String getUrl ()
```

Gets the `String` representation of the URL to the supplier's profile

**Returns:**

The URL

```
public int hashCode ()
```

## TextAutoSuggestionRequest

The class `TextAutoSuggestionRequest` is a member of [com.here.android.mpa.search](#) .

### Class Summary

```
public class TextAutoSuggestionRequest
```

*extends* [com.here.android.mpa.search.Request](#), [java.lang.Object](#)

Represents an extended `Request` used to retrieve a `List` of suggested search terms, instantiates results and refined search links by way of Places search services.

[For complete information, see the section [Class Details](#)]

## Nested Class Summary

Table 1161: Nested Classes in `TextAutoSuggestionRequest`

Nested Classes
<p>public static final enumeration <code>TextAutoSuggestionRequest.AutoSuggestFilterType</code></p> <p>Represents values describing AutoSuggest response's result filter types that can be used to filter the AutoSuggest response.</p>

## Constructor Summary

Table 1162: Constructors in `TextAutoSuggestionRequest`

Constructors
<p><code>TextAutoSuggestionRequest</code> (<code>String</code> partialTerm)</p> <p>Default constructor.</p>

## Method Summary

Table 1163: Methods in `TextAutoSuggestionRequest`

Methods
<p>public <code>ErrorCode</code> <code>execute</code> (<code>ResultListener&lt;AutoSuggest&gt;</code> listener)</p> <p>Executes an asynchronous request.</p>
<p>public int <code>getCollectionSize</code> ()</p> <p>Gets the current collection size being used for request responses.</p>
<p>public <code>RichTextFormatting</code> <code>getRichTextFormatting</code> ()</p> <p>Gets the current <code>RichTextFormatting</code> type being used in request responses.</p>
<p>public <code>TextAutoSuggestionRequest</code> <code>setCollectionSize</code> (int value)</p> <p>Sets a collection size to be used for request responses.</p>
<p>public <code>TextAutoSuggestionRequest</code> <code>setFilters</code> (<code>java.util.EnumSet</code> &lt;<code>AutoSuggestFilterType</code>&gt; filtersSet)</p> <p>Set result type filter.</p>
<p>public <code>TextAutoSuggestionRequest</code> <code>setMapViewport</code> (<code>GeoBoundingBox</code> mapViewport)</p> <p>The map viewport is a bounding box of the map area currently visible to the user.</p>
<p>public <code>TextAutoSuggestionRequest</code> <code>setQueryText</code> (<code>String</code> partialTerm)</p> <p>Set the query partial search term.</p>
<p>public <code>TextAutoSuggestionRequest</code> <code>setRichTextFormatting</code> (<code>RichTextFormatting</code> value)</p> <p>Sets a <code>RichTextFormatting</code> to be used in request responses.</p>
<p>public <code>TextAutoSuggestionRequest</code> <code>setSearchCenter</code> (<code>GeoCoordinate</code> center)</p> <p>Sets the search center.</p>

## Class Details

Represents an extended `Request` used to retrieve a `List` of suggested search terms, instants results and refined search links by way of Places search services.

`TextAutoSuggestionRequest` supports online only. Please use `TextSuggestionRequest` for offline.

A search location context must be provided by setting either a search center using `setSearchCenter(GeoCoordinate)` or a bounding map viewport using `setMapViewport(GeoBoundingBox)`. Failing to set a map viewport will result in an `INVALID_PARAMETER` when executing the request.

## Constructor Details

### `TextAutoSuggestionRequest (String partialTerm)`

Default constructor.

Creates a request to return a list of suggested search terms, instants results and refined search links that are related to a specified location context and a partial search term.

A search location context must be provided by setting either a search center using `setSearchCenter(GeoCoordinate)` or a bounding map viewport using `setMapViewport(GeoBoundingBox)`. Failing to set a map viewport will result in an `INVALID_PARAMETER` when executing the request.

#### Parameters:

- `partialTerm`  
A partial search term used to create a list of suggested search terms.

## Method Details

```
public ErrorCode execute (ResultListener<AutoSuggest> listener)
```

Executes an asynchronous request.

#### Parameters:

- `listener`  
A `ResultListener` passed along with the request to monitor progress

#### Returns:

The `ErrorCode` representing an appropriate result

```
public int getCollectionSize ()
```

Gets the current collection size being used for request responses.

#### Returns:

The current response collection size

```
public RichTextFormatting getRichTextFormatting ()
```

Gets the current *RichTextFormatting* type being used in request responses.

**Returns:**

The current *RichTextFormatting* type

```
public TextAutoSuggestionRequest setCollectionSize (int value)
```

Sets a collection size to be used for request responses. The maximum number of result items in each collection will be limited to this value. The valid value range is [1..100]. The default collection size is 20.

**Parameters:**

- **value**  
Desired response collection size per request.

**Returns:**

This *Request* object

**Throws:**

- **IllegalArgumentException**  
if size is out of range.

```
public TextAutoSuggestionRequest setFilters (java.util.EnumSet  
<AutoSuggestFilterType> filtersSet)
```

Set result type filter.

**Parameters:**

- **filtersSet**  
A `java.util.EnumSet` of *TextAutoSuggestionRequest.AutoSuggestFilterType* used to filter the AutoSuggestion response.

**Returns:**

The *TextAutoSuggestionRequest*.

```
public TextAutoSuggestionRequest setMapViewport (GeoBoundingBox mapViewport)
```

The map viewport is a bounding box of the map area currently visible to the user. The viewport can act as an implicit location context in the absence of an explicit location context. To ensure you get the best results possible, you should always set a viewport if there is a map visible to the user.

**Parameters:**

- **mapViewport**  
The bounding box of the map area currently visible.

```
public TextAutoSuggestionRequest setQueryText (String partialTerm)
```

Set the query partial search term.

**Parameters:**

- **partialTerm**  
A partial search term used to create a list of suggested search terms.

**Returns:**

The *TextAutoSuggestionRequest*.

```
public TextAutoSuggestionRequest setRichTextFormatting (RichTextFormatting value)
```

Sets a *RichTextFormatting* to be used in request responses. The default formatting is *HTML*.

**Parameters:**

- **value**  
Desired *RichTextFormatting*

**Returns:**

This *TextAutoSuggestionRequest* object

```
public TextAutoSuggestionRequest setSearchCenter (GeoCoordinate center)
```

Sets the search center.

**Parameters:**

- **center**  
The *GeoCoordinate* representing the location context used to search for nearby places.

**Returns:**

The *TextAutoSuggestionRequest*.

## AutoSuggestFilterType

The enumeration *AutoSuggestFilterType* is a member of *com.here.android.mpa.search.TextAutoSuggestionRequest*.

### Enumeration Summary

```
public static final enumeration TextAutoSuggestionRequest.AutoSuggestFilterType  
extends java.lang.Enum, java.lang.Object
```

Represents values describing AutoSuggest response's result filter types that can be used to filter the AutoSuggest response.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 1164: Enum Constants in `AutoSuggestFilterType`

Fields
<pre>public static final AutoSuggestFilterType ADDRESS</pre> <p>AutoSuggest response will contain Location and address suggestion result type.</p>
<pre>public static final AutoSuggestFilterType PLACE</pre> <p>AutoSuggest response will contain POI suggestion result type.</p>
<pre>public static final AutoSuggestFilterType CATEGORY</pre> <p>AutoSuggest response will contain Category search suggestion result type.</p>
<pre>public static final AutoSuggestFilterType CHAIN</pre> <p>AutoSuggest response will contain Chain/Brand search suggestion result type.</p>
<pre>public static final AutoSuggestFilterType QUERY</pre> <p>AutoSuggest response will contain Query completion suggestion result type.</p>

## Method Summary

Table 1165: Methods in `AutoSuggestFilterType`

Methods
<pre>public static AutoSuggestFilterType valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static TextAutoSuggestionRequest.AutoSuggestFilterType[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Represents values describing AutoSuggest response's result filter types that can be used to filter the AutoSuggest response.

### Enum Constant Details

```
public static final AutoSuggestFilterType ADDRESS
```

AutoSuggest response will contain Location and address suggestion result type.

```
public static final AutoSuggestFilterType PLACE
```

AutoSuggest response will contain POI suggestion result type.

```
public static final AutoSuggestFilterType CATEGORY
```

AutoSuggest response will contain Category search suggestion result type.

```
public static final AutoSuggestFilterType CHAIN
```

AutoSuggest response will contain Chain/Brand search suggestion result type.

```
public static final AutoSuggestFilterType QUERY
```

AutoSuggest response will contain Query completion suggestion result type.

## Method Details

```
public static AutoSuggestFilterType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static TextAutoSuggestionRequest.AutoSuggestFilterType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## TextSuggestionRequest

The class *TextSuggestionRequest* is a member of *com.here.android.mpa.search* .

### Class Summary

```
public class TextSuggestionRequest
```

```
extends com.here.android.mpa.search.Request, java.lang.Object
```

Represents an extended `Request` used to retrieve a `List` of search terms by way of Places search services.

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 1166: Constructors in TextSuggestionRequest

Constructors
<p><code>TextSuggestionRequest</code> (String partialTerm)</p> <p>Default constructor.</p>

## Method Summary

Table 1167: Methods in TextSuggestionRequest

Methods
<p>public <code>ErrorCode</code> <code>execute</code> (<code>ResultListener&lt;String&gt;</code> listener)</p> <p>Executes an asynchronous request.</p>
<p>public int <code>getCollectionSize</code> ()</p> <p>Gets the current collection size being used for request responses.</p>
<p>public <code>RichTextFormatting</code> <code>getRichTextFormatting</code> ()</p> <p>Deprecated: As of SDK 3.6.</p> <p>Gets the current <code>RichTextFormatting</code> type being used in request responses.</p>
<p>public <code>TextSuggestionRequest</code> <code>setCollectionSize</code> (int value)</p> <p>Sets a collection size to be used for request responses.</p>
<p>public <code>TextSuggestionRequest</code> <code>setMapViewport</code> (<code>GeoBoundingBox</code> mapViewport)</p> <p>The map viewport is a bounding box of the map area currently visible to the user.</p>
<p>public <code>TextSuggestionRequest</code> <code>setQueryText</code> (String partialTerm)</p> <p>Set the query partial search term.</p>
<p>public <code>TextSuggestionRequest</code> <code>setRichTextFormatting</code> (<code>RichTextFormatting</code> value)</p> <p>Deprecated: As of SDK 3.6.</p> <p>Sets a <code>RichTextFormatting</code> to be used in request responses.</p>
<p>public <code>TextSuggestionRequest</code> <code>setSearchCenter</code> (<code>GeoCoordinate</code> center)</p> <p>Sets the search center.</p>

## Class Details

Represents an extended `Request` used to retrieve a `List` of search terms by way of Places search services.

A search location context must be provided by setting either a search center using `setSearchCenter(GeoCoordinate)` or a bounding map viewport using `setMapViewport(GeoBoundingBox)`. Failing to set a map viewport will result in an `INVALID_PARAMETER` when executing the request.

## Constructor Details

`TextSuggestionRequest` (String partialTerm)

Default constructor.

Creates a request to return a list of suggested search terms that are related to a specified location context and a partial search term.

\* A search location context must be provided by setting either a search center using [setSearchCenter\(GeoCoordinate\)](#) or a bounding map viewport using [setMapViewport\(GeoBoundingBox\)](#). Failing to set a map viewport will result in an `INVALID_PARAMETER` when executing the request.

**Parameters:**

- **partialTerm**  
The partial term to search.

## Method Details

```
public ErrorCode execute (ResultListener<String> listener)
```

Executes an asynchronous request.

**Parameters:**

- **listener**  
A `ResultListener` passed along with the request to monitor progress

**Returns:**

The `ErrorCode` representing an appropriate result

```
public int getCollectionSize ()
```

Gets the current collection size being used for request responses.

**Returns:**

The current response collection size

```
public RichTextFormatting getRichTextFormatting ()
```

Deprecated: As of SDK 3.6.

Use [TextAutoSuggestionRequest](#) instead. `TextSuggestionRequest` does not support text formatting. The method `getRichTextFormatting` is deprecated. If you want to receive HTML formatted response use [TextAutoSuggestionRequest](#) instead in online mode.

Gets the current `RichTextFormatting` type being used in request responses.

**Returns:**

The current `RichTextFormatting` type

```
public TextSuggestionRequest setCollectionSize (int value)
```

Sets a collection size to be used for request responses. The maximum number of result items in each collection will be limited to this value. The valid value range is [1..100]. The default collection size is 20.

**Parameters:**

- **value**  
Desired response collection size per request.

**Returns:**

This *Request* object

**Throws:**

- **IllegalArgumentException**  
if size is out of range.

```
public TextSuggestionRequest setMapViewport (GeoBoundingBox mapViewport)
```

The map viewport is a bounding box of the map area currently visible to the user. The viewport can act as an implicit location context in the absence of an explicit location context. To ensure you get the best results possible, you should always set a viewport if there is a map visible to the user.

**Parameters:**

- **mapViewport**  
The bounding box of the map area currently visible.

```
public TextSuggestionRequest setQueryText (String partialTerm)
```

Set the query partial search term.

**Parameters:**

- **partialTerm**  
A partial search term used to create a list of suggested search terms.

**Returns:**

The *TextSuggestionRequest*.

```
public TextSuggestionRequest setRichTextFormatting (RichTextFormatting value)
```

Deprecated: As of SDK 3.6.

Use *TextAutoSuggestionRequest* instead. *TextSuggestionRequest* does not support text formatting. The method *setRichTextFormatting* is deprecated. If you want to receive HTML formatted response use *TextAutoSuggestionRequest* instead in online mode.

Sets a *RichTextFormatting* to be used in request responses. The default formatting is *PLAIN*.

**Parameters:**

- **value**

Desired RichTextFormatting

**Returns:**

This *TextSuggestionRequest* object

```
public TextSuggestionRequest setSearchCenter (GeoCoordinate center)
```

Sets the search center.

**Parameters:**

- **center**

The *GeoCoordinate* representing the location context used to search for nearby places.

**Returns:**

The *TextSuggestionRequest*.

## TransitDeparture

The class *TransitDeparture* is a member of *com.here.android.mpa.search* .

### Class Summary

```
public class TransitDeparture
```

```
extends java.lang.Object
```

Represents information about a single departure.

[For complete information, see the section *Class Details*]

### Field Summary

Table 1168: Fields in TransitDeparture

Fields
<pre>public static final String <i>DEPARTURE_PLATFORM_KEY_NAME</i></pre> <p>Key name to retrieve the departure platform information.</p>
<pre>public static final String <i>DEPARTURE_TIME_KEY_NAME</i></pre> <p>Key name to retrieve departure time ( <i>RFC 3339 date-time</i> format with timezone offset).</p>
<pre>public static final String <i>EXCEPTION_EVENT_ADDITIONAL</i></pre> <p>Additional departure information provided.</p>
<pre>public static final String <i>EXCEPTION_EVENT_CANCELLED</i></pre> <p>Departure has been cancelled.</p>

**Fields**

public static final String [EXCEPTION\\_EVENT\\_REDIRECTED](#)

Departure has been redirected.

public static final String [EXCEPTION\\_EVENT\\_REPLACED](#)

Departure has been replaced.

**Method Summary**

Table 1169: Methods in TransitDeparture

**Methods**

public boolean [equals](#) (Object obj)

For documentation, see [java.lang.Object](#)

public String [getDirection](#) ()

Gets direction of the departure on the line.

public String [getException](#) ()

An indicator for some exceptional event happened to this departure.

public java.util.List [getExtendedAttributes](#) (<[ExtendedAttribute](#)>)

Gets list of [ExtendedAttribute](#) features of departure.

public String [getLine](#) ()

Reference to the line in transit lines collection information.

public String [getOperator](#) ()

Gets a reference to the operator in the operators collection information.

public Map [getRealTimeInformation](#) ()

Gets the real (actual) departure time information.

public Map [getScheduledTimeInformation](#) ()

Gets the originally scheduled departure time information.

public int [hashCode](#) ()

For documentation, see [java.lang.Object](#)

**Class Details**

Represents information about a single departure. All times use [RFC 3339 date-time](#) format with timezone offset.

**Field Details**

public static final String [DEPARTURE\\_PLATFORM\\_KEY\\_NAME](#)

Key name to retrieve the departure platform information.

```
public static final String DEPARTURE_TIME_KEY_NAME
```

Key name to retrieve departure time ( *RFC 3339 date-time* format with timezone offset).

```
public static final String EXCEPTION_EVENT_ADDITIONAL
```

Additional departure information provided.

```
public static final String EXCEPTION_EVENT_CANCELLED
```

Departure has been cancelled.

```
public static final String EXCEPTION_EVENT_REDIRECTED
```

Departure has been redirected.

```
public static final String EXCEPTION_EVENT_REPLACED
```

Departure has been replaced.

## Method Details

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

### Parameters:

- `obj`

```
public String getDirection ()
```

Gets direction of the departure on the line.

### Returns:

The departure direction on the line.

```
public String getException ()
```

An indicator for some exceptional event happened to this departure. Possible values are:

`EXCEPTION_EVENT_REDIRECTED` , `EXCEPTION_EVENT_REPLACED` , `EXCEPTION_EVENT_CANCELLED` and `EXCEPTION_EVENT_ADDITIONAL` .

### Returns:

Exception event (if any have occurred).

```
public java.util.List <ExtendedAttribute> getExtendedAttributes ()
```

Gets list of *ExtendedAttribute* features of departure. Supported keys are `bikeAllowed` and `barrierFree`.

**Returns:**

List of departure *ExtendedAttribute*.

```
public String getLine ()
```

Reference to the line in transit lines collection information.

**Returns:**

The line name.

```
public String getOperator ()
```

Gets a reference to the operator in the operators collection information.

**Returns:**

The operator name.

```
public Map getRealTimeInformation ()
```

Gets the real (actual) departure time information. The `departure` key represents the departure time.

Known key identifier values are:

- `DEPARTURE_TIME_KEY_NAME` - real-time departure time (RFC 3339 date-time)
- `DEPARTURE_PLATFORM_KEY_NAME` - real-time departure platform (optional)

**Returns:**

The map collection of real (actual) departure time information.

```
public Map getScheduledTimeInformation ()
```

Gets the originally scheduled departure time information.

Known key identifier values are:

- `DEPARTURE_TIME_KEY_NAME` - scheduled departure time (*RFC 3339 date-time*)
- `DEPARTURE_PLATFORM_KEY_NAME` - scheduled departure platform (optional)

**Returns:**

The map collection of originally scheduled departure time information.

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## TransitDeparturesAttribute

The class *TransitDeparturesAttribute* is a member of *com.here.android.mpa.search* .

### Class Summary

```
public class TransitDeparturesAttribute
```

*extends* *com.here.android.mpa.search.ExtendedAttribute*, *java.lang.Object*

Represents a Transit Departures Extended Attribute that is associated with public transport stop/station and contains information about scheduled departures from the place.

[For complete information, see the section *Class Details*]

### Method Summary

Table 1170: Methods in *TransitDeparturesAttribute*

Methods
<pre>public TransitSchedulePage <i>getSchedule</i> ()</pre> <p>Gets a paged collection of scheduled departure information.</p>

### Class Details

Represents a Transit Departures Extended Attribute that is associated with public transport stop/station and contains information about scheduled departures from the place.

### Method Details

```
public TransitSchedulePage getSchedule ()
```

Gets a paged collection of scheduled departure information.

#### Returns:

*TransitSchedulePage* representing a paged collection of scheduled departure information.

## TransitDestination

The class *TransitDestination* is a member of *com.here.android.mpa.search* .

## Class Summary

public class **TransitDestination**

*extends java.lang.Object*

Represents a destination served from station/stop.

[For complete information, see the section [Class Details](#)]

## Method Summary

Table 1171: Methods in TransitDestination

Methods
<pre>public boolean equals (Object obj)</pre> <p>For documentation, see <i>java.lang.Object</i></p>
<pre>public String getDestination ()</pre> <p>Gets the name of the destination.</p>
<pre>public String getLine ()</pre> <p>Gets the name of the line serving the destination.</p>
<pre>public int hashCode ()</pre> <p>For documentation, see <i>java.lang.Object</i></p>

## Class Details

Represents a destination served from station/stop.

## Method Details

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

### Parameters:

- **obj**

```
public String getDestination ()
```

Gets the name of the destination.

### Returns:

The destination name.

```
public String getLine ()
```

Gets the name of the line serving the destination.

**Returns:**

The line name.

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## TransitLine

The class *TransitLine* is a member of *com.here.android.mpa.search* .

### Class Summary

```
public class TransitLine
```

```
extends java.lang.Object
```

Represents a public transport line.

[For complete information, see the section *Class Details*]

### Method Summary

Table 1172: Methods in TransitLine

Methods
<pre>public boolean <i>equals</i> (Object obj)</pre> <p>For documentation, see <i>java.lang.Object</i></p>
<pre>public String <i>getDestination</i> ()</pre> <p>Gets the line destination.</p>
<pre>public <i>TransitLineCategory</i> <i>getLineCategory</i> ()</pre> <p>Gets the category information for the line.</p>
<pre>public String <i>getName</i> ()</pre> <p>Gets the line name.</p>
<pre>public String <i>getOperator</i> ()</pre> <p>Gets the operator serving the line.</p>
<pre>public <i>TransitLineStyle</i> <i>getStyle</i> ()</pre> <p>Gets the style guideline information for the line.</p>
<pre>public int <i>hashCode</i> ()</pre>

### Class Details

Represents a public transport line.

## Method Details

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

### Parameters:

- `obj`

```
public String getDestination ()
```

Gets the line destination.

### Returns:

The line destination.

```
public TransitLineCategory getLineCategory ()
```

Gets the category information for the line.

### Returns:

The *TransitLineCategory* information.

```
public String getName ()
```

Gets the line name.

### Returns:

The line name

```
public String getOperator ()
```

Gets the operator serving the line.

### Returns:

The line operator.

```
public TransitLineStyle getStyle ()
```

Gets the style guideline information for the line.

### Returns:

The *TransitLineStyle* information.

```
public int hashCode ()
```

## TransitLineCategory

The class *TransitLineCategory* is a member of [com.here.android.mpa.search](#).

### Class Summary

```
public class TransitLineCategory
```

```
extends java.lang.Object
```

Represents the category information for the public transport line.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 1173: Methods in TransitLineCategory

Methods
<pre>public boolean <i>equals</i> (Object obj)</pre> <p>For documentation, see <i>java.lang.Object</i></p>
<pre>public String <i>getIcon</i> ()</pre> <p>Gets the icon for the category.</p>
<pre>public String <i>getId</i> ()</pre> <p>Gets the category unique identifier.</p>
<pre>public String <i>getLocalName</i> ()</pre> <p>Gets the locally used name for the category.</p>
<pre>public String <i>getTitle</i> ()</pre> <p>Gets the localized name of the category.</p>
<pre>public int <i>hashCode</i> ()</pre> <p>For documentation, see <i>java.lang.Object</i></p>

### Class Details

Represents the category information for the public transport line.

### Method Details

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

**Parameters:**

- **obj**

```
public String getIcon ()
```

Gets the icon for the category.

**Returns:**

The category icon.

```
public String getId ()
```

Gets the category unique identifier.

**Returns:**

The category identifier.

```
public String getLocalName ()
```

Gets the locally used name for the category.

**Returns:**

The locally used category name.

```
public String getTitle ()
```

Gets the localized name of the category.

**Returns:**

The localized category name.

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## TransitLineStyle

The class *TransitLineStyle* is a member of [com.here.android.mpa.search](#) .

### Class Summary

```
public class TransitLineStyle
```

*extends java.lang.Object*

Represents the styling guideline information for the public transport line.

[For complete information, see the section [Class Details](#)]

## Method Summary

Table 1174: Methods in TransitLineStyle

Methods
<pre>public boolean equals (Object obj)</pre>
<pre>public String getColor ()</pre> <p>Gets the color value assigned to a line.</p>
<pre>public String getIconShape ()</pre> <p>Gets the shape style identifying the icon for the line.</p>
<pre>public String getOutlineColor ()</pre> <p>Gets the color of the border around the line name.</p>
<pre>public String getTextColor ()</pre> <p>Gets the text color that should get used when the line color is used as background color.</p>
<pre>public int hashCode ()</pre> <p>For documentation, see <i>java.lang.Object</i></p>

## Class Details

Represents the styling guideline information for the public transport line. All colors are in hex format.

## Method Details

```
public boolean equals (Object obj)
```

### Parameters:

- `obj`

```
public String getColor ()
```

Gets the color value assigned to a line.

### Returns:

The line color value (hex format).

```
public String getIconShape ()
```

Gets the shape style identifying the icon for the line.

### Returns:

The icon shape.

```
public String getOutlineColor ()
```

Gets the color of the border around the line name.

**Returns:**

The line border color value (hex format).

```
public String getTextColor ()
```

Gets the text color that should get used when the line color is used as background color.

**Returns:**

The text color value (hex format).

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## TransitLinesAttribute

The class *TransitLinesAttribute* is a member of *com.here.android.mpa.search* .

### Class Summary

```
public class TransitLinesAttribute
```

*extends* *com.here.android.mpa.search.ExtendedAttribute*, *java.lang.Object*

Represents a Transit Lines Extended Attribute that is associated with public transport stop/station and contains information about the lines and destinations.

[For complete information, see the section *Class Details*]

### Method Summary

Table 1175: Methods in *TransitLinesAttribute*

Methods
<pre>public java.util.List &lt;<i>TransitDestination</i>&gt; <b>getDestinations</b> ()</pre> <p>Gets list of destinations served from this stop/station.</p>
<pre>public java.util.Map &lt;java.lang.String, <i>com.here.android.mpa.search.TransitLine</i>&gt; <b>getLines</b> ()</pre> <p>Gets collection of public transport lines using this stop/station.</p>

### Class Details

Represents a Transit Lines Extended Attribute that is associated with public transport stop/station and contains information about the lines and destinations.

## Method Details

```
public java.util.List <TransitDestination> getDestinations ()
```

Gets list of destinations served from this stop/station.

### Returns:

List of [TransitDestination](#) information.

```
public java.util.Map <java.lang.String,  
com.here.android.mpa.search.TransitLine> getLines ()
```

Gets collection of public transport lines using this stop/station.

### Returns:

Map collection of transport line stop/station name to [TransitLine](#) information.

## TransitOperator

The class [TransitOperator](#) is a member of [com.here.android.mpa.search](#).

## Class Summary

```
public class TransitOperator
```

```
extends java.lang.Object
```

Represents a public transport operator.

[For complete information, see the section [Class Details](#)]

## Method Summary

Table 1176: Methods in [TransitOperator](#)

Methods
<pre>public boolean <a href="#">equals</a> (<a href="#">Object</a> obj)</pre> <p>For documentation, see <a href="#">java.lang.Object</a></p>
<pre>public String <a href="#">getId</a> ()</pre> <p>Gets the operator identifier.</p>
<pre>public java.util.Map &lt;java.lang.String, com.here.android.mpa.search.TransitOperatorLink&gt; <a href="#">getLinks</a> ()</pre> <p>Gets the map collection of additional links to be displayed next to the departure information of the operator.</p>
<pre>public <a href="#">TransitOperatorSupplier</a> <a href="#">getSupplier</a> ()</pre> <p>Gets the supplier of the operator's schedule information.</p>

## Methods

```
public String getTitle ()
```

Gets the name of the operator.

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## Class Details

Represents a public transport operator.

## Method Details

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

### Parameters:

- `obj`

```
public String getId ()
```

Gets the operator identifier.

### Returns:

The operator identifier.

```
public java.util.Map <java.lang.String,  
com.here.android.mpa.search.TransitOperatorLink> getLinks ()
```

Gets the map collection of additional links to be displayed next to the departure information of the operator.

### Returns:

Map collection of operator's names to *TransitOperatorLink* information.

```
public TransitOperatorSupplier getSupplier ()
```

Gets the supplier of the operator's schedule information.

### Returns:

The *TransitOperatorSupplier* information.

```
public String getTitle ()
```

Gets the name of the operator.

### Returns:

The operator name.

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## TransitOperatorLink

The class *TransitOperatorLink* is a member of *com.here.android.mpa.search* .

### Class Summary

```
public class TransitOperatorLink
```

*extends java.lang.Object*

Represents an additional link associated with transit operator.

[For complete information, see the section *Class Details*]

### Field Summary

Table 1177: Fields in TransitOperatorLink

Fields
protected PlacesTransitOperatorLink <i>m_pimpl</i>

### Method Summary

Table 1178: Methods in TransitOperatorLink

Methods
public boolean <i>equals</i> (Object obj) For documentation, see <i>java.lang.Object</i>
public String <i>getText</i> () Gets the operator link text.
public Link <i>getUrl</i> () Gets the Link to the operator information.
public int <i>hashCode</i> () For documentation, see <i>java.lang.Object</i>

### Class Details

Represents an additional link associated with transit operator.

## Field Details

protected PlacesTransitOperatorLink `m_pimpl`

## Method Details

public boolean `equals (Object obj)`

For documentation, see *java.lang.Object*

### Parameters:

- `obj`

public String `getText ()`

Gets the operator link text.

### Returns:

The operator link text.

public [Link](#) `getUrl ()`

Gets the [Link](#) to the operator information.

### Returns:

The [Link](#) to the operator information.

public int `hashCode ()`

For documentation, see *java.lang.Object*

## TransitOperatorSupplier

The class *TransitOperatorSupplier* is a member of [com.here.android.mpa.search](#) .

### Class Summary

public class **TransitOperatorSupplier**

*extends java.lang.Object*

Represents a supplier of the public transport operator's schedule.

[For complete information, see the section [Class Details](#)]

## Method Summary

Table 1179: Methods in TransitOperatorSupplier

Methods
<pre>public boolean equals (Object obj)</pre> <p>For documentation, see <i>java.lang.Object</i></p>
<pre>public String getTitle ()</pre> <p>Gets the supplier title.</p>
<pre>public int hashCode ()</pre> <p>For documentation, see <i>java.lang.Object</i></p>

## Class Details

Represents a supplier of the public transport operator's schedule.

### Method Details

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

#### Parameters:

- **obj**

```
public String getTitle ()
```

Gets the supplier title.

#### Returns:

The supplier title.

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## TransitSchedulePage

The class *TransitSchedulePage* is a member of *com.here.android.mpa.search*.

### Class Summary

```
public class TransitSchedulePage
```

```
extends java.lang.Object
```

Represents departure information for a public transport stop/station.

[For complete information, see the section [Class Details](#)]

## Method Summary

Table 1180: Methods in TransitSchedulePage

Methods
<pre>public boolean equals (Object obj)</pre> <p>For documentation, see <a href="#">java.lang.Object</a></p>
<pre>public java.util.List &lt;TransitDeparture&gt; getItems ()</pre> <p>Gets the list of departures.</p>
<pre>public java.util.Map &lt;java.lang.String, com.here.android.mpa.search.TransitLine&gt; getLines ()</pre> <p>Gets the map collection of transit line names to TransitLine information.</p>
<pre>public TransitSchedulePageRequest getNextPageRequest ()</pre> <p>Gets the TransitSchedulePageRequest for requesting the next page of the TransitSchedulePage .</p>
<pre>public int getOffsetCount ()</pre> <p>Gets the collection offset count for the current page of the TransitSchedulePage .</p>
<pre>public java.util.Map &lt;java.lang.String, com.here.android.mpa.search.TransitOperator&gt; getOperators ()</pre> <p>Gets the map collection of transit line operators to TransitOperator information.</p>
<pre>public TransitSchedulePageRequest getPreviousPageRequest ()</pre> <p>Gets the TransitSchedulePageRequest for requesting the previous page of the TransitSchedulePage .</p>
<pre>public int hashCode ()</pre> <p>For documentation, see <a href="#">java.lang.Object</a></p>

## Class Details

Represents departure information for a public transport stop/station. Departure items are paginated based on page size parameter.

### Method Details

```
public boolean equals (Object obj)
```

For documentation, see [java.lang.Object](#)

Parameters:

- **obj**

```
public java.util.List <TransitDeparture> getItems ()
```

Gets the list of departures.

**Returns:**

The list of `TransitDeparture`

```
public java.util.Map <java.lang.String,  
com.here.android.mpa.search.TransitLine> getLines ()
```

Gets the map collection of transit line names to `TransitLine` information.

**Returns:**

The map collection of lines serving departures shown in current departure item list using line name as a key

```
public TransitSchedulePageRequest getNextPageRequest ()
```

Gets the `TransitSchedulePageRequest` for requesting the next page of the `TransitSchedulePage`.

**Returns:**

The `TransitSchedulePageRequest`

```
public int getOffsetCount ()
```

Gets the collection offset count for the current page of the `TransitSchedulePage`.

For the first page of results, the offset count is 0. Following any call to `getNextPageRequest()`, the offset count will be greater than 0.

**Returns:**

The collection offset count

```
public java.util.Map <java.lang.String,  
com.here.android.mpa.search.TransitOperator> getOperators ()
```

Gets the map collection of transit line operators to `TransitOperator` information.

**Returns:**

The map collection of operators operating on this stop/station using operator ID as a key

```
public TransitSchedulePageRequest getPreviousPageRequest ()
```

Gets the `TransitSchedulePageRequest` for requesting the previous page of the `TransitSchedulePage`.

**Returns:**

The `TransitSchedulePageRequest`

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## TransitSchedulePageRequest

The class *TransitSchedulePageRequest* is a member of *com.here.android.mpa.search* .

### Class Summary

```
public class TransitSchedulePageRequest
```

*extends* *com.here.android.mpa.search.Request*, *java.lang.Object*

Represents an extended *Request* used to retrieve *TransitSchedulePage* information associated with a *Place*, by way of Places search services.

[For complete information, see the section *Class Details*]

### Method Summary

Table 1181: Methods in *TransitSchedulePageRequest*

Methods
<pre>public boolean equals (Object obj)</pre> <p>For documentation, see <i>java.lang.Object</i></p>
<pre>public ErrorCode execute (ResultListener&lt;TransitSchedulePage&gt; eventListener)</pre> <p>Executes an asynchronous request.</p> <p>This method overrides <i>search.Request.execute(ResultListener)</i></p>
<pre>public int hashCode ()</pre> <p>For documentation, see <i>java.lang.Object</i></p>

### Class Details

Represents an extended *Request* used to retrieve *TransitSchedulePage* information associated with a *Place*, by way of Places search services.

Note: the response to a *TransitSchedulePageRequest* is a *TransitSchedulePage* object.

### Method Details

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

#### Parameters:

- **obj**

```
public ErrorCode execute (ResultListener<TransitSchedulePage> eventListener)
```

Executes an asynchronous request.

This method overrides [search.Request.execute\(ResultListener\)](#)

**Parameters:**

- `eventListener`

```
public int hashCode ()
```

For documentation, see [java.lang.Object](#)

## UserLink

The class *UserLink* is a member of [com.here.android.mpa.search](#) .

### Class Summary

```
public class UserLink
```

extends [com.here.android.mpa.search.Link](#), [java.lang.Object](#)

Represents a *UserLink* which contains additional attributes to describe a user.

[For complete information, see the section [Class Details](#)]

**See also:**

[getUser\(\)](#)

[getUser\(\)](#)

### Method Summary

Table 1182: Methods in UserLink

Methods
<pre>public boolean equals (Object obj)</pre> <p>For documentation, see <a href="#">java.lang.Object</a></p>
<pre>public String getName ()</pre> <p>Gets the name of the user that provided the the Link .</p>
<pre>public String getUrl ()</pre> <p>Gets the String representation of the URL to the user's profile</p>
<pre>public int hashCode ()</pre> <p>For documentation, see <a href="#">java.lang.Object</a></p>

## Class Details

Represents a *UserLink* which contains additional attributes to describe a user.

**See also:**

*getUser()*

*getUser()*

## Method Details

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

**Parameters:**

- **obj**

```
public String getName ()
```

Gets the name of the user that provided the the *Link* .

Note: a user name for a linked object is optional, so a call to this method could return empty .

**Returns:**

The icon URL (could be empty)

```
public String getUrl ()
```

Gets the *String* representation of the URL to the user's profile

**Returns:**

The URL

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

## ViaLink

The class *ViaLink* is a member of *com.here.android.mpa.search* .

## Class Summary

```
public class ViaLink
```

```
extends com.here.android.mpa.search.Link, java.lang.Object
```

Represents a [ViaLink](#) to an external website of the supplier of content.

[For complete information, see the section [Class Details](#)]

**See also:**

[getVia\(\)](#)

## Method Summary

Table 1183: Methods in ViaLink

Methods
<code>public boolean equals (Object obj)</code> For documentation, see <i>java.lang.Object</i>
<code>public String getUrl ()</code> Gets the String representation of the URL to an external website
<code>public int hashCode ()</code> For documentation, see <i>java.lang.Object</i>

## Class Details

Represents a [ViaLink](#) to an external website of the supplier of content.

**See also:**

[getVia\(\)](#)

## Method Details

`public boolean equals (Object obj)`

For documentation, see *java.lang.Object*

**Parameters:**

- `obj`

`public String getUrl ()`

Gets the String representation of the URL to an external website

**Returns:**

The URL

`public int hashCode ()`

For documentation, see *java.lang.Object*

## service

---

The package *service* is a member of *com.here.android.mpa*.

### Package Summary

#### service

The service package contains classes related to the mapping service.

### Package Details

The service package contains classes related to the mapping service. The classes in this package should not be imported.

## streetlevel

---

The package *streetlevel* is a member of *com.here.android.mpa*.

### Package Summary

#### streetlevel

The streetlevel package provides classes, interfaces, and enumerations that display an interactive *StreetLevelFragment*.

### Package Details

The streetlevel package provides classes, interfaces, and enumerations that display an interactive *StreetLevelFragment*. It also provides related functionality that allows your application to create and add street level content.

Some key classes and interfaces in this package are:

- [StreetLevelCoverage](#)
- [StreetLevelFragment](#)
- [StreetLevelModel](#)
- [StreetLevel](#)
- [StreetLevelGesture](#)
- [StreetLevelObject](#)

#### StreetLevelCoverage

This class allows the developer to search whether a given [GeoCoordinate](#) is in range of a street level bubble within a given search radius. The search is asynchronous and is called back to the application via the interface [Listener](#).

## StreetLevelFragment

The *StreetLevelFragment* class is a UI view that can be embedded into an activity or fragment to render street level information.

For Example:

```
<fragment
    class="com.here.android.mpa.streetlevel.StreetLevelFragment"
    android:id="@+id/mapfragment"
    android:layout_width="fill_parent"
    android:layout_height="fill_parent" />
```

## StreetLevelModel

Represents a model for street level data. For areas with appropriate street level coverage, applications can get a *StreetLevelModel* from a *getStreetLevelModel()* to render 360-degree street level imagery.

## StreetLevel

A *StreetLevel* object represents a unique street level bubble. This object is retrieved by requesting a bubble with *getStreetLevel(GeoCoordinate, int)*. For the best experience, the street level coverage should first be checked with *StreetLevelCoverage*.

## StreetLevelObject

The following is a list of objects that can be created by an application to augment the street level experience. User objects can be added via *addStreetLevelObject(StreetLevelObject)*

- *StreetLevelBillboard*
- *StreetLevelIcon*
- *StreetLevelRoute*

The following is a list of proxy objects that can be fetched from interacting with a street level bubble. Proxy objects are returned when the user interacts with a street level and is called back via *onObjectsSelected(List)*

- *StreetLevelLink*
- *StreetLevelBuilding*

# StreetLevel

The class *StreetLevel* is a member of *com.here.android.mpa.streetlevel*.

## Class Summary

public final class **StreetLevel**

*extends java.lang.Object*

Represents a street level object at a particular geographic location.

[For complete information, see the section *Class Details*]

**See also:**

*getStreetLevel()*

## Method Summary

Table 1184: Methods in StreetLevel

Methods
<pre>public <i>GeoCoordinate</i> <b>getPosition</b> ()</pre> <p>Gets the <i>GeoCoordinate</i> representing the center position of the <i>StreetLevel</i>.</p>
<pre>public java.util.List &lt;<i>StreetLevelBuilding</i>&gt; <b>getVisibleBuildings</b> ()</pre> <p>Gets the list of <i>StreetLevelBuilding</i> objects shown in the <i>StreetLevel</i>.</p>
<pre>public boolean <b>isDownloaded</b> ()</pre> <p>Determines whether street data for the <i>StreetLevel</i> has been downloaded.</p>

## Class Details

Represents a street level object at a particular geographic location.

**See also:**

[getStreetLevel\(\)](#)

## Method Details

```
public GeoCoordinate getPosition ()
```

Gets the *GeoCoordinate* representing the center position of the *StreetLevel*.

**Returns:**

The *GeoCoordinate*

```
public java.util.List <StreetLevelBuilding> getVisibleBuildings ()
```

Gets the list of *StreetLevelBuilding* objects shown in the *StreetLevel*.

**Returns:**

The list of *StreetLevelBuilding* objects

```
public boolean isDownloaded ()
```

Determines whether street data for the *StreetLevel* has been downloaded.

**Returns:**

True if the data has been downloaded, false otherwise

## StreetLevelBillboard

The class *StreetLevelBillboard* is a member of *com.here.android.mpa.streetlevel*.

### Class Summary

public final class **StreetLevelBillboard**

extends *com.here.android.mpa.streetlevel.StreetLevelIconBase*,  
*com.here.android.mpa.streetlevel.StreetLevelObject*, *com.here.android.mpa.common.ViewObject*,  
*java.lang.Object*

Represents a street level billboard object.

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 1185: Constructors in StreetLevelBillboard

Constructors
<i>StreetLevelBillboard</i> ( <i>GeoCoordinate</i> coordinate, <i>Image</i> image) Public Constructor

### Method Summary

Table 1186: Methods in StreetLevelBillboard

Methods
public float <i>getHeight</i> () Gets the current height of a <i>StreetLevelBillboard</i> , in meters.
public <i>StreetLevelBillboardOrientation</i> <i>getOrientation</i> () Gets the orientation of the <i>StreetLevelBillboard</i> .
public float <i>getWidth</i> () Gets the current width of a <i>StreetLevelBillboard</i> , in meters.
public <i>StreetLevelBillboard</i> <i>setFacadePlacementSize</i> (float width, float height, float minimumDistance, float maximumDistance) Sets icon size used in facade placement calculation.
public <i>StreetLevelBillboard</i> <i>setHeight</i> (float height) Sets a height, in meters, for the <i>StreetLevelBillboard</i> .
public <i>StreetLevelBillboard</i> <i>setOrientation</i> ( <i>StreetLevelBillboardOrientation</i> orientation) Sets the orientation for the <i>StreetLevelBillboard</i> .
public <i>StreetLevelBillboard</i> <i>setSize</i> (float width, float height) Sets a size for the billboard, in meters.

## Methods

```
public StreetLevelBillboard setWidth (float width)
```

Sets a width, in meters, for the *StreetLevelBillboard*.

---

## Class Details

Represents a street level billboard object. Users can add a *StreetLevelBillboard* object to an on-screen *StreetLevelModel* instance by binding it with a *StreetLevelFragment* object.

## Constructor Details

**StreetLevelBillboard** (*GeoCoordinate* coordinate, *Image* image)

Public Constructor

### Parameters:

- **coordinate**  
The *GeoCoordinate* for this billboard
- **image**  
Image texture to be displayed on this billboard

### Throws:

- **NullPointerException**  
Passed argument is null
- **IllegalArgumentException**  
Passed argument is invalid

## Method Details

```
public float getHeight ()
```

Gets the current height of a *StreetLevelBillboard*, in meters.

### Returns:

The current height

```
public StreetLevelBillboardOrientation getOrientation ()
```

Gets the orientation of the *StreetLevelBillboard*.

### Returns:

The orientation of the *StreetLevelBillboard*.

```
public float getWidth ()
```

Gets the current width of a *StreetLevelBillboard*, in meters.

**Returns:**

The current width

```
public StreetLevelBillboard setFacadePlacementSize (float width, float height,  
float minimumDistance, float maximumDistance)
```

Sets icon size used in facade placement calculation. By default the value specified in *setSize(float, float)* is used and each call to *setSize(float, float)* causes placement recalculation. Once *setFacadePlacementSize(float, float, float, float)* is called the value specified is used instead and *setSize(float, float)* does not cause facade placement recalculation. It is assumed that facade placement size is an upper limit of the actual size.

**Parameters:**

- **width**  
Width of the icon in meters.
- **height**  
Height of the icon in meters
- **minimumDistance**  
Minimum distance at which the size specified is applied.
- **maximumDistance**  
Maximum distance at which the size specified is applied.

**Returns:**

This *StreetLevelBillboard* object

```
public StreetLevelBillboard setHeight (float height)
```

Sets a height, in meters, for the *StreetLevelBillboard*.

**Parameters:**

- **height**  
Desired height

**Returns:**

This *StreetLevelBillboard* object

```
public StreetLevelBillboard setOrientation (StreetLevelBillboardOrientation  
orientation)
```

Sets the orientation for the *StreetLevelBillboard*.

**Parameters:**

- **orientation**

Orientation of the billboard

**Returns:**

This `StreetLevelBillboard` object

```
public StreetLevelBillboard setSize (float width, float height)
```

Sets a size for the billboard, in meters. If the size is not set, the billboard will not be displayed in the street level image.

**Parameters:**

- **width**

Desired width

- **height**

Desired height

**Returns:**

This `StreetLevelBillboard` object

```
public StreetLevelBillboard setWidth (float width)
```

Sets a width, in meters, for the `StreetLevelBillboard`.

**Parameters:**

- **width**

Desired width

**Returns:**

This `StreetLevelBillboard` object

## StreetLevelBillboardOrientation

The class `StreetLevelBillboardOrientation` is a member of `com.here.android.mpa.streetlevel`.

### Class Summary

```
public final class StreetLevelBillboardOrientation
```

```
extends java.lang.Object
```

Encapsulates the orientation for `StreetLevelBillboard` objects that users can add to a `StreetLevelModel`.

[For complete information, see the section [Class Details](#)]

## Nested Class Summary

Table 1187: Nested Classes in `StreetLevelBillboardOrientation`

Nested Classes
public static final enumeration <a href="#">StreetLevelBillboardOrientation.Orientation</a> This enumeration defines values for billboard orientation options

## Constructor Summary

Table 1188: Constructors in `StreetLevelBillboardOrientation`

Constructors
<a href="#">StreetLevelBillboardOrientation</a> ( <a href="#">Orientation</a> orientation, <a href="#">Vector3f</a> normal, <a href="#">Vector3f</a> up) Public Constructor

## Method Summary

Table 1189: Methods in `StreetLevelBillboardOrientation`

Methods
public boolean <a href="#">equals</a> (Object other) For documentation, see <a href="#">java.lang.Object</a>
public <a href="#">Vector3f</a> <a href="#">getNormalVector</a> () Gets the 3D normal vector of the billboard
public <a href="#">Orientation</a> <a href="#">getOrientation</a> () Gets the billboard orientation mode
public <a href="#">Vector3f</a> <a href="#">getUpVector</a> () Gets the 3D up vector of the billboard
public int <a href="#">hashCode</a> () For documentation, see <a href="#">java.lang.Object</a>
public void <a href="#">setNormalVector</a> ( <a href="#">Vector3f</a> normal) Sets the normal 3D vector of the billboard
public <a href="#">StreetLevelBillboardOrientation</a> <a href="#">setOrientation</a> ( <a href="#">Orientation</a> orientation) Sets the billboard orientation mode
public void <a href="#">setUpVector</a> ( <a href="#">Vector3f</a> up) Sets the up 3D vector of the billboard

## Class Details

Encapsulates the orientation for [StreetLevelBillboard](#) objects that users can add to a [StreetLevelModel](#). Changes to properties of this interface are reflected in the display of the associated [StreetLevelBillboard](#).

## Constructor Details

`StreetLevelBillboardOrientation` (*Orientation* orientation, *Vector3f* normal, *Vector3f* up)

Public Constructor

### Parameters:

- **orientation**  
The *StreetLevelBillboardOrientation.Orientation* mode for this billboard
- **normal**  
The normal *Vector3f* for this billboard
- **up**  
The up *Vector3f* for this billboard

## Method Details

```
public boolean equals (Object other)
```

For documentation, see *java.lang.Object*

### Parameters:

- **other**

```
public Vector3f getNormalVector ()
```

Gets the 3D normal vector of the billboard

### Returns:

The 3D normal vector

```
public Orientation getOrientation ()
```

Gets the billboard orientation mode

### Returns:

Billboard orientation mode

```
public Vector3f getUpVector ()
```

Gets the 3D up vector of the billboard

### Returns:

The 3D up vector

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public void setNormalVector (Vector3f normal)
```

Sets the normal 3D vector of the billboard

**Parameters:**

- **normal**  
Normal 3d vector

**Throws:**

- **NullPointerException**  
Passed argument is null

```
public StreetLevelBillboardOrientation setOrientation (Orientation orientation)
```

Sets the billboard orientation mode

**Parameters:**

- **orientation**  
Billboard orientation mode

**Returns:**

This **StreetLevelBillboardOrientation** object

```
public void setUpVector (Vector3f up)
```

Sets the up 3D vector of the billboard

**Parameters:**

- **up**  
Up 3d vector

## Orientation

The enumeration *Orientation* is a member of *com.here.android.mpa.streetlevel.StreetLevelBillboardOrientation*.

### Enumeration Summary

```
public static final enumeration StreetLevelBillboardOrientation.Orientation
```

*extends java.lang.Enum, java.lang.Object*

This enumeration defines values for billboard orientation options

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 1190: Enum Constants in Orientation

Fields
<pre>public static final Orientation FIXED</pre> <p>The billboard is set explicitly using normal and up vectors</p>
<pre>public static final Orientation VERTICAL_FIXED</pre> <p>The billboard is always upright, with the horizontal orientation set according to a normal vector</p>
<pre>public static final Orientation BILLBOARD</pre> <p>The billboard is always upright and oriented towards the camera</p>

## Method Summary

Table 1191: Methods in Orientation

Methods
<pre>public static Orientation valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static StreetLevelBillboardOrientation.Orientation[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

This enumeration defines values for billboard orientation options

### Enum Constant Details

```
public static final Orientation FIXED
```

The billboard is set explicitly using normal and up vectors

```
public static final Orientation VERTICAL_FIXED
```

The billboard is always upright, with the horizontal orientation set according to a normal vector

```
public static final Orientation BILLBOARD
```

The billboard is always upright and oriented towards the camera

## Method Details

```
public static Orientation valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static StreetLevelBillboardOrientation.Orientation[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## StreetLevelBuilding

The class *StreetLevelBuilding* is a member of [com.here.android.mpa.streetlevel](#) .

### Class Summary

```
public final class StreetLevelBuilding
```

extends [com.here.android.mpa.streetlevel.StreetLevelProxyObject](#), [com.here.android.mpa.common.ViewObject](#), [java.lang.Object](#)

Represents all street level building objects that are a visible component of an on-screen [StreetLevelFragment](#).

[For complete information, see the section [Class Details](#)]

### See also:

[getVisibleBuildings\(\)](#)

### Method Summary

Table 1192: Methods in *StreetLevelBuilding*

#### Methods

```
public float getHighlight ()
```

Gets the current *StreetLevelBuilding* highlight intensity, a float value within the range of [0..1] where 0 represents minimum intensity and 1 represents maximum intensity.

```
public Identifier getIdentifier ()
```

Gets the unique *StreetLevelBuilding* identifier, used for binding [StreetLevelIcon](#) and [StreetLevelBillboard](#) objects.

```
public GeoCoordinate getPosition ()
```

Gets the [GeoCoordinate](#) representing the position of the *StreetLevelBuilding* .

## Methods

```
public Type getType ()
```

Gets the type of object that the {link StreetLevelProxyObject} represents.

This method overrides *streetlevel.StreetLevelProxyObject.getType(void)*

```
public boolean setHighlight (float intensity)
```

Sets a highlight intensity for the *StreetLevelBuilding*, a float value within the range of [0..1] where 0 represents minimum intensity and 1 represents maximum intensity.

## Class Details

Represents all street level building objects that are a visible component of an on-screen *StreetLevelFragment*.

**See also:**

*getVisibleBuildings()*

## Method Details

```
public float getHighlight ()
```

Gets the current *StreetLevelBuilding* highlight intensity, a float value within the range of [0..1] where 0 represents minimum intensity and 1 represents maximum intensity.

**Returns:**

The current highlight intensity

```
public Identifier getIdentifier ()
```

Gets the unique *StreetLevelBuilding* identifier, used for binding *StreetLevelIcon* and *StreetLevelBillboard* objects.

**Returns:**

The *Identifier* for the building

```
public GeoCoordinate getPosition ()
```

Gets the *GeoCoordinate* representing the position of the *StreetLevelBuilding*.

**Returns:**

The *GeoCoordinate*. A null value is returned if the *StreetLevelBuilding* is not visible on screen.

```
public Type getType ()
```

Gets the type of object that the {link StreetLevelProxyObject} represents.

This method overrides *streetlevel.StreetLevelProxyObject.getType(void)*

```
public boolean setHighlight (float intensity)
```

Sets a highlight intensity for the `StreetLevelBuilding`, a float value within the range of [0..1] where 0 represents minimum intensity and 1 represents maximum intensity. The default value for highlight is 0, which represents no highlight.

**Parameters:**

- **intensity**  
Desired highlight intensity

**Returns:**

`true` if the operation is successful. Returns `false` otherwise, for example, highlight intensity is not in the valid range.

## StreetLevelCoverage

The class `StreetLevelCoverage` is a member of [com.here.android.mpa.streetlevel](http://com.here.android.mpa.streetlevel).

### Class Summary

```
public final class StreetLevelCoverage
```

```
extends java.lang.Object
```

Represents a class to determine whether specific areas of a map are covered for street level imagery.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 1193: Nested Classes in `StreetLevelCoverage`

Nested Classes
<pre>public static abstract interface StreetLevelCoverage.Listener</pre> <p>Represents a listener to provide notification upon completion of a <code>StreetLevelCoverage</code> operation.</p>
<pre>public static final enumeration StreetLevelCoverage.ResultCode</pre> <p>Represents values describing possible result types of the coverage check operation</p>

### Constructor Summary

Table 1194: Constructors in `StreetLevelCoverage`

Constructors
<pre>StreetLevelCoverage ()</pre> <p>Public constructor.</p>

## Method Summary

Table 1195: Methods in StreetLevelCoverage

Methods
<pre>public void <i>cancel</i> (<i>GeoCoordinate</i> geoCoordinate)</pre> <p>Cancel coverage check at <i>GeoCoordinate</i> <i>GeoCoordinate</i>, if still pending.</p>
<pre>public boolean <i>checkInCoverageZone</i> (<i>GeoCoordinate</i> geoCoordinate, int radius, boolean useAbsoluteCoverageCheck, <i>Listener</i> listener)</pre> <p>Determines whether the specified <i>GeoCoordinate</i> <i>GeoCoordinate</i> is within the street level coverage zone.</p>
<pre>public long <i>getTimeoutLimit</i> ()</pre> <p>Gets a timeout value in milliseconds for coverage check when an outstanding request should be cancelled.</p>
<pre>public void <i>setTimeoutLimit</i> (long value)</pre> <p>Sets a timeout value in milliseconds for coverage check when an outstanding request should be cancelled.</p>

## Class Details

Represents a class to determine whether specific areas of a map are covered for street level imagery.

## Constructor Details

### StreetLevelCoverage ()

Public constructor.

#### Throws:

- **AccessControlException**  
Access to this operation is denied. Contact your HERE representative for more information.

## Method Details

### public void *cancel* (*GeoCoordinate* geoCoordinate)

Cancel coverage check at *GeoCoordinate* *GeoCoordinate*, if still pending.

#### Parameters:

- **geoCoordinate**  
The location where coverage-check should be cancelled

### public boolean *checkInCoverageZone* (*GeoCoordinate* geoCoordinate, int radius, boolean useAbsoluteCoverageCheck, *Listener* listener)

Determines whether the specified *GeoCoordinate* *GeoCoordinate* is within the street level coverage zone.

Note: use the `onCoverageCheckCompleted(GeoCoordinate, int, StreetLevelCoverage.ResultCode)` callback to get the result.

## Parameters:

- **geoCoordinate**  
A *GeoCoordinate* to check for containment within the coverage zone
- **radius**  
A `int` representing the radius in meters
- **useAbsoluteCoverageCheck**  
This argument (when `true`) performs a precise street level coverage check. When enabled, additional map data maybe downloaded which may increase the time to perform the check. It is recommended the absolute coverage check be performed at high zoom levels (close to street level) or when an accurate coverage check is required. At low zoom levels or when an approximate coverage check is needed, pass `false`.
- **listener**  
Callback listener.

## Returns:

True if coverage request successfully submitted. False, if pending request still in-progress.

```
public long getTimeoutLimit ()
```

Gets a timeout value in milliseconds for coverage check when an outstanding request should be cancelled. Default value is -1, which means there will not be a timeout limit.

## Returns:

Timeout value in millisecond

```
public void setTimeoutLimit (long value)
```

Sets a timeout value in milliseconds for coverage check when an outstanding request should be cancelled. Caller of the request will received a callback with *CANCELLED*.

## Parameters:

- **value**  
Timeout value in millisecond. Acceptable values can be either a positive number or -1 to indicate no timeout.

## Throws:

- **IllegalArgumentException**  
if the timeout value is invalid.

## Listener

The interface *Listener* is a member of *com.here.android.mpa.streetlevel.StreetLevelCoverage*.

### Interface Summary

public static abstract interface **StreetLevelCoverage.Listener**

Represents a listener to provide notification upon completion of a *StreetLevelCoverage* operation.

[For complete information, see the section *Interface Details*]

### Method Summary

Table 1196: Methods in Listener

Methods
<pre>public abstract void <b>onCoverageCheckCompleted</b> (<i>GeoCoordinate</i> coordinate, int distanceToCoverage, <i>ResultCode</i> result)</pre>
A callback indicating that the <i>checkInCoverageZone(GeoCoordinate, int, boolean, StreetLevelCoverage.Listener)</i> method has completed its operation.

### Interface Details

Represents a listener to provide notification upon completion of a *StreetLevelCoverage* operation.

### Method Details

```
public abstract void onCoverageCheckCompleted (GeoCoordinate coordinate, int distanceToCoverage, ResultCode result)
```

A callback indicating that the *checkInCoverageZone(GeoCoordinate, int, boolean, StreetLevelCoverage.Listener)* method has completed its operation.

Note: this callback is sent from a callback thread, not from the UI thread.

#### Parameters:

- **coordinate**  
The *GeoCoordinate* *GeoCoordinate* used in the coverage check
- **distanceToCoverage**  
The distance (in meters) from the coordinate to the nearest coverage location.
- **result**  
A *StreetLevelCoverage.ResultCode* indicating the result of checking for street level coverage

## ResultCode

The enumeration *ResultCode* is a member of *com.here.android.mpa.streetlevel.StreetLevelCoverage*.

### Enumeration Summary

public static final enumeration **StreetLevelCoverage.ResultCode**

extends *java.lang.Enum*, *java.lang.Object*

Represents values describing possible result types of the coverage check operation

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 1197: Enum Constants in ResultCode

Fields
<pre>public static final ResultCode UNKNOWN_COVERAGE</pre> <p>The coverage for the selected area is unknown.</p>
<pre>public static final ResultCode HAS_COVERAGE</pre> <p>The selected area is within the street level coverage zone.</p>
<pre>public static final ResultCode HAS_NO_COVERAGE</pre> <p>The selected area is not within the street level coverage zone.</p>
<pre>public static final ResultCode NETWORK_ERROR</pre> <p>Request could not be completed because of a network error.</p>
<pre>public static final ResultCode CANCELLED</pre> <p>Request was cancelled.</p>

### Method Summary

Table 1198: Methods in ResultCode

Methods
<pre>public static ResultCode valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static StreetLevelCoverage.ResultCode[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

### Enumeration Details

Represents values describing possible result types of the coverage check operation

## Enum Constant Details

```
public static final ResultCode UNKNOWN_COVERAGE
```

The coverage for the selected area is unknown.

```
public static final ResultCode HAS_COVERAGE
```

The selected area is within the street level coverage zone.

```
public static final ResultCode HAS_NO_COVERAGE
```

The selected area is not within the street level coverage zone.

```
public static final ResultCode NETWORK_ERROR
```

Request could not be completed because of a network error.

```
public static final ResultCode CANCELLED
```

Request was cancelled.

## Method Details

```
public static ResultCode valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static StreetLevelCoverage.ResultCode[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## StreetLevelFragment

The class *StreetLevelFragment* is a member of [com.here.android.mpa.streetlevel](#).

## Class Summary

```
public class StreetLevelFragment
```

*extends java.lang.Object*

Represents a street level fragment.

[For complete information, see the section [Class Details](#)]

**See also:**

[android.app.Fragment](#)

## Constructor Summary

Table 1199: Constructors in StreetLevelFragment

Constructors
<a href="#">StreetLevelFragment</a> ()
Constructor

## Method Summary

Table 1200: Methods in StreetLevelFragment

Methods
<p>public Rect <a href="#">getCopyrightBoundaryRect</a> ()</p> <p>Gets the current HERE copyright logo's boundary rectangle.</p>
<p>public int <a href="#">getCopyrightLogoHeight</a> ()</p> <p>Returns the height of the copyright logo.</p>
<p>public int <a href="#">getCopyrightLogoWidth</a> ()</p> <p>Returns the width of the copyright logo.</p>
<p>public int <a href="#">getCopyrightMargin</a> ()</p> <p>Returns the current margin for the HERE copyright logo, in number of pixels, as an offset from the edge of the visible street level area to the edge of the logo.</p>
<p>public void <a href="#">getScreenCapture</a> (<a href="#">OnScreenCaptureListener</a> listener)</p> <p>Gets the full screen bitmap for the android.view.View.</p>
<p>public <a href="#">StreetLevelGesture</a> <a href="#">getStreetLevelGesture</a> ()</p> <p>Gets the <a href="#">StreetLevelGesture</a> interface for the <a href="#">StreetLevelModel</a>, used to enable or disable gestures.</p>
<p>public <a href="#">StreetLevelModel</a> <a href="#">getStreetLevelModel</a> ()</p> <p>Retrieve the <a href="#">StreetLevelModel</a>.</p>
<p>public void <a href="#">init</a> (<a href="#">OnEngineInitListener</a> listener)</p> <p>User of <a href="#">StreetLevelFragment</a> must call this function after the fragment is first attached to its activity.</p>
<p>public void <a href="#">init</a> (Context context, <a href="#">OnEngineInitListener</a> listener)</p> <p><b>Deprecated:</b> As of SDK 3.4.</p> <p>User of <a href="#">StreetLevelFragment</a> must call this function after the fragment is created.</p>

**Methods**

```
public void init (Context context, MapVariant variant, OnEngineInitListener listener)
```

Deprecated: As of SDK 3.4.

User of *StreetLevelFragment* must call this function after the fragment is created.

```
public void init (ApplicationContext context, OnEngineInitListener listener)
```

User of *StreetLevelFragment* must call this function after the fragment is created.

```
public View onCreateView (LayoutInflater inflater, ViewGroup container, Bundle savedInstanceState)
```

Called when a fragment is first attached to its activity.

```
public void onDestroy ()
```

Called when the fragment is destroyed.

```
public void onDestroyView ()
```

Called when the view previously created by *onCreateView(LayoutInflater, ViewGroup, Bundle)* has been detached from the fragment.

```
public void onInflate (Activity activity, AttributeSet attrs, Bundle savedInstanceState)
```

Called when a fragment is being created as part of a view layout inflation, typically from setting the content view of an activity.

```
public void onPause ()
```

Called when the Fragment is no longer resumed.

```
public void onResume ()
```

Called when the fragment is visible to the user and actively running.

```
public void onSaveInstanceState (Bundle outState)
```

Called when this fragment has been asked to save its current dynamic state.

```
public void setBlankStreetLevelImageVisible (boolean visible)
```

Request the view to draw "black" so a model can be reused without showing the previous street level image. This is useful in case an application tries to display the street level image for a location where street level coverage is not available. This API ensures that a "black" image is displayed if there is no street level coverage for the new location.

```
public void setCopyrightBoundaryRect (Rect rect)
```

Sets a rectangle, in pixels, relative to the top left corner of the *StreetLevelFragment*'s boundary, for the placement of the HERE copyright logo.

```
public void setCopyrightMargin (int margin)
```

Sets a margin for the HERE copyright logo, in number of pixels, as an offset from the edge of the visible street level area to the edge of the logo (depending on the placement). If the copyright logo position is *BOTTOM\_LEFT* the vertical offset is from the top of the copyright text. If copyright logo position is *BOTTOM\_RIGHT* the vertical offset is from the top of the Report Image link.

```
public void setOnTouchListener (View.OnTouchListener listener)
```

Sets an *android.view.OnTouchListener* to be invoked whenever a touch event is sent to the *StreetLevelFragment*.

## Class Details

Represents a street level fragment. This is the fragment class designed to handle all UI-related use cases, including rendering and screen touch events.

Note: each *StreetLevelFragment* must be bound to a *StreetLevelModel* instance, and *StreetLevel* objects should be persisted during application runtime. *StreetLevel* objects live and expire according to the associated activity's lifecycle. This fragment has `android.app.Fragment#setRetainInstance(boolean)` set, and therefore the *StreetLevelModel* will retain any properties applied to it during an application's lifetime.

A *StreetLevelFragment* is defined in an Android layout XML file. For example:

```
<fragment
  class="com.here.android.mpa.streetlevel.StreetLevelFragment"
  android:id="@+id/streetlevelfragment"
  android:layout_width="fill_parent"
  android:layout_height="fill_parent"
  android:layout_weight="1" />
```

Note: *StreetLevelFragment* automatically handles pause and resume of *MapEngine* during activity state changes, thus it is not necessary for the activity that owns *StreetLevelFragment*(s) to manually call `onPause()` / `onResume()` during the activity's `onPause()` and `onResume()`. However, considerations should be made regarding how much processing should be done in the `onResume()` method. Performing significant amounts of processing may delay the view rendering in cases such as device orientation change. It is recommended to use a specifically designated handler for organizing the amount of processing to be done in such cases.

See also:

[android.app.Fragment](#)

## Constructor Details

### StreetLevelFragment ()

Constructor

## Method Details

### public Rect getCopyrightBoundaryRect ()

Gets the current HERE copyright logo's boundary rectangle. Returns `null` if a boundary rect has not been set previously.

Returns:

The copyright logo's boundary rect. `null` if a boundary rect has not been set previously.

See also:

[setCopyrightBoundaryRect\(Rect\)](#)

```
public int getCopyrightLogoHeight ()
```

Returns the height of the copyright logo.

This method only returns a valid value once fragment initialization has taken completed.

**Returns:**

The height of the copyright logo, in number of pixels

```
public int getCopyrightLogoWidth ()
```

Returns the width of the copyright logo.

This method only returns a valid value once fragment initialization has completed.

**Returns:**

The width of the copyright logo, in number of pixels

```
public int getCopyrightMargin ()
```

Returns the current margin for the HERE copyright logo, in number of pixels, as an offset from the edge of the visible street level area to the edge of the logo. If the copyright logo position is `BOTTOM_LEFT` the vertical offset is from to the top of the copyright text. If copyright logo position is `BOTTOM_RIGHT` the vertical offset is from the top of the Report Image link. The default copyright margin values is set to one-third of the logo width.

This method only returns a valid value once fragment initialization has taken place.

**Returns:**

The current offset from the edge of the [StreetLevelFragment](#), in number of pixels

```
public void getScreenCapture (OnScreenCaptureListener listener)
```

Gets the full screen bitmap for the `android.view.View`. This API can be used to capture a screen shot of the [StreetLevelFragment](#). The API is asynchronous and will callback once the operation is completed via [OnScreenCaptureListener](#). Note the [StreetLevelFragment](#) must be visible to create the screen capture.

**Parameters:**

- **listener**  
A [OnScreenCaptureListener](#) to callback on screencapture completion.

```
public StreetLevelGesture getStreetLevelGesture ()
```

Gets the [StreetLevelGesture](#) interface for the [StreetLevelModel](#), used to enable or disable gestures.

**Returns:**

The [StreetLevelGesture](#)

```
public StreetLevelModel getStreetLevelModel ()
```

Retrieve the *StreetLevelModel*.

**Returns:**

the *StreetLevelModel* associated with this fragment

```
public void init (OnEngineInitListener listener)
```

User of *StreetLevelFragment* must call this function after the fragment is first attached to its activity. This automatically initialises the Restricted Map Factory and create a *StreetLevelModel* for use. This method is a method that should be used for fragments embedded in a layout XML. Do not use this method when *StreetLevelFragment* is created programatically.

This method will initialize *MapEngine* with *GLOBAL* map variant on first SDK usage and with stored map variant on sub-sequent usages.

**Parameters:**

- **listener**

A *OnEngineInitListener* object will be called when *StreetLevelFragment* initialization is finished. A null object can be supplied if caller do not expect any notification when initialization completes.

**See also:**

[OnEngineInitListener](#)

[init\(ApplicationContext, OnEngineInitListener\)](#)

```
public void init (Context context, OnEngineInitListener listener)
```

Deprecated: As of SDK 3.4.

Use [\(com.here.android.mpa.common.MapEngine#init\(com.here.android.mpa.common.ApplicationContext, instead.](#)

User of *StreetLevelFragment* must call this function after the fragment is created. This automatically initialises the Restricted Map Factory and create a *StreetLevelModel* for use. Do not use this method when *StreetLevelFragment* is created programatically.

This method will initialize *MapEngine* with *GLOBAL* map variant on first SDK usage and with stored map variant on sub-sequent usages.

**Parameters:**

- **context**

Context of the application.

- **listener**

A *OnEngineInitListener* object will be called when *StreetLevelFragment* initialization is finished. A null object can be supplied if caller do not expect any notification when initialization completes.

**See also:**

[OnEngineInitListener](#)[init\(OnEngineInitListener\)](#)

```
public void init (Context context, MapVariant variant, OnEngineInitListener listener)
```

Deprecated: As of SDK 3.4.

Use `MapEngine#init(ApplicationContext, OnEngineInitListener)` instead.

User of [StreetLevelFragment](#) must call this function after the fragment is created. This automatically initialises the Restricted Map Factory and create a `StreetLevelModel` for use. Do not use this method when `StreetLevelFragment` is created programatically.

This method can configure map variant which will be used by `MapEngine`. If initialization fails - `OPERATION_NOT_ALLOWED` will be reported. Currently following variants are supported: - [GLOBAL](#) - initialize `MapEngine` to use international map variant; - [KOREA](#) - initialize `MapEngine` to use Korean map variant; - null - initialize `MapEngine` to use stored map variant or international map variant for first run. This method is used to configure `MapEngine` to use certain map variant. If `MapEngine` was already configured and passed `variant` differs - error will be reported and initialization fails.

**Parameters:**

- **context**  
Context of the application.
- **variant**  
Map variant to use.
- **listener**  
A [OnEngineInitListener](#) object will be called when [StreetLevelFragment](#) initialization is finished. A null object can be supplied if caller do not expect any notification when initialization completes.

**See also:**[OnEngineInitListener](#)[init\(OnEngineInitListener\)](#)

```
public void init (ApplicationContext context, OnEngineInitListener listener)
```

User of [StreetLevelFragment](#) must call this function after the fragment is created. This automatically initialises the Restricted Map Factory and create a `StreetLevelModel` for use. Do not use this method when `StreetLevelFragment` is created programatically.

This method will initialize `MapEngine` with `ApplicationContext` to be used during initialization.

**Parameters:**

- **context**  
`ApplicationContext` to be used during initialization.
- **listener**

A *OnEngineInitListener* object will be called when *StreetLevelFragment* initialization is finished. A null object can be supplied if caller do not expect any notification when initialization completes.

**See also:**

*OnEngineInitListener*

*init(OnEngineInitListener)*

```
public View onCreateView (LayoutInflater inflater, ViewGroup container,  
Bundle savedInstanceState)
```

Called when a fragment is first attached to its activity. A Street Level View is automatically setup to cover the full size of the StreetLevelFragment dimension.

**Parameters:**

- **inflater**
- **container**
- **savedInstanceState**

**See also:**

`android.app.Fragment#onAttach(android.app.Activity)`

```
public void onDestroy ()
```

Called when the fragment is destroyed.

```
public void onDestroyView ()
```

Called when the view previously created by *onCreateView(LayoutInflater, ViewGroup, Bundle)* has been detached from the fragment. The *StreetLevelModel* created by the fragment will be detached from the fragment and destroyed automatically as part of the cleanup process. The `android.view.View.OnTouchListener` will also be disconnected from the fragment.

```
public void onInflate (Activity activity, AttributeSet attrs, Bundle  
savedInstanceState)
```

Called when a fragment is being created as part of a view layout inflation, typically from setting the content view of an activity. This may be called immediately after the fragment is created from a tag in a layout file.

**Parameters:**

- **activity**
- **attrs**
- **savedInstanceState**

**See also:**

`android.app.Fragment#onInflate(android.app.Activity, android.util.AttributeSet, android.os.Bundle)`

```
public void onPause ()
```

Called when the Fragment is no longer resumed. All Map Engine activities will be paused automatically.

**See also:**

```
android.app.Fragment#onPause()
```

```
public void onResume ()
```

Called when the fragment is visible to the user and actively running. All Map Engine activities will be resumed automatically.

**See also:**

```
android.app.Fragment#onResume()
```

```
public void onSaveInstanceState (Bundle outState)
```

Called when this fragment has been asked to save its current dynamic state. Saving its current state allows for it to be later reconstructed in a new instance.

**Parameters:**

- **outState**

**See also:**

```
android.app.Fragment#onSaveInstanceState(android.os.Bundle)
```

```
public void setBlankStreetLevelImageVisible (boolean visible)
```

Request the view to draw "black" so a model can be reused without showing the previous street level image. This is useful in case an application tries to display the street level image for a location where street level coverage is not available. This API ensures that a "black" image is displayed if there is no street level coverage for the new location.

**Parameters:**

- **visible**

Boolean value to indicate if the blank image represented by the "black" model is visible.

```
public void setCopyrightBoundaryRect (Rect rect)
```

Sets a rectangle, in pixels, relative to the top left corner of the *StreetLevelFragment*'s boundary, for the placement of the HERE copyright logo.

If the specified rectangle is not contained completely within the current visible street level area, their area of intersection will be used instead of the specified rectangle's area. The copyright logo and copyright margin must fit into the rectangle, otherwise specified rectangle will be ignored.

The rectangle is reset upon screen rotation or upon screen re-creation, or it can be done by setting a `null Rect`.

**Parameters:**

- **rect**

A `Rect` representing the desired rectangular container to be used for positioning the copyright logo. Use `null Rect` to reset the boundary container.

**Throws:**

- **IllegalArgumentException**  
if `Rect` supplied is invalid

**public void setCopyrightMargin (int margin)**

Sets a margin for the HERE copyright logo, in number of pixels, as an offset from the edge of the visible street level area to the edge of the logo (depending on the placement). If the copyright logo position is `BOTTOM_LEFT` the vertical offset is from to the top of the copyright text. If copyright logo position is `BOTTOM_RIGHT` the vertical offset is from the top of the Report Image link. The default copyright margin values is set to one-third of the logo width.

**Parameters:**

- **margin**

Desired offset from the edge of the [StreetLevelFragment](#)

**public void setOnTouchListener (View.OnTouchListener listener)**

Sets an `android.view.OnTouchListener` to be invoked whenever a touch event is sent to the [StreetLevelFragment](#).

**Parameters:**

- **listener**

An `android.view.OnTouchListener` to set for the [StreetLevelFragment](#)

**See also:**

[android.view.View.OnTouchListener](#)

## StreetLevelGesture

The class `StreetLevelGesture` is a member of [com.here.android.mpa.streetlevel](#).

### Class Summary

```
public class StreetLevelGesture
```

```
extends java.lang.Object
```

Encapsulates all user interactions and gestures that are applicable to a *StreetLevelFragment*.

[For complete information, see the section [Class Details](#)]

## Nested Class Summary

Table 1201: Nested Classes in StreetLevelGesture

Nested Classes
public static abstract interface <i>StreetLevelGesture.OnGestureListener</i> Event Listener interface for gesture events.

## Method Summary

Table 1202: Methods in StreetLevelGesture

Methods
public void <i>addOnGestureListener</i> ( <i>OnGestureListener</i> listener) Adds a <i>StreetLevelGesture.OnGestureListener</i> to listen for map gesture events.
public boolean <i>isDoubleTapEnabled</i> () Gets the boolean indicating whether double tap is enabled for the <i>StreetLevelGesture</i> .
public boolean <i>isPinchEnabled</i> () Gets the boolean indicating whether pinch is enabled for the <i>StreetLevelGesture</i> .
public boolean <i>isRotationEnabled</i> () Gets the boolean indicating whether rotation is enabled for the <i>StreetLevelGesture</i> .
public boolean <i>isTapEnabled</i> () Gets the boolean indicating whether tap is enabled for the <i>StreetLevelGesture</i> .
public void <i>removeOnGestureListener</i> ( <i>OnGestureListener</i> listener) Removes an existing <i>StreetLevelGesture.OnGestureListener</i> .
public <i>StreetLevelGesture</i> <i>setAllGesturesEnabled</i> (boolean enabled) Simultaneously sets every possible kind of gesture interaction to be either enabled or disabled for the <i>StreetLevelGesture</i> .
public <i>StreetLevelGesture</i> <i>setDoubleTapEnabled</i> (boolean enabled) Sets double tap interaction to be either enabled or disabled for the <i>StreetLevelGesture</i> .
public <i>StreetLevelGesture</i> <i>setPinchEnabled</i> (boolean enabled) Sets pinch interaction to be either enabled or disabled for the <i>StreetLevelGesture</i> .
public <i>StreetLevelGesture</i> <i>setRotationEnabled</i> (boolean enabled) Sets rotation interaction to be either enabled or disabled for the <i>StreetLevelGesture</i> .
public <i>StreetLevelGesture</i> <i>setTapEnabled</i> (boolean enabled) Sets tap interaction to be either enabled or disabled for the <i>StreetLevelGesture</i> .

## Class Details

Encapsulates all user interactions and gestures that are applicable to a *StreetLevelFragment*. By default all gestures are enabled.

## Method Details

```
public void addOnGestureListener (OnGestureListener listener)
```

Adds a *StreetLevelGesture.OnGestureListener* to listen for map gesture events.

Note: after you add a *StreetLevelGesture.OnGestureListener* to an application, remember to call *removeOnGestureListener(OnGestureListener)* if you no longer need to listen for street level gesture events and want to free up application resources.

### Parameters:

- **listener**

A *StreetLevelGesture.OnGestureListener* to add to this *StreetLevelGesture*

### See also:

*removeOnGestureListener(OnGestureListener)*

```
public boolean isDoubleTapEnabled ()
```

Gets the boolean indicating whether double tap is enabled for the *StreetLevelGesture*.

### Returns:

True if double tap is enabled, false otherwise

```
public boolean isPinchEnabled ()
```

Gets the boolean indicating whether pinch is enabled for the *StreetLevelGesture*.

### Returns:

True if pinch is enabled, false otherwise

```
public boolean isRotationEnabled ()
```

Gets the boolean indicating whether rotation is enabled for the *StreetLevelGesture*.

### Returns:

True if rotation is enabled, false otherwise

```
public boolean isTapEnabled ()
```

Gets the boolean indicating whether tap is enabled for the *StreetLevelGesture* .

### Returns:

True if tap is enabled, false otherwise

```
public void removeOnGestureListener (OnGestureListener listener)
```

Removes an existing *StreetLevelGesture.OnGestureListener*. Call this method to free up application resources once you no longer need to listen for map gesture events.

**Parameters:**

- **listener**  
A *StreetLevelGesture.OnGestureListener* to remove from this *StreetLevelGesture*

```
public StreetLevelGesture setAllGesturesEnabled (boolean enabled)
```

Simultaneously sets every possible kind of gesture interaction to be either enabled or disabled for the *StreetLevelGesture*.

**Parameters:**

- **enabled**  
A boolean specifying whether all gestures are enabled

**Returns:**

This *StreetLevelGesture* object

```
public StreetLevelGesture setDoubleTapEnabled (boolean enabled)
```

Sets double tap interaction to be either enabled or disabled for the *StreetLevelGesture*.

**Parameters:**

- **enabled**  
A boolean specifying whether double tap is enabled

**Returns:**

This *StreetLevelGesture* object

```
public StreetLevelGesture setPinchEnabled (boolean enabled)
```

Sets pinch interaction to be either enabled or disabled for the *StreetLevelGesture*.

**Parameters:**

- **enabled**  
A boolean specifying whether pinch is enabled

**Returns:**

This *StreetLevelGesture* object

```
public StreetLevelGesture setRotationEnabled (boolean enabled)
```

Sets rotation interaction to be either enabled or disabled for the *StreetLevelGesture*.

**Parameters:**

- **enabled**  
A boolean specifying whether rotation is enabled

**Returns:**

This *StreetLevelGesture* object

```
public StreetLevelGesture setTapEnabled (boolean enabled)
```

Sets tap interaction to be either enabled or disabled for the *StreetLevelGesture*.

**Parameters:**

- **enabled**  
A boolean specifying whether tap is enabled

**Returns:**

This *StreetLevelGesture* object

## OnGestureListener

The interface *OnGestureListener* is a member of *com.here.android.mpa.streetlevel.StreetLevelGesture*.

### Interface Summary

```
public static abstract interface StreetLevelGesture.OnGestureListener
```

Event Listener interface for gesture events.

[For complete information, see the section [Interface Details](#)]

### Nested Class Summary

Table 1203: Nested Classes in *OnGestureListener*

Nested Classes
<pre>public static abstract class <i>StreetLevelGesture.OnGestureListener.OnGestureListenerAdapter</i></pre> <p>Default implementation for the <i>OnGestureListener</i> interface.</p>

## Method Summary

Table 1204: Methods in OnGestureListener

Methods
<pre>public abstract boolean <i>onCompassSelected</i> ()</pre> <p>A callback indicating that the compass within the <i>StreetLevelFragment</i> has been selected.</p>
<pre>public abstract boolean <i>onDoubleTap</i> (PointF p)</pre> <p>A callback indicating the detection of a double tap user gesture within the <i>StreetLevelFragment</i>.</p>
<pre>public abstract boolean <i>onObjectsSelected</i> (java.util.List &lt;StreetLevelSelectedObject&gt; selectedObjects)</pre> <p>A callback indicating that one or more objects within the <i>StreetLevelFragment</i> has been selected.</p>
<pre>public abstract boolean <i>onPinchZoom</i> (float scaleFactor)</pre> <p>A callback indicating the detection of a pinch-to-zoom user gesture within the <i>StreetLevelFragment</i>.</p>
<pre>public abstract boolean <i>onRotate</i> (PointF from, PointF to)</pre> <p>A callback indicating the detection of a rotation or tilt user gesture within the <i>StreetLevelFragment</i>.</p>
<pre>public abstract boolean <i>onTap</i> (PointF p)</pre> <p>A callback indicating the detection of a tap user gesture within the <i>StreetLevelFragment</i>.</p>

## Interface Details

Event Listener interface for gesture events. Please use *StreetLevelGesture.OnGestureListener* if all events are necessary and *StreetLevelGesture.OnGestureListener.OnGestureListenerAdapter* if some events are required. This interface can be added via *StreetLevelGesture.addOnGestureListener(OnGestureListener)* and removed via *StreetLevelGesture.removeOnGestureListener(OnGestureListener)*. Please see *StreetLevelGesture* for a full set of configurable APIs.

## Method Details

```
public abstract boolean onCompassSelected ()
```

A callback indicating that the compass within the *StreetLevelFragment* has been selected.

### Returns:

True if the selection has been consumed (which prevents the default *StreetLevelFragment* compass selection behavior), false otherwise

```
public abstract boolean onDoubleTap (PointF p)
```

A callback indicating the detection of a double tap user gesture within the *StreetLevelFragment*.

### Parameters:

- **p**  
A PointF representing the on-screen point of the double-tap gesture

**Returns:**

True if the tap has been consumed (which prevents the default *StreetLevelFragment* double tap behavior), false otherwise

```
public abstract boolean onObjectsSelected (java.util.List  
<StreetLevelSelectedObject> selectedObjects)
```

A callback indicating that one or more objects within the *StreetLevelFragment* has been selected.

**Parameters:**

- **selectedObjects**  
A list of *StreetLevelSelectedObject* objects that have been selected

**Returns:**

True if the selection has been consumed (which prevents the default *StreetLevelFragment* object selection behavior), false otherwise

```
public abstract boolean onPinchZoom (float scaleFactor)
```

A callback indicating the detection of a pinch-to-zoom user gesture within the *StreetLevelFragment*.

**Parameters:**

- **scaleFactor**  
A scale factor relative to the points of the two simultaneous touches at separate screen coordinates

**Returns:**

True if consumed (which prevents the default *StreetLevelFragment* zoom-in or zoom-out behavior), false otherwise

```
public abstract boolean onRotate (PointF from, PointF to)
```

A callback indicating the detection of a rotation or tilt user gesture within the *StreetLevelFragment*.

**Parameters:**

- **from**  
A `android.graphics.PointF` representing the on-screen point where the user first touched the screen
- **to**  
A `android.graphics.PointF` representing the on-screen point where the user removed their finger from the screen

**Returns:**

True if consumed (which prevents the default *StreetLevelFragment* rotate-to-here behavior), false otherwise

```
public abstract boolean onTap (PointF p)
```

A callback indicating the detection of a tap user gesture within the *StreetLevelFragment*.

**Parameters:**

- **p**  
The point coordinate of the tap

**Returns:**

True if the tap has been consumed (which prevents the default *StreetLevelFragment* tap behavior), false otherwise

## OnGestureListenerAdapter

The class *OnGestureListenerAdapter* is a member of *com.here.android.mpa.streetlevel.StreetLevelGesture.OnGestureListener*.

### Class Summary

public static abstract class **StreetLevelGesture.OnGestureListener.OnGestureListenerAdapter**

implements *com.here.android.mpa.streetlevel.StreetLevelGesture.OnGestureListener*

extends *java.lang.Object*

Default implementation for the OnGestureListener interface.

[For complete information, see the section *Class Details*]

**See also:**

*StreetLevelGesture.OnGestureListener*

### Constructor Summary

Table 1205: Constructors in OnGestureListenerAdapter

Constructors
<i>OnGestureListenerAdapter</i> ()

### Method Summary

Table 1206: Methods in OnGestureListenerAdapter

Methods
public boolean <i>onCompassSelected</i> ()
A callback indicating that the compass within the <i>StreetLevelFragment</i> has been selected.
This method overrides <i>streetlevel.StreetLevelGesture.OnGestureListener.onCompassSelected(void)</i>

## Methods

```
public boolean onDoubleTap (PointF p)
```

A callback indicating the detection of a double tap user gesture within the *StreetLevelFragment*.

This method overrides *streetlevel.StreetLevelGesture.OnGestureListener.onDoubleTap(PointF)*

```
public boolean onObjectsSelected (java.util.List <StreetLevelSelectedObject> selectedObjects)
```

A callback indicating that one or more objects within the *StreetLevelFragment* has been selected.

This method overrides *streetlevel.StreetLevelGesture.OnGestureListener.onObjectsSelected(List)*

```
public boolean onPinchZoom (float scaleFactor)
```

A callback indicating the detection of a pinch-to-zoom user gesture within the *StreetLevelFragment*.

This method overrides *streetlevel.StreetLevelGesture.OnGestureListener.onPinchZoom(float)*

```
public boolean onRotate (PointF from, PointF to)
```

A callback indicating the detection of a rotation or tilt user gesture within the *StreetLevelFragment*.

This method overrides *streetlevel.StreetLevelGesture.OnGestureListener.onRotate(PointF, PointF)*

```
public boolean onTap (PointF p)
```

A callback indicating the detection of a tap user gesture within the *StreetLevelFragment*.

This method overrides *streetlevel.StreetLevelGesture.OnGestureListener.onTap(PointF)*

## Class Details

Default implementation for the *OnGestureListener* interface. Users may use this abstract class and overload specific methods to have a smaller code footprint.

See also:

[StreetLevelGesture.OnGestureListener](#)

## Constructor Details

**OnGestureListenerAdapter** ()

## Method Details

```
public boolean onCompassSelected ()
```

A callback indicating that the compass within the *StreetLevelFragment* has been selected.

This method overrides *streetlevel.StreetLevelGesture.OnGestureListener.onCompassSelected(void)*

```
public boolean onDoubleTap (PointF p)
```

A callback indicating the detection of a double tap user gesture within the *StreetLevelFragment*.

This method overrides *streetlevel.StreetLevelGesture.OnGestureListener.onDoubleTap(PointF)*

Parameters:

- `p`

```
public boolean onObjectsSelected (java.util.List <StreetLevelSelectedObject>
selectedObjects)
```

A callback indicating that one or more objects within the *StreetLevelFragment* has been selected.

This method overrides *streetlevel.StreetLevelGesture.OnGestureListener.onObjectsSelected(List)*

**Parameters:**

- `selectedObjects`

```
public boolean onPinchZoom (float scaleFactor)
```

A callback indicating the detection of a pinch-to-zoom user gesture within the *StreetLevelFragment*.

This method overrides *streetlevel.StreetLevelGesture.OnGestureListener.onPinchZoom(float)*

**Parameters:**

- `scaleFactor`

```
public boolean onRotate (PointF from, PointF to)
```

A callback indicating the detection of a rotation or tilt user gesture within the *StreetLevelFragment*.

This method overrides *streetlevel.StreetLevelGesture.OnGestureListener.onRotate(PointF, PointF)*

**Parameters:**

- `from`
- `to`

```
public boolean onTap (PointF p)
```

A callback indicating the detection of a tap user gesture within the *StreetLevelFragment*.

This method overrides *streetlevel.StreetLevelGesture.OnGestureListener.onTap(PointF)*

**Parameters:**

- `p`

## StreetLevelIcon

The class *StreetLevelIcon* is a member of *com.here.android.mpa.streetlevel* .

### Class Summary

```
public final class StreetLevelIcon
```

extends *com.here.android.mpa.streetlevel.StreetLevelIconBase*,  
*com.here.android.mpa.streetlevel.StreetLevelObject*, *com.here.android.mpa.common.ViewObject*,  
*java.lang.Object*

Represents a class for all street-level icon objects.

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 1207: Constructors in *StreetLevelIcon*

Constructors
<i>StreetLevelIcon</i> ( <i>GeoCoordinate</i> coordinate, <i>Image</i> image)
Public Constructor

## Method Summary

Table 1208: Methods in *StreetLevelIcon*

Methods
public <i>Identifier</i> <i>getAttachmentIdentifier</i> ()
Gets the <i>Identifier</i> for the building to which the <i>StreetLevelIconBase</i> ( <i>StreetLevelIcon</i> or <i>StreetLevelBillboard</i> ) is attached to.
public <i>StreetLevelIconSize</i> <i>getSize</i> ()
Gets the current <i>StreetLevelIconSize</i> of the <i>StreetLevelIcon</i> .
public <i>StreetLevelIcon</i> <i>setAttachmentIdentifier</i> ( <i>Identifier</i> identifier)
Attaches street level icon object to a <i>StreetLevelBuilding</i> with specified <i>Identifier</i> .
public <i>StreetLevelIcon</i> <i>setSize</i> ( <i>StreetLevelIconSize</i> size)
Sets a <i>StreetLevelIconSize</i> for the <i>StreetLevelIcon</i> .

## Class Details

Represents a class for all street-level icon objects. Users can add a *StreetLevelIcon* object to an on-screen *StreetLevelModel* instance by binding it with a *StreetLevelFragment* object.

## Constructor Details

*StreetLevelIcon* (*GeoCoordinate* coordinate, *Image* image)

Public Constructor

### Parameters:

- **coordinate**  
The location for this icon
- **image**

The logo image for this icon

## Method Details

```
public Identifier getAttachmentIdentifier ()
```

Gets the *Identifier* for the building to which the *StreetLevelIconBase* (*StreetLevelIcon* or *StreetLevelBillboard*) is attached to.

### Returns:

The attached building identifier or null in case icon or billboard is not attached to a building

```
public StreetLevelIconSize getSize ()
```

Gets the current *StreetLevelIconSize* of the *StreetLevelIcon*.

### Returns:

The *StreetLevelIconSize*

```
public StreetLevelIcon setAttachmentIdentifier (Identifier identifier)
```

Attaches street level icon object to a *StreetLevelBuilding* with specified *Identifier*.

Use null value to remove attachment.

### Parameters:

- **identifier**

Desired *Identifier* for the icon or billboard

### Returns:

This *StreetLevelIcon* object

```
public StreetLevelIcon setSize (StreetLevelIconSize size)
```

Sets a *StreetLevelIconSize* for the *StreetLevelIcon*. If the size is not set, the icon will not be displayed in the street-level image.

### Parameters:

- **size**

Desired *StreetLevelIconSize* for the *StreetLevelIcon*

### Returns:

This *StreetLevelIcon* object

## StreetLevelIconBase

The class *StreetLevelIconBase* is a member of *com.here.android.mpa.streetlevel*.

### Class Summary

public abstract class **StreetLevelIconBase**

extends *com.here.android.mpa.streetlevel.StreetLevelObject*, *com.here.android.mpa.common.ViewObject*, *java.lang.Object*

Represents a base class for all image-based street level objects that users can add to a *StreetLevelModel*.

[For complete information, see the section *Class Details*]

### Method Summary

Table 1209: Methods in StreetLevelIconBase

Methods
<p>public PointF <b>getAnchorPoint</b> ()</p> <p>Gets the array of float values representing the current X-coordinate (horizontal coordinate) and Y-coordinate (vertical coordinate) for the anchor point for the <i>StreetLevelIconBase</i> (<i>StreetLevelIcon</i> or <i>StreetLevelBillboard</i>).</p>
<p>public Identifier <b>getAttachmentIdentifier</b> ()</p> <p>Gets the <i>Identifier</i> for the building to which the <i>StreetLevelIconBase</i> (<i>StreetLevelIcon</i> or <i>StreetLevelBillboard</i>) is attached to.</p>
<p>public PointF <b>getBottomRightTextureCoordinate</b> ()</p> <p>Gets bottom right texture coordinate.</p>
<p>public StreetLevelIconPlacement <b>getPlacementMode</b> ()</p> <p>Gets mode for calculating the final display position in of the street level image base object.</p>
<p>public GeoCoordinate <b>getPosition</b> ()</p> <p>Gets the <i>GeoCoordinate</i> representing the current geographical location of the <i>StreetLevelIconBase</i> (<i>StreetLevelIcon</i> or <i>StreetLevelBillboard</i>).</p>
<p>public PointF <b>getTopLeftTextureCoordinate</b> ()</p> <p>Gets top left texture coordinate.</p>
<p>public float <b>getTransparency</b> ()</p> <p>Gets the current transparency for the <i>StreetLevelIconBase</i> (<i>StreetLevelIcon</i> or <i>StreetLevelBillboard</i>), a float value between 0 (fully transparent) and 1 (fully opaque).</p>
<p>public void <b>setAnchorPoint</b> (PointF anchor)</p> <p>Sets an anchor point for the <i>StreetLevelIconBase</i>, for example a <i>StreetLevelIcon</i> or <i>StreetLevelBillboard</i>.</p>
<p>public StreetLevelIconBase <b>setAttachmentIdentifier</b> (Identifier identifier)</p> <p>Attaches street level icon object to a <i>StreetLevelBuilding</i> with specified <i>Identifier</i>.</p>
<p>public void <b>setImage</b> (Image icon)</p> <p>Sets an <i>Image</i> for the <i>StreetLevelIconBase</i> (<i>StreetLevelIcon</i> or <i>StreetLevelBillboard</i>).</p>

## Methods

```
public void setPlacementMode (StreetLevelIconPlacement placement)
```

Sets mode for calculating the final display position of the street level image base object.

```
public void setPosition (GeoCoordinate coordinate)
```

Sets a *GeoCoordinate* representing the position for the *StreetLevelIconBase* (*StreetLevelIcon* or *StreetLevelBillboard*).

```
public void setTextureCoordinates (PointF topLeft, PointF bottomRight)
```

Sets the extent of texture coordinates.

```
public void setTransparency (float alpha)
```

Sets a transparency level, within the range of [0..1], for the *StreetLevelIconBase* (*StreetLevelIcon* or *StreetLevelBillboard*).

## Class Details

Represents a base class for all image-based street level objects that users can add to a *StreetLevelModel*.

This interface serves as a generalization (or abstract base) for several more specific street level object types, bundling their common properties. Users can add the following types of image-based street level objects to a *StreetLevelModel*:

- *StreetLevelIcon*
- *StreetLevelBillboard*

## Method Details

```
public PointF getAnchorPoint ()
```

Gets the array of float values representing the current X-coordinate (horizontal coordinate) and Y-coordinate (vertical coordinate) for the anchor point for the *StreetLevelIconBase* (*StreetLevelIcon* or *StreetLevelBillboard*).

### Returns:

Anchor Point of the icon or null in case the retrieval fails

```
public Identifier getAttachmentIdentifier ()
```

Gets the *Identifier* for the building to which the *StreetLevelIconBase* (*StreetLevelIcon* or *StreetLevelBillboard*) is attached to.

### Returns:

The attached building identifier or null in case icon or billboard is not attached to a building

```
public PointF getBottomRightTextureCoordinate ()
```

Gets bottom right texture coordinate.

### Returns:

Bottom right texture coordinate or null in case the retrieval fails

```
public StreetLevelIconPlacement getPlacementMode ()
```

Gets mode for calculating the final display position in of the street level image base object.

**Returns:**

The current placement mode

```
public GeoCoordinate getPosition ()
```

Gets the *GeoCoordinate* representing the current geographical location of the *StreetLevelIconBase* (*StreetLevelIcon* or *StreetLevelBillboard*).

**Returns:**

The *GeoCoordinate*

```
public PointF getTopLeftTextureCoordinate ()
```

Gets top left texture coordinate.

**Returns:**

Top left texture coordinate or null in case the retrieval fails

```
public float getTransparency ()
```

Gets the current transparency for the *StreetLevelIconBase* (*StreetLevelIcon* or *StreetLevelBillboard*), a float value between 0 (fully transparent) and 1 (fully opaque).

**Returns:**

The current transparency

```
public void setAnchorPoint (PointF anchor)
```

Sets an anchor point for the *StreetLevelIconBase*, for example a *StreetLevelIcon* or *StreetLevelBillboard*.

An anchor point specifies a point within an icon. When the icon is drawn inside a *StreetLevelFragment*, the anchor point should coincide with the exact location of the icon.

**Parameters:**

- **anchor**

The anchor point. Desired horizontal and vertical coordinate for the anchor must be within the range of [0..1]

**Throws:**

- **NullPointerException**

Passed argument is null

```
public StreetLevelIconBase setAttachmentIdentifier (Identifier identifier)
```

Attaches street level icon object to a *StreetLevelBuilding* with specified *Identifier*.

Use null value to remove current attachment.

**Parameters:**

- **identifier**  
Desired *Identifier* for the icon or billboard

**Returns:**

The updated *StreetLevelIconBase* object itself.

**Throws:**

- **NumberFormatException**  
Passed argument is of incorrect format
- **NullPointerException**  
Passed argument is null

```
public void setImage (Image icon)
```

Sets an *Image* for the *StreetLevelIconBase* (*StreetLevelIcon* or *StreetLevelBillboard*).

**Parameters:**

- **icon**  
Desired *Image* for the icon or billboard

**Throws:**

- **IllegalArgumentException**  
Passed argument is invalid
- **NullPointerException**  
Passed argument is null

**See also:**

[setAnchorPoint\(PointF\)](#)

```
public void setPlacementMode (StreetLevelIconPlacement placement)
```

Sets mode for calculating the final display position of the street level image base object.

**Parameters:**

- **placement**  
A *StreetLevelIconPlacement* representing the horizontal and vertical placement properties of the street level image base object *StreetLevelIconPlacement*

```
public void setPosition (GeoCoordinate coordinate)
```

Sets a *GeoCoordinate* representing the position for the *StreetLevelIconBase* (*StreetLevelIcon* or *StreetLevelBillboard*).

**Parameters:**

- **coordinate**  
Desired *GeoCoordinate* position for the icon or billboard

**Throws:**

- **IllegalArgumentException**  
Passed argument is invalid
- **NullPointerException**  
Passed argument is null

```
public void setTextureCoordinates (PointF topLeft, PointF bottomRight)
```

Sets the extent of texture coordinates.

**Parameters:**

- **topLeft**  
Top left texture coordinate, default (0, 0).
- **bottomRight**  
Bottom right texture coordinate, default (1, 1).

```
public void setTransparency (float alpha)
```

Sets a transparency level, within the range of [0..1], for the *StreetLevelIconBase* (*StreetLevelIcon* or *StreetLevelBillboard*). The final opacity is a combination of the value specified here and the value specified in *setOverlayTransparency(float)*.

**Parameters:**

- **alpha**  
Desired alpha value for the *StreetLevelIconBase*, 0 for fully transparent, 1 for fully opaque (the default value is 1)

**Throws:**

- **IllegalArgumentException**  
Passed argument is not within the range of [0..1].

## StreetLevelIconPlacement

The class *StreetLevelIconPlacement* is a member of *com.here.android.mpa.streetlevel*.

### Class Summary

public final class **StreetLevelIconPlacement**

*extends java.lang.Object*

Encapsulates the placement properties for all image-based street-level objects ( *StreetLevelIcon* or *StreetLevelBillboard*) that users can add to a *StreetLevelModel*.

[For complete information, see the section *Class Details*]

### Nested Class Summary

Table 1210: Nested Classes in StreetLevelIconPlacement

Nested Classes
public static final enumeration <i>StreetLevelIconPlacement.HorizontalPlacement</i> This enumeration defines values for automatic placement in lat/long coordinates.
public static final enumeration <i>StreetLevelIconPlacement.VerticalPlacement</i> This enumeration defines values for automatic placement in altitude.

### Constructor Summary

Table 1211: Constructors in StreetLevelIconPlacement

Constructors
<i>StreetLevelIconPlacement</i> ( <i>HorizontalPlacement</i> horizontalPlacement, <i>VerticalPlacement</i> verticalPlacement, float verticalHeight) Public constructor

### Method Summary

Table 1212: Methods in StreetLevelIconPlacement

Methods
public boolean <i>equals</i> (Object other) For documentation, see <i>java.lang.Object</i>
public <i>HorizontalPlacement</i> <i>getHorizontalPlacement</i> () Gets the current horizontal placement mode for the street-level image base object
public <i>VerticalPlacement</i> <i>getVerticalPlacement</i> () Gets the current vertical placement mode for the street-level image base object

## Methods

```
public float getVerticalPlacementHeight ()
```

Gets the vertical placement height

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public StreetLevelIconPlacement setHorizontalPlacement (HorizontalPlacement placement)
```

Sets the street-level image base object horizontal placement mode.

```
public StreetLevelIconPlacement setVerticalPlacement (VerticalPlacement placement)
```

Sets the street-level image base object vertical placement mode.

```
public StreetLevelIconPlacement setVerticalPlacementHeight (float height)
```

Sets the vertical placement height value.

## Class Details

Encapsulates the placement properties for all image-based street-level objects ( *StreetLevelIcon* or *StreetLevelBillboard*) that users can add to a *StreetLevelModel*. Changes to properties of this interface are reflected in the display of the associated *StreetLevelIcon* or *StreetLevelBillboard*.

## Constructor Details

```
StreetLevelIconPlacement (HorizontalPlacement horizontalPlacement,  
VerticalPlacement verticalPlacement, float verticalHeight)
```

Public constructor

### Parameters:

- **horizontalPlacement**  
Horizontal Placement mode.
- **verticalPlacement**  
Vertical Placement mode.
- **verticalHeight**  
Vertical height.

## Method Details

```
public boolean equals (Object other)
```

For documentation, see *java.lang.Object*

### Parameters:

- **other**

```
public HorizontalPlacement getHorizontalPlacement ()
```

Gets the current horizontal placement mode for the street-level image base object

**Returns:**

The horizontal placement mode

```
public VerticalPlacement getVerticalPlacement ()
```

Gets the current vertical placement mode for the street-level image base object

**Returns:**

The vertical placement mode

```
public float getVerticalPlacementHeight ()
```

Gets the vertical placement height

**Returns:**

The Vertical placement height

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public StreetLevelIconPlacement setHorizontalPlacement (HorizontalPlacement placement)
```

Sets the street-level image base object horizontal placement mode. The default value is *DEFAULT*.

**Parameters:**

- **placement**  
Horizontal Placement mode

**Returns:**

This *StreetLevelIconPlacement* object

```
public StreetLevelIconPlacement setVerticalPlacement (VerticalPlacement placement)
```

Sets the street-level image base object vertical placement mode. In case horizontal placement is set to *TRACK\_CAMERA*, vertical is ignored. The default value is *DEFAULT*.

**Parameters:**

- **placement**  
Vertical Placement mode

**Returns:**

This `StreetLevelIconPlacement` object

```
public StreetLevelIconPlacement setVerticalPlacementHeight (float height)
```

Sets the vertical placement height value. The height parameter has a different meaning depending on the placement mode.

**Parameters:**

- **height**
  - If the horizontal placement mode is `TRACK_CAMERA`, height is the vertical distance in meters from the camera.
  - If the vertical placement mode is `TERRAIN`, height is the distance in meters above the terrain.
  - If the vertical placement mode is `FACADE` and horizontal placement is `FACADE`, height is the desired height in meters above the terrain. However, if this value is lower than the facade's default street-level object height, the default will be used instead. For all other horizontal placements modes, the interpretation is the same as for `TERRAIN`.
  - If the vertical placement mode is `ATTACHMENT`, height is a scale factor relative to the attached building height, where 0 is bottom of the building and 1 is top. Values can be outside of [0,1] range.
  - If the vertical placement mode is `DEFAULT`, height is the meters above sea level.

**Returns:**

This `StreetLevelIconPlacement` object

**See also:**

[StreetLevelIconPlacement.VerticalPlacement](#)

[StreetLevelIconPlacement.HorizontalPlacement](#)

## HorizontalPlacement

The enumeration `HorizontalPlacement` is a member of `com.here.android.mpa.streetlevel.StreetLevelIconPlacement`.

### Enumeration Summary

```
public static final enumeration StreetLevelIconPlacement.HorizontalPlacement
```

```
extends java.lang.Enum, java.lang.Object
```

This enumeration defines values for automatic placement in lat/long coordinates.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 1213: Enum Constants in HorizontalPlacement

Fields
<pre>public static final HorizontalPlacement DEFAULT</pre> <p>The object is placed at its geocoordinate position.</p>
<pre>public static final HorizontalPlacement CENTROID</pre> <p>The icon is placed on the attached building's centroid, and it is visible through the building walls.</p>
<pre>public static final HorizontalPlacement SURFACE</pre> <p>The object is placed on the closest surface of an attached building, and it is visible through the building walls.</p>
<pre>public static final HorizontalPlacement FACADE</pre> <p>The object is placed on the most viewable side of an attached building.</p>
<pre>public static final HorizontalPlacement TRACK_CAMERA</pre> <p>The object is placed at its geocoordinate position.</p>

## Method Summary

Table 1214: Methods in HorizontalPlacement

Methods
<pre>public static HorizontalPlacement valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static StreetLevelIconPlacement.HorizontalPlacement[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

This enumeration defines values for automatic placement in lat/long coordinates.

### Enum Constant Details

```
public static final HorizontalPlacement DEFAULT
```

The object is placed at its geocoordinate position.

```
public static final HorizontalPlacement CENTROID
```

The icon is placed on the attached building's centroid, and it is visible through the building walls. This placement mode cannot be used with billboards.

```
public static final HorizontalPlacement SURFACE
```

The object is placed on the closest surface of an attached building, and it is visible through the building walls.

```
public static final HorizontalPlacement FACADE
```

The object is placed on the most viewable side of an attached building. The object's placement is updated as the camera moves.

```
public static final HorizontalPlacement TRACK_CAMERA
```

The object is placed at its geocoordinate position. All vertical placement modes are ignored; the vertical placement height is evaluated as meters above or below the camera instead.

### Method Details

```
public static HorizontalPlacement valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static StreetLevelIconPlacement.HorizontalPlacement[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## VerticalPlacement

The enumeration *VerticalPlacement* is a member of *com.here.android.mpa.streetlevel.StreetLevelIconPlacement*.

### Enumeration Summary

```
public static final enumeration StreetLevelIconPlacement.VerticalPlacement  
extends java.lang.Enum, java.lang.Object
```

This enumeration defines values for automatic placement in altitude.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 1215: Enum Constants in VerticalPlacement

Fields
<pre>public static final VerticalPlacement DEFAULT</pre> <p>Calculates height as meters above the sea level.</p>
<pre>public static final VerticalPlacement TERRAIN</pre> <p>Calculates height as meters above the terrain.</p>
<pre>public static final VerticalPlacement FACADE</pre> <p>Used with HorizontalPlacement.FACADE.</p>
<pre>public static final VerticalPlacement ATTACHMENT</pre> <p>Calculates height as a percentage of the building height.</p>

## Method Summary

Table 1216: Methods in VerticalPlacement

Methods
<pre>public static VerticalPlacement valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static StreetLevelIconPlacement.VerticalPlacement[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

This enumeration defines values for automatic placement in altitude.

### Enum Constant Details

```
public static final VerticalPlacement DEFAULT
```

Calculates height as meters above the sea level.

```
public static final VerticalPlacement TERRAIN
```

Calculates height as meters above the terrain.

```
public static final VerticalPlacement FACADE
```

Used with HorizontalPlacement.FACADE. The object will use a default height or the height that you provide (as calculated from the terrain), whichever is higher.

```
public static final VerticalPlacement ATTACHMENT
```

Calculates height as a percentage of the building height.

### Method Details

```
public static VerticalPlacement valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static StreetLevelIconPlacement.VerticalPlacement[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## StreetLevelIconSize

The class *StreetLevelIconSize* is a member of *com.here.android.mpa.streetlevel*.

### Class Summary

```
public final class StreetLevelIconSize
```

*extends java.lang.Object*

Encapsulates the size properties for a *StreetLevelIcon*.

[For complete information, see the section *Class Details*]

### Nested Class Summary

Table 1217: Nested Classes in *StreetLevelIconSize*

Nested Classes
<pre>public static final enumeration <i>StreetLevelIconSize.ScalePolicy</i></pre> <p>Represents values describing the policy for scaling a <i>StreetLevelIconSize</i>.</p>

## Constructor Summary

Table 1218: Constructors in `StreetLevelIconSize`

Constructors
<p><code>StreetLevelIconSize</code> (int width, int height)</p> <p>Public Constructor</p>

## Method Summary

Table 1219: Methods in `StreetLevelIconSize`

Methods
<p>public float <code>getFarDistance</code> ()</p> <p>Gets the current far distance of a <code>StreetLevelIcon</code>.</p>
<p>public float <code>getFarScale</code> ()</p> <p>Gets the current far scale of a <code>StreetLevelIcon</code>.</p>
<p>public int <code>getHeight</code> ()</p> <p>Gets the current height of a <code>StreetLevelIcon</code>, in pixels.</p>
<p>public float <code>getNearDistance</code> ()</p> <p>Gets the current near distance of a <code>StreetLevelIcon</code>.</p>
<p>public float <code>getNearScale</code> ()</p> <p>Gets the current near scale of a <code>StreetLevelIcon</code>.</p>
<p>public <code>ScalePolicy</code> <code>getScalePolicy</code> ()</p> <p>Gets the current <code>StreetLevelIconSize.ScalePolicy</code> of a <code>StreetLevelIcon</code>.</p>
<p>public int <code>getWidth</code> ()</p> <p>Gets the current width of a <code>StreetLevelIcon</code>, in pixels.</p>
<p>public <code>StreetLevelIconSize</code> <code>setFarDistance</code> (float farDistance)</p> <p>Sets a far distance for the <code>StreetLevelIconSize</code>.Default value is 1.0f.</p>
<p>public <code>StreetLevelIconSize</code> <code>setFarScale</code> (float farScale)</p> <p>Sets a far scale for the <code>StreetLevelIconSize</code>.Default value is 1.0f.</p>
<p>public <code>StreetLevelIconSize</code> <code>setHeight</code> (int height)</p> <p>Sets a height, in pixels, for the <code>StreetLevelIconSize</code>.</p>
<p>public <code>StreetLevelIconSize</code> <code>setNearDistance</code> (float nearDistance)</p> <p>Sets a near distance for the <code>StreetLevelIconSize</code>.</p>
<p>public <code>StreetLevelIconSize</code> <code>setNearScale</code> (float nearScale)</p> <p>Sets a near scale for the <code>StreetLevelIconSize</code>.</p>
<p>public <code>StreetLevelIconSize</code> <code>setScalePolicy</code> (<code>ScalePolicy</code> policy)</p> <p>Sets a <code>StreetLevelIconSize.ScalePolicy</code> for the <code>StreetLevelIconSize</code>.</p>

## Methods

```
public StreetLevelIconSize setWidth (int width)
```

Sets a width, in pixels, for the *StreetLevelIconSize*.

---

## Class Details

Encapsulates the size properties for a *StreetLevelIcon*. Changes to properties of this interface are reflected in the displayed size of the associated *StreetLevelIcon*.

## Constructor Details

### **StreetLevelIconSize** (int width, int height)

Public Constructor

#### Parameters:

- **width**  
Width of the icon, in pixels
- **height**  
Height of the icon, in pixels

## Method Details

```
public float getFarDistance ()
```

Gets the current far distance of a *StreetLevelIcon*.

#### Returns:

The current far distance

```
public float getFarScale ()
```

Gets the current far scale of a *StreetLevelIcon*.

#### Returns:

The current far scale

```
public int getHeight ()
```

Gets the current height of a *StreetLevelIcon*, in pixels.

#### Returns:

The current height

```
public float getNearDistance ()
```

Gets the current near distance of a *StreetLevelIcon*.

**Returns:**

The current near distance

```
public float getNearScale ()
```

Gets the current near scale of a *StreetLevelIcon*. Default value is 1.0f.

**Returns:**

The current near scale

```
public ScalePolicy getScalePolicy ()
```

Gets the current *StreetLevelIconSize.ScalePolicy* of a *StreetLevelIcon*.

**Returns:**

The current *StreetLevelIconSize.ScalePolicy*

```
public int getWidth ()
```

Gets the current width of a *StreetLevelIcon*, in pixels.

**Returns:**

The current width

```
public StreetLevelIconSize setFarDistance (float farDistance)
```

Sets a far distance for the *StreetLevelIconSize*. Default value is 1.0f.

**Parameters:**

- **farDistance**  
Desired far distance

**Returns:**

This *StreetLevelIconSize* object

```
public StreetLevelIconSize setFarScale (float farScale)
```

Sets a far scale for the *StreetLevelIconSize*. Default value is 1.0f.

**Parameters:**

- **farScale**  
Desired far scale

**Returns:**

This `StreetLevelIconSize` object

```
public StreetLevelIconSize setHeight (int height)
```

Sets a height, in pixels, for the *StreetLevelIconSize*.

**Parameters:**

- **height**  
Desired height

**Returns:**

This `StreetLevelIconSize` object

```
public StreetLevelIconSize setNearDistance (float nearDistance)
```

Sets a near distance for the *StreetLevelIconSize*. Default value is 1.0f.

**Parameters:**

- **nearDistance**  
Desired near distance

**Returns:**

This `StreetLevelIconSize` object

```
public StreetLevelIconSize setNearScale (float nearScale)
```

Sets a near scale for the *StreetLevelIconSize*. Default value is 1.0f.

**Parameters:**

- **nearScale**  
Desired near scale

**Returns:**

This `StreetLevelIconSize` object

```
public StreetLevelIconSize setScalePolicy (ScalePolicy policy)
```

Sets a *StreetLevelIconSize.ScalePolicy* for the *StreetLevelIconSize*. Default value is `ScalePolicy.FIXED`.

**Parameters:**

- **policy**  
Desired *StreetLevelIconSize.ScalePolicy*

**Returns:**

This `StreetLevelIconSize` object

```
public StreetLevelIconSize setWidth (int width)
```

Sets a width, in pixels, for the *StreetLevelIconSize*.

**Parameters:**

- **width**  
Desired width

**Returns:**

This `StreetLevelIconSize` object

## ScalePolicy

The enumeration *ScalePolicy* is a member of *com.here.android.mpa.streetlevel.StreetLevelIconSize*.

### Enumeration Summary

```
public static final enumeration StreetLevelIconSize.ScalePolicy
```

*extends java.lang.Enum, java.lang.Object*

Represents values describing the policy for scaling a *StreetLevelIconSize*.

[For complete information, see the section *Enumeration Details*]

### Enum Constant Summary

Table 1220: Enum Constants in *ScalePolicy*

Fields
<pre>public static final <i>ScalePolicy</i> <b>FIXED</b></pre> <p>Use a specified near-scale value.</p>
<pre>public static final <i>ScalePolicy</i> <b>LINEAR</b></pre> <p>Use a linear interpolation between near-scale and far-scale.</p>
<pre>public static final <i>ScalePolicy</i> <b>PERSPECTIVE</b></pre> <p>Use a value based on near-scale, distance from the camera and near distance.</p>

### Method Summary

Table 1221: Methods in *ScalePolicy*

Methods
<pre>public int <i>value</i> ()</pre>

## Methods

```
public static ScalePolicy valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static StreetLevelIconSize.ScalePolicy[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Represents values describing the policy for scaling a *StreetLevelIconSize*. The scale policy value is determined based on the on distance from the camera as well as the near and far distance values.

## Enum Constant Details

```
public static final ScalePolicy FIXED
```

Use a specified near-scale value.

```
public static final ScalePolicy LINEAR
```

Use a linear interpolation between near-scale and far-scale.

```
public static final ScalePolicy PERSPECTIVE
```

Use a value based on near-scale, distance from the camera and near distance.

## Method Details

```
public int value ()
```

```
public static ScalePolicy valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static StreetLevelIconSize.ScalePolicy[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## StreetLevelLink

The class *StreetLevelLink* is a member of [com.here.android.mpa.streetlevel](#) .

### Class Summary

public final class **StreetLevelLink**

extends [com.here.android.mpa.streetlevel.StreetLevelProxyObject](#), [com.here.android.mpa.common.ViewObject](#), [java.lang.Object](#)

Represents a class for all street level link objects used to follow from [StreetLevel](#) to [StreetLevel](#) within an on-screen [StreetLevelFragment](#).

[For complete information, see the section [Class Details](#)]

**See also:**

[getSelectedObjects\(PointF\)](#)

### Method Summary

Table 1222: Methods in StreetLevelLink

Methods
<pre>public <a href="#">StreetLevel</a> <a href="#">getStreetLevel</a> ()</pre> <p>Gets the <a href="#">StreetLevel</a> of the user object that the <a href="#">StreetLevelLink</a> represents.</p>
<pre>public <a href="#">Type</a> <a href="#">getType</a> ()</pre> <p>Gets the type of object that the {link <a href="#">StreetLevelProxyObject</a>} represents. This method overrides <a href="#">streetlevel.StreetLevelProxyObject.getType(void)</a></p>

### Class Details

Represents a class for all street level link objects used to follow from [StreetLevel](#) to [StreetLevel](#) within an on-screen [StreetLevelFragment](#). The street level link is visualised as a navigation arrow.

**See also:**

[getSelectedObjects\(PointF\)](#)

### Method Details

```
public StreetLevel getStreetLevel ()
```

Gets the [StreetLevel](#) of the user object that the [StreetLevelLink](#) represents.

**Returns:**

The [StreetLevel](#)

```
public Type getType ()
```

Gets the type of object that the {link StreetLevelProxyObject} represents.

This method overrides [streetlevel.StreetLevelProxyObject.getType\(void\)](#)

## StreetLevelModel

The class *StreetLevelModel* is a member of [com.here.android.mpa.streetlevel](#) .

### Class Summary

```
public final class StreetLevelModel
```

```
extends java.lang.Object
```

Represents a model for street level data.

[For complete information, see the section [Class Details](#)]

**See also:**

[StreetLevelCoverage](#)

### Nested Class Summary

Table 1223: Nested Classes in StreetLevelModel

Nested Classes
<pre>public static abstract interface <a href="#">StreetLevelModel.OnEventListener</a></pre> <p>Represents a listener to provide notification upon completion of a <i>StreetLevelModel</i> event.</p>
<pre>public static abstract interface <a href="#">StreetLevelModel.OnRetrievalListener</a></pre> <p>Listener class to be used with <a href="#">getStreetLevel(GeoCoordinate, StreetLevelModel.OnRetrievalListener)</a> to retrieve a <i>StreetLevel</i>.</p>

### Constructor Summary

Table 1224: Constructors in StreetLevelModel

Constructors
<pre><a href="#">StreetLevelModel</a> ()</pre> <p>Public Constructor</p>

## Field Summary

Table 1225: Fields in StreetLevelModel

Fields
<pre>public static final float MOVE_PRESERVE_HEADING</pre> <p>Pass this parameter value if the heading level is to be preserved when a <i>StreetLevel</i> object is redrawn.</p>
<pre>public static final float MOVE_PRESERVE_PITCH</pre> <p>Pass this parameter value if the pitch level is to be preserved when a <i>StreetLevel</i> object is redrawn.</p>
<pre>public static final float MOVE_PRESERVE_ZOOM</pre> <p>Pass this parameter value if the zoom level is to be preserved when a <i>StreetLevel</i> object is redrawn.</p>

## Method Summary

Table 1226: Methods in StreetLevelModel

Methods
<pre>public void addStreetLevelModelListener (OnEventListener eventListener)</pre> <p>Adds a <i>StreetLevelModel.OnEventListener</i> to listen for street level model events.</p>
<pre>public boolean addStreetLevelObject (StreetLevelObject streetLevelObject)</pre> <p>Adds a <i>StreetLevelObject</i> to the <i>StreetLevel</i>.</p>
<pre>public void cancelMoveTo (boolean animate)</pre> <p> Cancels a <i>StreetLevel</i> transition initiated previously by a call to <i>moveTo(StreetLevel, boolean, float, float, float)</i> or <i>moveTo(StreetLevel, boolean, GeoCoordinate, float)</i>.</p>
<pre>public void executeSynchronized (Runnable task)</pre> <p>Execute a batched set of commands to the <i>StreetLevelModel</i>.</p>
<pre>public PointF geoToPixel (GeoCoordinate geoCoordinates)</pre> <p>Converts a specified <i>GeoCoordinate</i> into a corresponding <i>PointF</i> that represents screen pixel coordinates.</p>
<pre>public float getHeading ()</pre> <p>Gets the current heading of the <i>StreetLevel</i>.</p>
<pre>public int getHeight ()</pre> <p>Gets the current height of the <i>StreetLevelModel</i>, in pixels.</p>
<pre>public float getMaxHeading ()</pre> <p>Gets the maximum heading value that is valid for the <i>StreetLevel</i>.</p>
<pre>public float getMaxPitch ()</pre> <p>Gets the maximum pitch value that is valid for the <i>StreetLevel</i>.</p>
<pre>public float getMaxZoom ()</pre> <p>Gets the maximum zoom value that is valid for the <i>StreetLevel</i>.</p>

**Methods**

```
public float getMinHeading ()
```

Gets the minimum heading value that is valid for the *StreetLevel*.

```
public float getMinPitch ()
```

Gets the minimum pitch value that is valid for the *StreetLevel*.

```
public float getMinZoom ()
```

Gets the minimum zoom value that is valid for the *StreetLevel*.

```
public float getOverlayTransparency ()
```

Gets the current overlay transparency value of the *StreetLevel*, a float within the range of [0..1].

```
public float getPitch ()
```

Gets the current pitch of the *StreetLevel*.

```
public GeoCoordinate getPosition ()
```

Gets the current camera position for the *StreetLevelModel*.

```
public java.util.List <StreetLevelSelectedObject> getSelectedObjects (PointF p)
```

Gets the List of *StreetLevelSelectedObject* objects which have been selected at the specified screen pixel coordinates.

```
public StreetLevelModelState getState ()
```

Gets the current state of the *StreetLevelModel*.

```
public boolean getStreetLevel (GeoCoordinate center, OnRetrievalListener listener)
```

Asynchronously gets the *StreetLevel* closest to a specified *GeoCoordinate*.

```
public StreetLevel getStreetLevel (GeoCoordinate center, int searchRadius)
```

Synchronously gets the *StreetLevel* closest to a specified *GeoCoordinate*.

```
public StreetLevel getStreetLevel (PointF point)
```

Gets the *StreetLevel* closest to a specified on-screen *PointF*.

```
public StreetLevel getStreetLevel ()
```

Gets the current active *StreetLevel*.

```
public int getWidth ()
```

Gets the current width of the *StreetLevelModel*, in pixels.

```
public float getZoom ()
```

Gets the current zoom level of the *StreetLevel*.

```
public boolean isCompassMapVisible ()
```

Gets the boolean indicating whether the street level compass map is shown for the *StreetLevelModel*.

```
public boolean isMoving ()
```

Determines whether the *StreetLevelModel* is moving from one *StreetLevel* to another.

```
public boolean isNavigationArrowVisible ()
```

Gets the current visibility state of the street navigation arrow.

**Methods**

```
public boolean isStreetGeometryVisible ()
```

Gets the current visibility state of street geometry.

```
public boolean isStreetLevelDataNeeded ()
```

Determines whether more *StreetLevel* data is needed.

```
public void moveCamera (GeoCoordinate position, float heading, float pitch, float zoom)
```

Moves the camera position to the specified position.

```
public void moveTo (StreetLevel streetLevel, boolean animation, float heading, float pitch, float zoom)
```

Moves the view to a specified *StreetLevel* (animating or not), while simultaneously setting the street level's heading (a fraction within the range of minimum and maximum levels), pitch (a fraction within the range of minimum and maximum levels), and zoom level (a fraction within the range of minimum and maximum levels).

```
public void moveTo (StreetLevel streetLevel, boolean animation, GeoCoordinate cameraHeading, float zoom)
```

Moves the view to a specified *StreetLevel* (animating or not), while simultaneously setting the street level's heading (a fraction within the range of minimum and maximum levels) and zoom (a fraction within the range of minimum and maximum levels).

```
public void pan (PointF from, PointF to)
```

Pans the *StreetLevel* from one specified on-screen *PointF* to another.

```
public GeoCoordinate pixelToGeo (PointF p)
```

Converts a pair of screen pixel coordinates into a corresponding *GeoCoordinate*.

```
public void removeStreetLevelModelListener (OnEventListener eventListener)
```

Removes an existing *StreetLevelModel.OnEventListener*.

```
public boolean removeStreetLevelObject (StreetLevelObject streetLevelObject)
```

Removes a *StreetLevelObject* from the *StreetLevel*.

```
public void rotate (PointF from, PointF to)
```

Rotates the *StreetLevel* from one specified on-screen *PointF* to another.

```
public void setCompassMapVisible (boolean visible)
```

Sets a *StreetLevelModel* to either show or hide the street level compass map.

```
public void setHeading (float heading)
```

Sets a heading for the *StreetLevel*.

```
public void setNavigationArrow (Image icon)
```

Sets an *Image* for the icon to be used as a street navigation arrow.

```
public void setNavigationArrowVisible (boolean visible)
```

Sets the visibility state for the street navigation arrow.

```
public void setOverlayTransparency (float alpha)
```

Sets an overlay transparency value for the *StreetLevel*, a float within the range of [0..1].

## Methods

```
public void setPitch (float pitch)
```

Sets a pitch for the [StreetLevel](#).

```
public void setStreetGeometryVisible (boolean visible)
```

Sets the visibility state for street geometry.

```
public void setZoom (float zoom)
```

Sets a zoom level for the [StreetLevel](#).

```
public List toCameraOrientation (PointF point)
```

Determines the camera orientation required to display a specified `PointF` in the center of the screen.

## Class Details

Represents a model for street level data. For areas with appropriate street level coverage, applications can bind a [StreetLevelModel](#) with a [StreetLevelFragment](#) to render 360-degree street level imagery.

See also:

[StreetLevelCoverage](#)

## Constructor Details

### `StreetLevelModel` ()

Public Constructor

## Field Details

```
public static final float MOVE_PRESERVE_HEADING
```

Pass this parameter value if the heading level is to be preserved when a [StreetLevel](#) object is redrawn. This is the one valid value that lies outside the range of typical [moveTo\(StreetLevel, boolean, GeoCoordinate, float\)](#) parameters.

```
public static final float MOVE_PRESERVE_PITCH
```

Pass this parameter value if the pitch level is to be preserved when a [StreetLevel](#) object is redrawn. This is the one valid value that lies outside the range of typical [moveTo\(StreetLevel, boolean, GeoCoordinate, float\)](#) parameters.

```
public static final float MOVE_PRESERVE_ZOOM
```

Pass this parameter value if the zoom level is to be preserved when a [StreetLevel](#) object is redrawn. This is the one valid value that lies outside the range of typical [moveTo\(StreetLevel, boolean, GeoCoordinate, float\)](#) parameters.

## Method Details

```
public void addStreetLevelModelListener (OnEventListener eventListener)
```

Adds a *StreetLevelModel.OnEventListener* to listen for street level model events.

Note: it is recommended to remove street level model event listeners after they are destroyed.

### Parameters:

- **eventListener**

A *StreetLevelModel.OnEventListener* to add to the *StreetLevelModel*

### See also:

[removeStreetLevelModelListener\(OnEventListener\)](#)

```
public boolean addStreetLevelObject (StreetLevelObject streetLevelObject)
```

Adds a *StreetLevelObject* to the *StreetLevel*.

### Parameters:

- **streetLevelObject**

A *StreetLevelObject* to add

### Returns:

True if the *StreetLevelObject* was added successfully, false otherwise

### See also:

[removeStreetLevelObject\(StreetLevelObject\)](#)

```
public void cancelMoveTo (boolean animate)
```

Cancels a *StreetLevel* transition initiated previously by a call to [moveTo\(StreetLevel, boolean, float, float, float\)](#) or [moveTo\(StreetLevel, boolean, GeoCoordinate, float\)](#). The original view will be re-established.

### Parameters:

- **animate**

A boolean specifying whether the move back to the original view is animated

```
public void executeSynchronized (Runnable task)
```

Execute a batched set of commands to the *StreetLevelModel*. This is useful to improve performance when multiple operations require re-rendering of the display.

### Parameters:

- **task**

Task block to execute synchronously.

```
public PointF geoToPixel (GeoCoordinate geoCoordinates)
```

Converts a specified *GeoCoordinate* into a corresponding PointF that represents screen pixel coordinates.

Note: this method could return null if the conversion fails.

**Parameters:**

- **geoCoordinates**

A *GeoCoordinate* to convert

**Returns:**

The PointF representing screen pixel coordinates (could be null)

```
public float getHeading ()
```

Gets the current heading of the *StreetLevel*.

**Returns:**

The current heading

```
public int getHeight ()
```

Gets the current height of the *StreetLevelModel*, in pixels.

**Returns:**

The current height

```
public float getMaxHeading ()
```

Gets the maximum heading value that is valid for the *StreetLevel*.

**Returns:**

The maximum heading value

```
public float getMaxPitch ()
```

Gets the maximum pitch value that is valid for the *StreetLevel*.

**Returns:**

The maximum pitch value

```
public float getMaxZoom ()
```

Gets the maximum zoom value that is valid for the *StreetLevel*.

**Returns:**

The maximum zoom value

```
public float getMinHeading ()
```

Gets the minimum heading value that is valid for the *StreetLevel*.

**Returns:**

The minimum heading value

```
public float getMinPitch ()
```

Gets the minimum pitch value that is valid for the *StreetLevel*.

**Returns:**

The minimum pitch value

```
public float getMinZoom ()
```

Gets the minimum zoom value that is valid for the *StreetLevel*.

**Returns:**

The minimum zoom value

```
public float getOverlayTransparency ()
```

Gets the current overlay transparency value of the *StreetLevel*, a float within the range of [0..1]. The overlay transparency is the transparency for the objects overlaid on top of the street level image like link arrows, street names, icons etc.

**Returns:**

The current overlay transparency value

```
public float getPitch ()
```

Gets the current pitch of the *StreetLevel*.

**Returns:**

The current pitch

```
public GeoCoordinate getPosition ()
```

Gets the current camera position for the *StreetLevelModel*.

**Returns:**

The *GeoCoordinate* representing the current camera position

```
public java.util.List <StreetLevelSelectedObject> getSelectedObjects (PointF p)
```

Gets the List of *StreetLevelSelectedObject* objects which have been selected at the specified screen pixel coordinates.

Note: use *getObject()* instance of to determine the exact types of *StreetLevelSelectedObject* objects that have been selected ( *StreetLevelBuilding*, *StreetLevelLink*, etc.).

**Parameters:**

- **p**  
Screen Pixel coordinate

**Returns:**

The List of selected *StreetLevelSelectedObject* objects

```
public StreetLevelModelState getState ()
```

Gets the current state of the *StreetLevelModel*. This is a compound call to get the zoom level, heading, pitch from one API.

**Returns:**

The *StreetLevelModelState*

```
public boolean getStreetLevel (GeoCoordinate center, OnRetrievalListener listener)
```

Asynchronously gets the *StreetLevel* closest to a specified *GeoCoordinate*. This is an optimized version of *getStreetLevel(GeoCoordinate, int)* as it retrieves the *StreetLevel* with optimal radius base on the current zoom level.

**Parameters:**

- **center**  
A *GeoCoordinate* representing the geographical position used to determine the closest *StreetLevel*.
- **listener**  
Callback listener to be notified when retrieval request completes.

**Returns:**

True if retrieval request can be processed. False, otherwise.

**Throws:**

- **NullPointerException**  
if center or listener is null.

**See also:**

[getStreetLevel\(GeoCoordinate, int\)](#)

[getStreetLevel\(PointF\)](#)

[getStreetLevel\(\)](#)

```
public StreetLevel getStreetLevel (GeoCoordinate center, int searchRadius)
```

Synchronously gets the *StreetLevel* closest to a specified *GeoCoordinate*.

The search is constrained by a specified radius, in meters, from the specified *GeoCoordinate* .

**Parameters:**

- **center**  
A *GeoCoordinate* representing the geographical position used to determine the closest *StreetLevel*
- **searchRadius**  
Desired search radius, in meters, from **center**.

**Returns:**

The *StreetLevel*

**See also:**

[getStreetLevel\(GeoCoordinate, OnRetrievalListener\)](#)

[getStreetLevel\(PointF\)](#)

[getStreetLevel\(\)](#)

```
public StreetLevel getStreetLevel (PointF point)
```

Gets the *StreetLevel* closest to a specified on-screen *PointF* .

**Parameters:**

- **point**  
A *PointF* representing the on-screen point used to determine the closest *StreetLevel*

**Returns:**

The *StreetLevel*

**See also:**

[getStreetLevel\(GeoCoordinate, OnRetrievalListener\)](#)

[getStreetLevel\(GeoCoordinate, int\)](#)

[getStreetLevel\(\)](#)

```
public StreetLevel getStreetLevel ()
```

Gets the current active *StreetLevel*.

**Returns:**

The current `StreetLevel`

**See also:**

[getStreetLevel\(GeoCoordinate, OnRetrievalListener\)](#)

[getStreetLevel\(GeoCoordinate, int\)](#)

[getStreetLevel\(PointF\)](#)

```
public int getWidth ()
```

Gets the current width of the *StreetLevelModel*, in pixels.

**Returns:**

The current width

```
public float getZoom ()
```

Gets the current zoom level of the *StreetLevel*.

**Returns:**

The current zoom level

```
public boolean isCompassMapVisible ()
```

Gets the boolean indicating whether the street level compass map is shown for the *StreetLevelModel*.

**Returns:**

True if the compass map is visible, false otherwise

```
public boolean isMoving ()
```

Determines whether the *StreetLevelModel* is moving from one *StreetLevel* to another.

**Returns:**

True if a *StreetLevel* move is in progress, false otherwise

```
public boolean isNavigationArrowVisible ()
```

Gets the current visibility state of the street navigation arrow.

**Returns:**

True if the street navigation arrow is currently visible, false otherwise

```
public boolean isStreetGeometryVisible ()
```

Gets the current visibility state of street geometry.

**Returns:**

True if street geometry is currently visible, false otherwise

```
public boolean isStreetLevelDataNeeded ()
```

Determines whether more *StreetLevel* data is needed.

**Returns:**

True if more data is needed, false otherwise

```
public void moveCamera (GeoCoordinate position, float heading, float pitch,  
float zoom)
```

Moves the camera position to the specified position.

**Parameters:**

- **position**  
Position of the Camera, Can have altitude to move the camera from the default height above the street.
- **heading**  
Desired heading of the Camera
- **pitch**  
Desired pitch of the Camera
- **zoom**  
Desired zoom of the Camera

Note: if you wish to keep the current heading, pitch or zoom level, pass one or more of the following values as the relevant parameter:

- *MOVE\_PRESERVE\_HEADING* to keep the current heading
- *MOVE\_PRESERVE\_PITCH* to keep the current pitch
- *MOVE\_PRESERVE\_ZOOM* to keep the current zoom level

```
public void moveTo (StreetLevel streetLevel, boolean animation, float  
heading, float pitch, float zoom)
```

Moves the view to a specified *StreetLevel* (animating or not), while simultaneously setting the street level's heading (a fraction within the range of minimum and maximum levels), pitch (a fraction within the range of minimum and maximum levels), and zoom level (a fraction within the range of minimum and maximum levels).

Note: if you wish to keep the current heading, pitch or zoom level, pass one or more of the following values as the relevant parameter:

- `MOVE_PRESERVE_HEADING` to keep the current heading
- `MOVE_PRESERVE_PITCH` to keep the current pitch
- `MOVE_PRESERVE_ZOOM` to keep the current zoom level

#### Parameters:

- `streetLevel`  
Desired `StreetLevel`
- `animation`  
A boolean specifying whether the move is animated
- `heading`  
Desired heading of the new `StreetLevel`
- `pitch`  
Desired pitch of the new `StreetLevel`
- `zoom`  
Desired zoom level of the new `StreetLevel`

#### See also:

[`moveTo\(StreetLevel, boolean, GeoCoordinate, float\)`](#)

[`getMinHeading\(\)`](#)

[`getMaxHeading\(\)`](#)

[`getMinPitch\(\)`](#)

[`getMaxPitch\(\)`](#)

[`getMinZoom\(\)`](#)

[`getMaxZoom\(\)`](#)

[`cancelMoveTo\(boolean\)`](#)

```
public void moveTo (StreetLevel streetLevel, boolean animation, GeoCoordinate  
cameraHeading, float zoom)
```

Moves the view to a specified [`StreetLevel`](#) (animating or not), while simultaneously setting the street level's heading (a fraction within the range of minimum and maximum levels) and zoom (a fraction within the range of minimum and maximum levels).

Note: if you wish to keep the current heading or zoom level, pass one or more of the following values as the relevant parameter:

- `MOVE_PRESERVE_HEADING` to keep the current heading
- `MOVE_PRESERVE_ZOOM` to keep the current zoom level

#### Parameters:

- `streetLevel`

Desired `StreetLevel`

- **animation**

A boolean specifying whether the move is animated

- **cameraHeading**

A *GeoCoordinate* representing the desired heading of the new `StreetLevel`

- **zoom**

Desired zoom level of the new `StreetLevel`

**See also:**

*moveTo(StreetLevel, boolean, float, float, float)*

*getMinHeading()*

*getMaxHeading()*

*getMinZoom()*

*getMaxZoom()*

*cancelMoveTo(boolean)*

**public void pan (PointF from, PointF to)**

Pans the *StreetLevel* from one specified on-screen `PointF` to another.

**Parameters:**

- **from**  
An originating on-screen `PointF` (pre-pan)
- **to**  
An on-screen `PointF` representing the end of the pan

**public *GeoCoordinate* pixelToGeo (PointF p)**

Converts a pair of screen pixel coordinates into a corresponding *GeoCoordinate*.

Note: this method could return `null` if the conversion fails.

**Parameters:**

- **p**  
Position of screen pixel to convert

**Returns:**

The *GeoCoordinate* (could be `null`)

**public void removeStreetLevelModelListener (*OnEventListener* eventListener)**

Removes an existing *StreetLevelModel.OnEventListener*.

Note: it is recommended to remove street level model event listeners after they are destroyed.

## Parameters:

- **eventListener**

A *StreetLevelModel.OnEventListener* to remove from the *StreetLevelModel*

```
public boolean removeStreetLevelObject (StreetLevelObject streetLevelObject)
```

Removes a *StreetLevelObject* from the *StreetLevel*.

## Parameters:

- **streetLevelObject**

A *StreetLevelObject* to remove

## Returns:

True if the *StreetLevelObject* was removed successfully, false otherwise

```
public void rotate (PointF from, PointF to)
```

Rotates the *StreetLevel* from one specified on-screen PointF to another.

## Parameters:

- **from**

An originating on-screen PointF (pre-rotation)

- **to**

An on-screen PointF representing the end of the rotation

```
public void setCompassMapVisible (boolean visible)
```

Sets a *StreetLevelModel* to either show or hide the street level compass map. By default, the compass map is visible.

The compass map is a circular map view that can be viewed by panning downward towards the ground. Its primary purpose is to provide users their direction and location context while they're viewing the street level. Users cannot directly manipulate a compass map, but changes from panning or navigating the street level image are immediately reflected in it.

## Parameters:

- **visible**

A boolean specifying whether compass map is going to be visible

```
public void setHeading (float heading)
```

Sets a heading for the *StreetLevel*.

## Parameters:

- **heading**

Desired heading

**See also:**

[getMinHeading\(\)](#)

[getMaxHeading\(\)](#)

```
public void setNavigationArrow (Image icon)
```

Sets an *Image* for the icon to be used as a street navigation arrow. There is no default navigation arrow image. If user does not provide one, no arrow will be displayed, but there is a hollow area at the bottom of the street level image where the arrow is supposed to be. Navigating the street level is still possible in this case by tapping on the corners of the hollow area.

**Parameters:**

- **icon**  
A *Image* representing image of the arrow

**Throws:**

- **NullPointerException**  
if icon is null.
- **IllegalArgumentException**  
if icon is not valid

```
public void setNavigationArrowVisible (boolean visible)
```

Sets the visibility state for the street navigation arrow. By default the navigation arrow is not visible.

**Parameters:**

- **visible**  
A boolean specifying whether the street navigation arrow is visible

```
public void setOverlayTransparency (float alpha)
```

Sets an overlay transparency value for the *StreetLevel*, a float within the range of [0..1]. This method sets the transparency for the objects overlaid on top of the street level image like link arrows, street names, icons etc.

**Parameters:**

- **alpha**  
Desired overlay transparency

```
public void setPitch (float pitch)
```

Sets a pitch for the *StreetLevel*.

**Parameters:**

- **pitch**  
Desired pitch

**See also:**

[getMinPitch\(\)](#)

[getMaxPitch\(\)](#)

```
public void setStreetGeometryVisible (boolean visible)
```

Sets the visibility state for street geometry.

**Parameters:**

- **visible**  
A boolean specifying whether street geometry is visible or not

```
public void setZoom (float zoom)
```

Sets a zoom level for the *StreetLevel*.

**Parameters:**

- **zoom**  
Desired zoom level

**See also:**

[getMinZoom\(\)](#)

[getMaxZoom\(\)](#)

```
public List toCameraOrientation (PointF point)
```

Determines the camera orientation required to display a specified *PointF* in the center of the screen.

**Parameters:**

- **point**  
Desired center *PointF* which would require a change in camera orientation

**Returns:**

The list of *Float* values representing the required camera orientation, where the first element contains the heading (in degrees) and second element contains the pitch (in degrees)

## OnEventListener

The interface *OnEventListener* is a member of *com.here.android.mpa.streetlevel.StreetLevelModel*.

### Interface Summary

public static abstract interface **StreetLevelModel.OnEventListener**

Represents a listener to provide notification upon completion of a *StreetLevelModel* event.

[For complete information, see the section *Interface Details*]

**See also:**

*addStreetLevelModelListener(OnEventListener)*

### Nested Class Summary

Table 1227: Nested Classes in OnEventListener

Nested Classes
public static abstract class <i>StreetLevelModel.OnEventListener.OnEventListenerAdapter</i> Default implementation for the OnEventListener interface.

### Method Summary

Table 1228: Methods in OnEventListener

Methods
public abstract void <i>onBuildingHide</i> ( <i>StreetLevelBuilding</i> building) A callback indicating a <i>StreetLevelBuilding</i> has been unloaded.
public abstract void <i>onBuildingShow</i> ( <i>StreetLevelBuilding</i> building) A callback indicating a <i>StreetLevelBuilding</i> has been loaded.
public abstract void <i>onIconPlaced</i> ( <i>StreetLevelSelectedObject</i> pickedObject) A callback indicating that an icon is successfully placed on a <i>StreetLevelSelectedObject</i>
public abstract void <i>onMoveContinue</i> () A callback indicating that a <i>StreetLevelModel</i> move has continued after waiting for <i>StreetLevel</i> data availability.
public abstract void <i>onMoveEnd</i> (boolean completed) A callback indicating that a <i>StreetLevelModel</i> move has ended.
public abstract void <i>onMoveEnd</i> ( <i>GeoCoordinate</i> coordinate) A callback indicating that a <i>StreetLevelModel</i> move has ended.
public abstract void <i>onMoveStart</i> () A callback indicating that a <i>StreetLevelModel</i> move has started.

## Methods

```
public abstract void onMoveWait ()
```

A callback indicating that a *StreetLevelModel* move is waiting for *StreetLevel* data to be available before continuing.

```
public abstract void onOrientationEnd (float heading, float pitch)
```

A callback indicating that a *StreetLevel* orientation change has ended.

```
public abstract void onOrientationStart (float heading, float pitch)
```

A callback indicating that a *StreetLevel* orientation change has started.

```
public abstract void onPositionChanged (GeoCoordinate coordinate)
```

A callback indicating that the *StreetLevel* position has changed.

```
public abstract void onStreetLevelChanged ()
```

A callback indicating that *StreetLevel* data has changed.

```
public abstract void onStreetLevelFullyLoaded ()
```

A callback indicating that *StreetLevel* data is fully loaded.

```
public abstract void onStreetLevelInvalidated ()
```

A callback indicating that *StreetLevel* data has become invalid.

```
public abstract void onStreetLevelPreviewAvailable ()
```

A callback indicating that *StreetLevel* preview image is available.

```
public abstract void onZoomEnd (float zoom)
```

A callback indicating that a *StreetLevel* zoom operation has ended.

```
public abstract void onZoomStart (float zoom)
```

A callback indicating that *StreetLevel* a zoom operation has started.

## Interface Details

Represents a listener to provide notification upon completion of a *StreetLevelModel* event.

See also:

[addStreetLevelModelListener\(OnEventListener\)](#)

## Method Details

```
public abstract void onBuildingHide (StreetLevelBuilding building)
```

A callback indicating a *StreetLevelBuilding* has been unloaded.

Parameters:

- **building**  
*StreetLevelBuilding*

```
public abstract void onBuildingShow (StreetLevelBuilding building)
```

A callback indicating a *StreetLevelBuilding* has been loaded.

**Parameters:**

- **building**  
*StreetLevelBuilding*

```
public abstract void onIconPlaced (StreetLevelSelectedObject pickedObject)
```

A callback indicating that an icon is successfully placed on a *StreetLevelSelectedObject*

**Parameters:**

- **pickedObject**  
*StreetLevelSelectedObject*

```
public abstract void onMoveContinue ()
```

A callback indicating that a *StreetLevelModel* move has continued after waiting for *StreetLevel* data availability.

```
public abstract void onMoveEnd (boolean completed)
```

A callback indicating that a *StreetLevelModel* move has ended.

**Parameters:**

- **completed**  
A boolean specifying whether the move operation was successful

```
public abstract void onMoveEnd (GeoCoordinate coordinate)
```

A callback indicating that a *StreetLevelModel* move has ended.

**Parameters:**

- **coordinate**  
Current position

```
public abstract void onMoveStart ()
```

A callback indicating that a *StreetLevelModel* move has started.

```
public abstract void onMoveWait ()
```

A callback indicating that a *StreetLevelModel* move is waiting for *StreetLevel* data to be available before continuing.

```
public abstract void onOrientationEnd (float heading, float pitch)
```

A callback indicating that a *StreetLevel* orientation change has ended.

**Parameters:**

- **heading**  
A camera heading
- **pitch**  
A camera pitch

```
public abstract void onOrientationStart (float heading, float pitch)
```

A callback indicating that a *StreetLevel* orientation change has started.

**Parameters:**

- **heading**  
A camera heading
- **pitch**  
A camera pitch

```
public abstract void onPositionChanged (GeoCoordinate coordinate)
```

A callback indicating that the *StreetLevel* position has changed.

**Parameters:**

- **coordinate**  
An updated position

```
public abstract void onStreetLevelChanged ()
```

A callback indicating that *StreetLevel* data has changed.

```
public abstract void onStreetLevelFullyLoaded ()
```

A callback indicating that *StreetLevel* data is fully loaded.

```
public abstract void onStreetLevelInvalidated ()
```

A callback indicating that *StreetLevel* data has become invalid.

```
public abstract void onStreetLevelPreviewAvailable ()
```

A callback indicating that [StreetLevel](#) preview image is available.

```
public abstract void onZoomEnd (float zoom)
```

A callback indicating that a [StreetLevel](#) zoom operation has ended.

**Parameters:**

- **zoom**  
A zoom level

```
public abstract void onZoomStart (float zoom)
```

A callback indicating that [StreetLevel](#) a zoom operation has started.

**Parameters:**

- **zoom**  
A zoom level

## OnEventListenerAdapter

The class *OnEventListenerAdapter* is a member of *com.here.android.mpa.streetlevel.StreetLevelModel.OnEventListener*.

### Class Summary

```
public static abstract class StreetLevelModel.OnEventListener.OnEventListenerAdapter
```

```
    implements com.here.android.mpa.streetlevel.StreetLevelModel.OnEventListener
```

```
    extends java.lang.Object
```

Default implementation for the OnEventListener interface.

[For complete information, see the section [Class Details](#)]

**See also:**

[StreetLevelModel.OnEventListener](#)

### Constructor Summary

Table 1229: Constructors in OnEventListenerAdapter

Constructors
<a href="#">OnEventListenerAdapter</a> ()

## Method Summary

Table 1230: Methods in OnEventListenerAdapter

### Methods

public void **onBuildingHide** (*StreetLevelBuilding* building)

A callback indicating a *StreetLevelBuilding* has been unloaded.

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onBuildingHide(StreetLevelBuilding)*

public void **onBuildingShow** (*StreetLevelBuilding* building)

A callback indicating a *StreetLevelBuilding* has been loaded.

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onBuildingShow(StreetLevelBuilding)*

public void **onIconPlaced** (*StreetLevelSelectedObject* pickedObject)

A callback indicating that an icon is successfully placed on a *StreetLevelSelectedObject*

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onIconPlaced(StreetLevelSelectedObject)*

public void **onMoveContinue** ()

A callback indicating that a *StreetLevelModel* move has continued after waiting for *StreetLevel* data availability.

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onMoveContinue(void)*

public void **onMoveEnd** (boolean completed)

A callback indicating that a *StreetLevelModel* move has ended. A callback indicating that a *StreetLevelModel* move has ended.

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onMoveEnd(boolean)*

public void **onMoveEnd** (*GeoCoordinate* coordinate)

A callback indicating that a *StreetLevelModel* move has ended. A callback indicating that a *StreetLevelModel* move has ended.

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onMoveEnd(GeoCoordinate)*

public void **onMoveStart** ()

A callback indicating that a *StreetLevelModel* move has started.

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onMoveStart(void)*

public void **onMoveWait** ()

A callback indicating that a *StreetLevelModel* move is waiting for *StreetLevel* data to be available before continuing.

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onMoveWait(void)*

public void **onOrientationEnd** (float heading, float pitch)

A callback indicating that a *StreetLevel* orientation change has ended.

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onOrientationEnd(float, float)*

public void **onOrientationStart** (float heading, float pitch)

A callback indicating that a *StreetLevel* orientation change has started.

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onOrientationStart(float, float)*

## Methods

```
public void onPositionChanged (GeoCoordinate coordinate)
```

A callback indicating that the *StreetLevel* position has changed.

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onPositionChanged(GeoCoordinate)*

```
public void onStreetLevelChanged ()
```

A callback indicating that *StreetLevel* data has changed.

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onStreetLevelChanged(void)*

```
public void onStreetLevelFullyLoaded ()
```

A callback indicating that *StreetLevel* data is fully loaded.

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onStreetLevelFullyLoaded(void)*

```
public void onStreetLevelInvalidated ()
```

A callback indicating that *StreetLevel* data has become invalid.

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onStreetLevelInvalidated(void)*

```
public void onStreetLevelPreviewAvailable ()
```

A callback indicating that *StreetLevel* preview image is available.

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onStreetLevelPreviewAvailable(void)*

```
public void onZoomEnd (float zoom)
```

A callback indicating that a *StreetLevel* zoom operation has ended.

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onZoomEnd(float)*

```
public void onZoomStart (float zoom)
```

A callback indicating that *StreetLevel* a zoom operation has started.

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onZoomStart(float)*

## Class Details

Default implementation for the *OnEventListener* interface. Users may use this abstract class and overload specific methods to have a smaller code footprint.

See also:

[StreetLevelModel.OnEventListener](#)

## Constructor Details

**OnEventListenerAdapter** ()

## Method Details

```
public void onBuildingHide (StreetLevelBuilding building)
```

A callback indicating a *StreetLevelBuilding* has been unloaded.

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onBuildingHide(StreetLevelBuilding)*

**Parameters:**

- **building**

`public void onBuildingShow (StreetLevelBuilding building)`

A callback indicating a *StreetLevelBuilding* has been loaded.

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onBuildingShow(StreetLevelBuilding)*

**Parameters:**

- **building**

`public void onIconPlaced (StreetLevelSelectedObject pickedObject)`

A callback indicating that an icon is successfully placed on a *StreetLevelSelectedObject*

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onIconPlaced(StreetLevelSelectedObject)*

**Parameters:**

- **pickedObject**

`public void onMoveContinue ()`

A callback indicating that a *StreetLevelModel* move has continued after waiting for *StreetLevel* data availability.

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onMoveContinue(void)*

`public void onMoveEnd (boolean completed)`

A callback indicating that a *StreetLevelModel* move has ended. A callback indicating that a *StreetLevelModel* move has ended.

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onMoveEnd(boolean)*

**Parameters:**

- **completed**

`public void onMoveEnd (GeoCoordinate coordinate)`

A callback indicating that a *StreetLevelModel* move has ended. A callback indicating that a *StreetLevelModel* move has ended.

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onMoveEnd(GeoCoordinate)*

**Parameters:**

- **coordinate**

```
public void onMoveStart ()
```

A callback indicating that a *StreetLevelModel* move has started.

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onMoveStart(void)*

```
public void onMoveWait ()
```

A callback indicating that a *StreetLevelModel* move is waiting for *StreetLevel* data to be available before continuing.

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onMoveWait(void)*

```
public void onOrientationEnd (float heading, float pitch)
```

A callback indicating that a *StreetLevel* orientation change has ended.

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onOrientationEnd(float, float)*

**Parameters:**

- **heading**
- **pitch**

```
public void onOrientationStart (float heading, float pitch)
```

A callback indicating that a *StreetLevel* orientation change has started.

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onOrientationStart(float, float)*

**Parameters:**

- **heading**
- **pitch**

```
public void onPositionChanged (GeoCoordinate coordinate)
```

A callback indicating that the *StreetLevel* position has changed.

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onPositionChanged(GeoCoordinate)*

**Parameters:**

- **coordinate**

```
public void onStreetLevelChanged ()
```

A callback indicating that *StreetLevel* data has changed.

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onStreetLevelChanged(void)*

```
public void onStreetLevelFullyLoaded ()
```

A callback indicating that *StreetLevel* data is fully loaded.

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onStreetLevelFullyLoaded(void)*

```
public void onStreetLevelInvalidated ()
```

A callback indicating that *StreetLevel* data has become invalid.

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onStreetLevelInvalidated(void)*

```
public void onStreetLevelPreviewAvailable ()
```

A callback indicating that *StreetLevel* preview image is available.

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onStreetLevelPreviewAvailable(void)*

```
public void onZoomEnd (float zoom)
```

A callback indicating that a *StreetLevel* zoom operation has ended.

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onZoomEnd(float)*

#### Parameters:

- **zoom**

```
public void onZoomStart (float zoom)
```

A callback indicating that *StreetLevel* a zoom operation has started.

This method overrides *streetlevel.StreetLevelModel.OnEventListener.onZoomStart(float)*

#### Parameters:

- **zoom**

## OnRetrievalListener

The interface *OnRetrievalListener* is a member of *com.here.android.mpa.streetlevel.StreetLevelModel*.

### Interface Summary

```
public static abstract interface StreetLevelModel.OnRetrievalListener
```

Listener class to be used with *getStreetLevel(GeoCoordinate, StreetLevelModel.OnRetrievalListener)* to retrieve a *StreetLevel*.

[For complete information, see the section *Interface Details*]

## Method Summary

Table 1231: Methods in OnRetrievalListener

Methods
<pre>public abstract void <i>onGetStreetLevelCompleted</i> (<i>StreetLevel</i> object)</pre> <p>Callback method to notify caller when the <i>StreetLevel</i> retrieval request is completed.</p>

## Interface Details

Listener class to be used with *getStreetLevel(GeoCoordinate, StreetLevelModel.OnRetrievalListener)* to retrieve a *StreetLevel*.

## Method Details

```
public abstract void onGetStreetLevelCompleted (StreetLevel object)
```

Callback method to notify caller when the *StreetLevel* retrieval request is completed.

### Parameters:

- **object**  
*StreetLevel* retrieved. Can be null if no *StreetLevel* is present.

## StreetLevelModelState

The class *StreetLevelModelState* is a member of *com.here.android.mpa.streetlevel*.

## Class Summary

```
public final class StreetLevelModelState
```

*implements android.os.Parcelable*

*extends java.lang.Object*

Represents a composite class comprising the zoom level, heading, pitch and roll for a *StreetLevelModel*.

[For complete information, see the section *Class Details*]

## Constructor Summary

Table 1232: Constructors in StreetLevelModelState

Constructors
<pre><i>StreetLevelModelState</i> (Parcel in)</pre>

## Field Summary

Table 1233: Fields in StreetLevelModelState

Fields
<code>public static final android.os.Parcelable.Creator &lt;StreetLevelModelState&gt; CREATOR</code>

## Method Summary

Table 1234: Methods in StreetLevelModelState

Methods
<code>public int <i>describeContents</i> ()</code> For documentation, see <code>android.os.Parcelable.describeContents()</code>
<code>public boolean <i>equals</i> (Object obj)</code> For documentation, see <code>java.lang.Object</code>
<code>public float <i>getHeading</i> ()</code> Gets the current heading of the <code>StreetLevelModel</code> .
<code>public float <i>getPitch</i> ()</code> Gets the current pitch of the <code>StreetLevelModel</code> .
<code>public float <i>getZoom</i> ()</code> Gets the current zoom level of the <code>StreetLevelModel</code> .
<code>public int <i>hashCode</i> ()</code> For documentation, see <code>java.lang.Object</code>
<code>public void <i>writeToParcel</i> (Parcel dest, int flags)</code> For documentation, see <code>android.os.Parcelable.writeToParcel(Parcel, int)</code>

## Class Details

Represents a composite class comprising the zoom level, heading, pitch and roll for a `StreetLevelModel`.

Note: this object can be retrieved by calling `getState()`.

## Constructor Details

### StreetLevelModelState (Parcel in)

Parameters:

- `in`

## Field Details

```
public static final android.os.Parcelable.Creator <StreetLevelModelState>  
CREATOR
```

## Method Details

```
public int describeContents ()
```

For documentation, see *android.os.Parcelable.describeContents()*

```
public boolean equals (Object obj)
```

For documentation, see *java.lang.Object*

### Parameters:

- `obj`

```
public float getHeading ()
```

Gets the current heading of the *StreetLevelModel*.

### Returns:

The current heading

```
public float getPitch ()
```

Gets the current pitch of the *StreetLevelModel*.

### Returns:

The current pitch

```
public float getZoom ()
```

Gets the current zoom level of the *StreetLevelModel*.

### Returns:

The current zoom level

```
public int hashCode ()
```

For documentation, see *java.lang.Object*

```
public void writeToParcel (Parcel dest, int flags)
```

For documentation, see [android.os.Parcelable.writeToParcel\(Parcel, int\)](#)

**Parameters:**

- `dest`
- `flags`

## StreetLevelObject

The class *StreetLevelObject* is a member of [com.here.android.mpa.streetlevel](#) .

### Class Summary

public abstract class **StreetLevelObject**

extends [com.here.android.mpa.common.ViewObject](#), [java.lang.Object](#)

Represents a base class for all street level related objects that users can add to an on-screen [StreetLevelModel](#) instance.

[For complete information, see the section [Class Details](#)]

**See also:**

[StreetLevelIconBase](#)

### Nested Class Summary

Table 1235: Nested Classes in StreetLevelObject

Nested Classes
<p>public static final enumeration <a href="#">StreetLevelObject.Type</a></p> <p>Represents values describing the types of objects that a user can add to a <a href="#">StreetLevelModel</a> instance by calling <a href="#">addStreetLevelObject(StreetLevelObject)</a>.</p>

### Method Summary

Table 1236: Methods in StreetLevelObject

Methods
<p>public <i>Type</i> <a href="#">getBaseType</a> ()</p> <p>Gets the base <a href="#">ViewObject.Type</a> that the <a href="#">StreetLevelObject</a> represents.</p>
<p>public <i>Type</i> <a href="#">getType</a> ()</p> <p>Gets the specific <a href="#">StreetLevelObject.Type</a> that the <a href="#">StreetLevelObject</a> represents.</p>

### Class Details

Represents a base class for all street level related objects that users can add to an on-screen [StreetLevelModel](#) instance.

This class serves as a generalization (or abstract base) for several more specified street level object types, bundling their common properties. Users can add the following types of street level objects to a *StreetLevelModel*:

- *StreetLevelIcon*
- *StreetLevelBillboard*

See also:

*StreetLevelIconBase*

## Method Details

```
public Type getBaseType ()
```

Gets the base *ViewObject.Type* that the *StreetLevelObject* represents.

Returns:

The *ViewObject.Type*

```
public Type getType ()
```

Gets the specific *StreetLevelObject.Type* that the *StreetLevelObject* represents.

Returns:

The *StreetLevelObject.Type*

## Type

The enumeration *Type* is a member of *com.here.android.mpa.streetlevel.StreetLevelObject*.

## Enumeration Summary

```
public static final enumeration StreetLevelObject.Type
```

*extends java.lang.Enum, java.lang.Object*

Represents values describing the types of objects that a user can add to a *StreetLevelModel* instance by calling *addStreetLevelObject(StreetLevelObject)*.

[For complete information, see the section *Enumeration Details*]

## Enum Constant Summary

Table 1237: Enum Constants in *Type*

### Fields

```
public static final Type BILLBOARD_OBJECT
```

A *StreetLevelBillboard*.

## Fields

```
public static final Type ICON_OBJECT
```

A *StreetLevelIcon*.

```
public static final Type ROUTE_OBJECT
```

A *StreetLevelRoute*

```
public static final Type UNKNOWN
```

An unknown *StreetLevelObject.Type*.

## Method Summary

Table 1238: Methods in Type

### Methods

```
public static Type valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static StreetLevelObject.Type[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Represents values describing the types of objects that a user can add to a *StreetLevelModel* instance by calling *addStreetLevelObject(StreetLevelObject)*.

### Enum Constant Details

```
public static final Type BILLBOARD_OBJECT
```

A *StreetLevelBillboard*.

```
public static final Type ICON_OBJECT
```

A *StreetLevelIcon*.

```
public static final Type ROUTE_OBJECT
```

A *StreetLevelRoute*

```
public static final Type UNKNOWN
```

An unknown *StreetLevelObject.Type*.

## Method Details

```
public static Type valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static StreetLevelObject.Type[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## StreetLevelOffScreenCapture

The class *StreetLevelOffScreenCapture* is a member of *com.here.android.mpa.streetlevel*.

### Class Summary

```
public final class StreetLevelOffScreenCapture
```

*implements* *com.here.android.mpa.common.OffScreenRenderer*

*extends* *java.lang.Object*

StreetLevel derivation of the *com.here.android.mpa.common.OffScreenRenderer* renderer.

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 1239: Constructors in StreetLevelOffScreenCapture

Constructors
<pre><i>StreetLevelOffScreenCapture</i> (Context context)</pre> Public constructor.

### Method Summary

Table 1240: Methods in StreetLevelOffScreenCapture

Methods
<pre>public void <i>getScreenCapture</i> (<i>OnScreenCaptureListener</i> listener)</pre> Returns a bitmap of the Street Level Imagery.
<pre>public void <i>pause</i> ()</pre> Pause the offscreen renderer

## Methods

```
public StreetLevelOffScreenCapture setModel (StreetLevelModel model)
```

Set the *StreetLevelModel* for off-screen rendering

```
public StreetLevelOffScreenCapture setSize (int width, int height)
```

Set the size of the requested screen capture.

```
public void start ()
```

Start the offscreen renderer.

```
public void start (SurfaceHolder renderTarget, SurfaceUpdatedListener listener)
```

Start the offscreen renderer.

```
public void stop ()
```

Stop the offscreen renderer.

## Class Details

*StreetLevel* derivation of the `com.here.android.mpa.common.OffScreenRenderer` renderer. This class allows the user to capture screenshots of a *StreetLevel* without using an Android View.

## Constructor Details

### *StreetLevelOffScreenCapture* (Context context)

Public constructor.

#### Parameters:

- **context**  
Application context.

#### Throws:

- **AccessControlException**  
Access to this operation is denied. Contact your HERE representative for more information.

## Method Details

```
public void getScreenCapture (OnScreenCaptureListener listener)
```

Returns a bitmap of the Street Level Imagery. Bitmap is of size set by `setSize(int, int)`. Call this method only after the rendering thread is started via `start()`. This method is asynchronous and will invoke a callback once the operation is completed through the *ScreenCaptureListener*. Note that the rendering thread must be started before this operation.

#### Parameters:

- **listener**  
A *ScreenCaptureListener* to listen for the callback when screen capture is complete.

**See also:**

[setSize\(int, int\)](#)

[start\(\)](#)

```
public void pause ()
```

Pause the offscreen renderer

```
public StreetLevelOffScreenCapture setModel (StreetLevelModel model)
```

Set the StreetLevelModel for off-screen rendering

**Parameters:**

- **model**  
*StreetLevelModel*

**Returns:**

This StreetLevelOffScreenCapture object

```
public StreetLevelOffScreenCapture setSize (int width, int height)
```

Set the size of the requested screen capture. This method must be called before [start\(\)](#).

**Parameters:**

- **width**  
Desired width of the returned bitmap
- **height**  
Desired height of the returned bitmap

**Returns:**

This StreetLevelOffScreenCapture object

```
public void start ()
```

Start the offscreen renderer. A new PBuffer based surface will be allocated.

```
public void start (SurfaceHolder renderTarget, SurfaceUpdatedListener  
listener)
```

Start the offscreen renderer. The renderer will be attached to the supplied Surface argument.

**Parameters:**

- **renderTarget**

Surface to attach to.

- **listener**

Callback when the surface has been updated

```
public void stop ()
```

Stop the offscreen renderer. All resource allocated will be released.

## StreetLevelProxyObject

The class *StreetLevelProxyObject* is a member of [com.here.android.mpa.streetlevel](#).

### Class Summary

public abstract class **StreetLevelProxyObject**

extends [com.here.android.mpa.common.ViewObject](#), [java.lang.Object](#)

Represents a base class for all street level objects rendered as part of the map.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 1241: Nested Classes in StreetLevelProxyObject

Nested Classes
public static final enumeration <a href="#">StreetLevelProxyObject.Type</a> Represents values describing the types of objects that can be retrieved from a <a href="#">StreetLevelModel</a> instance by calling <a href="#">getSelectedObjects(PointF)</a> .

### Method Summary

Table 1242: Methods in StreetLevelProxyObject

Methods
public abstract <a href="#">Type</a> <a href="#">getType</a> () Gets the type of object that the <a href="#">StreetLevelProxyObject</a> represents.

### Class Details

Represents a base class for all street level objects rendered as part of the map. This interface serves as a generalization (or abstract base) for several more specified proxy object types, bundling their common properties.

## Method Details

```
public abstract Type getType ()
```

Gets the type of object that the {link StreetLevelProxyObject} represents.

### Returns:

The `StreetLevelProxyObject.Type`

## Type

The enumeration `Type` is a member of `com.here.android.mpa.streetlevel.StreetLevelProxyObject`.

## Enumeration Summary

```
public static final enumeration StreetLevelProxyObject.Type
```

```
extends java.lang.Enum, java.lang.Object
```

Represents values describing the types of objects that can be retrieved from a `StreetLevelModel` instance by calling `getSelectedObjects(PointF)`.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 1243: Enum Constants in `Type`

Fields
<pre>public static final <i>Type</i> <b>LINK_OBJECT</b></pre> <p>A <code>StreetLevelLink</code>.</p>
<pre>public static final <i>Type</i> <b>BUILDING_OBJECT</b></pre> <p>A <code>StreetLevelBuilding</code>.</p>
<pre>public static final <i>Type</i> <b>TERRAIN_OBJECT</b></pre> <p>Not supported yet</p>
<pre>public static final <i>Type</i> <b>UNKNOWN</b></pre> <p>Unknown object type.</p>

## Method Summary

Table 1244: Methods in `Type`

Methods
<pre>public static <i>Type</i> <b>valueOf</b> (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>

## Methods

```
public static StreetLevelProxyObject.Type[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

---

## Enumeration Details

Represents values describing the types of objects that can be retrieved from a *StreetLevelModel* instance by calling *getSelectedObjects(PointF)*.

## Enum Constant Details

```
public static final Type LINK_OBJECT
```

A *StreetLevelLink*.

```
public static final Type BUILDING_OBJECT
```

A *StreetLevelBuilding*.

```
public static final Type TERRAIN_OBJECT
```

Not supported yet

```
public static final Type UNKNOWN
```

Unknown object type.

## Method Details

```
public static Type valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static StreetLevelProxyObject.Type[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## StreetLevelRoute

The class *StreetLevelRoute* is a member of *com.here.android.mpa.streetlevel* .

### Class Summary

public final class **StreetLevelRoute**

extends *com.here.android.mpa.streetlevel.StreetLevelObject*, *com.here.android.mpa.common.ViewObject*, *java.lang.Object*

Represents a route displayed within a *StreetLevelFragment*

[For complete information, see the section *Class Details*]

**See also:**

*StreetLevelFragment*

### Constructor Summary

Table 1245: Constructors in StreetLevelRoute

Constructors
<i>StreetLevelRoute</i> ()
<i>StreetLevelRoute</i> ( <i>Route</i> route)

### Method Summary

Table 1246: Methods in StreetLevelRoute

Methods	
public int <i>getColor</i> ()	Gets the current ARGB (Alpha/Red/Green/Blue) integer color value used to display the route.
public <i>Route</i> <i>getRoute</i> ()	Gets the <i>Route</i> that has been displayed on the StreetLevel.
public <i>StreetLevelRoute</i> <i>setColor</i> (int argbColor)	Sets a color for displaying the route, using an ARGB (Alpha/Red/Green/Blue) integer color value.
public <i>StreetLevelRoute</i> <i>setRoute</i> ( <i>Route</i> route)	Sets a <i>Route</i> that will be displayed on the StreetLevel.

### Class Details

Represents a route displayed within a *StreetLevelFragment*

**See also:**

*StreetLevelFragment*

## Constructor Details

`StreetLevelRoute ()`

`StreetLevelRoute (Route route)`

Parameters:

- `route`

## Method Details

`public int getColor ()`

Gets the current ARGB (Alpha/Red/Green/Blue) integer color value used to display the route.

Returns:

The current ARGB integer color value. The packed integer is made up of 4 bytes: alpha, red, green, blue. Each color component has a value range from [0..255] with 0 meaning no contribution for that component, and 255 meaning 100% contribution

See also:

[android.graphics.Color](#)

`public Route getRoute ()`

Gets the *Route* that has been displayed on the StreetLevel.

Returns:

The *Route*

`public StreetLevelRoute setColor (int argbColor)`

Sets a color for displaying the route, using an ARGB (Alpha/Red/Green/Blue) integer color value.

Parameters:

- `argbColor`

The ARGB integer color value. The packed integer is made up of 4 bytes: alpha, red, green, blue. Each color component has a value range from [0..255] with 0 meaning no contribution for that component, and 255 meaning 100% contribution

Returns:

The updated `StreetLevelRoute` object itself.

See also:

[android.graphics.Color](#)

```
public StreetLevelRoute setRoute (Route route)
```

Sets a *Route* that will be displayed on the *StreetLevel*. NOTE: Truck routes and public transport timetable routes are unsupported. A `java.lang.IllegalArgumentException` will be thrown.

**Parameters:**

- **route**  
A *Route* representing the route to be displayed on the *StreetLevel*

**Returns:**

The updated *StreetLevelRoute* object itself.

**Throws:**

- **`IllegalArgumentException`**  
if route is a truck or public transport timetable route.

## StreetLevelSelectedObject

The class *StreetLevelSelectedObject* is a member of `com.here.android.mpa.streetlevel`.

### Class Summary

```
public final class StreetLevelSelectedObject
```

```
extends java.lang.Object
```

Represents a base class for all objects that are selectable on a *StreetLevelFragment*.

[For complete information, see the section [Class Details](#)]

**See also:**

[\*getSelectedObjects\(PointF\)\*](#)

### Method Summary

Table 1247: Methods in *StreetLevelSelectedObject*

#### Methods

```
public Vector3f getNormal ()
```

Gets the *Vector3f* representing the normal vector of the selected object.

```
public ViewObject getObject ()
```

Gets the *ViewObject* representation of the *StreetLevelSelectedObject*.

```
public GeoCoordinate getPosition ()
```

Gets the *GeoCoordinate* representing the current position of the *StreetLevelSelectedObject*.

## Class Details

Represents a base class for all objects that are selectable on a *StreetLevelFragment*.

**See also:**

*getSelectedObjects(PointF)*

## Method Details

```
public Vector3f getNormal ()
```

Gets the *Vector3f* representing the normal vector of the selected object. This can be used with *StreetLevelBillboardOrientation* in *setOrientation(StreetLevelBillboardOrientation.Orientation)*

**Returns:**

The normal *Vector3d*

```
public ViewObject getObject ()
```

Gets the *ViewObject* representation of the *StreetLevelSelectedObject*.

Note: use `instanceof` to determine the exact type ( *StreetLevelBuilding*, *StreetLevelLink*, etc.).

**Returns:**

The *ViewObject*

```
public GeoCoordinate getPosition ()
```

Gets the *GeoCoordinate* representing the current position of the *StreetLevelSelectedObject*.

**Returns:**

The *GeoCoordinate*

## tce

---

The package *tce* is a member of *com.here.android.mpa*.

## Package Summary

**tce**

The package *tce* (Toll Cost Extension) provides classes, interfaces, and enumerations that allow your application to easily access Toll Cost Extension REST API.

## Package Details

The package `tce` (Toll Cost Extension) provides classes, interfaces, and enumerations that allow your application to easily access Toll Cost Extension REST API.

## TollCostError

The class `TollCostError` is a member of `com.here.android.mpa.tce`.

### Class Summary

```
public final class TollCostError
```

```
extends java.lang.Object
```

Represents error reported by `TollCostRequest`.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 1248: Nested Classes in TollCostError

Nested Classes
<pre>public static final enumeration <i>TollCostError.ErrorCode</i></pre>
Different Error codes reported by <code>TollCostRequest</code> .

### Method Summary

Table 1249: Methods in TollCostError

Methods
<pre>public <i>ErrorCode</i> <i>getErrorCode</i> ()</pre>
<pre>public String <i>getErrorMessage</i> ()</pre>

### Class Details

Represents error reported by `TollCostRequest`.

### Method Details

```
public ErrorCode getErrorCode ()
```

**Returns:**

error code.

```
public String getErrorMessage ()
```

**Returns:**

human readable description of this error.

## ErrorCode

The enumeration *ErrorCode* is a member of *com.here.android.mpa.tce.TollCostError*.

### Enumeration Summary

public static final enumeration **TollCostError.ErrorCode**

extends *java.lang.Enum*, *java.lang.Object*

Different Error codes reported by *TollCostRequest*.

[For complete information, see the section *Enumeration Details*]

### Enum Constant Summary

Table 1250: Enum Constants in ErrorCode

Fields
<pre>public static final ErrorCode SUCCESS</pre> <p>Operation successful.</p>
<pre>public static final ErrorCode NO_PERMISSION</pre> <p>No permission to use Toll cost feature.</p>
<pre>public static final ErrorCode ALREADY_RUNNING</pre> <p>Request is already in progress.</p>
<pre>public static final ErrorCode CANCELLED</pre> <p>Operation cancelled.</p>
<pre>public static final ErrorCode INVALID_PARAMETER</pre> <p>Invalid parameters.</p>
<pre>public static final ErrorCode NO_CONNECTION</pre> <p>No network connection.</p>
<pre>public static final ErrorCode SERVER_ERROR</pre> <p>Server error.</p>
<pre>public static final ErrorCode UNKNOWN</pre> <p>Unknown.</p>

## Method Summary

Table 1251: Methods in ErrorCode

Methods
<pre>public static <i>ErrorCode</i> valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>TollCostError.ErrorCode</i>[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Different Error codes reported by *TollCostRequest*.

### Enum Constant Details

```
public static final ErrorCode SUCCESS
```

Operation successful.

```
public static final ErrorCode NO_PERMISSION
```

No permission to use Toll cost feature.

```
public static final ErrorCode ALREADY_RUNNING
```

Request is already in progress.

```
public static final ErrorCode CANCELLED
```

Operation cancelled.

```
public static final ErrorCode INVALID_PARAMETER
```

Invalid parameters.

```
public static final ErrorCode NO_CONNECTION
```

No network connection.

```
public static final ErrorCode SERVER_ERROR
```

Server error.

```
public static final ErrorCode UNKNOWN
```

Unknown.

## Method Details

```
public static ErrorCode valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static TollCostError.ErrorCode[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## TollCostOptions

The class *TollCostOptions* is a member of [com.here.android.mpa.tce](#).

### Class Summary

```
public final class TollCostOptions
```

*extends java.lang.Object*

Represent different input parameters for *TollCostRequest*.

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 1252: Constructors in TollCostOptions

Constructors
<i>TollCostOptions</i> () Create TollCostOptions .

### Method Summary

Table 1253: Methods in TollCostOptions

Methods
public boolean <i>equals</i> (Object obj)

## Methods

```
public String getCurrency ()
```

Gets currency parameter in currency's ISO-4217 code.

```
public Date getDeparture ()
```

Gets the departure time for the given *Route*.

```
public TollCostVehicleProfile getVehicleProfile ()
```

Gets the copy of *TollCostVehicleProfile*.

```
public int hashCode ()
```

```
public void setCurrency (String currencyCode)
```

Sets the currency parameter in currency's ISO-4217 code.

```
public void setDeparture (Date date)
```

Sets the departure time for the *Route*.

```
public void setVehicleProfile (TollCostVehicleProfile vehicleProfile)
```

Sets the *TollCostVehicleProfile* parameters.

## Class Details

Represent different input parameters for *TollCostRequest*.

## Constructor Details

```
TollCostOptions ()
```

Create *TollCostOptions*.

## Method Details

```
public boolean equals (Object obj)
```

**Parameters:**

- *obj*

```
public String getCurrency ()
```

Gets currency parameter in currency's ISO-4217 code. Default value is EUR .

**Returns:**

currency parameter;

```
public Date getDeparture ()
```

Gets the departure time for the given *Route*.

**Returns:**

departure time of route if set previously, otherwise null.

```
public TollCostVehicleProfile getVehicleProfile ()
```

Gets the copy of *TollCostVehicleProfile*.

**Returns:**

the parameter *TollCostVehicleProfile*.

```
public int hashCode ()
```

```
public void setCurrency (String currencyCode)
```

Sets the currency parameter in currency's ISO-4217 code. All of the costs are returned in the specified currency. Default value is EUR .

When the currency is found to be invalid, the related request raises an *TollCostError* .

**Parameters:**

- **currencyCode**  
- currency's ISO-4217 code in string format.

**Throws:**

- **IllegalArgumentException**  
if format is null or not 3 character long.

```
public void setDeparture (Date date)
```

Sets the departure time for the *Route*.

**Parameters:**

- **date**  
departure time.

**Throws:**

- **NullPointerException**  
if date is null.

```
public void setVehicleProfile (TollCostVehicleProfile vehicleProfile)
```

Sets the *TollCostVehicleProfile* parameters.

**Parameters:**

- `vehicleProfile`  
*TollCostVehicleProfile* parameter.

## TollCostRequest

The class *TollCostRequest* is a member of *com.here.android.mpa.tce* .

### Class Summary

public final class **TollCostRequest**

*extends java.lang.Object*

Allows you to determine the toll costs for a specified route for a defined vehicle profile.

[For complete information, see the section *Class Details*]

### Nested Class Summary

Table 1254: Nested Classes in TollCostRequest

Nested Classes
public static abstract interface <i>TollCostRequest.Listener</i> Represents a listener that reports information about the completion of a TollCostRequest <i>TollCostRequest</i> .

### Constructor Summary

Table 1255: Constructors in TollCostRequest

Constructors
<i>TollCostRequest</i> ( <i>Route</i> route, <i>TollCostOptions</i> options) Create a Toll Cost Extension request with the given route and parameters.

### Method Summary

Table 1256: Methods in TollCostRequest

Methods
public void <i>cancel</i> () Attempts to cancel the ongoing <i>TollCostRequest</i> .
public void <i>execute</i> ( <i>Listener&lt;TollCostResult&gt;</i> listener) Execute the TollCostRequest asynchronously with the specified listener.

### Class Details

Allows you to determine the toll costs for a specified route for a defined vehicle profile.

Please note that it only support route calculated with transport mode *CAR* and *TRUCK* in *ONLINE* mode. Also note that, this request works only in Online Mode.

## Constructor Details

### TollCostRequest (*Route* route, *TollCostOptions* options)

Create a Toll Cost Extension request with the given route and parameters. The route parameter only provides the route and no routing option is considered for the toll cost calculation. It is the caller's responsibility to have the route and toll cost options compatible. When they are not compatible, e.g. for the toll cost the vehicle type is set as car, whereas the route is created for a truck, the quality of the outcome may deteriorate.

Please also note that route should only be calculated with transport mode *CAR* and *TRUCK* in *ONLINE* mode.

#### Parameters:

- **route**  
*Route* to calculate toll cost.
- **options**  
*TollCostOptions* to create TCE Request.

#### Throws:

- **IllegalArgumentException**  
if *route* or *options* is not valid OR route is calculated offline OR route is not calculated with transportMode *CAR* or *TRUCK*.

## Method Details

```
public void cancel ()
```

Attempts to cancel the ongoing *TollCostRequest*. Calling this method does not guarantees cancellation of the request. Subsequent calls of this method will be ignored, once the request is cancelled.

```
public void execute (Listener<TollCostResult> listener)
```

Execute the *TollCostRequest* asynchronously with the specified listener.

#### Parameters:

- **listener**  
A *TollCostRequest.Listener* to be notified with result when the request is completed.

## Listener<T>

The interface *Listener<T>* is a member of *com.here.android.mpa.tce.TollCostRequest*.

**Type Parameters:**

- **T**  
Listener data type.

**Interface Summary**

public static abstract interface **TollCostRequest.Listener**

Represents a listener that reports information about the completion of a TollCostRequest *TollCostRequest*.

[For complete information, see the section *Interface Details*]

**Method Summary**

Table 1257: Methods in Listener<T>

Methods
<pre>public abstract void <i>onComplete</i> (T data, <i>TollCostError</i> error)</pre> <p>A callback indicating that a request operation has completed.</p>

**Interface Details**

Represents a listener that reports information about the completion of a TollCostRequest *TollCostRequest*.

**Method Details**

```
public abstract void onComplete (T data, TollCostError error)
```

A callback indicating that a request operation has completed.

**Parameters:**

- **data**  
Search results (can be null if an error was encountered).
- **error**  
An *TollCostError* representing an appropriate error/success conditions.

## TollCostResult

The class *TollCostResult* is a member of *com.here.android.mpa.tce*.

**Class Summary**

public final class **TollCostResult**

*extends java.lang.Object*

Represent result of *TollCostRequest*.

[For complete information, see the section [Class Details](#)]

## Method Summary

Table 1258: Methods in TollCostResult

Methods
<pre>public Map <a href="#">getTollCostByCountry</a> ()</pre> <p>Gets the toll cost for each country the route traverses.</p>
<pre>public Map <a href="#">getTollCostByTollSystemName</a> ()</pre> <p>Gets the toll cost for each toll system the route traverses.</p>
<pre>public BigDecimal <a href="#">getTotalTollCost</a> ()</pre> <p>Gets the total toll cost of given <i>Route</i>.</p>

## Class Details

Represent result of [TollCostRequest](#). This class wrap different toll costs.

### Method Details

```
public Map getTollCostByCountry ()
```

Gets the toll cost for each country the route traverses.

**Returns:**

A map of ISO ALPHA-3 country code and toll cost in the specified [setCurrency\(String\)](#) currency. Default currency is EUR.

```
public Map getTollCostByTollSystemName ()
```

Gets the toll cost for each toll system the route traverses.

Please note that the toll system names will not be localized.

**Returns:**

A map of toll system name and toll cost in the specified [setCurrency\(String\)](#) currency. Default currency is EUR.

```
public BigDecimal getTotalTollCost ()
```

Gets the total toll cost of given *Route*.

**Returns:**

total toll cost in the specified [setCurrency\(String\)](#) currency. Default currency is EUR.

# TollCostVehicleProfile

The class *TollCostVehicleProfile* is a member of *com.here.android.mpa.tce* .

## Class Summary

public final class **TollCostVehicleProfile**

*extends java.lang.Object*

Specify vehicle parameters to calculate toll cost.

[For complete information, see the section *Class Details*]

**See also:**

*setVehicleProfile(TollCostVehicleProfile)*

## Nested Class Summary

Table 1259: Nested Classes in TollCostVehicleProfile

Nested Classes	
public static final enumeration	<i>TollCostVehicleProfile.EmissionType</i> Vehicle emission type.
public static final enumeration	<i>TollCostVehicleProfile.Hybrid</i> Vehicle running mode.
public static final enumeration	<i>TollCostVehicleProfile.ShippedHazardousGoods</i> Shipped Hazardous Goods
public static final enumeration	<i>TollCostVehicleProfile.TrailerType</i> Trailer Type.
public static final enumeration	<i>TollCostVehicleProfile.TrailersCount</i> Trailers count.
public static final enumeration	<i>TollCostVehicleProfile.VehicleType</i> Represent different Vehicle types.

## Constructor Summary

Table 1260: Constructors in TollCostVehicleProfile

Constructors
<i>TollCostVehicleProfile</i> ( ) public constructor

## Method Summary

Table 1261: Methods in TollCostVehicleProfile

Methods
<pre>public boolean equals (Object obj)</pre>
<pre>public EmissionType getEmissionType ()</pre> <p>Gets vehicle emission type.</p>
<pre>public double getHeight ()</pre> <p>Gets vehicle height in meters.</p>
<pre>public int getHeightAbove1stAxle ()</pre> <p>Gets height above 1st axle in meters.</p>
<pre>public Hybrid getHybridMode ()</pre> <p>Gets vehicle running mode.</p>
<pre>public double getLimitedWeight ()</pre> <p>Gets total weight of the vehicle including trailer(s) or caravan in tonne.</p>
<pre>public int getPassengersCount ()</pre> <p>Gets number of passengers can fit in vehicle.</p>
<pre>public ShippedHazardousGoods getShippedHazardousGoods ()</pre> <p>Gets hazardous goods transported in the vehicle.</p>
<pre>public int getTiresCount ()</pre> <p>Gets vehicle's tires count.</p>
<pre>public TrailersCount getTrailerCount ()</pre> <p>Gets trailer count.</p>
<pre>public double getTrailerHeight ()</pre> <p>Gets trailer height in meters.</p>
<pre>public int getTrailerNumberAxles ()</pre> <p>Gets number of trailer's axles.</p>
<pre>public TrailerType getTrailerType ()</pre> <p>Gets trailer type.</p>
<pre>public int getVehicleAxles ()</pre> <p>Gets number of vehicle's axles (not including trailer axles).</p>
<pre>public VehicleType getVehicleType ()</pre> <p>Gets vehicle type.</p>
<pre>public double getWeight ()</pre> <p>Gets vehicle weight in tonne.</p>
<pre>public int hashCode ()</pre>

**Methods**

```
public boolean isCommercial ()
```

Gets if the vehicle is designed for commercial use.

```
public boolean isDisabledEquipped ()
```

Gets if the vehicle is specially equipped for transporting disabled people.

```
public TollCostVehicleProfile setCommercial (boolean commercial)
```

Sets if the vehicle is designed for commercial use.

```
public void setDisabledEquipped (boolean enable)
```

Sets if the vehicle is specially equipped for transporting disabled people.

```
public TollCostVehicleProfile setEmissionType (EmissionType emissionType)
```

Sets vehicle emission type.

```
public TollCostVehicleProfile setHeight (double height)
```

Sets vehicle height in meters.

```
public TollCostVehicleProfile setHeightAbove1stAxle (int heightAbove1stAxle)
```

Sets height above 1st axle in meters.

```
public TollCostVehicleProfile setHybridMode (Hybrid hybridMode)
```

Sets vehicle running mode.

```
public TollCostVehicleProfile setLimitedWeight (double limitedWeight)
```

Sets total weight of the vehicle including trailer(s) or caravan in tonne.

```
public TollCostVehicleProfile setPassengersCount (int passengersCount)
```

Set number of passengers can fit in vehicle.

```
public TollCostVehicleProfile setShippedHazardousGoods (ShippedHazardousGoods shippedHazardousGoods)
```

Sets hazardous goods transported in the vehicle.

```
public TollCostVehicleProfile setTiresCount (int tiresCount)
```

Sets vehicle's tires count.

```
public TollCostVehicleProfile setTrailerCount (TrailersCount trailerCount)
```

Sets trailer count.

```
public TollCostVehicleProfile setTrailerHeight (double trailerHeight)
```

Sets trailer height in meters.

```
public TollCostVehicleProfile setTrailerNumberAxles (int trailerNumberAxles)
```

Sets number of trailer's axles.

```
public TollCostVehicleProfile setTrailerType (TrailerType trailerType)
```

Sets trailer type.

```
public TollCostVehicleProfile setVehicleAxles (int axles)
```

Sets number of vehicle's axles (not including trailer axles).

### Methods

```
public TollCostVehicleProfile setVehicleType (VehicleType vehicleType)
```

Sets vehicle type.

```
public TollCostVehicleProfile setWeight (double weight)
```

Sets vehicle weight in tonne.

### Class Details

Specify vehicle parameters to calculate toll cost. This class can be used to create *TollCostOptions* that can be further used in *TollCostRequest* to make request for toll cost .

#### See also:

[setVehicleProfile\(TollCostVehicleProfile\)](#)

### Constructor Details

**TollCostVehicleProfile ()**

public constructor

### Method Details

```
public boolean equals (Object obj)
```

#### Parameters:

- **obj**

```
public EmissionType getEmissionType ()
```

Gets vehicle emission type. Default is *NONE*.

#### Returns:

vehicle emission type.

```
public double getHeight ()
```

Gets vehicle height in meters.

#### Returns:

vehicle's height.

```
public int getHeightAbove1stAxle ()
```

Gets height above 1st axle in meters.

**Returns:**

height above 1st axle.

```
public Hybrid getHybridMode ()
```

Gets vehicle running mode. Default is *NONE*.

**Returns:**

vehicle running mode.

```
public double getLimitedWeight ()
```

Gets total weight of the vehicle including trailer(s) or caravan in tonne.

**Returns:**

total weight of the vehicle including trailer(s) or caravan in tonne.

```
public int getPassengersCount ()
```

Gets number of passengers can fit in vehicle. Default is 1 .

**Returns:**

number of passengers can fit in vehicle.

```
public ShippedHazardousGoods getShippedHazardousGoods ()
```

Gets hazardous goods transported in the vehicle. Default is *NONE*.

**Returns:**

hazardous goods transported in the vehicle.

```
public int getTiresCount ()
```

Gets vehicle's tires count. Default is 4 .

**Returns:**

vehicle's tires count.

```
public TrailersCount getTrailerCount ()
```

Gets trailer count. Default is *VEHICLE\_WITHOUT\_TRAILER*.

**Returns:**

Trailer count.

```
public double getTrailerHeight ()
```

Gets trailer height in meters.

**Returns:**

Trailer height in meters.

```
public int getTrailerNumberAxles ()
```

Gets number of trailer's axles. Default is 0 .

**Returns:**

Number of trailer's axles.

```
public TrailerType getTrailerType ()
```

Gets trailer type. Default is *NONE*.

**Returns:**

Trailer type.

```
public int getVehicleAxles ()
```

Gets number of vehicle's axles (not including trailer axles). Default is 2 .

**Returns:**

number of vehicle's axles.

```
public VehicleType getVehicleType ()
```

Gets vehicle type. Default is *AUTO*.

**Returns:**

vehicle type.

```
public double getWeight ()
```

Gets vehicle weight in tonne.

**Returns:**

vehicle weight in tonne.

```
public int hashCode ()
```

```
public boolean isCommercial ()
```

Gets if the vehicle is designed for commercial use. Default is false .

**Returns:**

if the vehicle is designed for commercial use

```
public boolean isDisabledEquipped ()
```

Gets if the vehicle is specially equipped for transporting disabled people.

**Returns:**

if the vehicle is specially equipped for transporting disabled people.

```
public TollCostVehicleProfile setCommercial (boolean commercial)
```

Sets if the vehicle is designed for commercial use. Default is false .

**Parameters:**

- **commercial**  
if the vehicle is designed for commercial use

**Returns:**

updated instance for chaining.

```
public void setDisabledEquipped (boolean enable)
```

Sets if the vehicle is specially equipped for transporting disabled people. Default is false .

**Parameters:**

- **enable**  
if the vehicle is specially equipped for transporting disabled people.

```
public TollCostVehicleProfile setEmissionType (EmissionType emissionType)
```

Sets vehicle emission type. Default is *NONE*.

**Parameters:**

- **emissionType**  
vehicle emission type.

**Returns:**

updated instance for chaining.

```
public TollCostVehicleProfile setHeight (double height)
```

Sets vehicle height in meters.

**Parameters:**

- **height**  
vehicle height in meters.

**Returns:**

updated instance for chaining.

**Throws:**

- **IllegalArgumentException**  
if height is not greater than 0.

```
public TollCostVehicleProfile setHeightAbove1stAxle (int heightAbove1stAxle)
```

Sets height above 1st axle in meters.

**Parameters:**

- **heightAbove1stAxle**  
height above 1st axle.

**Returns:**

updated instance for chaining.

**Throws:**

- **IllegalArgumentException**  
if heightAbove1stAxle is not greater than 0.

```
public TollCostVehicleProfile setHybridMode (Hybrid hybridMode)
```

Sets vehicle running mode. Default is *NONE*.

**Parameters:**

- **hybridMode**  
vehicle running mode.

**Returns:**

updated instance for chaining.

```
public TollCostVehicleProfile setLimitedWeight (double limitedWeight)
```

Sets total weight of the vehicle including trailer(s) or caravan in tonne.

**Parameters:**

- **limitedWeight**

total weight of the vehicle including trailer(s) or caravan in tonne.

**Returns:**

updated instance for chaining.

**Throws:**

- **IllegalArgumentException**

if limitedWeight is not greater than 0.

```
public TollCostVehicleProfile setPassengersCount (int passengersCount)
```

Set number of passengers can fit in vehicle. Default is 1 .

**Parameters:**

- **passengersCount**

number of passengers.

**Returns:**

updated instance for chaining.

**Throws:**

- **IllegalArgumentException**

if passengersCount is not greater than 0.

```
public TollCostVehicleProfile setShippedHazardousGoods (ShippedHazardousGoods  
shippedHazardousGoods)
```

Sets hazardous goods transported in the vehicle. Default is *NONE*.

**Parameters:**

- **shippedHazardousGoods**

hazardous goods transported in the vehicle.

**Returns:**

updated instance for chaining.

```
public TollCostVehicleProfile setTiresCount (int tiresCount)
```

Sets vehicle's tires count. Default is 4 .

**Parameters:**

- **tiresCount**

tires count.

**Returns:**

updated instance for chaining.

**Throws:**

- **IllegalArgumentException**  
if `tiresCount` is not greater than 0.

```
public TollCostVehicleProfile setTrailerCount (TrailersCount trailerCount)
```

Sets trailer count. Default is `VEHICLE_WITHOUT_TRAILER`.

Note - `setTrailerType(TollCostVehicleProfile.TrailerType)`, `setTrailerHeight(double)` and `setTrailerNumberAxles(int)` should also be set otherwise `TollCostError` will be reported while making request.

**Parameters:**

- **trailerCount**  
number of trailer.

**Returns:**

updated instance for chaining.

```
public TollCostVehicleProfile setTrailerHeight (double trailerHeight)
```

Sets trailer height in meters.

Note - `setTrailerType(TollCostVehicleProfile.TrailerType)`, `setTrailerCount(TollCostVehicleProfile.TrailersCount)` and `setTrailerNumberAxles(int)` should also be set otherwise `TollCostError` will be reported while making request.

**Parameters:**

- **trailerHeight**  
trailer height.

**Returns:**

updated instance for chaining.

**Throws:**

- **IllegalArgumentException**  
if `trailerHeight` is not greater than 0.

**See also:**

[`setTrailerType\(TrailerType\)`](#)

```
public TollCostVehicleProfile setTrailerNumberAxles (int trailerNumberAxles)
```

Sets number of trailer's axles.

Note - `setTrailerType(TollCostVehicleProfile.TrailerType)`, `setTrailerHeight(double)` and `setTrailerCount(TollCostVehicleProfile.TrailersCount)` should also be set otherwise `TollCostError` will be reported while making request.

**Parameters:**

- **trailerNumberAxles**  
number of trailer's axles.

**Returns:**

updated instance for chaining.

**Throws:**

- **IllegalArgumentException**  
if trailerNumberAxles is not greater than 0.

**See also:**

[setTrailerType\(TrailerType\)](#)

```
public TollCostVehicleProfile setTrailerType (TrailerType trailerType)
```

Sets trailer type. Default is `NONE`.

Note - `setTrailerCount(TollCostVehicleProfile.TrailersCount)`, `setTrailerHeight(double)` and `setTrailerNumberAxles(int)` should also be set, if Trailer type is not `NONE` otherwise `TollCostError` will be reported while making request.

**Parameters:**

- **trailerType**  
trailer Type

**Returns:**

updated instance for chaining.

```
public TollCostVehicleProfile setVehicleAxles (int axles)
```

Sets number of vehicle's axles (not including trailer axles). Default is 2 .

**Parameters:**

- **axles**  
vehicle's axles

**Returns:**

updated instance for chaining.

**Throws:**

- **IllegalArgumentException**  
if axles is not greater than 0.

```
public TollCostVehicleProfile setVehicleType (VehicleType vehicleType)
```

Sets vehicle type. Default is *AUTO*.

**Parameters:**

- **vehicleType**  
vehicle type.

**Returns:**

updated instance for chaining.

```
public TollCostVehicleProfile setWeight (double weight)
```

Sets vehicle weight in tonne.

**Parameters:**

- **weight**  
vehicle weight.

**Returns:**

updated instance for chaining.

**Throws:**

- **IllegalArgumentException**  
if weight is not greater than 0.

## EmissionType

The enumeration *EmissionType* is a member of *com.here.android.mpa.tce.TollCostVehicleProfile*.

### Enumeration Summary

```
public static final enumeration TollCostVehicleProfile.EmissionType
```

```
extends java.lang.Enum, java.lang.Object
```

Vehicle emission type.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 1262: Enum Constants in EmissionType

Fields
<pre>public static final EmissionType NONE</pre> <p>No emission type set.</p>
<pre>public static final EmissionType EURO_I</pre> <p>EURO_I emission type.</p>
<pre>public static final EmissionType EURO_II</pre> <p>EURO_II emission type.</p>
<pre>public static final EmissionType EURO_III</pre> <p>EURO_III emission type.</p>
<pre>public static final EmissionType EURO_IV</pre> <p>EURO_IV emission type.</p>
<pre>public static final EmissionType EURO_V</pre> <p>EURO_V emission type.</p>
<pre>public static final EmissionType EURO_VI</pre> <p>EURO_VI emission type.</p>
<pre>public static final EmissionType EURO_EEV</pre> <p>EURO_EEV emission type.</p>
<pre>public static final EmissionType ELECTRIC_VEHICLES</pre> <p>Electric vehicles.</p>

## Method Summary

Table 1263: Methods in EmissionType

Methods
<pre>public static EmissionType valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static TollCostVehicleProfile.EmissionType[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Vehicle emission type.

## Enum Constant Details

```
public static final EmissionType NONE
```

No emission type set.

```
public static final EmissionType EURO_I
```

EURO\_I emission type.

```
public static final EmissionType EURO_II
```

EURO\_II emission type.

```
public static final EmissionType EURO_III
```

EURO\_III emission type.

```
public static final EmissionType EURO_IV
```

EURO\_IV emission type.

```
public static final EmissionType EURO_V
```

EURO\_V emission type.

```
public static final EmissionType EURO_VI
```

EURO\_VI emission type.

```
public static final EmissionType EURO_EEV
```

EURO\_EEV emission type.

```
public static final EmissionType ELECTRIC_VEHICLES
```

Electric vehicles.

## Method Details

```
public static EmissionType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static TollCostVehicleProfile.EmissionType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Hybrid

The enumeration *Hybrid* is a member of *com.here.android.mpa.tce.TollCostVehicleProfile*.

### Enumeration Summary

```
public static final enumeration TollCostVehicleProfile.Hybrid
```

```
extends java.lang.Enum, java.lang.Object
```

Vehicle running mode.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 1264: Enum Constants in Hybrid

Fields
<pre>public static final <i>Hybrid</i> <b>PARTIALLY_ON_ELECTRICITY</b></pre> <p>the vehicle is partly running on electricity.</p>
<pre>public static final <i>Hybrid</i> <b>NONE</b></pre> <p>Otherwise</p>

### Method Summary

Table 1265: Methods in Hybrid

Methods
<pre>public static <i>Hybrid</i> <b>valueOf</b> (<i>String</i> name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>TollCostVehicleProfile.Hybrid[]</i> <b>values</b> ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

### Enumeration Details

Vehicle running mode.

### Enum Constant Details

```
public static final Hybrid PARTIALLY_ON_ELECTRICITY
```

the vehicle is partly running on electricity.

```
public static final Hybrid NONE
```

Otherwise

### Method Details

```
public static Hybrid valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static TollCostVehicleProfile.Hybrid[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## ShippedHazardousGoods

The enumeration *ShippedHazardousGoods* is a member of *com.here.android.mpa.tce.TollCostVehicleProfile*.

### Enumeration Summary

```
public static final enumeration TollCostVehicleProfile.ShippedHazardousGoods
```

*extends java.lang.Enum, java.lang.Object*

Shipped Hazardous Goods

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 1266: Enum Constants in ShippedHazardousGoods

Fields
<pre>public static final <i>ShippedHazardousGoods</i> NONE</pre>
No Hazardous Goods

## Fields

```
public static final ShippedHazardousGoods EXPLOSIVES
```

Explosives

```
public static final ShippedHazardousGoods ANY_HAZARDOUS_MATERIAL
```

Any hazardous material

## Method Summary

Table 1267: Methods in *ShippedHazardousGoods*

### Methods

```
public static ShippedHazardousGoods valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static TollCostVehicleProfile.ShippedHazardousGoods[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Shipped Hazardous Goods

### Enum Constant Details

```
public static final ShippedHazardousGoods NONE
```

No Hazardous Goods

```
public static final ShippedHazardousGoods EXPLOSIVES
```

Explosives

```
public static final ShippedHazardousGoods ANY_HAZARDOUS_MATERIAL
```

Any hazardous material

## Method Details

```
public static ShippedHazardousGoods valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static TollCostVehicleProfile.ShippedHazardousGoods[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## TrailerType

The enumeration *TrailerType* is a member of *com.here.android.mpa.tce.TollCostVehicleProfile*.

### Enumeration Summary

```
public static final enumeration TollCostVehicleProfile.TrailerType
```

```
extends java.lang.Enum, java.lang.Object
```

Trailer Type.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 1268: Enum Constants in TrailerType

Fields
<pre>public static final <i>TrailerType</i> <b>NONE</b></pre> <p>No trailer type.</p>
<pre>public static final <i>TrailerType</i> <b>CARAVAN</b></pre> <p>Caravan</p>
<pre>public static final <i>TrailerType</i> <b>TRAILER</b></pre> <p>Trailer</p>

### Method Summary

Table 1269: Methods in TrailerType

Methods
<pre>public static <i>TrailerType</i> <b>valueOf</b> (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>TollCostVehicleProfile.TrailerType[]</i> <b>values</b> ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

### Enumeration Details

Trailer Type.

### Enum Constant Details

```
public static final TrailerType NONE
```

No trailer type.

```
public static final TrailerType CARAVAN
```

Caravan

```
public static final TrailerType TRAILER
```

Trailer

### Method Details

```
public static TrailerType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static TollCostVehicleProfile.TrailerType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## TrailersCount

The enumeration *TrailersCount* is a member of *com.here.android.mpa.tce.TollCostVehicleProfile*.

### Enumeration Summary

```
public static final enumeration TollCostVehicleProfile.TrailersCount
```

```
extends java.lang.Enum, java.lang.Object
```

Trailers count.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 1270: Enum Constants in TrailersCount

Fields
<pre>public static final TrailersCount VEHICLE_WITHOUT_TRAILER</pre> <p>Vehicle without trailer</p>
<pre>public static final TrailersCount VEHICLE_WITH_ONE_TRAILER</pre> <p>Vehicle with one trailer,</p>
<pre>public static final TrailersCount VEHICLE_WITH_TWO_TRAILERS</pre> <p>Vehicle with two trailers.</p>
<pre>public static final TrailersCount VEHICLE_WITH_THREE_OR_MORE_TRAILERS</pre> <p>Vehicle with three or more trailers.</p>

## Method Summary

Table 1271: Methods in TrailersCount

Methods
<pre>public static TrailersCount valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static TollCostVehicleProfile.TrailersCount[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Trailers count.

### Enum Constant Details

```
public static final TrailersCount VEHICLE_WITHOUT_TRAILER
```

Vehicle without trailer

```
public static final TrailersCount VEHICLE_WITH_ONE_TRAILER
```

Vehicle with one trailer,

```
public static final TrailersCount VEHICLE_WITH_TWO_TRAILERS
```

Vehicle with two trailers.

```
public static final TrailersCount VEHICLE_WITH_THREE_OR_MORE_TRAILERS
```

Vehicle with three or more trailers.

### Method Details

```
public static TrailersCount valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static TollCostVehicleProfile.TrailersCount[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## VehicleType

The enumeration *VehicleType* is a member of *com.here.android.mpa.tce.TollCostVehicleProfile*.

### Enumeration Summary

```
public static final enumeration TollCostVehicleProfile.VehicleType
```

```
extends java.lang.Enum, java.lang.Object
```

Represent different Vehicle types.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 1272: Enum Constants in VehicleType

Fields
<pre>public static final <i>VehicleType</i> <b>MOTORCYCLE</b></pre> <p>MotorCycle</p>
<pre>public static final <i>VehicleType</i> <b>AUTO</b></pre> <p>Auto</p>
<pre>public static final <i>VehicleType</i> <b>TRUCK</b></pre> <p>Truck</p>
<pre>public static final <i>VehicleType</i> <b>MOTOR_HOME</b></pre> <p>Motor Home</p>

## Fields

```
public static final VehicleType MINIBUS
```

Mini bus

```
public static final VehicleType BUS
```

Bus

```
public static final VehicleType MOTORCYCLE_SIDE CAR
```

Motorcycle sidecar

```
public static final VehicleType TRICYCLE
```

Tricycle

```
public static final VehicleType DELIVERY_TRUCK
```

Delivery Truck

```
public static final VehicleType SNOWMOBILE
```

Snow Mobile

```
public static final VehicleType PICK_UP
```

Pickup

```
public static final VehicleType TRACTOR
```

Tractor

```
public static final VehicleType TAXI
```

Taxi

```
public static final VehicleType HCM_EME
```

HCM/EME

## Method Summary

Table 1273: Methods in *VehicleType*

### Methods

```
public static VehicleType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static TollCostVehicleProfile.VehicleType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Represent different Vehicle types.

### Enum Constant Details

```
public static final VehicleType MOTORCYCLE
```

MotorCycle

```
public static final VehicleType AUTO
```

Auto

```
public static final VehicleType TRUCK
```

Truck

```
public static final VehicleType MOTOR_HOME
```

Motor Home

```
public static final VehicleType MINIBUS
```

Mini bus

```
public static final VehicleType BUS
```

Bus

```
public static final VehicleType MOTORCYCLE_SIDE CAR
```

Motorcycle sidecar

```
public static final VehicleType TRICYCLE
```

Tricycle

```
public static final VehicleType DELIVERY_TRUCK
```

Delivery Truck

```
public static final VehicleType SNOWMOBILE
```

Snow Mobile

```
public static final VehicleType PICK_UP
```

Pickup

```
public static final VehicleType TRACTOR
```

Tractor

```
public static final VehicleType TAXI
```

Taxi

```
public static final VehicleType HCM_EME
```

HCM/EME

## Method Details

```
public static VehicleType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static TollCostVehicleProfile.VehicleType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## urbanmobility

---

The package *urbanmobility* is a member of *com.here.android.mpa*.

### Package Summary

#### *urbanmobility*

The package *urbanmobility* provides classes, callbacks, and enumerations that can be used to enable functionality related to public transit such as search for nearby transit stations and requests for departure boards.

### Package Details

The package *urbanmobility* provides classes, callbacks, and enumerations that can be used to enable functionality related to public transit such as search for nearby transit stations and requests for departure boards.

## AbstractListRequest<T>

The class *AbstractListRequest<T>* is a member of *com.here.android.mpa.urbanmobility*.

### Type Parameters:

- **T**  
specifies the type of the object returned when executing this request.

### Class Summary

public abstract class **AbstractListRequest**

extends *com.here.android.mpa.urbanmobility.AbstractRequest*, *java.lang.Object*

Represents an abstract request that expects List as a result, and provides access to common request parameters.

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 1274: Constructors in AbstractListRequest<T>

Constructors
<i>AbstractListRequest</i> ()

### Method Summary

Table 1275: Methods in AbstractListRequest<T>

Methods
public <i>AbstractRequest&lt;T&gt;</i> <i>setMaximumResults</i> (int maxResults) Sets the maximum number of results to be returned in the response.

### Class Details

Represents an abstract request that expects List as a result, and provides access to common request parameters. All setter methods return the current instance, so these calls can be chained.

IMPORTANT: Urban Mobility is a Beta feature. The related classes are subject to change without notice.

### Constructor Details

**AbstractListRequest** ()

## Method Details

```
public AbstractRequest<T> setMaximumResults (int maxResults)
```

Sets the maximum number of results to be returned in the response. It is not set by default.

### Parameters:

- `maxResults`  
number of results in response, must be greater than 0

### Returns:

this request instance

### Throws:

- `IllegalArgumentException`  
if `maxResults` is invalid.

## AbstractRequest<T>

The class `AbstractRequest<T>` is a member of `com.here.android.mpa.urbanmobility`.

### Type Parameters:

- `T`  
specifies the type of the object returned when executing this request.

## Class Summary

```
public abstract class AbstractRequest
```

```
extends java.lang.Object
```

Represents an abstract request and provides access to common request parameters.

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 1276: Constructors in `AbstractRequest<T>`

Constructors
<code>AbstractRequest ()</code>

## Method Summary

Table 1277: Methods in `AbstractRequest<T>`

Methods
<code>public boolean equals (Object o)</code>

## Methods

```
public void execute ()
```

Asynchronously retrieves a response for this request.

```
public int hashCode ()
```

```
public AbstractRequest<T> setClient (String client)
```

Sets the name of the client.

## Class Details

Represents an abstract request and provides access to common request parameters. All setter methods return the current instance, so these calls can be chained.

IMPORTANT: Urban Mobility is a Beta feature. The related classes are subject to change without notice.

## Constructor Details

### `AbstractRequest ()`

## Method Details

```
public boolean equals (Object o)
```

**Parameters:**

- `o`

```
public void execute ()
```

Asynchronously retrieves a response for this request. Clients should provide a `ResponseListener` which will be called upon completion of the request.

```
public int hashCode ()
```

```
public AbstractRequest<T> setClient (String client)
```

Sets the name of the client. "unset" will be used if not set.

**Parameters:**

- `client`  
name of the client

**Returns:**

this request instance

## AccessPoint

The class `AccessPoint` is a member of `com.here.android.mpa.urbanmobility`.

### Class Summary

```
public final class AccessPoint
```

```
extends java.lang.Object
```

Represents information about an access point to a *Departure* or *Arrival*.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 1278: Methods in `AccessPoint`

#### Methods

```
public boolean equals (Object o)
```

```
public GeoCoordinate getCoordinate ()
```

Get coordinates of this access point.

```
public String getId ()
```

Get ID of this access point.

```
public String getName ()
```

Get the name of the access point.

```
public int hashCode ()
```

### Class Details

Represents information about an access point to a *Departure* or *Arrival*. Locations like railway station may have multiple entrance or exits which coordinates may differ a lot. `AccessPoint` represents such single entrance or exit.

IMPORTANT: Urban Mobility is a Beta feature. The related classes are subject to change without notice.

### Method Details

```
public boolean equals (Object o)
```

Parameters:

- `o`

```
public GeoCoordinate getCoordinate ()
```

Get coordinates of this access point.

**Returns:**

access point coordinates

```
public String getId ()
```

Get ID of this access point.

**Returns:**

access point id

```
public String getName ()
```

Get the name of the access point.

**Returns:**

access point name

```
public int hashCode ()
```

## Address

The class *Address* is a member of [com.here.android.mpa.urbanmobility](#) .

### Class Summary

```
public final class Address
```

*extends java.lang.Object*

Represents information about an address: coordinates, street name, postal code etc.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 1279: Methods in Address

Methods
<pre>public boolean equals (Object o)</pre>
<pre>public String getCity ()</pre> <p>Get the name of the city.</p>
<pre>public GeoCoordinate getCoordinate ()</pre> <p>Get coordinates corresponding to this address.</p>

## Methods

```
public String getCountry ()
```

Get the name of the country.

```
public String getCountryCode ()
```

Get 3 letter ISO 3166-1 country code.

```
public String getDistrict ()
```

Get the city district name.

```
public String getHouseNumber ()
```

Get the house number.

```
public String getName ()
```

Get the name of the place at this address if available, empty string otherwise.

```
public String getOpeningHours ()
```

Gets opening hours of a parking lot

```
public String getParkingId ()
```

Gets unique identifier for a parking lot

```
public Boolean getPnR ()
```

Gets whether parking lot is designated specifically for Park and Ride

```
public String getPostalCode ()
```

Get the postal code.

```
public Integer getSpaces ()
```

Gets number of parking spaces available in a parking lot

```
public String getState ()
```

Get the country state name, if applicable.

```
public String getStreet ()
```

Get the street name.

```
public int hashCode ()
```

## Class Details

Represents information about an address: coordinates, street name, postal code etc.

IMPORTANT: Urban Mobility is a Beta feature. The related classes are subject to change without notice.

## Method Details

```
public boolean equals (Object o)
```

Parameters:

- o

```
public String getCity ()
```

Get the name of the city.

**Returns:**

city name

```
public GeoCoordinate getCoordinate ()
```

Get coordinates corresponding to this address. NOTE: Same Addresses (same postal code, street name, house number etc.) may potentially have different coordinates, please be aware of that.

**Returns:**

coordinates associated with this address

```
public String getCountry ()
```

Get the name of the country.

**Returns:**

name of the country

```
public String getCountryCode ()
```

Get 3 letter ISO 3166-1 country code.

**Returns:**

ISO country code

```
public String getDistrict ()
```

Get the city district name.

**Returns:**

district name

```
public String getHouseNumber ()
```

Get the house number.

**Returns:**

house number

```
public String getName ()
```

Get the name of the place at this address if available, empty string otherwise.

**Returns:**

name of the place or empty string if not available

**public String getOpeningHours ()**

Gets opening hours of a parking lot

**Returns:**

opening hours of a parking lot

**public String getParkingId ()**

Gets unique identifier for a parking lot

**Returns:**

unique identifier for a parking lot

**public Boolean getPnR ()**

Gets whether parking lot is designated specifically for Park and Ride

**Returns:**

whether parking lot is designated specifically for Park and Ride

**public String getPostalCode ()**

Get the postal code.

**Returns:**

postal code

**public Integer getSpaces ()**

Gets number of parking spaces available in a parking lot

**Returns:**

number of parking spaces available in a parking lot

**public String getState ()**

Get the country state name, if applicable.

**Returns:**

state name

```
public String getStreet ()
```

Get the street name.

**Returns:**

street name

```
public int hashCode ()
```

## Alert

The class *Alert* is a member of *com.here.android.mpa.urbanmobility*.

### Class Summary

```
public final class Alert
```

*extends java.lang.Object*

Represents an alert/disruption information about particular *Transport* and *Operator*.

[For complete information, see the section *Class Details*]

### Method Summary

Table 1280: Methods in Alert

Methods
<pre>public boolean equals (Object o)</pre>
<pre>public Branding getBranding ()</pre> <p>Gets alert source branding info.</p>
<pre>public String getId ()</pre> <p>Get unique Id for this alert.</p>
<pre>public String getInfo ()</pre> <p>Get alert information text to display to the user.</p>
<pre>public Provider getProvider ()</pre> <p>Get <i>Provider</i> of the alert data.</p>
<pre>public Link getSource ()</pre> <p>Get a <i>Link</i> to the original source of this alert (Twitter feed, Agency API, RSS etc.).</p>

## Methods

```
public java.util.Collection <Transport> getTransports ()
```

Get Collection of *Transport* objects affected by this alert.

```
public Date getValidFrom ()
```

Get the Date from which this alert is valid.

```
public Date getValidTill ()
```

Get the Date till which this alert is valid.

```
public int hashCode ()
```

---

## Class Details

Represents an alert/disruption information about particular *Transport* and *Operator*.

IMPORTANT: Urban Mobility is a Beta feature. The related classes are subject to change without notice.

## Method Details

```
public boolean equals (Object o)
```

**Parameters:**

- **o**

```
public Branding getBranding ()
```

Gets alert source branding info. Some alert sources (like Twitter) have branding requirement and clients must comply to these and show to the user.

**Returns:**

source *Branding* info, or null if not available.

```
public String getId ()
```

Get unique Id for this alert. Might help to identify if this alert was already processed on the client.

**Returns:**

alert id

```
public String getInfo ()
```

Get alert information text to display to the user. Information text is localized according to `Locale.getDefault()`. If given language is not supported English version is returned.

**Returns:**

alert information text

```
public Provider getProvider ()
```

Get *Provider* of the alert data.

**Returns:**

alert data provider

```
public Link getSource ()
```

Get a *Link* to the original source of this alert (Twitter feed, Agency API, RSS etc.).

**Returns:**

Link to the alert's source, or null if not available

```
public java.util.Collection <Transport> getTransports ()
```

Get Collection of *Transport* objects affected by this alert.

**Returns:**

collection of transports

```
public Date getValidFrom ()
```

Get the Date from which this alert is valid.

**Returns:**

valid from date, or null if not available

```
public Date getValidTill ()
```

Get the Date till which this alert is valid.

**Returns:**

valid till date, or null if not available

```
public int hashCode ()
```

## AlternativeDeparture

The class *AlternativeDeparture* is a member of *com.here.android.mpa.urbanmobility* .

## Class Summary

public final class **AlternativeDeparture**

*extends java.lang.Object*

Represents information about an alternative departure.

[For complete information, see the section [Class Details](#)]

## Method Summary

Table 1281: Methods in AlternativeDeparture

Methods
<code>public boolean equals (Object o)</code>
<code>public <i>RealTimeInfo</i> getRealTimeInfo ()</code> Gets the real-time departure time if available.
<code>public Date getTime ()</code> Gets the originally scheduled departure time.
<code>public <i>Transport</i> getTransport ()</code> Gets the transport information.
<code>public int hashCode ()</code>

## Class Details

Represents information about an alternative departure.

IMPORTANT: Urban Mobility Departure Board is a Beta feature. The related classes are subject to change without notice.

## Method Details

`public boolean equals (Object o)`

**Parameters:**

- `o`

`public RealTimeInfo getRealTimeInfo ()`

Gets the real-time departure time if available.

**Returns:**

real-time departure time, or null when not available.

`public Date getTime ()`

Gets the originally scheduled departure time.

**Returns:**

Originally scheduled departure time, or null if not available.

```
public Transport getTransport ()
```

Gets the transport information.

**Returns:**

transport information, or null if not available

```
public int hashCode ()
```

## Arrival

The class *Arrival* is a member of [com.here.android.mpa.urbanmobility](#).

### Class Summary

```
public final class Arrival
```

```
extends java.lang.Object
```

Represents information about an arrival.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 1282: Methods in Arrival

#### Methods

```
public boolean equals (Object o)
```

```
public AccessPoint getAccessPoint ()
```

Gets *AccessPoint* which should be used to access this location.

```
public Place getPlace ()
```

Gets the arrival *Place* information.

```
public String getPlatform ()
```

Gets the originally scheduled arrival platform.

```
public RealTimeInfo getRealTimeInfo ()
```

Gets the arrival real-time info if available.

## Methods

```
public Station getStation ()
```

Gets the arrival *Station* information.

```
public Date getTime ()
```

Gets the originally scheduled arrival time.

```
public int hashCode ()
```

---

## Class Details

Represents information about an arrival.

IMPORTANT: Urban Mobility routing is a Beta feature. The related classes are subject to change without notice.

## Method Details

```
public boolean equals (Object o)
```

**Parameters:**

- *o*

```
public AccessPoint getAccessPoint ()
```

Gets *AccessPoint* which should be used to access this location.

**Returns:**

*AccessPoint*, or null if not available

```
public Place getPlace ()
```

Gets the arrival *Place* information.

**Returns:**

arrival *Place* information, or null if not available

```
public String getPlatform ()
```

Gets the originally scheduled arrival platform.

**Returns:**

originally scheduled arrival platform, or empty string if not available.

```
public RealTimeInfo getRealTimeInfo ()
```

Gets the arrival real-time info if available.

**Returns:**

arrival real-time info, or null if not available

```
public Station getStation ()
```

Gets the arrival *Station* information. NOTE: This property is available only if arrival *Place* is also a *Station*.

**Returns:**

*Station* information ,or null if not available

```
public Date getTime ()
```

Gets the originally scheduled arrival time.

**Returns:**

originally scheduled arrival time, or null if not available

```
public int hashCode ()
```

## Branding

The class *Branding* is a member of [com.here.android.mpa.urbanmobility](#) .

### Class Summary

```
public final class Branding
```

```
extends java.lang.Object
```

Represents alert source branding info.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 1283: Methods in Branding

#### Methods

```
public boolean equals (Object o)
```

```
public String getTweetAvatarUrl ()
```

Gets url of the tweet author avatar.

## Methods

```
public String getTweetFullName ()
```

Gets full name of the tweet author.

```
public String getTweetId ()
```

Gets id of the source tweet.

```
public Date getTweetTime ()
```

Gets timestamp of the source tweet.

```
public String getTweetUser ()
```

Gets username of the tweet author.

```
public int hashCode ()
```

## Class Details

Represents alert source branding info. Some alert sources (like Twitter) have branding requirement and clients must comply to these and show to the user.

IMPORTANT: Urban Mobility is a Beta feature. The related classes are subject to change without notice.

## Method Details

```
public boolean equals (Object o)
```

**Parameters:**

- `o`

```
public String getTweetAvatarUrl ()
```

Gets url of the tweet author avatar.

**Returns:**

url of the tweet author avatar, or empty string if not available

```
public String getTweetFullName ()
```

Gets full name of the tweet author.

**Returns:**

full name of the tweet author, or empty string if not available

```
public String getTweetId ()
```

Gets id of the source tweet.

**Returns:**

id of the tweet, or empty string if not available

```
public Date getTweetTime ()
```

Gets timestamp of the source tweet.

**Returns:**

tweet timestamp, or null if not available

```
public String getTweetUser ()
```

Gets username of the tweet author.

**Returns:**

username of the tweet author, or empty string if not available

```
public int hashCode ()
```

## BrandingLogosRequest

The class *BrandingLogosRequest* is a member of *com.here.android.mpa.urbanmobility*.

### Class Summary

```
public class BrandingLogosRequest
```

*extends* *com.here.android.mpa.urbanmobility.AbstractRequest*, *java.lang.Object*

Represents a request to retrieve information about branding logos of transit agencies.

[For complete information, see the section *Class Details*]

### Nested Class Summary

Table 1284: Nested Classes in *BrandingLogosRequest*

Nested Classes
<pre>public static final enumeration <i>BrandingLogosRequest.LogoSize</i></pre> <p>Represents possible logo sizes.</p>

## Method Summary

Table 1285: Methods in `BrandingLogosRequest`

Methods
<pre>public <i>BrandingLogosRequest</i> setSize (<i>LogoSize</i> size)</pre> <p>Set desired logo size.</p>

## Class Details

Represents a request to retrieve information about branding logos of transit agencies.

IMPORTANT: Urban Mobility is a Beta feature. The related classes are subject to change without notice.

## Method Details

```
public BrandingLogosRequest setSize (LogoSize size)
```

Set desired logo size. It is *SMALL* by default.

### Parameters:

- **size**  
desired *BrandingLogosRequest.LogoSize*

### Returns:

this request instance

## LogoSize

The enumeration *LogoSize* is a member of *com.here.android.mpa.urbanmobility.BrandingLogosRequest*.

## Enumeration Summary

```
public static final enumeration BrandingLogosRequest.LogoSize
```

```
extends java.lang.Enum, java.lang.Object
```

Represents possible logo sizes.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 1286: Enum Constants in `LogoSize`

Fields
<pre>public static final <i>LogoSize</i> SMALL</pre> <p>Default small logo image.</p>

## Fields

```
public static final LogoSize LARGE
```

High resolution logo image (if available).

---

## Method Summary

Table 1287: Methods in *LogoSize*

### Methods

```
public static LogoSize valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static BrandingLogosRequest.LogoSize[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

---

## Enumeration Details

Represents possible logo sizes.

### Enum Constant Details

```
public static final LogoSize SMALL
```

Default small logo image.

```
public static final LogoSize LARGE
```

High resolution logo image (if available).

### Method Details

```
public static LogoSize valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static BrandingLogosRequest.LogoSize[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## BrandingLogosResult

The class *BrandingLogosResult* is a member of *com.here.android.mpa.urbanmobility*.

### Class Summary

```
public class BrandingLogosResult
```

```
extends java.lang.Object
```

Represents information about branding logos of transit agencies.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 1288: Methods in BrandingLogosResult

Methods
<pre>public boolean <i>equals</i> (Object o)</pre>
<pre>public java.util.List &lt;Link&gt; <i>getLogos</i> ()</pre> <p>Gets ordered list of hyperlinks to branded logos of agencies.</p>
<pre>public int <i>hashCode</i> ()</pre>

### Class Details

Represents information about branding logos of transit agencies.

IMPORTANT: Urban Mobility is a Beta feature. The related classes are subject to change without notice.

### Method Details

```
public boolean equals (Object o)
```

Parameters:

- *o*

```
public java.util.List <Link> getLogos ()
```

Gets ordered list of hyperlinks to branded logos of agencies. Typically these are just urls to PNG file.

Returns:

List of logo *Links*.

```
public int hashCode ()
```

## City

The class `City` is a member of `com.here.android.mpa.urbanmobility`.

### Class Summary

```
public class City
```

```
extends java.lang.Object
```

Represents a city with the associated city coverage information.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 1289: Methods in City

Methods
<pre>public boolean equals (Object o)</pre>
<pre>public String getCountry ()</pre> <p>Gets the name of the country that the city belongs to.</p>
<pre>public Date getCreated ()</pre> <p>Gets the date that the city information was created.</p>
<pre>public String getDisplayName ()</pre> <p>Gets hint of how name, state and country could be displayed in screen.</p>
<pre>public int getDistance ()</pre> <p>Gets distance to be used when user coordinates are known.</p>
<pre>public GeoCoordinate getLocation ()</pre> <p>Gets geo coordinates of the city.</p>
<pre>public MissingCoverage getMissingCoverage ()</pre> <p>Gets information about missing operators, lines or timetables.</p>
<pre>public String getName ()</pre> <p>Gets name of the city.</p>
<pre>public java.util.Collection &lt;Operator&gt; getOperators ()</pre> <p>Gets operators serving city.</p>
<pre>public int getPopulation ()</pre> <p>Gets the city population.</p>
<pre>public java.util.Collection &lt;Provider&gt; getProviders ()</pre> <p>Gets coverage data providers.</p>

## Methods

```
public float getQuality ()
```

Gets the percentage of the city coverage in between 0.0 (nothing covered) and 1.0 (completely covered).

```
public double getRelevancy ()
```

Gets city relevancy as a weight value [0..1], that reflects how relevant this city should be for user when user is in some specific location.

```
public String getState ()
```

Gets name of the state that the city belongs to.

```
public int getStopsCount ()
```

Gets the number of stops found in this city.

```
public int getTransportsCount ()
```

Gets the number of transports found.

```
public Date getUpdated ()
```

Gets the date the city information was updated.

```
public int hashCode ()
```

## Class Details

Represents a city with the associated city coverage information.

IMPORTANT: Urban Mobility Coverage Search is a Beta feature. The related classes are subject to change without notice.

## Method Details

```
public boolean equals (Object o)
```

**Parameters:**

- o

```
public String getCountry ()
```

Gets the name of the country that the city belongs to. Country name is localized according to `Locale.getDefault()`. If given language is not supported English version is returned.

**Returns:**

Name of the country.

```
public Date getCreated ()
```

Gets the date that the city information was created.

**Returns:**

The date the city information was created.

```
public String getDisplayName ( )
```

Gets hint of how name, state and country could be displayed in screen. There is no guarantee that this hint must be correct. Display name is localized according to `Locale.getDefault()`. If given language is not supported English version is returned.

**Returns:**

Display name string or empty string.

```
public int getDistance ( )
```

Gets distance to be used when user coordinates are known.

**Returns:**

Distance in meters, or -1 if not available.

```
public GeoCoordinate getLocation ( )
```

Gets geo coordinates of the city.

**Returns:**

Geo coordinates of the city.

```
public MissingCoverage getMissingCoverage ( )
```

Gets information about missing operators, lines or timetables.

**Returns:**

Information about missing operators, lines or timetables, or null if not available.

```
public String getName ( )
```

Gets name of the city. Name is localized according to `Locale.getDefault()`. If given language is not supported English version is returned.

**Returns:**

Name of the city.

```
public java.util.Collection <Operator> getOperators ( )
```

Gets operators serving city.

**Returns:**

Collection of operators serving city.

```
public int getPopulation ()
```

Gets the city population.

**Returns:**

City population, or -1 if not available.

```
public java.util.Collection <Provider> getProviders ()
```

Gets coverage data providers.

**Returns:**

Collection of data providers.

```
public float getQuality ()
```

Gets the percentage of the city coverage in between 0.0 (nothing covered) and 1.0 (completely covered).

**Returns:**

City coverage quality from 0.0 to 1.0, or -1.0 if not available.

```
public double getRelevancy ()
```

Gets city relevancy as a weight value [0..1], that reflects how relevant this city should be for user when user is in some specific location. This will mostly give correct results but it cannot be guaranteed.

**Returns:**

City relevancy 0..1, or -1.0 if not available.

```
public String getState ()
```

Gets name of the state that the city belongs to.

**Returns:**

Name of the state that the city belongs to, or empty string if not available.

```
public int getStopsCount ()
```

Gets the number of stops found in this city.

**Returns:**

Number of stops found, or -1 if not available.

```
public int getTransportsCount ()
```

Gets the number of transports found.

**Returns:**

Number of transports found, or -1 if not available.

```
public Date getUpdated ()
```

Gets the date the city information was updated.

**Returns:**

The date the city information was updated.

```
public int hashCode ()
```

## CityCoverageRequest

The class *CityCoverageRequest* is a member of [com.here.android.mpa.urbanmobility](#).

### Class Summary

```
public class CityCoverageRequest
```

*extends* [com.here.android.mpa.urbanmobility.AbstractListRequest](#),  
[com.here.android.mpa.urbanmobility.AbstractRequest](#), [java.lang.Object](#)

Represents a request to retrieve public transit data coverage by city.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 1290: Nested Classes in CityCoverageRequest

Nested Classes
<pre>public static final enumeration <a href="#">CityCoverageRequest.UpdateType</a></pre> <p>Indicates if the result should contain only NEW or UPDATED cities (since given time).</p>

### Method Summary

Table 1291: Methods in CityCoverageRequest

Methods
<pre>public <a href="#">CityCoverageRequest</a> <a href="#">setLocation</a> (<a href="#">GeoCoordinate</a> value)</pre> <p>Sets the location of the center point for search.</p>

## Methods

```
public CityCoverageRequest setNearbyMax (int value)
```

Set maximum number of cities returned in a separate "nearby" list.

```
public CityCoverageRequest setRadius (int value)
```

Sets the radius.

```
public CityCoverageRequest setRequestCityDetailsEnabled (boolean value)
```

Set if city details (such as population, available operators) should be returned.

```
public CityCoverageRequest setTime (Date value)
```

Sets a time filter for result cities.

```
public CityCoverageRequest setUpdateType (UpdateType value)
```

Sets type of time filter, which determines if the result will contain new, updated, or both new and updated, cities (since the given time).

## Class Details

Represents a request to retrieve public transit data coverage by city. All setter methods return the current instance, so these calls can be chained.

IMPORTANT: Urban Mobility Coverage Search is a Beta feature. The related classes are subject to change without notice.

## Method Details

```
public CityCoverageRequest setLocation (GeoCoordinate value)
```

Sets the location of the center point for search. It is not set by default - returns all cities.

### Parameters:

- **value**  
coordinates of center point for search

### Returns:

this request instance

```
public CityCoverageRequest setNearbyMax (int value)
```

Set maximum number of cities returned in a separate "nearby" list. Cities with zero relevancy are included in this list. All cities with relevancy value of more than 0 are returned in the "main" cities list. By default, this value is not set, so no nearby cities list is returned.

Note: Cities in the "nearby" list are returned without any details.

### Parameters:

- **value**  
number of nearby cities in response, must be greater than 0

**Returns:**

this request instance

**Throws:**

- **IllegalArgumentException**  
if nearbyMax is invalid.

```
public CityCoverageRequest setRadius (int value)
```

Sets the radius, in meters, that define the area of the search. It is 150,000 by default.

**Parameters:**

- **value**  
area of the search, in meters, must be greater than or equal 0

**Returns:**

this request instance

**Throws:**

- **IllegalArgumentException**  
if radius is invalid.

```
public CityCoverageRequest setRequestCityDetailsEnabled (boolean value)
```

Set if city details (such as population, available operators) should be returned. It is true by default.

**Parameters:**

- **value**  
true if city details should be returned, false otherwise

**Returns:**

this request instance

```
public CityCoverageRequest setTime (Date value)
```

Sets a time filter for result cities. Use *CityCoverageRequest.UpdateType* parameter to specify how filtering behaves. If it will return cities created or updated since given time, or both (created or updated). It is not set by default - no time filtering.

**Parameters:**

- **value**  
date and time filter

**Returns:**

this request instance

```
public CityCoverageRequest setUpdateType (UpdateType value)
```

Sets type of time filter, which determines if the result will contain new, updated, or both new and updated, cities (since the given time). By default *ALL* is used.

**Parameters:**

- **value**  
type of time filter

**Returns:**

this request instance

## UpdateType

The enumeration *UpdateType* is a member of *com.here.android.mpa.urbanmobility.CityCoverageRequest*.

### Enumeration Summary

```
public static final enumeration CityCoverageRequest.UpdateType
```

```
extends java.lang.Enum, java.lang.Object
```

Indicates if the result should contain only NEW or UPDATED cities (since given time).

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 1292: Enum Constants in UpdateType

Fields
<pre>public static final <i>UpdateType</i> <b>ALL</b></pre> <p>Both new and cities updated since the given time are returned.</p>
<pre>public static final <i>UpdateType</i> <b>NEW</b></pre> <p>Only new cities since the given time are returned.</p>
<pre>public static final <i>UpdateType</i> <b>UPDATED</b></pre> <p>Only cities updated since the given time are returned.</p>

## Method Summary

Table 1293: Methods in UpdateType

Methods
<pre>public static UpdateType valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static CityCoverageRequest.UpdateType[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Indicates if the result should contain only NEW or UPDATED cities (since given time). Default is ALL cities (both updated and new since given time) are returned.

### Enum Constant Details

```
public static final UpdateType ALL
```

Both new and cities updated since the given time are returned.

```
public static final UpdateType NEW
```

Only new cities since the given time are returned.

```
public static final UpdateType UPDATED
```

Only cities updated since the given time are returned.

## Method Details

```
public static UpdateType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static CityCoverageRequest.UpdateType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## CityCoverageResult

The class `CityCoverageResult` is a member of `com.here.android.mpa.urbanmobility`.

### Class Summary

```
public class CityCoverageResult
```

```
extends com.here.android.mpa.urbanmobility.CitySearchResult, java.lang.Object
```

Represents detailed information about cities coverage.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 1294: Methods in CityCoverageResult

#### Methods

```
public boolean equals (Object o)
```

```
public java.util.List <City> getNearbyCities ()
```

Gets nearby cities with minimum coverage data.

```
public int hashCode ()
```

### Class Details

Represents detailed information about cities coverage.

IMPORTANT: Urban Mobility Coverage Search is a Beta feature. The related classes are subject to change without notice.

### Method Details

```
public boolean equals (Object o)
```

**Parameters:**

- `o`

```
public java.util.List <City> getNearbyCities ()
```

Gets nearby cities with minimum coverage data.

**Returns:**

List of cities.

```
public int hashCode ()
```

## CitySearchRequest

The class *CitySearchRequest* is a member of *com.here.android.mpa.urbanmobility*.

### Class Summary

```
public class CitySearchRequest
```

```
extends com.here.android.mpa.urbanmobility.AbstractListRequest,  
com.here.android.mpa.urbanmobility.AbstractRequest, java.lang.Object
```

Represents a request to search city by name and get public transit data coverage for it.

[For complete information, see the section *Class Details*]

### Method Summary

Table 1295: Methods in *CitySearchRequest*

Methods
<pre>public <i>CitySearchRequest</i> <b>setRequestCityDetailsEnabled</b> (boolean details)</pre> <p>Set if city details (such as population and available operators) should be returned.</p>

### Class Details

Represents a request to search city by name and get public transit data coverage for it. All setter methods return the current instance, so these calls can be chained.

IMPORTANT: Urban Mobility Coverage Search is a Beta feature. The related classes are subject to change without notice.

### Method Details

```
public CitySearchRequest setRequestCityDetailsEnabled (boolean details)
```

Set if city details (such as population and available operators) should be returned. It is true by default.

#### Parameters:

- **details**  
true if city details should be returned, false otherwise

#### Returns:

this request instance

## CitySearchResult

The class `CitySearchResult` is a member of `com.here.android.mpa.urbanmobility`.

### Class Summary

```
public class CitySearchResult
```

```
extends java.lang.Object
```

Represents detailed information about found cities and related coverage.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 1296: Methods in CitySearchResult

Methods
<pre>public boolean equals (Object o)</pre>
<pre>public java.util.List &lt;City&gt; getCities ()</pre> <p>Gets cities with detailed coverage data.</p>
<pre>public int getRealTimeCount ()</pre> <p>Gets total count of CoverageType.REAL_TIME supported cities.</p>
<pre>public Date getRefTime ()</pre> <p>Get time of most updated available coverage data.</p>
<pre>public int getSimpleRoutingCount ()</pre> <p>Gets total count of CoverageType.SIMPLE_ROUTING supported cities.</p>
<pre>public int getTimeTableCount ()</pre> <p>Gets total count of CoverageType.TIME_TABLE supported cities.</p>
<pre>public int hashCode ()</pre>

### Class Details

Represents detailed information about found cities and related coverage.

IMPORTANT: Urban Mobility Coverage Search is a Beta feature. The related classes are subject to change without notice.

### Method Details

```
public boolean equals (Object o)
```

Parameters:

- `o`

```
public java.util.List <City> getCities ()
```

Gets cities with detailed coverage data.

**Returns:**

List of cities.

```
public int getRealTimeCount ()
```

Gets total count of CoverageType.REAL\_TIME supported cities.

**Returns:**

Number of CoverageType.REAL\_TIME supported cities.

```
public Date getRefTime ()
```

Get time of most updated available coverage data. Client can save this and when checking for new updates, set the time parameter as this value.

**Returns:**

Time of most updated available coverage data.

```
public int getSimpleRoutingCount ()
```

Gets total count of CoverageType.SIMPLE\_ROUTING supported cities.

**Returns:**

Number of CoverageType.SIMPLE\_ROUTING supported cities.

```
public int getTimeTableCount ()
```

Gets total count of CoverageType.TIME\_TABLE supported cities.

**Returns:**

Number of CoverageType.TIME\_TABLE supported cities.

```
public int hashCode ()
```

## CoverageType

The enumeration *CoverageType* is a member of [com.here.android.mpa.urbanmobility](http://com.here.android.mpa.urbanmobility).

## Enumeration Summary

public final enumeration **CoverageType**

*extends* `java.lang.Enum`, `java.lang.Object`

Type of coverage.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 1297: Enum Constants in CoverageType

Fields
<pre>public static final CoverageType REAL_TIME</pre> <p>Covered with real time data (e.g.</p>
<pre>public static final CoverageType SIMPLE_ROUTING</pre> <p>Covered with simple routing data.</p>
<pre>public static final CoverageType TIME_TABLE</pre> <p>Covered with time table data.</p>
<pre>public static final CoverageType UNKNOWN</pre> <p>Information about coverage type is unavailable.</p>

## Method Summary

Table 1298: Methods in CoverageType

Methods
<pre>public static CoverageType valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static CoverageType[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Type of coverage.

IMPORTANT: Urban Mobility Coverage Search is a Beta feature. The related classes are subject to change without notice.

## Enum Constant Details

```
public static final CoverageType REAL_TIME
```

Covered with real time data (e.g. got directly from 3rd-party api).

```
public static final CoverageType SIMPLE_ROUTING
```

Covered with simple routing data.

```
public static final CoverageType TIME_TABLE
```

Covered with time table data.

```
public static final CoverageType UNKNOWN
```

Information about coverage type is unavailable.

## Method Details

```
public static CoverageType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static CoverageType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Departure

The class *Departure* is a member of [com.here.android.mpa.urbanmobility](#).

### Class Summary

```
public final class Departure
```

```
extends java.lang.Object
```

Represents information about a departure.

[For complete information, see the section [Class Details](#)]

## Method Summary

Table 1299: Methods in Departure

Methods
<pre>public boolean equals (Object o)</pre>
<pre>public AccessPoint getAccessPoint ()</pre> <p>Gets <i>AccessPoint</i> which should be used to access this location.</p>
<pre>public java.util.List &lt;AlternativeDeparture&gt; getAlternativeDepartures ()</pre> <p>Gets a list of departures which are alternative to this departure.</p>
<pre>public DepartureFrequency getDepartureFrequency ()</pre> <p>Gets a <i>DepartureFrequency</i> object describing frequency of similar departures.</p>
<pre>public Place getPlace ()</pre> <p>Gets the <i>Place</i> information from which this departure occurs.</p>
<pre>public String getPlatform ()</pre> <p>Gets the originally scheduled departure platform.</p>
<pre>public RealTimeInfo getRealTimeInfo ()</pre> <p>Gets the real-time departure time if available.</p>
<pre>public Station getStation ()</pre> <p>Gets the <i>Station</i> information from which this departure occurs.</p>
<pre>public Date getTime ()</pre> <p>Gets the originally scheduled departure time.</p>
<pre>public Transport getTransport ()</pre> <p>Gets the transport information.</p>
<pre>public int hashCode ()</pre>

## Class Details

Represents information about a departure.

IMPORTANT: Urban Mobility Departure Board is a Beta feature. The related classes are subject to change without notice.

## Method Details

```
public boolean equals (Object o)
```

Parameters:

- `o`

```
public AccessPoint getAccessPoint ()
```

Gets *AccessPoint* which should be used to access this location.

**Returns:**

*AccessPoint*, or null if not available

```
public java.util.List <AlternativeDeparture> getAlternativeDepartures ()
```

Gets a list of departures which are alternative to this departure.

**Returns:**

list of alternative departures if any

```
public DepartureFrequency getDepartureFrequency ()
```

Gets a *DepartureFrequency* object describing frequency of similar departures.

**Returns:**

information about departure frequency, or null if not available

```
public Place getPlace ()
```

Gets the *Place* information from which this departure occurs.

**Returns:**

*Place* from which this departure occurs, or null if not available

```
public String getPlatform ()
```

Gets the originally scheduled departure platform.

**Returns:**

originally scheduled departure platform, or empty string if not available.

```
public RealTimeInfo getRealTimeInfo ()
```

Gets the real-time departure time if available.

**Returns:**

real-time departure time or null when not available

```
public Station getStation ()
```

Gets the *Station* information from which this departure occurs. NOTE: This property is available only if *Place* of the departure is also a *Station*.

**Returns:**

*Station* information ,or null if not available

```
public Date getTime ()
```

Gets the originally scheduled departure time.

**Returns:**

Originally scheduled departure time, or null if not available.

```
public Transport getTransport ()
```

Gets the transport information.

**Returns:**

transport information, or null if not available

```
public int hashCode ()
```

## DepartureBoard

The class *DepartureBoard* is a member of [com.here.android.mpa.urbanmobility](#) .

### Class Summary

```
public final class DepartureBoard
```

```
extends java.lang.Object
```

Represents departure information for a public transport at a given stop/station.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 1300: Methods in DepartureBoard

Methods
<pre>public boolean <i>equals</i> (Object o)</pre>
<pre>public java.util.List &lt;<i>Departure</i>&gt; <i>getDepartures</i> ()</pre> <p>Gets the list of departures.</p>
<pre>public java.util.Collection &lt;<i>Link</i>&gt; <i>getOperatorDisclaimers</i> ()</pre> <p>Gets collection of associated operator disclaimer <i>Links</i>.</p>

## Methods

```
public java.util.Collection <Operator> getOperators ()
```

Gets the collection of *Operator* objects.

```
public java.util.Collection <Transport> getTransports ()
```

Gets the collection of *Transport* objects.

```
public int hashCode ()
```

---

## Class Details

Represents departure information for a public transport at a given stop/station.

IMPORTANT: Urban Mobility Departure Board is a Beta feature. The related classes are subject to change without notice.

## Method Details

```
public boolean equals (Object o)
```

**Parameters:**

- *o*

```
public java.util.List <Departure> getDepartures ()
```

Gets the list of departures.

**Returns:**

The list of *Departures*

```
public java.util.Collection <Link> getOperatorDisclaimers ()
```

Gets collection of associated operator disclaimer *Links*.

**Returns:**

collection of *Links*

```
public java.util.Collection <Operator> getOperators ()
```

Gets the collection of *Operator* objects.

**Returns:**

The collection of operators operating on this stop/station

```
public java.util.Collection <Transport> getTransports ()
```

Gets the collection of *Transport* objects.

**Returns:**

the collection of transports serving departures shown in current departure list

```
public int hashCode ()
```

## DepartureBoardRequest

The class *DepartureBoardRequest* is a member of *com.here.android.mpa.urbanmobility*.

### Class Summary

```
public final class DepartureBoardRequest
```

```
extends com.here.android.mpa.urbanmobility.AbstractListRequest,  
com.here.android.mpa.urbanmobility.AbstractRequest, java.lang.Object
```

Represents a request to retrieve a station next departures board.

[For complete information, see the section *Class Details*]

### Method Summary

Table 1301: Methods in *DepartureBoardRequest*

Methods
<pre>public <i>DepartureBoardRequest</i> <b>setRequestRealTimeInfoEnabled</b> (boolean returnRealTimeInfo)</pre> <p>Set if <i>RealTimeInfo</i> for found departures should be included in the response.</p>
<pre>public <i>DepartureBoardRequest</i> <b>setStrictResultEnabled</b> (boolean strict)</pre> <p>Indicates that departure board should include results only for given stop, not also for related stops.</p>
<pre>public <i>DepartureBoardRequest</i> <b>setTime</b> (Date time)</pre> <p>Sets the time point after which departures should be returned.</p>
<pre>public <i>DepartureBoardRequest</i> <b>setTransportTypes</b> (EnumSet transportTypes)</pre> <p>Sets which transport types are allowed to be included in the response.</p>

### Class Details

Represents a request to retrieve a station next departures board. Note that all setter methods return current instance so these calls can be nicely chained.

**IMPORTANT:** Urban Mobility Departure Board is a Beta feature. The related classes are subject to change without notice.

## Method Details

```
public DepartureBoardRequest setRequestRealTimeInfoEnabled (boolean  
returnRealTimeInfo)
```

Set if *RealTimeInfo* for found departures should be included in the response. It is false by default.

### Parameters:

- **returnRealTimeInfo**  
indicates if real-time info should be returned

### Returns:

this request instance

```
public DepartureBoardRequest setStrictResultEnabled (boolean strict)
```

Indicates that departure board should include results only for given stop, not also for related stops. Default is false, i.e. departure board might contain departures for related stops.

### Parameters:

- **strict**  
true to request departures only for given stop, false otherwise

### Returns:

this request instance

```
public DepartureBoardRequest setTime (Date time)
```

Sets the time point after which departures should be returned. It is current time by default.

### Parameters:

- **time**  
time of departures

### Returns:

this request instance

```
public DepartureBoardRequest setTransportTypes (EnumSet transportTypes)
```

Sets which transport types are allowed to be included in the response. All transport types are included by default.

### Parameters:

- **transportTypes**  
allowed transport types

### Returns:

this request instance

**Throws:**

- `IllegalArgumentException`  
if `transportTypes` is empty.

## DepartureFrequency

The class `DepartureFrequency` is a member of `com.here.android.mpa.urbanmobility`.

### Class Summary

public final class **DepartureFrequency**

*extends java.lang.Object*

Represents information about departure frequencies.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 1302: Methods in `DepartureFrequency`

Methods
public boolean <code>equals</code> (Object o)
public int <code>getMaxRealTimeInterval</code> () Gets maximal number of minutes between expected transport realtime departures.
public int <code>getMaxScheduledInterval</code> () Gets maximal number of minutes between transport scheduled departures.
public int <code>getMinRealTimeInterval</code> () Gets minimal number of minutes between expected transport realtime departures.
public int <code>getMinScheduledInterval</code> () Gets minimal number of minutes between transport scheduled departures.
public int <code>hashCode</code> ()

### Class Details

Represents information about departure frequencies.

IMPORTANT: Urban Mobility Departure Board is a Beta feature. The related classes are subject to change without notice.

## Method Details

```
public boolean equals (Object o)
```

**Parameters:**

- `o`

```
public int getMaxRealTimeInterval ()
```

Gets maximal number of minutes between expected transport realtime departures.

**Returns:**

maximal number of minutes between expected transport realtime departures, or -1 if not known

```
public int getMaxScheduledInterval ()
```

Gets maximal number of minutes between transport scheduled departures.

**Returns:**

maximal number of minutes between transport scheduled departures, or -1 if not known

```
public int getMinRealTimeInterval ()
```

Gets minimal number of minutes between expected transport realtime departures.

**Returns:**

minimal number of minutes between expected transport realtime departures, or -1 if not known

```
public int getMinScheduledInterval ()
```

Gets minimal number of minutes between transport scheduled departures.

**Returns:**

minimal number of minutes between transport scheduled departures, or -1 if not known

```
public int hashCode ()
```

## ErrorCode

The enumeration *ErrorCode* is a member of [com.here.android.mpa.urbanmobility](#).

## Enumeration Summary

```
public final enumeration ErrorCode
```

*extends java.lang.Enum, java.lang.Object*

This enum represents Urban Mobility request errors.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 1303: Enum Constants in ErrorCode

Fields
<pre>public static final ErrorCode NONE</pre> <p>No error.</p>
<pre>public static final ErrorCode VIOLATES_OPTIONS</pre> <p>A route was found but is invalid because it makes use of roads that were disabled by <i>RouteOptions</i>.</p>
<pre>public static final ErrorCode INVALID_OPERATION</pre> <p>The operation is not allowed at this time because another request is in progress.</p>
<pre>public static final ErrorCode INVALID_CREDENTIALS</pre> <p>The HERE application ID and application code were missing or invalid.</p>
<pre>public static final ErrorCode INVALID_PARAMETERS</pre> <p>Invalid request parameters were provided.</p>
<pre>public static final ErrorCode INVALID_PERIOD</pre> <p>Given time period is invalid.</p>
<pre>public static final ErrorCode START_DESTINATION_TOO_CLOSE</pre> <p>The start and destination locations are too close to each other.</p>
<pre>public static final ErrorCode CANCELLED</pre> <p>The request was cancelled.</p>
<pre>public static final ErrorCode OPERATION_NOT_ALLOWED</pre> <p>Access to this operation is denied.</p>
<pre>public static final ErrorCode NETWORK_COMMUNICATION</pre> <p>There was a network communications error.</p>
<pre>public static final ErrorCode NOT_FOUND</pre> <p>No search matches were found.</p>
<pre>public static final ErrorCode ROUTING_NOT_POSSIBLE</pre> <p>Routing was not possible.</p>
<pre>public static final ErrorCode NO_COVERAGE</pre> <p>No coverage in this region/area.</p>
<pre>public static final ErrorCode NO_STATION_NEARBY</pre> <p>No stations were found near the given address.</p>

## Fields

```
public static final ErrorCode UNAVAILABLE_API
```

API is not available in this region or area.

```
public static final ErrorCode INVALID_RESPONSE
```

Backend service returned invalid response.

```
public static final ErrorCode SERVICE_UNAVAILABLE
```

The backend service was unavailable.

```
public static final ErrorCode INSUFFICIENT_MAP_DATA
```

The route cannot be calculated because there is not enough local map data to perform route calculation.

```
public static final ErrorCode OUT_OF_MEMORY
```

There was insufficient memory to complete the request.

```
public static final ErrorCode UNKNOWN
```

There was an unknown error.

## Method Summary

Table 1304: Methods in `ErrorCode`

### Methods

```
public static ErrorCode valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static ErrorCode[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

This enum represents Urban Mobility request errors.

IMPORTANT: Urban Mobility is a Beta feature. The related classes are subject to change without notice.

### Enum Constant Details

```
public static final ErrorCode NONE
```

No error.

```
public static final ErrorCode VIOLATES_OPTIONS
```

A route was found but is invalid because it makes use of roads that were disabled by *RouteOptions*.

```
public static final ErrorCode INVALID_OPERATION
```

The operation is not allowed at this time because another request is in progress.

```
public static final ErrorCode INVALID_CREDENTIALS
```

The HERE application ID and application code were missing or invalid.

```
public static final ErrorCode INVALID_PARAMETERS
```

Invalid request parameters were provided.

```
public static final ErrorCode INVALID_PERIOD
```

Given time period is invalid.

```
public static final ErrorCode START_DESTINATION_TOO_CLOSE
```

The start and destination locations are too close to each other.

```
public static final ErrorCode CANCELLED
```

The request was cancelled.

```
public static final ErrorCode OPERATION_NOT_ALLOWED
```

Access to this operation is denied. Contact your HERE representative for more information.

```
public static final ErrorCode NETWORK_COMMUNICATION
```

There was a network communications error.

```
public static final ErrorCode NOT_FOUND
```

No search matches were found.

```
public static final ErrorCode ROUTING_NOT_POSSIBLE
```

Routing was not possible.

```
public static final ErrorCode NO_COVERAGE
```

No coverage in this region/area.

```
public static final ErrorCode NO_STATION_NEARBY
```

No stations were found near the given address.

```
public static final ErrorCode UNAVAILABLE_API
```

API is not available in this region or area.

```
public static final ErrorCode INVALID_RESPONSE
```

Backend service returned invalid response.

```
public static final ErrorCode SERVICE_UNAVAILABLE
```

The backend service was unavailable. Try again later.

```
public static final ErrorCode INSUFFICIENT_MAP_DATA
```

The route cannot be calculated because there is not enough local map data to perform route calculation. Client can re-download map data and calculate route again.

```
public static final ErrorCode OUT_OF_MEMORY
```

There was insufficient memory to complete the request.

```
public static final ErrorCode UNKNOWN
```

There was an unknown error.

## Method Details

```
public static ErrorCode valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static ErrorCode[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## ExploredCoverage

The class *ExploredCoverage* is a member of [com.here.android.mpa.urbanmobility](#).

### Class Summary

```
public class ExploredCoverage
```

```
extends java.lang.Object
```

Represents coverage information about a location that is further away.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 1305: Methods in ExploredCoverage

Methods
<pre>public boolean equals (Object o)</pre>
<pre>public int getRadius ()</pre> Gets radius for which the coverage information is provided.
<pre>public java.util.Collection &lt;Station&gt; getStations ()</pre> Gets information about maximum five (5) closest stations.
<pre>public int getStopsCount ()</pre> Gets number of stops found within the specified radius.
<pre>public java.util.Collection &lt;Transport&gt; getTransports ()</pre> Gets transports taken from the closest five (5) stops within the specified radius, sorted by feature type.
<pre>public int getTransportsCount ()</pre> Gets number of transports found within the specified radius.
<pre>public int hashCode ()</pre>

### Class Details

Represents coverage information about a location that is further away. In other words, a user needs to first change the location to get routing. This coverage information also includes information to the closest station (if there is one inside of radius) and information of lines going through five closest stations (if these stations are inside of the radius).

IMPORTANT: Urban Mobility Coverage Search is a Beta feature. The related classes are subject to change without notice.

### Method Details

```
public boolean equals (Object o)
```

**Parameters:**

- 0

```
public int getRadius ()
```

Gets radius for which the coverage information is provided. The default value is 150000 metres.

**Returns:**

Radius for which the coverage information is provided, in metres.

```
public java.util.Collection <Station> getStations ()
```

Gets information about maximum five (5) closest stations.

**Returns:**

Collection of stations.

```
public int getStopsCount ()
```

Gets number of stops found within the specified radius.

**Returns:**

Number of stops found within the specified radius.

```
public java.util.Collection <Transport> getTransports ()
```

Gets transports taken from the closest five (5) stops within the specified radius, sorted by feature type.

**Returns:**

Collection of transports.

```
public int getTransportsCount ()
```

Gets number of transports found within the specified radius.

**Returns:**

Number of transports found within the specified radius.

```
public int hashCode ()
```

## Fare

The class *Fare* is a member of [com.here.android.mpa.urbanmobility](#).

### Class Summary

public final class **Fare**

*extends java.lang.Object*

Represents information about a single fare (e.g.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 1306: Methods in Fare

Methods
public boolean <a href="#">equals</a> (Object o)
public String <a href="#">getCurrency</a> () Gets ISO 4217 code of currency in which the price is given, e.g.
public Boolean <a href="#">getEstimated</a> () Gets whether the fare price is estimated or if it's an exact value.
public <i>FareType</i> <a href="#">getFareType</a> () Gets type of fare represented by this object.
public java.util.Collection < <a href="#">Link</a> > <a href="#">getLinks</a> () Gets the collection of <a href="#">Links</a> associated with this fare e.g.
public double <a href="#">getMaximumPrice</a> () Gets maximum price of the fare (or parking costs if reason is "parking")
public String <a href="#">getName</a> () Gets name of the fare.
public double <a href="#">getPrice</a> () Gets price of the fare (or parking costs if reason is "parking")
public String <a href="#">getPriceAsString</a> () Gets the fare price as a formatted, ready-to-display string, entailing the currency.
public String <a href="#">getReason</a> () Gets the reason for the cost described in this element, e.g.
public int <a href="#">hashCode</a> ()
public String <a href="#">toString</a> ()

## Class Details

Represents information about a single fare (e.g. ticket).

IMPORTANT: Urban Mobility routing is a Beta feature. The related classes are subject to change without notice.

## Method Details

```
public boolean equals (Object o)
```

Parameters:

- o

```
public String getCurrency ()
```

Gets ISO 4217 code of currency in which the price is given, e.g. "EUR".

Returns:

ISO 4217 code of currency of the price

See also:

[ISO 4217](#)

```
public Boolean getEstimated ()
```

Gets whether the fare price is estimated or if it's an exact value. For example most taxi fares can only be estimated since the final price depends on the trip duration which is affected by the traffic.

Returns:

true if the price is estimated, false if exact

```
public FareType getFareType ()
```

Gets type of fare represented by this object. The client application is responsible to correctly visualize the fare model to the user. Since the supported fare types can be extended in the future, it's recommended hiding the fare information when encountering an unrecognized fare type.

Returns:

type of fare

```
public java.util.Collection <Link> getLinks ()
```

Gets the collection of *Links* associated with this fare e.g. to booking page.

Returns:

Collection of *Links* associated with this fare, or empty collection.

```
public double getMaximumPrice ()
```

Gets maximum price of the fare (or parking costs if reason is "parking")

If the price is a range, indicated by fare type being set to *RANGE*, this value will be representing the upper bound of the range, and *getPrice()* returns possibly the lower bound of a price range. If the price is not a range, this method will return the same value as *getPrice()*.

**Returns:**

price of the fare (possibly upper bound of a price range)

**See also:**

*getFareType()*

*getPrice()*

```
public String getName ()
```

Gets name of the fare.

**Returns:**

name of the fare

```
public double getPrice ()
```

Gets price of the fare (or parking costs if reason is "parking")

For parking costs this is the maximum hourly rate or daily rate.

When fare type is set to *RANGE*, this method returns the lower bound of a price range, and *getMaximumPrice()* contains the upper bound of a price range, or the same value as this method if the price is exact.

**Returns:**

price of the fare (possibly lower bound of a price range)

**See also:**

*getFareType()*

*getMaximumPrice()*

```
public String getPriceAsString ()
```

Gets the fare price as a formatted, ready-to-display string, entailing the currency. Insensitive to locale, uses a fixed convention for simplicity sake.

**Returns:**

fare price as a ready-to-display string (incl. currency)

```
public String getReason ()
```

Gets the reason for the cost described in this element, e.g. parking.

**Returns:**

the reason for the cost (eg. parking)

```
public int hashCode ()
```

```
public String toString ()
```

## FareType

The enumeration *FareType* is a member of [com.here.android.mpa.urbanmobility](#).

### Enumeration Summary

```
public final enumeration FareType
```

*extends java.lang.Enum, java.lang.Object*

Specifies the type of a fare

[For complete information, see the section [Enumeration Details](#)]

**See also:**

[Fare](#)

### Enum Constant Summary

Table 1307: Enum Constants in FareType

Fields
<pre>public static final <i>FareType</i> <b>HOURLY</b></pre> <p>The indicated price is the cost per hour.</p>
<pre>public static final <i>FareType</i> <b>DAILY</b></pre> <p>The indicated price is the cost per day.</p>
<pre>public static final <i>FareType</i> <b>RANGE</b></pre> <p>The price represents a range with minimum and maximum value.</p>
<pre>public static final <i>FareType</i> <b>UNRECOGNIZED</b></pre> <p>The fare type is specific, but not recognized by the SDK</p>

## Method Summary

Table 1308: Methods in FareType

Methods
<pre>public static <i>FareType</i> <i>valueOf</i> (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>FareType</i>[] <i>values</i> ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Specifies the type of a fare

**See also:**

[Fare](#)

## Enum Constant Details

```
public static final FareType HOURLY
```

The indicated price is the cost per hour. Example: 11\$/hour.

```
public static final FareType DAILY
```

The indicated price is the cost per day. Example: 62\$/day.

```
public static final FareType RANGE
```

The price represents a range with minimum and maximum value.

```
public static final FareType UNRECOGNIZED
```

The fare type is specific, but not recognized by the SDK

## Method Details

```
public static FareType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

**Parameters:**

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static FareType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## FeatureAvailability

The enumeration *FeatureAvailability* is a member of *com.here.android.mpa.urbanmobility*.

### Enumeration Summary

```
public final enumeration FeatureAvailability
```

```
extends java.lang.Enum, java.lang.Object
```

Three state flag indicating if given feature is available, unavailable, or there is no information about availability.

[For complete information, see the section *Enumeration Details*]

### Enum Constant Summary

Table 1309: Enum Constants in FeatureAvailability

Fields
<pre>public static final <i>FeatureAvailability</i> <b>YES</b></pre> <p>Feature is available.</p>
<pre>public static final <i>FeatureAvailability</i> <b>NO</b></pre> <p>Feature is unavailable.</p>
<pre>public static final <i>FeatureAvailability</i> <b>UNKNOWN</b></pre> <p>Feature availability is unknown.</p>

### Method Summary

Table 1310: Methods in FeatureAvailability

Methods
<pre>public static <i>FeatureAvailability</i> <b>valueOf</b> (<i>String</i> name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>FeatureAvailability</i>[] <b>values</b> ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

### Enumeration Details

Three state flag indicating if given feature is available, unavailable, or there is no information about availability.

IMPORTANT: Urban Mobility is a Beta feature. The related classes are subject to change without notice.

## Enum Constant Details

```
public static final FeatureAvailability YES
```

Feature is available.

```
public static final FeatureAvailability NO
```

Feature is unavailable.

```
public static final FeatureAvailability UNKNOWN
```

Feature availability is unknown.

## Method Details

```
public static FeatureAvailability valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static FeatureAvailability[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## IntermediateStop

The class *IntermediateStop* is a member of [com.here.android.mpa.urbanmobility](#).

### Class Summary

```
public final class IntermediateStop
```

```
extends java.lang.Object
```

Represents information intermediate stop along a *RouteSection*.

[For complete information, see the section [Class Details](#)]

## Method Summary

Table 1311: Methods in `IntermediateStop`

Methods
<code>public boolean equals (Object o)</code>
<code>public Date getArrivalTime ()</code> Get the arrival time at this stop if available, returns null otherwise.
<code>public Date getDepartureTime ()</code> Get the departure time at this stop if available, returns null otherwise.
<code>public RealTimeInfo getRealTimeInfo ()</code> Get <i>RealTimeInfo</i> about departure and/or arrival at this stop if available, returns null otherwise.
<code>public Station getStation ()</code> Get full <i>Station</i> info about this intermediate stop.
<code>public int hashCode ()</code>

## Class Details

Represents information intermediate stop along a *RouteSection*.

IMPORTANT: Urban Mobility routing is a Beta feature. The related classes are subject to change without notice.

## Method Details

`public boolean equals (Object o)`

### Parameters:

- `o`

`public Date getArrivalTime ()`

Get the arrival time at this stop if available, returns null otherwise.

### Returns:

arrival time or null if not available

`public Date getDepartureTime ()`

Get the departure time at this stop if available, returns null otherwise.

### Returns:

departure time or null if not available

```
public RealTimeInfo getRealTimeInfo ()
```

Get *RealTimeInfo* about departure and/or arrival at this stop if available, returns null otherwise.

**Returns:**

real-time info or null if not available

```
public Station getStation ()
```

Get full *Station* info about this intermediate stop.

**Returns:**

full station information

```
public int hashCode ()
```

## Link

The class *Link* is a member of *com.here.android.mpa.urbanmobility*.

### Class Summary

```
public final class Link
```

```
extends java.lang.Object
```

Represents a link which can be associated with operator, transit alert or a ticket.

[For complete information, see the section *Class Details*]

### Nested Class Summary

Table 1312: Nested Classes in Link

Nested Classes
<pre>public static final enumeration <i>Link.LinkType</i></pre> <p>Type of the link as enum for convenient use.</p>

### Method Summary

Table 1313: Methods in Link

Methods
<pre>public boolean <i>equals</i> (Object o)</pre>
<pre>public String <i>getText</i> ()</pre> <p>Gets the link text.</p>

## Methods

```
public LinkType getType ()
```

Gets the link type, i.e.

```
public String getUrl ()
```

Gets the URL of the link.

```
public String getUrlText ()
```

Gets clickable part of text.

```
public int hashCode ()
```

---

## Class Details

Represents a link which can be associated with operator, transit alert or a ticket. For example, a link to the transit operator's website. This information must be exposed in the client application.

IMPORTANT: Urban Mobility is a Beta feature. The related classes are subject to change without notice.

## Method Details

```
public boolean equals (Object o)
```

### Parameters:

- *o*

```
public String getText ()
```

Gets the link text.

### Returns:

link text.

```
public LinkType getType ()
```

Gets the link type, i.e. is it link to agency web-site or logo or a ticket booking link.

### Returns:

the link type

```
public String getUrl ()
```

Gets the URL of the link.

### Returns:

URL of the link

```
public String getUrlText ()
```

Gets clickable part of text. If not available (empty string) the full text need to be clickable. For example if `getText()` returns "Lorem ipsum dolor sit amet, consectetur adipiscing elit." and `getUrlText()` returns "Lorem ipsum" then only "Lorem ipsum" part should be clickable.

**Returns:**

clickable part of text, or empty string if not available

```
public int hashCode ()
```

## LinkType

The enumeration `LinkType` is a member of `com.here.android.mpa.urbanmobility.Link`.

### Enumeration Summary

```
public static final enumeration Link.LinkType
```

*extends java.lang.Enum, java.lang.Object*

Type of the link as enum for convenient use.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 1314: Enum Constants in LinkType

Fields
<pre>public static final LinkType AGENCY</pre> <p>Link type agency: Operator information URL.</p>
<pre>public static final LinkType AGENCY_LOGO</pre> <p>Link type logo: Operator logo URL.</p>
<pre>public static final LinkType TARIFF</pre> <p>Link type tariff: Tariff information URL.</p>
<pre>public static final LinkType ALERT</pre> <p>Link type alert: Link to original source of transit alert (eg.</p>
<pre>public static final LinkType WEBSITE</pre> <p>Link type website: Website URL.</p>
<pre>public static final LinkType BOOKING</pre> <p>Link type booking: Booking url.</p>

### Fields

```
public static final LinkType UNKNOWN
```

Link type unknown.

## Method Summary

Table 1315: Methods in *LinkType*

### Methods

```
public static LinkType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static Link.LinkType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Type of the link as enum for convenient use. The allowed values are:

### Enum Constant Details

```
public static final LinkType AGENCY
```

Link type agency: Operator information URL.

```
public static final LinkType AGENCY_LOGO
```

Link type logo: Operator logo URL.

```
public static final LinkType TARIFF
```

Link type tariff: Tariff information URL.

```
public static final LinkType ALERT
```

Link type alert: Link to original source of transit alert (eg. Twitter page). There is not text in Link node when alert.

```
public static final LinkType WEBSITE
```

Link type website: Website URL.

```
public static final LinkType BOOKING
```

Link type booking: Booking url.

```
public static final LinkType UNKNOWN
```

Link type unknown.

### Method Details

```
public static LinkType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static Link.LinkType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Maneuver

The class *Maneuver* is a member of *com.here.android.mpa.urbanmobility* .

### Class Summary

```
public class Maneuver
```

```
extends java.lang.Object
```

Represents maneuver needed to take during the journey.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 1316: Nested Classes in Maneuver

Nested Classes	
public static final enumeration	<i>Maneuver.Action</i>
public static final enumeration	<i>Maneuver.Direction</i>

## Constructor Summary

Table 1317: Constructors in Maneuver

Constructors
<i>Maneuver</i> (ManeuverImpl impl)

## Method Summary

Table 1318: Methods in Maneuver

Methods
public boolean <i>equals</i> (Object o)
public Action <i>getAction</i> () Gets the action for this maneuver.
public GeoBoundingBox <i>getBoundingBox</i> () Gets the <i>GeoBoundingBox</i> of the maneuver - the smallest rectangle that contains maneuver geometry.
public Direction <i>getDirection</i> () Gets maneuver direction hint.
public int <i>getDistance</i> () Gets distance from start to end of the maneuver, in meters.
public long <i>getDuration</i> () Gets duration - the amount of time in seconds for a single maneuver.
public java.util.List <GeoCoordinate> <i>getGeometry</i> () Gets maneuver geometry - list of points that for maneuver polyline.
public String <i>getInstruction</i> () Gets verbal description of maneuver.
public String <i>getNextRoadName</i> () Gets name of the next road in the route that the maneuver is heading toward.
public String <i>getNextRoadNumber</i> () Gets number of the road (such as A5, B49, etc.) towards which the maneuver is heading.
public int <i>hashCode</i> ()

## Class Details

Represents maneuver needed to take during the journey.

IMPORTANT: Urban Mobility routing is a Beta feature. The related classes are subject to change without notice.

## Constructor Details

`Maneuver (ManeuverImpl impl)`

Parameters:

- `impl`

## Method Details

`public boolean equals (Object o)`

Parameters:

- `o`

`public Action getAction ()`

Gets the action for this maneuver. Does not always indicate a direction.

Returns:

[Maneuver.Action](#) to be taken

`public GeoBoundingBox getBoundingBox ()`

Gets the [GeoBoundingBox](#) of the maneuver - the smallest rectangle that contains maneuver geometry.

Returns:

[GeoBoundingBox](#) that contains maneuver geometry

`public Direction getDirection ()`

Gets maneuver direction hint. Can be used to display the appropriate arrow icon for the maneuver.

Returns:

[Maneuver.Direction](#) hint

`public int getDistance ()`

Gets distance from start to end of the maneuver, in meters.

Returns:

distance in meters, or -1 if not available

`public long getDuration ()`

Gets duration - the amount of time in seconds for a single maneuver.

**Returns:**

duration in seconds

```
public java.util.List <GeoCoordinate> getGeometry ()
```

Gets maneuver geometry - list of points that for maneuver polyline.

**Returns:**

list of coordinates

```
public String getInstruction ()
```

Gets verbal description of maneuver. Instruction is localized according to `Locale.getDefault()`. If given language is not supported English version is returned.

**Returns:**

instruction, or empty string if not available

```
public String getNextRoadName ()
```

Gets name of the next road in the route that the maneuver is heading toward.

**Returns:**

name of the road, or empty string if not available

```
public String getNextRoadNumber ()
```

Gets number of the road (such as A5, B49, etc.) towards which the maneuver is heading.

**Returns:**

number of the road, or empty string if not available

```
public int hashCode ()
```

## Action

The enumeration *Action* is a member of *com.here.android.mpa.urbanmobility.Maneuver*.

### Enumeration Summary

```
public static final enumeration Maneuver.Action
```

```
extends java.lang.Enum, java.lang.Object
```

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 1319: Enum Constants in Action

Fields
<code>public static final Action UNDEFINED</code>
<code>public static final Action DEPART</code>
<code>public static final Action DEPART_AIRPORT</code>
<code>public static final Action ARRIVE</code>
<code>public static final Action ARRIVE_AIRPORT</code>
<code>public static final Action ARRIVE_LEFT</code>
<code>public static final Action ARRIVE_RIGHT</code>
<code>public static final Action LEFT_LOOP</code>
<code>public static final Action LEFT_UTURN</code>
<code>public static final Action SHARP_LEFT_TURN</code>
<code>public static final Action LEFT_TURN</code>
<code>public static final Action SLIGHT_LEFT_TURN</code>
<code>public static final Action CONTINUE</code>
<code>public static final Action SLIGHT_RIGHT_TURN</code>
<code>public static final Action RIGHT_TURN</code>
<code>public static final Action SHARP_RIGHT_TURN</code>
<code>public static final Action RIGHT_UTURN</code>
<code>public static final Action RIGHT_LOOP</code>
<code>public static final Action LEFT_EXIT</code>
<code>public static final Action RIGHT_EXIT</code>
<code>public static final Action LEFT_RAMP</code>
<code>public static final Action RIGHT_RAMP</code>
<code>public static final Action LEFT_FORK</code>
<code>public static final Action MIDDLE_FORK</code>
<code>public static final Action RIGHT_FORK</code>
<code>public static final Action LEFT_MERGE</code>
<code>public static final Action RIGHT_MERGE</code>

**Fields**

```
public static final Action NAME_CHANGE
```

```
public static final Action TRAFFIC_CIRCLE
```

```
public static final Action FERRY
```

```
public static final Action LEFT_ROUNDABOUT_EXIT_1
```

```
public static final Action LEFT_ROUNDABOUT_EXIT_2
```

```
public static final Action LEFT_ROUNDABOUT_EXIT_3
```

```
public static final Action LEFT_ROUNDABOUT_EXIT_4
```

```
public static final Action LEFT_ROUNDABOUT_EXIT_5
```

```
public static final Action LEFT_ROUNDABOUT_EXIT_6
```

```
public static final Action LEFT_ROUNDABOUT_EXIT_7
```

```
public static final Action LEFT_ROUNDABOUT_EXIT_8
```

```
public static final Action LEFT_ROUNDABOUT_EXIT_9
```

```
public static final Action LEFT_ROUNDABOUT_EXIT_10
```

```
public static final Action LEFT_ROUNDABOUT_EXIT_11
```

```
public static final Action LEFT_ROUNDABOUT_EXIT_12
```

```
public static final Action RIGHT_ROUNDABOUT_EXIT_1
```

```
public static final Action RIGHT_ROUNDABOUT_EXIT_2
```

```
public static final Action RIGHT_ROUNDABOUT_EXIT_3
```

```
public static final Action RIGHT_ROUNDABOUT_EXIT_4
```

```
public static final Action RIGHT_ROUNDABOUT_EXIT_5
```

```
public static final Action RIGHT_ROUNDABOUT_EXIT_6
```

```
public static final Action RIGHT_ROUNDABOUT_EXIT_7
```

```
public static final Action RIGHT_ROUNDABOUT_EXIT_8
```

```
public static final Action RIGHT_ROUNDABOUT_EXIT_9
```

```
public static final Action RIGHT_ROUNDABOUT_EXIT_10
```

```
public static final Action RIGHT_ROUNDABOUT_EXIT_11
```

```
public static final Action RIGHT_ROUNDABOUT_EXIT_12
```

```
public static final Action ENTER
```

```
public static final Action CHANGE
```

```
public static final Action LEAVE
```

## Method Summary

Table 1320: Methods in Action

Methods
<pre>public static <i>Action</i> <i>valueOf</i> (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>Maneuver.Action</i>[] <i>values</i> ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

### Enum Constant Details

```
public static final Action UNDEFINED
```

```
public static final Action DEPART
```

```
public static final Action DEPART_AIRPORT
```

```
public static final Action ARRIVE
```

```
public static final Action ARRIVE_AIRPORT
```

```
public static final Action ARRIVE_LEFT
```

```
public static final Action ARRIVE_RIGHT
```

```
public static final Action LEFT_LOOP
```

```
public static final Action LEFT_UTURN
```

```
public static final Action SHARP_LEFT_TURN
```

```
public static final Action LEFT_TURN
```

```
public static final Action SLIGHT_LEFT_TURN
```

```
public static final Action CONTINUE
```

```
public static final Action SLIGHT_RIGHT_TURN
```

```
public static final Action RIGHT_TURN
```

```
public static final Action SHARP_RIGHT_TURN
```

```
public static final Action RIGHT_UTURN
```

```
public static final Action RIGHT_LOOP
```

```
public static final Action LEFT_EXIT
```

```
public static final Action RIGHT_EXIT
```

```
public static final Action LEFT_RAMP
```

```
public static final Action RIGHT_RAMP
```

```
public static final Action LEFT_FORK
```

```
public static final Action MIDDLE_FORK
```

```
public static final Action RIGHT_FORK
```

```
public static final Action LEFT_MERGE
```

```
public static final Action RIGHT_MERGE
```

```
public static final Action NAME_CHANGE
```

```
public static final Action TRAFFIC_CIRCLE
```

```
public static final Action FERRY
```

```
public static final Action LEFT_ROUNDABOUT_EXIT_1
```

```
public static final Action LEFT_ROUNDABOUT_EXIT_2
```

```
public static final Action LEFT_ROUNDABOUT_EXIT_3
```

```
public static final Action LEFT_ROUNDABOUT_EXIT_4
```

```
public static final Action LEFT_ROUNDABOUT_EXIT_5
```

```
public static final Action LEFT_ROUNDABOUT_EXIT_6
```

```
public static final Action LEFT_ROUNDABOUT_EXIT_7
```

```
public static final Action LEFT_ROUNDABOUT_EXIT_8
```

```
public static final Action LEFT_ROUNDABOUT_EXIT_9
```

```
public static final Action LEFT_ROUNDABOUT_EXIT_10
```

```
public static final Action LEFT_ROUNDABOUT_EXIT_11
```

```
public static final Action LEFT_ROUNDABOUT_EXIT_12
```

```
public static final Action RIGHT_ROUNDABOUT_EXIT_1
```

```
public static final Action RIGHT_ROUNDABOUT_EXIT_2
```

```
public static final Action RIGHT_ROUNDABOUT_EXIT_3
```

```
public static final Action RIGHT_ROUNDABOUT_EXIT_4
```

```
public static final Action RIGHT_ROUNDABOUT_EXIT_5
```

```
public static final Action RIGHT_ROUNDABOUT_EXIT_6
```

```
public static final Action RIGHT_ROUNDABOUT_EXIT_7
```

```
public static final Action RIGHT_ROUNDABOUT_EXIT_8
```

```
public static final Action RIGHT_ROUNDABOUT_EXIT_9
```

```
public static final Action RIGHT_ROUNDABOUT_EXIT_10
```

```
public static final Action RIGHT_ROUNDABOUT_EXIT_11
```

```
public static final Action RIGHT_ROUNDABOUT_EXIT_12
```

```
public static final Action ENTER
```

```
public static final Action CHANGE
```

```
public static final Action LEAVE
```

## Method Details

```
public static Action valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static Maneuver.Action[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Direction

The enumeration *Direction* is a member of *com.here.android.mpa.urbanmobility.Maneuver*.

## Enumeration Summary

```
public static final enumeration Maneuver.Direction
```

```
extends java.lang.Enum, java.lang.Object
```

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 1321: Enum Constants in Direction

Fields
public static final <i>Direction</i> <b>UNDEFINED</b>
public static final <i>Direction</i> <b>FORWARD</b>
public static final <i>Direction</i> <b>RIGHT</b>
public static final <i>Direction</i> <b>LEFT</b>
public static final <i>Direction</i> <b>BEAR_RIGHT</b>
public static final <i>Direction</i> <b>LIGHT_RIGHT</b>
public static final <i>Direction</i> <b>HARD_RIGHT</b>
public static final <i>Direction</i> <b>UTURN_RIGHT</b>
public static final <i>Direction</i> <b>UTURN_LEFT</b>
public static final <i>Direction</i> <b>HARD_LEFT</b>
public static final <i>Direction</i> <b>LIGHT_LEFT</b>

## Fields

```
public static final Direction BEAR_LEFT
```

---

## Method Summary

Table 1322: Methods in *Direction*

### Methods

```
public static Direction valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static Maneuver.Direction[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

---

## Enumeration Details

### Enum Constant Details

```
public static final Direction UNDEFINED
```

```
public static final Direction FORWARD
```

```
public static final Direction RIGHT
```

```
public static final Direction LEFT
```

```
public static final Direction BEAR_RIGHT
```

```
public static final Direction LIGHT_RIGHT
```

```
public static final Direction HARD_RIGHT
```

```
public static final Direction UTURN_RIGHT
```

```
public static final Direction UTURN_LEFT
```

```
public static final Direction HARD_LEFT
```

```
public static final Direction LIGHT_LEFT
```

```
public static final Direction BEAR_LEFT
```

### Method Details

```
public static Direction valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static Maneuver.Direction[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## MissingCoverage

The class *MissingCoverage* is a member of *com.here.android.mpa.urbanmobility*.

### Class Summary

```
public class MissingCoverage
```

```
extends java.lang.Object
```

Represents missing coverage information.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 1323: Methods in MissingCoverage

Methods
public boolean <i>equals</i> (Object o)
public java.util.Collection < <i>Operator</i> > <i>getOperators</i> () Gets collection of public transit operators with missing coverage.
public java.util.Collection < <i>Transport</i> > <i>getTransports</i> () Gets collection of transports with missing coverage.

## Methods

```
public CoverageType getType ()
```

Gets type of missing coverage.

```
public int hashCode ()
```

## Class Details

Represents missing coverage information.

IMPORTANT: Urban Mobility Coverage Search is a Beta feature. The related classes are subject to change without notice.

## Method Details

```
public boolean equals (Object o)
```

**Parameters:**

- o

```
public java.util.Collection <Operator> getOperators ()
```

Gets collection of public transit operators with missing coverage.

**Returns:**

Collection of operators with missing coverage.

```
public java.util.Collection <Transport> getTransports ()
```

Gets collection of transports with missing coverage.

**Returns:**

Collection of transports with missing coverage.

```
public CoverageType getType ()
```

Gets type of missing coverage.

**Returns:**

Type of missing coverage.

```
public int hashCode ()
```

## MultiBoardRequest

The class *MultiBoardRequest* is a member of *com.here.android.mpa.urbanmobility*.

### Class Summary

```
public class MultiBoardRequest
```

```
extends com.here.android.mpa.urbanmobility.AbstractListRequest,  
com.here.android.mpa.urbanmobility.AbstractRequest, java.lang.Object
```

Represents a request to retrieve a multi station departures board.

[For complete information, see the section *Class Details*]

### Method Summary

Table 1324: Methods in MultiBoardRequest

Methods
<pre>public <i>MultiBoardRequest</i> <b>setDepartureTime</b> (Date time)</pre> <p>Sets the time point after which departures should be returned.</p>
<pre>public <i>MultiBoardRequest</i> <b>setMaxDeparturesPerStation</b> (int maxDepartures)</pre> <p>Sets the maximum number of departures to be returned per station.</p>
<pre>public <i>MultiBoardRequest</i> <b>setRadius</b> (int radius)</pre> <p>Sets radius in meters that defines the area of the search.</p>
<pre>public <i>MultiBoardRequest</i> <b>setRequestRealTimeInfoEnabled</b> (boolean realTimeInfo)</pre> <p>Set if <i>RealTimeInfo</i> for found departures should be included in the response.</p>
<pre>public <i>MultiBoardRequest</i> <b>setTransportTypes</b> (EnumSet transportTypes)</pre> <p>Sets which transport types are allowed to be included in the response.</p>

### Class Details

Represents a request to retrieve a multi station departures board. Note that all setter methods return current instance so these calls can be nicely chained.

IMPORTANT: Urban Mobility Departure Board is a Beta feature. The related classes are subject to change without notice.

### Method Details

```
public MultiBoardRequest setDepartureTime (Date time)
```

Sets the time point after which departures should be returned. It is current time by default.

Parameters:

- `time`

time of departures

**Returns:**

this request instance

```
public MultiBoardRequest setMaxDeparturesPerStation (int maxDepartures)
```

Sets the maximum number of departures to be returned per station. It is not set by default.

**Parameters:**

- **maxDepartures**  
number of departures to be returned per station, must be greater than 0

**Returns:**

this request instance

**Throws:**

- **IllegalArgumentException**  
if maxDepartures is invalid.

```
public MultiBoardRequest setRadius (int radius)
```

Sets radius in meters that defines the area of the search. It is 500 by default.

**Parameters:**

- **radius**  
area of the search in meters, must be greater than or equal 0

**Returns:**

this request instance

**Throws:**

- **IllegalArgumentException**  
if radius is invalid.

```
public MultiBoardRequest setRequestRealTimeInfoEnabled (boolean realTimeInfo)
```

Set if *RealTimeInfo* for found departures should be included in the response. It is false by default.

**Parameters:**

- **realTimeInfo**  
true if real-time info should be returned, false otherwise

**Returns:**

this request instance

```
public MultiBoardRequest setTransportTypes (EnumSet transportTypes)
```

Sets which transport types are allowed to be included in the response. All transport types are included by default.

**Parameters:**

- **transportTypes**  
allowed transport types

**Returns:**

this request instance

**Throws:**

- **IllegalArgumentException**  
if transportTypes is empty.

## MultiBoardResult

The class *MultiBoardResult* is a member of [com.here.android.mpa.urbanmobility](#).

### Class Summary

```
public final class MultiBoardResult
```

```
extends java.lang.Object
```

Represents multi departure information for a public transport around a given location.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 1325: Methods in MultiBoardResult

Methods
public boolean <i>equals</i> (Object o)
public java.util.Collection < <i>StationWithDepartureBoard</i> > <i>getStations</i> () Gets the collection of stations with departure boards.
public java.util.Collection < <i>Transport</i> > <i>getTransports</i> () Gets the collection of <i>Transport</i> objects.
public int <i>hashCode</i> ()

### Class Details

Represents multi departure information for a public transport around a given location.

IMPORTANT: Urban Mobility Departure Board is a Beta feature. The related classes are subject to change without notice.

## Method Details

```
public boolean equals (Object o)
```

**Parameters:**

- `o`

```
public java.util.Collection <StationWithDepartureBoard> getStations ()
```

Gets the collection of stations with departure boards.

**Returns:**

The collection of *StationWithDepartureBoards*

```
public java.util.Collection <Transport> getTransports ()
```

Gets the collection of *Transport* objects.

**Returns:**

the collection of transports serving departures shown in current departure boards

```
public int hashCode ()
```

## NearbyCoverageRequest

The class *NearbyCoverageRequest* is a member of *com.here.android.mpa.urbanmobility* .

### Class Summary

```
public class NearbyCoverageRequest
```

```
extends com.here.android.mpa.urbanmobility.AbstractRequest, java.lang.Object
```

Represents a request to retrieve nearby public transit data coverage.

[For complete information, see the section *Class Details*]

## Method Summary

Table 1326: Methods in `NearbyCoverageRequest`

Methods
<pre>public <i>NearbyCoverageRequest</i> <b>setRequestCityDetailsEnabled</b> (boolean details)</pre> <p>Sets whether if city details (such as population and available operators) should be returned.</p>

## Class Details

Represents a request to retrieve nearby public transit data coverage. All setter methods return the current instance, so these calls can be chained.

IMPORTANT: Urban Mobility Coverage Search is a Beta feature. The related classes are subject to change without notice.

## Method Details

```
public NearbyCoverageRequest setRequestCityDetailsEnabled (boolean details)
```

Sets whether if city details (such as population and available operators) should be returned. It is true by default.

### Parameters:

- **details**  
true if city details should be returned, false otherwise

### Returns:

this request instance

# NearbyCoverageResult

The class `NearbyCoverageResult` is a member of `com.here.android.mpa.urbanmobility`.

## Class Summary

```
public class NearbyCoverageResult
```

```
extends java.lang.Object
```

Represents information about nearby stops, lines, and city (in case if the user is assumed to be in one).

[For complete information, see the section [Class Details](#)]

## Method Summary

Table 1327: Methods in NearbyCoverageResult

Methods
<pre>public boolean equals (Object o)</pre>
<pre>public City getCity ()</pre> <p>Gets coverage information about a city.</p>
<pre>public ExploredCoverage getExploredCoverage ()</pre> <p>Gets information about what is available in the more remote vicinity.</p>
<pre>public String getGeoRef ()</pre> <p>Gets reference to the user's location as Geohash (e.g.</p>
<pre>public int getRadius ()</pre> <p>Gets the radius, in meters, for which the coverage information is provided.</p>
<pre>public int getStopsCount ()</pre> <p>Gets number of stops found.</p>
<pre>public int getTransportsCount ()</pre> <p>Gets the number of transports found.</p>
<pre>public CoverageType getType ()</pre> <p>Gets type of coverage in this area</p>
<pre>public int hashCode ()</pre>
<pre>public boolean isCovered ()</pre> <p>Gets whether or not the user is considered to be covered.</p>

## Class Details

Represents information about nearby stops, lines, and city (in case if the user is assumed to be in one).

IMPORTANT: Urban Mobility Coverage Search is a Beta feature. The related classes are subject to change without notice.

## Method Details

```
public boolean equals (Object o)
```

Parameters:

- `o`

```
public City getCity ()
```

Gets coverage information about a city.

Returns:

Coverage information about a city, or null if not available.

```
public ExploredCoverage getExploredCoverage ()
```

Gets information about what is available in the more remote vicinity. Routing is based on this information as soon as the user location has changed.

**Returns:**

Explored coverage information, or null if not available.

```
public String getGeoRef ()
```

Gets reference to the user's location as Geohash (e.g. "u33d") that can be used to collect feedback without disclosing the user's exact location.

**Returns:**

User location reference as Geohash string.

```
public int getRadius ()
```

Gets the radius, in meters, for which the coverage information is provided. The default value of radius is 150000m.

**Returns:**

Radius for which the coverage information is provided.

```
public int getStopsCount ()
```

Gets number of stops found.

**Returns:**

Number of stops found.

```
public int getTransportsCount ()
```

Gets the number of transports found.

**Returns:**

Number of transports found.

```
public CoverageType getType ()
```

Gets type of coverage in this area

**Returns:**

Type of coverage in this area.

```
public int hashCode ()
```

```
public boolean isCovered ()
```

Gets whether or not the user is considered to be covered.

**Returns:**

True if user is considered to be covered otherwise false.

## Operator

The class *Operator* is a member of [com.here.android.mpa.urbanmobility](#).

### Class Summary

```
public final class Operator
```

```
extends java.lang.Object
```

Represents a public transport operator.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 1328: Methods in Operator

Methods
<pre>public boolean equals (Object o)</pre>
<pre>public String getEmail ()</pre> <p>Gets the operator email address.</p>
<pre>public String getId ()</pre> <p>Gets the operator identifier/code.</p>
<pre>public java.util.Collection &lt;Link&gt; getLinks ()</pre> <p>Gets Link s to operator related resources e.g.</p>
<pre>public String getName ()</pre> <p>Gets the name of the operator.</p>
<pre>public String getPhone ()</pre> <p>Gets the operator contact phone number.</p>

## Methods

```
public CoverageType getType ()
```

Gets the coverage type of the operator.

```
public int hashCode ()
```

---

## Class Details

Represents a public transport operator.

IMPORTANT: Urban Mobility is a Beta feature. The related classes are subject to change without notice.

## Method Details

```
public boolean equals (Object o)
```

**Parameters:**

- o

```
public String getEmail ()
```

Gets the operator email address.

**Returns:**

The operator email address, or empty string if not available.

```
public String getId ()
```

Gets the operator identifier/code.

**Returns:**

operator identifier/code.

```
public java.util.Collection <Link> getLinks ()
```

Gets Link s to operator related resources e.g. agency logo link.

**Returns:**

Collection of operator related resources Links.

```
public String getName ()
```

Gets the name of the operator.

**Returns:**

The operator name.

```
public String getPhone ()
```

Gets the operator contact phone number.

**Returns:**

The operator contact phone number, or empty string if not available.

```
public CoverageType getType ()
```

Gets the coverage type of the operator.

**Returns:**

The operator *CoverageType*.

```
public int hashCode ()
```

## Place

The class *Place* is a member of *com.here.android.mpa.urbanmobility*.

### Class Summary

```
public class Place
```

*extends java.lang.Object*

Represents information about a place like transit station, airport etc..

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 1329: Constructors in Place

#### Constructors

```
Place (PlaceImpl impl)
```

### Method Summary

Table 1330: Methods in Place

#### Methods

```
public boolean equals (Object o)
```

## Methods

```
public Address getAddress ()
```

Get the *Address* associated with this place.

```
public FeatureAvailability getBlindGuideAvailability ()
```

Indicates if blind guide is available at given place.

```
public int getDistanceFromCurrentLocation ()
```

Get distance from your current location to the place in meters.

```
public long getDurationFromCurrentLocation ()
```

Get duration from your current location to the place in seconds.

```
public FeatureAvailability getElevatorAvailability ()
```

Indicates if elevator is available at given place.

```
public FeatureAvailability getEscalatorAvailability ()
```

Indicates if escalator is available at given place.

```
public String getInfo ()
```

Gets optional informational text related to this place.

```
public java.util.Collection <Transport> getTransports ()
```

Gets the transports operating at this place.

```
public int hashCode ()
```

## Class Details

Represents information about a place like transit station, airport etc..

IMPORTANT: Urban Mobility is a Beta feature. The related classes are subject to change without notice.

## Constructor Details

**Place (PlaceImpl impl)**

Parameters:

- `impl`

## Method Details

```
public boolean equals (Object o)
```

Parameters:

- `o`

```
public Address getAddress ()
```

Get the [Address](#) associated with this place.

**Returns:**

place address

```
public FeatureAvailability getBlindGuideAvailability ()
```

Indicates if blind guide is available at given place.

**Returns:**

[FeatureAvailability](#) flag indicating blind guide availability

```
public int getDistanceFromCurrentLocation ()
```

Get distance from your current location to the place in meters. NOTE: It is available only if current location was specified in request.

**Returns:**

distance to the place in meters, or -1 if not available

```
public long getDurationFromCurrentLocation ()
```

Get duration from your current location to the place in seconds. NOTE: It is available only if current location was specified in request.

**Returns:**

duration to the place in seconds, or -1 if not available

```
public FeatureAvailability getElevatorAvailability ()
```

Indicates if elevator is available at given place.

**Returns:**

[FeatureAvailability](#) flag indicating elevator availability

```
public FeatureAvailability getEscalatorAvailability ()
```

Indicates if escalator is available at given place.

**Returns:**

[FeatureAvailability](#) flag indicating escalator availability

```
public String getInfo ()
```

Gets optional informational text related to this place.

**Returns:**

information text, or empty string if not available

```
public java.util.Collection <Transport> getTransports ()
```

Gets the transports operating at this place.

**Returns:**

collection of transports

```
public int hashCode ()
```

## Provider

The class *Provider* is a member of [com.here.android.mpa.urbanmobility](#).

### Class Summary

```
public class Provider
```

```
extends java.lang.Object
```

Represents a public transport data provider.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 1331: Methods in Provider

Methods
public boolean <i>equals</i> (Object o)
public String <i>getName</i> () Gets name of provider.
public int <i>hashCode</i> ()

### Class Details

Represents a public transport data provider. One data provider (such as an aggregation website or API) can provide data for multiple *Operator* which provide transit in a specific location.

**IMPORTANT:** Urban Mobility is a Beta feature. The related classes are subject to change without notice.

## Method Details

```
public boolean equals (Object o)
```

Parameters:

- `o`

```
public String getName ()
```

Gets name of provider. Name is localized according to `Locale.getDefault()`. If given language is not supported English version is returned.

Returns:

Name of provider.

```
public int hashCode ()
```

## RealTimeInfo

The class *RealTimeInfo* is a member of *com.here.android.mpa.urbanmobility* .

### Class Summary

```
public final class RealTimeInfo
```

*extends java.lang.Object*

Represents real-time information of a departure or arrival.

[For complete information, see the section *Class Details*]

### Nested Class Summary

Table 1332: Nested Classes in RealTimeInfo

Nested Classes
public static final enumeration <i>RealTimeInfo.RealTimeStatus</i>

### Method Summary

Table 1333: Methods in RealTimeInfo

Methods
public boolean <i>equals</i> (Object o)
public Date <i>getArrivalTime</i> ()
Gets the real-time arrival time if available, returns null otherwise.

## Methods

```
public Date getDepartureTime ()
```

Gets the real-time departure time if available, returns null otherwise.

```
public String getPlatform ()
```

Gets the real-time departure/arrival platform if available, returns empty string otherwise.

```
public RealTimeStatus getStatus ()
```

An indicator for some exceptional event happened to this departure/arrival.

```
public int hashCode ()
```

---

## Class Details

Represents real-time information of a departure or arrival.

IMPORTANT: Urban Mobility is a Beta feature. The related classes are subject to change without notice.

## Method Details

```
public boolean equals (Object o)
```

**Parameters:**

- o

```
public Date getArrivalTime ()
```

Gets the real-time arrival time if available, returns null otherwise.

**Returns:**

real-time arrival time or null if not available

```
public Date getDepartureTime ()
```

Gets the real-time departure time if available, returns null otherwise.

**Returns:**

real-time departure time or null if not available

```
public String getPlatform ()
```

Gets the real-time departure/arrival platform if available, returns empty string otherwise.

**Returns:**

real-time departure/arrival platform or empty string if not available.

```
public RealTimeStatus getStatus ()
```

An indicator for some exceptional event happened to this departure/arrival. Possible values are members of [RealTimeInfo.RealTimeStatus](#)

**Returns:**

Exception event, default is *OK*.

```
public int hashCode ()
```

## RealTimeStatus

The enumeration *RealTimeStatus* is a member of *com.here.android.mpa.urbanmobility.RealTimeInfo*.

### Enumeration Summary

```
public static final enumeration RealTimeInfo.RealTimeStatus
```

```
extends java.lang.Enum, java.lang.Object
```

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 1334: Enum Constants in RealTimeStatus

Fields
<pre>public static final RealTimeStatus OK</pre> <p>Is scheduled at the original arrival/departure time and at the given platform.</p>
<pre>public static final RealTimeStatus REDIRECTED</pre> <p>The line is not following the normal stops sequence.</p>
<pre>public static final RealTimeStatus REPLACED</pre> <p>User should take a replacement transport for this departure/arrival.</p>
<pre>public static final RealTimeStatus CANCELLED</pre> <p>The service has a permanent failure and will not arrive and depart.</p>
<pre>public static final RealTimeStatus ADDITIONAL</pre> <p>This is an additional not planned service.</p>

### Method Summary

Table 1335: Methods in RealTimeStatus

Methods
<pre>public static RealTimeStatus valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>

## Methods

```
public static RealTimeInfo.RealTimeStatus[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

---

## Enumeration Details

### Enum Constant Details

```
public static final RealTimeStatus OK
```

Is scheduled at the original arrival/departure time and at the given platform.

```
public static final RealTimeStatus REDIRECTED
```

The line is not following the normal stops sequence.

```
public static final RealTimeStatus REPLACED
```

User should take a replacement transport for this departure/arrival.

```
public static final RealTimeStatus CANCELLED
```

The service has a permanent failure and will not arrive and depart.

```
public static final RealTimeStatus ADDITIONAL
```

This is an additional not planned service.

### Method Details

```
public static RealTimeStatus valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static RealTimeInfo.RealTimeStatus[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## RequestManager

The class *RequestManager* is a member of *com.here.android.mpa.urbanmobility*.

### Class Summary

public final class **RequestManager**

*extends java.lang.Object*

Represents a manager responsible for creating Urban Mobility specific requests, with a *RequestManager.ResponseListener* to trigger appropriate callback methods upon completion.

[For complete information, see the section *Class Details*]

### Nested Class Summary

Table 1336: Nested Classes in RequestManager

Nested Classes
public static abstract interface <i>RequestManager.ResponseListener</i> Represents a listener to provide information about request result.

### Constructor Summary

Table 1337: Constructors in RequestManager

Constructors
<i>RequestManager</i> ()

### Method Summary

Table 1338: Methods in RequestManager

Methods
public <i>BrandingLogosRequest</i> <i>createBrandingLogosRequest</i> ( <i>ResponseListener&lt;BrandingLogosResult&gt;</i> listener) Creates an instance of <i>BrandingLogosRequest</i> to get information about branding logos of transit agencies.
public <i>CityCoverageRequest</i> <i>createCityCoverageRequest</i> ( <i>ResponseListener&lt;CityCoverageResult&gt;</i> listener) Creates an instance of <i>CityCoverageRequest</i> to get coverage data.
public <i>CitySearchRequest</i> <i>createCitySearchRequest</i> (String cityName, <i>ResponseListener&lt;CitySearchResult&gt;</i> listener) Creates an instance of <i>CitySearchRequest</i> to search by city name.
public <i>DepartureBoardRequest</i> <i>createDepartureBoardRequest</i> ( <i>GeoCoordinate</i> stationCoordinate, String stationId, <i>ResponseListener&lt;DepartureBoard&gt;</i> listener) Creates an instance of <i>DepartureBoardRequest</i> .

## Methods

```
public MultiBoardRequest createMultiBoardRequest (GeoCoordinate stationCoordinate,  
ResponseListener<MultiBoardResult> listener)
```

Creates an instance of *MultiBoardRequest* to search by coordinates.

```
public MultiBoardRequest createMultiBoardRequest (Set stationIds, ResponseListener<MultiBoardResult>  
listener)
```

Creates an instance of *MultiBoardRequest* to search only by Station IDs.

```
public NearbyCoverageRequest createNearbyCoverageRequest (GeoCoordinate location,  
ResponseListener<NearbyCoverageResult> listener)
```

Creates an instance of *NearbyCoverageRequest* to get nearby coverage data.

```
public StationSearchRequest createStationSearchRequest (GeoCoordinate stationCoordinate, String  
stationName, ResponseListener<StationSearchResult> listener)
```

Creates an instance of *StationSearchRequest* with optional name filter.

```
public StationSearchRequest createStationSearchRequest (Set stationIds,  
ResponseListener<StationSearchResult> listener)
```

Creates an instance of *StationSearchRequest* to search only by Station IDs.

## Class Details

Represents a manager responsible for creating Urban Mobility specific requests, with a *RequestManager.ResponseListener* to trigger appropriate callback methods upon completion.

IMPORTANT: Urban Mobility is a Beta feature. The related classes are subject to change without notice.

## Constructor Details

**RequestManager** ( )

## Method Details

```
public BrandingLogosRequest createBrandingLogosRequest  
(ResponseListener<BrandingLogosResult> listener)
```

Creates an instance of *BrandingLogosRequest* to get information about branding logos of transit agencies.

### Parameters:

- **listener**

Instance of *RequestManager.ResponseListener* that will be called on request completion.

### Returns:

new instance of *BrandingLogosRequest*

```
public CityCoverageRequest createCityCoverageRequest  
(ResponseListener<CityCoverageResult> listener)
```

Creates an instance of *CityCoverageRequest* to get coverage data.

**Parameters:**

- **listener**  
Instance of *RequestManager.ResponseListener* that will be called on request completion.

**Returns:**

new instance of *CityCoverageRequest*

```
public CitySearchRequest createCitySearchRequest (String cityName,  
ResponseListener<CitySearchResult> listener)
```

Creates an instance of *CitySearchRequest* to search by city name.

**Parameters:**

- **cityName**  
Name of the city or its beginning. By default, the city name is in the local language. Exceptions for non-local users are transcribed city names in countries with non-Latin scripts and English names of important stops in some cities, such as Central Station in Berlin, Germany. Must not be empty or null.
- **listener**  
Instance of *RequestManager.ResponseListener* that will be called on request completion.

**Returns:**

new instance of *CitySearchRequest*

**Throws:**

- **IllegalArgumentException**  
if *cityName* is invalid.

```
public DepartureBoardRequest createDepartureBoardRequest (GeoCoordinate  
stationCoordinate, String stationId, ResponseListener<DepartureBoard> listener)
```

Creates an instance of *DepartureBoardRequest*.

**Parameters:**

- **stationCoordinate**  
The station coordinates. Must not be null.
- **stationId**  
Station ID for which departures will be returned. Must not be null or empty.
- **listener**  
Instance of *RequestManager.ResponseListener* that will be called on request completion.

## Returns:

new instance of `DepartureBoardRequest`

## Throws:

- `IllegalArgumentException`  
if `stationCoordinate` or `stationId` is invalid.

```
public MultiBoardRequest createMultiBoardRequest (GeoCoordinate  
stationCoordinate, ResponseListener<MultiBoardResult> listener)
```

Creates an instance of *MultiBoardRequest* to search by coordinates.

## Parameters:

- `stationCoordinate`  
The station coordinates. Must not be null.
- `listener`  
Instance of *RequestManager.ResponseListener* that will be called on request completion.

## Returns:

new instance of `MultiBoardRequest`

## Throws:

- `IllegalArgumentException`  
if `stationCoordinate` is invalid.

```
public MultiBoardRequest createMultiBoardRequest (Set stationIds,  
ResponseListener<MultiBoardResult> listener)
```

Creates an instance of *MultiBoardRequest* to search only by Station IDs.

## Parameters:

- `stationIds`  
Set of stations IDs. Must not be null or empty.
- `listener`  
Instance of *RequestManager.ResponseListener* that will be called on request completion.

## Returns:

new instance of `MultiBoardRequest`

## Throws:

- `IllegalArgumentException`  
if `stationCoordinate` is invalid.

```
public NearbyCoverageRequest createNearbyCoverageRequest (GeoCoordinate
location, ResponseListener<NearbyCoverageResult> listener)
```

Creates an instance of *NearbyCoverageRequest* to get nearby coverage data.

**Parameters:**

- **location**  
The location of center point for search.
- **listener**  
Instance of *RequestManager.ResponseListener* that will be called on request completion.

**Returns:**

new instance of *NearbyCoverageRequest*

**Throws:**

- **IllegalArgumentException**  
if *location* is invalid.

```
public StationSearchRequest createStationSearchRequest (GeoCoordinate
stationCoordinate, String stationName, ResponseListener<StationSearchResult>
listener)
```

Creates an instance of *StationSearchRequest* with optional name filter. When *stationName* is given (non-null and non-empty), it will be used to filter out the search result.

**Parameters:**

- **stationCoordinate**  
The station coordinates. Must not be null.
- **stationName**  
Station name or empty string if not specified.
- **listener**  
Instance of *RequestManager.ResponseListener* that will be called on request completion.

**Returns:**

new instance of *StationSearchRequest*

**Throws:**

- **IllegalArgumentException**  
if *stationCoordinate* is invalid.

```
public StationSearchRequest createStationSearchRequest (Set stationIds,
ResponseListener<StationSearchResult> listener)
```

Creates an instance of *StationSearchRequest* to search only by Station IDs.

**Parameters:**

- **stationIds**  
IDs to search for or empty Set if none were specified. Must not be empty or null.
- **listener**  
Instance of *RequestManager.ResponseListener* that will be called on request completion.

**Returns:**

new instance of *StationSearchRequest*

**Throws:**

- **IllegalArgumentException**  
if *stationIds* is invalid - null or empty.

## ResponseListener<T>

The interface *ResponseListener<T>* is a member of *com.here.android.mpa.urbanmobility.RequestManager*.

**Type Parameters:**

- **T**

### Interface Summary

public static abstract interface **RequestManager.ResponseListener**

Represents a listener to provide information about request result.

[For complete information, see the section [Interface Details](#)]

### Method Summary

Table 1339: Methods in *ResponseListener<T>*

Methods
public abstract void <i>onError</i> ( <i>ErrorCode</i> errorCode, String errorMessage) A callback indicating that a request has finished with error.
public abstract void <i>onSuccess</i> (T requestResult) A callback indicating that a request has finished with success.

### Interface Details

Represents a listener to provide information about request result.

## Method Details

```
public abstract void onError (ErrorCode errorCode, String errorMessage)
```

A callback indicating that a request has finished with error.

### Parameters:

- **errorCode**  
Error code.
- **errorMessage**  
Error description string, or null if not available.

```
public abstract void onSuccess (T requestResult)
```

A callback indicating that a request has finished with success.

### Parameters:

- **requestResult**  
The object representing request result.

## RouteSection

The class *RouteSection* is a member of [com.here.android.mpa.urbanmobility](#) .

### Class Summary

```
public final class RouteSection
```

```
extends java.lang.Object
```

Represents information about a single section/segment of a *UMRoute* which is covered by a single *TransportType* or is a pedestrian walk.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 1340: Methods in *RouteSection*

Methods
public boolean <i>equals</i> (Object o)
public java.util.Collection <Alert> <i>getAlerts</i> () Gets collection of associated <i>Alerts</i> .
public <i>Arrival</i> <i>getArrival</i> () Get information about this route section arrival.

## Methods

```
public Departure getDeparture ()
```

Get information about this route section departure.

```
public int getDistance ()
```

Get distance in meters covered by this route section.

```
public long getDuration ()
```

Get expected duration in seconds to cover this route section.

```
public java.util.Collection <Fare> getFares ()
```

Get the *Fares* which cover this particular route section.

```
public java.util.List <GeoCoordinate> getGeometry ()
```

Get the geometry of this route section.

```
public String getId ()
```

Gets unique id for this section.

```
public java.util.List <IntermediateStop> getIntermediateStops ()
```

Get all *IntermediateStops* of this route section.

```
public java.util.List <Maneuver> getManeuvers ()
```

Get list of *Maneuvers* for this route section, or empty list if not available.

```
public java.util.Collection <Link> getOperatorDisclaimers ()
```

Gets collection of associated operator disclaimer *Links*.

```
public TransportType getTransportType ()
```

Get *TransportType* which is used on this route section.

```
public int hashCode ()
```

```
public boolean isTimeUncertain ()
```

Indicate if departure/arrival times are uncertain.

## Class Details

Represents information about a single section/segment of a *UMRoute* which is covered by a single *TransportType* or is a pedestrian walk.

IMPORTANT: Urban Mobility routing is a Beta feature. The related classes are subject to change without notice.

## Method Details

```
public boolean equals (Object o)
```

Parameters:

- o

```
public java.util.Collection <Alert> getAlerts ()
```

Gets collection of associated *Alerts*.

**Returns:**

collection of *Alerts*

```
public Arrival getArrival ()
```

Get information about this route section arrival. See *Arrival* for details.

**Returns:**

information about arrival

```
public Departure getDeparture ()
```

Get information about this route section departure. See *Departure* for details.

**Returns:**

information about departure

```
public int getDistance ()
```

Get distance in meters covered by this route section.

**Returns:**

distances in meters

```
public long getDuration ()
```

Get expected duration in seconds to cover this route section.

**Returns:**

duration in seconds

```
public java.util.Collection <Fare> getFares ()
```

Get the *Fares* which cover this particular route section.

**Returns:**

collection of fares

```
public java.util.List <GeoCoordinate> getGeometry ()
```

Get the geometry of this route section.

**Returns:**

geometry as list of *GeoCoordinate* objects

```
public String getId ()
```

Gets unique id for this section.

**Returns:**

unique section id

```
public java.util.List <IntermediateStop> getIntermediateStops ()
```

Get all *IntermediateStops* of this route section. Will return empty list in case of walking section or when intermediate stops are not available for given route.

**Returns:**

list of intermediate stops

```
public java.util.List <Maneuver> getManeuvers ()
```

Get list of *Maneuvers* for this route section, or empty list if not available.

**Returns:**

list of maneuvers

```
public java.util.Collection <Link> getOperatorDisclaimers ()
```

Gets collection of associated operator disclaimer *Links*.

**Returns:**

collection of *Links*

```
public TransportType getTransportType ()
```

Get *TransportType* which is used on this route section. Returns null if this it is a walking section.

**Returns:**

transport type of this section or null if it is a walking section

```
public int hashCode ()
```

```
public boolean isTimeUncertain ()
```

Indicate if departure/arrival times are uncertain. It is true for estimated values and false if it comes from real time or time table data.

**Returns:**

true if departure/arrival time is uncertain (i.e. value is estimated), false otherwise (i.e. value is from time table or real time)

## Station

The class *Station* is a member of [com.here.android.mpa.urbanmobility](#).

### Class Summary

public class **Station**

extends [com.here.android.mpa.urbanmobility.Place](#), [java.lang.Object](#)

Represents information about a Station.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 1341: Methods in Station

#### Methods

public boolean *equals* (Object o)

public String *getId* ()

Gets the identifier of the station, which is specific to transit backend.

public int *hashCode* ()

public boolean *isDepartureBoardAvailable* ()

Indicates if this station has a departure board available, meaning that a [DepartureBoardRequest](#) can be executed with this station ID to get a [DepartureBoard](#).

### Class Details

Represents information about a Station.

IMPORTANT: Urban Mobility is a Beta feature. The related classes are subject to change without notice.

### Method Details

public boolean *equals* (Object o)

**Parameters:**

- o

```
public String getId ()
```

Gets the identifier of the station, which is specific to transit backend.

**Returns:**

id of the station

```
public int hashCode ()
```

```
public boolean isDepartureBoardAvailable ()
```

Indicates if this station has a departure board available, meaning that a [DepartureBoardRequest](#) can be executed with this station ID to get a [DepartureBoard](#).

**Returns:**

true if departure board is available, false otherwise

## StationSearchRequest

The class *StationSearchRequest* is a member of *com.here.android.mpa.urbanmobility*.

### Class Summary

```
public final class StationSearchRequest
```

```
extends com.here.android.mpa.urbanmobility.AbstractListRequest,  
com.here.android.mpa.urbanmobility.AbstractRequest, java.lang.Object
```

Represents a request to search stations within certain radius by name, geo-coordinates or IDs.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 1342: Nested Classes in StationSearchRequest

Nested Classes
<pre>public static final enumeration StationSearchRequest.NameMatchingMethod</pre> <p>Possible matching methods for a station name.</p>

### Method Summary

Table 1343: Methods in StationSearchRequest

Methods
<pre>public StationSearchRequest setMaximumResults (int maxResults)</pre>

## Methods

```
public StationSearchRequest setRadius (int radius)
```

Set the station search radius in meters.

```
public StationSearchRequest setRequestStationDetailsEnabled (boolean details)
```

Set if station details (e.g.

```
public StationSearchRequest setStationNameMatchingMethod (NameMatchingMethod method)
```

Set the matching method for station names when searching with name filter.

## Class Details

Represents a request to search stations within certain radius by name, geo-coordinates or IDs. Note that all setter methods return current instance so these calls can be nicely chained.

IMPORTANT: Urban Mobility Transit Station Search is a Beta feature. The related classes are subject to change without notice.

## Method Details

```
public StationSearchRequest setMaximumResults (int maxResults)
```

### Parameters:

- **maxResults**

```
public StationSearchRequest setRadius (int radius)
```

Set the station search radius in meters. It is 500 by default.

### Parameters:

- **radius**  
search radius in meters, must be greater than or equal 0

### Returns:

this request instance

### Throws:

- **IllegalArgumentException**  
if radius is invalid.

```
public StationSearchRequest setRequestStationDetailsEnabled (boolean details)
```

Set if station details (e.g. lines running through the station) should be returned. It is true by default.

### Parameters:

- **details**  
true if station details should be returned, false otherwise

**Returns:**

this request instance

```
public StationSearchRequest setStationNameMatchingMethod (NameMatchingMethod
method)
```

Set the matching method for station names when searching with name filter. It is FUZZY by default.

**Parameters:**

- **method**  
matching method

**Returns:**

this request instance

## NameMatchingMethod

The enumeration *NameMatchingMethod* is a member of *com.here.android.mpa.urbanmobility.StationSearchRequest*.

### Enumeration Summary

```
public static final enumeration StationSearchRequest.NameMatchingMethod
```

```
extends java.lang.Enum, java.lang.Object
```

Possible matching methods for a station name.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

**Table 1344: Enum Constants in NameMatchingMethod**

Fields
<pre>public static final <i>NameMatchingMethod</i> <b>STRICT</b></pre> <p>Search for a station with the name exactly match one of the names requested or contains its part.</p>
<pre>public static final <i>NameMatchingMethod</i> <b>FUZZY</b></pre> <p>Search for a station with the name similar to one of the names requested i.e.</p>

## Method Summary

Table 1345: Methods in NameMatchingMethod

Methods
<pre>public static <i>NameMatchingMethod</i> valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>StationSearchRequest.NameMatchingMethod[]</i> values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Possible matching methods for a station name. Default is FUZZY meaning that non-exact matches will be allowed.

### Enum Constant Details

```
public static final NameMatchingMethod STRICT
```

Search for a station with the name exactly match one of the names requested or contains its part.

```
public static final NameMatchingMethod FUZZY
```

Search for a station with the name similar to one of the names requested i.e. non-exact matches are allowed.

## Method Details

```
public static NameMatchingMethod valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- name**  
 A string containing the name of the enumeration member whose value is to be retrieved.

```
public static StationSearchRequest.NameMatchingMethod[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## StationSearchResult

The class *StationSearchResult* is a member of *com.here.android.mpa.urbanmobility*.

## Class Summary

public final class **StationSearchResult**

extends *java.lang.Object*

Station Search result which contains a `java.util.java.util.List` of found *Stations* and, when requested, a `java.util.java.util.Collection` of all unique *Transports* that run through those stations.

[For complete information, see the section [Class Details](#)]

## Method Summary

Table 1346: Methods in `StationSearchResult`

Methods
<code>public boolean equals (Object o)</code>
<code>public java.util.List &lt;Station&gt; getStations ()</code> Get the list of found <i>Stations</i>
<code>public java.util.Collection &lt;Transport&gt; getTransports ()</code> Gets the collection of <i>Transport</i> objects.
<code>public int hashCode ()</code>

## Class Details

Station Search result which contains a `java.util.java.util.List` of found *Stations* and, when requested, a `java.util.java.util.Collection` of all unique *Transports* that run through those stations.

IMPORTANT: Urban Mobility Transit Station Search is a Beta feature. The related classes are subject to change without notice.

## Method Details

`public boolean equals (Object o)`

Parameters:

- `o`

`public java.util.List <Station> getStations ()`

Get the list of found *Stations*

Returns:

list of found stations, might be empty

```
public java.util.Collection <Transport> getTransports ()
```

Gets the collection of *Transport* objects.

**Returns:**

the collection of transports serving departures shown in current departure list

```
public int hashCode ()
```

## StationWithDepartureBoard

The class *StationWithDepartureBoard* is a member of *com.here.android.mpa.urbanmobility*.

### Class Summary

```
public final class StationWithDepartureBoard
```

extends *com.here.android.mpa.urbanmobility.Station*, *com.here.android.mpa.urbanmobility.Place*, *java.lang.Object*

Represents stop/station with departure information for a public transport.

[For complete information, see the section *Class Details*]

### Method Summary

Table 1347: Methods in *StationWithDepartureBoard*

Methods
public boolean <i>equals</i> (Object o)
public <i>DepartureBoard</i> <i>getDepartureBoard</i> () Gets stop/station information for which departure board belongs.
public int <i>hashCode</i> ()

### Class Details

Represents stop/station with departure information for a public transport.

IMPORTANT: Urban Mobility Departure Board is a Beta feature. The related classes are subject to change without notice.

### Method Details

```
public boolean equals (Object o)
```

**Parameters:**

- o

```
public DepartureBoard getDepartureBoard ()
```

Gets stop/station information for which departure board belongs.

**Returns:**

The station information for which departure board belongs.

```
public int hashCode ()
```

## Tariff

The class *Tariff* is a member of *com.here.android.mpa.urbanmobility*.

### Class Summary

```
public final class Tariff
```

*extends java.lang.Object*

Represents a collection of *Fares* which together covers the cost of a certain *UMRoute*.

[For complete information, see the section *Class Details*]

### Method Summary

Table 1348: Methods in *Tariff*

#### Methods

```
public boolean equals (Object o)
```

```
public java.util.Collection <Fare> getFares ()
```

Gets Collection of *Fare* objects which describe fare for individual section in the route.

```
public int hashCode ()
```

### Class Details

Represents a collection of *Fares* which together covers the cost of a certain *UMRoute*.

IMPORTANT: Urban Mobility routing is a Beta feature. The related classes are subject to change without notice.

### Method Details

```
public boolean equals (Object o)
```

**Parameters:**

- 0

```
public java.util.Collection <Fare> getFares ()
```

Gets Collection of *Fare* objects which describe fare for individual section in the route.

**Returns:**

collection of fare for individual section in the route

```
public int hashCode ()
```

## Transport

The class *Transport* is a member of *com.here.android.mpa.urbanmobility*.

### Class Summary

```
public class Transport
```

*extends java.lang.Object*

Represents a kind of transport (e.g.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 1349: Methods in Transport

#### Methods

```
public boolean equals (Object o)
```

```
public FeatureAvailability getBarrierFree ()
```

Indicates if transport is barrier free.

```
public FeatureAvailability getBikeAllowed ()
```

Indicates if bikes are allowed for this transport.

```
public int getColor ()
```

Gets the transport color.

```
public String getDirection ()
```

Gets the transport direction if applicable (e.g.

```
public String getName ()
```

Gets the transport name.

## Methods

```
public Operator getOperator ()
```

Gets the operator serving the transport.

```
public int getOutlineColor ()
```

Gets the color of the border around the transport name.

```
public int getTextColor ()
```

Gets the text color that should get used when the transport color is used as background color.

```
public TransportType getTransportType ()
```

Gets the type of transport.

```
public String getTransportTypeName ()
```

Gets the locally used name for this transport type.

```
public int hashCode ()
```

## Class Details

Represents a kind of transport (e.g. transit line or bike) with its properties like name, color that can be used to display on the map, or operator that serves given transport.

IMPORTANT: Urban Mobility is a Beta feature. The related classes are subject to change without notice.

## Method Details

```
public boolean equals (Object o)
```

**Parameters:**

- `o`

```
public FeatureAvailability getBarrierFree ()
```

Indicates if transport is barrier free.

**Returns:**

*FeatureAvailability* flag indicating if transport is barrier free

```
public FeatureAvailability getBikeAllowed ()
```

Indicates if bikes are allowed for this transport.

**Returns:**

*FeatureAvailability* flag indicating if bikes are allowed for this transport

```
public int getColor ()
```

Gets the transport color. See `android.graphics.android.graphics.Color` for more details on color format.

**Returns:**

transport color, or `Color.BLACK` if none

```
public String getDirection ()
```

Gets the transport direction if applicable (e.g. bus which goes to "Flughafen Tegel Airport").

**Returns:**

the transport direction, or empty string if not available

```
public String getName ()
```

Gets the transport name. Name is localized according to `Locale.getDefault()`. If given language is not supported English version is returned.

**Returns:**

the transport name, or empty string if not available

```
public Operator getOperator ()
```

Gets the operator serving the transport.

**Returns:**

the transport operator, or null if not available

```
public int getOutlineColor ()
```

Gets the color of the border around the transport name. See `android.graphics.android.graphics.Color` for more details on color format.

**Returns:**

transport border color, or `Color.TRANSPARENT` if none

```
public int getTextColor ()
```

Gets the text color that should get used when the transport color is used as background color. See `android.graphics.android.graphics.Color` for more details on color format.

**Returns:**

text color, or `Color.BLACK` if none

```
public TransportType getTransportType ()
```

Gets the type of transport.

**Returns:**

`TransportType` representing kind of transport

```
public String getTransportTypeName ()
```

Gets the locally used name for this transport type. Name is localized according to `Locale.getDefault()`. If given language is not supported English version is returned.

**Returns:**

locally used transport type name or empty string if not available

```
public int hashCode ()
```

## venues3d

---

The package `venues3d` is a member of `com.here.android.mpa`.

### Package Summary

#### `venues3d`

This package provides facilities to search and display objects representing three-dimensional views of venues.

### Package Details

This package provides facilities to search and display objects representing three-dimensional views of venues. It replaces the venue maps feature contained in the `com.here.android.mpa.venuemaps` package.

The entry point to this Venue 3D feature is either the [VenueMapFragment](#) class with UI support, or [VenueService](#), which offers headless venue functionality.

For more information on using 3D venues, please consult the "3D Venues" section in the HERE SDK for Android Developer's Guide.

## Area

The class `Area` is a member of `com.here.android.mpa.venues3d`.

### Class Summary

public class **Area**

extends `com.here.android.mpa.venues3d.SpatialObject`, `java.lang.Object`

This class is a base class that represents a physical area within a Venue .

[For complete information, see the section [Class Details](#)]

**See also:**

[Venue](#)

[Level](#)

[OuterArea](#)

[Space](#)

### Constructor Summary

Table 1350: Constructors in Area

Constructors
<a href="#">Area</a> ( <code>AreaImpl impl</code> ) Package Private Constructor

### Method Summary

Table 1351: Methods in Area

Methods
public <code>GeoBoundingBox</code> <a href="#">getBoundingBox</a> () This method retrieves the bounding box for this Area .
public <code>GeoCoordinate</code> <a href="#">getCenter</a> () This method retrieves the center of the bounding box of the Area .
public <code>String</code> <a href="#">getName</a> () This method retrieves the human-readable name related to the holder of the spatial area.

## Methods

```
public GeoPolygon getPolygon ()
```

This method retrieves the *GeoPolygon* for this *Area* , if it exists.

---

## Class Details

This class is a base class that represents a physical area within a *Venue* . It is extended by the classes *OuterArea* and *Space* , both of which have a bounding box and center coordinates, and possibly a *GeoPolygon* .

This class can not be instantiated directly. Subclasses *OuterArea* and *Space* can be obtained by methods on *Level* .

**See also:**

[Venue](#)

[Level](#)

[OuterArea](#)

[Space](#)

## Constructor Details

### **Area** (*AreaImpl* impl)

Package Private Constructor

**Parameters:**

- **impl**  
The impl object to be constructed of.

## Method Details

```
public GeoBoundingBox getBoundingBox ()
```

This method retrieves the bounding box for this *Area* .

**Returns:**

An object representing the bounding box for the given area.

```
public GeoCoordinate getCenter ()
```

This method retrieves the center of the bounding box of the *Area* .

**Returns:**

An object containing the geographic coordinates of the center of the given area.

```
public String getName ()
```

This method retrieves the human-readable name related to the holder of the spatial area. This can be, for example, the name of a shop.

**Returns:**

The string containing the name.

```
public GeoPolygon getPolygon ()
```

This method retrieves the `GeoPolygon` for this `Area`, if it exists.

**Returns:**

A `GeoPolygon` or null.

## BaseLocation

The class `BaseLocation` is a member of [com.here.android.mpa.venues3d](#).

### Class Summary

```
public class BaseLocation
```

```
extends java.lang.Object
```

This class represents a location used in indoor routing.

[For complete information, see the section [Class Details](#)]

**See also:**

[RoutingController](#)

### Nested Class Summary

Table 1352: Nested Classes in `BaseLocation`

Nested Classes
<pre>public static final enumeration <a href="#">BaseLocation.LocationType</a></pre> <p>This enumeration defines identifiers for location types.</p>

### Constructor Summary

Table 1353: Constructors in `BaseLocation`

Constructors
<pre><a href="#">BaseLocation</a> ()</pre>

## Constructors

**BaseLocation** (BaseLocationImpl impl)

Package Private Constructor

## Field Summary

Table 1354: Fields in BaseLocation

### Fields

protected *LocationType* *m\_locationType*

protected *BaseLocation* *m\_parkingLocation*

protected BaseLocationImpl *m\_pimpl*

## Method Summary

Table 1355: Methods in BaseLocation

### Methods

public *Area* *getArea* ()

This method returns *Area* associated with a location.

public *GeoCoordinate* *getGeoCoordinate* ()

This method returns a *GeoCoordinate* associated with a location.

public *LocationType* *getType* ()

This method return *BaseLocation.LocationType* of this instance.

public boolean *isValid* ()

This method returns information if a given location is valid.

public void *setParkingLocation* (*BaseLocation* location)

This method sets parking location.

## Class Details

This class represents a location used in indoor routing.

See also:

[RoutingController](#)

## Constructor Details

**BaseLocation** ()

**BaseLocation** (BaseLocationImpl impl)

Package Private Constructor

## Parameters:

- `impl`

The impl object to be constructed of.

## Field Details

protected *LocationType* `m_locationType`

protected *BaseLocation* `m_parkingLocation`

protected `BaseLocationImpl m_pimpl`

## Method Details

public *Area* `getArea ()`

This method returns *Area* associated with a location. If a location relates to a *Space*, it returns a *Space* object. If a location relates to a *OuterArea*, it returns a *OuterArea* object. Otherwise this method returns null.

### Returns:

An *Area* associated with a location

public *GeoCoordinate* `getGeoCoordinate ()`

This method returns a *GeoCoordinate* associated with a location.

### Returns:

A *GeoCoordinate* associated with a location

public *LocationType* `getType ()`

This method return *BaseLocation.LocationType* of this instance.

### Returns:

A location type.

public boolean `isValid ()`

This method returns information if a given location is valid.

**Returns:**

A boolean indicates if a location is valid

```
public void setParkingLocation (BaseLocation location)
```

This method sets parking location.

**Parameters:**

- **location**  
*BaseLocation* object.

## LocationType

The enumeration *LocationType* is a member of *com.here.android.mpa.venues3d.BaseLocation*.

### Enumeration Summary

```
public static final enumeration BaseLocation.LocationType
```

*extends java.lang.Enum, java.lang.Object*

This enumeration defines identifiers for location types.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

**Table 1356: Enum Constants in LocationType**

Fields
<pre>public static final <i>LocationType</i> <b>SPACE</b></pre> <p>Location in inside a space.</p>
<pre>public static final <i>LocationType</i> <b>OUTDOOR</b></pre> <p>Location is outdoor.</p>
<pre>public static final <i>LocationType</i> <b>LEVEL</b></pre> <p>Free point on given level.</p>
<pre>public static final <i>LocationType</i> <b>OTHER</b></pre> <p>Location is outdoor.</p>

## Method Summary

Table 1357: Methods in LocationType

Methods
<pre>public static LocationType valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static BaseLocation.LocationType[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

This enumeration defines identifiers for location types.

### Enum Constant Details

```
public static final LocationType SPACE
```

Location in inside a space.

```
public static final LocationType OUTDOOR
```

Location is outdoor.

```
public static final LocationType LEVEL
```

Free point on given level.

```
public static final LocationType OTHER
```

Location is outdoor.

## Method Details

```
public static LocationType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static BaseLocation.LocationType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## CombinedNavigationManager

The class *CombinedNavigationManager* is a member of *com.here.android.mpa.venues3d*.

### Class Summary

public class **CombinedNavigationManager**

*extends java.lang.Object*

A navigation manager class that provides guidance advice and information along a combined route.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 1358: Nested Classes in CombinedNavigationManager

Nested Classes
<p>public static abstract interface <i>CombinedNavigationManager.CombinedNavigationManagerListener</i></p> <p>An interface for responding to navigation events sent by the CombinedNavigationManager.</p>
<p>public static final enumeration <i>CombinedNavigationManager.CombinedNavigationState</i></p> <p>The possible states of CombinedNavigationManager.</p>
<p>public static final enumeration <i>CombinedNavigationManager.CombinedNavigationType</i></p> <p>Specifies the possible types of navigation.</p>

### Field Summary

Table 1359: Fields in CombinedNavigationManager

Fields
<p>public static final double <i>INVALID_DISTANCE_VALUE</i></p> <p>Represents an invalid distance value.</p>

### Method Summary

Table 1360: Methods in CombinedNavigationManager

Methods
<p>public void <i>addListener</i> (<i>CombinedNavigationManagerListener</i> listener)</p> <p>Adds a listener to the navigation manager.</p>
<p>public <i>CombinedNavigationType</i> <i>getCurrentNavigationType</i> ()</p> <p>Returns the type of currently active navigation.</p>

## Methods

```
public double getDistanceFromStart ()
```

Returns the current distance from the start point of navigation.

```
public double getDistanceToDestination ()
```

Returns the current distance to destination.

```
public CombinedNavigationState getNavigationState ()
```

Gets the current state of the navigation related to the tracked route.

```
public boolean isPaused ()
```

Returns true, if current navigation is paused, false otherwise.

```
public void pause (boolean value)
```

When set to true, the current navigation will be paused (if any).

```
public void removeListener (CombinedNavigationManagerListener listener)
```

Removes a listener from the navigation manager.

```
public boolean simulate (CombinedRoute route, double speed, boolean distortionEnabled, double updateInterval)
```

Starts a turn-by-turn navigation simulation session using the specified combined route.

```
public boolean start (CombinedRoute route)
```

Starts a turn-by-turn navigation session using the specified combined route.

```
public void stop ()
```

Stops a turn-by-turn navigation session started via [start\(CombinedRoute\)](#) or [simulate\(CombinedRoute, double, boolean, double\)](#)

## Class Details

A navigation manager class that provides guidance advice and information along a combined route.

## Field Details

```
public static final double INVALID\_DISTANCE\_VALUE
```

Represents an invalid distance value.

See also:

[getDistanceFromStart\(\)](#)

[getDistanceToDestination\(\)](#)

## Method Details

```
public void addListener (CombinedNavigationManagerListener listener)
```

Adds a listener to the navigation manager. The listener must implement the [CombinedNavigationManager.CombinedNavigationManagerListener](#) interface. The listener receives event callbacks containing information about the current navigation session.

**Parameters:**

- **listener**

The [CombinedNavigationManager.CombinedNavigationManagerListener](#) object to be added.

```
public CombinedNavigationType getCurrentNavigationType ()
```

Returns the type of currently active navigation.

```
public double getDistanceFromStart ()
```

Returns the current distance from the start point of navigation.

**Returns:**

the distance from the start point in meters. Returns [INVALID\\_DISTANCE\\_VALUE](#) if an error occurred or navigation hasn't been started.

```
public double getDistanceToDestination ()
```

Returns the current distance to destination.

**Returns:**

the distance to destination in meters. Returns [INVALID\\_DISTANCE\\_VALUE](#) if an error occurred or navigation hasn't been started.

```
public CombinedNavigationState getNavigationState ()
```

Gets the current state of the navigation related to the tracked route.

```
public boolean isPaused ()
```

Returns `true` , if current navigation is paused, `false` otherwise.

**Returns:**

`true`, if current navigation is paused, `false` otherwise.

```
public void pause (boolean value)
```

When set to `true` , the current navigation will be paused (if any). When set to `false` , the current navigation will resume if previously paused. This has no effect if there is no navigation currently in progress.

**Parameters:**

- **value**

When set to `true`, the current navigation will be paused (if any).

```
public void removeListener (CombinedNavigationManagerListener listener)
```

Removes a listener from the navigation manager. The listener must implement the *CombinedNavigationManager.CombinedNavigationManagerListener* interface. The listener receives event callbacks containing information about the current navigation session.

**Parameters:**

- **listener**

The *CombinedNavigationManager.CombinedNavigationManagerListener* object to be removed.

```
public boolean simulate (CombinedRoute route, double speed, boolean  
distortionEnabled, double updateInterval)
```

Starts a turn-by-turn navigation simulation session using the specified combined route.

**Parameters:**

- **route**

The combined route section to navigate.

- **speed**

The speed at which the simulated location changes in meters per second.

- **distortionEnabled**

If enabled, each generated position will be distorted with some random factor

- **updateInterval**

Specifies how often the new position will be updated. I.e. it controls smoothness of the navigation simulation.

**Returns:**

True if started successfully and false otherwise, indicating that one of the route sections is invalid or the navigation is already running.

```
public boolean start (CombinedRoute route)
```

Starts a turn-by-turn navigation session using the specified combined route.

**Parameters:**

- **route**

The combined route section to navigate.

**Returns:**

True if started successfully and false otherwise, indicating that one of the route sections is invalid or the navigation is already running.

```
public void stop ()
```

Stops a turn-by-turn navigation session started via `start(CombinedRoute)` or `simulate(CombinedRoute, double, boolean, double)`

## CombinedNavigationManagerListener

The interface `CombinedNavigationManagerListener` is a member of `com.here.android.mpa.venues3d.CombinedNavigationManager`.

### Interface Summary

```
public static abstract interface CombinedNavigationManager.CombinedNavigationManagerListener
```

An interface for responding to navigation events sent by the `CombinedNavigationManager`.

[For complete information, see the section [Interface Details](#)]

### Method Summary

Table 1361: Methods in `CombinedNavigationManagerListener`

Methods
<pre>public abstract void <b>onDestinationReached</b> ()</pre> <p>Called when the destination of turn-by-turn navigation is reached.</p>
<pre>public abstract void <b>onIndoorSectionWillStart</b> (<b>VenueRoute</b> indoorSection, <b>CombinedRoute</b> combinedRoute)</pre> <p>Called when an indoor section of the combined route will be started.</p>
<pre>public abstract void <b>onLinkingSectionWillStart</b> (<b>LinkingRoute</b> linkingSection, <b>CombinedRoute</b> combinedRoute)</pre> <p>Called when an link section of the combined route will be started.</p>
<pre>public abstract void <b>onOutdoorSectionWillStart</b> (<b>OutdoorRoute</b> outdoorSection, <b>CombinedRoute</b> combinedRoute)</pre> <p>Called when an outdoor section of the combined route will be started.</p>
<pre>public abstract void <b>onRouteUpdated</b> (<b>CombinedRoute</b> combinedRoute)</pre> <p>Called when a change is made to the route being navigated.</p>

### Interface Details

An interface for responding to navigation events sent by the `CombinedNavigationManager`.

### Method Details

```
public abstract void onDestinationReached ()
```

Called when the destination of turn-by-turn navigation is reached.

```
public abstract void onIndoorSectionWillStart (VenueRoute indoorSection,  
CombinedRoute combinedRoute)
```

Called when an indoor section of the combined route will be started.

**Parameters:**

- **indoorSection**  
VenueRoute representing the next indoor section.
- **combinedRoute**  
CombinedRoute representing the current route.

```
public abstract void onLinkingSectionWillStart (LinkingRoute linkingSection,  
CombinedRoute combinedRoute)
```

Called when an link section of the combined route will be started.

**Parameters:**

- **linkingSection**  
LinkRoute representing the next link section.
- **combinedRoute**  
CombinedRoute representing the current route.

```
public abstract void onOutdoorSectionWillStart (OutdoorRoute outdoorSection,  
CombinedRoute combinedRoute)
```

Called when an outdoor section of the combined route will be started.

**Parameters:**

- **outdoorSection**  
OutdoorRoute representing the next outdoor section.
- **combinedRoute**  
CombinedRoute representing the current route.

```
public abstract void onRouteUpdated (CombinedRoute combinedRoute)
```

Called when a change is made to the route being navigated. This can occur after successful rerouting due to the user leaving the current route.

**Parameters:**

- **combinedRoute**  
CombinedRoute representing the current route.

## CombinedNavigationState

The enumeration *CombinedNavigationState* is a member of *com.here.android.mpa.venues3d.CombinedNavigationManager*.

### Enumeration Summary

public static final enumeration **CombinedNavigationManager.CombinedNavigationState**

extends *java.lang.Enum*, *java.lang.Object*

The possible states of *CombinedNavigationManager* .

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 1362: Enum Constants in *CombinedNavigationState*

Fields
<pre>public static final CombinedNavigationState IDLE</pre> <p>No navigation is in progress.</p>
<pre>public static final CombinedNavigationState PAUSED</pre> <p>Navigation is in progress but not currently active.</p>
<pre>public static final CombinedNavigationState RUNNING</pre> <p>Navigation is in progress and active.</p>
<pre>public static final CombinedNavigationState SIMULATING</pre> <p>Navigation simulating is in progress and active.</p>

### Method Summary

Table 1363: Methods in *CombinedNavigationState*

Methods
<pre>public static CombinedNavigationState valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static CombinedNavigationManager.CombinedNavigationState[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

### Enumeration Details

The possible states of *CombinedNavigationManager* .

### Enum Constant Details

public static final *CombinedNavigationState* **IDLE**

No navigation is in progress.

public static final *CombinedNavigationState* **PAUSED**

Navigation is in progress but not currently active.

public static final *CombinedNavigationState* **RUNNING**

Navigation is in progress and active.

public static final *CombinedNavigationState* **SIMULATING**

Navigation simulating is in progress and active.

### Method Details

public static *CombinedNavigationState* **valueOf** (String name)

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

public static *CombinedNavigationManager.CombinedNavigationState[]* **values** ()

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## CombinedNavigationType

The enumeration *CombinedNavigationType* is a member of *com.here.android.mpa.venues3d.CombinedNavigationManager*.

### Enumeration Summary

public static final enumeration **CombinedNavigationManager.CombinedNavigationType**

*extends java.lang.Enum, java.lang.Object*

Specifies the possible types of navigation.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 1364: Enum Constants in `CombinedNavigationType`

Fields
<pre>public static final CombinedNavigationType NONE</pre> <p>None navigation is currently active</p>
<pre>public static final CombinedNavigationType INDOOR</pre> <p>Currently indoor navigation is active</p>
<pre>public static final CombinedNavigationType LINK</pre> <p>Currently link section navigation is active</p>
<pre>public static final CombinedNavigationType OUTDOOR</pre> <p>Currently outdoor navigation is active</p>

## Method Summary

Table 1365: Methods in `CombinedNavigationType`

Methods
<pre>public static CombinedNavigationType valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static CombinedNavigationManager.CombinedNavigationType[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Specifies the possible types of navigation.

### Enum Constant Details

```
public static final CombinedNavigationType NONE
```

None navigation is currently active

```
public static final CombinedNavigationType INDOOR
```

Currently indoor navigation is active

```
public static final CombinedNavigationType LINK
```

Currently link section navigation is active

```
public static final CombinedNavigationType OUTDOOR
```

Currently outdoor navigation is active

### Method Details

```
public static CombinedNavigationType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**

A string containing the name of the enumeration member whose value is to be retrieved.

```
public static CombinedNavigationManager.CombinedNavigationType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## CombinedRoute

The class *CombinedRoute* is a member of [com.here.android.mpa.venues3d](#) .

### Class Summary

```
public class CombinedRoute
```

```
extends java.lang.Object
```

Represents route from start to end point.

[For complete information, see the section [Class Details](#)]

#### See also:

[IRouteSection](#)

### Nested Class Summary

Table 1366: Nested Classes in CombinedRoute

Nested Classes
<pre>public static final enumeration <i>CombinedRoute.VenueRoutingError</i></pre> <p>Represents identifiers for routing errors.</p>

## Method Summary

Table 1367: Methods in CombinedRoute

Methods
<pre>public boolean <a href="#">conformsConnectorOptions</a> ()</pre> <p>Returns true if the returned route does no use any accessors set to be avoided in <a href="#">VenueRouteOptions</a>.</p>
<pre>public boolean <a href="#">conformsModeOptions</a> ()</pre> <p>Returns true if the result route for every outdoor segment, except to/from parking, is the mode the user has requested in <a href="#">VenueRouteOptions</a>.</p>
<pre>public <a href="#">RoutingError</a> <a href="#">getCoreMapError</a> ()</pre> <p>Returns <a href="#">RoutingError</a>, indicating inner core map error.</p>
<pre>public <a href="#">BaseLocation</a> <a href="#">getEnd</a> ()</pre> <p>Returns a <a href="#">BaseLocation</a> objects associated with end point of the route.</p>
<pre>public <a href="#">VenueRoutingError</a> <a href="#">getError</a> ()</pre> <p>Returns <a href="#">CombinedRoute.VenueRoutingError</a> indicating route computation result.</p>
<pre>public int <a href="#">getLength</a> ()</pre> <p>Returns the length of the route in meters.</p>
<pre>public java.util.List &lt;<a href="#">IRouteSection</a>&gt; <a href="#">getRouteSections</a> ()</pre> <p>Returns a list of <a href="#">IRouteSection</a> objects associated with this route instance.</p>
<pre>public <a href="#">BaseLocation</a> <a href="#">getStart</a> ()</pre> <p>Returns a <a href="#">BaseLocation</a> objects associated with start point of the route.</p>
<pre>public java.util.List &lt;<a href="#">BaseLocation</a>&gt; <a href="#">getWaypoints</a> ()</pre> <p>Returns a list of <a href="#">BaseLocation</a> objects associated with waypoints on the route including start and end points.</p>

## Class Details

Represents route from start to end point. The route is split to one or more route sections.

**See also:**

[IRouteSection](#)

## Method Details

```
public boolean conformsConnectorOptions ()
```

Returns true if the returned route does no use any accessors set to be avoided in [VenueRouteOptions](#).

Sometimes, no route can be created that satisfies all route options set by the user (like: use of elevators, escalators, stairs and ramps). If any of these are set to be avoided, this method can be used to check if the calculated route still uses any of these accessors.

**Returns:**

true if the returned route does no use any accessors set to be avoided in [VenueRouteOptions](#).

```
public boolean conformsModeOptions ()
```

Returns `true` if the result route for every outdoor segment, except to/from parking, is the mode the user has requested in [VenueRouteOptions](#).

**Returns:**

`true` if the result route for every outdoor segment, except to/from parking, is the mode the user has requested in [VenueRouteOptions](#).

```
public RoutingError getCoreMapError ()
```

Returns [RoutingError](#), indicating inner core map error. This function should be used only when the method `getError` returns the error code `CORE_MAP`.

**Returns:**

[RoutingError](#), indicating inner core map error.

```
public BaseLocation getEnd ()
```

Returns a [BaseLocation](#) objects associated with end point of the route.

**Returns:**

Last point of route (flag anchor).

```
public VenueRoutingError getError ()
```

Returns [CombinedRoute.VenueRoutingError](#) indicating route computation result.

**Returns:**

[CombinedRoute.VenueRoutingError](#) indicating route computation result.

```
public int getLength ()
```

Returns the length of the route in meters.

**Returns:**

The length of the route in meters.

```
public java.util.List <IRouteSection> getRouteSections ()
```

Returns a list of [IRouteSection](#) objects associated with this route instance. This information can be used to check type of turn-by-turn information available for each route sections of this combined route instance.

**Returns:**

A list of route sections.

```
public BaseLocation getStart ()
```

Returns a *BaseLocation* objects associated with start point of the route.

**Returns:**

First point of route (flag anchor).

```
public java.util.List <BaseLocation> getWaypoints ()
```

Returns a list of *BaseLocation* objects associated with waypoints on the route including start and end points.

**Returns:**

List of waypoint point on route (flag anchors).

## VenueRoutingError

The enumeration *VenueRoutingError* is a member of *com.here.android.mpa.venues3d.CombinedRoute*.

### Enumeration Summary

```
public static final enumeration CombinedRoute.VenueRoutingError
```

*extends java.lang.Enum, java.lang.Object*

Represents identifiers for routing errors.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 1368: Enum Constants in *VenueRoutingError*

Fields
<pre>public static final <i>VenueRoutingError</i> <b>NO_ERROR</b></pre> <p>No error</p>
<pre>public static final <i>VenueRoutingError</i> <b>ARGUMENTS</b></pre> <p>Problem with arguments</p>
<pre>public static final <i>VenueRoutingError</i> <b>INTERNAL</b></pre> <p>Internal problem in HereSDK or data problem</p>
<pre>public static final <i>VenueRoutingError</i> <b>CORE_MAP</b></pre> <p>Problem with core map routing</p>

### Fields

```
public static final VenueRoutingError UNKNOWN
```

Unknown problem

## Method Summary

Table 1369: Methods in VenueRoutingError

### Methods

```
public static VenueRoutingError valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static CombinedRoute.VenueRoutingError[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Represents identifiers for routing errors.

### Enum Constant Details

```
public static final VenueRoutingError NO_ERROR
```

No error

```
public static final VenueRoutingError ARGUMENTS
```

Problem with arguments

```
public static final VenueRoutingError INTERNAL
```

Internal problem in HereSDK or data problem

```
public static final VenueRoutingError CORE_MAP
```

Problem with core map routing

```
public static final VenueRoutingError UNKNOWN
```

Unknown problem

### Method Details

```
public static VenueRoutingError valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static CombinedRoute.VenueRoutingError[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Content

The class *Content* is a member of *com.here.android.mpa.venues3d*.

### Class Summary

```
public final class Content
```

```
extends java.lang.Object
```

This class encapsulates POI (Point Of Interest) information of the spatial area in a venue.

[For complete information, see the section [Class Details](#)]

### Method Summary

Table 1370: Methods in Content

Methods
<pre>public <i>Address</i> getAddress ()</pre> <p>This method retrieves the postal address of the spatial area.</p>
<pre>public String getContentId ()</pre> <p>This method retrieves the unique content identifier of the spatial area.</p>
<pre>public Map getCustomAttributes ()</pre> <p>Gets the Map&lt;String, Object&gt; of custom attributes.</p>
<pre>public String getEmail ()</pre> <p>This method retrieves the email address related to holder of the spatial area.</p>
<pre>public String getName ()</pre> <p>This method retrieves the human-readable name related to the holder of the spatial area.</p>
<pre>public String getParentCategoryId ()</pre> <p>This method retrieves the parent <i>Category</i> identifier of the spatial area.</p>
<pre>public String getPhoneNumber ()</pre> <p>This method returns the phone number related to holder of the spatial area.</p>

## Methods

```
public String getPlaceCategoryId ()
```

This method retrieves the *Category* identifier of the spatial area.

```
public List getSearchTags ()
```

This method retrieves the tags which describes the content holder.

```
public String getUniqueVenueId ()
```

This method retrieves the unique venue identifier of the spatial area.

```
public String getWebsite ()
```

This method retrieves the URL of the web site related to holder of the spatial area.

## Class Details

This class encapsulates POI (Point Of Interest) information of the spatial area in a venue. Examples of POI information are the street address, access information, search tags, space type, category.

## Method Details

```
public Address getAddress ()
```

This method retrieves the postal address of the spatial area.

### Returns:

An object containing the address of the spatial area.

```
public String getContentId ()
```

This method retrieves the unique content identifier of the spatial area. Content ID can be used in *PlaceRequest(String, String)* together with reference name *VENUES\_CONTENT\_ID\_REFERENCE\_NAME* to get reach information about the content. Request can fail if there is no information about the content in Places API.

### Returns:

A String containing the content identifier.

```
public Map getCustomAttributes ()
```

Gets the Map<String, Object> of custom attributes. Attribute values may be of type `java.lang.Boolean`, `java.lang.Double`, `java.lang.String`, `java.lang.List`, and `java.lang.Map`.

### Returns:

a `java.util.Map<String, Object>` from strings to values encoding the custom attributes or `null` if there are no custom properties.

```
public String getEmail ()
```

This method retrieves the email address related to holder of the spatial area.

**Returns:**

The string containing the email address.

```
public String getName ()
```

This method retrieves the human-readable name related to the holder of the spatial area. This can be, for example, the name of a shop.

**Returns:**

The string containing the name.

```
public String getParentCategoryId ()
```

This method retrieves the parent *Category* identifier of the spatial area. This information can be used, for example, to check the type of the space: shopping, transportation-facility, etc.

**Returns:**

The string containing the parent category identifier.

```
public String getPhoneNumber ()
```

This method returns the phone number related to holder of the spatial area.

**Returns:**

The string containing the phone number.

```
public String getPlaceCategoryId ()
```

This method retrieves the *Category* identifier of the spatial area. For example, this information can be used to check the type of store, such as food and clothing.

**Returns:**

The string containing the category identifier.

**See also:**

[getSortedSpacesByCategory\(String\)](#)

```
public List getSearchTags ()
```

This method retrieves the tags which describes the content holder. For example, the tags for an electronics retailer may contain: television, phone, mobile, computer, and so on. The tags can help you search inside a venue ( Venue ) for specific key words.

**Returns:**

A list of text strings representing the tags.

```
public String getUniqueVenueId ()
```

This method retrieves the unique venue identifier of the spatial area. This identifier is constant for each spatial area and can't be changed in later data updates.

**Returns:**

The string containing the unique venue identifier.

```
public String getWebsite ()
```

This method retrieves the URL of the web site related to holder of the spatial area.

**Returns:**

The string containing the URL.

## DeselectionSource

The enumeration *DeselectionSource* is a member of *com.here.android.mpa.venues3d*.

### Enumeration Summary

```
public final enumeration DeselectionSource
```

```
extends java.lang.Enum, java.lang.Object
```

This enumeration defines identifiers for values indicating how a venue was deselected.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 1371: Enum Constants in DeselectionSource

#### Fields

```
public static final DeselectionSource MOVE_OUT
```

Indicates that the map was moved away from the venue.

```
public static final DeselectionSource ZOOM_OUT
```

Indicates that the map was zoomed out to a zoom level at which the venue is not visible or not fully visible in the view port.

```
public static final DeselectionSource MAP_TAPPED
```

Indicates that the map was tapped outside the venue.

## Fields

```
public static final DeselectionSource LAYER_SWITCHED_OFF
```

Indicates that the VenueMapLayer was switched off.

```
public static final DeselectionSource SELECT_OTHER_VENUE
```

Indicates that another venue was selected.

```
public static final DeselectionSource MANUALLY
```

Indicates that a Venue was deselected manually through the API.

## Method Summary

Table 1372: Methods in DeselectionSource

### Methods

```
public static DeselectionSource valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static DeselectionSource[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

This enumeration defines identifiers for values indicating how a venue was deselected.

### Enum Constant Details

```
public static final DeselectionSource MOVE_OUT
```

Indicates that the map was moved away from the venue.

```
public static final DeselectionSource ZOOM_OUT
```

Indicates that the map was zoomed out to a zoom level at which the venue is not visible or not fully visible in the view port.

```
public static final DeselectionSource MAP_TAPPED
```

Indicates that the map was tapped outside the venue.

```
public static final DeselectionSource LAYER_SWITCHED_OFF
```

Indicates that the VenueMapLayer was switched off.

```
public static final DeselectionSource SELECT_OTHER_VENUE
```

Indicates that another venue was selected.

```
public static final DeselectionSource MANUALLY
```

Indicates that a Venue was deselected manually through the API.

### Method Details

```
public static DeselectionSource valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static DeselectionSource[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## IRouteSection

The interface *IRouteSection* is a member of *com.here.android.mpa.venues3d* .

### Interface Summary

```
public abstract interface IRouteSection
```

An interface for checking a route section type.

[For complete information, see the section [Interface Details](#)]

#### See also:

[LinkingRoute](#)

[OutdoorRoute](#)

[VenueRoute](#)

### Nested Class Summary

Table 1373: Nested Classes in IRouteSection

#### Nested Classes

```
public static final enumeration IRouteSection.RouteSectionType
```

This enumeration defines identifiers for route sections types.

## Method Summary

Table 1374: Methods in IRouteSection

Methods
<pre>public abstract int <a href="#">getLength</a> ()</pre> <p>Returns the length of this route section in meters.</p>
<pre>public abstract <a href="#">RouteSectionType</a> <a href="#">getRouteSectionType</a> ()</pre> <p>Returns <i>IRouteSection.RouteSectionType</i> of this route section.</p>

## Interface Details

An interface for checking a route section type.

### See also:

[LinkingRoute](#)

[OutdoorRoute](#)

[VenueRoute](#)

## Method Details

```
public abstract int getLength ()
```

Returns the length of this route section in meters.

### Returns:

The route's length in meters

```
public abstract RouteSectionType getRouteSectionType ()
```

Returns *IRouteSection.RouteSectionType* of this route section.

### Returns:

A route type.

## RouteSectionType

The enumeration *RouteSectionType* is a member of *com.here.android.mpa.venues3d.IRouteSection*.

## Enumeration Summary

```
public static final enumeration IRouteSection.RouteSectionType
```

```
extends java.lang.Enum, java.lang.Object
```

This enumeration defines identifiers for route sections types.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 1375: Enum Constants in `RouteSectionType`

Fields
<pre>public static final RouteSectionType VENUE</pre> <p>Route section is inside a venue.</p>
<pre>public static final RouteSectionType OUTDOOR</pre> <p>Route section is outside a venue.</p>
<pre>public static final RouteSectionType LINK</pre> <p>Route section describes a direct line from the start to the end point of the section, where there is no turn-by-turn routing data is available.</p>

## Method Summary

Table 1376: Methods in `RouteSectionType`

Methods
<pre>public static RouteSectionType valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static IRouteSection.RouteSectionType[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

This enumeration defines identifiers for route sections types.

### Enum Constant Details

```
public static final RouteSectionType VENUE
```

Route section is inside a venue.

```
public static final RouteSectionType OUTDOOR
```

Route section is outside a venue.

```
public static final RouteSectionType LINK
```

Route section describes a direct line from the start to the end point of the section, where there is no turn-by-turn routing data is available. This typically may occur in sections where one end is inside a venue and other end outside a venue.

## Method Details

```
public static RouteSectionType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static IRouteSection.RouteSectionType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Level

The class *Level* is a member of *com.here.android.mpa.venues3d*.

## Class Summary

```
public final class Level
```

```
extends java.lang.Object
```

This class represents a storey in a *Venue* (building).

[For complete information, see the section *Class Details*]

### See also:

*Venue*

*OuterArea*

*VenueController*

## Method Summary

Table 1377: Methods in Level

### Methods

```
public boolean equals (Object o)
```

```
public Area getAreaAtPosition (GeoCoordinate position)
```

This method retrieves the *Area* of the level at a given position.

```
public GeoCoordinate getCenter ()
```

This method retrieves the coordinates of the center of the given *Level*.

## Methods

```
public int getFloorNumber ()
```

This method retrieves the floor number assigned to the given `Level` .

```
public String getFloorSynonym ()
```

This method retrieves the floor synonym, for example: 1, B, P1, MEZZ etc.

```
public java.util.List <Space> getNearbySpaces (GeoCoordinate position, float radius)
```

This method retrieves spaces that intersect a circle around a given coordinate.

```
public java.util.List <OuterArea> getOuterAreas ()
```

This method retrieves a list of `OuterArea` objects associated with the given `Level` instance.

```
public java.util.List <Space> getSortedSpaces ()
```

This method retrieves an alphabetically-ordered list of `Space` objects for the given instance of `Level` , excluding facilities.

```
public java.util.List <Space> getSortedSpacesByCategory (String categoryName)
```

This method retrieves an alphabetically-ordered list of `Space` objects that belong to the category specified by the caller for all the `OuterArea` instances that belong to the given `Level` .

```
public java.util.List <Space> getSortedSpacesWithFacilities ()
```

This method retrieves an alphabetically-ordered list of all the `Space` objects associated with all the `OuterArea` objects of the given instance of `Level` .

```
public int hashCode ()
```

## Class Details

This class represents a storey in a `Venue` (building). A `Venue` consists of one or more `Level` objects. Each `Level` in turn includes one or more `OuterArea` objects.

`Level` cannot be instantiated directly. Instead, it can be obtained by calling the `getLevels()` method.

**See also:**

[Venue](#)

[OuterArea](#)

[VenueController](#)

## Method Details

```
public boolean equals (Object o)
```

**Parameters:**

- `o`

```
public Area getAreaAtPosition (GeoCoordinate position)
```

This method retrieves the `Area` of the level at a given position.

**Parameters:**

- **position**

The position for which to return the area.

**Returns:**

An area or null. The area may be a *Space* or an *OuterArea*.

```
public GeoCoordinate getCenter ()
```

This method retrieves the coordinates of the center of the given `Level` .

**Returns:**

An object containing the geographic coordinates of the center of the given level.

```
public int getFloorNumber ()
```

This method retrieves the floor number assigned to the given `Level` . Note that 0 (zero) indicates the ground floor, negative values indicate underground floors and positive values indicate floors above ground level.

**Returns:**

A value indicating the floor number.

```
public String getFloorSynonym ()
```

This method retrieves the floor synonym, for example: 1, B, P1, MEZZ etc.

**Returns:**

A `String` object containing the floor synonym.

```
public java.util.List <Space> getNearbySpaces (GeoCoordinate position, float radius)
```

This method retrieves spaces that intersect a circle around a given coordinate.

**Parameters:**

- **position**  
The position of the center of the circle.
- **radius**  
The radius of the circle in meters.

**Returns:**

A (possibly empty) list of nearby spaces.

```
public java.util.List <OuterArea> getOuterAreas ()
```

This method retrieves a list of *OuterArea* objects associated with the given *Level* instance. Depending on the physical appearance of the building, a *Level* can include one or more *OuterArea* objects. An *OuterArea* object can be used to get the *Space* objects associated with it.

**Returns:**

A list of instances of *OuterArea*.

```
public java.util.List <Space> getSortedSpaces ()
```

This method retrieves an alphabetically-ordered list of *Space* objects for the given instance of *Level* , excluding facilities. This method returns the *Space* objects for all *OuterArea* objects associated with the given instance of *Level*

**Returns:**

A list of *Space* objects, excluding facilities.

```
public java.util.List <Space> getSortedSpacesByCategory (String  
categoryName)
```

This method retrieves an alphabetically-ordered list of *Space* objects that belong to the category specified by the caller for all the *OuterArea* instances that belong to the given *Level* .

**Parameters:**

- **categoryName**  
The category of *OuterArea* instances to retrieve.

**Returns:**

A list of *Space* objects.

```
public java.util.List <Space> getSortedSpacesWithFacilities ()
```

This method retrieves an alphabetically-ordered list of all the *Space* objects associated with all the *OuterArea* objects of the given instance of *Level* . Facilities are included in the returned list.

**Returns:**

A list of *Space* objects, including facilities.

```
public int hashCode ()
```

## LevelLocation

The class *LevelLocation* is a member of *com.here.android.mpa.venues3d* .

## Class Summary

public class **LevelLocation**

extends *com.here.android.mpa.venues3d.BaseLocation*, *java.lang.Object*

Represents a level free point location used as either start- or endpoint in indoor routing.

[For complete information, see the section [Class Details](#)]

**See also:**

[OutdoorLocation](#)

[SpaceLocation](#)

[RoutingController](#)

## Constructor Summary

Table 1378: Constructors in LevelLocation

### Constructors

**LevelLocation** (*Level* level, *GeoCoordinate* coordinate, *VenueController* controller)

Constructs a level location object.

## Class Details

Represents a level free point location used as either start- or endpoint in indoor routing.

**See also:**

[OutdoorLocation](#)

[SpaceLocation](#)

[RoutingController](#)

## Constructor Details

**LevelLocation** (*Level* level, *GeoCoordinate* coordinate, *VenueController* controller)

Constructs a level location object.

**Parameters:**

- **level**  
*Level* object.
- **coordinate**  
geolocation as a *GeoCoordinate*.
- **controller**  
*VenueController* object representing a venue where the space is located.

## LinkingRoute

The class *LinkingRoute* is a member of *com.here.android.mpa.venues3d* .

### Class Summary

public class **LinkingRoute**

*implements* *com.here.android.mpa.venues3d.IRouteSection*

*extends* *java.lang.Object*

Represents a link section of the route.

[For complete information, see the section *Class Details*]

**See also:**

*OutdoorRoute*

*VenueRoute*

### Method Summary

Table 1379: Methods in LinkingRoute

Methods
public boolean <i>equals</i> (Object o)
public <i>GeoCoordinate</i> <i>getFrom</i> () Returns a geolocation of the start point of this route route section.
public int <i>getLength</i> ()
public <i>RouteSectionType</i> <i>getRouteSectionType</i> () Returns <i>IRouteSection.RouteSectionType</i> of this route section.
public <i>GeoCoordinate</i> <i>getTo</i> () Returns a geolocation of the end point of this route route section.
public int <i>hashCode</i> ()

### Class Details

Represents a link section of the route. The route can contain sections that are inside venue, outside venue, and link sections that typically connects indoor and outdoor locations together.

**See also:**

*OutdoorRoute*

*VenueRoute*

## Method Details

```
public boolean equals (Object o)
```

Parameters:

- `o`

```
public GeoCoordinate getFrom ()
```

Returns a geolocation of the start point of this route route section.

Returns:

A [GeoCoordinate](#) object representing the start point of this route section.

```
public int getLength ()
```

```
public RouteSectionType getRouteSectionType ()
```

Returns [IRouteSection.RouteSectionType](#) of this route section.

Returns:

A route type.

```
public GeoCoordinate getTo ()
```

Returns a geolocation of the end point of this route route section.

Returns:

A [GeoCoordinate](#) object representing the end point of this route section.

```
public int hashCode ()
```

## Margin

The class *Margin* is a member of [com.here.android.mpa.venues3d](#) .

### Class Summary

```
public class Margin
```

```
extends java.lang.Object
```

This class represents margins in screen pixels.

[For complete information, see the section [Class Details](#)]

## Constructor Summary

Table 1380: Constructors in Margin

Constructors
<b><i>Margin</i></b> (int left, int top, int right, int bottom) This method is a constructor.

## Method Summary

Table 1381: Methods in Margin

Methods
public int <b><i>getBottom</i></b> () This method retrieves the bottom margin.
public int <b><i>getLeft</i></b> () This method retrieves the left margin.
public int <b><i>getRight</i></b> () This method retrieves the right margin.
public int <b><i>getTop</i></b> () This method retrieves the top margin.

## Class Details

This class represents margins in screen pixels.

## Constructor Details

### **Margin** (int left, int top, int right, int bottom)

This method is a constructor.

#### Parameters:

- **left**  
A value indicating the left margin.
- **top**  
A value indicating the top margin.
- **right**  
A value indicating the right margin.
- **bottom**  
A value indicating the bottom margin.

## Method Details

```
public int getBottom ()
```

This method retrieves the bottom margin.

**Returns:**

A value indicating the bottom margin in screen pixels.

```
public int getLeft ()
```

This method retrieves the left margin.

**Returns:**

A value indicating the left margin in screen pixels.

```
public int getRight ()
```

This method retrieves the right margin.

**Returns:**

A value indicating the right margin in screen pixels.

```
public int getTop ()
```

This method retrieves the top margin.

**Returns:**

A value indicating the top margin in screen pixels.

## OutdoorLocation

The class *OutdoorLocation* is a member of *com.here.android.mpa.venues3d* .

### Class Summary

```
public class OutdoorLocation
```

```
extends com.here.android.mpa.venues3d.BaseLocation, java.lang.Object
```

Represents an outdoor location used as either start- or endpoint in indoor routing.

[For complete information, see the section *Class Details*]

**See also:**

*SpaceLocation*

*RoutingController*

## Class Details

Represents an outdoor location used as either start- or endpoint in indoor routing.

**See also:**

[SpaceLocation](#)

[RoutingController](#)

# OutdoorRoute

The class *OutdoorRoute* is a member of [com.here.android.mpa.venues3d](#).

## Class Summary

public class **OutdoorRoute**

implements [com.here.android.mpa.venues3d.IRouteSection](#)

extends [java.lang.Object](#)

Represents an outdoor section of the route.

[For complete information, see the section [Class Details](#)]

**See also:**

[LinkingRoute](#)

[VenueRoute](#)

## Method Summary

Table 1382: Methods in OutdoorRoute

Methods
public boolean <a href="#">equals</a> (Object o)
public <a href="#">GeoBoundingBox</a> <a href="#">getBoundingBox</a> () Gets the <a href="#">GeoBoundingBox</a> of the outdoor route.
public int <a href="#">getLength</a> ()
public <a href="#">Route</a> <a href="#">getRoute</a> () Returns <a href="#">Route</a> object encapsulated by this route section.
public <a href="#">RouteSectionType</a> <a href="#">getRouteSectionType</a> () Returns <a href="#">IRouteSection.RouteSectionType</a> of this route section.
public int <a href="#">hashCode</a> ()

## Class Details

Represents an outdoor section of the route. The route can contain sections that are inside venue, outside venue, and link sections that typically connects indoor and outdoor locations together.

**See also:**

[LinkingRoute](#)

[VenueRoute](#)

## Method Details

```
public boolean equals (Object o)
```

**Parameters:**

- `o`

```
public GeoBoundingBox getBoundingBox ()
```

Gets the [GeoBoundingBox](#) of the outdoor route.

**Returns:**

A [GeoBoundingBox](#) object.

```
public int getLength ()
```

```
public Route getRoute ()
```

Returns [Route](#) object encapsulated by this route section.

**Returns:**

A route object.

```
public RouteSectionType getRouteSectionType ()
```

Returns [IRouteSection.RouteSectionType](#) of this route section.

```
public int hashCode ()
```

## OuterArea

The class [OuterArea](#) is a member of [com.here.android.mpa.venues3d](#) .

## Class Summary

public final class **OuterArea**

extends *com.here.android.mpa.venues3d.Area*, *com.here.android.mpa.venues3d.SpatialObject*,  
*java.lang.Object*

This class represents the physical outer area of a *Level* associated with a *Venue* (building).

[For complete information, see the section *Class Details*]

**See also:**

*Venue*

*Level*

*getSortedSpaces()*

*getSortedSpacesByCategory(String)*

*getSortedSpacesWithFacilities()*

*Space*

*VenueController*

## Method Summary

Table 1383: Methods in OuterArea

Methods
<pre>public java.util.List &lt;Space&gt; <b>getNearbySpaces</b> (<i>GeoCoordinate</i> position, float radius)</pre> <p>This method retrieves spaces that intersect a circle around a given coordinate.</p>
<pre>public <i>Space</i> <b>getSpaceAtPosition</b> (<i>GeoCoordinate</i> position)</pre> <p>This method retrieves the <i>Space</i> of the outer area at a given position.</p>
<pre>public java.util.List &lt;Space&gt; <b>getSpaces</b> ()</pre> <p>This method retrieves an array of <i>Space</i> objects for the given instance of <i>OuterArea</i> .</p>

## Class Details

This class represents the physical outer area of a *Level* associated with a *Venue* (building).

A level may have several outer areas for, depending on the physical appearance of the building. This class can be used to get *Space* objects associated with it.

*OuterArea* cannot be instantiated directly. Instead, it can be obtained by calling *getOuterAreas()*.

**See also:**

*Venue*

*Level*

*getSortedSpaces()*

[getSortedSpacesByCategory\(String\)](#)

[getSortedSpacesWithFacilities\(\)](#)

[Space](#)

[VenueController](#)

## Method Details

```
public java.util.List <Space> getNearbySpaces (GeoCoordinate position, float radius)
```

This method retrieves spaces that intersect a circle around a given coordinate.

### Parameters:

- **position**  
The position of the center of the circle.
- **radius**  
The radius of the circle in meters.

### Returns:

A (possibly empty) list of nearby spaces.

```
public Space getSpaceAtPosition (GeoCoordinate position)
```

This method retrieves the *Space* of the outer area at a given position.

### Parameters:

- **position**  
The position for which to return the space.

### Returns:

A space or null.

```
public java.util.List <Space> getSpaces ()
```

This method retrieves an array of *Space* objects for the given instance of *OuterArea* .

### Returns:

A list of *Space* objects.

## RoutingController

The class *RoutingController* is a member of [com.here.android.mpa.venues3d](#) .

## Class Summary

public class **RoutingController**

extends *java.lang.Object*

[For complete information, see the section [Class Details](#)]

## Nested Class Summary

Table 1384: Nested Classes in RoutingController

Nested Classes
public static abstract interface <i>RoutingController.RoutingControllerListener</i> Represents a listener to provide notification when a route calculation is completed.

## Method Summary

Table 1385: Methods in RoutingController

Methods
public void <i>addListener</i> ( <i>RoutingControllerListener</i> listener) Adds <i>RoutingController.RoutingControllerListener</i> object to RoutingController object.
public void <i>calculateCombinedRoute</i> ( <i>BaseLocation</i> from, <i>BaseLocation</i> to, <i>VenueRouteOptions</i> options) Starts route calculation with given start and end locations.
public void <i>calculateCombinedRoute</i> ( <i>BaseLocation[]</i> points, <i>VenueRouteOptions</i> options) Starts route calculation with given waypoints.
public void <i>hideRoute</i> () Hides the currently visible route.
public void <i>removeListener</i> ( <i>RoutingControllerListener</i> listener) Removes given <i>RoutingController.RoutingControllerListener</i> object from the list of listeners, which receive the <i>CombinedRoute</i> related events.
public void <i>showRoute</i> ( <i>CombinedRoute</i> route) Shows combined route from start location to destination in the map.

## Class Details

### Method Details

public void **addListener** (*RoutingControllerListener* listener)

Adds *RoutingController.RoutingControllerListener* object to RoutingController object.

Parameters:

- listener

The `RoutingControllerListener` object to be added

```
public void calculateCombinedRoute (BaseLocation from, BaseLocation to,  
VenueRouteOptions options)
```

Starts route calculation with given start and end locations. Calculation is done in an asynchronous manner, and the calculated route will be available for listeners of the `RoutingController.RoutingControllerListener` interface upon completion. Parking locations are only taken into account if the transport mode is set to car in `RouteOptions`. If the transport mode is car and the starting point has an associated parking location, the route segment from the starting point to the associated parking location will be in pedestrian mode. If the transport mode is car and the end point has an associated parking location, the route segment from the parking location to the end point will be in pedestrian mode.

**Parameters:**

- **from**  
The start point of the route as `BaseLocation` object.
- **to**  
The end point of the route as `BaseLocation` object.
- **options**  
The route options to set.

```
public void calculateCombinedRoute (BaseLocation[] points, VenueRouteOptions  
options)
```

Starts route calculation with given waypoints. Calculation is done in an asynchronous manner, and the calculated route will be available for listeners of the `RoutingController.RoutingControllerListener` interface upon completion. Parking locations are only taken into account for the start and end points of the route, and only if the transport mode is set to car in `RouteOptions`. Parking locations on intermediate waypoints are ignored. If the transport mode is car and the starting point has an associated parking location, the route segment from the starting point to the associated parking location will be in pedestrian mode. If the transport mode is car and the end point has an associated parking location, the route segment from the parking location to the end point will be in pedestrian mode.

**Parameters:**

- **points**  
The points on of the route as `BaseLocation` object (start, waypoints, end). Maximum number of elements is 11 (9 waypoints).
- **options**  
The route options to set.

```
public void hideRoute ()
```

Hides the currently visible route. Does nothing if there is no route visible.

```
public void removeListener (RoutingControllerListener listener)
```

Removes given *RoutingController.RoutingControllerListener* object from the list of listeners, which receive the *CombinedRoute* related events.

**Parameters:**

- **listener**  
The *RoutingControllerListener* object to be removed.

```
public void showRoute (CombinedRoute route)
```

Shows combined route from start location to destination in the map. This route can be used as a guide about how to get from starting point to the destination. Only one route at a time can be shown. When calling this method while there is already a route visible in the map, it will be replaced with the given route.

**Parameters:**

- **route**  
The route to show.

## RoutingControllerListener

The interface *RoutingControllerListener* is a member of *com.here.android.mpa.venues3d.RoutingController*.

### Interface Summary

```
public static abstract interface RoutingController.RoutingControllerListener
```

Represents a listener to provide notification when a route calculation is completed.

[For complete information, see the section [Interface Details](#)]

### Method Summary

Table 1386: Methods in *RoutingControllerListener*

Methods
<pre>public abstract void <i>onCombinedRouteCompleted</i> (<i>CombinedRoute</i> route)</pre> <p>Route calculation is completed.</p>

### Interface Details

Represents a listener to provide notification when a route calculation is completed.

This class can not be instantiated directly. Use *getRoutingController()* to obtain an instances of this class.

## Method Details

public abstract void **onCombinedRouteCompleted** (*CombinedRoute* route)

Route calculation is completed.

### Parameters:

- **route**

The *CombinedRoute* object representing different route sections including indoor part(s), possible outdoor part and possible link section(s). The route can be shown on the map using *showRoute(CombinedRoute)* method. A *CombinedRoute* route object contains 0 route sections in case if route calculation fails.

## Space

The class *Space* is a member of *com.here.android.mpa.venues3d* .

## Class Summary

public final class **Space**

extends *com.here.android.mpa.venues3d.Area*, *com.here.android.mpa.venues3d.SpatialObject*,  
*java.lang.Object*

This class represents a physical space in a Venue (building), for example a shop in a shopping mall.

[For complete information, see the section *Class Details*]

### See also:

*Content*

*Venue*

## Nested Class Summary

Table 1387: Nested Classes in Space

Nested Classes
public static final enumeration <i>Space.SpaceType</i> This enumeration defines identifiers for space types.

## Method Summary

Table 1388: Methods in Space

Methods
public <i>Content</i> <i>getContent</i> () This method obtains the <i>Content</i> object associated with the given Space instance.

## Methods

```
public int getFloorNumber ()
```

This method retrieves the floor number assigned to the given `Level` .

```
public String getFloorSynonym ()
```

This method retrieves the floor synonym, for example: 1, B, P1, MEZZ etc.

```
public Bitmap getIcon (Context context)
```

This method obtains the icon used to indicate the given space on the map.

```
public SpaceType getType ()
```

This method obtains the space type assigned to the given object.

```
public String getVenueName ()
```

This method obtains the name of the Venue in which the given space is located.

## Class Details

This class represents a physical space in a Venue (building), for example a shop in a shopping mall. When the [VenueMapFragment](#) is used, the Space is interactive and the application user can tap on it.

**See also:**

[Content](#)

[Venue](#)

## Method Details

```
public Content getContent ()
```

This method obtains the [Content](#) object associated with the given Space instance.

**Returns:**

An object representing the content of the given Space instance.

```
public int getFloorNumber ()
```

This method retrieves the floor number assigned to the given `Level` . Note that 0 (zero) indicates the ground floor, negative values indicate underground floors and positive values indicate floors above ground level.

**Returns:**

A value indicating the floor number.

```
public String getFloorSynonym ()
```

This method retrieves the floor synonym, for example: 1, B, P1, MEZZ etc.

**Returns:**

A string object containing the floor synonym.

```
public Bitmap getIcon (Context context)
```

This method obtains the icon used to indicate the given space on the map.

**Parameters:**

- **context**  
An object representing the context of the application.

**Returns:**

A Bitmap object representing the icon or null if the Space does not use an icon.

```
public SpaceType getType ()
```

This method obtains the space type assigned to the given object. Use this method to determine if the space is a facility.

**Returns:**

An object indicating the *Space.SpaceType*.

```
public String getVenueName ()
```

This method obtains the name of the Venue in which the given space is located.

**Returns:**

A string containing the name of the venue.

## SpaceType

The enumeration *SpaceType* is a member of *com.here.android.mpa.venues3d.Space*.

### Enumeration Summary

```
public static final enumeration Space.SpaceType
```

```
extends java.lang.Enum, java.lang.Object
```

This enumeration defines identifiers for space types.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 1389: Enum Constants in SpaceType

Fields
<pre>public static final SpaceType SPACE</pre> <p>Indicates a standard Space object.</p>
<pre>public static final SpaceType FACILITY</pre> <p>Indicates a Space object which is a facility.</p>

## Method Summary

Table 1390: Methods in SpaceType

Methods
<pre>public static SpaceType valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static Space.SpaceType[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

This enumeration defines identifiers for space types.

### Enum Constant Details

```
public static final SpaceType SPACE
```

Indicates a standard Space object.

```
public static final SpaceType FACILITY
```

Indicates a Space object which is a facility. Examples of facilities are elevators, stairs, toilets, ATM's etc.

### Method Details

```
public static SpaceType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static Space.SpaceType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## SpaceLocation

The class *SpaceLocation* is a member of *com.here.android.mpa.venues3d* .

### Class Summary

```
public class SpaceLocation
```

```
extends com.here.android.mpa.venues3d.BaseLocation, java.lang.Object
```

Represents a indoor space location used as either start- or endpoint in indoor routing.

[For complete information, see the section *Class Details*]

**See also:**

*OutdoorLocation*

*RoutingController*

### Constructor Summary

Table 1391: Constructors in *SpaceLocation*

Constructors
<p><i>SpaceLocation</i> (<i>Space</i> space, <i>VenueController</i> controller)</p> <p>Constructs a space location object with a given space and venue controller objects.</p>

### Class Details

Represents a indoor space location used as either start- or endpoint in indoor routing.

**See also:**

*OutdoorLocation*

*RoutingController*

### Constructor Details

*SpaceLocation* (*Space* space, *VenueController* controller)

Constructs a space location object with a given space and venue controller objects.

**Parameters:**

- **space**  
*Space* object.
- **controller**

*VenueController* object representing a venue where the space is located.

## SpatialObject

The class *SpatialObject* is a member of *com.here.android.mpa.venues3d*.

### Class Summary

public class **SpatialObject**

*extends java.lang.Object*

This class represents a physical space on a map.

[For complete information, see the section [Class Details](#)]

### Constructor Summary

Table 1392: Constructors in SpatialObject

Constructors
<i>SpatialObject</i> ( <i>SpatialObjectImpl impl</i> )
Package Private Constructor

### Method Summary

Table 1393: Methods in SpatialObject

Methods
public boolean <i>equals</i> (Object o)
public String <i>getId</i> ()
This method retrieves a string which uniquely identifies the given instance of <i>SpatialObject</i> .
public int <i>hashCode</i> ()

### Class Details

This class represents a physical space on a map. This space is defined by a unique identifier.

### Constructor Details

**SpatialObject** (*SpatialObjectImpl impl*)

Package Private Constructor

Parameters:

- *impl*

The impl object to be constructed of.

### Method Details

```
public boolean equals (Object o)
```

**Parameters:**

- `o`

```
public String getId ()
```

This method retrieves a string which uniquely identifies the given instance of `SpatialObject`. The string can be used to specify the space for example, when calling the method `selectAsync(String, String)`.

**Returns:**

A string containing the unique identifier of the object.

```
public int hashCode ()
```

## StyleSettings

The class `StyleSettings` is a member of `com.here.android.mpa.venues3d`.

### Class Summary

```
public class StyleSettings
```

```
extends java.lang.Object
```

Defines style settings for venue and space objects.

[For complete information, see the section [Class Details](#)]

**See also:**

[RoutingController](#)

### Constructor Summary

Table 1394: Constructors in `StyleSettings`

Constructors
<a href="#">StyleSettings ()</a>
Constructs a <code>StyleSettings</code> object.

## Method Summary

Table 1395: Methods in StyleSettings

Methods
<pre>public Integer <a href="#">getFillColor</a> ()</pre> <p>Returns the fill color of the object if it's specified or null otherwise.</p>
<pre>public Integer <a href="#">getLabelFillColor</a> ()</pre> <p>Returns the fill color of the label text of the object if it's specified or null otherwise.</p>
<pre>public Image <a href="#">getLabelImage</a> ()</pre> <p>Returns the image which is shown with the label of the object.</p>
<pre>public String <a href="#">getLabelName</a> ()</pre> <p>Returns the name which is shown in the label of the object.</p>
<pre>public Integer <a href="#">getLabelOutlineColor</a> ()</pre> <p>Returns the outline color of the label text of the object if it's specified or null otherwise.</p>
<pre>public Integer <a href="#">getOutlineColor</a> ()</pre> <p>Returns the outline color of the object if it's specified or null otherwise.</p>
<pre>public Integer <a href="#">getSelectedFillColor</a> ()</pre> <p>Returns the fill color of the object in the selected state if it's specified or null otherwise.</p>
<pre>public Integer <a href="#">getSelectedOutlineColor</a> ()</pre> <p>Returns the outline color of the object in the selected state if it's specified or null otherwise.</p>
<pre>public void <a href="#">setFillColor</a> (Integer color)</pre> <p>Sets the fill color of the object.</p>
<pre>public void <a href="#">setLabelFillColor</a> (Integer color)</pre> <p>Sets the fill color of the label text of the object.</p>
<pre>public void <a href="#">setLabelImage</a> (Image image)</pre> <p>Sets the image which is shown with the label of the object.</p>
<pre>public void <a href="#">setLabelName</a> (String name)</pre> <p>Sets the name which is shown in the label of the object.</p>
<pre>public void <a href="#">setLabelOutlineColor</a> (Integer color)</pre> <p>Sets the outline color of the label text of the object.</p>
<pre>public void <a href="#">setOutlineColor</a> (Integer color)</pre> <p>Sets the outline color of the object.</p>
<pre>public void <a href="#">setSelectedFillColor</a> (Integer color)</pre> <p>Sets the fill color of the object in the selected state.</p>
<pre>public void <a href="#">setSelectedOutlineColor</a> (Integer color)</pre> <p>Sets the outline color of the object in the selected state.</p>

## Class Details

Defines style settings for venue and space objects.

**See also:**

[RoutingController](#)

## Constructor Details

### StyleSettings ()

Constructs a StyleSettings object.

## Method Details

### public Integer getFillColor ()

Returns the fill color of the object if it's specified or null otherwise.

**Returns:**

A color as 32-bit Integer. Format is (in hex): 0xAARRGGBB.

**See also:**

[setFillColor\(Integer\)](#)

### public Integer getLabelFillColor ()

Returns the fill color of the label text of the object if it's specified or null otherwise.

**Returns:**

A color as 32-bit Integer. Format is (in hex): 0xAARRGGBB.

**See also:**

[setLabelFillColor\(Integer\)](#)

### public Image getLabelImage ()

Returns the image which is shown with the label of the object.

**Returns:**

An *Image* which is shown with the label of the object.

**See also:**

[setLabelImage\(Image\)](#)

### public String getLabelName ()

Returns the name which is shown in the label of the object.

**Returns:**

A String which is shown in the label of the object.

**See also:**

[\*setLabelName\(String\)\*](#)

```
public Integer getLabelOutlineColor ()
```

Returns the outline color of the label text of the object if it's specified or null otherwise.

**Returns:**

A color as 32-bit Integer. Format is (in hex): 0xAARRGGBB.

**See also:**

[\*setLabelOutlineColor\(Integer\)\*](#)

```
public Integer getOutlineColor ()
```

Returns the outline color of the object if it's specified or null otherwise.

**Returns:**

A color as 32-bit Integer. Format is (in hex): 0xAARRGGBB.

**See also:**

[\*setOutlineColor\(Integer\)\*](#)

```
public Integer getSelectedFillColor ()
```

Returns the fill color of the object in the selected state if it's specified or null otherwise.

**Returns:**

A color as 32-bit integer. Format is (in hex): 0xAARRGGBB.

**See also:**

[\*setSelectedFillColor\(Integer\)\*](#)

```
public Integer getSelectedOutlineColor ()
```

Returns the outline color of the object in the selected state if it's specified or null otherwise.

**Returns:**

A color as 32-bit Integer. Format is (in hex): 0xAARRGGBB.

**See also:**

[\*setSelectedOutlineColor\(Integer\)\*](#)

```
public void setFillColor (Integer color)
```

Sets the fill color of the object. A color is 32-bit Integer or null if it's not specified.

**Parameters:**

- **color**  
A color as 32-bit Integer. Format is (in hex): 0xAARRGGBB.

**See also:**

[getFillColor\(\)](#)

```
public void setLabelFillColor (Integer color)
```

Sets the fill color of the label text of the object. A color is 32-bit Integer or null if it's not specified.

**Parameters:**

- **color**  
A color as 32-bit Integer. Format is (in hex): 0xAARRGGBB.

**See also:**

[getLabelFillColor\(\)](#)

```
public void setLabelImage (Image image)
```

Sets the image which is shown with the label of the object.

**Parameters:**

- **image**  
A *Image* which is shown with the label of the object.

**See also:**

[getLabelImage\(\)](#)

```
public void setLabelName (String name)
```

Sets the name which is shown in the label of the object.

**Parameters:**

- **name**  
A String which is shown in the label of the object.

**See also:**

[getLabelName\(\)](#)

```
public void setLabelOutlineColor (Integer color)
```

Sets the outline color of the label text of the object. A color is 32-bit Integer or null if it's not specified.

**Parameters:**

- **color**  
A color as 32-bit Integer. Format is (in hex): 0xAARRGGBB.

**See also:**

[getLabelOutlineColor\(\)](#)

```
public void setOutlineColor (Integer color)
```

Sets the outline color of the object. A color is 32-bit Integer or null if it's not specified.

**Parameters:**

- **color**  
A color as 32-bit Integer. Format is (in hex): 0xAARRGGBB.

**See also:**

[getOutlineColor\(\)](#)

```
public void setSelectedFillColor (Integer color)
```

Sets the fill color of the object in the selected state. A color is 32-bit Integer or null if it's not specified.

**Parameters:**

- **color**  
A color as 32-bit Integer. Format is (in hex): 0xAARRGGBB.

**See also:**

[getSelectedFillColor\(\)](#)

```
public void setSelectedOutlineColor (Integer color)
```

Sets the outline color of the object in the selected state. A color is 32-bit Integer or null if it's not specified.

**Parameters:**

- **color**  
A color as 32-bit Integer. Format is (in hex): 0xAARRGGBB.

**See also:**

[getSelectedOutlineColor\(\)](#)

## Venue

The class *Venue* is a member of `com.here.android.mpa.venues3d`.

### Class Summary

public final class **Venue**

*extends java.lang.Object*

This class represents a public building or a group of public buildings on a map.

[For complete information, see the section [Class Details](#)]

**See also:**

[Level](#)

[OuterArea](#)

[Space](#)

[VenueController](#)

### Method Summary

Table 1396: Methods in Venue

Methods
<pre>public boolean equals (Object o)</pre>
<pre>public GeoBoundingBox getBoundingBox ()</pre> <p>This method retrieves the bounding box of the given Venue instance.</p>
<pre>public GeoCoordinate getCenter ()</pre> <p>This method retrieves the center of the bounding box of the given venue.</p>
<pre>public Content getContent ()</pre> <p>This method retrieves the <i>Content</i> object the given Venue instance.</p>
<pre>public String getId ()</pre> <p>This method retrieves a string which uniquely identifies the given venue.</p>
<pre>public java.util.List &lt;Level&gt; getLevels ()</pre> <p>This method retrieves a list of <i>Level</i> objects for the given Venue .</p>
<pre>public java.util.List &lt;Space&gt; getNearbySpaces (Space space, float radius)</pre> <p>This method retrieves spaces that intersect a circle around the center of a space.</p>
<pre>public java.util.List &lt;Space&gt; getSortedSpaces ()</pre> <p>This method retrieves the alphabetically ordered array of <i>Space</i> objects for the given Venue .</p>
<pre>public Space getSpace (String id)</pre> <p>This method retrieves the space or the facility as the <i>Space</i> object based on the given identifier inside this Venue .</p>

## Methods

```
public int hashCode ()
```

---

### Class Details

This class represents a public building or a group of public buildings on a map. Examples of public buildings are shopping malls and airports. Venue objects are based on models stored by the back-end service and constructed as necessary, for example when the map pans to an area where a venue exists. Similarly, when the map is panned away from that area, the venue object is removed from the map view to free up the memory reserved for the venues.

A Venue instance includes one or more [Level](#) objects. A [Level](#) in turn consists of one or more [OuterArea](#) objects. An [OuterArea](#) represents a physical form of an outer area of a level in the building. An [OuterArea](#) typically contains [Space](#) objects that represent, for example, single shops inside the venue.

A Venue cannot be instantiated directly. Instead, an instance can be obtained by calling [getVenue\(\)](#).

#### See also:

[Level](#)

[OuterArea](#)

[Space](#)

[VenueController](#)

### Method Details

```
public boolean equals (Object o)
```

#### Parameters:

- `o`

```
public GeoBoundingBox getBoundingBox ()
```

This method retrieves the bounding box of the given Venue instance.

#### Returns:

An object representing the bounding box that encloses the given venue.

```
public GeoCoordinate getCenter ()
```

This method retrieves the center of the bounding box of the given venue.

#### Returns:

An object containing the geographic coordinates of the center of the bounding box of the given venue.

```
public Content getContent ()
```

This method retrieves the *Content* object the given Venue instance.

**Returns:**

An object representing the venue content.

```
public String getId ()
```

This method retrieves a string which uniquely identifies the given venue.

**Returns:**

The unique identifier of the given Venue object.

```
public java.util.List <Level> getLevels ()
```

This method retrieves a list of *Level* objects for the given Venue . A *Level* consist of one or more *OuterArea* objects.

**Returns:**

The list of *Level* objects.

```
public java.util.List <Space> getNearbySpaces (Space space, float radius)
```

This method retrieves spaces that intersect a circle around the center of a space.

**Parameters:**

- **space**  
The *Space* for which to find nearby spaces.
- **radius**  
The radius in meters of the circle around the center of the space inside of which to search for nearby spaces.

**Returns:**

A (possibly empty) list of nearby spaces.

```
public java.util.List <Space> getSortedSpaces ()
```

This method retrieves the alphabetically ordered array of *Space* objects for the given Venue .

**Returns:**

The list of *Space* objects ordered alphabetically per level, starting from the lowest level.

```
public Space getSpace (String id)
```

This method retrieves the space or the facility as the *Space* object based on the given identifier inside this Venue .

## Parameters:

- **id**

The string containing the Space identifier.

## Returns:

An object representing the requested space or `null` if there is no match for the identifier.

## See also:

[getId\(\)](#)

```
public int hashCode ()
```

## VenueAccount

The class *VenueAccount* is a member of [com.here.android.mpa.venues3d](#) .

### Class Summary

```
public final class VenueAccount
```

```
extends java.lang.Object
```

This class represents a HERE account information used in venue service.

[For complete information, see the section [Class Details](#)]

## See also:

[VenueService](#)

### Method Summary

Table 1397: Methods in VenueAccount

#### Methods

```
public String getDescription ()
```

Returns a string which provides additional information about the given instance of *VenueAccount* .

```
public String getId ()
```

Returns a string which uniquely identifies the given instance of *VenueAccount* .

### Class Details

This class represents a HERE account information used in venue service.

## See also:

[VenueService](#)

### Method Details

```
public String getDescription ()
```

Returns a string which provides additional information about the given instance of `VenueAccount` .

**Returns:**

A string containing the description of the object.

```
public String getId ()
```

Returns a string which uniquely identifies the given instance of `VenueAccount` .

**Returns:**

A string containing the unique identifier of the object.

## VenueController

The class `VenueController` is a member of `com.here.android.mpa.venues3d` .

### Class Summary

```
public final class VenueController
```

```
extends java.lang.Object
```

This class encapsulates interactions of a viewable `Venue`.

[For complete information, see the section [Class Details](#)]

**See also:**

```
addListener\(VenueListener\)
```

### Constructor Summary

Table 1398: Constructors in VenueController

#### Constructors

```
VenueController (VenueControllerImpl impl)
```

### Method Summary

Table 1399: Methods in VenueController

#### Methods

```
public void deselectSpace ()
```

This method deselects the currently selected space.

## Methods

```
public Level getGroundLevel ()
```

This method retrieves an object representing the ground level.

```
public BaseLocation getLocation (PointF tapPoint, boolean preferSpace)
```

Returns the *BaseLocation* object based on the screen pixel coordinates.

```
public int getModelScale ()
```

```
public GeoCoordinate getNormalGeoCoordinate (GeoCoordinate scaledCoord)
```

This method returns normal geocoordinate from scaled geocoordinate used in Venue Zoom.

```
public GeoCoordinate getScaledGeoCoordinate (GeoCoordinate coord)
```

This method returns scaled geocoordinate to be used in Venue Zoom.

```
public Level getSelectedLevel ()
```

This method retrieves an object representing the selected level.

```
public Space getSelectedSpace ()
```

This method retrieves the selected *Space* or null if no space is currently selected.

```
public StyleSettings getStyleSettings ()
```

Returns *StyleSettings* object for the VenueController .

```
public StyleSettings getStyleSettings (Space space)
```

Returns *StyleSettings* object for the specific space.

```
public Venue getVenue ()
```

This method obtains the *Venue* object the given instance of VenueController represents.

```
public void selectLevel (Level level)
```

This method selects the level indicated by the caller.

```
public void selectSpace (Space space)
```

This method selects the space specified by the caller from the given *Venue*.

```
public void setStyleSettings (StyleSettings settings)
```

Sets *StyleSettings* object for the VenueController .

```
public void setStyleSettings (StyleSettings settings, Space space)
```

Sets *StyleSettings* object for the specific space.

```
public boolean useVenueZoom (boolean venueZoomInUse)
```

This method set Venue Zoom on or off.

## Class Details

This class encapsulates interactions of a viewable *Venue*. Methods of this class allow clients to select and deselect *Levels* and *Spaces*.

This class can not be instantiated directly. Instead an instance of this class is returned by various map interaction operations (like tapping the venue in the map) for clients registered as a [VenueMapFragment.VenueListener](#) with [VenueMapFragment](#).

**See also:**

[addListener\(VenueListener\)](#)

## Constructor Details

**VenueController** (VenueControllerImpl impl)

**Parameters:**

- **impl**

## Method Details

**public void deselectSpace ()**

This method deselects the currently selected space.

**public [Level](#) getGroundLevel ()**

This method retrieves an object representing the ground level.

**Returns:**

An object representing the ground level.

**public [BaseLocation](#) getLocation (PointF tapPoint, boolean preferSpace)**

Returns the [BaseLocation](#) object based on the screen pixel coordinates.

**Parameters:**

- **tapPoint**  
The screen pixel coordinates.
- **preferSpace**  
If true and user clicked on the [Space](#), returns the [SpaceLocation](#) object, otherwise returns [LevelLocation](#).

**Returns:**

The [LevelLocation](#) or [SpaceLocation](#) object, if taps point is inside the venue, the [OutdoorLocation](#) object otherwise.

**public int getModelScale ()**

**public [GeoCoordinate](#) getNormalGeoCoordinate ([GeoCoordinate](#) scaledCoord)**

This method returns normal geocoordinate from scaled geocoordinate used in Venue Zoom. In Venue Zoom mode coordinates need to be scaled in order to show map objects properly.

**Parameters:**

- **scaledCoord**  
Scaled coordinate to be converted to normal coodintate.

**Returns:**

Normal geocoordinate from scaled geocoordinate used in Venue Zoom.

```
public GeoCoordinate getScaledGeoCoordinate (GeoCoordinate coord)
```

This method returns scaled geocoordinate to be used in Venue Zoom. In Venue Zoom mode coordinates need to be scaled in order to show map objects properly.

**Parameters:**

- **coord**  
Coordinate to be converted to scale coodintate.

**Returns:**

Scaled geocoordinate to be used in Venue Zoom.

```
public Level getSelectedLevel ()
```

This method retrieves an object representing the selected level.

**Returns:**

An object representing the selected level.

```
public Space getSelectedSpace ()
```

This method retrieves the selected *Space* or null if no space is currently selected.

**Returns:**

An object representing the selected space or null if no space is currently selected.

```
public StyleSettings getStyleSettings ()
```

Returns *StyleSettings* object for the *VenueController* . Style settings can change visual representation of the *VenueController* , including colors for the shape and the label, the name and the icon.

**Returns:**

A *StyleSettings* object for the specific *VenueController* or null if style settings are not set.

```
public StyleSettings getStyleSettings (Space space)
```

Returns *StyleSettings* object for the specific space. Style settings can change visual representation of the space, including colors for the shape and the label, the name and the icon.

**Parameters:**

- **space**  
A *Space* object for which style settings are applied.

**Returns:**

A *StyleSettings* object for the specific space or null if style settings are not set.

```
public Venue getVenue ()
```

This method obtains the *Venue* object the given instance of *VenueController* represents.

**Returns:**

An instance of *Venue*.

```
public void selectLevel (Level level)
```

This method selects the level indicated by the caller. The selected level is viewed as the topmost in the venue. Levels on top of the selected venue are hidden. Levels below the selected venue are obscured by the selected level.

**Parameters:**

- **level**  
A value indicating the level to select.

```
public void selectSpace (Space space)
```

This method selects the space specified by the caller from the given *Venue*.

**Parameters:**

- **space**  
An object indicating the space to select.

```
public void setStyleSettings (StyleSettings settings)
```

Sets *StyleSettings* object for the *VenueController* . Style settings can change visual representation of the *VenueController* , including colors for the shape and the label, the name and the icon.

**Parameters:**

- **settings**  
A *StyleSettings* settings object.

```
public void setStyleSettings (StyleSettings settings, Space space)
```

Sets *StyleSettings* object for the specific space. Style settings can change visual representation of the space, including colors for the shape and the label, the name and the icon.

**Parameters:**

- **settings**  
A *StyleSettings* settings object.
- **space**  
*Space* object for which style settings will be applied.

```
public boolean useVenueZoom (boolean venueZoomInUse)
```

This method set Venue Zoom on or off. Venue Zoom shows venues in enlarged mode. In this mode the map is not visible but is replaced with a grey color.

In order to use Venue Zoom it must be enabled, and Map zoom level must be at least 18.

Use *enableVenueZoom(boolean)* to enable the feature.

**Parameters:**

- **venueZoomInUse**  
Defines whether Venue Zoom is in use or not.

**Returns:**

A boolean value indicating whether the transition was actually done.

## VenueGestureListener

The class *VenueGestureListener* is a member of *com.here.android.mpa.venues3d* .

### Class Summary

```
public class VenueGestureListener
```

```
    implements com.here.android.mpa.mapping.MapGesture.OnGestureListener,  
    com.here.android.mpa.venues3d.VenueMapFragment.VenueListener
```

```
    extends java.lang.Object
```

*VenueGestureListener* provides an application a possibility to use Venue Zoom with conventional pinch zoom gesture.

[For complete information, see the section *Class Details*]

## Constructor Summary

Table 1400: Constructors in VenueGestureListener

Constructors
<code>VenueGestureListener</code> ( <code>VenueLayerAdapter</code> venueLayer, int pixelDensity)

## Method Summary

Table 1401: Methods in VenueGestureListener

Methods
public boolean <code>onDoubleTapEvent</code> (PointF p)
public void <code>onFloorChanged</code> ( <code>Venue</code> venue, <code>Level</code> level, <code>Level</code> level1)
public boolean <code>onLongPressEvent</code> (PointF p)
public void <code>onLongPressRelease</code> ()
public boolean <code>onMapObjectsSelected</code> (java.util.List < <code>ViewObject</code> > objects)
public void <code>onMultiFingerManipulationEnd</code> ()
public void <code>onMultiFingerManipulationStart</code> ()
public void <code>onPanEnd</code> ()
public void <code>onPanStart</code> ()
public void <code>onPinchLocked</code> ()
public boolean <code>onPinchZoomEvent</code> (float scaleFactor, PointF p)
public boolean <code>onRotateEvent</code> (float rotateAngle)
public void <code>onRotateLocked</code> ()
public void <code>onSpaceDeselected</code> ( <code>Venue</code> venue, <code>Space</code> space)
public void <code>onSpaceSelected</code> ( <code>Venue</code> venue, <code>Space</code> space)
public boolean <code>onTapEvent</code> (PointF p)
public boolean <code>onTiltEvent</code> (float angle)
public boolean <code>onTwoFingerTapEvent</code> (PointF p)
public void <code>onVenueDeselected</code> ( <code>Venue</code> venue, <code>DeselectionSource</code> deselectionSource)
public void <code>onVenueSelected</code> ( <code>Venue</code> venue)
public void <code>onVenueTapped</code> ( <code>Venue</code> venue, float v, float v1)
public void <code>onVenueVisibleInViewport</code> ( <code>Venue</code> venue, boolean b)

## Class Details

`VenueGestureListener` provides an application a possibility to use Venue Zoom with conventional pinch zoom gesture. Up to the maximum zoom level supported by *Map*, the gestures are handled by the current default gesture handler. When zooming more in with pinch gesture, the Venue Zoom is activated. Zooming out using pinch gesture will deactivate Venue Zoom and return back to normal zoom range.

## Constructor Details

`VenueGestureListener` (*`VenueLayerAdapter`* venueLayer, int pixelDensity)

Parameters:

- venueLayer
- pixelDensity

## Method Details

```
public boolean onDoubleTapEvent (PointF p)
```

Parameters:

- p

```
public void onFloorChanged (Venue venue, Level level, Level level1)
```

Parameters:

- venue
- level
- level1

```
public boolean onLongPressEvent (PointF p)
```

Parameters:

- p

```
public void onLongPressRelease ()
```

```
public boolean onMapObjectsSelected (java.util.List <ViewObject> objects)
```

Parameters:

- objects

```
public void onMultiFingerManipulationEnd ()
```

```
public void onMultiFingerManipulationStart ()
```

```
public void onPanEnd ()
```

```
public void onPanStart ()
```

```
public void onPinchLocked ()
```

```
public boolean onPinchZoomEvent (float scaleFactor, PointF p)
```

Parameters:

- `scaleFactor`
- `p`

```
public boolean onRotateEvent (float rotateAngle)
```

Parameters:

- `rotateAngle`

```
public void onRotateLocked ()
```

```
public void onSpaceDeselected (Venue venue, Space space)
```

Parameters:

- `venue`
- `space`

```
public void onSpaceSelected (Venue venue, Space space)
```

Parameters:

- `venue`
- `space`

```
public boolean onTapEvent (PointF p)
```

Parameters:

- `p`

```
public boolean onTiltEvent (float angle)
```

Parameters:

- angle

```
public boolean onTwoFingerTapEvent (PointF p)
```

Parameters:

- p

```
public void onVenueDeselected (Venue venue, DeselectionSource deselectionSource)
```

Parameters:

- venue
- deselectionSource

```
public void onVenueSelected (Venue venue)
```

Parameters:

- venue

```
public void onVenueTapped (Venue venue, float v, float v1)
```

Parameters:

- venue
- v
- v1

```
public void onVenueVisibleInViewport (Venue venue, boolean b)
```

Parameters:

- venue
- b

## VenueInfo

The class *VenueInfo* is a member of [com.here.android.mpa.venues3d](#).

## Class Summary

public final class **VenueInfo**

extends *com.here.android.mpa.venues3d.SpatialObject*, *java.lang.Object*

This class encapsulates the identification and location information for a *Venue*.

[For complete information, see the section *Class Details*]

## Method Summary

Table 1402: Methods in VenueInfo

Methods
<pre>public <i>GeoBoundingBox</i> <b>getBoundingBox</b> ()</pre> <p>This method retrieves a bounding box enclosing the venue.</p>
<pre>public boolean <b>getIsAlternativeSource</b> ()</pre> <p>This method returns true if the venue is located in an alternative source.</p>
<pre>public String <b>getName</b> ()</pre> <p>This method retrieves the name of the venue.</p>

## Class Details

This class encapsulates the identification and location information for a *Venue*. An instance of the class is returned by the search methods *getVenuesIn(GeoBoundingBox)* and *getVenueById(String)* of *VenueService*. The *Map* can be centered, based on the geographic coordinates of the venue returned by *getBoundingBox()*. You can open a venue, using the venue identifier returned by *getId()* called on *VenueInfo* .

## Method Details

```
public GeoBoundingBox getBoundingBox ()
```

This method retrieves a bounding box enclosing the venue. A bounding box is an area defined by the minimum and maximum longitudes and latitudes of the venue.

### Returns:

An object representing the bounding box that encloses the venue.

```
public boolean getIsAlternativeSource ()
```

This method returns true if the venue is located in an alternative source. More information about primary and alternative sources can be found in *setIsCombinedContent(boolean)*.

### Returns:

A boolean containing the information if the venue is located in an alternative source.

```
public String getName ()
```

This method retrieves the name of the venue.

**Returns:**

A string containing the name of the venue.

## VenueLayerAdapter

The interface *VenueLayerAdapter* is a member of *com.here.android.mpa.venues3d* .

### Interface Summary

```
public abstract interface VenueLayerAdapter
```

An interface for 3D Venue related functions that both *VenueMapFragment* and *VenueMapView* implements.

[For complete information, see the section *Interface Details*]

### Method Summary

Table 1403: Methods in VenueLayerAdapter

Methods
<pre>public abstract void addListener (VenueListener listener)</pre> <p>This method adds the <i>VenueMapFragment.VenueListener</i> object provided by the caller to the list of active listeners.</p>
<pre>public abstract void addVenueZoomListener (VenueZoomListener listener)</pre> <p>Adds the <i>VenueMapFragment.VenueZoomListener</i> object to the list of active listeners.</p>
<pre>public abstract boolean cancelVenueSelection ()</pre> <p>This method attempts to cancel all <i>Venue</i> loading and selection that may be currently in progress.</p>
<pre>public abstract void deselectVenue ()</pre> <p>This method deselects the currently selected <i>Venue</i>.</p>
<pre>public abstract Activity getActivity ()</pre> <p>This method retrieves an <i>android.app.Activity</i> object associated with this object.</p>
<pre>public abstract CombinedNavigationManager getCombinedNavigationManager ()</pre> <p>This method retrieves a <i>CombinedNavigationManager</i> object, which can be used to navigate <i>CombinedRoute</i> objects.</p>
<pre>public abstract Map getMap ()</pre> <p>This method retrieves a <i>Map</i> object associated with this object.</p>
<pre>public abstract MapGesture getMapGesture ()</pre> <p>This method retrieves a <i>MapGesture</i> object associated with this object.</p>
<pre>public abstract Margin getMargin ()</pre> <p>This method retrieves the margins for the current venue view in screen pixels.</p>

## Methods

```
public abstract VenueNavigationManager getNavigationManager ()
```

This method retrieves a *VenueNavigationManager* object, which can be used to navigate *VenueRoute* objects.

```
public abstract PositionIndicator getPositionIndicator ()
```

Returns the *PositionIndicator* instance that renders the current position with a marker.

```
public abstract RoutingController getRoutingController ()
```

This method retrieves a *RoutingController* object, which can be used to search and get *IRouteSection* objects.

```
public abstract Venue getSelectedVenue ()
```

This method retrieves the selected *Venue* object.

```
public abstract VenueController getVenueController (Venue venue)
```

This method retrieves the instance of *VenueController* for the *Venue* specified by the caller.

```
public abstract VenueService getVenueService ()
```

This method retrieves a *VenueService* object, which can be used to search and get *Venue* objects.

```
public abstract boolean isFloorChangingAnimationEnabled ()
```

This method retrieves a Boolean value indicating whether floor-change animation is enabled.

```
public abstract boolean isHideIconOnSelectedSpaceEnabled ()
```

Check if the icon on a space is hidden when the space is selected.

```
public abstract boolean isOpenModeEnabled ()
```

This method retrieves a Boolean indicating if the open mode is enabled.

```
public abstract boolean isVenueEnteringAnimationEnabled ()
```

This method retrieves a Boolean value indicating whether venue-entry animation is enabled.

```
public abstract boolean isVenueInViewCallbackEnabled ()
```

This method obtains a Boolean value indicating whether *onVenueVisibleInViewport(Venue, boolean)* messages are sent to objects registered as *VenueMapFragment.VenueListener*.

```
public abstract boolean isVenueLayerVisible ()
```

This method retrieves a Boolean indicating the visibility of the venues (the venue layer) on the map.

```
public abstract boolean isVenueVisible (String id)
```

This method checks if a *Venue* is visible.

```
public abstract void removeListener (VenueListener listener)
```

This method removes the *VenueMapFragment.VenueListener* object provided by the caller from the list of listeners, which receive the venue and space related events.

```
public abstract void removeListener (VenueZoomListener listener)
```

Removes given *VenueMapFragment.VenueZoomListener* object from the list of listeners, which receive the Venue Zoom related events.

```
public abstract VenueInfo selectAsync (String venueId, String spaceId)
```

This method selects a *Venue* and a *Space* within it in a 3D view mode.

## Methods

```
public abstract boolean selectVenue (Venue venue)
```

This method selects the *Venue* in a 3D view mode.

```
public abstract VenueInfo selectVenueAsync (String id)
```

This method uses the id provided by the caller to select the corresponding venue in a 3D view mode.

```
public abstract void setFloorChangingAnimation (boolean enabled)
```

This method controls whether or not an animation is used on floor change.

```
public abstract void setHideIconOnSelectedSpaceEnabled (boolean value)
```

Control if the icon on a space should be hidden when the space is selected.

```
public abstract void setMargin (Margin value)
```

This method sets the margins for the current venue view in screen pixels.

```
public abstract void setOpenModeEnabled (boolean value)
```

This method sets a flag indicating whether or not the open mode is enabled.

```
public abstract void setVenueEnteringAnimation (boolean enabled)
```

This method enables or disables an animation used when the venue is opened.

```
public abstract void setVenueLayerVisible (boolean value)
```

This method sets a flag indicating whether or not the venue layer is visible.

```
public abstract void setVenuesInViewPortCallback (boolean enabled)
```

This method a flag to indicate whether [onVenueVisibleInViewPort\(Venue, boolean\)](#) messages are to be sent to objects registered as [VenueMapFragment.VenueListener](#).

## Interface Details

An interface for 3D Venue related functions that both [VenueMapFragment](#) and [VenueMapView](#) implements. This interface makes it easier to re-use code between [VenueMapFragment](#) and [VenueMapView](#) based UI components.

## Method Details

```
public abstract void addListener (VenueListener listener)
```

This method adds the [VenueMapFragment.VenueListener](#) object provided by the caller to the list of active listeners. The [VenueListener](#) object contains method implementations for handling venue- and space-related events, such as selecting and deselecting a venue.

### Parameters:

- **listener**

The [VenueListener](#) object to be added.

### See also:

[removeListener\(VenueListener\)](#)

```
public abstract void addVenueZoomListener (VenueZoomListener listener)
```

Adds the *VenueMapFragment.VenueZoomListener* object to the list of active listeners. The *VenueZoomListener* object contains method implementation for handling Venue Zoom activation and deactivation notification.

**Parameters:**

- **listener**

The *VenueZoomListener* object to be added.

**See also:**

[removeListener\(VenueZoomListener\)](#)

```
public abstract boolean cancelVenueSelection ()
```

This method attempts to cancel all *Venue* loading and selection that may be currently in progress.

**Returns:**

true if venue loading and selection actually have been cancelled, otherwise false.

```
public abstract void deselectVenue ()
```

This method deselects the currently selected *Venue*.

```
public abstract Activity getActivity ()
```

This method retrieves an `android.app.Activity` object associated with this object.

**Returns:**

An `Activity` object.

```
public abstract CombinedNavigationManager getCombinedNavigationManager ()
```

This method retrieves a *CombinedNavigationManager* object, which can be used to navigate *CombinedRoute* objects.

**Returns:**

The *CombinedNavigationManager* object.

```
public abstract Map getMap ()
```

This method retrieves a *Map* object associated with this object.

**Returns:**

A `Map` object.

```
public abstract MapGesture getMapGesture ()
```

This method retrieves a *MapGesture* object associated with this object.

**Returns:**

A *MapGesture* object.

```
public abstract Margin getMargin ()
```

This method retrieves the margins for the current venue view in screen pixels.

**Returns:**

An object representing the venue view margins.

**See also:**

[\*setMargin\(Margin\)\*](#)

```
public abstract VenueNavigationManager getNavigationManager ()
```

This method retrieves a *VenueNavigationManager* object, which can be used to navigate *VenueRoute* objects.

**Returns:**

The *VenueNavigationManager* object.

```
public abstract PositionIndicator getPositionIndicator ()
```

Returns the *PositionIndicator* instance that renders the current position with a marker. The position indicator should be used with *PositioningManager*.

**Returns:**

The *PositionIndicator*

```
public abstract RoutingController getRoutingController ()
```

This method retrieves a *RoutingController* object, which can be used to search and get *IRouteSection* objects.

**Returns:**

A *RoutingController* object, or null if initialization is not completed yet.

```
public abstract Venue getSelectedVenue ()
```

This method retrieves the selected *Venue* object.

**Returns:**

An object representing the selected venue, or null if no venue is selected.

```
public abstract VenueController getVenueController (Venue venue)
```

This method retrieves the instance of *VenueController* for the *Venue* specified by the caller.

**Parameters:**

- **venue**  
An instance of *Venue* for which to retrieve a venue controller object.

**Returns:**

An object representing the venue controller for the venue specified by the caller or `null` if the venue is not assigned to a controller (there is no such venue on the map).

**Throws:**

- **AccessControlException**  
Access to this operation is denied. Contact your HERE representative for more information.

```
public abstract VenueService getVenueService ()
```

This method retrieves a *VenueService* object, which can be used to search and get *Venue* objects.

**Returns:**

A *VenueService* object, or `null` if initialization is not completed yet.

```
public abstract boolean isFloorChangingAnimationEnabled ()
```

This method retrieves a Boolean value indicating whether floor-change animation is enabled.

**Returns:**

`true` if floor changing animation is enabled, otherwise `false`.

**See also:**

[\*setFloorChangingAnimation\(boolean\)\*](#)

```
public abstract boolean isHideIconOnSelectedSpaceEnabled ()
```

Check if the icon on a space is hidden when the space is selected.

**Returns:**

`True` if the icon on a selected space is hidden and `false` otherwise. The default is `true`.

```
public abstract boolean isOpenModeEnabled ()
```

This method retrieves a Boolean indicating if the open mode is enabled. By default the open mode is disabled. In the open mode a user can see outer areas and spaces all the time. A selected floor and a floor stack is always shown. Venues are selected automatically.

**Returns:**

The Boolean value which indicates if the open mode is enabled.

**See also:**

[setOpenModeEnabled\(boolean\)](#)

```
public abstract boolean isVenueEnteringAnimationEnabled ()
```

This method retrieves a Boolean value indicating whether venue-entry animation is enabled.

**Returns:**

true if the venue-entry animation is enabled, otherwise code false}.

**See also:**

[setVenueEnteringAnimation\(boolean\)](#)

```
public abstract boolean isVenueInViewportCallbackEnabled ()
```

This method obtains a Boolean value indicating whether [onVenueVisibleInViewport\(Venue, boolean\)](#) messages are sent to objects registered as [VenueMapFragment.VenueListener](#).

**Returns:**

true if the messages are sent, otherwise false.

```
public abstract boolean isVenueLayerVisible ()
```

This method retrieves a Boolean indicating the visibility of the venues (the venue layer) on the map.

**Returns:**

A Boolean value indicating if the venue layer is visible,

**See also:**

[setVenueLayerVisible\(boolean\)](#)

```
public abstract boolean isVenueVisible (String id)
```

This method checks if a [Venue](#) is visible. It can be used to check if the venue layer has loaded and displayed a specific venue on the map.

**Parameters:**

- **id**  
A string containing the id of the venue to be checked.

**Returns:**

true to indicate that the venue is visible on the map, otherwise false.

**See also:**[getId\(\)](#)

```
public abstract void removeListener (VenueListener listener)
```

This method removes the *VenueMapFragment.VenueListener* object provided by the caller from the list of listeners, which receive the venue and space related events.

**Parameters:**

- **listener**

The *VenueListener* object to be removed.

**See also:**[addListener\(VenueListener\)](#)

```
public abstract void removeListener (VenueZoomListener listener)
```

Removes given *VenueMapFragment.VenueZoomListener* object from the list of listeners, which receive the Venue Zoom related events.

**Parameters:**

- **listener**

The *VenueZoomListener* object to be removed.

**See also:**[addListener\(VenueListener\)](#)

```
public abstract VenueInfo selectAsync (String venueId, String spaceId)
```

This method selects a *Venue* and a *Space* within it in a 3D view mode. The venue and space must match their respective ids as provided by the caller. In the 3D view mode layers and spaces of the venue are visible for the application user. The method is asynchronous, because the venue must be downloaded if it is not already present in the cache. *onVenueSelected(Venue)* callback method is called when the venue have been selected.

**Parameters:**

- **venueId**

The id of the venue to be selected.

- **spaceId**

The id of the space to be selected. If `null`, only the venue is selected.

**Returns:**

An object representing the venue info on success, `null` if no venue was found to match the supplied identifier.

## Throws:

- **AccessControlException**

Access to this operation is denied. Contact your HERE representative for more information.

## See also:

[getId\(\)](#)

[getId\(\)](#)

```
public abstract boolean selectVenue (Venue venue)
```

This method selects the *Venue* in a 3D view mode. In the 3D view mode, layers and spaces of the venue are visible to the application user. This method opens an already downloaded venue. *onVenueSelected(Venue)* callback method is called when the venue has been selected.

## Parameters:

- **venue**

An object representing the venue to be selected.

## Returns:

true, if the venue has been found on the map and opened, otherwise false.

## Throws:

- **AccessControlException**

Access to this operation is denied. Contact your HERE representative for more information.

```
public abstract VenueInfo selectVenueAsync (String id)
```

This method uses the id provided by the caller to select the corresponding venue in a 3D view mode. In the 3D view mode, layers and spaces of the venue are visible for the application user. The method is asynchronous, because the venue must be downloaded if it is not already present in the cache. The callback method *onVenueSelected(Venue)* is called when the venue have been selected.

## Parameters:

- **id**

The identifier of the venue to be selected.

## Returns:

An object representing the venue info on success, null if no venue was found to match the supplied identifier.

## Throws:

- **AccessControlException**

Access to this operation is denied. Contact your HERE representative for more information.

## See also:

[getId\(\)](#)

```
public abstract void setFloorChangingAnimation (boolean enabled)
```

This method controls whether or not an animation is used on floor change. Visible floors can be changed by tapping one of them or by using the venue selector widget. By default animation is not used.

**Parameters:**

- **enabled**

A Boolean value, `true` if the animation is to be enabled, otherwise `false`.

**See also:**

[isFloorChangingAnimationEnabled\(\)](#)

```
public abstract void setHideIconOnSelectedSpaceEnabled (boolean value)
```

Control if the icon on a space should be hidden when the space is selected.

**Parameters:**

- **value**

True if the icon on a selected space should be hidden and false otherwise. The default is true.

```
public abstract void setMargin (Margin value)
```

This method sets the margins for the current venue view in screen pixels. The defaults are (0, 0, 0, 0).

**Parameters:**

- **value**

**See also:**

[getMargin\(\)](#)

```
public abstract void setOpenModeEnabled (boolean value)
```

This method sets a flag indicating whether or not the open mode is enabled. By default the open mode is disabled. In the open mode a user can see outer areas and spaces all the time. A selected floor and a floor stack is always shown. Venues are selected automatically.

Updating the open mode is done in the background, so changes to this property may not be immediately reflected in its value. Changes to this property will deselect a selected venue.

**Parameters:**

- **value**

Boolean value which indicates if the open mode is enabled.

**See also:**

### *isOpenModeEnabled()*

```
public abstract void setVenueEnteringAnimation (boolean enabled)
```

This method enables or disables an animation used when the venue is opened. A visible venue can be entered (opened) by tapping on it. By default animation is not used.

#### Parameters:

- **enabled**

A Boolean value, `true` if the animation is to be enabled, otherwise `false`.

#### See also:

### *isVenueEnteringAnimationEnabled()*

```
public abstract void setVenueLayerVisible (boolean value)
```

This method sets a flag indicating whether or not the venue layer is visible. By default venues are visible.

#### Parameters:

- **value**

A Boolean value indicating if the venues layer is visible, `true` to make the layer visible, `false` to hide the layer.

#### See also:

### *isVenueLayerVisible()*

```
public abstract void setVenuesInViewportCallback (boolean enabled)
```

This method a flag to indicate whether *onVenueVisibleInViewport(Venue, boolean)* messages are to be sent to objects registered as *VenueMapFragment.VenueListener*. By default the message is not sent.

#### Parameters:

- **enabled**

A Boolean, `true` if the messages are to be sent, otherwise `false`.

## VenueManeuver

The class *VenueManeuver* is a member of *com.here.android.mpa.venues3d*.

### Class Summary

```
public class VenueManeuver
```

```
extends java.lang.Object
```

This class represents a single route maneuver of an indoor route section.

[For complete information, see the section [Class Details](#)]

See also:

[VenueRoute](#)

## Nested Class Summary

Table 1404: Nested Classes in VenueManeuver

Nested Classes
<p>public static final enumeration <a href="#">VenueManeuver.ActionType</a></p> <p>This enumeration defines identifiers for enter/exit action types.</p>
<p>public static final enumeration <a href="#">VenueManeuver.ConnectorType</a></p> <p>This enumeration defines values that describe a connector type from one space to other.</p>

## Method Summary

Table 1405: Methods in VenueManeuver

Methods
<p>public boolean <a href="#">equals</a> (Object o)</p>
<p>public <a href="#">ActionType</a> <a href="#">getActionType</a> ()</p> <p>Returns an <a href="#">VenueManeuver.ActionType</a> for this maneuver.</p>
<p>public int <a href="#">getAngle</a> ()</p> <p>The angle in degrees from end of the start road to the start of the end road.</p>
<p>public <a href="#">GeoBoundingBox</a> <a href="#">getBoundingBox</a> ()</p> <p>Gets the <a href="#">GeoBoundingBox</a> of the route subsegment the <a href="#">VenueManeuver</a> belongs to.</p>
<p>public <a href="#">ConnectorType</a> <a href="#">getConnectorType</a> ()</p> <p>Returns a <a href="#">VenueManeuver.ConnectorType</a> for this maneuver.</p>
<p>public float <a href="#">getDistanceFromPreviousManeuver</a> ()</p> <p>Returns a distance of this maneuver from possible previous maneuver.</p>
<p>public float <a href="#">getDistanceFromStart</a> ()</p> <p>Returns a distance of this maneuver from the start of the route section.</p>
<p>public float <a href="#">getDistanceToNextManeuver</a> ()</p> <p>Returns a distance of this maneuver to possible next maneuver.</p>
<p>public int <a href="#">getFloorIndex</a> ()</p> <p>Returns a floor index where maneuver happens.</p>
<p>public <a href="#">GeoCoordinate</a> <a href="#">getGeoCoordinate</a> ()</p> <p>Returns a location a <a href="#">GeoCoordinate</a> of this maneuver.</p>

## Methods

```
public java.util.List <GeoCoordinate> getGeometry ()
```

Returns the geometry of this maneuver.

```
public int getMapOrientation ()
```

Gets the map orientation at the start of the maneuver, in degrees.

```
public String getNaturalGuidancePOI ()
```

Gets the name of the natural guidance POI.

```
public static float getNaturalGuidanceRadius ()
```

Gets the search radius for natural guidance.

```
public Space getSpace ()
```

Returns an [Space](#) object related to this maneuver.

```
public VenueManeuver getTargetManeuver ()
```

Returns a target [VenueManeuver](#) for a series of connectors of the same type (elevator, escalator etc.) which are going in the same direction.

```
public Turn getTurn ()
```

Gets the [Maneuver.Turn](#) required to complete the maneuver.

```
public int hashCode ()
```

```
public static void setNaturalGuidanceRadius (float radius)
```

Sets the search radius for natural guidance.

## Class Details

This class represents a single route maneuver of an indoor route section.

### See also:

[VenueRoute](#)

## Method Details

```
public boolean equals (Object o)
```

### Parameters:

- `o`

```
public ActionType getActionType ()
```

Returns an [VenueManeuver.ActionType](#) for this maneuver.

### Returns:

An action id.

```
public int getAngle ()
```

The angle in degrees from end of the start road to the start of the end road. Angle has a value from 0, 360, north is up, clockwise.

Note: a returned value of zero represents the end road that continues in the same direction as the start road.

**Returns:**

The angle in degrees

```
public GeoBoundingBox getBoundingBox ()
```

Gets the *GeoBoundingBox* of the route subsegment the *VenueManeuver* belongs to.

**Returns:**

A *GeoBoundingBox* object.

```
public ConnectorType getConnectorType ()
```

Returns a *VenueManeuver.ConnectorType* for this maneuver.

**Returns:**

A connector type.

```
public float getDistanceFromPreviousManeuver ()
```

Returns a distance of this maneuver from possible previous maneuver.

**Returns:**

A distance in meters.

```
public float getDistanceFromStart ()
```

Returns a distance of this maneuver from the start of the route section.

**Returns:**

A distance in meters.

```
public float getDistanceToNextManeuver ()
```

Returns a distance of this maneuver to possible next maneuver.

**Returns:**

A distance in meters.

```
public int getFloorIndex ()
```

Returns a floor index where maneuver happens.

**Returns:**

A floor index.

```
public GeoCoordinate getGeoCoordinate ()
```

Returns a location a *GeoCoordinate* of this maneuver.

**Returns:**

A geolocation of the maneuver.

```
public java.util.List <GeoCoordinate> getGeometry ()
```

Returns the geometry of this maneuver.

**Returns:**

The geometry of the maneuver.

```
public int getMapOrientation ()
```

Gets the map orientation at the start of the maneuver, in degrees.

Note: a returned value of zero represents true-north, with increasing values representing a clockwise progression of map orientation.

**Returns:**

The orientation

```
public String getNaturalGuidancePOI ()
```

Gets the name of the natural guidance POI.

**Returns:**

The name of the natural guidance POI or the empty string.

```
public static float getNaturalGuidanceRadius ()
```

Gets the search radius for natural guidance.

**Returns:**

The search radius for natural guidance in meters.

```
public Space getSpace ()
```

Returns an *Space* object related to this maneuver.

**Returns:**

An space object.

```
public VenueManeuver getTargetManeuver ()
```

Returns a target *VenueManeuver* for a series of connectors of the same type (elevator, escalator etc.) which are going in the same direction. We accept some links between connectors, like in case of stairs or escalators. For example, if the user enters an elevator, then the target maneuver will be the exit from it. Otherwise returns null.

**Returns:**

An *VenueManeuver* object.

```
public Turn getTurn ()
```

Gets the *Maneuver.Turn* required to complete the maneuver.

**Returns:**

The *Maneuver.Turn*

```
public int hashCode ()
```

```
public static void setNaturalGuidanceRadius (float radius)
```

Sets the search radius for natural guidance.

**Parameters:**

- **radius**  
The search radius for natural guidance in meters.

## ActionType

The enumeration *ActionType* is a member of *com.here.android.mpa.venues3d.VenueManeuver*.

### Enumeration Summary

```
public static final enumeration VenueManeuver.ActionType
```

```
extends java.lang.Enum, java.lang.Object
```

This enumeration defines identifiers for enter/exit action types.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 1406: Enum Constants in ActionType

Fields
<pre>public static final ActionType NO_ACTION</pre> <p>No action.</p>
<pre>public static final ActionType ENTER</pre> <p>Enter action.</p>
<pre>public static final ActionType EXIT</pre> <p>Exit action.</p>

## Method Summary

Table 1407: Methods in ActionType

Methods
<pre>public static ActionType valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static VenueManeuver.ActionType[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

This enumeration defines identifiers for enter/exit action types.

### Enum Constant Details

```
public static final ActionType NO_ACTION
```

No action.

```
public static final ActionType ENTER
```

Enter action.

```
public static final ActionType EXIT
```

Exit action.

## Method Details

```
public static ActionType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static VenueManeuver.ActionType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## ConnectorType

The enumeration *ConnectorType* is a member of *com.here.android.mpa.venues3d.VenueManeuver*.

### Enumeration Summary

```
public static final enumeration VenueManeuver.ConnectorType
```

```
extends java.lang.Enum, java.lang.Object
```

This enumeration defines values that describe a connector type from one space to other.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 1408: Enum Constants in ConnectorType

Fields
<pre>public static final <i>ConnectorType</i> <b>ELEVATOR</b></pre> <p>An elevator.</p>
<pre>public static final <i>ConnectorType</i> <b>ESCALATOR</b></pre> <p>An escalator.</p>
<pre>public static final <i>ConnectorType</i> <b>STAIRS</b></pre> <p>Stairs.</p>
<pre>public static final <i>ConnectorType</i> <b>SKYWALK</b></pre> <p>A skywalk.</p>
<pre>public static final <i>ConnectorType</i> <b>SHUTTLE</b></pre> <p>A shuttle.</p>

## Fields

```
public static final ConnectorType MOVING_SIDEWALK
```

A moving sidewalk.

```
public static final ConnectorType RAMP
```

A ramp.

```
public static final ConnectorType OTHER_CATEGORY
```

An other connector.

```
public static final ConnectorType NO_CONNECTOR
```

Not a connector.

## Method Summary

Table 1409: Methods in ConnectorType

### Methods

```
public static ConnectorType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static VenueManeuver.ConnectorType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

This enumeration defines values that describe a connector type from one space to other.

### Enum Constant Details

```
public static final ConnectorType ELEVATOR
```

An elevator.

```
public static final ConnectorType ESCALATOR
```

An escalator.

```
public static final ConnectorType STAIRS
```

Stairs.

```
public static final ConnectorType SKYWALK
```

A skywalk.

```
public static final ConnectorType SHUTTLE
```

A shuttle.

```
public static final ConnectorType MOVING_SIDEWALK
```

A moving sidewalk.

```
public static final ConnectorType RAMP
```

A ramp.

```
public static final ConnectorType OTHER_CATEGORY
```

An other connector.

```
public static final ConnectorType NO_CONNECTOR
```

Not a connector.

## Method Details

```
public static ConnectorType valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static VenueManeuver.ConnectorType[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## VenueMapFragment

The class *VenueMapFragment* is a member of *com.here.android.mpa.venues3d* .

### Class Summary

```
public class VenueMapFragment
```

```
implements com.here.android.mpa.venues3d.VenueLayerAdapter
```

extends *com.here.android.mpa.mapping.MapFragment*, *java.lang.Object*

This class extends *MapFragment* and adds support for 3D venues.

[For complete information, see the section [Class Details](#)]

## Nested Class Summary

Table 1410: Nested Classes in VenueMapFragment

Nested Classes
public static abstract interface <i>VenueMapFragment.VenueListener</i>
public static abstract interface <i>VenueMapFragment.VenueZoomListener</i>
Represents a listener to provide notification of the venue service's status upon its initialization.

## Constructor Summary

Table 1411: Constructors in VenueMapFragment

Constructors
<i>VenueMapFragment</i> ()
Constructor

## Method Summary

Table 1412: Methods in VenueMapFragment

Methods
public void <i>addListener</i> ( <i>VenueListener</i> listener)
public void <i>addVenueZoomListener</i> ( <i>VenueZoomListener</i> listener)
public boolean <i>cancelVenueSelection</i> ()
public void <i>deselectVenue</i> ()
public <i>CombinedNavigationManager</i> <i>getCombinedNavigationManager</i> ()
public <i>Margin</i> <i>getMargin</i> ()
public <i>VenueNavigationManager</i> <i>getNavigationManager</i> ()
public <i>PositionIndicator</i> <i>getPositionIndicator</i> ()
public <i>RoutingController</i> <i>getRoutingController</i> ()
public <i>Venue</i> <i>getSelectedVenue</i> ()
public <i>VenueController</i> <i>getVenueController</i> ( <i>Venue</i> venue)
public <i>VenueService</i> <i>getVenueService</i> ()

## Methods

```
public void init (OnEngineInitListener listener)
```

Initializes the *MapEngine* and *VenueService* and displays a map that occupies the entire *MapFragment*'s view rectangle.

```
public void init (Context context, OnEngineInitListener listener)
```

**Deprecated:** As of SDK 3.5.

Initializes the *MapEngine* and *VenueService* and displays a map that occupies the entire *MapFragment*'s view rectangle.

```
public void init (ApplicationContext context, OnEngineInitListener listener)
```

Initializes the *MapEngine* and *VenueService* and displays a map that occupies the entire *MapFragment*'s view rectangle.

```
public void init (OnEngineInitListener listener, VenueServiceListener serviceListener)
```

Initializes the *MapEngine* and *VenueService* and displays a map that occupies the entire *MapFragment*'s view rectangle.

```
public void init (Context context, OnEngineInitListener listener, VenueServiceListener serviceListener)
```

**Deprecated:** As of SDK 3.5.

Initializes the *MapEngine* and *VenueService* and displays a map that occupies the entire *MapFragment*'s view rectangle.

```
public void init (ApplicationContext context, OnEngineInitListener listener, VenueServiceListener serviceListener)
```

Initializes the *MapEngine* and *VenueService* and displays a map that occupies the entire *MapFragment*'s view rectangle.

```
public void init (Context context, MapVariant variant, OnEngineInitListener listener, VenueServiceListener serviceListener)
```

**Deprecated:** As of SDK 3.5.

Initializes the *MapEngine* and *VenueService* and displays a map that occupies the entire *MapFragment*'s view rectangle.

```
public void init (ApplicationContext context, MapVariant variant, OnEngineInitListener listener, VenueServiceListener serviceListener)
```

Initializes the *MapEngine* and *VenueService* and displays a map that occupies the entire *MapFragment*'s view rectangle.

```
public boolean isFloorChangingAnimationEnabled ()
```

```
public boolean isHidelconOnSelectedSpaceEnabled ()
```

```
public boolean isOpenModeEnabled ()
```

```
public boolean isVenueEnteringAnimationEnabled ()
```

```
public boolean isVenueInViewPortCallbackEnabled ()
```

```
public boolean isVenueLayerVisible ()
```

```
public boolean isVenueVisible (String id)
```

```
public void onDestroy ()
```

```
public void onPause ()
```

```
public void onResume ()
```

```
public void removeListener (VenueListener listener)
```

```
public void removeListener (VenueZoomListener listener)
```

## Methods

```
public VenueInfo selectAsync (String venueId, String spaceId)
```

```
public boolean selectVenue (Venue venue)
```

```
public VenueInfo selectVenueAsync (String id)
```

```
public void setFloorChangingAnimation (boolean enabled)
```

```
public void setHideIconOnSelectedSpaceEnabled (boolean value)
```

```
public void setMargin (Margin value)
```

```
public void setOpenModeEnabled (boolean value)
```

```
public void setVenueEnteringAnimation (boolean enabled)
```

```
public void setVenueLayerVisible (boolean value)
```

```
public void setVenuesInViewportCallback (boolean enabled)
```

## Class Details

This class extends [MapFragment](#) and adds support for 3D venues. It allows [Venues](#) such as shopping malls and airports to be shown on the map as interactive 3D models. In addition, it enables the display of spaces inside venues and of venue access information (such as information about entrances).

An instance of `VenueMapFragment` must be initialized by calling its `init(OnEngineInitListener, VenueServiceListener)` method. To enable interactive use an instance of `VenueMapFragment`, add listeners for relevant events to the it as shown in the example below.

```
VenueMapFragment mapFragment = (VenueMapFragment)
    getFragmentManager().findFragmentById(R.id.map_fragment); mapFragment.init(null, new
VenueServiceListener() {
    public void onInitializationCompleted(InitStatus result) {
        if (result == InitStatus.ONLINE_SUCCESS ||
            result == InitStatus.OFFLINE_SUCCESS)
        {
            mapFragment.addListener(venueListener);
        }
    }
    public void onGetVenueCompleted(Venue venue) {
    }
}); // Venue can then be opened on a tap event:
public void onVenueTapped(Venue venue, float x, float y) {
    mapFragment.openVenue(venue);
}
```

See [MapFragment](#) API documentation for more information about the life cycle of the fragment and how to use it in a layout file.

A `VenueMapFragment` is an add-on to the base map functionality with its own content loading and cache. For this reason, if a fragment is not already present in the cache, it needs to be downloaded before it can be displayed and therefore a small delay may occur before the venue appears on the the map.

## Constructor Details

### VenueMapFragment ()

Constructor

## Method Details

```
public void addListener (VenueListener listener)
```

Parameters:

- listener

```
public void addVenueZoomListener (VenueZoomListener listener)
```

Parameters:

- listener

```
public boolean cancelVenueSelection ()
```

```
public void deselectVenue ()
```

```
public CombinedNavigationManager getCombinedNavigationManager ()
```

```
public Margin getMargin ()
```

```
public VenueNavigationManager getNavigationManager ()
```

```
public PositionIndicator getPositionIndicator ()
```

```
public RoutingController getRoutingController ()
```

```
public Venue getSelectedVenue ()
```

```
public VenueController getVenueController (Venue venue)
```

Parameters:

- `venue`

```
public VenueService getVenueService ()
```

```
public void init (OnEngineInitListener listener)
```

Initializes the *MapEngine* and *VenueService* and displays a map that occupies the entire *MapFragment*'s view rectangle.

This method will initialize *MapEngine* with *GLOBAL* map variant on first SDK usage and with stored map variant on sub-subsequent usages.

Note that even after engine initialization, most *VenueMapFragment* features cannot be used until *VenueService* is ready. Listen for this ready status by using *VenueServiceListener.onInitializationCompleted(InitStatus)*.

Due to this requirement, it is recommended to use `init(OnEngineInitListener, VenueServiceListener)` for most cases instead.

**Parameters:**

- `listener`

**See also:**

*init(OnEngineInitListener, VenueServiceListener)*

```
public void init (Context context, OnEngineInitListener listener)
```

**Deprecated:** As of SDK 3.5.

Use `VenueMapFragment#init(ApplicationContext, OnEngineInitListener)` instead.

Initializes the *MapEngine* and *VenueService* and displays a map that occupies the entire *MapFragment*'s view rectangle.

This method will initialize *MapEngine* with *GLOBAL* map variant on first SDK usage and with stored map variant on sub-subsequent usages.

Note that even after engine initialization, most *VenueMapFragment* features cannot be used until *VenueService* is ready. Listen for this ready status by using *VenueServiceListener.onInitializationCompleted(InitStatus)*.

Due to this requirement, it is recommended to use `init(ApplicationContext, OnEngineInitListener, VenueServiceListener)` for most cases instead.

**Parameters:**

- `context`
- `listener`

**See also:**

*init(ApplicationContext, OnEngineInitListener, VenueServiceListener)*

```
public void init (ApplicationContext context, OnEngineInitListener listener)
```

Initializes the *MapEngine* and *VenueService* and displays a map that occupies the entire *MapFragment*'s view rectangle.

This method will initialize *MapEngine* with *GLOBAL* map variant on first SDK usage and with stored map variant on sub-sequent usages.

Note that even after engine initialization, most *VenueMapFragment* features cannot be used until *VenueService* is ready. Listen for this ready status by using *VenueServiceListener.onInitializationCompleted(InitStatus)*.

Due to this requirement, it is recommended to use `init(ApplicationContext, OnEngineInitListener, VenueServiceListener)` for most cases instead.

**Parameters:**

- **context**
- **listener**

**See also:**

[\*init\(ApplicationContext, OnEngineInitListener, VenueServiceListener\)\*](#)

```
public void init (OnEngineInitListener listener, VenueServiceListener serviceListener)
```

Initializes the *MapEngine* and *VenueService* and displays a map that occupies the entire *MapFragment*'s view rectangle. Users of *VenueMapFragment* should call this method after the fragment is first attached to its activity.

This method will initialize *MapEngine* with *GLOBAL* map variant on first SDK usage and with stored map variant on sub-sequent usages.

This method can be used for *VenueMapFragment* objects that are created programmatically or declared in a layout XML file.

**Parameters:**

- **listener**  
A *OnEngineInitListener* object that will be called when *VenueMapFragment* initialization is finished. A null object can be supplied if the caller does not require any notification when initialization completes.
- **serviceListener**  
A *VenueService.VenueServiceListener* object that will be called when *VenueService* initialization is finished. Venue related calls should be made only after the user receives the callback *VenueServiceListener.onInitializationCompleted(InitStatus)*. A null object can be supplied if the caller does not require any notification when initialization completes.

**See also:**

[\*OnEngineInitListener\*](#)

[\*VenueService.VenueServiceListener\*](#)

[\*init\(ApplicationContext, OnEngineInitListener\)\*](#)

*init(ApplicationContext, OnEngineInitListener)*

*init(ApplicationContext, OnEngineInitListener, VenueServiceListener)*

```
public void init (Context context, OnEngineInitListener listener,  
VenueServiceListener serviceListener)
```

Deprecated: As of SDK 3.5.

Use `VenueMapFragment#init(ApplicationContext, OnEngineInitListener, VenueServiceListener)` instead.

Initializes the *MapEngine* and *VenueService* and displays a map that occupies the entire *MapFragment*'s view rectangle. Users of *VenueMapFragment* should call this method after the fragment is first attached to its activity.

This method will initialize *MapEngine* with *GLOBAL* map variant on first SDK usage and with stored map variant on sub-subsequent usages.

#### Parameters:

- **context**  
The application context of this fragment.
- **listener**  
A *OnEngineInitListener* object that will be called when *VenueMapFragment* initialization is finished. A null object can be supplied if the caller does not require any notification when initialization completes.
- **serviceListener**  
A *VenueService.VenueServiceListener* object that will be called when *VenueService* initialization is finished. Venue related calls should be made only after the user receives the callback *VenueServiceListener.onInitializationCompleted(InitStatus)*. A null object can be supplied if the caller does not require any notification when initialization completes.

#### See also:

*OnEngineInitListener*

*VenueService.VenueServiceListener*

*init(ApplicationContext, OnEngineInitListener)*

*init(OnEngineInitListener)*

*init(OnEngineInitListener, VenueServiceListener)*

```
public void init (ApplicationContext context, OnEngineInitListener listener,  
VenueServiceListener serviceListener)
```

Initializes the *MapEngine* and *VenueService* and displays a map that occupies the entire *MapFragment*'s view rectangle. Users of *VenueMapFragment* should call this method after the fragment is first attached to its activity.

This method will initialize *MapEngine* with *GLOBAL* map variant on first SDK usage and with stored map variant on sub-subsequent usages.

**Parameters:**

- **context**

ApplicationContext to be used during initialization.

- **listener**

A *OnEngineInitListener* object that will be called when VenueMapFragment initialization is finished. A null object can be supplied if the caller does not require any notification when initialization completes.

- **serviceListener**

A *VenueService.VenueServiceListener* object that will be called when VenueService initialization is finished. Venue related calls should be made only after the user receives the callback *VenueServiceListener.onInitializationCompleted(InitStatus)*. A null object can be supplied if the caller does not require any notification when initialization completes.

**See also:**

*OnEngineInitListener*

*VenueService.VenueServiceListener*

*init(ApplicationContext, OnEngineInitListener)*

*init(OnEngineInitListener)*

*init(OnEngineInitListener, VenueServiceListener)*

```
public void init (Context context, MapVariant variant, OnEngineInitListener
listener, VenueServiceListener serviceListener)
```

Deprecated: As of SDK 3.5.

Use `VenueMapFragment.init(ApplicationContext, MapVariant, OnEngineInitListener, VenueServiceListener)` instead.

Initializes the *MapEngine* and *VenueService* and displays a map that occupies the entire *MapFragment*'s view rectangle. Users of VenueMapFragment should call this method after the fragment is first attached to its activity.

This method can be used for VenueMapFragment objects that are created programmatically or declared in a layout XML file.

This method can configure map variant which will be used by MapEngine. If initialization fails, OPERATION\_NOT\_ALLOWED will be reported. Currently the following variants are supported:

- - `MapVariant#GLOBAL` - initialize `MapEngine` to use international map variant;
- - `MapVariant#KOREA` - initialize `MapEngine` to use Korean map variant;
- - null - initialize `MapEngine` to use stored map variant or international map variant for first run.

This method is used to configure MapEngine to use certain map variant. If MapEngine was already configured and passed `variant` differs, an error will be reported and initialization fails.

**Parameters:**

- **context**

The application context of this fragment.

- **variant**

Map variant to use.

- **listener**

A *OnEngineInitListener* object that will be called when *VenueMapFragment* initialization is finished. A null object can be supplied if the caller does not require any notification when initialization completes.

- **serviceListener**

A *VenueService.VenueServiceListener* object that will be called when *VenueService* initialization is finished. Venue related calls should be made only after the user receives the callback *VenueServiceListener.onInitializationCompleted(InitStatus)*. A null object can be supplied if the caller does not require any notification when initialization completes.

**See also:**

*OnEngineInitListener*

*VenueService.VenueServiceListener*

*init(ApplicationContext, OnEngineInitListener)*

*init(OnEngineInitListener)*

*init(OnEngineInitListener, VenueServiceListener)*

```
public void init (ApplicationContext context, MapVariant variant,
OnEngineInitListener listener, VenueServiceListener serviceListener)
```

Initializes the *MapEngine* and *VenueService* and displays a map that occupies the entire *MapFragment*'s view rectangle. Users of *VenueMapFragment* should call this method after the fragment is first attached to its activity.

This method can be used for *VenueMapFragment* objects that are created programatically or declared in a layout XML file.

This method can configure map variant which will be used by *MapEngine*. If initialization fails, *OPERATION\_NOT\_ALLOWED* will be reported. Currently the following variants are supported:

- - *MapVariant#GLOBAL* - initialize *MapEngine* to use international map variant;
- - *MapVariant#KOREA* - initialize *MapEngine* to use Korean map variant;
- - null - initialize *MapEngine* to use stored map variant or international map variant for first run.

This method is used to configure *MapEngine* to use certain map variant. If *MapEngine* was already configured and passed *variant* differs, an error will be reported and initialization fails.

**Parameters:**

- **context**

*ApplicationContext* to be used during initialization.

- **variant**

Map variant to use.

- **listener**

A *OnEngineInitListener* object that will be called when *VenueMapFragment* initialization is finished. A null object can be supplied if the caller does not require any notification when initialization completes.

- **serviceListener**

A *VenueService.VenueServiceListener* object that will be called when *VenueService* initialization is finished. Venue related calls should be made only after the user receives the callback *VenueServiceListener.onInitializationCompleted(InitStatus)*. A null object can be supplied if the caller does not require any notification when initialization completes.

**See also:**

*OnEngineInitListener*

*VenueService.VenueServiceListener*

*init(ApplicationContext, OnEngineInitListener)*

*init(OnEngineInitListener)*

*init(OnEngineInitListener, VenueServiceListener)*

```
public boolean isFloorChangingAnimationEnabled ()
```

```
public boolean isHideIconOnSelectedSpaceEnabled ()
```

```
public boolean isOpenModeEnabled ()
```

```
public boolean isVenueEnteringAnimationEnabled ()
```

```
public boolean isVenueInViewportCallbackEnabled ()
```

```
public boolean isVenueLayerVisible ()
```

```
public boolean isVenueVisible (String id)
```

**Parameters:**

- **id**

```
public void onDestroy ()
```

```
public void onPause ()
```

```
public void onResume ()
```

```
public void removeListener (VenueListener listener)
```

Parameters:

- listener

```
public void removeListener (VenueZoomListener listener)
```

Parameters:

- listener

```
public VenueInfo selectAsync (String venueId, String spaceId)
```

Parameters:

- venueId
- spaceId

```
public boolean selectVenue (Venue venue)
```

Parameters:

- venue

```
public VenueInfo selectVenueAsync (String id)
```

Parameters:

- id

```
public void setFloorChangingAnimation (boolean enabled)
```

Parameters:

- enabled

```
public void setHideIconOnSelectedSpaceEnabled (boolean value)
```

Parameters:

- value

```
public void setMargin (Margin value)
```

**Parameters:**

- value

```
public void setOpenModeEnabled (boolean value)
```

**Parameters:**

- value

```
public void setVenueEnteringAnimation (boolean enabled)
```

**Parameters:**

- enabled

```
public void setVenueLayerVisible (boolean value)
```

**Parameters:**

- value

```
public void setVenuesInViewportCallback (boolean enabled)
```

**Parameters:**

- enabled

## VenueListener

The interface *VenueListener* is a member of *com.here.android.mpa.venues3d.VenueMapFragment*.

### Interface Summary

```
public static abstract interface VenueMapFragment.VenueListener
```

[For complete information, see the section [Interface Details](#)]

### Method Summary

Table 1413: Methods in VenueListener

Methods
<pre>public abstract void onFloorChanged (Venue venue, Level oldLevel, Level newLevel)</pre> <p>This callback method is triggered when a floor is changed.</p>
<pre>public abstract void onSpaceDeselected (Venue venue, Space space)</pre> <p>This callback method is triggered when a space is deselected.</p>

## Methods

```
public abstract void onSpaceSelected (Venue venue, Space space)
```

This callback method is triggered when a space is tapped.

```
public abstract void onVenueDeselected (Venue venue, DeselectionSource source)
```

This callback method is triggered when a venue is deselected.

```
public abstract void onVenueSelected (Venue venue)
```

This callback method is triggered when a venue is selected.

```
public abstract void onVenueTapped (Venue venue, float x, float y)
```

This callback method is triggered when a venue is tapped.

```
public abstract void onVenueVisibleInViewport (Venue venue, boolean visible)
```

This callback method is triggered when a venue becomes visible to triggering area, or when a venue disappears from the triggering area.

## Interface Details

### Method Details

```
public abstract void onFloorChanged (Venue venue, Level oldLevel, Level newLevel)
```

This callback method is triggered when a floor is changed.

#### Parameters:

- **venue**  
The *Venue* where the floor is changed.
- **oldLevel**  
The previously selected *Level*.
- **newLevel**  
The currently selected *Level*.

```
public abstract void onSpaceDeselected (Venue venue, Space space)
```

This callback method is triggered when a space is deselected.

#### Parameters:

- **venue**  
The *Venue* with deselected space.
- **space**  
The deselected *Space*.

```
public abstract void onSpaceSelected (Venue venue, Space space)
```

This callback method is triggered when a space is tapped.

**Parameters:**

- **venue**  
The *Venue* with selected space.
- **space**  
The selected *Space*.

```
public abstract void onVenueDeselected (Venue venue, DeselectionSource source)
```

This callback method is triggered when a venue is deselected.

**Parameters:**

- **venue**  
The deselected *Venue*.
- **source**  
The source which has called deselection of the venue.

```
public abstract void onVenueSelected (Venue venue)
```

This callback method is triggered when a venue is selected.

**Parameters:**

- **venue**  
The selected *Venue*.

```
public abstract void onVenueTapped (Venue venue, float x, float y)
```

This callback method is triggered when a venue is tapped.

**Parameters:**

- **venue**  
The tapped *Venue*.
- **x**  
The x screen position on the tapped point.
- **y**  
The y screen position on the tapped point.

```
public abstract void onVenueVisibleInViewport (Venue venue, boolean visible)
```

This callback method is triggered when a venue becomes visible to triggering area, or when a venue disappears from the triggering area. The triggering area is centered to the viewport. The width of the triggering area is  $\frac{2}{3}$  of the screen width and its height is the same as the width.

#### Parameters:

- **venue**  
The *Venue* object or null if there are no visible venues nearby.
- **visible**  
A flag indicating if the venue is visible or not.

## VenueZoomListener

The interface *VenueZoomListener* is a member of *com.here.android.mpa.venues3d.VenueMapFragment*.

### Interface Summary

public static abstract interface **VenueMapFragment.VenueZoomListener**

Represents a listener to provide notification of the venue service's status upon its initialization.

[For complete information, see the section [Interface Details](#)]

### Method Summary

Table 1414: Methods in VenueZoomListener

Methods
public abstract void <i>onVenueZoomUpdated</i> ( <i>Venue</i> venue, boolean active) This callback method is triggered when Venue Zoom is activate or deactivated.

### Interface Details

Represents a listener to provide notification of the venue service's status upon its initialization.

### Method Details

public abstract void **onVenueZoomUpdated** (*Venue* venue, boolean active)

This callback method is triggered when Venue Zoom is activate or deactivated.

#### Parameters:

- **venue**  
The *Venue* object or null where activation or deactivation happened.
- **active**  
A flag indicating if Venue Zoom is active or not.

## VenueMapView

The class *VenueMapView* is a member of *com.here.android.mpa.venues3d*.

### Class Summary

public class **VenueMapView**

*implements* *com.here.android.mpa.venues3d.VenueLayerAdapter*

*extends* *com.here.android.mpa.mapping.MapView*, *java.lang.Object*

This class adds support for 3D venues to a map view.

[For complete information, see the section *Class Details*]

### Constructor Summary

Table 1415: Constructors in VenueMapView

Constructors
<p><i>VenueMapView</i> (Context context)</p> <p>Constructor that initializes the context.</p>
<p><i>VenueMapView</i> (Context context, AttributeSet attrs)</p> <p>Constructor that initializes the context and a set of attributes.</p>

### Method Summary

Table 1416: Methods in VenueMapView

Methods
public void <i>addListener</i> ( <i>VenueListener</i> listener)
public void <i>addVenueZoomListener</i> ( <i>VenueZoomListener</i> listener)
public boolean <i>cancelVenueSelection</i> ()
public void <i>deselectVenue</i> ()
public Activity <i>getActivity</i> ()
public <i>CombinedNavigationManager</i> <i>getCombinedNavigationManager</i> ()
public <i>Margin</i> <i>getMargin</i> ()
public <i>VenueNavigationManager</i> <i>getNavigationManager</i> ()
public <i>PositionIndicator</i> <i>getPositionIndicator</i> ()
public <i>RoutingController</i> <i>getRoutingController</i> ()
public <i>Venue</i> <i>getSelectedVenue</i> ()

## Methods

```
public VenueController getVenueController (Venue venue)
```

```
public VenueService getVenueService ()
```

```
public void init (Activity activity, VenueServiceListener serviceListener)
```

Initializes the *VenueMapView* and *VenueService* and displays a map that occupies the entire view rectangle.

```
public boolean isFloorChangingAnimationEnabled ()
```

```
public boolean isHideIconOnSelectedSpaceEnabled ()
```

```
public boolean isOpenModeEnabled ()
```

```
public boolean isVenueEnteringAnimationEnabled ()
```

```
public boolean isVenueInViewportCallbackEnabled ()
```

```
public boolean isVenueLayerVisible ()
```

```
public boolean isVenueVisible (String id)
```

```
public void onPause ()
```

```
public void onResume ()
```

```
public void removeListener (VenueListener listener)
```

```
public void removeListener (VenueZoomListener listener)
```

```
public VenueInfo selectAsync (String venueId, String spaceId)
```

```
public boolean selectVenue (Venue venue)
```

```
public VenueInfo selectVenueAsync (String id)
```

```
public void setFloorChangingAnimation (boolean enabled)
```

```
public void setHideIconOnSelectedSpaceEnabled (boolean value)
```

```
public void setMargin (Margin value)
```

```
public void setOpenModeEnabled (boolean value)
```

```
public void setVenueEnteringAnimation (boolean enabled)
```

```
public void setVenueLayerVisible (boolean value)
```

```
public void setVenuesInViewportCallback (boolean enabled)
```

## Class Details

This class adds support for 3D venues to a map view. It allows *Venues* such as shopping malls and airports to be shown on the map as interactive 3D models. In addition, it enables the display of spaces inside venues and of venue access information (such as information about entrances).

An instance of `VenueMapView` must be initialized by calling its `init(Activity, VenueService.VenueServiceListener)` method. To enable interactive use an instance of `VenueMapView`, add listeners for relevant events to the it as shown in the example below.

```
VenueMapView m_mapView;
Map m_map; public void onCreate(Bundle savedInstanceState) {
    // ...other initializations...
    m_mapView = (VenueMapView) findViewById(R.id.mapcanvas);
    MapEngine.getInstance().init(this, m_listener);
    // ... other initializations...
} private OnEngineInitListener m_listener = new
OnEngineInitListener() {
    // ...other initializations...
    m_map = new Map();
    m_mapView.setMap(m_map);
    m_mapView.init(m_activity, m_venueServiceListener);
    // ...other initializations...
} private VenueServiceListener m_venueServiceListener = new
VenueServiceListener() {</body>
```

## Constructor Details

### VenueMapView (Context context)

Constructor that initializes the context.

#### Parameters:

- **context**  
Context of the `MapView`.

### VenueMapView (Context context, AttributeSet attrs)

Constructor that initializes the context and a set of attributes.

#### Parameters:

- **context**  
Context of the `MapView`.
- **attrs**  
An `AttributeSet` representing attributes of the `MapView`.

## Method Details

### public void addListener (VenueListener listener)

#### Parameters:

- **listener**

```
public void addVenueZoomListener (VenueZoomListener listener)
```

Parameters:

- `listener`

```
public boolean cancelVenueSelection ()
```

```
public void deselectVenue ()
```

```
public Activity getActivity ()
```

```
public CombinedNavigationManager getCombinedNavigationManager ()
```

```
public Margin getMargin ()
```

```
public VenueNavigationManager getNavigationManager ()
```

```
public PositionIndicator getPositionIndicator ()
```

```
public RoutingController getRoutingController ()
```

```
public Venue getSelectedVenue ()
```

```
public VenueController getVenueController (Venue venue)
```

Parameters:

- `venue`

```
public VenueService getVenueService ()
```

```
public void init (Activity activity, VenueServiceListener serviceListener)
```

Initializes the `VenueMapView` and `VenueService` and displays a map that occupies the entire view rectangle.

Note that even after initialization, most `VenueMapView` features cannot be used until `VenueService` is ready. Listen for this ready status by using `onInitializationCompleted(VenueService.InitStatus)`.

**Parameters:**

- **activity**  
The host activity.
- **serviceListener**  
Listener for the ready status.

```
public boolean isFloorChangingAnimationEnabled ()
```

```
public boolean isHideIconOnSelectedSpaceEnabled ()
```

```
public boolean isOpenModeEnabled ()
```

```
public boolean isVenueEnteringAnimationEnabled ()
```

```
public boolean isVenueInViewportCallbackEnabled ()
```

```
public boolean isVenueLayerVisible ()
```

```
public boolean isVenueVisible (String id)
```

**Parameters:**

- **id**

```
public void onPause ()
```

```
public void onResume ()
```

```
public void removeListener (VenueListener listener)
```

**Parameters:**

- **listener**

```
public void removeListener (VenueZoomListener listener)
```

**Parameters:**

- listener

```
public VenueInfo selectAsync (String venueId, String spaceId)
```

Parameters:

- venueId
- spaceId

```
public boolean selectVenue (Venue venue)
```

Parameters:

- venue

```
public VenueInfo selectVenueAsync (String id)
```

Parameters:

- id

```
public void setFloorChangingAnimation (boolean enabled)
```

Parameters:

- enabled

```
public void setHideIconOnSelectedSpaceEnabled (boolean value)
```

Parameters:

- value

```
public void setMargin (Margin value)
```

Parameters:

- value

```
public void setOpenModeEnabled (boolean value)
```

Parameters:

- value

```
public void setVenueEnteringAnimation (boolean enabled)
```

Parameters:

- enabled

```
public void setVenueLayerVisible (boolean value)
```

**Parameters:**

- value

```
public void setVenuesInViewportCallback (boolean enabled)
```

**Parameters:**

- enabled

## VenueNavigationManager

The class *VenueNavigationManager* is a member of *com.here.android.mpa.venues3d* .

### Class Summary

```
public class VenueNavigationManager
```

```
extends java.lang.Object
```

A navigation manager class that provides guidance advice and information along an indoor route.

[For complete information, see the section *Class Details*]

### Nested Class Summary

Table 1417: Nested Classes in VenueNavigationManager

Nested Classes
<pre>public static final enumeration VenueNavigationManager.NavigationState</pre> <p>The possible states of VenueNavigationManager .</p>
<pre>public static final enumeration VenueNavigationManager.TrackingMode</pre> <p>The mode that is used when map tracking is enabled.</p>
<pre>public static final enumeration VenueNavigationManager.TrackingTilt</pre> <p>The tilt that is used when map tracking is enabled.</p>
<pre>public static abstract interface VenueNavigationManager.VenueNavigationManagerListener</pre> <p>An interface for responding to navigation events sent by the VenueNavigationManager .</p>

## Field Summary

Table 1418: Fields in VenueNavigationManager

Fields
<p>public static final float <code>INVALID_DISTANCE_VALUE</code></p> <p>Represents an invalid distance value.</p>
<p>public static final long <code>INVALID_TIME_INTERVAL_VALUE</code></p> <p>Represents an invalid time interval value.</p>

## Method Summary

Table 1419: Methods in VenueNavigationManager

Methods
<p>public void <code>addListener (VenueNavigationManagerListener listener)</code></p> <p>Adds a listener to the navigation manager.</p>
<p>public boolean <code>areBeepsEnabled ()</code></p>
<p>public float <code>getAverageSpeed ()</code></p> <p>Returns the current average speed in the current navigation session.</p>
<p>public <code>VenueManeuver</code> <code>getCurrentManeuver ()</code></p> <p>Returns the current, upcoming VenueManeuver in the current navigation session.</p>
<p>public float <code>getDistanceFromStart ()</code></p> <p>Returns the current distance from the start point of navigation.</p>
<p>public float <code>getDistanceToCurrentManeuver ()</code></p> <p>Returns the remaining distance to the current VenueManeuver.</p>
<p>public float <code>getDistanceToDestination ()</code></p> <p>Returns the current distance to destination.</p>
<p>public float <code>getDistanceToNextManeuver ()</code></p> <p>Returns the remaining distance to the next VenueManeuver after the current one.</p>
<p>public float <code>getManeuverZoomDistance ()</code></p> <p>Gets the distance from the maneuver at which the maneuver zoom is active.</p>
<p>public float <code>getManeuverZoomLevel ()</code></p> <p>Gets the level to which to zoom in when the maneuver zoom is active.</p>
<p>public <code>TrackingMode</code> <code>getMapTrackingMode ()</code></p> <p>Returns map tracking mode.</p>
<p>public <code>TrackingTilt</code> <code>getMapTrackingTilt ()</code></p> <p>Returns how the map is tilted when map tracking is enabled.</p>

**Methods**

```
public NavigationState getNavigationState ()
```

Gets the current state of the navigation related to the tracked route.

```
public VenueManeuver getNextManeuver ()
```

Returns the next *VenueManeuver* after the current *VenueManeuver* in the current navigation session.

```
public long getReroutingTimeout ()
```

Returns the time interval in seconds, after which the route will be recalculated in case the user moves far away from the current route.

```
public long getTimeToArrival ()
```

Returns the number of seconds that remain to travel to the destination, or *INVALID\_TIME\_INTERVAL\_VALUE* on error.

```
public float getTravelledDistance ()
```

Returns the travelled distance in the current navigation session.

```
public VenueLayerAdapter getVenueLayer ()
```

```
public boolean isManeuverZoomEnabled ()
```

Returns whether zooming in on maneuvers is enabled during navigation.

```
public boolean isMapTrackingEnabled ()
```

Returns true, if `VenueNavigationManager` is allowed to automatically update map position as navigation progresses, false otherwise.

```
public boolean isPaused ()
```

Returns true, if current navigation is paused, false otherwise.

```
public boolean isVibrationEnabled ()
```

Returns whether device vibration is enabled during navigation.

```
public void pause (boolean value)
```

When set to true, the current navigation will be paused (if any).

```
public void removeListener (VenueNavigationManagerListener listener)
```

Removes a listener from the navigation manager.

```
public void setBeepsEnabled (boolean enabled)
```

Enables/disables device beep sounds during navigation.

```
public void setManeuverZoomDistance (float distance)
```

Sets the distance from the maneuver at which the maneuver zoom is active.

```
public void setManeuverZoomEnabled (boolean enabled)
```

Enables/disables zooming in on maneuvers during navigation.

```
public void setManeuverZoomLevel (float level)
```

Sets the level to which to zoom in when the maneuver zoom is active.

```
public void setMapTrackingEnabled (boolean value)
```

Allows the *VenueNavigationManager* to automatically update map position as navigation progresses.

## Methods

```
public void setMapTrackingMode (TrackingMode value)
```

Controls how the map is moved and rotated when map tracking is enabled.

```
public void setMapTrackingTilt (TrackingTilt value)
```

Controls how the map is tilted when map tracking is enabled.

```
public void setReroutingTimeout (long timeoutInSeconds)
```

Sets the rerouting timeout in seconds.

```
public void setVibrationEnabled (boolean enabled)
```

Enables/disables device vibration during navigation.

```
public boolean start (VenueRoute routeSection, CombinedRoute route)
```

Starts a turn-by-turn navigation session using the specified venue route section.

```
public boolean start (LinkingRoute routeSection, CombinedRoute route)
```

Starts a turn-by-turn navigation session using the specified linking route section.

```
public void stop ()
```

Stops a turn-by-turn navigation session started via [start\(VenueRoute, CombinedRoute\)](#).

---

## Class Details

A navigation manager class that provides guidance advice and information along an indoor route.

## Field Details

```
public static final float INVALID\_DISTANCE\_VALUE
```

Represents an invalid distance value.

**See also:**

[getDistanceFromStart\(\)](#)

[getDistanceToCurrentManeuver\(\)](#)

[getDistanceToDestination\(\)](#)

[getDistanceToNextManeuver\(\)](#)

```
public static final long INVALID\_TIME\_INTERVAL\_VALUE
```

Represents an invalid time interval value.

**See also:**

[getTimeToArrival\(\)](#)

## Method Details

`public void addListener (VenueNavigationManagerListener listener)`

Adds a listener to the navigation manager. The listener must implement the *VenueNavigationManager.VenueNavigationManagerListener* interface. The listener receives event callbacks containing information about the current navigation session.

### Parameters:

- `listener`

The *VenueNavigationManager.VenueNavigationManagerListener* object to be added.

`public boolean areBeepsEnabled ()`

### Returns:

Whether beep sounds are enabled during navigation.

### See also:

[\*setBeepsEnabled\(boolean\)\*](#)

`public float getAverageSpeed ()`

Returns the current average speed in the current navigation session.

### Returns:

average speed in m/s.

`public VenueManeuver getCurrentManeuver ()`

Returns the current, upcoming *VenueManeuver* in the current navigation session.

### Returns:

The upcoming *VenueManeuver*. Can be null, if navigation hasn't been started.

`public float getDistanceFromStart ()`

Returns the current distance from the start point of navigation.

### Returns:

the distance from the start point in meters. Returns *INVALID\_DISTANCE\_VALUE* if an error occurred or navigation hasn't been started.

`public float getDistanceToCurrentManeuver ()`

Returns the remaining distance to the current *VenueManeuver*.

**Returns:**

the distance to the current VenueManeuver in meters. Returns *INVALID\_DISTANCE\_VALUE* if an error occurred or if the upcoming maneuver is not available yet.

**See also:**

[getCurrentManeuver\(\)](#)

## public float **getDistanceToDestination** ()

Returns the current distance to destination.

**Returns:**

the distance to destination in meters. Returns *INVALID\_DISTANCE\_VALUE* if an error occurred or navigation hasn't been started.

## public float **getDistanceToNextManeuver** ()

Returns the remaining distance to the next VenueManeuver after the current one.

**Returns:**

the distance to the next VenueManeuver in meters. Returns *INVALID\_DISTANCE\_VALUE* if an error occurred or if the next maneuver is not available yet.

**See also:**

[getNextManeuver\(\)](#)

## public float **getManeuverZoomDistance** ()

Gets the distance from the maneuver at which the maneuver zoom is active.

**Returns:**

The distance to the maneuver in meters.

## public float **getManeuverZoomLevel** ()

Gets the level to which to zoom in when the maneuver zoom is active.

**Returns:**

The zoom level.

## public *TrackingMode* **getMapTrackingMode** ()

Returns map tracking mode. The default value is *FOLLOW*.

**Returns:**

How the map is moved and rotated when map tracking is enabled.

```
public TrackingTilt getMapTrackingTilt ()
```

Returns how the map is tilted when map tracking is enabled. The default value is *TILT3D*.

**Returns:**

How the map is tilted when map tracking is enabled.

```
public NavigationState getNavigationState ()
```

Gets the current state of the navigation related to the tracked route.

**Returns:**

The current state of the navigation related to the tracked route.

```
public VenueManeuver getNextManeuver ()
```

Returns the next *VenueManeuver* after the current *VenueManeuver* in the current navigation session.

**Returns:**

The next *VenueManeuver* after the current one. Can be null, if navigation hasn't been started or when the current *VenueManeuver* is the last one.

**See also:**

[getCurrentManeuver\(\)](#)

```
public long getReroutingTimeout ()
```

Returns the time interval in seconds, after which the route will be recalculated in case the user moves far away from the current route. When the user significantly deviates from the specified route, a new route will be calculated starting from the user's current position after this timeout expires.

**Returns:**

The time interval in seconds, after which the route will be recalculated in case the user moves far away from the current route.

**See also:**

[setReroutingTimeout\(long\)](#)

[onRerouteBegin\(\)](#)

```
public long getTimeToArrival ()
```

Returns the number of seconds that remain to travel to the destination, or *INVALID\_TIME\_INTERVAL\_VALUE* on error.

**Returns:**

The number of seconds that remain to travel to the destination.

```
public float getTravelledDistance ()
```

Returns the travelled distance in the current navigation session.

**Returns:**

travelled distance in meters.

```
public VenueLayerAdapter getVenueLayer ()
```

**Returns:**

The *VenueLayerAdapter* object for this instance of navigation manager.

```
public boolean isManeuverZoomEnabled ()
```

Returns whether zooming in on maneuvers is enabled during navigation.

**Returns:**

true if zooming in on maneuvers is enabled during navigation, and false otherwise.

```
public boolean isMapTrackingEnabled ()
```

Returns true, if @code *VenueNavigationManager* is allowed to automatically update map position as navigation progresses, false otherwise. By default returns true.

**Returns:**

true, if @code *VenueNavigationManager* is allowed to automatically update map position as navigation progresses, false otherwise.

```
public boolean isPaused ()
```

Returns true, if current navigation is paused, false otherwise.

**Returns:**

true, if current navigation is paused, false otherwise.

```
public boolean isVibrationEnabled ()
```

Returns whether device vibration is enabled during navigation.

**Returns:**

true if device vibration is enabled during navigation.

**See also:**

[setVibrationEnabled\(boolean\)](#)

```
public void pause (boolean value)
```

When set to `true`, the current navigation will be paused (if any). When set to `false`, the current navigation will resume if previously paused. This has no effect if there is no navigation currently in progress.

**Parameters:**

- **value**

When set to `true`, the current navigation will be paused (if any).

```
public void removeListener (VenueNavigationManagerListener listener)
```

Removes a listener from the navigation manager. The listener must implement the [VenueNavigationManager.VenueNavigationManagerListener](#) interface. The listener receives event callbacks containing information about the current navigation session.

**Parameters:**

- **listener**

The [VenueNavigationManager.VenueNavigationManagerListener](#) object to be removed.

```
public void setBeepsEnabled (boolean enabled)
```

Enables/disables device beep sounds during navigation. If enabled, these will be triggered on specific navigation events, like maneuver change, rerouting, reaching destination, etc.

**Parameters:**

- **enabled**

Flag to indicate the enable state of device beep sounds.

**See also:**

[areBeepsEnabled\(\)](#)

```
public void setManeuverZoomDistance (float distance)
```

Sets the distance from the maneuver at which the maneuver zoom is active.

**Parameters:**

- **distance**

The distance to the maneuver in meters.

```
public void setManeuverZoomEnabled (boolean enabled)
```

Enables/disables zooming in on maneuvers during navigation.

**Parameters:**

- **enabled**  
Flag to indicate the enable state of maneuver zooming.

**public void setManeuverZoomLevel (float level)**

Sets the level to which to zoom in when the maneuver zoom is active.

**Parameters:**

- **level**  
The zoom level.

**public void setMapTrackingEnabled (boolean value)**

Allows the *VenueNavigationManager* to automatically update map position as navigation progresses.

**Parameters:**

- **value**  
true to enable map tracking, false otherwise.

**public void setMapTrackingMode (*TrackingMode* value)**

Controls how the map is moved and rotated when map tracking is enabled.

**Parameters:**

- **value**  
*VenueNavigationManager.TrackingMode* value to define how the map is moved when map tracking is enabled.

**public void setMapTrackingTilt (*TrackingTilt* value)**

Controls how the map is tilted when map tracking is enabled. In 2D and 3D modes, the map will automatically be tilted back appropriately when the tilt value is changed. In Custom mode, the tilt will not be changed. Use custom mode to allow the map to be manually tilted during navigation or to set the tilt to a fixed custom value.

**Parameters:**

- **value**  
*VenueNavigationManager.TrackingTilt* value to define how the map is tilted when map tracking is enabled.

**public void setReroutingTimeout (long timeoutInSeconds)**

Sets the rerouting timeout in seconds. This is the time interval in seconds, after which the route will be recalculated in case the user moves far away from the current route

**Parameters:**

- **timeoutInSeconds**  
Time interval in seconds.

**See also:**

[getReroutingTimeout\(\)](#)

## `public void setVibrationEnabled (boolean enabled)`

Enables/disables device vibration during navigation. If enabled, vibration will be triggered on specific navigation events, like maneuver change, rerouting, reaching destination, etc.

**Parameters:**

- **enabled**  
Flag to indicate the enable state of device vibration.

**Throws:**

- **AccessControlException**  
in case when there are no `android.permission.VIBRATE` permission granted.

## `public boolean start (VenueRoute routeSection, CombinedRoute route)`

Starts a turn-by-turn navigation session using the specified venue route section.

**Parameters:**

- **routeSection**  
The venue route section to navigate.
- **route**  
The route used to navigate.

**Returns:**

True if started successfully and false otherwise, indicating that the venue route section is invalid or the navigation is already running.

## `public boolean start (LinkingRoute routeSection, CombinedRoute route)`

Starts a turn-by-turn navigation session using the specified linking route section.

**Parameters:**

- **routeSection**  
The linking route section to navigate.
- **route**

The route used to navigate.

**Returns:**

True if started successfully and false otherwise, indicating that the venue route section is invalid or the navigation is already running.

```
public void stop ()
```

Stops a turn-by-turn navigation session started via *start(VenueRoute, CombinedRoute)*.

## NavigationState

The enumeration *NavigationState* is a member of *com.here.android.mpa.venues3d.VenueNavigationManager*.

### Enumeration Summary

```
public static final enumeration VenueNavigationManager.NavigationState
```

```
extends java.lang.Enum, java.lang.Object
```

The possible states of *VenueNavigationManager* .

[For complete information, see the section *Enumeration Details*]

### Enum Constant Summary

Table 1420: Enum Constants in *NavigationState*

Fields
<pre>public static final NavigationState IDLE</pre> <p>No navigation is in progress.</p>
<pre>public static final NavigationState RUNNING</pre> <p>Navigation is in progress and active.</p>
<pre>public static final NavigationState PAUSED</pre> <p>Navigation is in progress but not currently active.</p>

### Method Summary

Table 1421: Methods in *NavigationState*

Methods
<pre>public static NavigationState valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>

## Methods

```
public static VenueNavigationManager.NavigationState[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

---

## Enumeration Details

The possible states of `VenueNavigationManager`.

### Enum Constant Details

```
public static final NavigationState IDLE
```

No navigation is in progress.

```
public static final NavigationState RUNNING
```

Navigation is in progress and active.

```
public static final NavigationState PAUSED
```

Navigation is in progress but not currently active.

### Method Details

```
public static NavigationState valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static VenueNavigationManager.NavigationState[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## TrackingMode

The enumeration `TrackingMode` is a member of `com.here.android.mpa.venues3d.VenueNavigationManager`.

### Enumeration Summary

```
public static final enumeration VenueNavigationManager.TrackingMode
```

*extends java.lang.Enum, java.lang.Object*

The mode that is used when map tracking is enabled.

[For complete information, see the section [Enumeration Details](#)]

## Enum Constant Summary

Table 1422: Enum Constants in TrackingMode

Fields
<pre>public static final TrackingMode FOLLOW</pre> <p>Pan and rotate as object moves.</p>
<pre>public static final TrackingMode NORTH_UP</pre> <p>Only pan to follow object.</p>
<pre>public static final TrackingMode FREE_ROTATION</pre> <p>Only pan to follow object.</p>

## Method Summary

Table 1423: Methods in TrackingMode

Methods
<pre>public int getValue ()</pre>
<pre>public static TrackingMode valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static VenueNavigationManager.TrackingMode[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

The mode that is used when map tracking is enabled.

### Enum Constant Details

```
public static final TrackingMode FOLLOW
```

Pan and rotate as object moves.

```
public static final TrackingMode NORTH_UP
```

Only pan to follow object. Fix orientation to north.

```
public static final TrackingMode FREE_ROTATION
```

Only pan to follow object. Free rotation mode.

## Method Details

```
public int getValue ()
```

```
public static TrackingMode valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static VenueNavigationManager.TrackingMode[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## TrackingTilt

The enumeration *TrackingTilt* is a member of *com.here.android.mpa.venues3d.VenueNavigationManager*.

### Enumeration Summary

```
public static final enumeration VenueNavigationManager.TrackingTilt
```

```
extends java.lang.Enum, java.lang.Object
```

The tilt that is used when map tracking is enabled.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 1424: Enum Constants in TrackingTilt

Fields
<pre>public static final <i>TrackingTilt</i> <b>TILT2D</b></pre> <p>The map will be automatically tilted to a 2D perspective.</p>
<pre>public static final <i>TrackingTilt</i> <b>TILT3D</b></pre> <p>The map will be automatically tilted to a 3D perspective.</p>
<pre>public static final <i>TrackingTilt</i> <b>CUSTOM</b></pre> <p>The map tilt will not be changed.</p>

## Method Summary

Table 1425: Methods in TrackingTilt

Methods
<pre>public int <i>getValue</i> ()</pre>
<pre>public static <i>TrackingTilt</i> <i>valueOf</i> (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static <i>VenueNavigationManager.TrackingTilt[]</i> <i>values</i> ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

The tilt that is used when map tracking is enabled.

### Enum Constant Details

```
public static final TrackingTilt TILT2D
```

The map will be automatically tilted to a 2D perspective.

```
public static final TrackingTilt TILT3D
```

The map will be automatically tilted to a 3D perspective.

```
public static final TrackingTilt CUSTOM
```

The map tilt will not be changed.

## Method Details

```
public int getValue ()
```

```
public static TrackingTilt valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static VenueNavigationManager.TrackingTilt[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## VenueNavigationManagerListener

The interface *VenueNavigationManagerListener* is a member of *com.here.android.mpa.venues3d.VenueNavigationManager*.

### Interface Summary

public static abstract interface **VenueNavigationManager.VenueNavigationManagerListener**

An interface for responding to navigation events sent by the *VenueNavigationManager*.

[For complete information, see the section *Interface Details*]

### Method Summary

Table 1426: Methods in VenueNavigationManagerListener

Methods
<p>public abstract void <b>onCurrentManeuverChanged</b> (<i>VenueManeuver</i> maneuver, <i>VenueManeuver</i> nextManeuver)</p> <p>Called when the current (upcoming) maneuver is updated.</p>
<p>public abstract void <b>onDestinationReached</b> ()</p> <p>Called when the destination of turn-by-turn navigation is reached.</p>
<p>public abstract void <b>onPositionLost</b> ()</p> <p>Called when the navigation manager loses its indoor position.</p>
<p>public abstract void <b>onPositionRestored</b> ()</p> <p>Called when the navigation manager finds its indoor position.</p>
<p>public abstract void <b>onRerouteBegin</b> ()</p> <p>Called when rerouting is triggered due to the user leaving the current route section.</p>
<p>public abstract void <b>onRerouteEnd</b> ()</p> <p>Called when rerouting, due to the user leaving the current route section, has finished.</p>
<p>public abstract void <b>onRouteSectionUpdated</b> (<i>VenueRoute</i> routeSection, <i>CombinedRoute</i> combinedRoute)</p> <p>Called when a change is made to the route section being navigated.</p>

### Interface Details

An interface for responding to navigation events sent by the *VenueNavigationManager*.

## Method Details

```
public abstract void onCurrentManeuverChanged (VenueManeuver maneuver,  
VenueManeuver nextManeuver)
```

Called when the current (upcoming) maneuver is updated. The "current" maneuver is the upcoming, or next, maneuver to be taken. The "next" maneuver is actually the maneuver to be taken after the current maneuver.

### Parameters:

- **maneuver**  
The current (upcoming) maneuver to be made.
- **nextManeuver**  
The maneuver to be made AFTER THE CURRENT MANEUVER.

```
public abstract void onDestinationReached ()
```

Called when the destination of turn-by-turn navigation is reached.

```
public abstract void onPositionLost ()
```

Called when the navigation manager loses its indoor position.

```
public abstract void onPositionRestored ()
```

Called when the navigation manager finds its indoor position.

```
public abstract void onRerouteBegin ()
```

Called when rerouting is triggered due to the user leaving the current route section. If a new route section is successfully calculated, it is immediately applied to the current navigation session and [onRouteSectionUpdated\(VenueRoute, CombinedRoute\)](#) is called. After rerouting, the [onRerouteEnd\(\)](#) is called.

```
public abstract void onRerouteEnd ()
```

Called when rerouting, due to the user leaving the current route section, has finished. This method just means an attempt to reroute finished and does not guarantee that a new route was successfully created.

```
public abstract void onRouteSectionUpdated (VenueRoute routeSection,  
CombinedRoute combinedRoute)
```

Called when a change is made to the route section being navigated. This can occur after successful rerouting due to the user leaving the current route (see [onRerouteBegin\(\)](#)).

### Parameters:

- **routeSection**  
VenueRoute representing the route section that was set.
- **combinedRoute**  
CombinedRoute representing the current route.

## VenueRoute

The class *VenueRoute* is a member of [com.here.android.mpa.venues3d](#) .

### Class Summary

public class **VenueRoute**

implements [com.here.android.mpa.venues3d.IRouteSection](#)

extends [java.lang.Object](#)

Represents a section of the route which is inside a venue.

[For complete information, see the section [Class Details](#)]

**See also:**

[LinkingRoute](#)

[OutdoorRoute](#)

### Method Summary

Table 1427: Methods in VenueRoute

Methods
public boolean <a href="#">equals</a> (Object o)
public <a href="#">GeoBoundingBox</a> <a href="#">getBoundingBox</a> () Gets the <a href="#">GeoBoundingBox</a> of the venue route.
public <a href="#">GeoBoundingBox</a> <a href="#">getBoundingBox</a> (Level level) Gets the <a href="#">GeoBoundingBox</a> of the venue route on the given Level .
public int <a href="#">getLength</a> ()
public <a href="#">RouteSectionType</a> <a href="#">getRouteSectionType</a> () Returns <a href="#">IRouteSection.RouteSectionType</a> of this route section.
public <a href="#">Venue</a> <a href="#">getVenue</a> () Gets the <a href="#">Venue</a> where venue route is located.
public java.util.List < <a href="#">VenueManeuver</a> > <a href="#">getVenueManeuvers</a> () Returns a list of <a href="#">VenueManeuver</a> objects of this route section.
public int <a href="#">hashCode</a> ()

## Class Details

Represents a section of the route which is inside a venue. The route can contain sections that are inside venue, outside venue, and link sections that typically connects indoor and outdoor locations together.

**See also:**

[LinkingRoute](#)

[OutdoorRoute](#)

## Method Details

```
public boolean equals (Object o)
```

**Parameters:**

- `o`

```
public GeoBoundingBox getBoundingBox ()
```

Gets the [GeoBoundingBox](#) of the venue route.

**Returns:**

A [GeoBoundingBox](#) object.

```
public GeoBoundingBox getBoundingBox (Level level)
```

Gets the [GeoBoundingBox](#) of the venue route on the given [Level](#) .

**Parameters:**

- `level`  
The level for which to return the bounding box.

**Returns:**

A [GeoBoundingBox](#) object. Returns null if the route does not touch the given level.

```
public int getLength ()
```

```
public RouteSectionType getRouteSectionType ()
```

Returns [IRouteSection.RouteSectionType](#) of this route section.

```
public Venue getVenue ()
```

Gets the [Venue](#) where venue route is located.

**Returns:**

A Venue object.

```
public java.util.List <VenueManeuver> getVenueManeuvers ()
```

Returns a list of *VenueManeuver* objects of this route section.

**Returns:**

A list of maneuver objects.

```
public int hashCode ()
```

## VenueRouteOptions

The class *VenueRouteOptions* is a member of *com.here.android.mpa.venues3d*.

### Class Summary

```
public class VenueRouteOptions
```

```
extends java.lang.Object
```

Defines routing options used in indoor routing.

[For complete information, see the section *Class Details*]

**See also:**

*RoutingController*

### Constructor Summary

Table 1428: Constructors in VenueRouteOptions

Constructors
<pre>VenueRouteOptions ()</pre> <p>Constructs a VenueRouteOptions object.</p>

### Method Summary

Table 1429: Methods in VenueRouteOptions

Methods
<pre>public boolean areCorridorsPreferred ()</pre> <p>Returns if corridors are preferred.</p>
<pre>public boolean areElevatorsAllowed ()</pre> <p>Checks whether Elevators are allowed.</p>

**Methods**

```
public boolean areEscalatorsAllowed ()
```

Checks whether Escalators are allowed.

```
public boolean areGroundEntrancesPreferred ()
```

Returns if ground entrances are preferred.

```
public boolean areRampsAllowed ()
```

Checks whether Ramps are allowed.

```
public boolean areStairsAllowed ()
```

Checks whether Stairs are allowed.

```
public int getColor (RouteSectionType route_type)
```

Returns color of the route line for the given *IRouteSection.RouteSectionType*.

```
public int getConnectorColor ()
```

Returns color of the route line for an accessor connection.

```
public boolean getFlagsVisible ()
```

Returns visibility status of flags indicating the start and end points of a route.

```
public boolean getIconsVisible ()
```

Returns visibility status of icons indicating entrances and access methods (e.g.

```
public double getIndoorRouteWidth ()
```

Gets a line width for indoor route section of the route.

```
public int getOutdoorRouteWidth ()
```

Gets a line width for outdoor route section of the route.

```
public RouteOptions getRouteOptions ()
```

Returns *RouteOptions* related to this instance.

```
public boolean getRouteVisible (RouteSectionType route_type)
```

Returns visibility status of given *IRouteSection.RouteSectionType*.

```
public boolean isAutoParkingEnabled ()
```

Returns auto parking status.

```
public void setAutoParkingEnabled (boolean enabled)
```

Sets auto parking status.

```
public void setColor (RouteSectionType route_type, int a, int r, int g, int b)
```

Sets color of the route line for the given *IRouteSection.RouteSectionType*.

```
public void setConnectorColor (int a, int r, int g, int b)
```

Sets color of the route line for an accessor connection.

```
public void setCorridorsPreferred (boolean enabled)
```

Sets if corridors are preferred.

## Methods

```
public void setElevatorsAllowed (boolean value)
```

Sets whether Elevators are allowed.

```
public void setEscalatorsAllowed (boolean value)
```

Sets whether Escalators are allowed.

```
public void setFlagsVisible (boolean visible)
```

Sets visibility status of flags indicating the start and end points of a route.

```
public void setGroundEntrancesPreferred (boolean enabled)
```

Sets if ground entrances are preferred.

```
public void setIconVisible (boolean visible)
```

Sets visibility status of possible icons along a route.

```
public void setIndoorRouteWidth (double width)
```

Set a line width for indoor route section of the route.

```
public void setOutdoorRouteWidth (int width)
```

Set a line width for outdoor route section of the route.

```
public void setRampsAllowed (boolean value)
```

Sets whether Ramps are allowed.

```
public void setRouteOptions (RouteOptions options)
```

Sets [RouteOptions](#) related to this instance.

```
public void setRouteVisible (RouteSectionType route_type, boolean visible)
```

Sets visibility status for given [IRouteSection.RouteSectionType](#).

```
public void setStairsAllowed (boolean value)
```

Sets whether Stairs are allowed.

## Class Details

Defines routing options used in indoor routing.

**See also:**

[RoutingController](#)

## Constructor Details

**VenueRouteOptions ()**

Constructs a VenueRouteOptions object.

## Method Details

```
public boolean areCorridorsPreferred ()
```

Returns if corridors are preferred. If true, routing algorithm will try to follow corridors without going through spaces (shops, rooms etc.).

**Returns:**

Corridors are preferred.

**See also:**

[\*setCorridorsPreferred\(boolean\)\*](#)

```
public boolean areElevatorsAllowed ()
```

Checks whether Elevators are allowed.

**Returns:**

true if allowed otherwise false.

```
public boolean areEscalatorsAllowed ()
```

Checks whether Escalators are allowed.

**Returns:**

true if allowed otherwise false.

```
public boolean areGroundEntrancesPreferred ()
```

Returns if ground entrances are preferred. If true, routing algorithm will try to enter venue through ground entrances. Otherwise all entrances will be used equally.

**Returns:**

Ground entrances are preferred.

**See also:**

[\*setGroundEntrancesPreferred\(boolean\)\*](#)

```
public boolean areRampsAllowed ()
```

Checks whether Ramps are allowed.

**Returns:**

true if allowed otherwise false.

```
public boolean areStairsAllowed ()
```

Checks whether Stairs are allowed.

**Returns:**

true if allowed otherwise false.

```
public int getColor (RouteSectionType route_type)
```

Returns color of the route line for the given *IRouteSection.RouteSectionType*.

**Parameters:**

- **route\_type**

Color of given *IRouteSection.RouteSectionType* will be returned.

**Returns:**

A color as 32-bit integer. Format is (in hex): 0xAARRGGBB.

**See also:**

[setColor\(RouteSectionType, int, int, int, int\)](#)

```
public int getConnectorColor ()
```

Returns color of the route line for an accessor connection.

**Returns:**

A color as 32-bit integer. Format is (in hex): 0xAARRGGBB.

**See also:**

[setConnectorColor\(int, int, int, int\)](#)

```
public boolean getFlagsVisible ()
```

Returns visibility status of flags indicating the start and end points of a route.

**Returns:**

true is visible, otherwise false.

**See also:**

[setFlagsVisible\(boolean\)](#)

```
public boolean getIconsVisible ()
```

Returns visibility status of icons indicating entrances and access methods (e.g. stairs, elevators etc.) along the route. For example if the route leads to a different level via stairs, that is indicated by the stairs icon.

**Returns:**

true is visible, otherwise false.

**See also:**

[setIconsVisible\(boolean\)](#)

```
public double getIndoorRouteWidth ()
```

Gets a line width for indoor route section of the route.

**Returns:**

A route line width in meters.

**See also:**

[setIndoorRouteWidth\(double\)](#)

```
public int getOutdoorRouteWidth ()
```

Gets a line width for outdoor route section of the route.

**Returns:**

A route line width in meters.

**See also:**

[setOutdoorRouteWidth\(int\)](#)

```
public RouteOptions getRouteOptions ()
```

Returns [RouteOptions](#) related to this instance.

**Returns:**

The route options.

**See also:**

[setRouteOptions\(RouteOptions\)](#)

```
public boolean getRouteVisible (RouteSectionType route_type)
```

Returns visibility status of given [IRouteSection.RouteSectionType](#).

**Parameters:**

- **route\_type**

Visibility status of given [IRouteSection.RouteSectionType](#) will be returned.

**Returns:**

true is visible, otherwise false

**See also:**

[setRouteVisible\(RouteSectionType, boolean\)](#)

```
public boolean isAutoParkingEnabled ()
```

Returns auto parking status. If auto parking is enabled and there is no manually selected valid parking lots, routing algorithm will automatically select best parking lots and will make route through them.

**Returns:**

Auto parking status.

**See also:**

[setAutoParkingEnabled\(boolean\)](#)

```
public void setAutoParkingEnabled (boolean enabled)
```

Sets auto parking status.

**Parameters:**

- **enabled**  
true if auto parking is enabled, false otherwise.

**See also:**

[isAutoParkingEnabled\(\)](#)

```
public void setColor (RouteSectionType route_type, int a, int r, int g, int b)
```

Sets color of the route line for the given [IRouteSection.RouteSectionType](#).

**Parameters:**

- **route\_type**  
Color of given [IRouteSection.RouteSectionType](#) will be set.
- **a**  
An opacity of the color
- **r**  
A red component of the color
- **g**  
A green component of the color
- **b**  
A blue component of the color

**See also:**

[getColor\(RouteSectionType\)](#)

```
public void setConnectorColor (int a, int r, int g, int b)
```

Sets color of the route line for an accessor connection.

**Parameters:**

- **a**  
An opacity of the color
- **r**  
A red component of the color
- **g**  
A green component of the color
- **b**  
A blue component of the color

See also:

[getColorConnectorColor\(\)](#)

**public void setCorridorsPreferred (boolean enabled)**

Sets if corridors are preferred. If true, routing algorithm will try to follow corridors without going through spaces (shops, rooms etc.).

**Parameters:**

- **enabled**  
true if corridors are preferred, false otherwise.

See also:

[areCorridorsPreferred\(\)](#)

**public void setElevatorsAllowed (boolean value)**

Sets whether Elevators are allowed.

Use [conformsConnectorOptions\(\)](#) to verify if calculated route conforms this option.

**Parameters:**

- **value**  
Use true if allowed, otherwise false.

**public void setEscalatorsAllowed (boolean value)**

Sets whether Escalators are allowed.

Use [conformsConnectorOptions\(\)](#) to verify if calculated route conforms this option.

**Parameters:**

- **value**  
Use true if allowed, otherwise false.

```
public void setFlagsVisible (boolean visible)
```

Sets visibility status of flags indicating the start and end points of a route.

**Parameters:**

- **visible**  
Set true to get flags visible, otherwise false

**See also:**

[getFlagsVisible\(\)](#)

```
public void setGroundEntrancesPreferred (boolean enabled)
```

Sets if ground entrances are preferred. If true, routing algorithm will try to enter venue through ground entrances. Otherwise all entrances will be used equally.

**Parameters:**

- **enabled**  
true if ground entrances are preferred, false otherwise.

**See also:**

[areGroundEntrancesPreferred\(\)](#)

```
public void setIconsVisible (boolean visible)
```

Sets visibility status of possible icons along a route.

**Parameters:**

- **visible**  
true to get icons visible, otherwise false.

**See also:**

[getIconsVisible\(\)](#)

```
public void setIndoorRouteWidth (double width)
```

Set a line width for indoor route section of the route.

**Parameters:**

- **width**  
A route line width in meters. Minimum value is 0.01 and maximum value is 3.0. Default value is 1.2.

**See also:**

[getIndoorRouteWidth\(\)](#)

```
public void setOutdoorRouteWidth (int width)
```

Set a line width for outdoor route section of the route.

**Parameters:**

- **width**

A route line width in meters. Minimum value is 1 and maximum value is 100. Default value is 10.

**See also:**

[getOutdoorRouteWidth\(\)](#)

```
public void setRampsAllowed (boolean value)
```

Sets whether Ramps are allowed.

Use [conformsConnectorOptions\(\)](#) to verify if calculated route conforms this option.

**Parameters:**

- **value**

Use true if allowed, otherwise false.

```
public void setRouteOptions (RouteOptions options)
```

Sets [RouteOptions](#) related to this instance.

**Parameters:**

- **options**

The route options.

**See also:**

[getRouteOptions\(\)](#)

```
public void setRouteVisible (RouteSectionType route_type, boolean visible)
```

Sets visibility status for given [IRouteSection.RouteSectionType](#).

**Parameters:**

- **route\_type**

Set visibility status for given route section type.

- **visible**

Set true to get the route section visible, otherwise false

**See also:**

[getRouteVisible\(RouteSectionType\)](#)

```
public void setStairsAllowed (boolean value)
```

Sets whether Stairs are allowed.

Use [conformsConnectorOptions\(\)](#) to verify if calculated route conforms this option.

**Parameters:**

- **value**  
Use true if allowed, otherwise false.

## VenueService

The class *VenueService* is a member of [com.here.android.mpa.venues3d](#).

### Class Summary

```
public final class VenueService
```

```
extends java.lang.Object
```

VenueService offers methods to search for venues and to get *Venue* objects based on search.

[For complete information, see the section [Class Details](#)]

### Nested Class Summary

Table 1430: Nested Classes in VenueService

Nested Classes
<pre>public static final enumeration VenueService.InitStatus</pre> <p>Represents values that describe the initialization status of the <i>VenueService</i>.</p>
<pre>public static abstract interface VenueService.VenueAuthenticationListener</pre> <p>Represents a listener to provide notification of the venue authentication event.</p>
<pre>public static abstract interface VenueService.VenueLoadListener</pre> <p>Represents a listener to provide notification of the venue load events.</p>
<pre>public static final enumeration VenueService.VenueLoadStatus</pre> <p>Represents values that describe the venue load status of the <i>VenueService</i>.</p>
<pre>public static abstract interface VenueService.VenueServiceClearCacheListener</pre> <p>Represents a listener to provide notification of the venue service's status upon its cache clearing.</p>
<pre>public static abstract interface VenueService.VenueServiceListener</pre> <p>Represents a listener to provide notification of the venue service's status upon its initialization.</p>
<pre>public static abstract interface VenueService.VenueServiceStopListener</pre> <p>Represents a listener to provide notification of the venue service's status upon its stopping.</p>

## Method Summary

Table 1431: Methods in VenueService

Methods
<pre>public void <b>addListener</b> (<i>VenueServiceListener</i> listener)</pre> <p>Adds <i>VenueService.VenueServiceListener</i> object to VenueService object.</p>
<pre>public void <b>addVenueLoadListener</b> (<i>VenueLoadListener</i> listener)</pre> <p>Adds <i>VenueService.VenueLoadListener</i> object to VenueService object.</p>
<pre>public void <b>authenticate</b> (<i>VenueAuthenticationListener</i> listener)</pre> <p>Starts VenueService authentication asynchronously, without starting VenueService .</p>
<pre>public static <i>VenueService</i> <b>createAdditionalService</b> (Context context)</pre> <p>Creates an additional instance of VenueService class.</p>
<pre>public void <b>enableVenueZoom</b> (boolean enable)</pre> <p>Enables or disables Venue Zoom.</p>
<pre>public <i>VenueAccount</i> <b>getActiveVenueAccount</b> ()</pre> <p>Returns the active <i>VenueAccount</i>, if any exists, or null otherwise.</p>
<pre>public <i>InitStatus</i> <b>getInitStatus</b> ()</pre> <p>Returns status of starting the VenueService .</p>
<pre>public static <i>VenueService</i> <b>getInstance</b> (Context context)</pre> <p>Gets an main instance of this class.</p>
<pre>public java.util.List &lt;<i>VenueAccount</i>&gt; <b>getVenueAccounts</b> ()</pre> <p>Returns all available <i>VenueAccount</i> objects, if any.</p>
<pre>public void <b>getVenueAsync</b> (<i>VenueInfo</i> venue)</pre> <p>Asynchronously gets the <i>Venue</i> object that is specified by the given <i>VenueInfo</i> object.</p>
<pre>public <i>VenueInfo</i> <b>getVenueAt</b> (<i>GeoCoordinate</i> point)</pre> <p>Searches for a venue near the given <i>GeoCoordinate</i>.</p>
<pre>public <i>VenueInfo</i> <b>getVenueAt</b> (<i>GeoCoordinate</i> point, float radius)</pre> <p>Searches for a venue near the given <i>GeoCoordinate</i>.</p>
<pre>public <i>VenueInfo</i> <b>getVenueById</b> (String id)</pre> <p>Searches for a venue by the given venue identifier.</p>
<pre>public void <b>getVenuesAsync</b> (java.util.List &lt;<i>VenueInfo</i>&gt; venues)</pre> <p>Asynchronously gets the <i>Venue</i> object that is specified by the given list of <i>VenueInfo</i> objects.</p>
<pre>public void <b>getVenuesAsync</b> (java.util.List &lt;<i>VenueInfo</i>&gt; venues, <i>GeoCoordinate</i> center)</pre> <p>Asynchronously gets the <i>Venue</i> object that is specified by the given list of <i>VenueInfo</i> objects.</p>
<pre>public java.util.List &lt;<i>VenueInfo</i>&gt; <b>getVenuesAt</b> (<i>GeoCoordinate</i> point)</pre> <p>Searches for venues at a given <i>GeoCoordinate</i>.</p>

**Methods**

```
public java.util.List <VenueInfo> getVenuesAt (GeoCoordinate point, float radius)
```

Searches for venues near the given *GeoCoordinate*.

```
public void getVenuesGentlyAsync (java.util.List <VenueInfo> venues, GeoCoordinate center)
```

```
public java.util.List <VenueInfo> getVenuesIn (GeoBoundingBox searchBox)
```

Searches for venues inside the given *GeoBoundingBox*.

```
public boolean isCombinedContent ()
```

Gets a value indicating whether the HERE SDK and the HERE private 3D venue content will be used together.

```
public boolean isDevEnv ()
```

Gets a value indicating whether the development or another backend is used.

```
public boolean isPrivateContent ()
```

Gets a value indicating whether the HERE SDK or the HERE private 3D venue content is to be used.

```
public boolean isSDKContent ()
```

Gets a value indicating whether the HERE SDK or the HERE SUITE content is used.

```
public boolean isTestEnv ()
```

Gets a value indicating whether a normal or a test backend is used.

```
public boolean isVenueZoomEnabled ()
```

Returns boolean value indicating whether Venue Zoom is enabled or not.

```
public void removeListener (VenueServiceListener listener)
```

Removes given *VenueService.VenueServiceListener* object from the list of listeners, which receive the *Venue* related events.

```
public void removeVenueLoadListener (VenueLoadListener listener)
```

Removes given *VenueService.VenueLoadListener* object from the list of listeners, which receive the *Venue* load events.

```
public boolean setActiveVenueAccount (VenueAccount account)
```

Sets an active *VenueAccount* object.

```
public void setDevEnv (boolean useDevEnv)
```

Sets a value indicating whether the development or another backend is used.

```
public void setHereAccountToken (String token)
```

Sets a HERE account token.

```
public void setIsCombinedContent (boolean isCombinedContent)
```

Sets a value indicating whether the HERE SDK and the HERE private 3D venue content will be used together.

```
public void setPrivateContent (boolean isPrivateContent)
```

Sets a value indicating whether the HERE SDK or the HERE private 3D venue content is to be used.

```
public void setTestEnv (boolean useTestEnv)
```

Sets a value indicating whether a normal or a test backend is used.

```
public void startAsync ()
```

Starts *VenueService* asynchronously.

## Methods

```
public static void stopAndClearCache (VenueServiceClearCacheListener listener)
```

Clears cached data including all downloaded venues.

```
public void stopAsync (VenueServiceStopListener stopListener)
```

Stops VenueService asynchronously.

## Class Details

VenueService offers methods to search for venues and to get *Venue* objects based on search. Use of this object does not necessitate *Map* involvement.

This class can not be instantiated directly. Use *getInstance(Context)* method to get an instance of the class instead.

## Method Details

```
public void addListener (VenueServiceListener listener)
```

Adds *VenueService.VenueServiceListener* object to VenueService object.

### Parameters:

- **listener**  
The VenueServiceListener object to be added.

```
public void addVenueLoadListener (VenueLoadListener listener)
```

Adds *VenueService.VenueLoadListener* object to VenueService object.

### Parameters:

- **listener**  
The VenueLoadListener object to be added.

```
public void authenticate (VenueAuthenticationListener listener)
```

Starts VenueService authentication asynchronously, without starting VenueService. Can be used to retrieve information about available [@link VenueAccount](#) object for current HERE account.

An authentication status is returned to the object registered as *VenueService.VenueAuthenticationListener*.

### Parameters:

- **listener**  
*VenueService.VenueAuthenticationListener* object which will be called after authentication is done.

### See also:

[setHereAccountToken\(String\)](#)

[getActiveVenueAccount\(\)](#)

[getVenueAccounts\(\)](#)

[setActiveVenueAccount\(VenueAccount\)](#)

```
public static VenueService createAdditionalService (Context context)
```

Creates an additional instance of `VenueService` class.

**Parameters:**

- **context**  
Android application `android.content.Context`.

**Returns:**

Instance of `VenueService` class.

```
public void enableVenueZoom (boolean enable)
```

Enables or disables Venue Zoom. Venue Zoom allows bigger zoom levels for opened venues. By default Venue Zoom is not used. In order to view a particular venue in Venue Zoom mode, use [VenueGestureListener](#). Alternatively, use [useVenueZoom\(boolean\)](#).

**Parameters:**

- **enable**  
if `true`, Venue Zoom is enabled, otherwise not.

**See also:**

[isVenueZoomEnabled\(\)](#)

```
public VenueAccount getActiveVenueAccount ()
```

Returns the active [VenueAccount](#), if any exists, or null otherwise. A `VenueAccount` object only exists if the user is authenticated with a HERE account token and if the account is connected to at least one private content sources. If an account has been made active by a call to [setActiveVenueAccount\(VenueAccount\)](#), that account is returned. Otherwise, the first account in the list of accounts is returned. `VenueService` will use this account only if private content is active.

**Returns:**

`VenueAccount` object if any exist, and null otherwise.

**See also:**

[setHereAccountToken\(String\)](#)

[authenticate\(VenueAuthenticationListener\)](#)

[getVenueAccounts\(\)](#)

[setActiveVenueAccount\(VenueAccount\)](#)

```
public InitStatus getInitStatus ()
```

Returns status of starting the *VenueService* .

**Returns:**

the *VenueService.InitStatus* of starting the *VenueService*.

```
public static VenueService getInstance (Context context)
```

Gets an main instance of this class.

**Parameters:**

- **context**  
Android application `android.content.Context`.

**Returns:**

Instance of *VenueService* class.

```
public java.util.List <VenueAccount> getVenueAccounts ()
```

Returns all available *VenueAccount* objects, if any. The *VenueAccount* object exists only if the user is authenticated with a HERE account token and if this account is connected to at least one private content sources.

**Returns:**

The array of *VenueAccount*, if any available, empty list otherwise.

**See also:**

[\*setHereAccountToken\(String\)\*](#)

[\*authenticate\(VenueAuthenticationListener\)\*](#)

[\*getActiveVenueAccount\(\)\*](#)

[\*setActiveVenueAccount\(VenueAccount\)\*](#)

```
public void getVenueAsync (VenueInfo venue)
```

Asynchronously gets the *Venue* object that is specified by the given *VenueInfo* object.

Use [\*addListener\(VenueServiceListener\)\*](#) to add object implementing listener for loading completion.

**Parameters:**

- **venue**  
The *VenueInfo* specifying venue to be get.

**Throws:**

- **AccessControlException**

Access to this operation is denied. Contact your HERE representative for more information.

```
public VenueInfo getVenueAt (GeoCoordinate point)
```

Searches for a venue near the given *GeoCoordinate*.

**Parameters:**

- **point**  
Defines a point near which venue is searching.

**Returns:**

The closest *VenueInfo* to the specified point or null if there is no any

```
public VenueInfo getVenueAt (GeoCoordinate point, float radius)
```

Searches for a venue near the given *GeoCoordinate*.

**Parameters:**

- **point**  
Defines a point near which a venue is searching.
- **radius**  
Defines a radius in meters where to search a venue.

**Returns:**

The closest *VenueInfo* to the specified point or null if there is no any

```
public VenueInfo getVenueById (String id)
```

Searches for a venue by the given venue identifier.

**Parameters:**

- **id**  
The venue identifier to be searched.

**Returns:**

*VenueInfo* representing the found venue. Null if no venue found with the given identifier.

**Throws:**

- **AccessControlException**  
Access to this operation is denied. Contact your HERE representative for more information.

**See also:**

[getId\(\)](#)

```
public void getVenuesAsync (java.util.List <VenueInfo> venues)
```

Asynchronously gets the *Venue* object that is specified by the given list of *VenueInfo* objects.

Use *addListener(VenueServiceListener)* to add object implementing listener for loading completion.

**Parameters:**

- **venues**  
The list of *VenueInfo* specifying venues to be get.

**Throws:**

- **IllegalArgumentException**  
if the list of venues is null or empty.
- **AccessControlException**  
Access to this operation is denied. Contact your HERE representative for more information.

```
public void getVenuesAsync (java.util.List <VenueInfo> venues, GeoCoordinate center)
```

Asynchronously gets the *Venue* object that is specified by the given list of *VenueInfo* objects.

Use *addListener(VenueServiceListener)* to add object implementing listener for loading completion.

**Parameters:**

- **venues**  
The list of *VenueInfo* specifying venues to be get.
- **center**  
The center *GeoCoordinate*. The closest venue to the center will be loaded first.

**Throws:**

- **IllegalArgumentException**  
if the list of venues is null or empty.
- **AccessControlException**  
Access to this operation is denied. Contact your HERE representative for more information.

```
public java.util.List <VenueInfo> getVenuesAt (GeoCoordinate point)
```

Searches for venues at a given *GeoCoordinate*.

**Parameters:**

- **point**  
Defines a point at which venues are searching.

**Returns:**

The array of *VenueInfo* found at the specified point

```
public java.util.List <VenueInfo> getVenuesAt (GeoCoordinate point, float radius)
```

Searches for venues near the given GeoCoordinate.

**Parameters:**

- **point**  
Defines a point near which venues are searching.
- **radius**  
Defines a radius in meters where to search venues.

**Returns:**

The array of *VenueInfo* found near the specified point

```
public void getVenuesGentlyAsync (java.util.List <VenueInfo> venues, GeoCoordinate center)
```

**Parameters:**

- **venues**
- **center**

```
public java.util.List <VenueInfo> getVenuesIn (GeoBoundingBox searchBox)
```

Searches for venues inside the given *GeoBoundingBox*.

**Parameters:**

- **searchBox**  
Defines an area in which venues are searching.

**Returns:**

The array of *VenueInfo* found inside the specified area

**Throws:**

- **AccessControlException**  
Access to this operation is denied. Contact your HERE representative for more information.

```
public boolean isCombinedContent ()
```

Gets a value indicating whether the HERE SDK and the HERE private 3D venue content will be used together. By default combined content is not used.

If *VenueService* is using private content, then data from the private content will be used as the primary source, and HERE SDK data as an alternative one. Otherwise HERE SDK content will be the primary source

of data and the private content will be an alternative one. This method needs to be called before starting VenueService with `startAsync()` or, if available, VenueMapLayer with `VenueMapLayer#startAsync()`.

**Returns:**

true if the HERE SDK and the HERE private 3D venue content will be used together, false otherwise.

## public boolean isDevEnv ()

Gets a value indicating whether the development or another backend is used. The backend specified by `setTestEnv` is used by default.

**Returns:**

true if development backend is used, false otherwise.

## public boolean isPrivateContent ()

Gets a value indicating whether the HERE SDK or the HERE private 3D venue content is to be used. The HERE SDK content is used by default.

**Returns:**

true if HERE private 3D venue content is used, false otherwise.

## public boolean isSDKContent ()

Gets a value indicating whether the HERE SDK or the HERE SUITE content is used. The HERE SDK content is used by default.

**Returns:**

true if the HERE SDK content is set, otherwise the HERE SUITE content is used.

## public boolean isTestEnv ()

Gets a value indicating whether a normal or a test backend is used. The normal backend is used by default. The value returned by this method is irrelevant when `isDevEnv()` returns true, because then the development environment is used.

**Returns:**

true if a test backend is used, false otherwise.

## public boolean isVenueZoomEnabled ()

Returns boolean value indicating whether Venue Zoom is enabled or not.

**Returns:**

true if Venue Zoom is enabled, otherwise false.

**See also:**

[enableVenueZoom\(boolean\)](#)

**public void removeListener ([VenueServiceListener](#) listener)**

Removes given [VenueService.VenueServiceListener](#) object from the list of listeners, which receive the [Venue](#) related events.

**Parameters:**

- **listener**  
The [VenueServiceListener](#) object to be removed.

**public void removeVenueLoadListener ([VenueLoadListener](#) listener)**

Removes given [VenueService.VenueLoadListener](#) object from the list of listeners, which receive the [Venue](#) load events.

**Parameters:**

- **listener**  
The [VenueLoadListener](#) object to be removed.

**public boolean setActiveVenueAccount ([VenueAccount](#) account)**

Sets an active [VenueAccount](#) object. In case of success, the user can restart the current [VenueService](#) object with the [startAsync\(\)](#) method to switch to another private content source, related to the new active [VenueAccount](#) object. [VenueService](#) will use this account only if private content is activated.

**Parameters:**

- **account**  
[VenueAccount](#) object which needs to be active.

**Returns:**

true if [VenueAccount](#) was set successfully, false otherwise.

**See also:**

[setHereAccountToken\(String\)](#)

[authenticate\(VenueAuthenticationListener\)](#)

[getActiveVenueAccount\(\)](#)

[getVenueAccounts\(\)](#)

## `public void setDevEnv (boolean useDevEnv)`

Sets a value indicating whether the development or another backend is used. By default, the backend specified by `setTestEnv` is used.

This method needs to be called before starting `VenueService` with `startAsync()` or, if available, `VenueMapLayer` with `VenueMapLayer#startAsync()`. If `VenueService` is already running, stop it first using `stopAsync(VenueService.VenueServiceStopListener)`, and then after calling this method, start it again using `startAsync()`.

### Parameters:

- **useDevEnv**  
if `true`, development environment is set, otherwise the environment specified by `setTestEnv` is used.

## `public void setHereAccountToken (String token)`

Sets a HERE account token. In case of valid token and if private content is used, `VenueService` will be using private bucket of a HERE account instead of private bucket of the app.

### Parameters:

- **token**  
HERE account token. Can be null. In this case the token is removed.

## `public void setIsCombinedContent (boolean isCombinedContent)`

Sets a value indicating whether the HERE SDK and the HERE private 3D venue content will be used together. By default combined content is not used.

If `VenueService` is using private content, then data from the private content will be used as the primary source, and HERE SDK data as an alternative one. Otherwise HERE SDK content will be the primary source of data and the private content will be an alternative one. This method needs to be called before starting `VenueService` with `startAsync()` or, if available, `VenueMapLayer` with `VenueMapLayer#startAsync()`. If `VenueService` is already running, stop it first using `stopAsync(VenueService.VenueServiceStopListener)`, and then after calling this method, start it again using `startAsync()`.

### Parameters:

- **isCombinedContent**  
if `true`, the combined content is set, otherwise one source of data will be used.

## `public void setPrivateContent (boolean isPrivateContent)`

Sets a value indicating whether the HERE SDK or the HERE private 3D venue content is to be used. The HERE SDK content is used by default.

This method needs to be called before starting `VenueService` with `startAsync()` or, if available, `VenueMapLayer` with `VenueMapLayer#startAsync()`. If `VenueService` is already running, stop it first using

`stopAsync(VenueService.VenueServiceStopListener)`, and then after calling this method, start it again using `startAsync()`.

**Parameters:**

- **isPrivateContent**  
if `true`, the PRIVATE content is set, otherwise the HERE SDK content is used.

**public void setTestEnv (boolean useTestEnv)**

Sets a value indicating whether a normal or a test backend is used. The normal backend is used by default. If `setDevEnv` has been set to `true`, this setting is meaningless, as the development environment will be used.

This method needs to be called before starting `VenueService` with `startAsync()` or, if available, `VenueMapLayer` with `VenueMapLayer#startAsync()`. If `VenueService` is already running, stop it first using `stopAsync(VenueService.VenueServiceStopListener)`, and then after calling this method, start it again using `startAsync()`.

**Parameters:**

- **useTestEnv**  
if `true`, test environment is set, otherwise normal environment is used.

**public void startAsync ()**

Starts `VenueService` asynchronously. The method will do nothing if `VenueService` is already initialized with status `ONLINE_SUCCESS`.

An initialization status is returned to objects registered as `VenueService.VenueServiceListener`.

**public static void stopAndClearCache (VenueServiceClearCacheListener listener)**

Clears cached data including all downloaded venues. All running instances of `VenueService` will be stopped asynchronously and locked (`getInitStatus()` will return `LOCKED` during the operation). After cache is cleared, `VenueService` needs to be started again using `startAsync()`.

**Parameters:**

- **listener**  
`VenueServiceClearCacheListener#onVenueServiceCacheCleared()` is called when cache is cleared.

**public void stopAsync (VenueServiceStopListener stopListener)**

Stops `VenueService` asynchronously. The callback interface given as a parameter will be called when the service has been stopped and `Venue` loading is not happening any more. Use `startAsync()` to start `VenueService` again.

**Parameters:**

- `stopListener`

`VenueServiceStopListener#onVenueServiceStopped()` is called when Venue loading has been stopped.

## InitStatus

The enumeration `InitStatus` is a member of `com.here.android.mpa.venues3d.VenueService`.

### Enumeration Summary

public static final enumeration **VenueService.InitStatus**

extends `java.lang.Enum`, `java.lang.Object`

Represents values that describe the initialization status of the `VenueService`.

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 1432: Enum Constants in `InitStatus`

Fields
<pre>public static final InitStatus ONLINE_SUCCESS</pre> <p>The <code>VenueService</code> successfully authenticate on the server and initialized data.</p>
<pre>public static final InitStatus OFFLINE_SUCCESS</pre> <p>The <code>VenueService</code> failed to authenticate on the server, but successfully initialized previously cached data.</p>
<pre>public static final InitStatus AUTH_FAILED</pre> <p>The <code>VenueService</code> failed to authenticate on the server and there is no previously cached data.</p>
<pre>public static final InitStatus INIT_STYLES_FAILED</pre> <p>The <code>VenueService</code> failed to initialize styles.</p>
<pre>public static final InitStatus INIT_ICONS_FAILED</pre> <p>The <code>VenueService</code> failed to initialize icons.</p>
<pre>public static final InitStatus INIT_INDEX_FAILED</pre> <p>The <code>VenueService</code> failed to initialize index file.</p>
<pre>public static final InitStatus ONLINE_FAILED</pre> <p>The <code>VenueService</code> failed to authenticate on the server.</p>
<pre>public static final InitStatus NOT_STARTED</pre> <p>The initialization wasn't started.</p>

### Fields

```
public static final InitStatus IN_PROGRESS
```

The initialization in progress.

```
public static final InitStatus LOCKED
```

The *VenueService* is locked with the method `stopAndClearCache(VenueService.VenueServiceClearCacheListener)`.

## Method Summary

Table 1433: Methods in *InitStatus*

### Methods

```
public static InitStatus valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

```
public static VenueService.InitStatus[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## Enumeration Details

Represents values that describe the initialization status of the *VenueService*.

### Enum Constant Details

```
public static final InitStatus ONLINE_SUCCESS
```

The *VenueService* successfully authenticate on the server and initialized data.

```
public static final InitStatus OFFLINE_SUCCESS
```

The *VenueService* failed to authenticate on the server, but successfully initialized previously cached data.

```
public static final InitStatus AUTH_FAILED
```

The *VenueService* failed to authenticate on the server and there is no previously cached data.

```
public static final InitStatus INIT_STYLES_FAILED
```

The *VenueService* failed to initialize styles.

```
public static final InitStatus INIT_ICONS_FAILED
```

The *VenueService* failed to initialize icons.

```
public static final InitStatus INIT_INDEX_FAILED
```

The VenueService failed to initialize index file.

```
public static final InitStatus ONLINE_FAILED
```

The VenueService failed to authenticate on the server. If *OFFLINE\_SUCCESS* has been previously received, the previously cached data is in use. Otherwise VenueService failed to initialise.

```
public static final InitStatus NOT_STARTED
```

The initialization wasn't started.

```
public static final InitStatus IN_PROGRESS
```

The initialization in progress.

```
public static final InitStatus LOCKED
```

The VenueService is locked with the method *stopAndClearCache(VenueService.VenueServiceClearCacheListener)*. VenueService can't be started until status will be changed to *NOT\_STARTED*.

## Method Details

```
public static InitStatus valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static VenueService.InitStatus[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## VenueAuthenticationListener

The interface *VenueAuthenticationListener* is a member of *com.here.android.mpa.venues3d.VenueService*.

### Interface Summary

```
public static abstract interface VenueService.VenueAuthenticationListener
```

Represents a listener to provide notification of the venue authentication event.

[For complete information, see the section [Interface Details](#)]

## Method Summary

Table 1434: Methods in VenueAuthenticationListener

Methods
<pre>public abstract void <b>onAuthenticationCompleted</b> (boolean result, String errorMessage)</pre> <p>On VenueService authentication callback.</p>

## Interface Details

Represents a listener to provide notification of the venue authentication event.

## Method Details

```
public abstract void onAuthenticationCompleted (boolean result, String errorMessage)
```

On VenueService authentication callback.

### Parameters:

- **result**  
The boolean value which represents the authentication result. Returns `true`, if authentication finished successfully, `false` otherwise.
- **errorMessage**  
The `String` message which returns an error information from the http response in case of failure.

## VenueLoadListener

The interface `VenueLoadListener` is a member of `com.here.android.mpa.venues3d.VenueService`.

## Interface Summary

```
public static abstract interface VenueService.VenueLoadListener
```

Represents a listener to provide notification of the venue load events.

[For complete information, see the section [Interface Details](#)]

## Method Summary

Table 1435: Methods in VenueLoadListener

Methods
<pre>public abstract void onVenueLoadCompleted (Venue venue, VenueInfo info, VenueLoadStatus status)</pre> <p>On Venue loading completed callback.</p>

## Interface Details

Represents a listener to provide notification of the venue load events.

### Method Details

```
public abstract void onVenueLoadCompleted (Venue venue, VenueInfo info, VenueLoadStatus status)
```

On Venue loading completed callback.

If the venue exists in the cache, and there is an updated version available online, this callback function is called two times for one venue. You can check whether the venue given as a parameter is an updated version of a venue already received by comparing them using *equals(Object)* method, or comparing uniques id's of the venues.

#### Parameters:

- **venue**  
The loaded *Venue*. Is null if the venue loading fails.
- **info**  
The *VenueInfo* object related to requested Venue.
- **status**  
The *VenueService.VenueLoadStatus* of the *Venue*.

## VenueLoadStatus

The enumeration *VenueLoadStatus* is a member of *com.here.android.mpa.venues3d.VenueService*.

### Enumeration Summary

```
public static final enumeration VenueService.VenueLoadStatus
```

```
extends java.lang.Enum, java.lang.Object
```

Represents values that describe the venue load status of the *VenueService*.

[For complete information, see the section *Enumeration Details*]

## Enum Constant Summary

Table 1436: Enum Constants in VenueLoadStatus

Fields
<pre>public static final VenueLoadStatus ONLINE_SUCCESS</pre> <p>The VenueService successfully downloaded the venue.</p>
<pre>public static final VenueLoadStatus OFFLINE_SUCCESS</pre> <p>The VenueService successfully returned the cached venue.</p>
<pre>public static final VenueLoadStatus FAILED</pre> <p>The VenueService failed to deliver the venue.</p>

## Method Summary

Table 1437: Methods in VenueLoadStatus

Methods
<pre>public static VenueLoadStatus valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static VenueService.VenueLoadStatus[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

## Enumeration Details

Represents values that describe the venue load status of the *VenueService*.

### Enum Constant Details

```
public static final VenueLoadStatus ONLINE_SUCCESS
```

The VenueService successfully downloaded the venue.

```
public static final VenueLoadStatus OFFLINE_SUCCESS
```

The VenueService successfully returned the cached venue.

```
public static final VenueLoadStatus FAILED
```

The VenueService failed to deliver the venue. The reasons why VenueService failed is unknown.

### Method Details

```
public static VenueLoadStatus valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

#### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static VenueService.VenueLoadStatus[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.

## VenueServiceClearCacheListener

The interface *VenueServiceClearCacheListener* is a member of *com.here.android.mpa.venues3d.VenueService*.

### Interface Summary

```
public static abstract interface VenueService.VenueServiceClearCacheListener
```

Represents a listener to provide notification of the venue service's status upon its cache clearing.

[For complete information, see the section [Interface Details](#)]

### Method Summary

Table 1438: Methods in *VenueServiceClearCacheListener*

Methods
<pre>public abstract void <i>onVenueServiceCacheCleared</i> ()</pre> <p>This callback is called after cache was cleared using <i>stopAndClearCache(VenueService.VenueServiceClearCacheListener)</i>.</p>

### Interface Details

Represents a listener to provide notification of the venue service's status upon its cache clearing.

### Method Details

```
public abstract void onVenueServiceCacheCleared ()
```

This callback is called after cache was cleared using *stopAndClearCache(VenueService.VenueServiceClearCacheListener)*.

## VenueServiceListener

The interface *VenueServiceListener* is a member of *com.here.android.mpa.venues3d.VenueService*.

## Interface Summary

public static abstract interface **VenueService.VenueServiceListener**

Represents a listener to provide notification of the venue service's status upon its initialization.

[For complete information, see the section [Interface Details](#)]

## Method Summary

Table 1439: Methods in VenueServiceListener

Methods
<pre>public abstract void <b>onGetVenueCompleted</b> (<i>Venue</i> venue)</pre> <p>Deprecated: As of SDK 3.3. On Venue loading completed callback.</p>
<pre>public abstract void <b>onInitializationCompleted</b> (<i>InitStatus</i> result)</pre> <p>On VenueService initialization callback.</p>

## Interface Details

Represents a listener to provide notification of the venue service's status upon its initialization.

## Method Details

```
public abstract void onGetVenueCompleted (Venue venue)
```

Deprecated: As of SDK 3.3.

Use [VenueService.VenueLoadListener](#) instead.

On Venue loading completed callback.

If the venue exists in the cache, and there is an updated version available online, this callback function is called two times for one venue. You can check whether the venue given as a parameter is an updated version of a venue already received by comparing them using [equals\(Object\)](#) method, or comparing unqiues id's of the venues.

### Parameters:

- **venue**  
The loaded [Venue](#).

```
public abstract void onInitializationCompleted (InitStatus result)
```

On VenueService initialization callback.

### Parameters:

- **result**  
The [VenueService.InitStatus](#) enum which represent current status of the service.

## VenueServiceStopListener

The interface *VenueServiceStopListener* is a member of *com.here.android.mpa.venues3d.VenueService*.

### Interface Summary

public static abstract interface **VenueService.VenueServiceStopListener**

Represents a listener to provide notification of the venue service's status upon its stopping.

[For complete information, see the section *Interface Details*]

### Method Summary

Table 1440: Methods in VenueServiceStopListener

Methods
<pre>public abstract void <i>onVenueServiceStopped</i> ()</pre>
This callback is called after <i>Venue</i> loading has been stopped using <i>stopAsync(VenueService.VenueServiceStopListener)</i> and no more venues are being loaded any more.

### Interface Details

Represents a listener to provide notification of the venue service's status upon its stopping.

### Method Details

```
public abstract void onVenueServiceStopped ()
```

This callback is called after *Venue* loading has been stopped using *stopAsync(VenueService.VenueServiceStopListener)* and no more venues are being loaded any more.

## VenueSimulatedLocationSource

The class *VenueSimulatedLocationSource* is a member of *com.here.android.mpa.venues3d*.

### Class Summary

public class **VenueSimulatedLocationSource**

extends *com.here.android.mpa.common.LocationDataSource*, *java.lang.Object*

Represents a position data source which is able to simulate indoor positioning based on a provided *VenueRoute* object.

[For complete information, see the section *Class Details*]

## Nested Class Summary

Table 1441: Nested Classes in VenueSimulatedLocationSource

Nested Classes
public static final enumeration <a href="#">VenueSimulatedLocationSource.SimulationState</a> The possible states of VenueSimulatedLocationSource .

## Constructor Summary

Table 1442: Constructors in VenueSimulatedLocationSource

Constructors
VenueSimulatedLocationSource (VenueRoute routeSection, double speed, boolean distortionEnabled) Constructs a simulated location source object.
VenueSimulatedLocationSource (LinkingRoute routeSection, double speed, boolean distortionEnabled) Constructs a simulated location source object.

## Method Summary

Table 1443: Methods in VenueSimulatedLocationSource

Methods
public int <a href="#">getGpsStatus</a> ()
public int <a href="#">getIndoorStatus</a> ()
public Location <a href="#">getLastKnownLocation</a> ()
public int <a href="#">getNetworkStatus</a> ()
public SimulationState <a href="#">getSimulationState</a> () Gets the current state of the simulation related to the tracked route.
public double <a href="#">getUpdatesInterval</a> ()
public boolean <a href="#">isPaused</a> () Returns true , if current simulation is paused, false otherwise.
public void <a href="#">pause</a> (boolean value) When set to true , the current simulation will be paused (if any).
public void <a href="#">setUpdatesInterval</a> (double seconds) Changes the interval between two consecutive simulated indoor position changes.
public boolean <a href="#">start</a> (LocationMethod method)
public void <a href="#">stop</a> ()

## Class Details

Represents a position data source which is able to simulate indoor positioning based on a provided `VenueRoute` object.

## Constructor Details

`VenueSimulatedLocationSource` (*`VenueRoute`* `routeSection`, `double` `speed`, `boolean` `distortionEnabled`)

Constructs a simulated location source object.

### Parameters:

- `routeSection`  
The venue route section for which to simulate the location.
- `speed`  
The speed at which the simulated location changes in meters per second.
- `distortionEnabled`  
If enabled, each generated position will be distorted with some random factor

`VenueSimulatedLocationSource` (*`LinkingRoute`* `routeSection`, `double` `speed`, `boolean` `distortionEnabled`)

Constructs a simulated location source object.

### Parameters:

- `routeSection`  
The linking route section for which to simulate the location.
- `speed`  
The speed at which the simulated location changes in meters per second.
- `distortionEnabled`  
If enabled, each generated position will be distorted with some random factor

## Method Details

```
public int getGpsStatus ()
```

```
public int getIndoorStatus ()
```

```
public Location getLastKnownLocation ()
```

```
public int getNetworkStatus ()
```

```
public SimulationState getSimulationState ()
```

Gets the current state of the simulation related to the tracked route.

```
public double getUpdatesInterval ()
```

**Returns:**

Interval in seconds between two consecutive updates of simulated indoor positions.

**See also:**

[\*setUpdatesInterval\(double\)\*](#)

```
public boolean isPaused ()
```

Returns `true` , if current simulation is paused, `false` otherwise.

**Returns:**

`true`, if current simulation is paused, `false` otherwise.

```
public void pause (boolean value)
```

When set to `true` , the current simulation will be paused (if any). When set to `false` , the current simulation will resume if previously paused. This has no effect if there is no simulation currently in progress.

**Parameters:**

- **value**  
When set to `true`, the current simulation will be paused (if any).

```
public void setUpdatesInterval (double seconds)
```

Changes the interval between two consecutive simulated indoor position changes. This affects the smoothness of simulation.

**Parameters:**

- **seconds**  
Time in seconds

```
public boolean start (LocationMethod method)
```

**Parameters:**

- **method**

```
public void stop ()
```

## SimulationState

The enumeration *SimulationState* is a member of *com.here.android.mpa.venues3d.VenueSimulatedLocationSource*.

### Enumeration Summary

```
public static final enumeration VenueSimulatedLocationSource.SimulationState
extends java.lang.Enum, java.lang.Object
```

The possible states of *VenueSimulatedLocationSource* .

[For complete information, see the section [Enumeration Details](#)]

### Enum Constant Summary

Table 1444: Enum Constants in *SimulationState*

Fields
<pre>public static final SimulationState IDLE</pre> <p>No simulation is in progress.</p>
<pre>public static final SimulationState RUNNING</pre> <p>Simulation is in progress and active.</p>
<pre>public static final SimulationState PAUSED</pre> <p>Simulation is in progress but not currently active.</p>

### Method Summary

Table 1445: Methods in *SimulationState*

Methods
<pre>public static SimulationState valueOf (String name)</pre> <p>This method retrieves the enumeration value that matches the name specified by the caller.</p>
<pre>public static VenueSimulatedLocationSource.SimulationState[] values ()</pre> <p>This method retrieves an array of constants of the given enum type in the order in which they are declared.</p>

### Enumeration Details

The possible states of *VenueSimulatedLocationSource* .

## Enum Constant Details

```
public static final SimulationState IDLE
```

No simulation is in progress.

```
public static final SimulationState RUNNING
```

Simulation is in progress and active.

```
public static final SimulationState PAUSED
```

Simulation is in progress but not currently active.

## Method Details

```
public static SimulationState valueOf (String name)
```

This method retrieves the enumeration value that matches the name specified by the caller.

### Parameters:

- **name**  
A string containing the name of the enumeration member whose value is to be retrieved.

```
public static VenueSimulatedLocationSource.SimulationState[] values ()
```

This method retrieves an array of constants of the given enum type in the order in which they are declared.