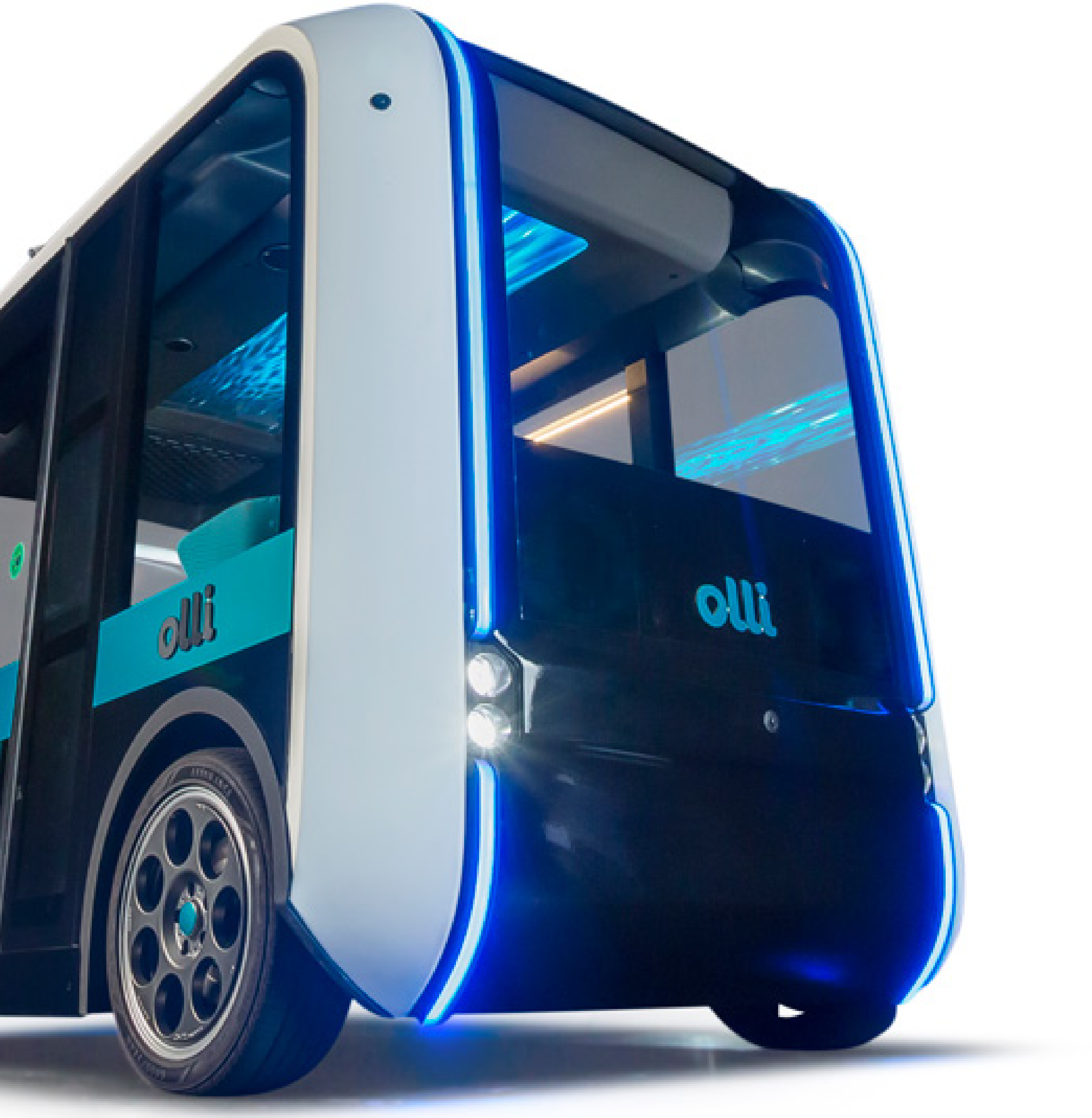


olli

Rides Into The Future.

A Local Motors Safety Report

local motors by

Situation Analysis

Olli has delivered the future of autonomous mobility to our doorsteps. And our bus stops. And our train stations. Olli, a 3D-printed, self-driving shuttle developed by Local Motors through a one-of-a-kind co-creation community known as Launch Forth, is also delivering a sustainable and safe transportation option for anyone who needs to get from one point to another.

As a low-speed vehicle with a fully integrated, triple-redundant safety system, Olli is a gateway vehicle for an eager and potentially anxious public that is learning more about autonomous mobility every day.

The Local Motors Vision

Our goal is to drive the future, not just what drives you in the future. And, it's our strong belief that the how is just as important as the what. But what matters most to us is the who.

MAKE ROADS SAFER Globally, nearly 1.25 million people die in road crashes each year, with 20-50 million becoming disabled or injured. 94% of crashes are human caused.

LIFT PEOPLE FROM POVERTY The typical job is accessible to only 27% of a metro workforce by transit in 90 minutes or less. Studies show that transportation can be the single largest factor in escaping poverty.

GREEN SPACE Little bits of green can improve mental health. With less space needed for cars, nature can be everywhere. Water runoff can be moved above ground as streams for people to enjoy.

LIMIT CLIMATE CHANGE Growing cities are putting deeper demands on energy consumption. Sustainable transportation can reduce carbon emissions by billions of metric tons each year.

DISABILITY ACCESSIBILITY One in five people in the U.S., or more than 66 million, have a disability. Six million have difficulty getting transportation. One in five elderly can no longer drive.

SKILLED JOB CREATIONS Training and development of new job skills, human talents that AI machines can’t replicate (creativity, collaborative activity, abstract and systems thinking, complex communication.)

MORE RIDER PRODUCTIVITY 50 minutes can be saved per person daily by not driving to work, equaling one billion hours globally. Time can instead be spent working, relaxing or accessing entertainment.

CAREFREE EXPERIENCE Olli offers a carefree experience, allowing riders to focus on whatever they want. With the ability to create an environment to suit one’s desires including music, lighting, heated seats & WiFi, riding is a pleasure - even fun.

Table of Contents

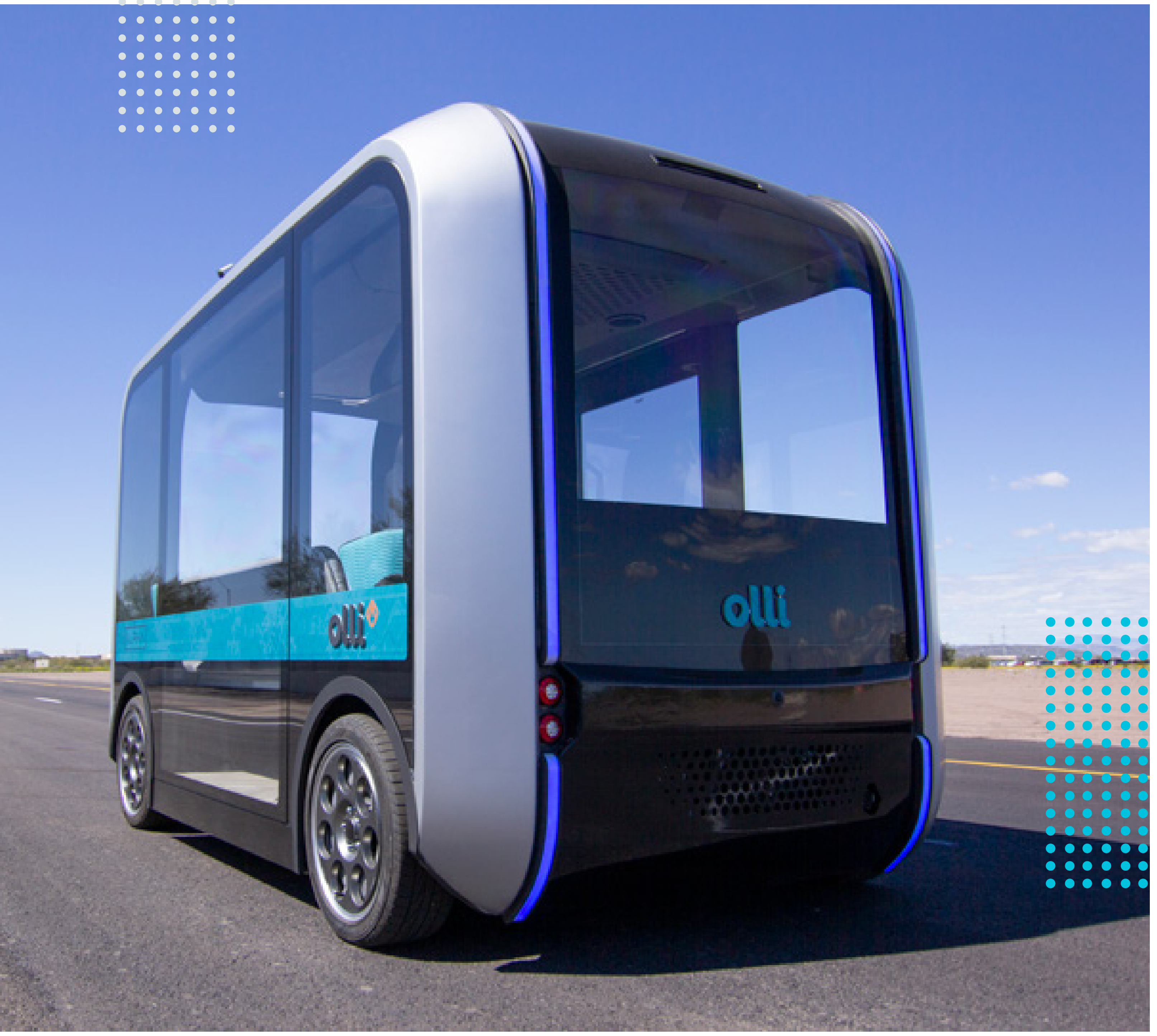
Introduction

Local Motors is pleased to publish this Voluntary Safety Self Assessment (VSSA) for Olli in response to the U.S. Department of Transportation's (USDOT) voluntary guidance regarding automated driving systems. The guidance, published by the National Highway Traffic Safety Administration (NHTSA), outlines safety elements involved with the development, testing, and deployment of autonomous vehicles. This assessment will address Local Motors' approach to those elements.

As technology evolves, so will the safety protocols observed and adopted by Local Motors. As such, please ensure this is the most recently updated safety information.

Published October 16, 2019.

What is Olli?



Olli is the first co-created and 3D-printed, self-driving shuttle equipped with cognitive response technology and an obstacle avoidance system. An electric vehicle, Olli is a sustainable mobility option that introduces the public to autonomous transportation at low speeds.

Olli's design was born from a co-creation community fostered by Local Motors and known as Launch Forth, and her development involves collaborative input from a number of partners, including Robotic Research and Goodyear.

Olli, while promising new transportation options for the future, is more than an idea. She has been put to use on the University at Buffalo campus, she has carried passengers along a busy and narrow route in Australia and she has shuttled folks around National Harbor in Maryland. In addition, Olli has been used by college students at Sacramento State University, by festival-goers at CalExpo and by military members at Joint Base Myer-Henderson Hall in the Washington, D.C. area.

With every mile, Olli gathers data about systems, rides, safety and usage. And, as a champion of innovation, Local Motors plans to reinvest all of those insights to keep moving autonomous mobility forward.

Specs for Olli

RANGE

Average Range	Up to 30 mi

CAPACITY

Max Passengers	8 seated

MOTOR

Max Torque	2,500 Nm
Continuous Torque	1,300 Nm
Max Power	160 kW (215 hp)
Continuous Power	120 kW
Max Speed	40 km/h (25 mph) (limited)
Type	Protean Pd18 Hub Motor (x2)

POWER SYSTEM

Max Capacity (kWh)	18.5 Max (16.2 Usable)
Charger Type	11 kWh
Charge Time (Level 2)	2 hours (Varying on EVSE)

DRIVETRAIN

Transmission or Driveline	Hub Motor

SENSORS

LiDAR	7x 3D Velodyne
Radar	4x SRR2, 1x Fwd ESR
Inertial Measurement Unit	Yes
Optical Camera	10x HD CCTV
GPS	2x GPS Antenna

COMMUNICATION / DATA

4G LTE GSM
On-Board Data Recorder

HVAC

In-Roof Unit	8.5kW Cooling, 10kW Heating

DIMENSIONS

Length	3945 mm (12.94 ft)
Width	2041 mm (6.70 ft)
Height	2637 mm (8.65 ft)
Wheelbase	2570 mm (8.43 ft)
Passenger Room Height	1921 mm (6.3 ft)

WEIGHT

Curb Weight	2045 kg (4500 lb)
Carrying Capacity	907 kg (2000 lb)

CHASSIS / SUSPENSION / BRAKES

Chassis	3D-printed Polymer Composite & Aluminum
Front Suspension	Air Spring over Damper, Independent
Rear Suspension	Air Spring over Damper, Independent
Front Brakes	Disc
Rear Brakes	Disc
Tires	225/50R18
Emergency Brake	Manual cable pull handbrake

→ Back to Table of Contents

Safety

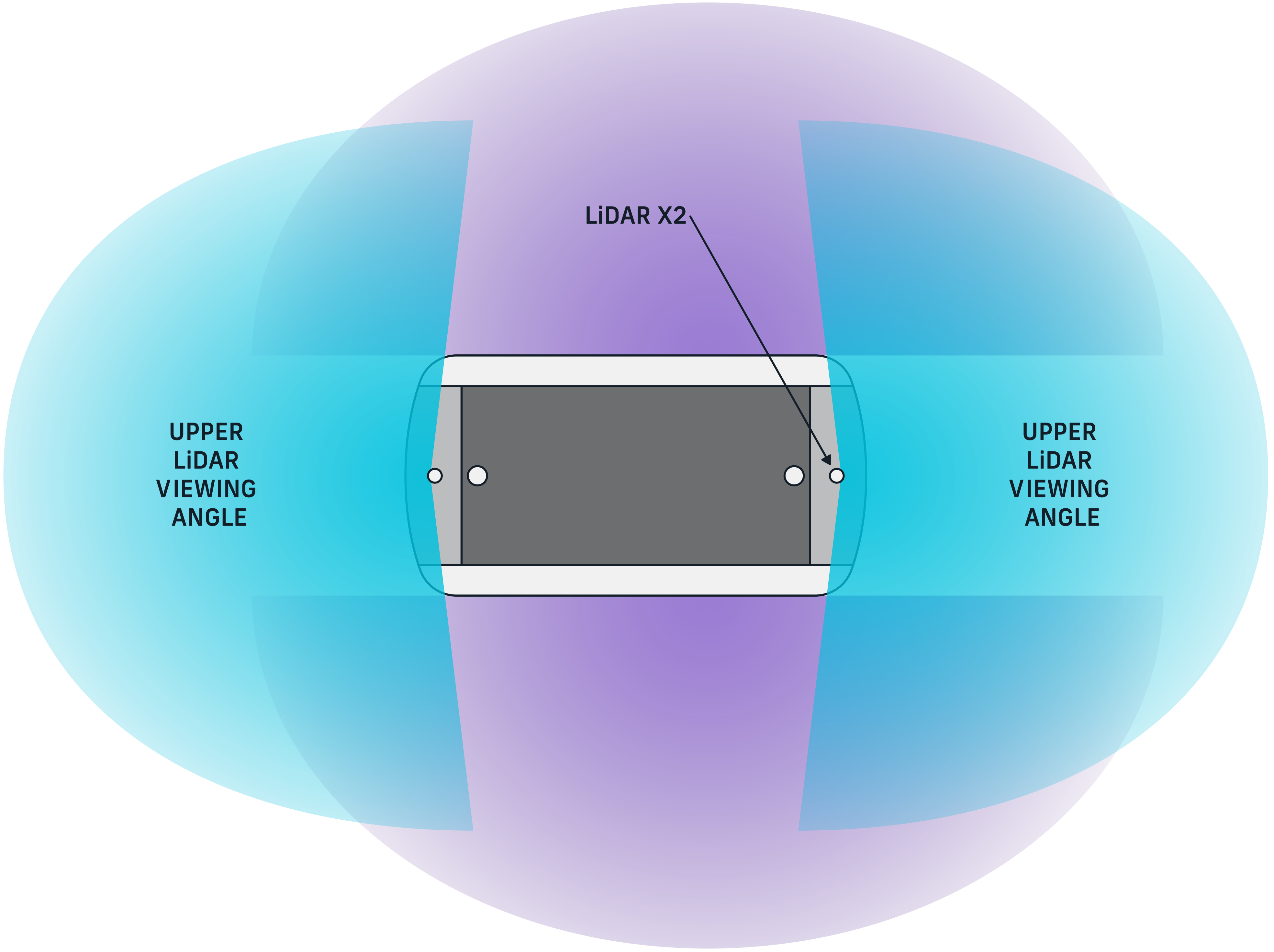
Local Motors understands that systems, design and outside influences all play roles in how Olli is received, how Olli functions and how Olli keeps her passengers safe. Local Motors incorporates safety into every aspect of design, application and deployment. Keeping passengers safe while educating them about autonomous technology are keys to the future success of Olli and to realize the greatest possible benefits of autonomous mobility. Local Motors' approach to safety is based on Olli's low speed and limited domain and a laser focus on direct customer engagement and specific consumer feedback.

NHTSA outlines 12 safety design elements in its voluntary guidance. The following pages explain how Local Motors' approach to safety aligns with each of these 12 elements, providing context and protocols for each.

→ Back to Table of Contents

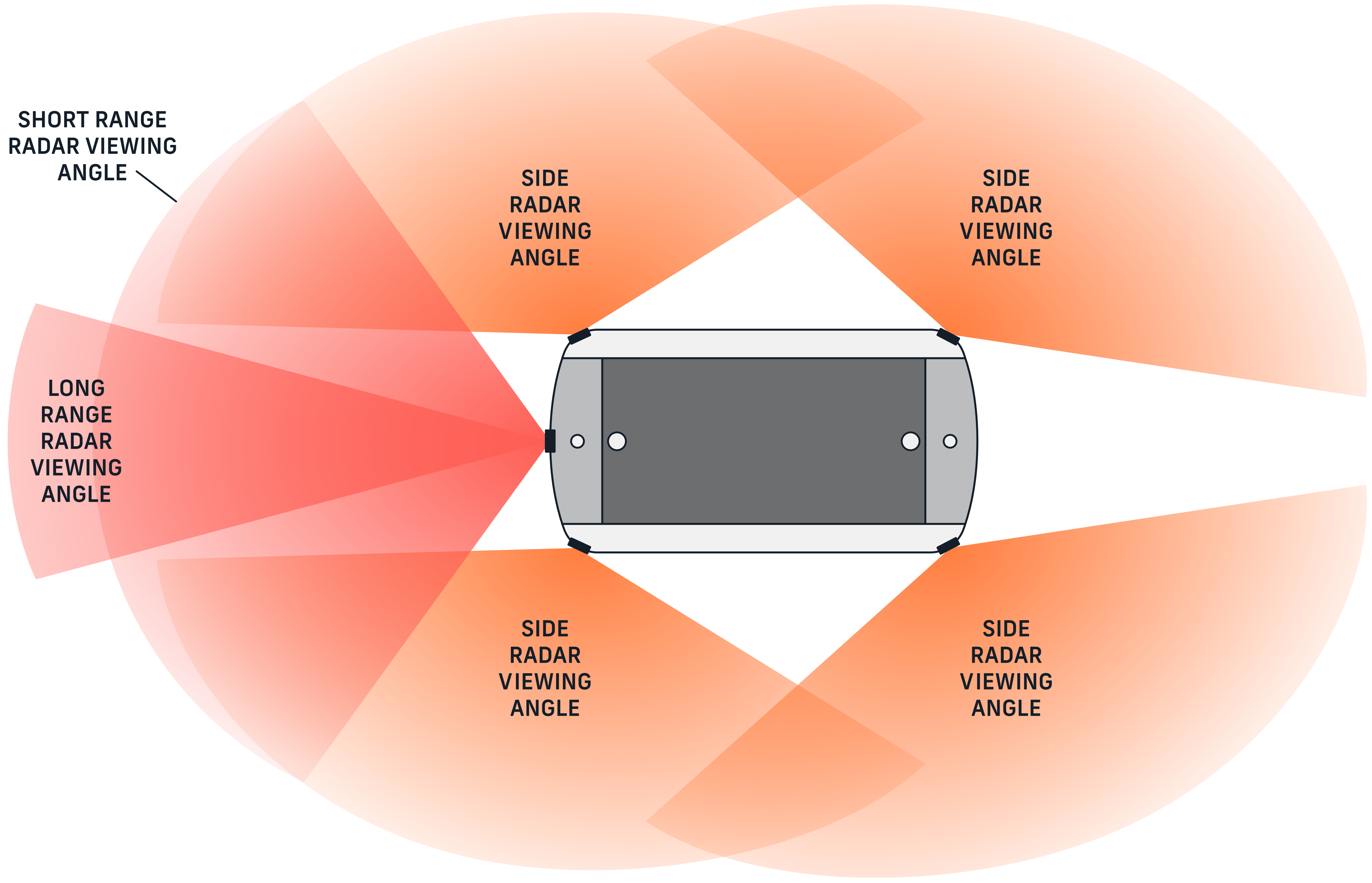
System Safety

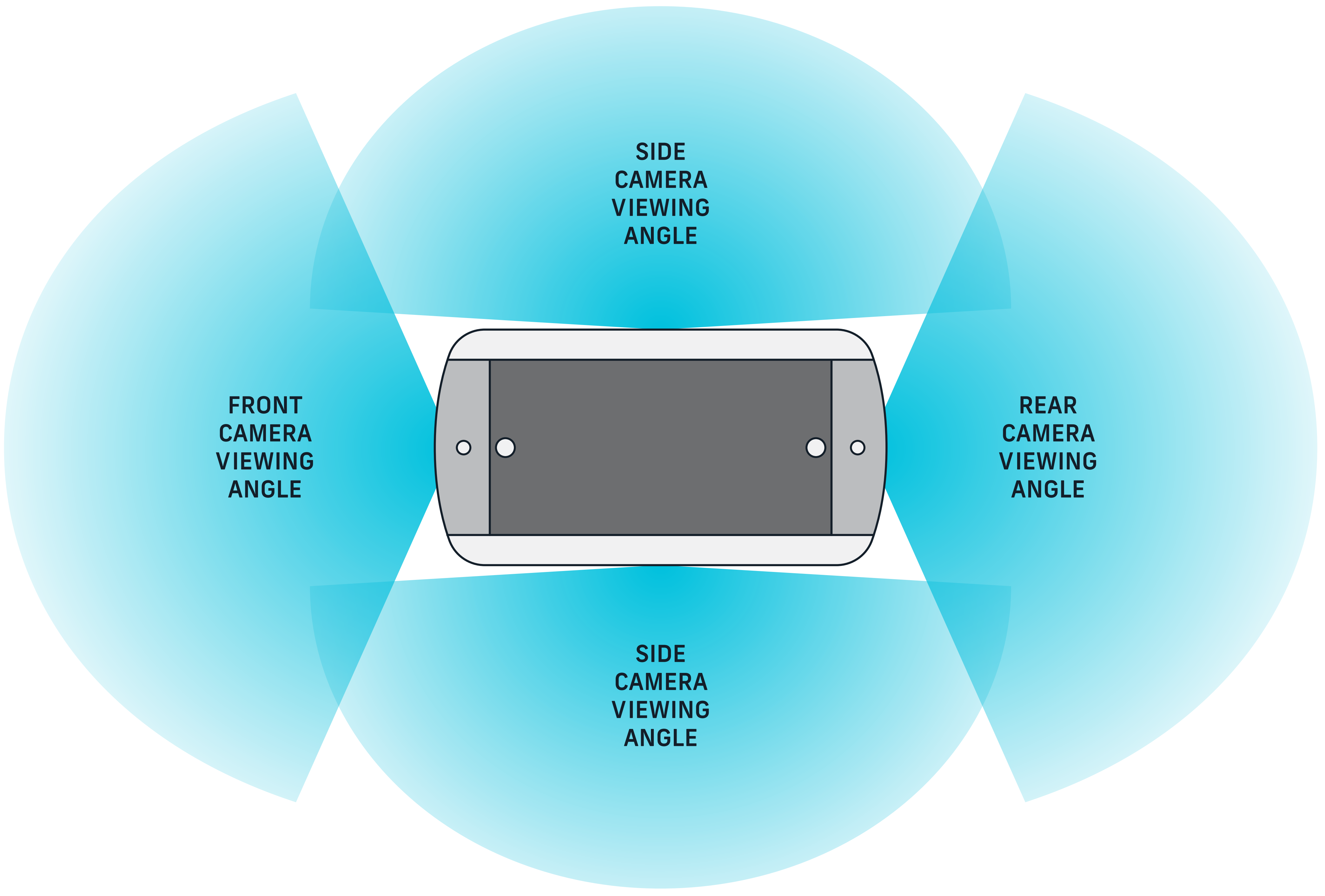
Olli is equipped with a number of safety features, including human oversight despite her autonomous capabilities. Olli's six LiDAR sensors, five radars and six cameras allow the shuttle to capture a 360-degree view of the vehicle and her surroundings at all times. In addition, her obstacle avoidance technology ensures that the vehicle steers clear of collisions and has the ability to re-route the shuttle should her path become obstructed.



Olli LiDARs

- Direct measurement of range and direction
- Not affected by lighting conditions
- Degraded by dust or fog





Olli Radars

- Direct measurement of range
- Direct measurement of relative velocity
- Not affected by lighting conditions
- Less sensitive to dust or fog

Olli Cameras

- High Resolution
- Direct measurement of color and direction
- Sensitive to lighting conditions
- Sensitive to dust or fog

For Olli, system safety is of paramount importance throughout every stage, from concept to production, even though the shuttle is primarily operated at low speeds. Initially, system safety is defined in product operation requirements. Subsequently, these requirements are transferred to system design through state diagrams for systems, subsystems, and components. Design failure mode effects and analysis (DFMEA) assess system design and fills in any gaps in safety design.

The vehicle control unit (VCU) is the ultimate arbiter of all the functional requests from various systems. Software developed for the VCU ensures that performance limits for throttle, steering, and braking are strictly followed. Diagnostics developed in the VCU ensure that the majority of the system faults are captured, and subsequent fault actions, such as failure buzzer, limited system and vehicle operation are built to address the overall safety of the passengers and the vehicle.

System safety is ensured for each Olli vehicle through extensive and rigorous post-production checks and design verification plan and report (DVPR) testing. DVPR testing includes checks for systems safety in both manual and autonomous mode. Autonomous driving system data is continuously collected and monitored to ensure proper operation. Redundancy functions of the automated driving system (ADS) and VCU ensure that the chance of Olli's malfunction is minimal. Also, planned launch of Olli with a safety steward ensures that any deficiency is quickly identified and addressed.

Operational Design Domain

Olli is designed to serve users in need of transportation in a variety of settings, including but not limited to, educational and business campuses, entertainment districts and city centers, healthcare facilities and any number of other venues. Pending regulatory advancements related to autonomous vehicles, Olli can be used on private roads or on public roads that have received specific clearance to operate a self-driving vehicle, as is the case in National Harbor, Maryland.

Olli is capable of driving up to 25 miles per hour, however her most frequent trips will operate at less than 20 miles per hour.

Object and Event Detection

Olli is equipped with a segment-first obstacle avoidance system that allows the shuttle to respond to obstacles as the vehicle encounters them. The novelty of the system is that it allows the shuttle to find a new, safe path around the obstacle if it becomes stationary, where other autonomous vehicles may become immobilized. Olli's LiDAR, which provides a 360-degree view, also allows her to detect obstacles on the horizon.

The Olli Pilot Testing Initialization Criteria and Specifications (OPTICS) test used by Local Motors provides initial verification of the ADS' functionality to be expected in standard operation. Part of the calibration protocol within the OPTICS test uses objects, humans and other vehicles, both stationary and in motion, that the ADS can expect to see in service as criteria for system initialization.

The OPTICS test protocol includes operating the vehicle in ADS mode on a closed test course at the Local Motors facility through simulated scenarios to verify expected standard functionality.

Obstruction Testing

Obstructions may be encountered along the vehicle route, whether stationary, such as wheelie bins, trash, parked vehicles, or moving obstructions, including pedestrians, strollers, pets, cyclists, sports equipment.

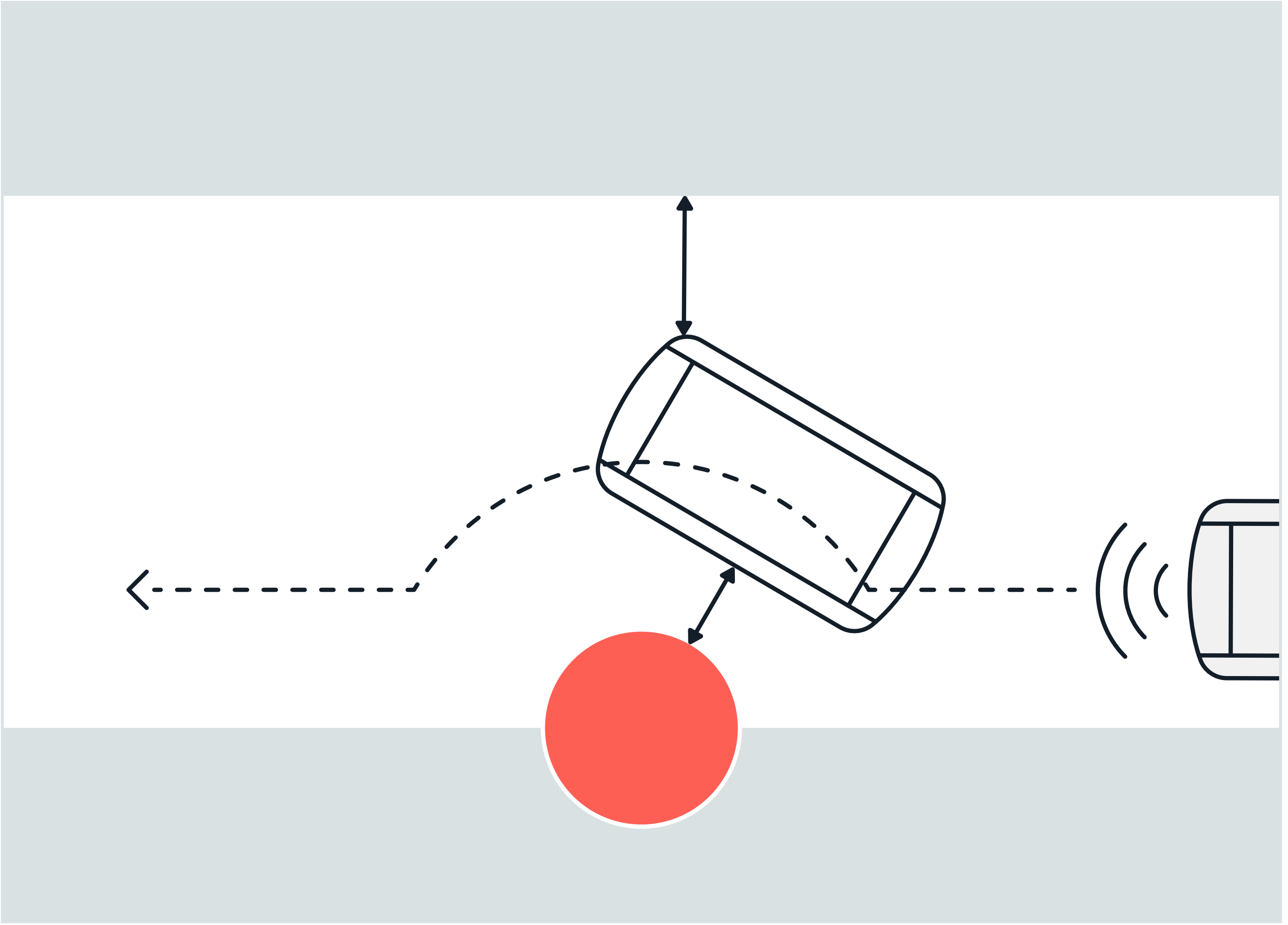
Stationary obstructions are simulated by placing a visual target such as a box, cylinder or barrier on the ground at the test points. Moving obstructions are simulated by mounting the obstructions on castors and setting them in motion using a pole attachment.

Real-world obstructions may take different forms and sizes, so to reflect this, visual targets of different dimensions should be employed to ensure that the shuttle can reliably detect obstructions.

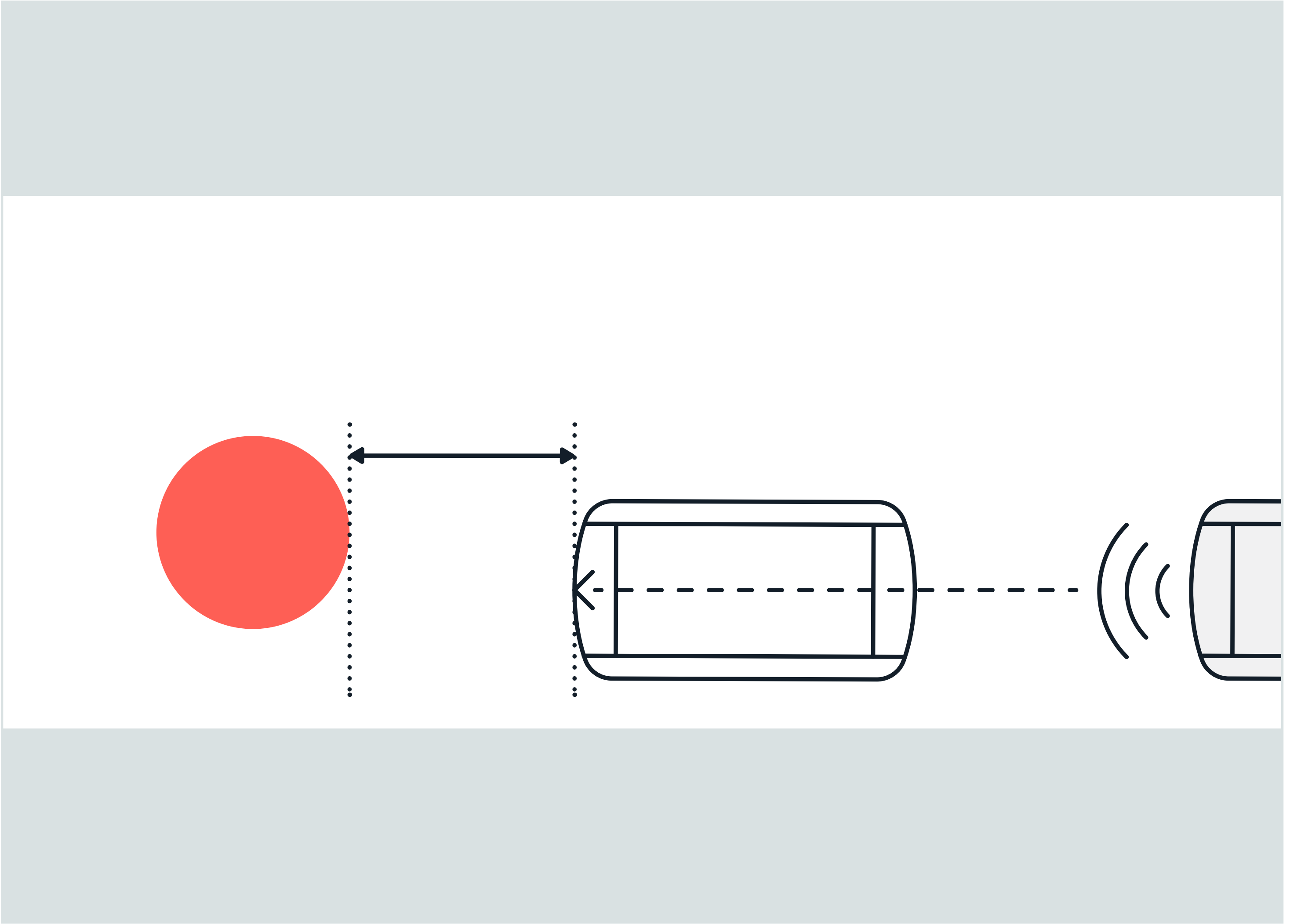
Relative sizes of different obstructions

The following tests describe what is conducted at various points around the test circuit. Since several of the procedures involve testing the collision avoidance capability of the vehicle, the appropriate personal protective equipment is employed by all staff conducting the tests. In addition, the steward who is on board at all times during the tests, remains alert and ready to engage emergency stop procedures, if required.

→ Back to Table of Contents



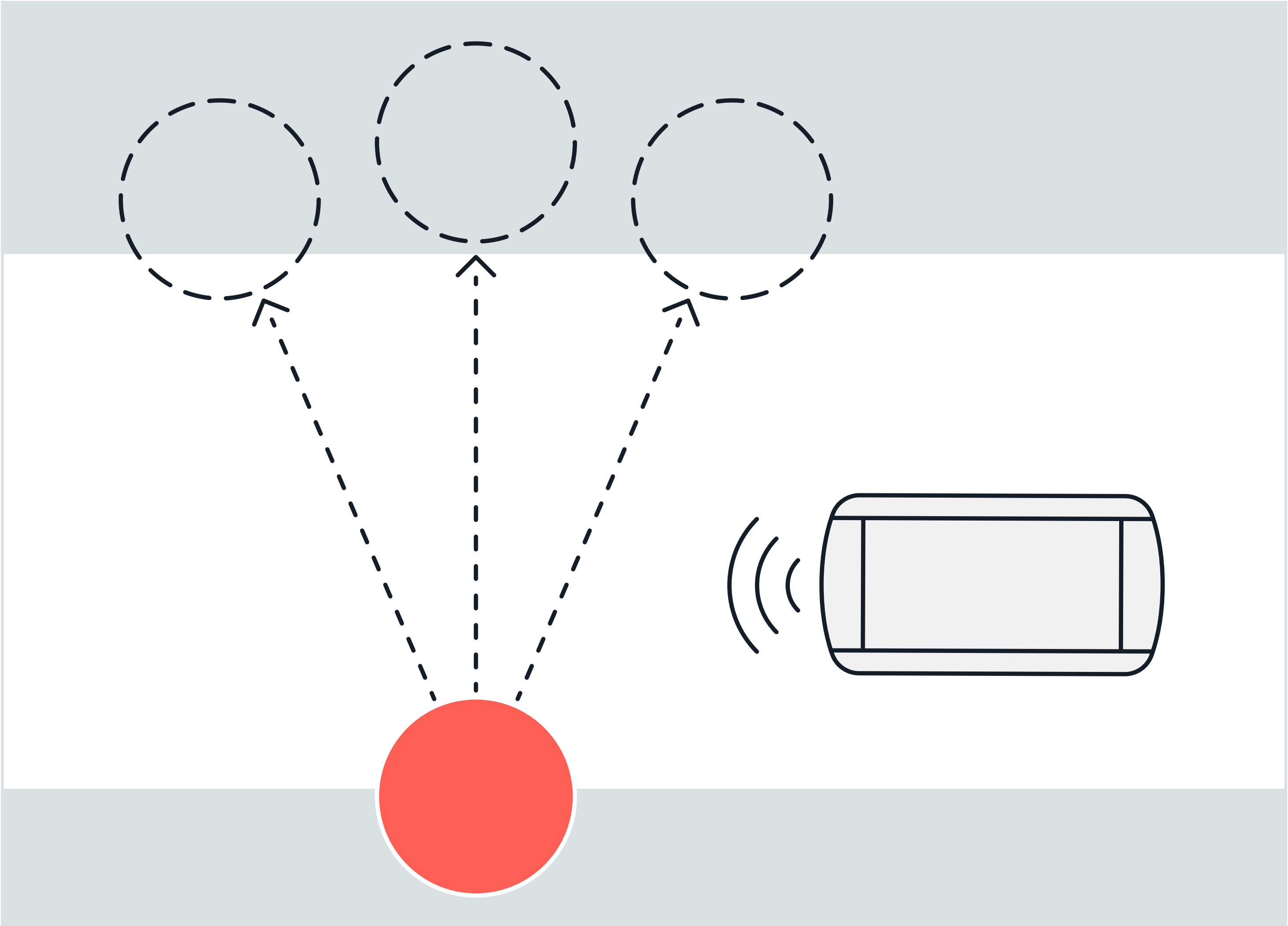
Obstacle avoidance test



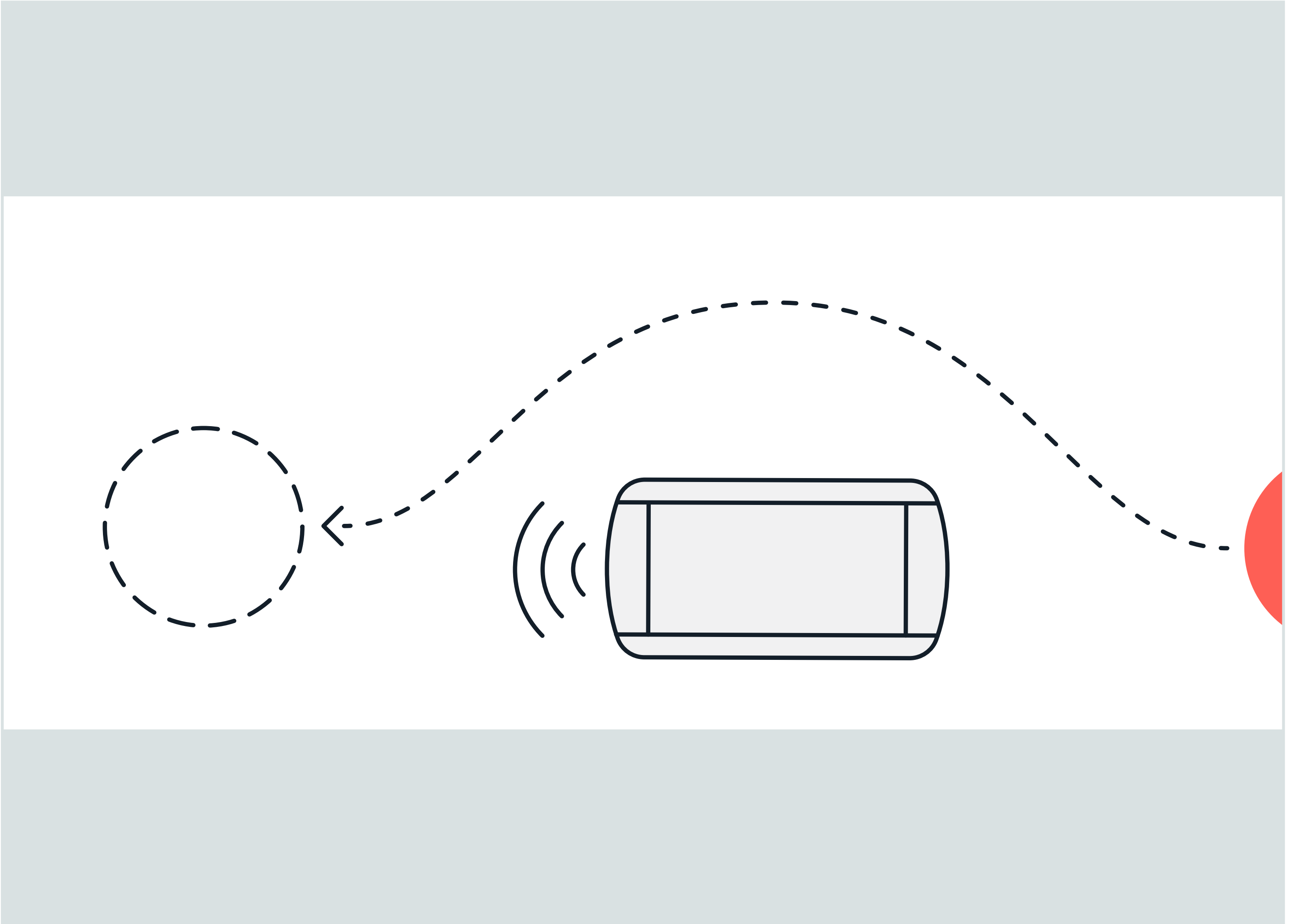
Obstacle halt test

Stationary Obstruction Tests

ITEM	PROCEDURE	EXPECTED RESULT
1. Obstacle avoidance	Place an obstacle in the vehicle's path at a position which leaves sufficient space for circumvention. Record the percentage of the path blocked by the obstacle.	• Obstacle is detected and shuttle adjusts route to pass around the obstacle. • Shuttle does not contact obstacle or boundaries of travel corridor. Record the closest approach to the obstacle and corridor boundary.
2. Obstacle halt	Place an obstacle in the vehicle's path at a position which does not leave sufficient space for circumvention.	• Obstacle is detected and shuttle comes to a halt before reaching the obstacle. Record the distance between the stopped shuttle and the obstacle. • Shuttle does not contact obstacle or boundaries of travel corridor.
3. Halt recovery	After the vehicle has halted before an obstacle, remove the obstacle from the path.	The shuttle resumes autonomous travel.
4. Symmetric test	Repeat steps 1-3 with an obstacle introduced from the opposite side of the path.	The shuttle passes the tests in a similar way.



Path-crossing traffic test

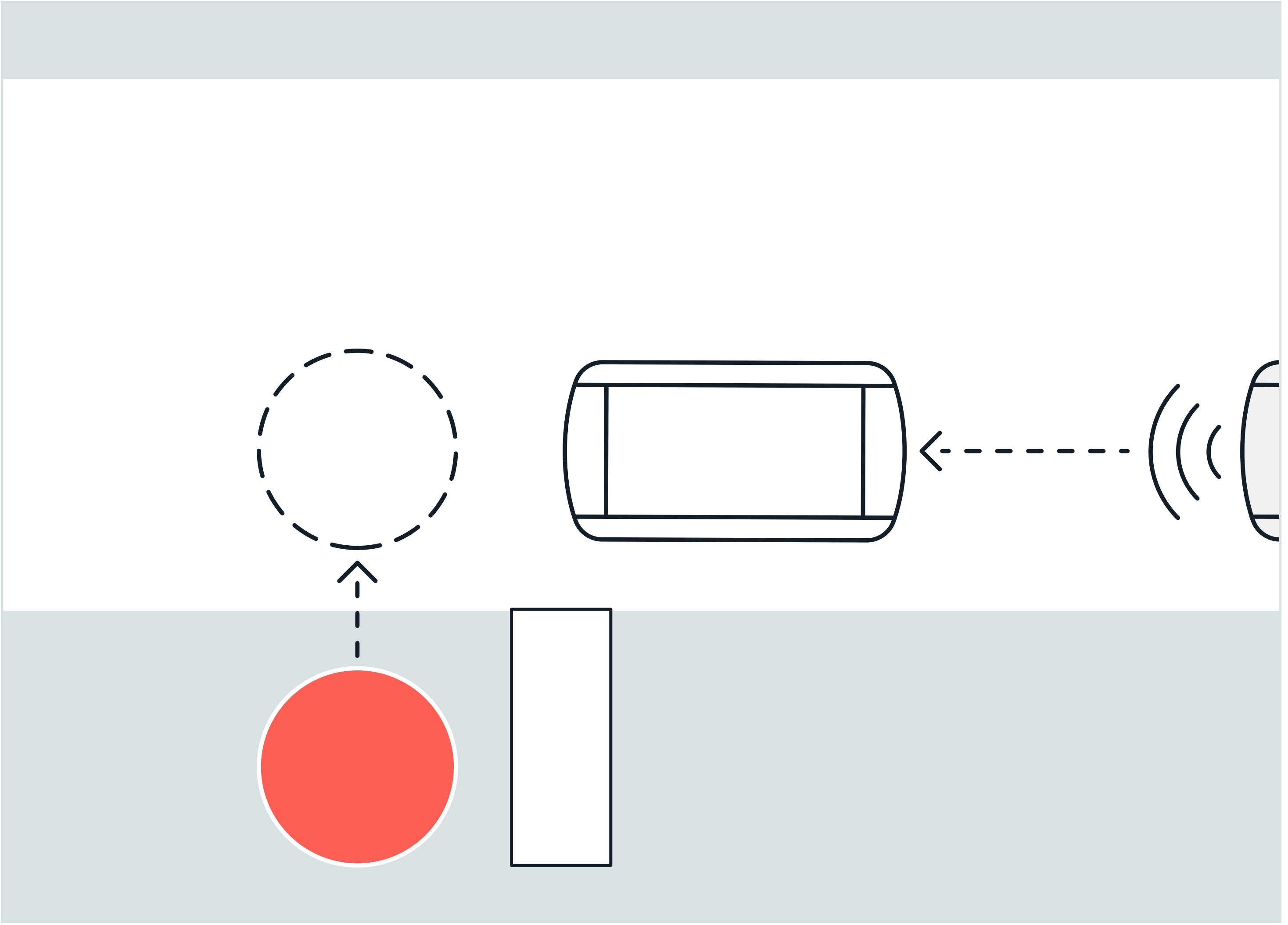


Same direction overtaking test

Moving Obstruction Tests

ITEM	PROCEDURE	EXPECTED RESULT
1. Path-crossing traffic	With the shuttle driving autonomously along the path, have the moving obstacle approach from one side of the path and cross to the opposite side. Perform this at a distance where the shuttle is forced to give way to the obstacle.	• Obstacle is detected and shuttle slows and halts to give way. Record the distance from the crossing point at which the shuttle stops. • Shuttle does not contact obstacle or boundaries of travel corridor.
2.	Repeat step 1 from the opposite side of the path.	The shuttle passes the tests in a similar way.

ITEM	PROCEDURE	EXPECTED RESULT
1. Same direction overtaking	With the shuttle driving autonomously along the path, have the moving obstacle approach from behind the shuttle and perform an overtaking maneuver, leaving sufficient leeway for the shuttle to proceed undisturbed.	• Obstacle is detected and shuttle proceeds along routed path without stopping. • Shuttle does not contact obstacle or boundaries of travel corridor.
2. Aggressive overtaking	Repeat step 1 with an aggressive overtaking maneuver which forces the shuttle to slow down or stop.	• Obstacle detected as hazardous and the shuttle slows or halts until the obstacle has passed. • Shuttle does not contact obstacle or boundaries of travel corridor.



Blind spot obstacle test

Blind Spot Test

There are several locations along the trial route where a moving obstruction may emerge from behind a feature which blocks the shuttle's view. This reduces the time available for the autonomous driving system to recognize and react to the new obstacle.

The blind spot test simulates these conditions using a blind-spot barrier and movable obstruction equipment from the previous tests.

ITEM	PROCEDURE	EXPECTED RESULT
1. Blind spot avoidance	Place the blind spot barrier in the vehicle's path at a position which leaves sufficient space for circumvention. Record the percentage of the path blocked by the obstacle.	• Barrier is detected and shuttle adjusts route to pass around the barrier. • Shuttle does not contact obstacle or boundaries of travel corridor.
2. Obstacle avoidance	Introduce the moving obstacle from behind the blind spot barrier so that it enters the vehicle's path at a position which leaves sufficient space for circumvention.	• Obstacle is detected from blind spot and shuttle adjusts route to pass around the obstacle. Record the distance between the stopped shuttle and the obstacle. • Shuttle does not contact obstacle or boundaries of travel corridor.
3. Obstacle halt	Repeat step 2 and introduce the obstacle in the vehicle's path at a position which does not leave sufficient space for circumvention.	• Obstacle is detected from blind spot and shuttle comes to a halt before reaching the obstacle. Record the distance between the stopped shuttle and the obstacle. • Shuttle does not contact obstacle or boundaries of travel corridor.
4. Halt recovery	After the vehicle has halted before the obstacle, remove the obstacle from the path.	• The shuttle resumes autonomous travel.

→ Back to Table of Contents

Fallback (Minimal Risk Condition)

Olli is a fully autonomous vehicle supervised by a human steward, who is trained to intervene should the vehicle experience a system failure. Olli is also equipped with a triple-redundant system of sensors and cameras that will automatically recognize a situation outside Olli's operational design domain.

The ADS processes information from LiDAR and radar to make decisions regarding Olli's operation. The vehicle control unit has inbuilt software functionality to stop the vehicle and immediately apply brakes as soon as communication with the autonomous kit is not detected. All of this happens in milliseconds to ensure minimal damage.

Currently, Olli operates only in predetermined, thoroughly mapped routes. If Olli is placed outside the predetermined route, the autonomous mode does not engage. Also, autonomous mode requires proper operation of the GPS system, LiDAR and radar sensors.

A thorough risk analysis has been conducted to help mitigate risk and effects of environmental interaction throughout a wide variety of operational possibilities. The risk assessment looks at all possible conditions which could occur with all aspects of not only the vehicle, sensor suite, software, operating environment and support systems. The possibility of inadequate functionality is weighed against the severity of the situation. Olli is deemed to provide superior behavior under all reasonably possible scenarios which could cause operational risks.

Validation Methods

After being tested extensively at its manufacturing facilities and at campuses owned by Local Motors partners, Olli was given the opportunity to be validated in the real world. The self-driving shuttle has been deployed with success to a number of operational domains, including multiple university campuses, corporate campuses, entertainment and shopping districts, a military base, beachfront communities, convention centers, sports venues, urban city centers, and fairgrounds.

As part of a global fleet challenge, Olli is being utilized in three-month increments at numerous locations, gathering valuable data along the way. Validation methods, prior to those deployments, included the following:

PHASE 01

Low Speed Vehicle Platform Control Validation

- Powertrain control validation by achieving various, steady-state velocities within given tolerances
- Steering control validation by performing turns in curves with different radii of curvature at different speeds within given tolerances
- Service brake control validation by performing stopping distance tests and stopping points from various speeds within given tolerances
- Turning signal and lighting marker controls during validation tests

PHASE 02

Moderate Speed Vehicle Platform Control Validation

- Powertrain control validation by achieving various, steady-state velocities within given tolerances
- Steering control validation by performing turns in curves with different radii of curvature at different speeds within given tolerances
- Service brake control validation by performing stopping distance tests and stopping points from various speeds within given tolerances
- Turning signal and lighting marker controls during validation tests

PHASE 01

Low Speed Vehicle Sensor Perception and Control Static and Dynamic Validation

- GPS localization and signal strength
- Forward sensor perception of LiDARs and radars
- Rear sensor perception of LiDARs and radars
- Side sensor perception of LiDARs and radars
- Close proximity sensor perception of LiDARs and radars
- Forward obstacle avoidance control
- Side obstacle avoidance control

PHASE 02

Moderate to High Speed Vehicle Sensor Perception & Control Static and Dynamic Validation

- GPS localization and signal strength
- Forward obstacle avoidance control

→ Back to Table of Contents

Human Machine Interface

The human machine interface (HMI) computer in Olli has a BOT interface application, which shows the ADS route and displays the conditions of the LiDAR and radar sensors. A safety steward inside the vehicle monitors Olli's location and her route throughout Olli's operation, and the steward is able to engage a manual mode in the event of any deviation from normal operation. Olli is also equipped with an emergency stop button and an emergency release button for her doors, which ensure quick emergency response. Safety belts are mandatory for passengers inside Olli during pre-commercial testing and they help prevent injuries during emergency braking. The steward also has access to a graphic user interface (GUI), which allows real-time monitoring and control of vital vehicle functions at all times.

Unique, external lighting features, known as lightinos, provide an intuitive indication of what Olli is preparing to do, be it stopping, starting or turning. Two internal display screens provide riders with real-time progress of the specified route. And an interactive infotainment system allows passengers to communicate with Olli for informative, as well as critical updates.

Vehicle Cybersecurity

Olli is equipped with triple-redundant operating technology that is designed to withstand a cyber attack. Should a sophisticated attack occur, it would trigger Olli's safety systems and the onboard steward would be able to intervene and disengage autonomous mode.

Cybersecurity on Olli is based on a tiered approach of implementation, access controls, monitoring, logging and notifications. The systems are designed to reduce the possibility of a cybersecurity event by segmentation of components and applications. No system is completely secure, however Local Motors continually evaluates its systems and regularly implements updates to increase the security of the vehicle.

Access to the systems, both physically and electronically, is limited to those that require access and is controlled with least-privilege accounts. Olli's network inbound traffic is prohibited except through VPN tunnels established between onboard systems and Local Motors' network systems. Outbound communication for data collection is secured to a cloud-based system with digital certificates. Network segmentation on the vehicle helps prevent cross-vulnerabilities between critical systems. Logs are regularly reviewed for anomalies and notifications to support teams are sent when anomalies are detected.

Local Motors works with third parties and suppliers to enhance the security of its vehicles and to learn about new cybersecurity best practices and guidelines.

Crashworthiness

Olli is equipped with a robust seatbelt system for passenger safety that is tied directly to the chassis design. Passengers riding on Olli are currently required to use the seatbelts provided at each seat. Olli's seating is configured around the perimeter of the vehicle, creating open space in the center. The vehicle's onboard steward is able to secure his or her stance by holding a stability bar positioned near the steward's station at the front of the vehicle or with a specialized jumpseat, depending on the version of the Olli.

Voluntary testing, at the shuttle's most-often used speed, has yielded results that illustrate the durability of Olli's 3D-printed body should it collide with a stationary object.

Olli's operational domain constraints limit the maximum operating speed to reduce the severity of any impact. To further reduce the potential for impacts, Olli operates in low traffic environments.

Post-Crash ADS Behavior

Olli has two ways of entering Emergency Mode: an emergency button and impact sensors. The red emergency stop button is located near where the onboard steward is positioned, and impact sensors are positioned on the front and rear of the vehicle. In Emergency Mode with the ignition key switch on, all drive motor power is removed, the drive system is effectively in neutral and the brake system will apply 85 percent brake force until the ignition switch is turned off.

In order to move or operate the vehicle after Emergency Mode is entered, the emergency stop button must be reset, if pushed, and the ignition must be turned off for at least 15 seconds before being switched on again. If there is no damage to the vehicle control system, it may be operated in the manual mode.

This safety protocol is augmented with industry-unique bumper safety sensors that will not allow resumption of operation until all potential obstacles have been checked and cleared.

Data Recording

Local Motors has equipped Olli with a number of sensors and systems designed to collect data for real-time and future use. Data collection allows Local Motors to be nimble with Olli, and it provides opportunities for informed adjustments to be made to systems, technology and procedures.

Local Motors' OPTICS Test, to initialize and calibrate the ADS, includes the verification of the onboard hard drive data recorder, which is used to download vehicle telemetry logged while test driving. The data recorder is removed from the vehicle daily and plugged into an uploader CPU for automatic data transfer, storage and review.

The Local Motors data management and digital communication interface offering, Modally, integrates seamlessly into any transportation environment to keep both the operator and rider informed. From a traffic light network to a multi-modal mobility service, Modally can help upgrade to a unique and complete ridership platform meshing together public transport, car sharing, bike sharing and the shuttle system.

The back-end system includes a fleet management platform to control and monitor the vehicle's operations (charging, maintenance, real-time vehicle health and rider status). Modally handles operations and maintenance including upgrades of vehicle communication software, digital interfaces and integrations. Booking a ride on Modally will secure a safe and timely ride to designated destinations.

→ Back to Table of Contents

Consumer Education and Training

Olli debuted in the Greater Washington D.C. area in June of 2016 at the grand opening of Local Motors' National Harbor, Maryland facility. Olli briefly operated on closed roads to demonstrate her capabilities and purpose, showcasing her effectiveness to help transport visitors around the harbor. The facility was designed to serve as a public place where co-creation can flourish and vehicle technologies can rapidly advance. Local Motors has created and fostered something unique in the industry, by making a sizeable investment in the demonstration facility, with its focus on consumer (end user) and customer education and training. Local Motors stands alone in the market with this commitment.

Olli, and the technology she employs, is new to most people. The Olli Fleet Challenge, a global engagement effort that began in the fall of 2018, served as a first-hand educational model for users on an experiential level. The ongoing fleet challenge continues to introduce Olli to users around the world, educating them on her self-driving technology, safety, sustainable energy source and ability to be user-friendly, accessible and adaptive.

In addition to the fleet challenges, Local Motors regularly seizes opportunities that allow visibility for consumer and industry education efforts. Local Motors also utilizes strategic marketing and sales materials to educate its audiences about the company's overall vision and Olli products.

Local Motors has developed operator manuals for customer and steward use and training, and has developed service manuals for vehicle maintenance and repair training. In addition, Local Motors continues to build out its deployment service team to be engaged in vehicle service with customers, as well as continual education and training throughout a vehicle's service life.

Local Motors is committed to safety, and all riders around the globe are briefed prior to boarding Olli. The brief includes passenger, steward and vehicle safety guidelines, and emergency procedures. After their ride, passengers are encouraged to provide feedback about their experience, including how safe they felt on Olli via online and paper surveys administered at the time of their ride. To date, thousands of riders have been able to experience Olli, with 99.15 percent of survey respondents claiming they felt safe on Olli.

#AccessibleOlli Program

Local Motors, and its partners at IBM and the CTA foundation, and AARP recognized there was an opportunity to address the needs of an underserved mobility market. Providing low cost, on-demand, reliable transportation to those with accessibility needs is something all operators and municipalities desire. Local Motors recognized that an automated shuttle like Olli, could help solve this problem, but officials were concerned about how the shuttle would support equity and access as a driverless vehicle.

In order to better understand possible solutions for these challenges, Local Motors realized it needed more than just the resources within its company and those of its partners. To engage a broader community, enlisting the thoughts and solutions of a much larger audience, Local Motors tapped into its online, co-creation platform known as Launch Forth. That platform is regularly responsible for soliciting solutions for problems on a global scale.

Local Motors challenged the world to solve accessible mobility problems using the newest and most relevant technologies. The insights, solutions and data captured from these numerous phases and programs provided some of the best guidance for how a rapid integrator such as Local Motors and Olli could solve mobility challenges.

Beyond the digital realm, events were hosted at the Local Motors facility in National Harbor, encompassing a qualitative session to explore desired features and benefits of an accessible, self-driving vehicle for 50+ consumers. Additionally, the #AccessibleOlli program hosted more than 150 guests with various impairments, and advocate agencies including AARP, the Department of Labor for the Office of Disabilities Employment Policy (DOL ODEP), American Council of the Blind, National Disability Institute, Pulley Vocational, Youthquest Foundation and the US Access Board.

The non-needs community was invited to participate in the Olli Care Station Interactive Tour with activities that included “Restricted Hand Movement”, “Seeing With Your Hands”, “Eyes that Hear” and “Tour Memory Challenge.” These activities were created to understand the challenges of the more than 66 million Americans who live with disabilities.

These on-site and online efforts became the basis for creating the customer personas for vision, hearing, cognitive and mobility impairments. Local Motors was able to bring together 25 partner companies with the goal of creating an #AccessibleOlli vehicle which integrated multiple new and emerging technologies designed to solve accessibility challenges. The final result was presented at CES 2018, demonstrating how technology can improve people’s lives.

Local Motors continued to utilize its co-creation method by inviting the thousands of people who experienced the vehicle to provide feedback for further developing solutions that Local Motors could bring to market, starting with its next generation of Olli.


Maryland Secretary of Transportation, Pete Rahn, learning about Olli

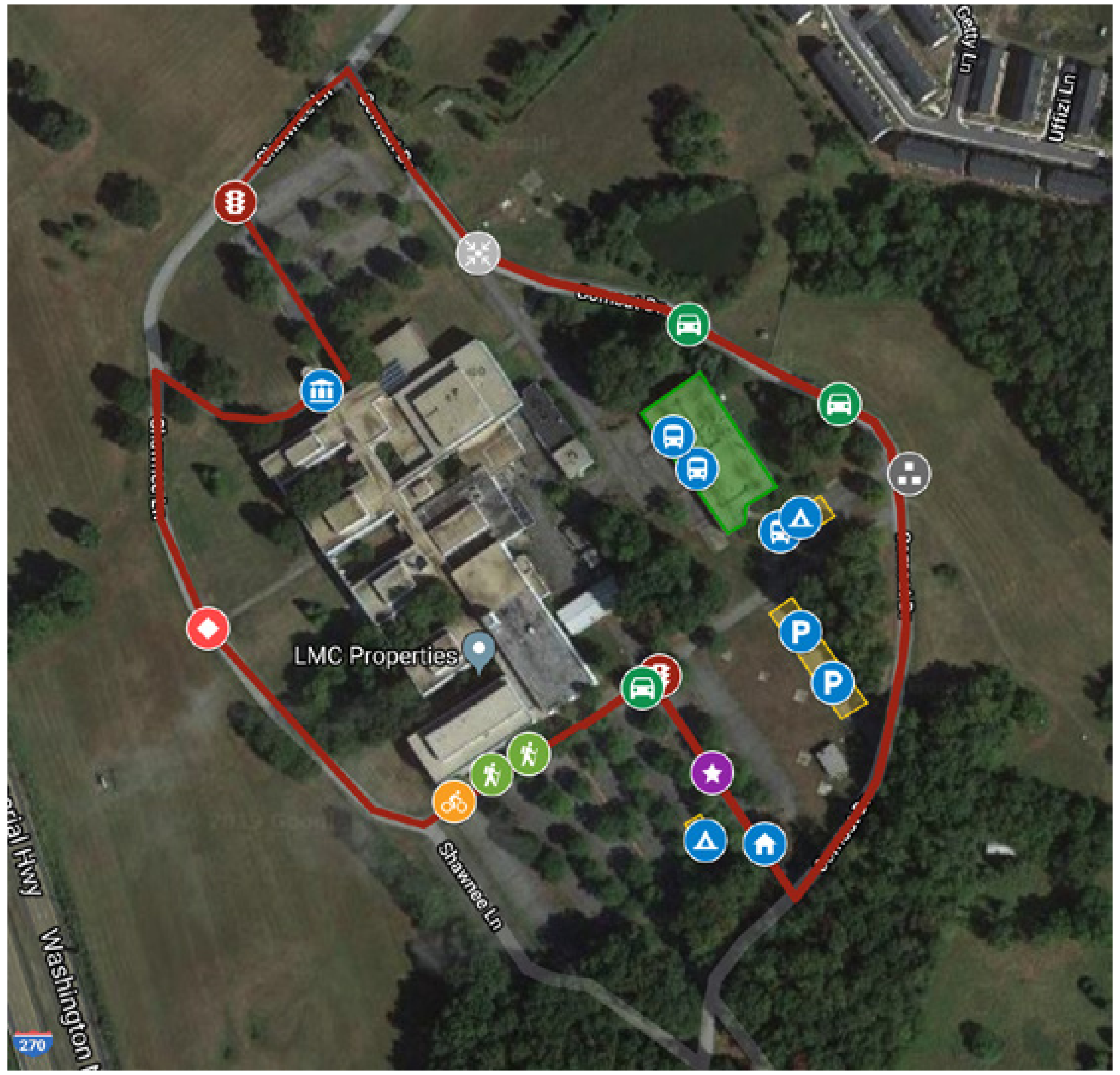
Olli Demo Day in Clarksburg, MD

Local Motors hosted a “Demo Days” event in April 2018 at partner Robotic Research’s closed campus in Clarksburg, Maryland. Demo Day served as host to more than 300 global stakeholders with a valued interest in Olli. Stakeholders were introduced to the inner workings of the vehicle, her cognitive functions, materials and design structure and the 3D-printing manufacturing process.

The event also provided a glimpse into Olli’s obstacle avoidance, traffic merging and pedestrian and bicyclist recognition capabilities.

HMI

During Demo Days, riders interacted with Olli via IBM Watson and Lex to experience a live interaction of how the vehicle communicates with passengers. A map showing real time location of the vehicle was displayed on Olli's screens, and broadcast announcements informed riders of the state of the vehicle and response to potential emergencies.



Olli Receives Permit from the State of Maryland

In 2018, Local Motors pursued a permit with the State of Maryland to begin operating in National Harbor. Approvals from county stakeholders such as National Harbor, the Department of Public Works and Transportation, and the Fire and EMS Department along with Maryland Department of Transportation and Maryland Transportation Authority were required before the state could issue a permit to operate.

The permit process consisted of submitting an application to the Maryland Department of Transportation for highly-automated vehicle testing. In addition, local stakeholders visited the National Harbor facility to inspect the vehicle and take demonstration rides. The application requested several requirements including, but not limited to, a safety guidance approach, proof of vehicle testing, safety and compliance plans, as well as vehicle incidents and crash reports.

To receive the permit, along with submitting extensive documentation, Local Motors demonstrated a three-phased approach which would allow an opportunity to offer rides to enterprise-level clients and government officials on a fixed-route in the first phase, followed by the option to give rides on expanded routes to the public in the second and third phases.

The permit was issued in December of 2018 by the Maryland Department of Transportation and the Maryland Motor Vehicle Administration.

Olli Begins Operating Daily on National Harbor Roads

January 2019 marked the beginning of another historic moment for Local Motors, with Olli ready to officially give demonstration rides in National Harbor. Olli's initial approved route is a 1.4-mile loop, leaving the Local Motors facility to the Southpointe location behind Gaylord National Resort and Convention Center on the harbor. During their journey, passengers have the opportunity to experience Olli's ability to operate among mixed-use traffic, easily maneuvering around curves and corners and smoothly ascending and descending hills. They are also able to experience a comfortable ride as they see how she interacts with pedestrians in a low-speed, controlled environment.

Federal, State and Local Laws

Regulations and legislation related to autonomous vehicles are still evolving even as self-driving vehicles hit the roads. Local Motors evaluates all federal, state and local laws to ensure compliance for the base vehicle within appropriate vehicle classes. Independent experts are utilized to support suitable specifications.

However, Local Motors uses a "forward looking" approach to equip Olli with safety features that are expected to be required by future regulatory action.

Local Motors also collects data in a number of areas, including but not limited to demo time, weather conditions, number of trips, number of passengers on trips, speed, number of takeovers, quick stops/near misses, crash avoidance maneuvers, and failure to obey traffic devices. This data is used to influence regulations and legislation related to autonomous mobility, report to customer stakeholders, further develop Olli's capabilities, and demonstrate the vehicle's readiness to begin transporting public passengers.

olli *is committed to a safer transportation future for everyone.*

How will we get there? By leveraging the very best of human ingenuity while reducing human error along the way and by complementing the gaps within transit networks in order to increase efficiency, convenience and dependability.

local motors by