



# BRIDGE MANAGEMENT SYSTEM(BMS)

## User Manual

Version 1.0.0

### Select Area

**Division:**

DHAKA ▼

**District:**

MANIKGANJ ▼

**Upazila:**

SINGAIR ▼

### Select RSDMS Module

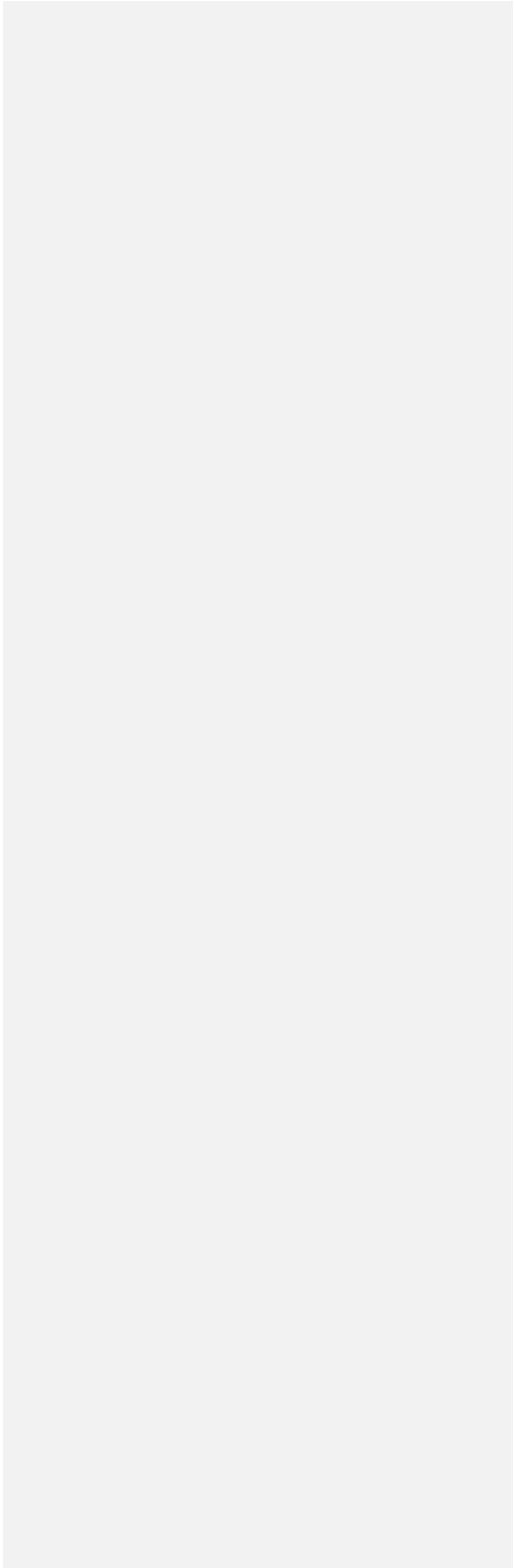
Data Module    Application Module

Report Module    GIS Module

Document Module    Bridge Module

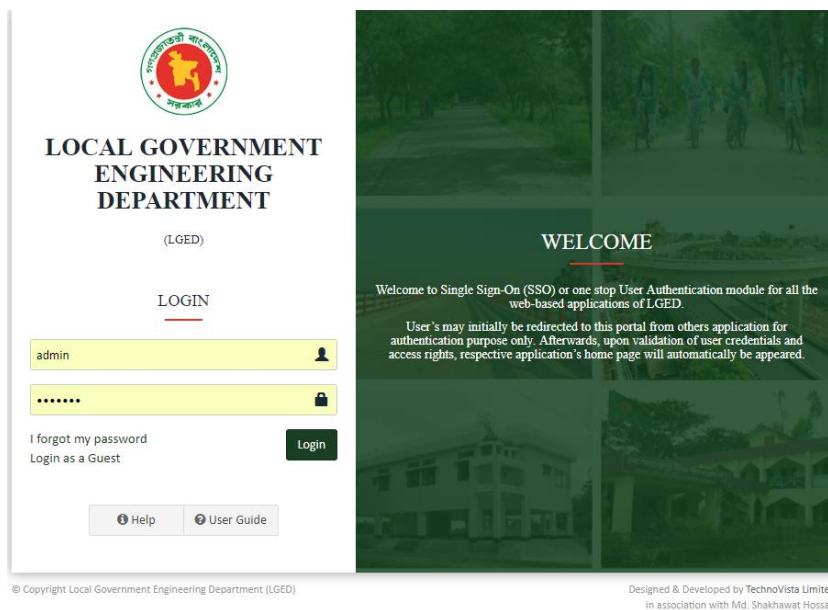
**Table of Contents**

Introduction: ..... 1  
Short Descriptions of Dashboard: ..... 2  
Inventory:..... 3  
Inspection: ..... 7  
Analysis : ..... 9  
Report: ..... 11  
MAP: ..... 12  
Admin Module: ..... 13  
Conclusion:..... 14



## Introduction:

BMS is made for **Local Government Engineering Department (LGED)**, Bangladesh. It's a standalone Dashboard for managing Bridges all over the Bangladesh. A user can manage entirely everything of a Bridge. This web application starts with a Login Page which is managed by LGED Central Authentication System.



Main Sections of BMS is Maintaining a Bridge or existing GAP. There are couple of Modules within this Application. This manual highlightes how to use those Modules etc.

### Short Descriptions of Dashboard:

After logging in, from the RSDMS Homepage, there is a Button for entering BMS.

## LGED RSDMS DASHBOARD

The dashboard is titled "LGED RSDMS DASHBOARD" and is divided into two main sections on the left and a large image area on the right.

**Select Area**

- Division: DHAKA
- District: MANIKGANJ
- Upazila: SINGAIR

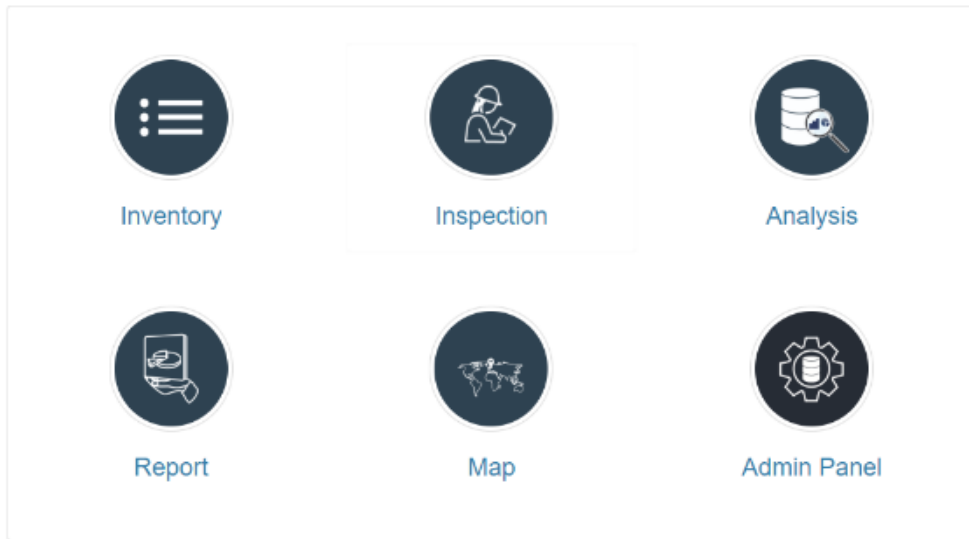
**Select RSDMS Module**

- Data Module
- Application Module
- Report Module
- GIS Module
- Document Module
- Bridge Module** (highlighted with a red box)

The right side of the dashboard features a large image with the following text: "Web-Based Road and Structure Management System (RSDMS) Beta Testing Phase LGED Government of Bangladesh". Below the image, it says "Temporarily Hosted by" followed by the logo for "Maks Inc." and their address: "Transportation Engineering, Planning & Policy Consultants, Dallas, Washington DC, Islamabad, USA".

A red arrow points from the "Bridge Module" button to a blue button labeled "This is the Button for BMS" located at the bottom right of the image area.

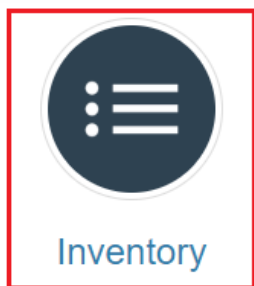
After entering into BMS,it will show the main Dashboard of BMS.All the Modules of BMS are there.



There are 6 Modules of BMS.All of those has individual sections along with different management types.Below are listed Modules with there functionalities.

### **Inventory:**

Click on the **Inventory** Button to enter into Inventory Module.



Inventory module can help you to manage identification, traffic, channel etc. properties of a Bridge. User can add/remove Bridges from here and also all the basic information placed here. This module is divided by some segment. We will show how to navigate those sections step by step

### Road / Bridge Selection:

The very first page of Inventory Module is for selecting the specific Road or selecting the specific Bridge of Specific Road. For all Bridges of a specific Road, user need to click the button “View Details” of the corresponding row of the grid. If you need to jump into a specific Bridge, then click the dropdown “Select Bridge”. It will show the list of all Bridges of that road. Then selecting one of them will jump into the specific Bridge Section.

Road Code	Road Name	Type	Bridge	
356822001	Singair to Paragram GC via Maniknagar GC & Sirajpur hat.	Upazila Road		<a href="#">View Details</a>
356822002	Singair to Baira Rd.	Upazila Road	3568220010301	<a href="#">View Details</a>
356822003	Singair-Novabgonj Via Charigram GC Rd.	Upazila Road	3568220010307	<a href="#">View Details</a>
356822004	Binnadangi Zila Road (Basta)-Novabganj Upazila via Hatmi Bazar, Maniknagar Gc & Sollah.	Upazila Road	3568220010308	<a href="#">View Details</a>
356822005	Charigram GC to Barundi GC Rd.	Upazila Road	3568220010309	<a href="#">View Details</a>
356822006	Bhaumdakhin R&H-Dhaka Aricha NHW via Khasharchar.	Upazila Road	3568220010310	<a href="#">View Details</a>
356822007	Joymontop-Maniknagar GC.	Upazila Road	3568220010311	<a href="#">View Details</a>
356822008	Singair-Suapur GC via Kangsha.	Upazila Road	3568220010312	<a href="#">View Details</a>
356822009	Baira GC-Katigram GC.	Upazila Road	3568220010313	<a href="#">View Details</a>
356822010	Defoltoli Bazar (R&H)-Charigram GC Via Baldhara UP Rd.	Upazila Road	3568220010314	<a href="#">View Details</a>
356823001	Rishipara (Singair) R&H-Baldhara UP (paril)	Union Road	Select Bridge	<a href="#">View Details</a>
356823002	Balmal R&H to Baira UP.	Union Road	Select Bridge	<a href="#">View Details</a>
356823003	Balmal R&H-Baldhara Bazar	Union Road	Select Bridge	<a href="#">View Details</a>
356823004	Baldhara UP office-Uttar Jamsha Bazar(Jamsha UP) Road	Union Road	Select Bridge	<a href="#">View Details</a>
356823005	Baira UP-Bangla Bazar Road	Union Road	Select Bridge	<a href="#">View Details</a>
356823006	Joymontop UP Office (R&H)-Maniknagar GC	Union Road	Select Bridge	<a href="#">View Details</a>
356823007	Jamirta UP Office (Maniknagar GC)-Nilombarpatty Bazar.	Union Road	Select Bridge	<a href="#">View Details</a>
356823008	Dakshin Charigram bazar-Jamsha UP office Road	Union Road	Select Bridge	<a href="#">View Details</a>

### Bridge List:

At the Bridge List page, all the bridges of that specific Road will shown as a Grid. Each row denotes a Bridge with the basic information. There are 5 buttons into each row. Those are:

- Edit Bridge
- Remove Bridge
- Show MAP for that Bridge
- Basic Information at a glance
- Images

Also there is a “Add new record” button for adding new Bridge into the system.

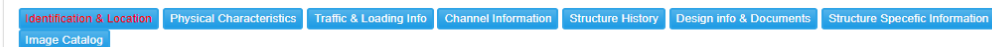
[Add new record](#)

Bridge Code	Road Code	Bridge Type	Length (m)	FacilityType	Chainage (m)	Latitude	Longitude	Feature Intersected	
		BridgeType	0.00		0.00	0.000000	0.000000		Update Cancel
3568220010301	356822001	Girder Bridge	31.00	Upazilla Road	0.00	23.808803	90.147923	Waterway	
3568220010307	356822001	Girder Bridge	16.00	Upazilla Road	5,989.00	23.773806	90.161140	Roadway	
3568220010308	356822001	Girder Bridge	19.00	Upazilla Road	7,028.00	23.757297	90.174147	Railway	
3568220010309	356822001	Girder Bridge	16.00	Upazilla Road	7,715.00	23.752302	90.180093	Land	
3568220010310	356822001	Girder Bridge	19.00	Upazilla Road	8,157.00	23.750253	90.179951	Waterway	
3568220010311	356822001	Girder Bridge	16.00	Upazilla Road	8,656.00	23.757450	90.179542	Waterway	
3568220010312	356822001	Girder Bridge	16.00	Upazilla Road	9,555.00	23.759458	90.189444	Waterway	
3568220010313	356822001	Girder Bridge	13.00	Upazilla Road	9,780.00	23.758446	90.189511	Waterway	
3568220010314	356822001	Girder Bridge	61.00	Upazilla Road	10,977.00	23.750000	90.200000	Waterway	
3568220010615	356822001	Bailey Bridge	61.00	Upazilla Road	11,405.00	23.752251	90.208523	Waterway	
3568220010316	356822001	Girder Bridge	13.00	Upazilla Road	12,385.00	23.741405	90.209505	Waterway	
3568220010317	356822001	Girder Bridge	13.00	Upazilla Road	14,945.00	23.727308	90.216785	Waterway	
3568220010318	356822001	Girder Bridge	13.00	Upazilla Road	16,393.00	23.713319	90.218930	Waterway	

You can also edit the information of an existing bridge by clicking edit button. It will open the specific row as edit mode and there will show 2 buttons for Update and Cancel.

### Specific Bridge Menu:

There is a menu list at the top of the page for a specific Bridge. Initially this menu list is disabled. After selecting one specific Bridge, this menu will redirect to different sections of a Bridge.



There are many individual sections denoted as menu into the list. Those are:

- Identification and Location: Basic information of a Bridge.
- Physical Characteristics: Physical information of a Bridge.
- Traffic & Loading info: This section shows the information of Bridge Traffic and Loading capabilities.
- Channel Information: Shows Bridge Channel Information.
- Structure History: Shows Bridge Basic structure information. It includes Construction history.
- Design Inf & Documents: Shows design info and documents. User can upload different documents for different part of a Bridge.
- Structure Specific Information: Shows different Bridge Specific information as segmented. This portion shows different types of information depends on Bridge Type.
- Image catalog: Shows all images of a bridge.

### Structure Specific Information:

This section implies different segment as Bridge wise.Each section has individual grid of information and user can edit those information as the same way we saw in previous section.

Road Code	Bridge Code	Bridge Type	Length (m)
356822001	3568220010301	Girder Bridge	31.00

Sub-Structure	Bearing Assembly	Super-Structure	Deck	Joint	Approach	Channel & Navigation	Safety Feature	...
---------------	------------------	-----------------	------	-------	----------	----------------------	----------------	-----



Abutment				Wingwall			
Material	Height (m)	Width (m)	Thickness (mm)	Foundation Type	Material	Type	Material
Concrete	0	0	0		Concrete		Concrete

### Image catalog:

In this section,user can show/upload new images as Bridge Element wise.

Road Code	Bridge Code	Bridge Type	Length (m)
356822001	3568220010301	Girder Bridge	31.00

Bridge Images	
 ABUTMENT <a href="#">x Delete</a>	 WINGWALL <a href="#">x Delete</a>

Select Element

Abutment

Upload Image

Select files...

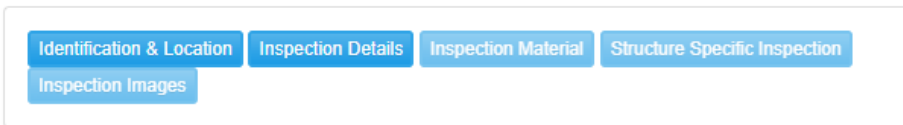


## Inspection:

Inspection Module is one of the Major Module of BMS. User can insert / update Survey/inspection data of a Bridge here. This module also starts from Bridge/Road list same as Inventory Module.

After selecting specific Bridge, Inspection module starts with some menu items. There are couple of menus. Those are:

- Identification & Location: Bridge basic information of a Bridge
- Inspection Details: Details inspection information of a Bridge
- Inspection material: Shows the material information of Bridge Inspection. User can change material type of an inspection. Into the next step, Information shows as segmented which is dependent into this material type.
- Structure Specific Information: Shows specific information as structure wise.
- Inspection Images: shows images of an inspection.




## Inspection Material:

Division: DHAKA  
District: MANIKGANJ  
Upazila: SINGAIR



Road Code	Bridge Code	Bridge Type	Length (m)
356822001	3568220010301	Girder Bridge	31.00


+ Add New Record		
Element	Material	Action
Channel & Navigation	Channel Navigation	

### Structure Specific Inspection:

This section shows structure wise inspection information. It depends on Bridge type and Material Type. There are different segments for insert/update information.

<b>Road Code</b>	<b>Bridge Code</b>	<b>Bridge Type</b>	<b>Length (m)</b>
356822001	3568220010301	Girder Bridge	31.00

Aggradation	Degradation	Stream Migration	Undermining	Debris Accumulation	Level	Action
No	Presence	No	Photos Taken	Not Applicable		

1 - 1 of 1 items

### Inspection Images:

All the inspection images show here. User can upload new images into specific distress page of a Bridge.

<b>Road Code</b>	<b>Bridge Code</b>	<b>Bridge Type</b>	<b>Length (m)</b>
356822001	3568220010301	Girder Bridge	31.00

#### Inspection Image Gallery



DEBRIS\_ACCUMULATION

## Analysis :

In this Module, user can do Analysis Bridge information and can see the result of them. There are one major algorithm delivered by LGED which do the analysis part. Basically this analysis runs the algorithm with specific Bridge information.

The screenshot shows the 'Pre Process Data' section of the LGED RSDMS WEB interface. At the top, there is a navigation bar with 'LGED RSDMS WEB', 'Dashboard', and 'Modules'. Below this, a blue button labeled 'Pre Process Data' is visible. Underneath, a box titled 'Click here to Choose area' contains three radio buttons: 'Whole Area', 'Select Specific Area' (which is selected), and 'Select Road'. Below the radio buttons is an 'Area Type' dropdown menu. A 'Confirm Selection' button is located at the bottom of this box. Below the entire section is a 'Back to Bridge menu' button.

There are some functionalities which help to do the analysis. Those are:

- Pre Process Data: This button runs the algorithm with all data. All the generated data is stored into the database, and after selecting filter criteria, those data show into a Grid.
- Area Filter: There are couple of sub filters here:
  - Whole Area: This will show analysis result of entire Bridge data from database.
  - Select Specific Area: User can choose area for which they want to see analysis result.
  - Select Road: User can select specific road for seeing analysis result for those roads.

After selecting filter criteria, Result will show into a grid.

The screenshot shows the 'Analysis on Bridge' grid. At the top, there are tabs for 'Analysis on Bridge', 'Analysis on GAP', 'Work Programming', and 'Selected Bridge Group'. Below the tabs is a 'Re Assess Data' button and an 'Export Data to Excel File' button. The main table has the following columns: Maintenance Type, Critical Elements (C54), Critical Elements (C53), Comment, Maintenance Remarks, Submit Review, and Action. The table contains several rows of data, including entries for 'Expansion / Major Maintenance / Minor CB', 'Pier-1 (204)', 'Abutment-1 (201)', and 'Wingwall-1 (202)'. Each row has a corresponding 'Action' button (pencil icon).

Maintenance Type	Critical Elements (C54)	Critical Elements (C53)	Comment	Maintenance Remarks	Submit Review	Action
Expansion / Major Maintenance / Minor CB	Deck Slab-1 ( 501 ) , Bridge Railing-1 ( 505 )		Structural Review			[Action]
Expansion / Major Maintenance / Minor CB		Girder-1 ( 404 )	Structural Review			[Action]
Expansion / Major Maintenance / Minor CB		Wingwall-1 ( 202 )	Structural Review			[Action]
ant	Pier-1 ( 204 )					
ant	Abutment-1 ( 201 )	Channel & Navigation-1 ( 800 )				
ant	Wingwall-1 ( 202 )					
Expansion / Major Maintenance / Minor CB			Structural Review			[Action]

User can give manual review into the result and this review stores into the database. Also there are several types of filters into the grid. There are two tabs besides each other. One is for showing the result of Bridges. Another is for showing the results of GAPS. Those tabs are identical. User can reassess Bridge result by selecting the specific bridge and press the Re Assess Button. Result will be updated after reassessment of a Bridge. Also, if user gives Manual Maintenance, those data will go into the Work Programming section for further process.

### Work Programming and Selected Bridge Group:

Work programming is a section for calculating Bridge maintenance costing. This costing depends on Maintenance type and Bridge length. User can select some of the bridges and then can send those to the Selected Bridge Group section. Into the Selected Bridge Group section, either user can progress with data or either user can remove data from there. Removed data will again be restored into the Work Programming section.

Analysis on Bridge | Analysis on GAP | **Work Programming** | Selected Bridge Group

Send to Selected Group

Selected Total Cost : Tk 0  
Selected Total Length : m 0

Bridge | GAP

Export Data to Excel File

Bridge Code	Structure Type	Length (m)	Rank	Structural Deficiency (SD) Score	Priority Score	Chainage (m)	Maintenance Type	Cost	
3568220010312	Girder Bridge	16	1	31.69	45.35	9555	Rehabilitation	4,480,000	
3568220010303	Girder Bridge	10	4	22.88	38.3		Major Maintenance	1,500,000	
3568220010313	Girder Bridge	13	10	19.18	35.34	9780	Rehabilitation	3,640,000	

Analysis on Bridge | Analysis on GAP | **Work Programming** | Selected Bridge Group

Export Data to Excel File

Road Code	Road Name	Bridge Code	Chainage (m)	Structure Type	Length (m)	Cost	Action
356822001	Singair to Paragram GC via Maniknagar GC & Sirajpur hat.	3568220010312	9555	Girder Bridge	16	4,480,000	
356822001	Singair to Paragram GC via Maniknagar GC & Sirajpur hat.	3568220010303		Girder Bridge	10	1,500,000	
356822001	Singair to Paragram GC via Maniknagar GC & Sirajpur hat.	3568220010313	9780	Girder Bridge	13	3,640,000	

## Report:

There are 3 basic reports into the Report Module. Those are:

- Bridge Need Assessment Report (By Road, By Upazilla, By District)
- Bridge Info Report
- GAP Info Report.

Select Report Type

Bridge Need Assessment  
 Bridge Info Report  
 GAP Info Report

Select Area

District: MANIKGANJ

Upazilla: SINGAIR

Structure Code: 3568220010309

Rpt\_BridgeInfoDetails 1 / 3

### Detailed Report of Bridge

DISTRICT: MANIKGANJ	UPAZILLA: SINGAIR	Length: 16 m
STRUCTURE CODE: 3568220010309	ROAD CODE: 356822001	ROAD NAME: Singair to Paragram GC via Maniknagar GC & Sirajpur hat.
STRUCTURE TYPE: Girder Bridge	CHAINAGE: 7715 m	CONSTRUCTION YEAR: 1983

**MAINTENANCE NEED ASSESSMENT**

Elements with CS4 Condition			Elements with CS3 Condition			Elements with CS2 Condition		
Sub Structure Elements	Super Structure Elements	Non Structure Elements	Sub Structure Elements	Super Structure Elements	Non Structure Elements	Sub Structure Elements	Super Structure Elements	Non Structure Elements
							Deck Slab	

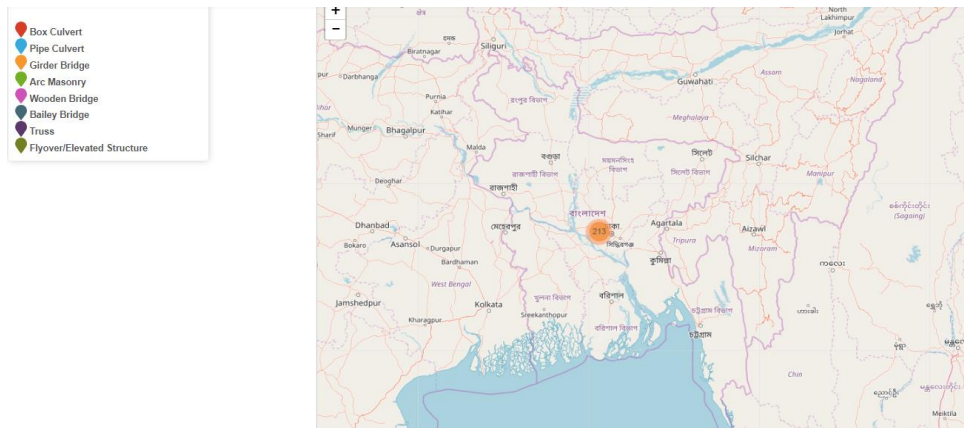
AGGREGATED CONDITION STATE (CS)

There are Filters for All Report Type. If user selects Bridge Assessment report, then three other options shows for selecting type (By Road, By Upazilla, By District). In all other report types, there are filter for selecting District, Upazilla and Structure Code.

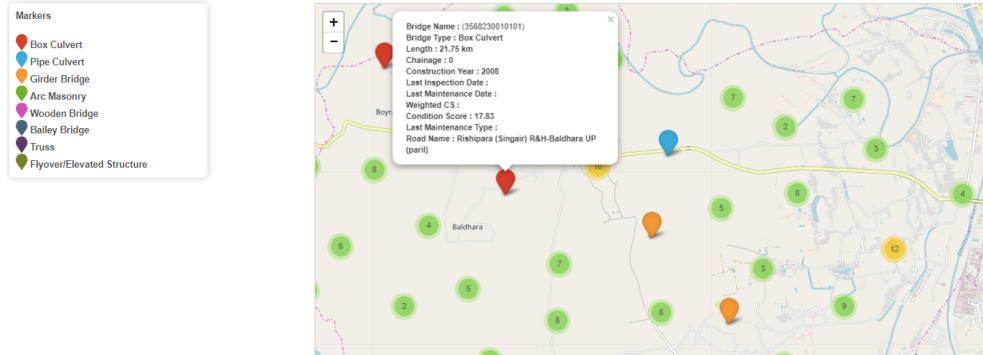
## MAP:

In the MAP Module ,there is a wide varied MAP situated.This customized MAP shows the Bridge locations into corresponding location.Also each bridge shows with some basic information.

There are different types of icon denotes different types of Bridge.Also bridges icons shows with clustering.



## Bridge MAP



## Admin Module:

In this module, admin can set configuration data for different settings. There are couple of config sections:

- Age Factor Settings
- Environmental Factor Settings
- Road Type Factor Settings
- Material vulnerability
- SI Factor
- Selected Bridge Group Costing
- Co Efficient Setting

All the sections come with data grid with necessary data which are editable by admin user.

These changes will take effect immediately after updating.

The screenshot displays the 'Age Factor' configuration page within an admin interface. On the left, there is a sidebar menu with options: 'Age Factor', 'Environmental Factor', 'Road Type Factor', 'Material Vulnerability', 'SI Factor', 'Selected Bridge Group Costing', 'Settings', and 'Co Efficient Settings'. The main content area shows a table titled 'Age Factor' with a '+ Add New Record' button. The table has four columns: 'Maximum Range', 'Minimum Range', 'Factor Value', and 'Action'. The data rows are as follows:

Maximum Range	Minimum Range	Factor Value	Action
10	0	1	▲
20	11	1.5	▲
30	21	2	▲
40	31	2.5	▲
50	41	3	▲
60	51	3.5	▲
100	61	4	▲

At the bottom of the table, there is a pagination control showing '1 - 7 of 7 items' and navigation icons. The footer of the page contains the text: '© Copyright Local Government Engineering Department (LGED). Designed & Developed by Maks Inc. USA.'

| **Conclusion:**

BMS is a standalone system for managing entire Bridges / Structures by LGED. This is much user friendly and easily maintainable

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| Thank You