



# GIS Portal

*A GIS Based Web Application for Project Planning of LGED*

## User Guide

Version 2.0

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## INTRODUCTION

Welcome to the GIS Portal of LGED. Using this application you can-

- ❖ Create LGED's road network maps with , and customize the number and type of object layers for viewing on the map,
- ❖ Create special maps to support decision making in different project planning and monitoring activities,
- ❖ Identify or check duplicate roads while planning for new project schemes,
- ❖ View project-wise maps and generate project road inventories, and-
- ❖ Generate road inventory and map summary reports.

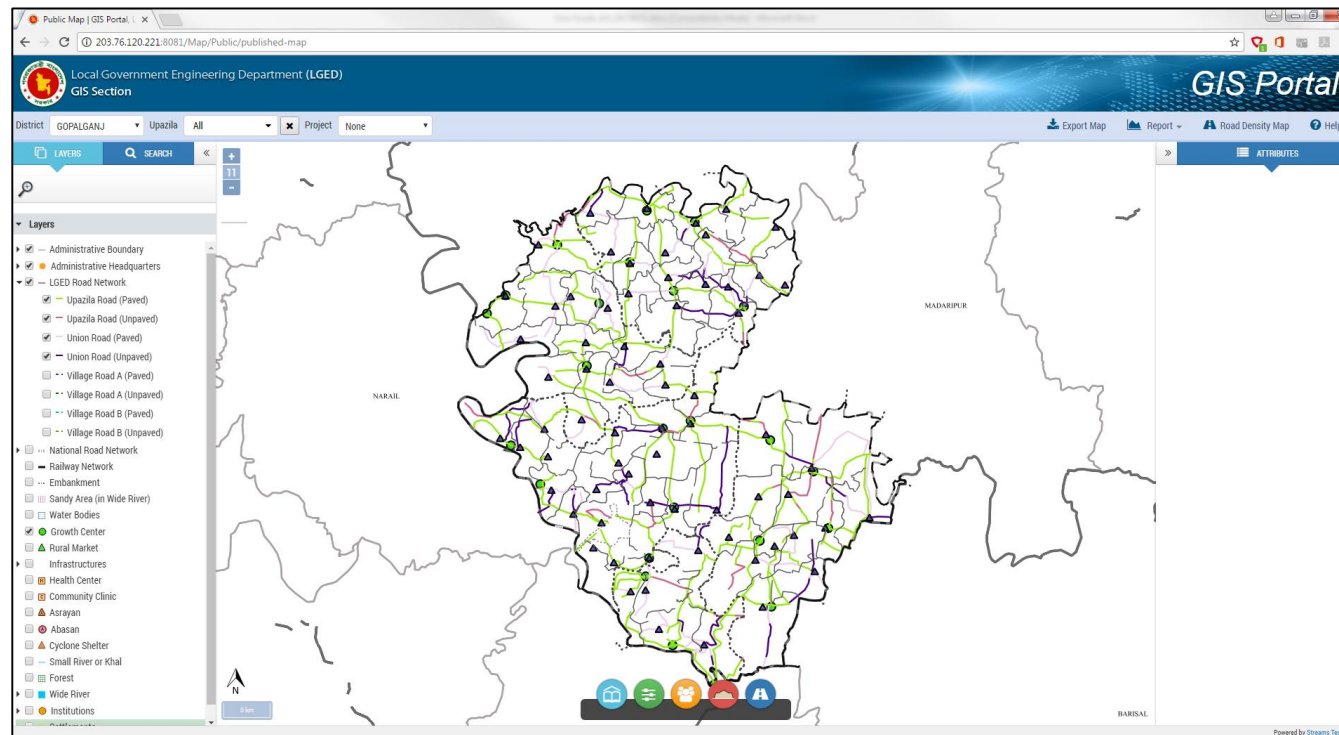
The web application is accessible at link:

<http://gis.lged.gov.bd/>

This document has been prepared as the User Guide of this application for the new and existing public users. It demonstrates you different features and tools for generation of road GIS maps, and how to utilize those features in different project planning and monitoring activities. For any query on this application or this guide, please contact via email: [info@lged.gov.bd](mailto:info@lged.gov.bd).

## BACKGROUND

GIS Portal was first developed under the project- Development of GIS Based Web Application for Project Planning of LGED, by Streams Tech Ltd. in June, 2016. The project was initiated by the ICT unit of LGED, after allocation of funds from the GOB, in order to bring advantage of GIS technology in mapping on web platform and decision support in different project planning and monitoring activities. GIS Portal has been, so far, a solid foundation for an integrated GIS asset management system for LGED.



## USER GROUPS

This web application is intended primarily for LGED's engineers and GIS staffs who frequently use GIS maps in different project planning and monitoring activities, and in reporting. Besides, it will be used by the central GIS and MIS units of LGED in order to systematically maintain their asset information in a spatial and digital database.

Other than LGED officials, the application will be frequently used by engineers, planners, research organizations, universities, NGOs, and other government and non-government development authorities who often need LGED's maps. However, anyone can access to the application without any prerequisites or log-in requirements.

## DISCLAIMER

This web application is a sole property of the ICT unit, LGED. , and LGED reserves the right to make and execute any decision on this application. Copying and using any or whole part of it without permission from the ICT unit of LGED, for commercial purposes, or for illegal activities will severely violate the national IP copyright law of Bangladesh, and shall fall under legal actions.

Although the outputs are generated using LGED's GIS database in this application, but LGED is not responsible and assumes no liability whatsoever for any results or any use made of the results, nor for any damages or litigation that result from the use of this program for any purpose.

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## ACRONYMS

AADT	Annual Average Daily Traffic
CVD	Cumulative number of Commercial Vehicles per Day
GIS	Geographic Information System
GOB	Government of Bangladesh
ICT	Information and Communication Technology
IRI	International Roughness Index
STL	Streams Tech Ltd.
LGED	Local Government Engineering Department
NGO	Non-Government Organization
UI	User Interface

# 1 GETTING STARTED

## 1.1 LOAD APPLICATION PAGE

To load the web application page on your browser, go to the link at: <http://gis.lged.gov.bd/>

The screenshot shows the GIS Portal website interface. The browser address bar displays "203.76.120.221:8081". The header includes the LGED logo and "Local Government Engineering Department (LGED) GIS Section" on the left, and "GIS Portal" on the right. The main content area features a "Welcome to the GIS Portal of LGED" message, a "User Guide" button, and a "Go to Map" button. Below this is an "Analytical Map" section titled "Upazila Level % of Paved Road of Bangladesh" with a "View Map" button. A small map of Bangladesh is visible in the "Analytical Map" section. The footer indicates "Total Number of visitors: 4" and "Powered by Streams Tech Ltd."

## 1.2 USER INTERFACE

The application map page has five major compartments in its user interface as shown below.

The screenshot displays the GIS Portal interface for the Local Government Engineering Department (LGED) GIS Section. The interface is divided into several functional areas:

- Header (Banner, menu bar):** Located at the top, it includes the LGED logo, the text "Local Government Engineering Department (LGED) GIS Section", and the "GIS Portal" title. It also features navigation options like "District GAIBANDHA", "Upazila All", and "Project None", along with utility icons for "Export Map", "Report", "Road Density Map", and "Help".
- Layer Panel (Layer list, road search):** A vertical panel on the left side containing a search bar and a list of map layers such as "Administrative Boundary", "Administrative Headquarters", "LGED Road Network", "National Road Network", "Railway Network", "Embankment", "Sandy Area (in Wide River)", "Water Bodies", "Growth", "Cyclone", "Small River of River", "Forest", "Wide River", "Institutions", and "Settlements".
- Map Window:** The central area displaying a detailed map of the road network with various colored lines representing different road types and features.
- Tools:** A horizontal toolbar at the bottom center of the map window, containing icons for home, layers, search, pan, zoom, and other map navigation functions.
- Attribute View Panel (Attribute summary):** A panel on the right side showing the "ATTRIBUTES" for the selected "Road Network". It includes a table with the following data:

Name	Value
Road ID	132672001
Category	UPAZILA ROAD
Surface Type	
Description	UPAZILA ROAD (Pucca)
Chainage (Start)	6049
Chainage (End)	6430

Each compartment has a number of options as illustrated below.

### 1.2.1 HEADER

Header contains two items, a banner and a menu bar.



The menu bar items are listed below.

Location or project search box



Map export command



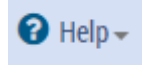
Report menu



Road Density map generation button

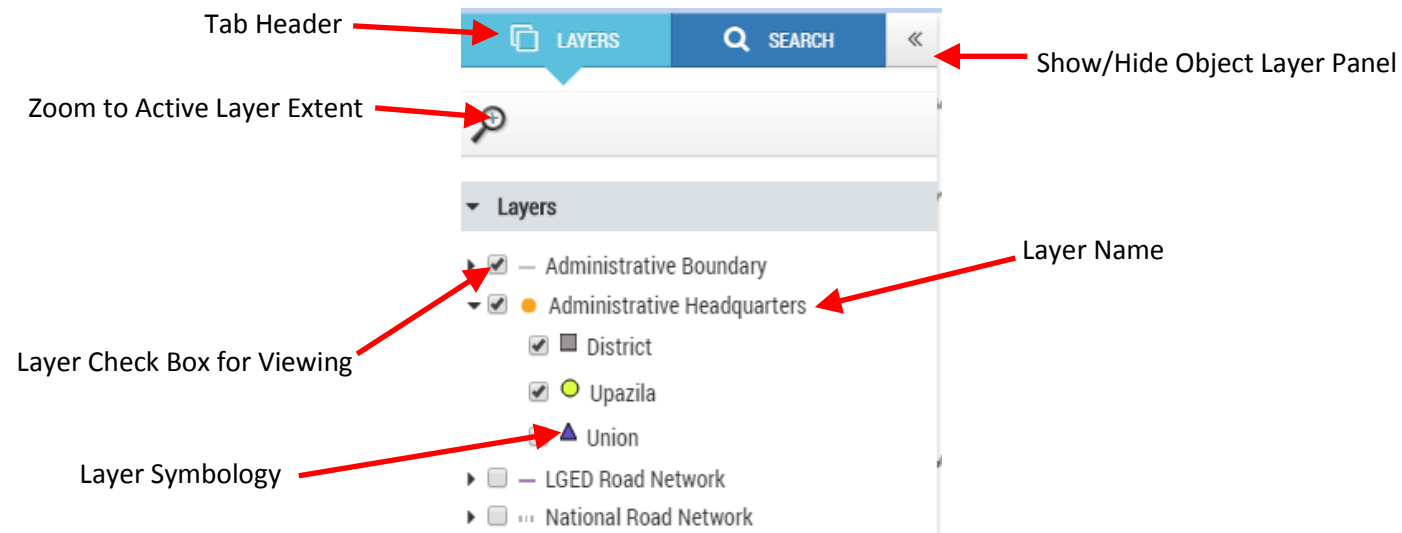


Help Menu



### 1.2.2 OBJECT LAYER PANEL

Object layer panel contains two tabs, LAYERS and SEARCH. LAYERS tab has following features. User can only check or uncheck these layers but they are not allowed to change any layer properties.



The SEARCH tab is provided for advance road query, selection and display on the map. It has following outlook.

Tab Header

Show/Hide Object Layer Panel

Road Search Criteria Setting Box

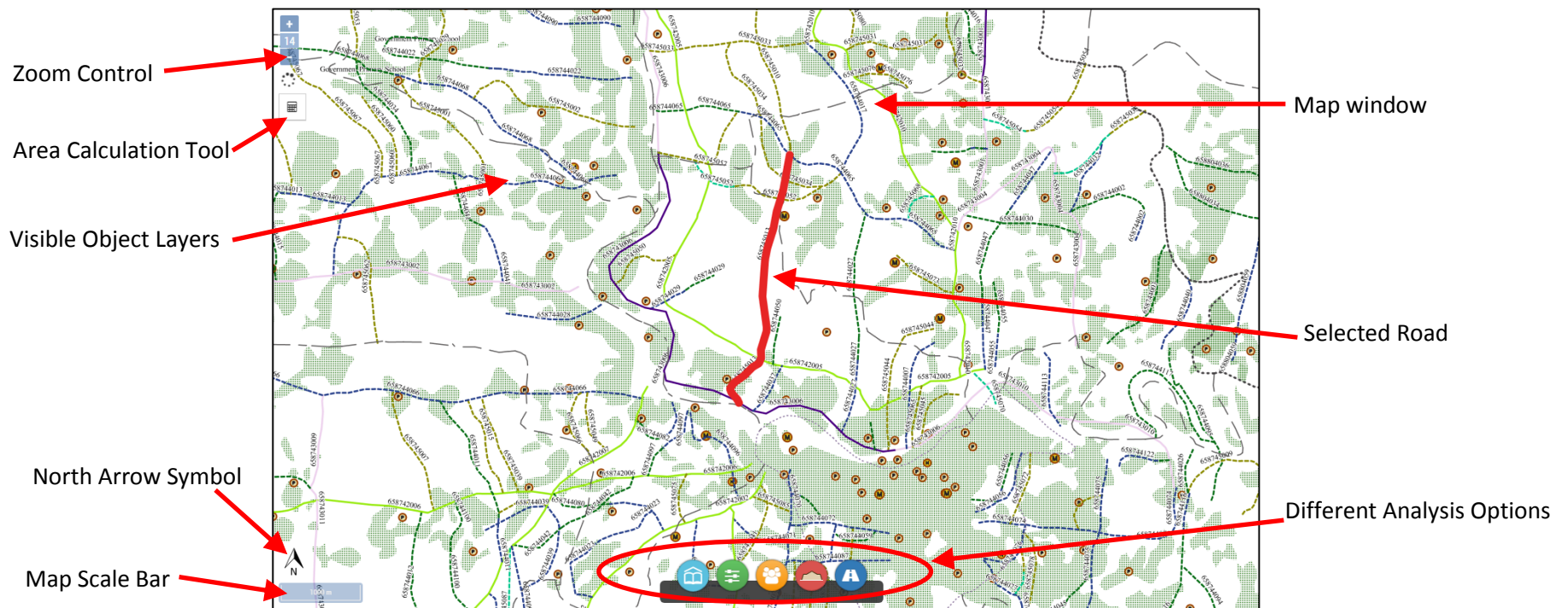
Search Command

Search Result List

Road Name	Road ID
Tupamari U.P.to Kachary hat.	173643014
Tupamari U.P to Polashbari U.P. near R&H road.	173643036

### 1.2.3 MAP WINDOW

It's the main component of the application interface which shows you the feature layers (which are checked in the object layer panel). It allows you to navigate through the map, select or highlight a road or any other feature, zoom the extent to the desired level, view object labels, and to perform some advanced spatial and geometric analyses for project planning. Map window has specific items as shown below.



## 1.2.4 ATTRIBUTE VIEW PANEL

Attribute view panel, located at the right side of the interface, consists of two tabs, ATTRIBUTES and ROAD SUMMARY. When an object is selected on the map, the ATTRIBUTES tab shows its properties. The ROAD SUMMARY tab is specially provided for the road objects. When a road object is selected on the map, this tab shows a comprehensive inventory report of that road.

The ATTRIBUTES tab has following common features.

The screenshot shows the Attribute View Panel interface. At the top, there are two tabs: 'ATTRIBUTES' and 'ROAD SUMMARY'. A red arrow points to a double-right arrow icon on the left of the 'ATTRIBUTES' tab, labeled 'Show/Hide Attribute View Panel'. Another red arrow points to the 'ROAD SUMMARY' tab, labeled 'Tab Header'. Below the tabs, there is a header for the selected object: '< 1 of 3 > LGED Road Network'. A red circle highlights the '< 1 of 3 >' part, with a red arrow pointing to it labeled 'Special Attribute View Option (When multiple objects are selected)'. Below this header is a table with two columns: 'Name' and 'Value'. The table contains the following data:

Name	Value
Road ID	658744050
Category	VILLAGE ROAD A
Surface Type	Ert
Description	VILLAGE ROAD A (Katcha)
Upazila ID	67603
District ID	676

A red bracket on the right side of the table is labeled 'Attribute List'.



The ROAD SUMMRAY tab contains following items.






The screenshot shows the 'ROAD SUMMARY' tab in a software application. The interface includes a 'Show/Hide Attribute View Panel' button (a double arrow icon), a 'Tab Header' with 'ATTRIBUTES' and 'ROAD SUMMARY' tabs, and an 'Export Command' button. Below these is a 'Road Inventory Report' section containing a table of road data and an 'Export' button. A red bracket groups the table data as 'Road Inventory Data'. A black line with a jagged end is drawn at the bottom of the table.

Road Inventory Report	
Road ID	658744050
Road Name	Ataispika-dolairdar road
Upazila	MOULVIBAZAR-S
Road Type	Village Road-A
District	MOULVIBAZAR
Road Length	
Paved	0
Unpaved	1500
Total	1500

### 1.2.5 MAP ANALYSIS OPTIONS

At bottom of the map window, there is a list of five special analysis options, especially for the road network. These are described below.

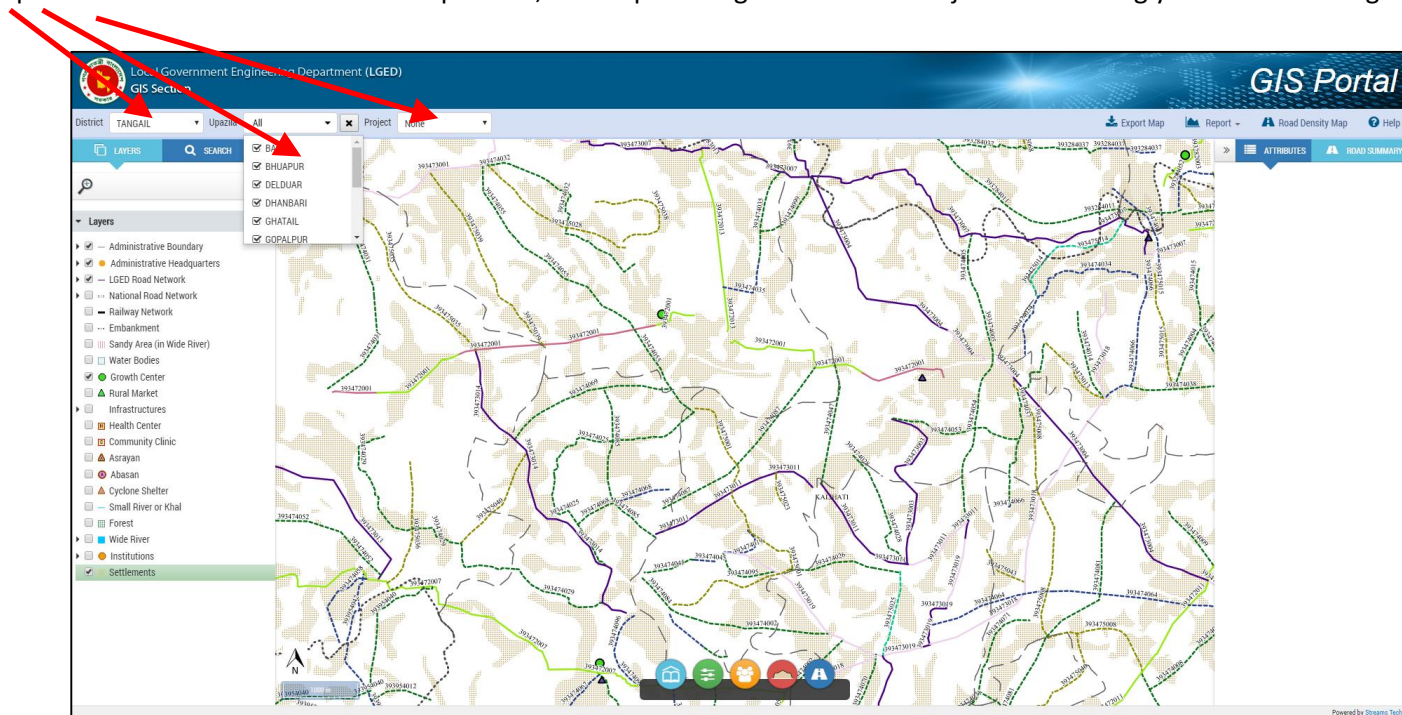



Tool Icon	Tool/Feature Name	Function
	School served area identification tool	Identifies a circular served (or influence zone) area around each school feature based on a user specified buffer distance, and displays the served area on the map.
	Duplicate road identifying tool (to be used in project planning)	Identifies duplicate roads based on user supplied road information, and displays them in a table.
	Road served area identification tool	Identifies a polygon served (or influence zone) area around a selected road object based on a user specified buffer distance, and displays the served area on the map. Besides it also shows an estimate of served population number based on habitat density in the settlement areas.
	Road cross section view tool	Displays cross section information of a selected road in a diagram.
	Road special property selection tool for viewing on the map	Allows users to specify a single property among AADT, IRI and CVD; and then to generate a second level road symbology based on that property and view on the map. By doing this, this tool allows to view a two-fold symbology view for the same road layer, e.g. one usually showing the road category, and another one (overlaid on the first one) showing that special property.

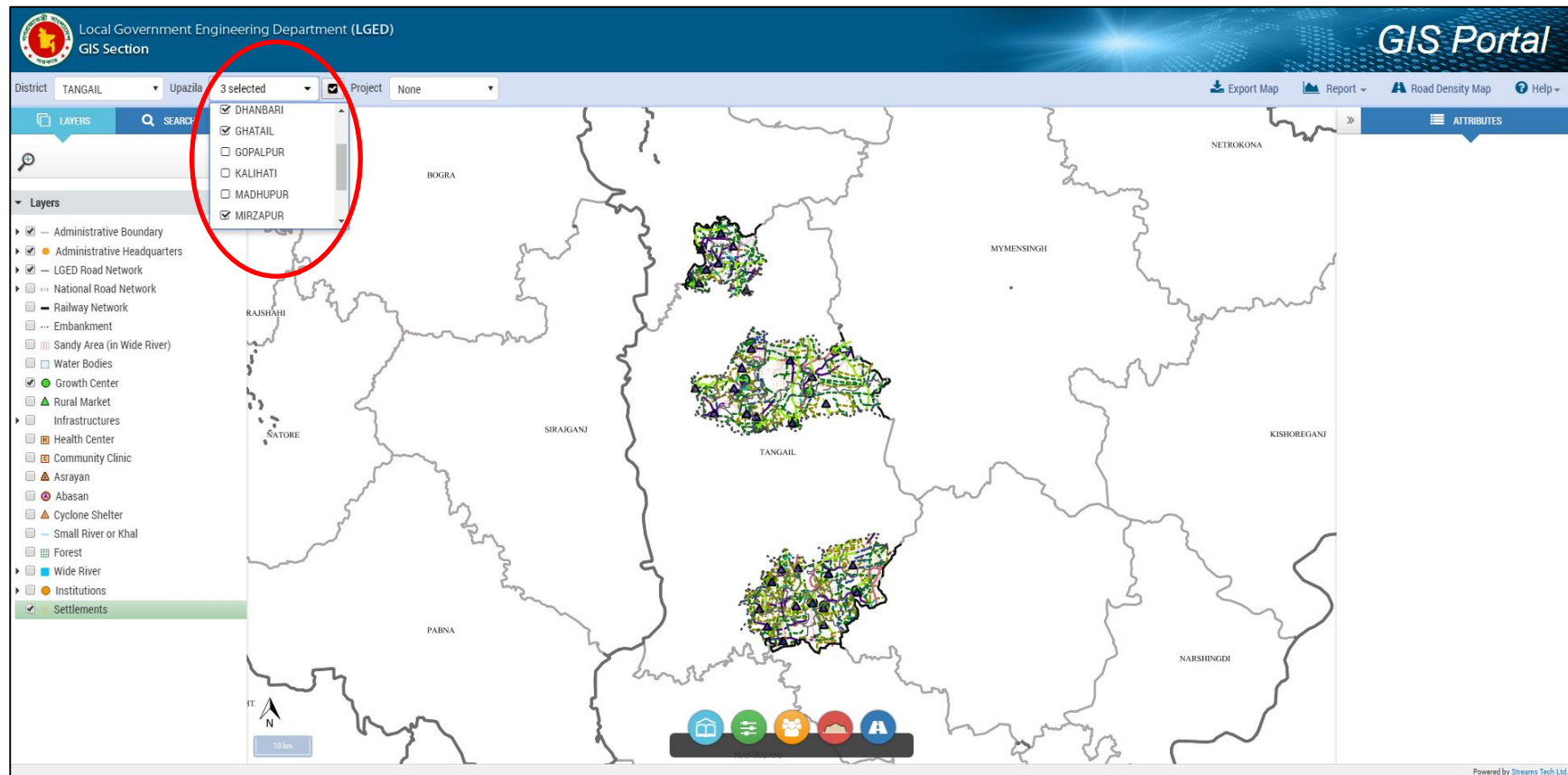
## 2 WORKING WITH THE APPLICATION

### 2.1 SEARCH LOCATION AND VIEW ROAD NETWORK ON THE MAP

When you have loaded the application on your browser, you can search location based on district or upazila names, and on project names. These names are provided in a dropdown list in the menu bar. When specified, the map viewing extent will be adjusted accordingly like the following figure.

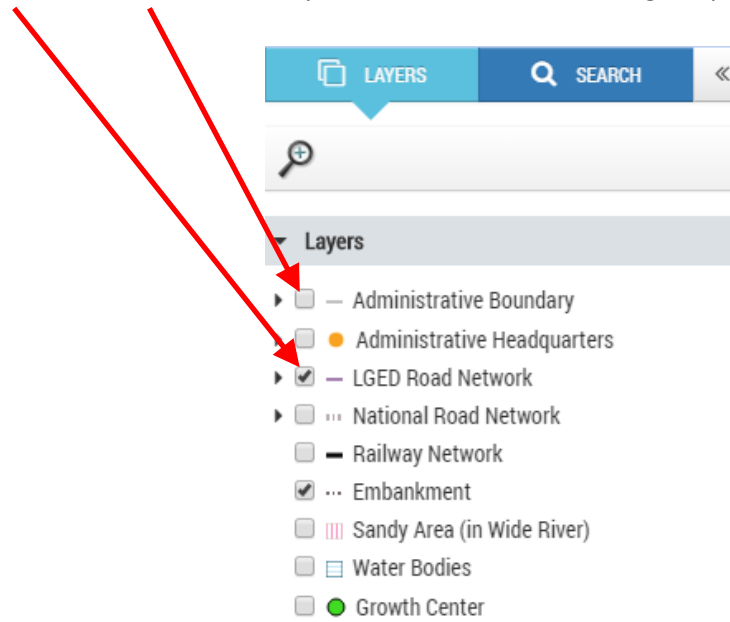


You specify more than one upazila within a district on the map for viewing. You can check or uncheck all upazilas at a time by clicking on  button located beside the upazila search box.




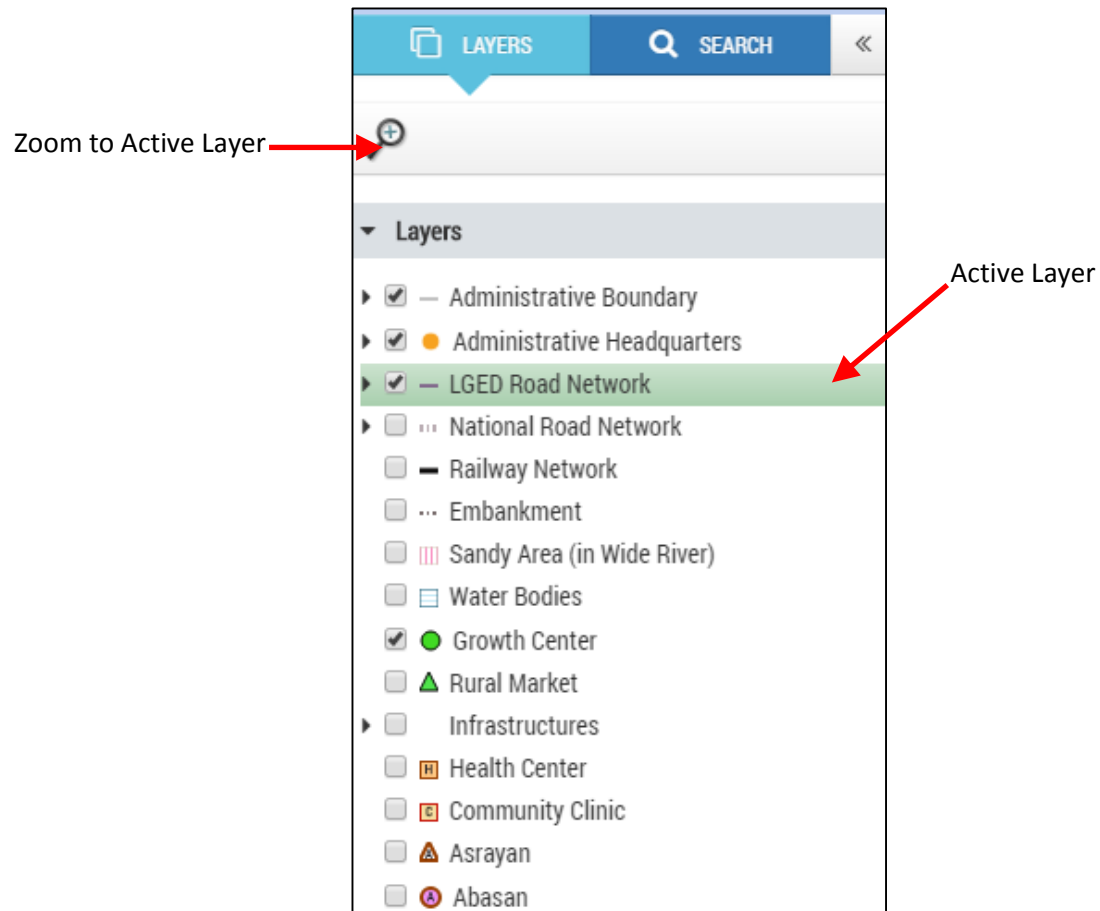
## 2.2 CHECK/UNCHECK LAYERS FOR VIEWING ON THE MAP

The application has a default setting for viewing the object layers. However, depending on your need, you can switch off some layers from viewing, thereby eliminate unnecessary objects on a map and improve visualization of other objects. Check or uncheck the box shown with a layer name to control its visibility on the map. User can only check or uncheck these layers but not allowed to change any layer properties.





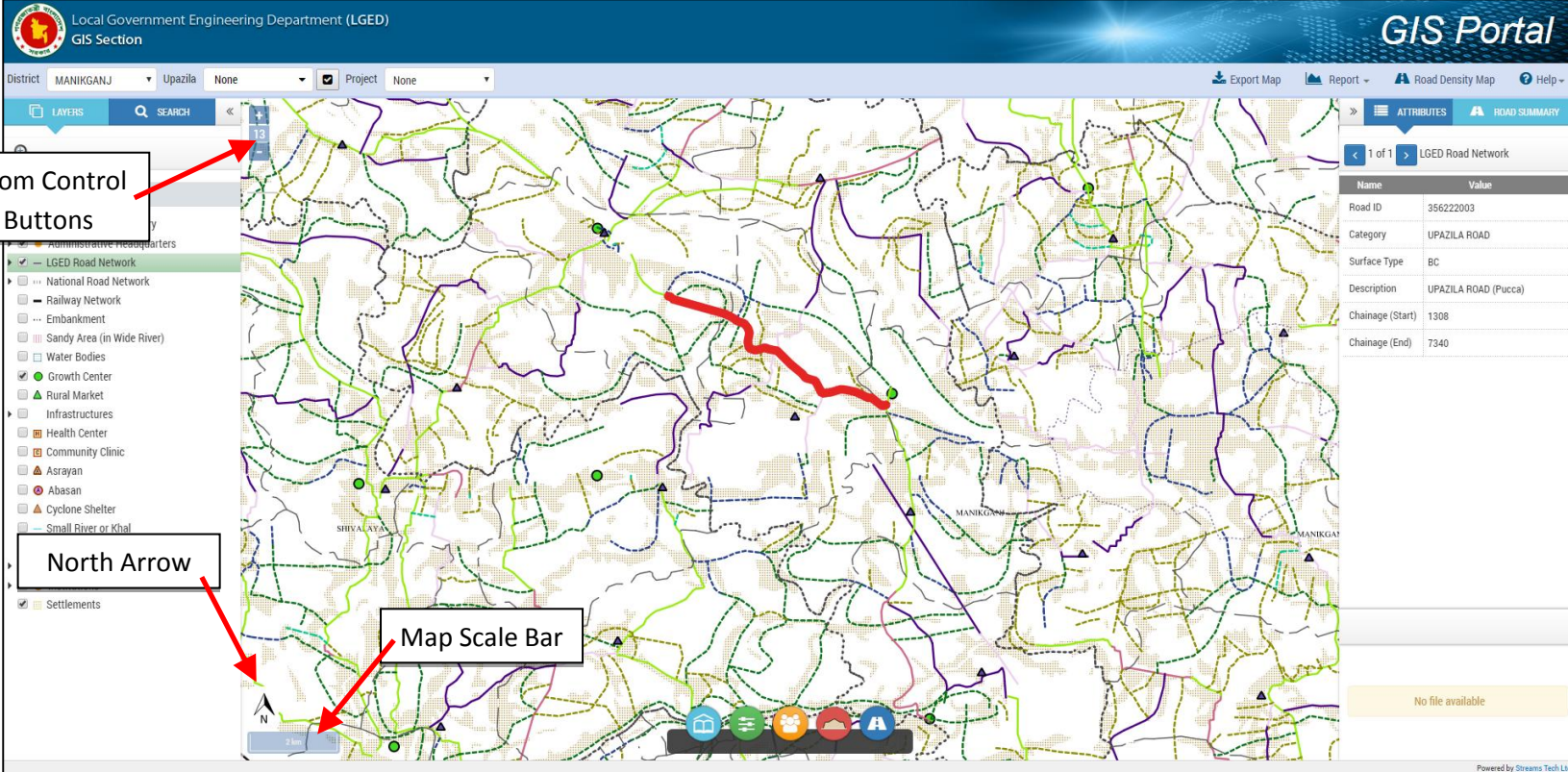
### 2.3 SET ACTIVE LAYER

Click once on the object layer name in the layer panel to make it the active layer. The active layer name is highlighted with light green color as shown below. You can also zoom to the active layer extent by clicking on  button given in the layer panel.



## 2.4 ADJUST MAP ZOOM LEVEL

Use  or  buttons shown at the top-left corner of the map (shown below), or use mouse scrolling to adjust the zoom level. With change in zoom level, the map scale will be automatically updated.



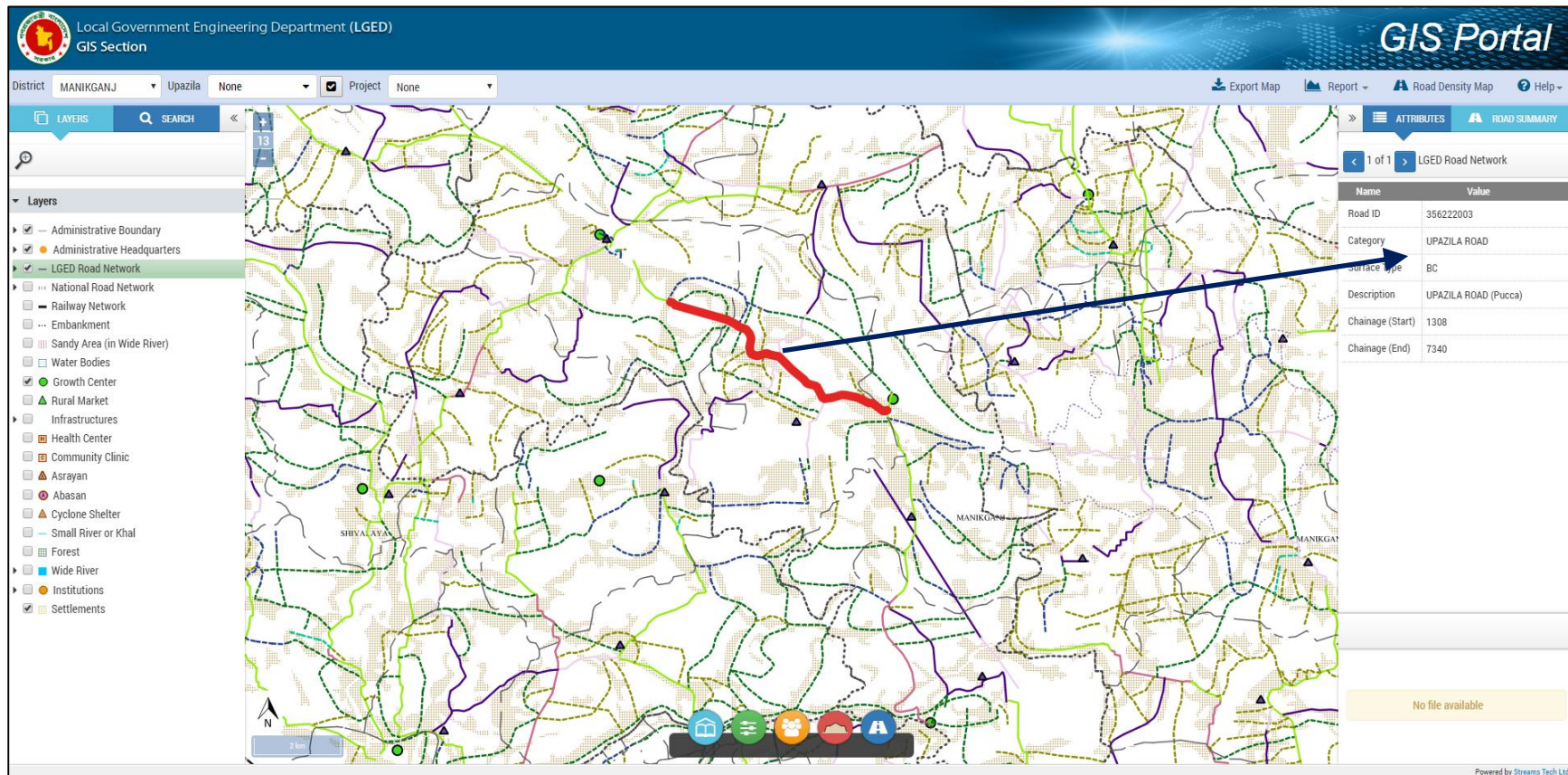
The screenshot displays the LGED GIS Portal interface. The top navigation bar includes the LGED logo, 'Local Government Engineering Department (LGED) GIS Section', and 'GIS Portal'. Below this, there are dropdown menus for 'District' (MANIKGANJ), 'Upazila' (None), and 'Project' (None). The main map area shows a road network with various colored lines. A red line highlights a specific road segment. On the left, a 'LAYERS' panel lists various map features, with 'LGED Road Network' selected. A 'Zoom Control Buttons' callout points to the '+' and '-' buttons in the top-left corner of the map. A 'North Arrow' callout points to the north arrow symbol in the bottom-left corner. A 'Map Scale Bar' callout points to the scale bar in the bottom-left corner. On the right, an 'ATTRIBUTES' panel shows details for a selected road segment, including 'Road ID', 'Category', 'Surface Type', 'Description', 'Chainage (Start)', and 'Chainage (End)'. The bottom of the interface features a toolbar with icons for home, layers, search, and other functions.

Name	Value
Road ID	356222003
Category	UPAZILA ROAD
Surface Type	BC
Description	UPAZILA ROAD (Pucca)
Chainage (Start)	1308
Chainage (End)	7340



## 2.5 SELECT A ROAD AND VIEW ATTRIBUTES

To select a road and highlight it on the map, make the road layer active. Then click on the desired road feature on the map. The application will highlight it and show the properties in the attribute panel.



The screenshot displays the GIS Portal interface for the Local Government Engineering Department (LGED) GIS Section. The map shows the LGED Road Network, with a specific road highlighted in red. The attribute panel on the right shows the following properties:

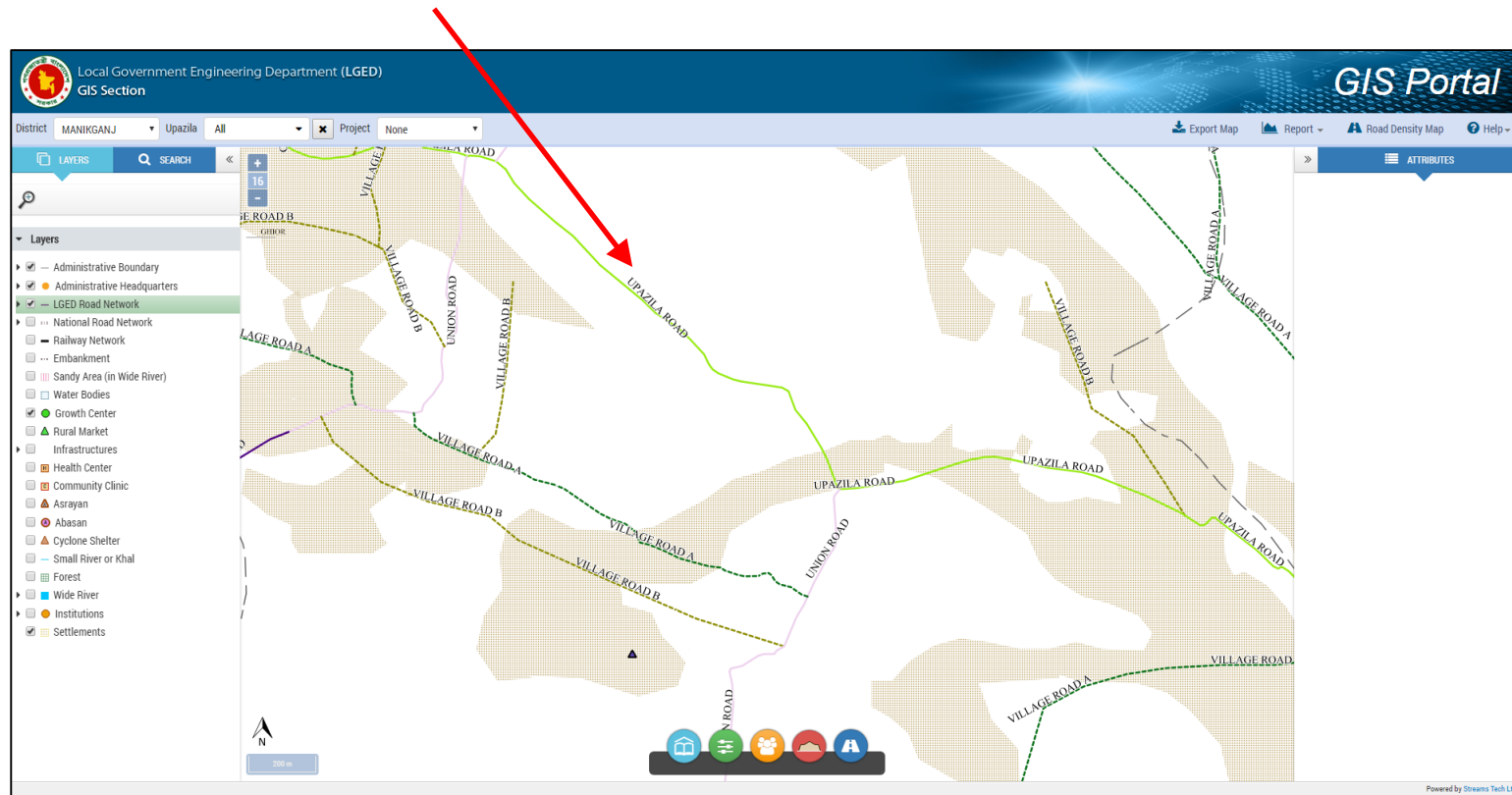
Name	Value
Road ID	356222003
Category	UPAZILA ROAD
Surface Type	BC
Description	UPAZILA ROAD (Pucca)
Chainage (Start)	1308
Chainage (End)	7340

The interface includes a layers panel on the left, a search bar, and a top navigation bar with options like 'Export Map', 'Report', 'Road Density Map', and 'Help'. The map shows various geographical features and infrastructure, with a scale bar and north arrow at the bottom left.

You can select any other type of object similarly and view its attributes on the map.





## 2.6 VIEW ROAD LABELS ON THE MAP

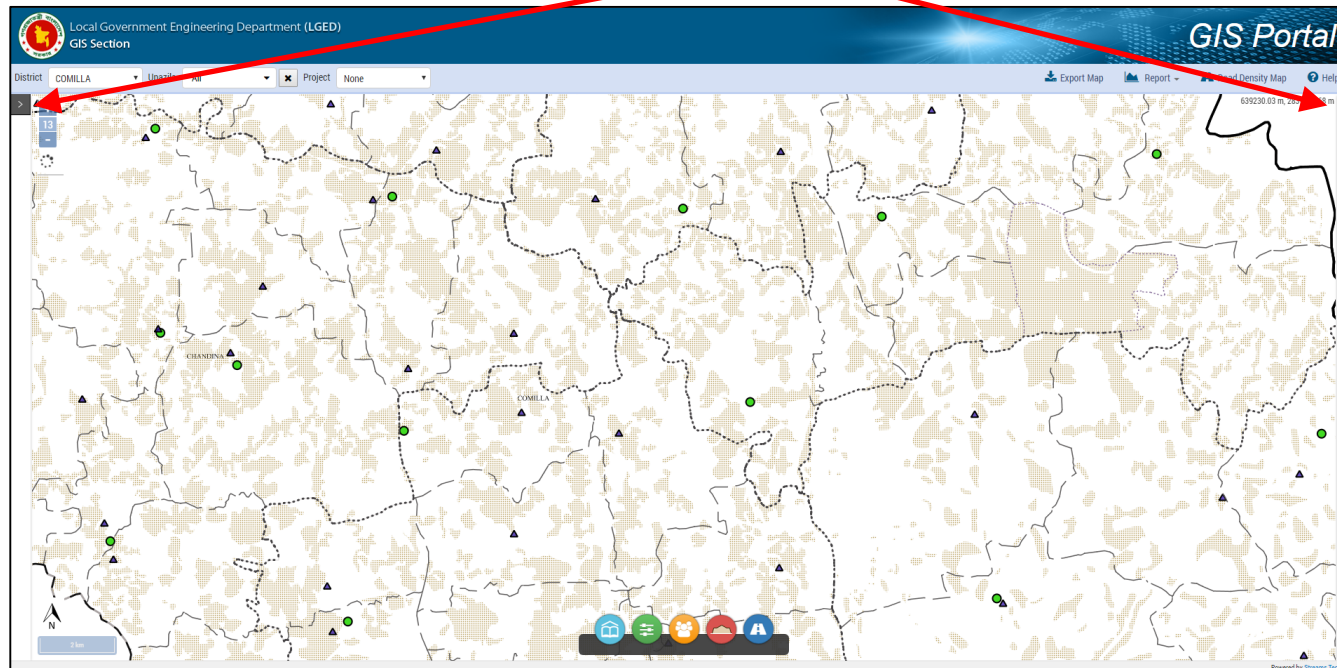
If configured by the application administrator, the map will display you the road labels. The label is set usually the road names or IDs. To view road labels, zoom in the road view extent until the labels become visible.



## 2.7 OTHER USEFUL OPERATIONS

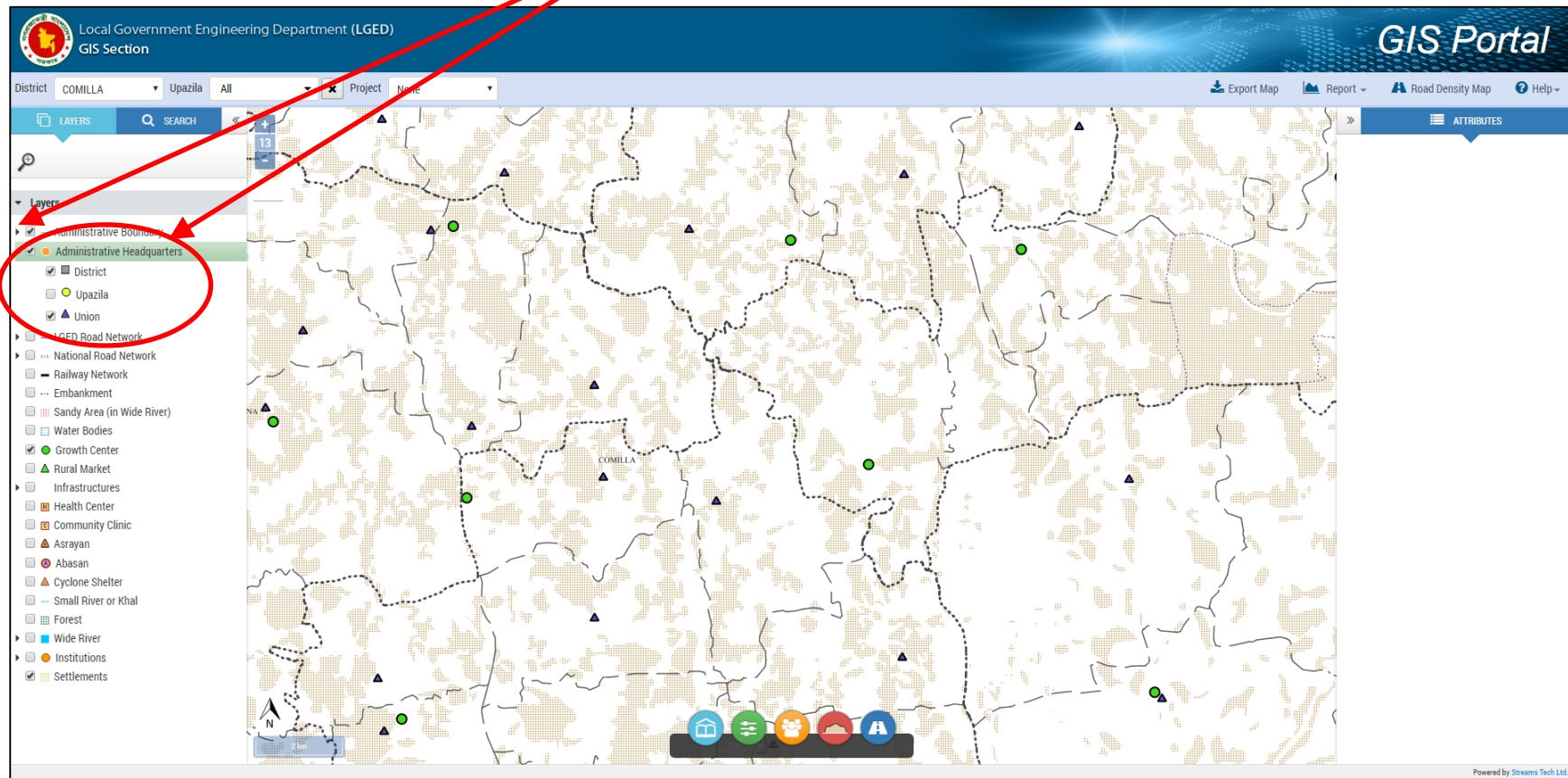
### 2.7.1 SHOW/HIDE PANELS

You can show or hide the layer panel and the attribute panel for better visualization of the map extent. Use  or  buttons to hide those panels respectively. And, use  and  buttons to view them again. When you have hid them, the interface should look like the following figure.



## 2.7.2 EXPAND/COLLAPSE SYMBOLOGY CLASSIFICATIONS

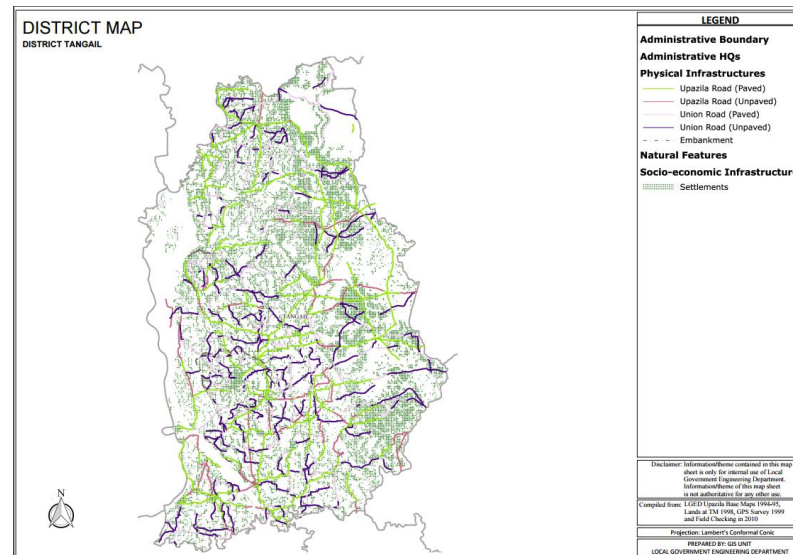
Symbology for some layers are provided with sub-classifications. For example, road layer is classified into four types. For convenience in display in the layer panel, these classifications are provided with symbology expand/collapse options as shown below.



## 2.8 EXPORT MAP

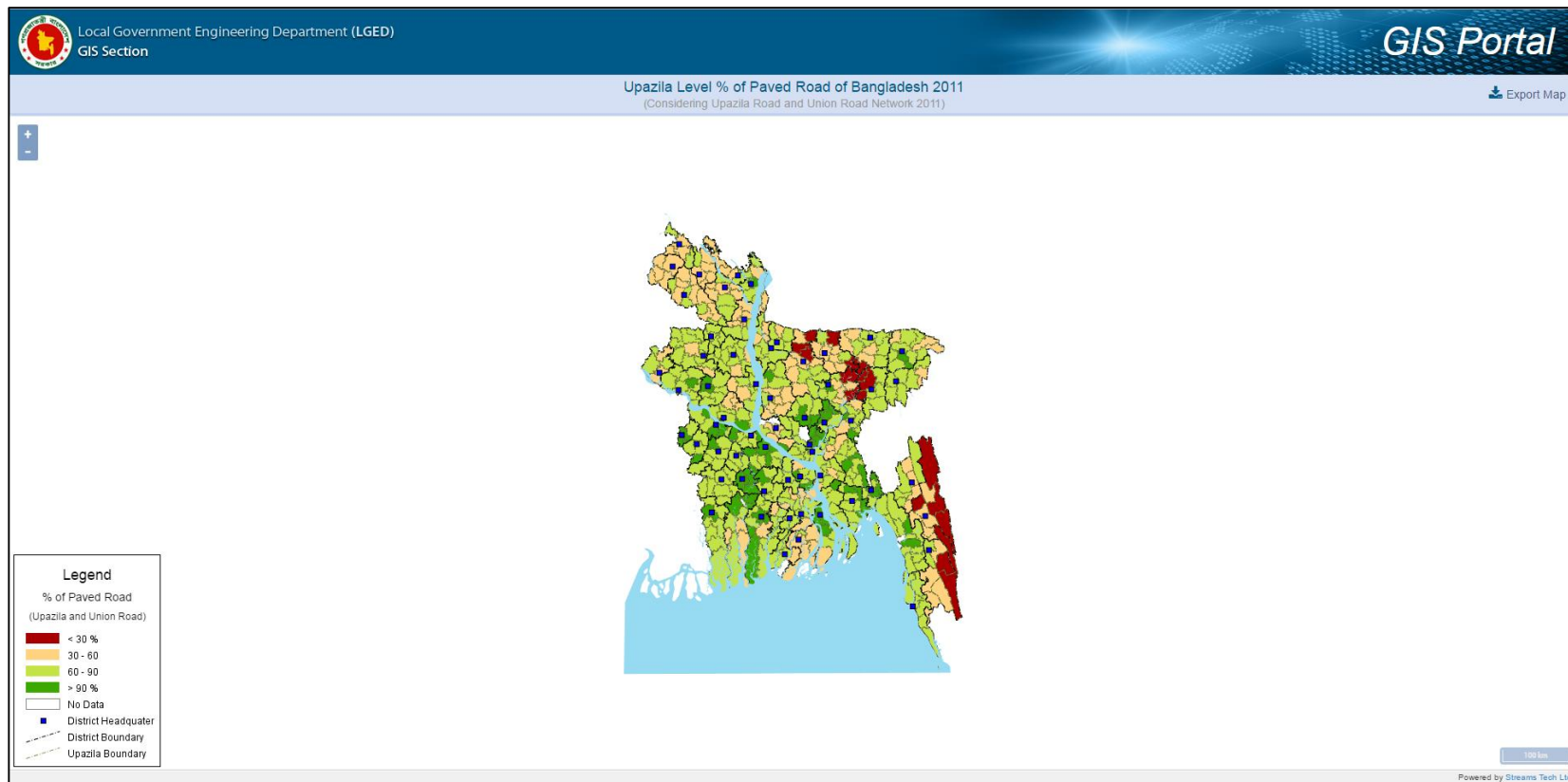
### 2.8.1 EXPORT DISTRICT OR UPAZILA MAP

You can export district or upazila maps to pdf files from GIS Portal. Upzila map extents depend on how many of them you have specified under a particular district. After selection of locations and printable object layers, click on the *Export Map* button located on the menu bar as shown below. A preview of the map layout will open in a separate tab as a pdf file on your browser. If ok, then download the file and save it to your computer.

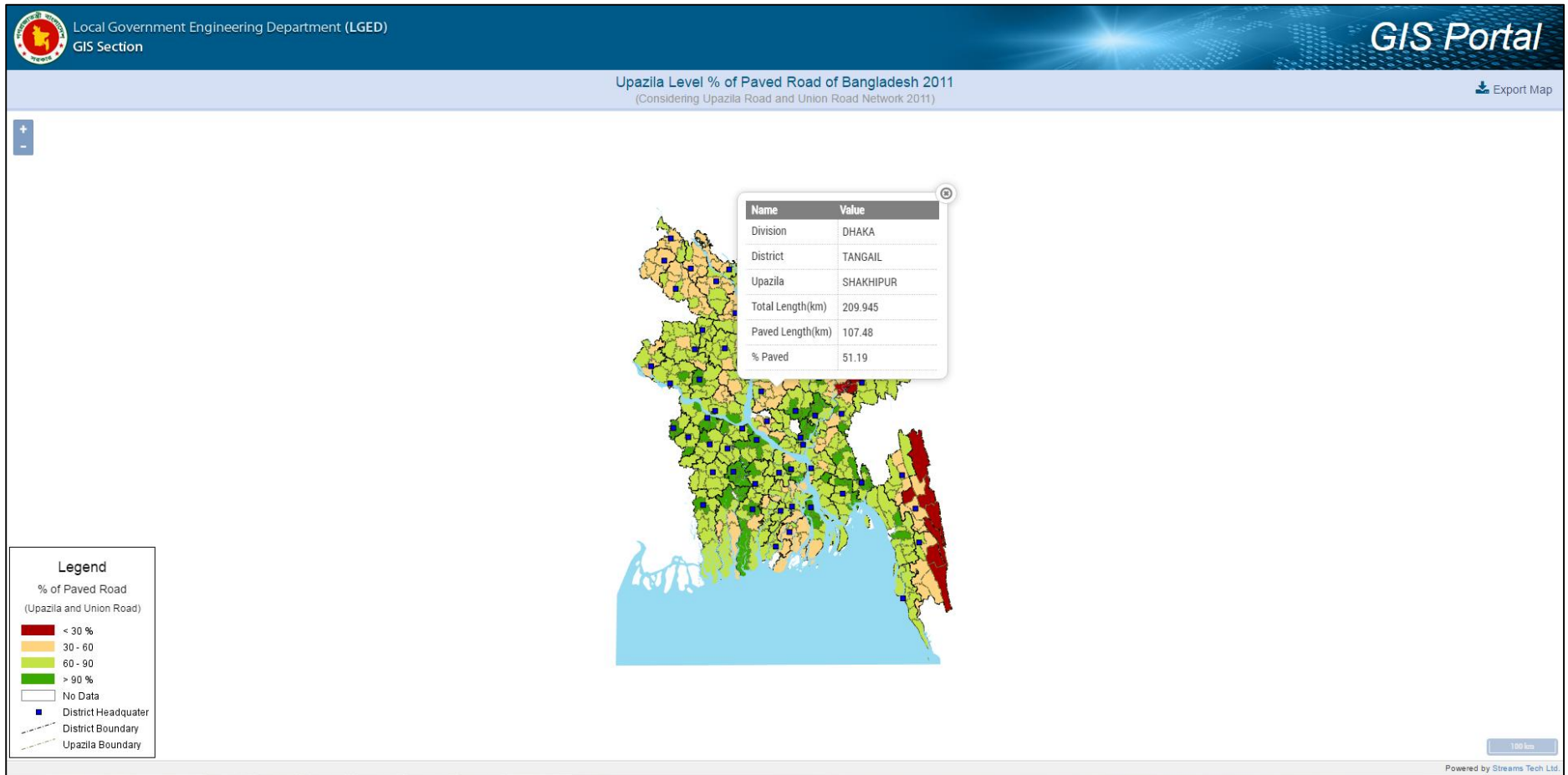


## 2.8.2 EXPORT ROAD DENSITY MAP

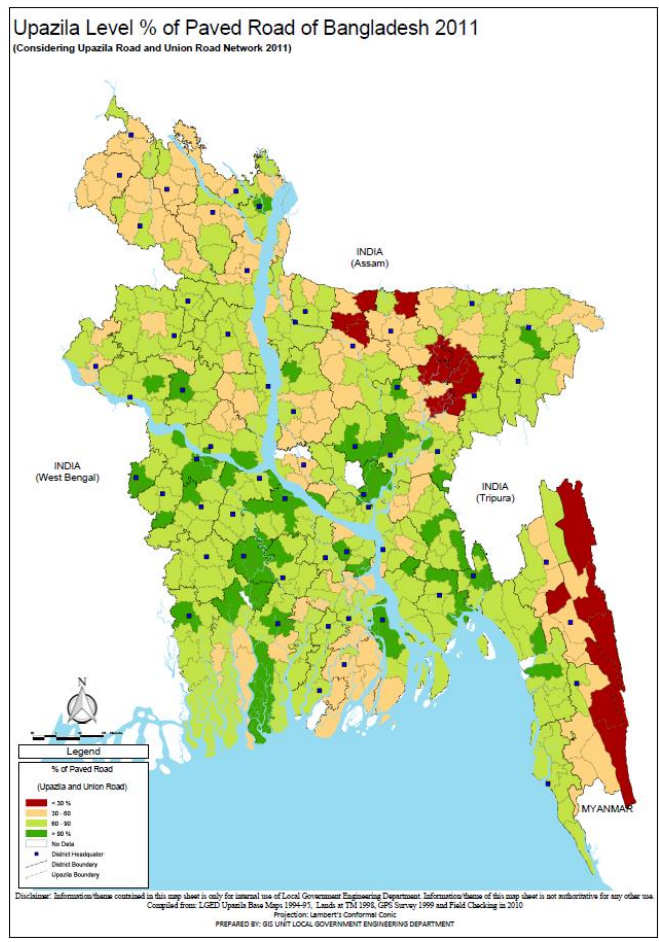
You can view and export percent paved road network map of LGED for over whole country using GIS Portal. It's a static map showing you the percentage of total road length that has been paved at upazila level. Click on *Road Density Map* button on the menu bar to view this on your browser. It will open in a separate tab.



Click on any upazila on the map and it will show you a summary statistics of paved road network like following.



To export the map to a pdf file, click on *Export Map* button as shown at the top-right corner of the map panel. A map layout will be displayed in a separate tab like following. You can then download and save the file.



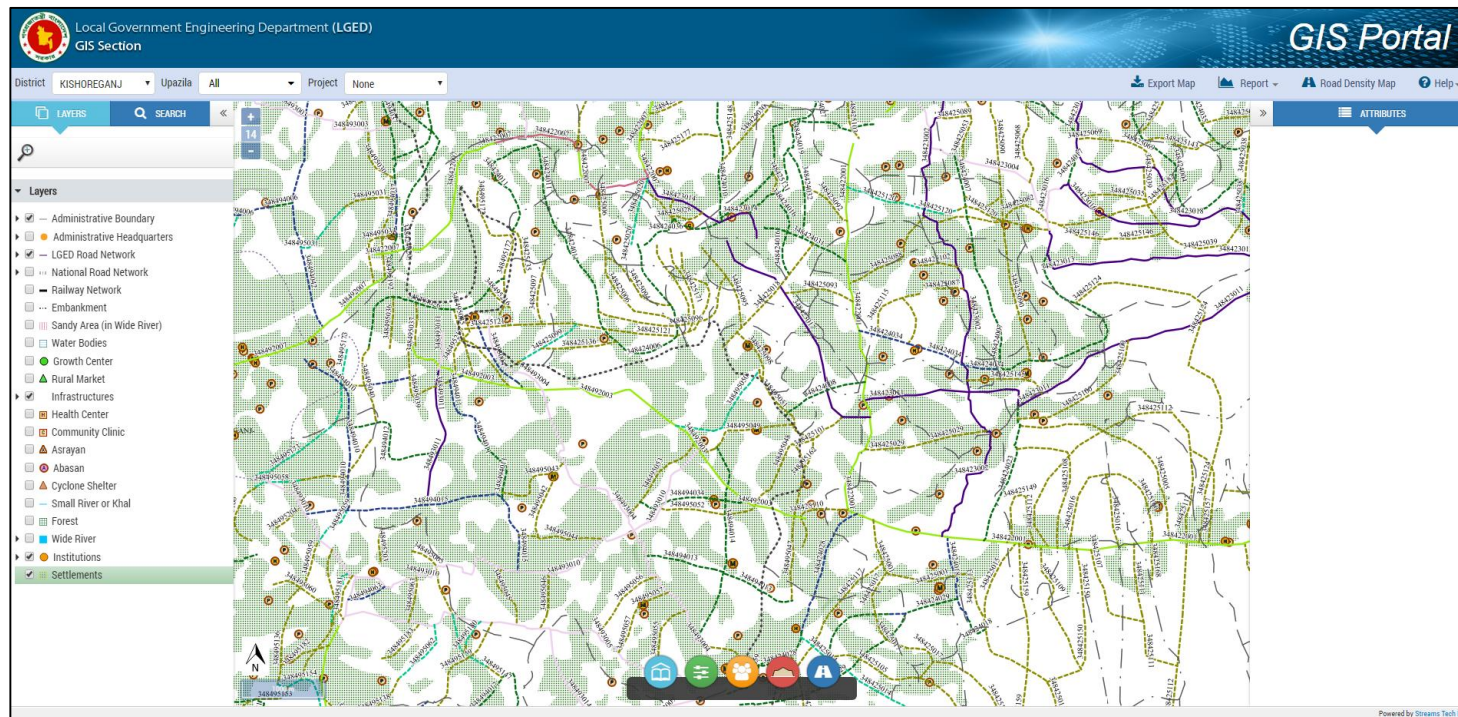



## 3 MAP ANALYSIS OPTIONS FOR PROJECT PLANNING AND MONITORING

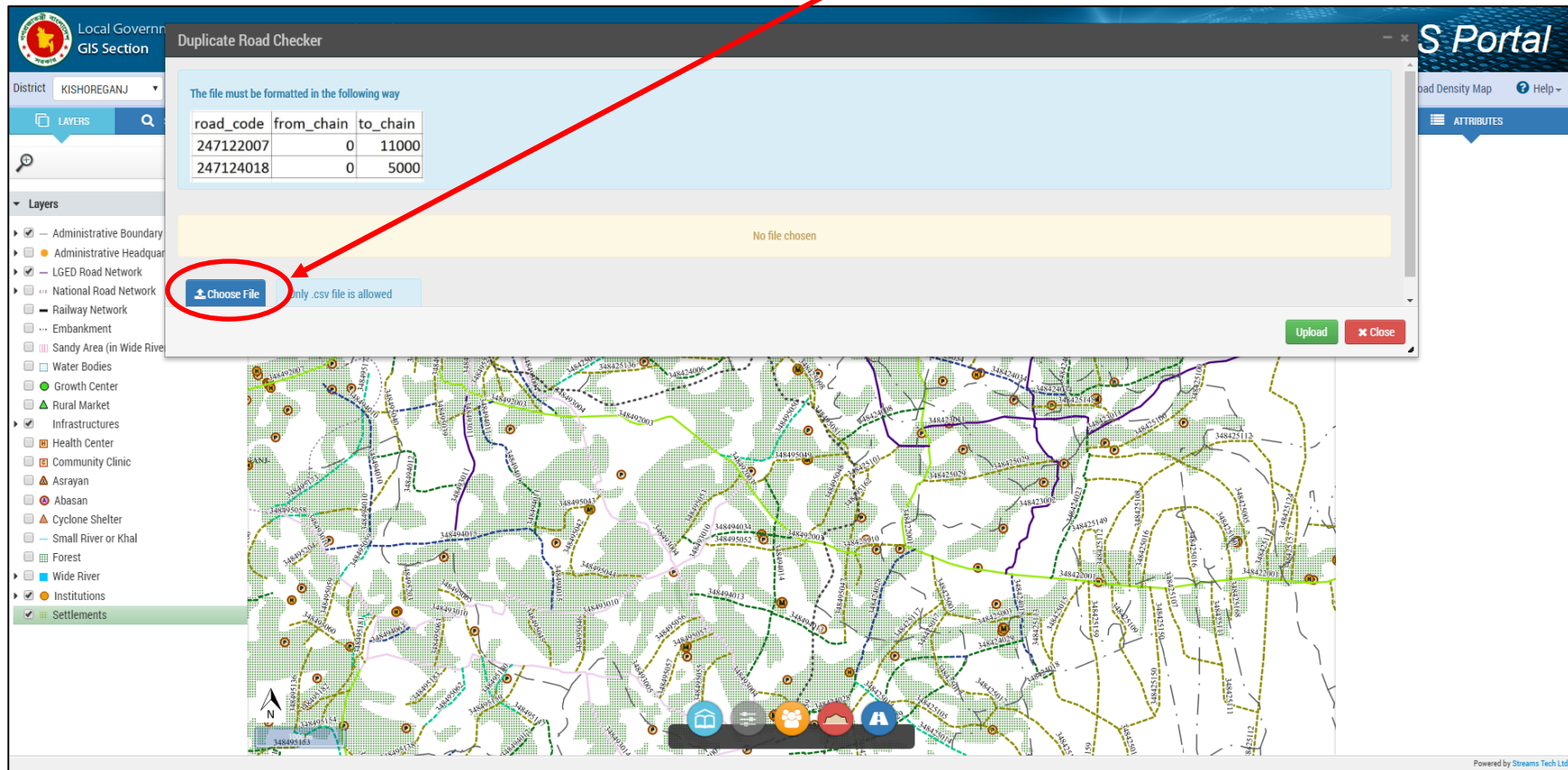
### 3.1 DUPLICATE ROAD IDENTIFYING MODULE

You can use the application to identify duplicate roads (if any) during listing them for project planning. To do so:

1. Specify the map location, and zoom road network to the desired extent.



2. Now click on  button near the bottom of the map window. It will ask you to specify the road list file (for checking duplicates) from your computer.



Local Government GIS Section

District: KISHOREGANJ

Layers: Administrative Boundary, Administrative Headquarters, LGED Road Network, National Road Network, Railway Network, Embankment, Sandy Area (in Wide River), Water Bodies, Growth Center, Rural Market, Infrastructures, Health Center, Community Clinic, Asrayan, Abasan, Cyclone Shelter, Small River or Khal, Forest, Wide River, Institutions, Settlements

The file must be formatted in the following way

road_code	from_chain	to_chain
247122007	0	11000
247124018	0	5000

No file chosen

Choose File (only .csv file is allowed)

Upload Close

Powered by Streams Tech Ltd.

The road list file has a standard data format which must be maintained for use in this application. The file format is given in **Appendix-A**.

3. After specifying the road list file, click the upload button.

The screenshot shows the GIS Portal interface for the Local Government Engineering Department (LGED) GIS Section. The 'Duplicate Road Checker' dialog box is open, displaying a table with the following data:

road_code	from_chain	to_chain
247122007	0	11000
247124018	0	5000

The dialog box also includes a 'Choose File' button, a note 'Only .csv file is allowed', and an 'Upload' button circled in red. A red arrow points from the text above to the 'Upload' button. The background shows a map of Narshingdi with various road layers and a sidebar with layer controls.

4. The application will now analyze and verify the road list data with existing or ongoing project information in the database, and then show an output table where you can find the duplicate roads (if any).

Proposed Project					Existing Project					Duplicate?	Select Road
District	Upazila	Road Code	From Chain	To Chain	Project Code	Project Name	From Chain	To Chain	Work Type		
KISHOREGANJ	AUSTAGRAM	348023005	4000	5000	KIRIDP	KIRIDP	3570	5570	Unpaved to Paved	Yes	<input type="checkbox"/>
KISHOREGANJ	AUSTAGRAM	348024030	200	800	KIRIDP	KIRIDP	0	1200	Unpaved to Paved	Yes	<input type="checkbox"/>
KISHOREGANJ	AUSTAGRAM	348024006	0	2000	KIRIDP	KIRIDP	0	2000	Unpaved to Paved	Yes	<input type="checkbox"/>
KISHOREGANJ	AUSTAGRAM	348023009	100	1200	KIRIDP	KIRIDP	0	2750	Unpaved to Paved	Yes	<input type="checkbox"/>
KISHOREGANJ	AUSTAGRAM	348023004	0	1000						No	<input type="checkbox"/>

Notice that the status report shows a column for road selection option. If you check this, corresponding item will be highlighted on the map. You can select single or multiple duplicate road features from the list. However, to view a duplicate road on the map, the district of the road must match with the district specified on the menu bar.

Note that if you select a duplicate road, the highlighted portion displays only the duplicated segment but not the full road length.

The tool also generates two tabular reports after analyzing road duplication status. These are:

- Proposed Scheme Details
- Category-wise Road Status

These reports are generated using the formats used LGED and Planning Commission. The *Proposed Scheme Details* provides a table listing work summary for the selected roads under completed, ongoing and proposed projects. The inventory will be presented categorically based on road type and administrative boundaries. A schematic of the proposed scheme details is shown below.

Sl. No.	Road ID- (Scheme Name)	Total length(km)	Already developed length(km)	Length included in other ongoing projects(km)	Remaining length(km)	Proposed for development in this project	
						Length(km)	Chainage
1	2	3	4	5	6	7	8
Upazila : AUSTAGRAM, District : KISHOREGANJ							
Union Road							
1.	348023004- (Austagram-Badhia ghat-Kalma UP office road)	9.53	9.53	-2.68	2.68	1	Ch.0-1000 m
2.	348023005- (Austagram-Mohishertilla-Gagra UP office Rd)	11.37	11.37	-5.8	5.8	1	Ch.4000-5000 m

The *Category-wise Road Status* shows a summary of the proposed scheme details like the following figure.

**Duplicate Road Checker**

Duplication Status | Proposed Scheme Details | **Category wise Road Status**

District : KISHOREGANJ

Sl No.	Road category/Type	Total length(km)	Already developed length(km)	Length included in other ongoing projects(km)	Length to be developed(km)	Length proposed in this project
1	2	3	4	5	6	7
1	Union Road	21.7	21.165	-8.475	9.01	2.05
2	Village Road-A	10.4	10.4	-2.05	2.05	4

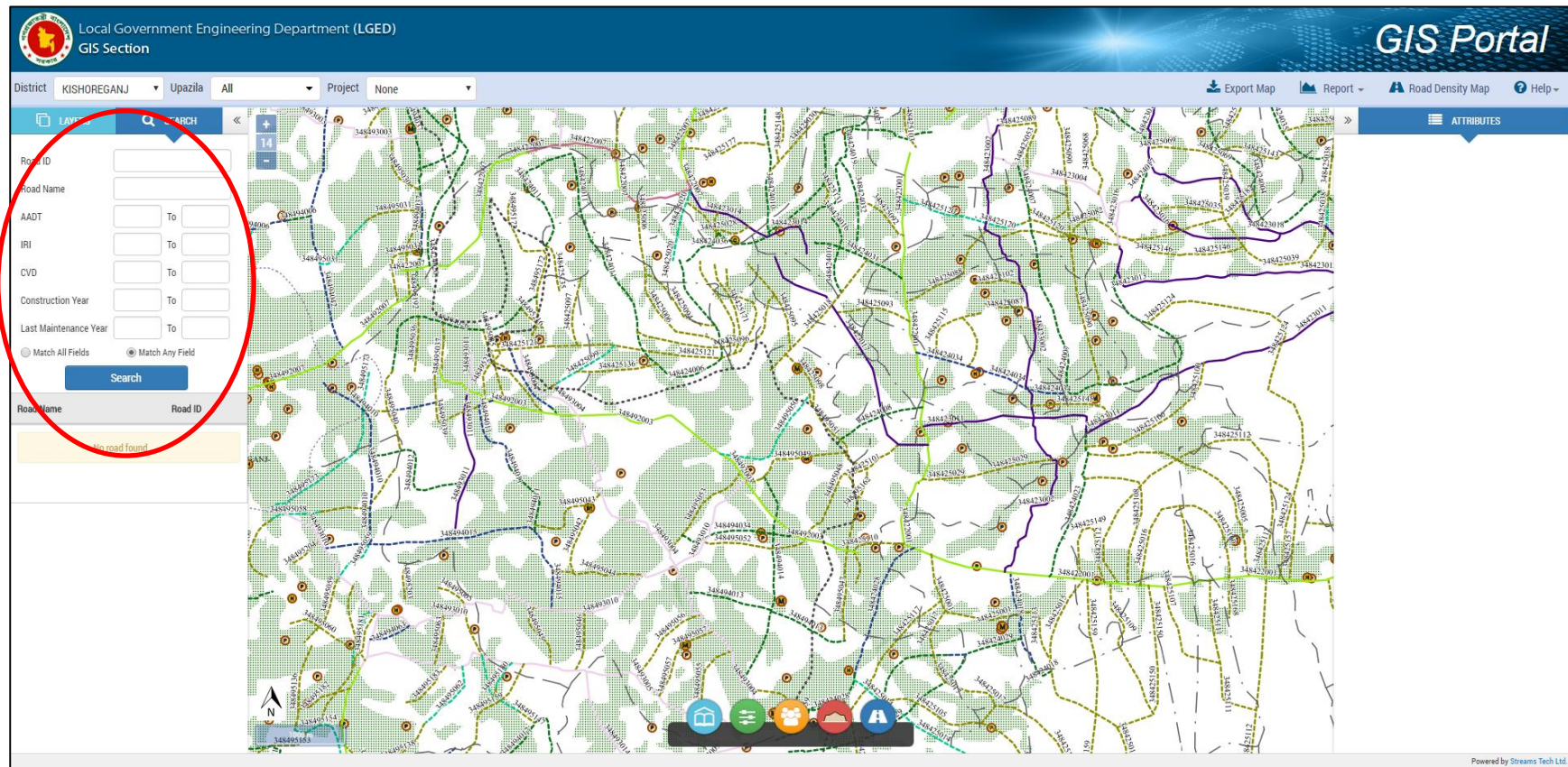
Upload | Export | Close

The above reports can be exported to a CSV file. After you have finished, click on the Close button to exit from the report window.

### 3.2 MULTIPLE ATTRIBUTE BASED ROAD SEARCH OPTION

You can search and identify a road on the map based on a single or multiple attribute criteria in the SEARCH tab located at the object layer panel. To do so:

1. Launch the application and specify the map location. Zoom the road layer to the desired extent.
2. Click on SEARCH tab to make it active. Notice that a set of search criteria is provided under SEARCH tab as shown below.



3. Insert the road code, or road name, or any other criteria value in respective fields. You can set single or multiple criteria at a time also.
4. After you have inserted values for search criteria, click search command. The application will display a list of roads that match search criteria.

Local Government Engineering Department (LGED)  
GIS Section

District: KISHOREGANJ | Upazila: All | Project: None

Export Map | Report | Road Density Map | Help

LAVERS | SEARCH | ATTRIBUTES

Search Filters:

- Road ID:
- Road Name:
- AADT:  To  (circled in red)
- IRI:  To  (circled in red)
- CVD:  To
- Construction Year:  To
- Last Maintenance Year:  To
- Match All Fields  Match Any Field
- 

Search Results:

Road Name	Road ID
Austagram-Bajitpur road via Dighirpar	348022001
Austagram-Mitamoin Road	348022002
Austagram-Adampur GC Rd.	348022003
Austagram-Austagram launchghat-SabianagarGC road	348022004
Austagram-Ekurdia Bazar Road	348023001
Kastul UPoffice-Nikli GC Rd.	348023002
Bangalpara-Huamanpur UP office Road	348023003
Austagram-Badha ghat-Kalma UP office road.	348023004

Map: Aerial view of a road network with various roads highlighted in different colors (green, yellow, purple, red). A red circle highlights a specific road on the map.

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- Select any road in the search result list. The application will zoom to that road location and highlight the road on the map. You can thus browse through all identified roads one by one.



Local Government Engineering Department (LGED)  
GIS Section

KISHOREGANJ Upazila All Project None

Export Map Report Road Density Map Help

LAYERS SEARCH

Road ID:

Road Name:

AADT: 100 To 2000

IRI: 6 To 10

CVD:  To

Construction Year:  To

Last Maintenance Year:  To

Match All Fields  Match Any Field

Search

Road Name	Road ID
Austagram-Bajitpur road via Dighirpar	348022001
Austagram-Mitamoin Road	348022002
Austagram-Adampur GC Rd.	348022003
Austagram-Austagram launchhat-SabianagarGC road	348022004
Austagram-Ekurdia Bazar Road	348023001
<b>Kastul UPoffice-Nikli GC Rd.</b>	<b>348023002</b>
Banglipara Mahabubpur UP office Road	348023003
Austagram-Badhia ghat-Kalma UP office road	348023004

ATTRIBUTES ROAD SUMMARY

1 of 1 LGED Road Network


Name	Value
Road ID	348023002
Category	UNION ROAD
Surface Type	Ert
Description	UNION ROAD (Katcha)
Chainage (Start)	
Chainage (End)	5420

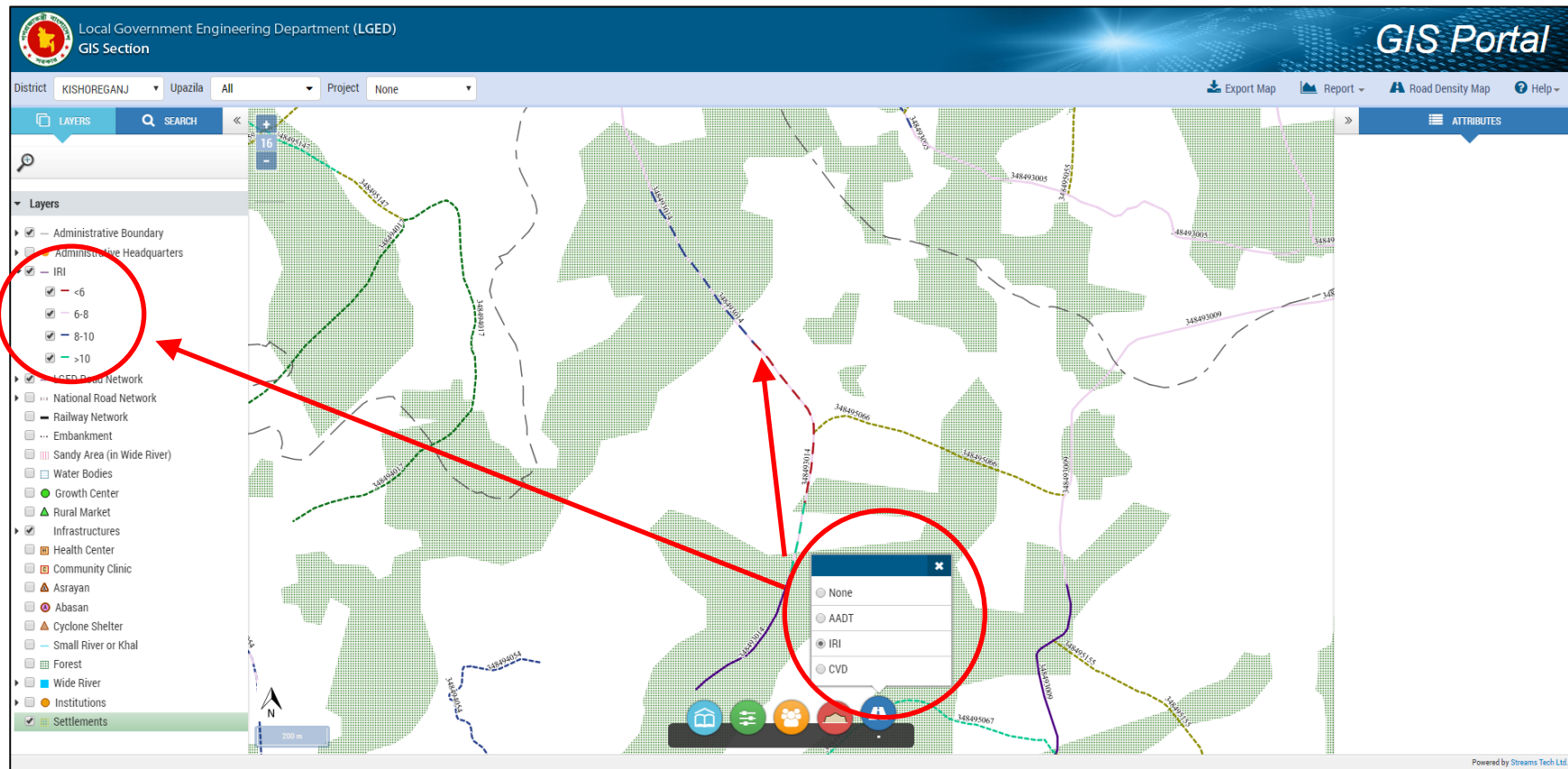
No file available

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### 3.3 TWOFOLD SYMBOLOGY SETTING IN VIEWING ROAD LAYER

GIS Portal provides you an advanced twofold layer symbology settings in viewing road network on the map. By default, the road layer symbology is classified according to its types e.g. upazila roads, union roads, village road-A etc. However, there is another symbology classification option provided so that users can view another property overlaid on the previous symbology. You can specify one property among AADT, IRI and CVD for this purpose. To do so:


1. Launch the application and specify the map location. Zoom the road layer to the desired extent.
2. Now click on  button at the bottom of map window. It will display you a list to specify which property you want to view in symbology. Select any of them. Notice that another color and line type themes are overlaid on the previous symbology. It will appear like following.

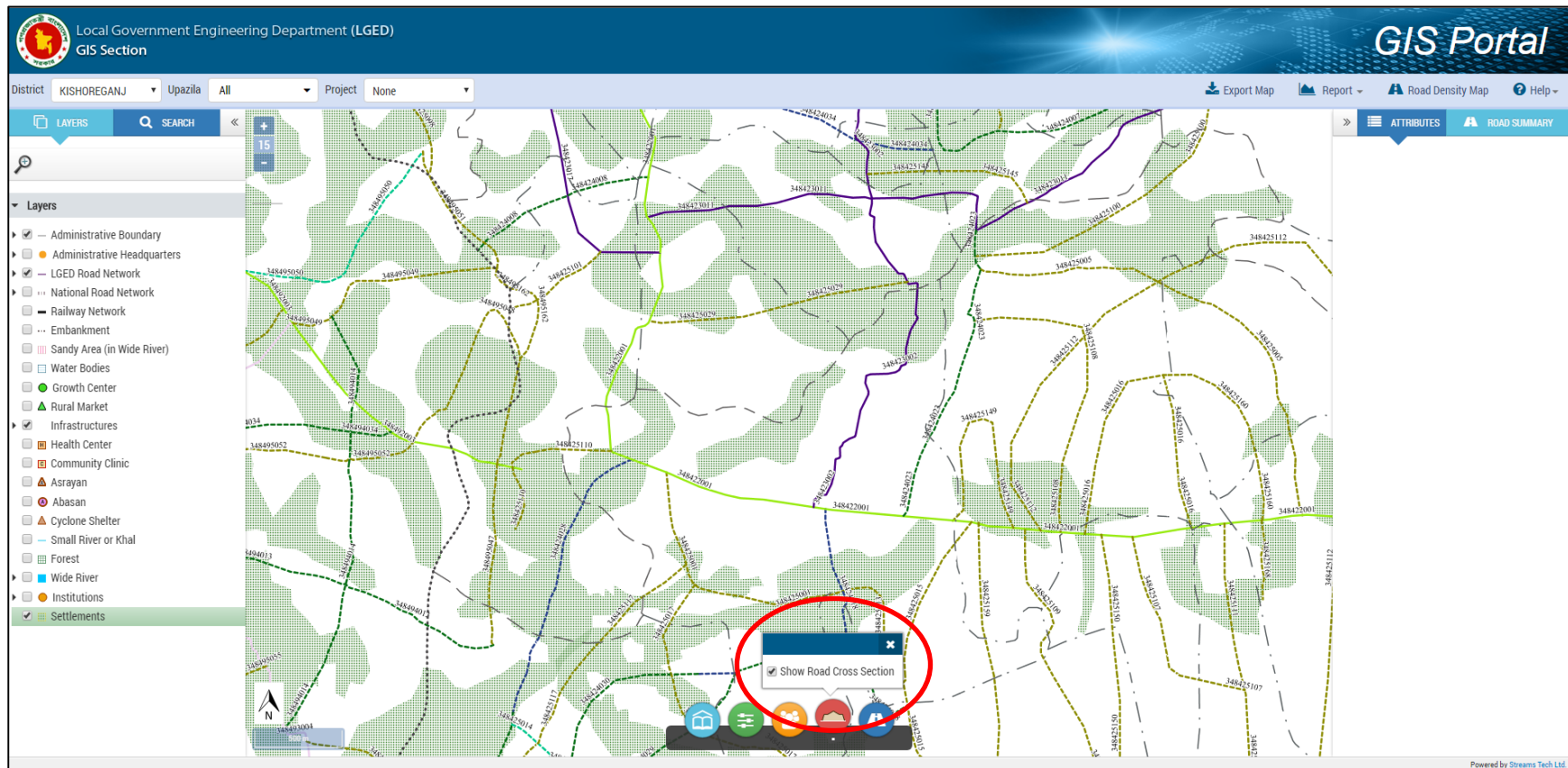


3. You can switch off this special symbology by specifying *None* in the property selection list.

### 3.4 ROAD CROSS SECTION VIEW

To view the cross section properties of a selected road on the map:

1. Launch the application and specify the map location. Zoom the road layer to the desired extent.
2. Click on  button located at the bottom of the map window and check the Road Cross Section View option. It will appear like the following figure.



3. Then select the road for which you want to view the cross section. The cross section diagram will appear. You can export the diagram to an image file. After you have finished with cross section view, close the window.

Local Government Engineering Department (LGED)  
GIS Section

**GIS Portal**

District: KISHOREGANJ | Upazila: All | Project: None

Export Map | Report | Road Density Map | Help

LAYERS | SEARCH

Layers

- Administrative Boundary
- Administrative Headquarters
- LGED Road Network
- National Road Network
- Railway Network
- Embankment
- Sandy Area (in Wide River)
- Water Bodies
- Growth Center
- Rural Market
- Infrastructures
  - Health Center
  - Community Clinic
  - Asrayan
  - Abasan
  - Cyclone Shelter
  - Small River or Khal
  - Forest
  - Wide River
- Institutions
- Settlements

Road Cross Section

Road Name: Karimganj-Gundhar GC Road  
Road Code: 348422001

7.42M Crest | 1.88M Shoulder Left | 3.66M Carriage | 1.88M Shoulder Right | 7.42M Crest | 1.82M Embankment

Export | Close

ATTRIBUTES | ROAD SUMMARY

1 of 1 | LGED Road Network


Name	Value
Road ID	348422001
Category	UPAZILA ROAD
Surface Type	BC
Description	UPAZILA ROAD (Pucca)
Chainage (Start)	
Chainage (End)	10000

No file available

Powered by Streams Tech Ltd.

### 3.5 ROAD SERVED AREA AND POPULATION

You can identify population served area boundary for a selected road on the map using this application. For this purpose, you need to provide a buffer distance as a primary input. The application will show you a shaded polygon boundary on the map. In addition, the tool will give you an estimate of population located within that buffer zone. To perform this task:

1. Launch the application, and zoom road network to the desired extent.
2. Click on  button located at the bottom of the map window. It will display you option for road served area identification. Check the option, and insert an appropriate buffer distance.
3. Now, select the desired road. The application will show a shaded polygon around the road. You can now visualize the influence zone of that road, see an estimate of served population under that zone, and compare the served area with the actual settlements.


The screenshot displays the GIS Portal interface for the Local Government Engineering Department (LGED) GIS Section. The map shows a road network with a selected road highlighted in green. A pink shaded area represents the 'Road Served Area' with a width of 500 meters. A callout box indicates a 'Road Served Population: 111'. The right sidebar shows the 'Road Summary' for 'VILLAGE ROAD A' with details like Road ID, Category, Surface Type, and Chainage. The bottom right corner shows a 'No file available' message.

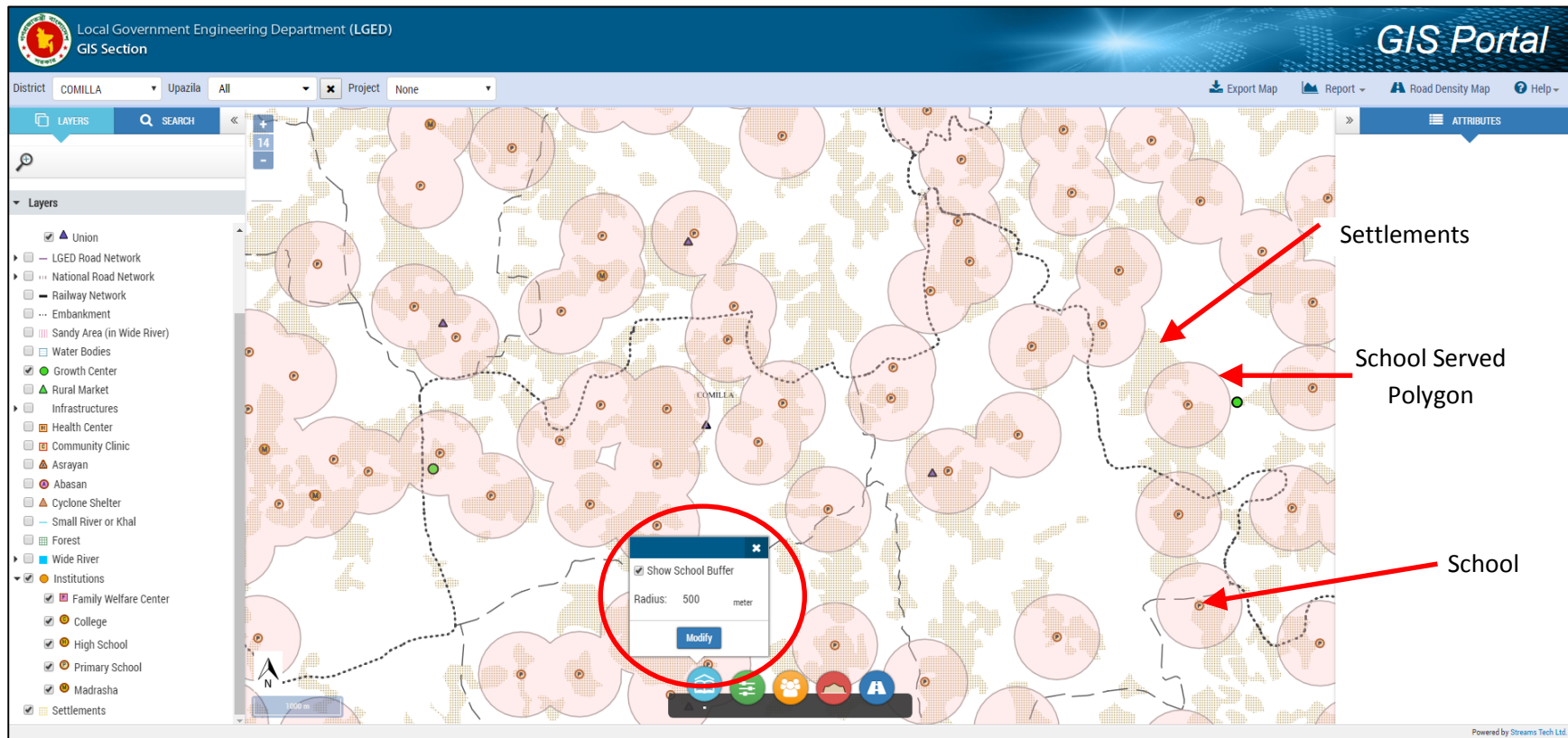
4. Once you have finished navigating road served area on the map, uncheck the option in the input setting box and then close.



### 3.6 SCHOOL SERVED AREA

Similar to a road served area, you can identify population served area boundary by the local schools on the map using this application. For this purpose, you need to provide a buffer distance as a primary input. The application will show you a circular served area boundary for each school feature on the map. To perform this task:


1. Launch the application, and zoom the school layer to the desired extent.
2. Click on  button located at the bottom of the map window. It will display you option for school served area identification. Check the option, and insert an appropriate buffer distance.
3. You may close the input setting box. The application will show a shaded polygon around each school. You can now visualize the influence zone of the schools, and compare the served area with the actual settlements.








4. Once you have finished navigating school served area on the map, uncheck the option in the input setting box and then close.

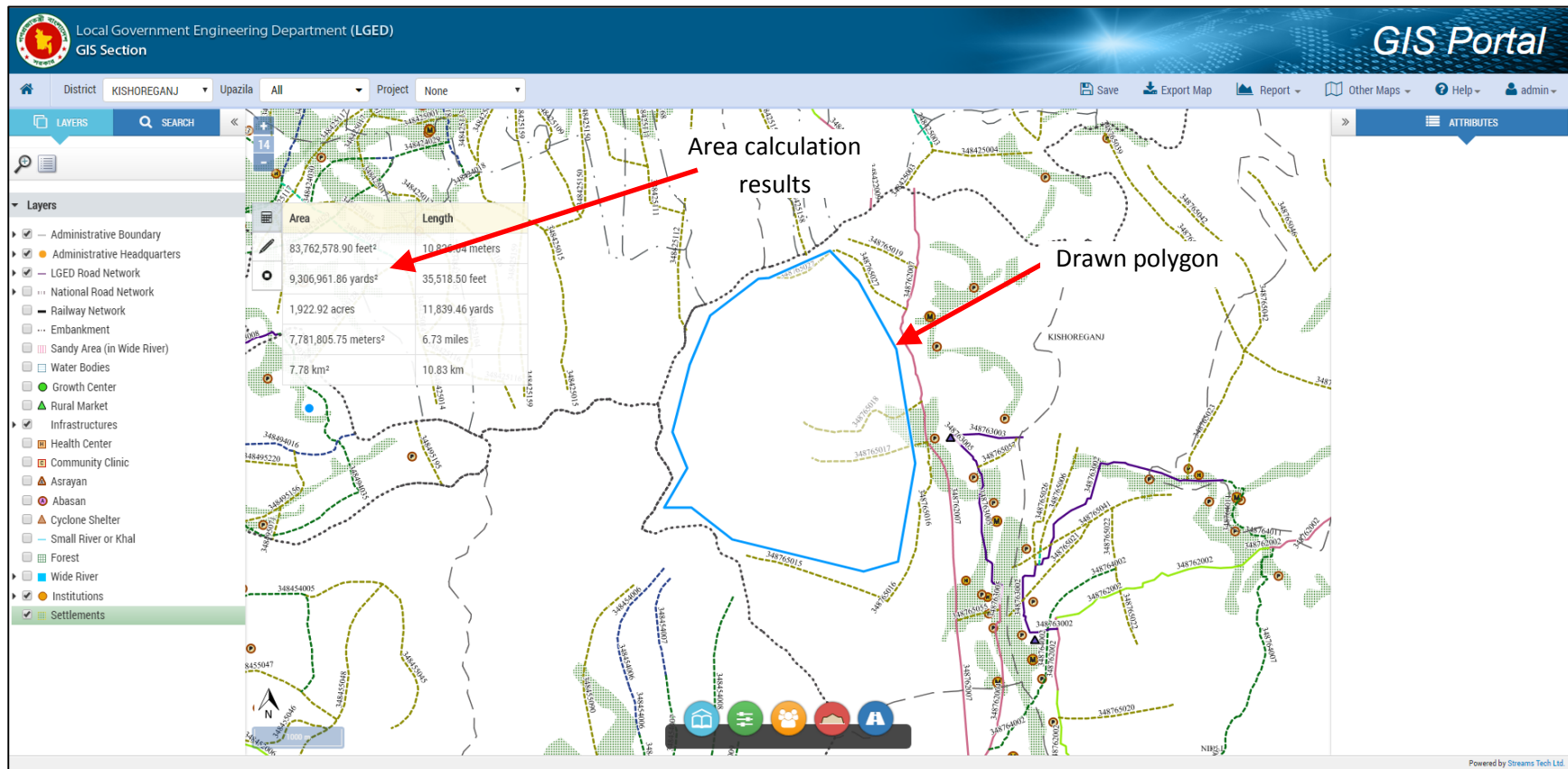
### 3.7 CALCULATE AREA AND LENGTH ON THE MAP


In GIS Portal, you can measure the length along a path or area of a polygon on the map. To do so:

1. Click on  button located below the zoom bar on the map. The tool is now enabled to draw a polygon or a polyline on your map panel, and it will appear like the following figure.

	Area	Length
	0.00 feet <sup>2</sup>	0.00 meters
	0.00 yards <sup>2</sup>	0.00 feet
	0.00 acres	0.00 yards
	0.00 meters <sup>2</sup>	0.00 miles
	0.00 km <sup>2</sup>	0.00 km

2. Notice that different measuring units are available in the tool. The  button and  button are used to activate or stop feature creation modes respectively. Move your cursor to the desired location on the map and start digitizing. With each click, a vertex will be created and the tool will show the geometry. Double click to finish the sketch. The tool will create a polygon and show you the calculated area and perimeter like following figure.



- However, if you want to measure the length along a path or road, then click on the start and end positions on the selected path at first. Double click to finish the sketch. A straight line will be visible. Now, click on  button to activate feature edit mode again. Now go over the created feature and click on the positions where you want to create vertices and to adjust alignment. Make sure you click and drag simultaneously so that the route

alignment becomes accurate. It should appear like the following figure.

The screenshot displays the GIS Portal interface for the Local Government Engineering Department (LGED) GIS Section. The map shows a blue path line with a red arrow pointing to it labeled "Drawn path line". Another red arrow points to a table of calculated lengths labeled "Calculated length".

Area	Length
0.00 feet <sup>2</sup>	6,918.12 meters
0.00 yards <sup>2</sup>	22,697.25 feet
0.00 acres	7,565.73 yards
0.00 meters <sup>2</sup>	4.30 miles
0.00 km <sup>2</sup>	6.92 km

The interface includes a layers panel on the left, a search bar, and a top navigation bar with options like Save, Export Map, Report, and Help. The bottom right shows an attributes table for "Administrative Boundary" with fields for Name, Value, Type, upazila\_id, and dist\_id.

- Click on  button to stop the feature creation mode. The tool will be closed.

Note that the polygon or polyline objects created using this tool don't belong to any available GIS mapping layers. And they are not stored to any file or location. They are created temporarily just to calculate area or length at suitable locations on the map.

## 4 REPORTING FEATURES

You can generate several types of road network reports or road inventory reports using this application, which may be extremely useful for project planning, monitoring and budgeting. The report menu contains following four categories of inventory reports which can be generated during working on the map.

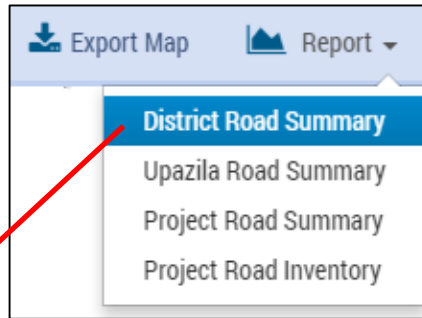
- District Road Summary
- Upazila Road Summary
- Project Road Summary
- Project Road Inventory

Besides, you can view attribute summary table for any selected object on the map, and can generate an inventory report for a selected road.

### 4.1 DISTRICT ROAD SUMMARY

To generate a district road summary report:

1. Launch the application on your browser, and open the desired district road network map.
2. Go to the menu bar and click on Report tab. It will show a list of report categories. Click on District Road Summary. It will show you the district road summary report.



**District Road Map Summary Report**

District Name	KISHOREGANJ			
Number of Upazila	13			
Area of the District(km <sup>2</sup> )	2688.6			

Road Type	Paved		Unpaved		Total
	Length(km)	Length(km)	Number(#)	Length(km)	
Upazila Road	410	181	106	591	
Union Road	350	385	218	735	
Village Road-A	289	1138	631	1427	
Village Road-B	124	1955	1257	2079	

[Export](#) [Close](#)

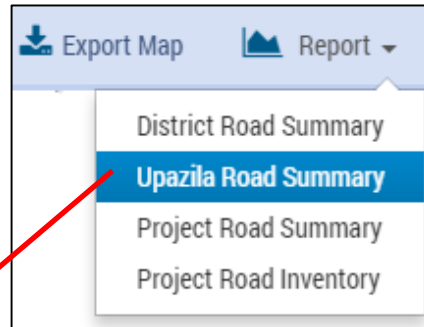
5. You can export the report to an Excel file. After you have finished, click on the Close button to exit from the report window.



## 4.2 UPAZILA ROAD SUMMARY

To generate an upazila road summary report:

1. Launch the application on your browser, and open the desired upazila road network map.
2. Go to the menu bar and click on Report tab. It will show a list of report categories. Click on Upazila Road Summary. It will show you the upazila road inventory report.



Upazila Road Map Summary Report

Upazila Name	BAJITPUR			
District Name	KISHOREGANJ			
Area of the Upazila(Km <sup>2</sup> )	193.76			

Road Type	Paved		Unpaved		Total
	Length(km)	Length(km)	Number(#)	Length(km)	
Upazila Road	52	13	10	65	
Union Road	33	47	30	80	
Village Road-A	22	92	61	114	
Village Road-B	8	124	79	132	

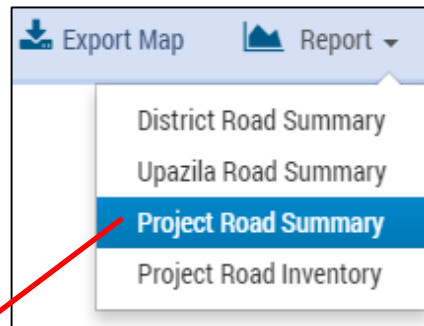
Export Close

3. You can export the report to an Excel file. After you have finished, click on the Close button to exit from the report window.

### 4.3 PROJECT ROAD SUMMARY

This report provides you the road length summary of a project based on a district or an upazila boundary. To generate a project based road summary report:

1. Launch the application on your browser, and open the desired project road network map within a district or an upazila boundary.
2. Go to the menu bar and click on Report tab. It will show a list of report categories. Click on Project Road Summary. It will show you the project road length summary.



Project Road Summary

Project Name	KIRIDP
District Name	KISHOREGANJ
Number of Upazila	13

Road Type	Length(km)
VILLAGE ROAD A	113
VILLAGE ROAD B	48.21
UPAZILA ROAD	25.7
UNION ROAD	21.15

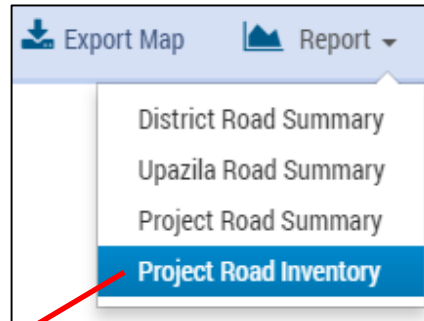
Export Close

3. You can export the report to an Excel file. After you have finished, click on the Close button to exit from the report window.

#### 4.4 PROJECT ROAD INVENTORY

Similarly to the project road length summary, you can generate another and more detailed road inventory report which also contains type of road works done under that project. To generate a project inventory report:

1. Launch the application on your browser, and open the desired project road network map within a district or an upazila boundary.
2. Go to the menu bar and click on Report tab. It will show a list of report categories. Click on Project Road Inventory. It will show you the detailed inventory report.



Project Road Inventory

Project Name: KIRIDP

VILLAGE ROAD B					
Road ID	Road Name	From Chainage(m)	To Chainage(m)	Work Length(km)	Work Type
348025003	Sabianagar-Alinagar Rd	0	2650	2.65	Unpaved to Paved
348025013	Astogram-Gagra-Boro Haor Rd	400	4200	3.8	Unpaved to Paved

VILLAGE ROAD A					
Road ID	Road Name	From Chainage(m)	To Chainage(m)	Work Length(km)	Work Type
348024011	Abdullahpur-ichappur Rd	3040	6350	3.31	Unpaved to Paved
348024006	Austagram-Bangalpara via Baraichar	0	2000	2	Unpaved to Paved

UNION ROAD					
Road ID	Road Name	From Chainage(m)	To Chainage(m)	Work Length(km)	Work Type
348023008	Austagram U P-Austagram GC road	0	270	0.27	Unpaved to Paved

Export Close



3. You can export the report to an Excel file. After you have finished, click on the Close button to exit from the report window.

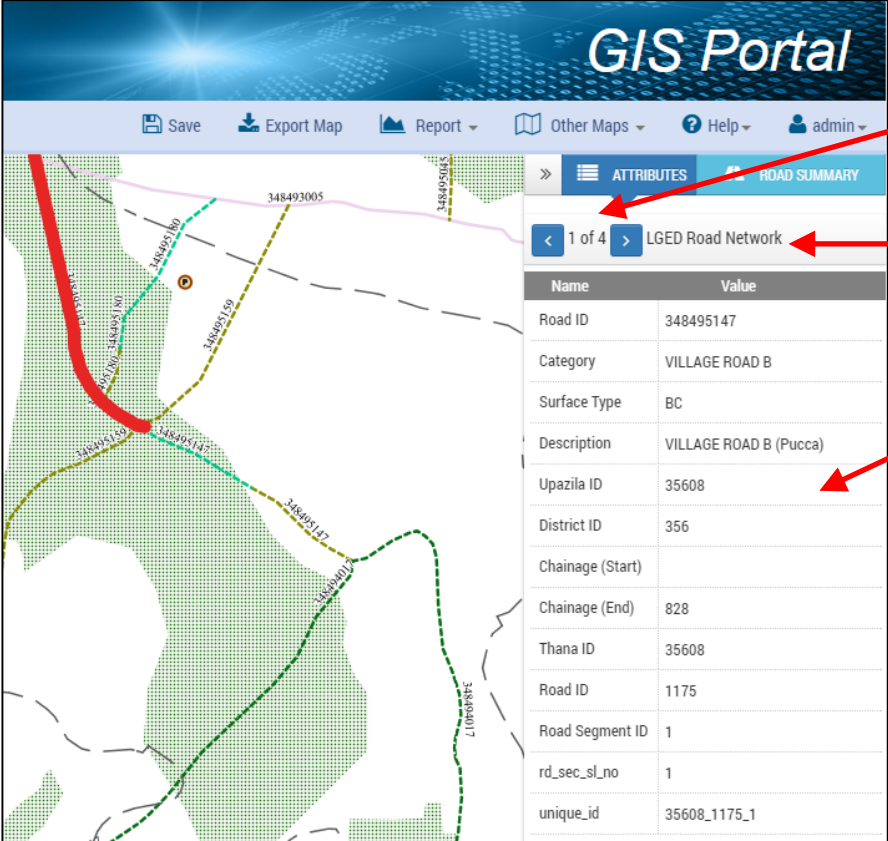
## 4.5 OBJECT ATTRIBUTE TABLE

When you select a road or another object on the map, the application shows you an attribute summary table in the attribute panel.

The screenshot displays the GIS Portal interface for the Local Government Engineering Department (LGED) GIS Section. The map shows the Comilla District with various infrastructure layers. A blue dot on the map is labeled "Selected Object". The attribute panel on the right displays a table with columns "Name" and "Value". The table shows "Name" and "ID 41967043".

Name	Value
Name	
ID	41967043

However, there could be more than one objects located at the point where you have clicked on the map. In such case, the attribute panel shows the number of objects actually selected on the map, and displays the properties of a single object among them. You can shuffle among the objects and their property tables by clicking on  and  buttons. One such illustration is given below.



GIS Portal

Save Export Map Report Other Maps Help admin

ATTRIBUTES ROAD SUMMARY

< 1 of 4 > LGED Road Network

Name	Value
Road ID	348495147
Category	VILLAGE ROAD B
Surface Type	BC
Description	VILLAGE ROAD B (Pucca)
Upazila ID	35608
District ID	356
Chainage (Start)	
Chainage (End)	828
Thana ID	35608
Road ID	1175
Road Segment ID	1
rd_sec_sl_no	1
unique_id	35608_1175_1

Total number of layers selected

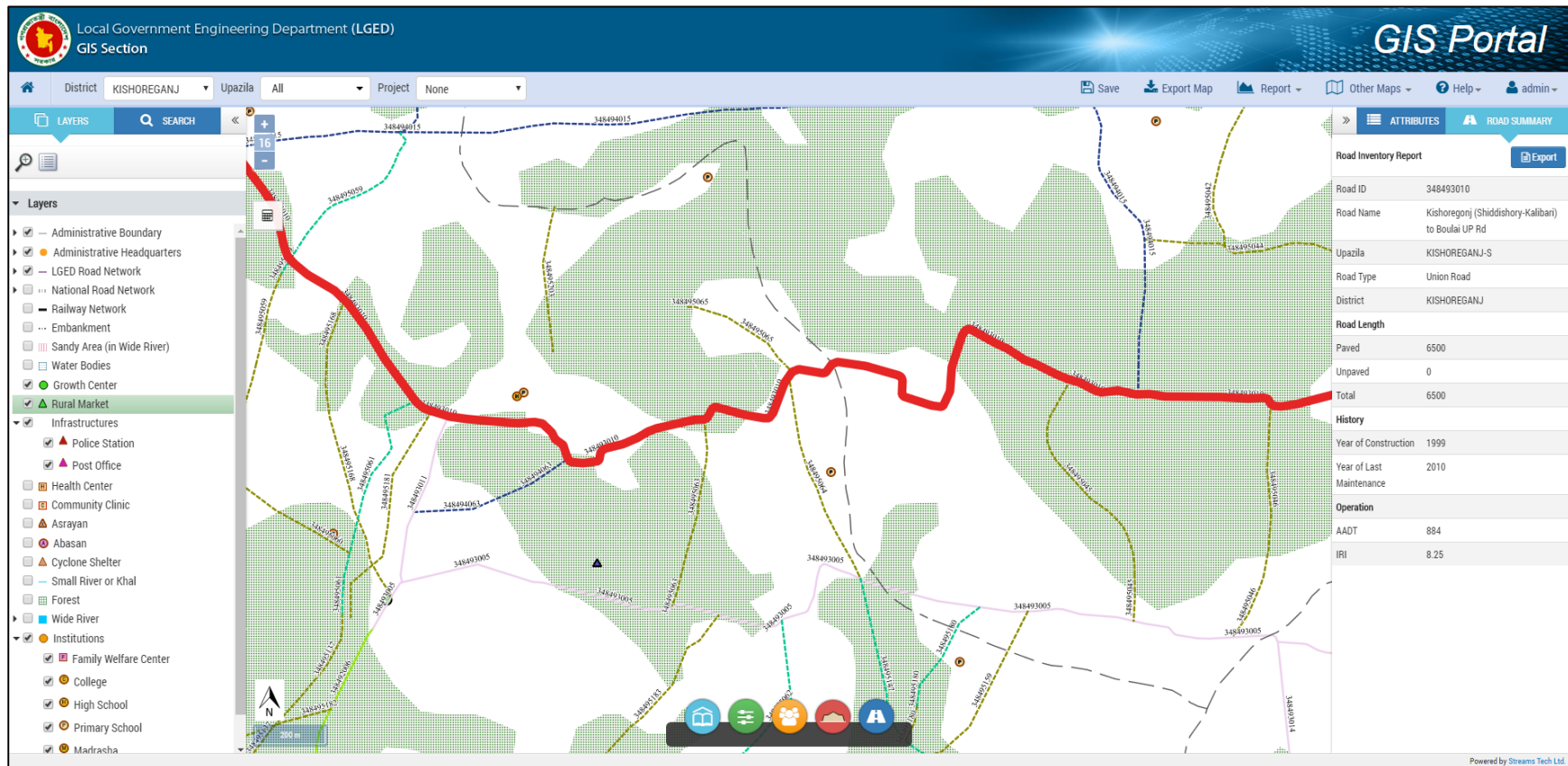
Selected Layer

Properties of the selected object



## 4.6 SINGLE ROAD INVENTORY REPORT

When selected on the map, the application generates an inventory report for a particular road. You can view it under ROAD SUMMARY tab in the attribute panel. This report can be also exported to an excel file.



The screenshot displays the GIS Portal interface for the Local Government Engineering Department (LGED) GIS Section. The main map shows a network of roads, with one road highlighted in red. The right-hand panel shows the 'ROAD SUMMARY' tab, which contains the following data:

Road Inventory Report	
Road ID	348493010
Road Name	Kishoregong (Shiddishory-Kalbari) to Boulal UP Rd
Upazila	KISHOREGANJ-S
Road Type	Union Road
District	KISHOREGANJ
<b>Road Length</b>	
Paved	6500
Unpaved	0
Total	6500
<b>History</b>	
Year of Construction	1999
Year of Last Maintenance	2010
<b>Operation</b>	
AADT	884
IRI	8.25

## APPENDIX-A: PROPOSED ROAD LIST FILE FORMAT

The road list file uploaded in the application and used for duplicate road checking in a proposed project, is a simple text or spreadsheet file having minimum three columns with a structured data format. A sample of this file is shown below.

<b>ROAD ID</b>	<b>FROM CHAINAGE (m)</b>	<b>TO CHAINAGE (m)</b>
255572002	1200	2000
255572003	100	350
542405137	0	500
542402001	1000	1200
542402002	600	750

The data characteristics are specified in the following table.

<b>Column No.</b>	<b>Field Description</b>	<b>Value Type</b>
1	Road Segment ID	Numeric, integer
2	Starting chainage number	Numeric, double
3	Ending chainage number	Numeric, double

The road list file must have first three data columns as specified above. The rest data columns (if any) are not read, and ignored by the application.

## APPENDIX-B: FREQUENTLY ASKED QUESTIONS (FAQS)

### **What is the GIS Portal of LGED?**

The GIS Portal of LGED is a web based GIS mapping application. Using this application, you can create customized maps online using LGED's GIS shape files.

### **What's the purpose of this application?**

This application is developed with an aim to support different project planning activities of LGED including checking of road duplications, and to general users in preparing customized GIS maps, especially for the road network.

### **Who are the users of this application?**

This web application is intended primarily for LGED's engineers and GIS staffs who frequently use GIS maps in different project planning and monitoring activities, and in reporting. Besides, it will be used by the central GIS and MIS units of LGED in order to systematically maintain their asset information in a spatial and digital database.

Other than LGED officials, the application will be frequently used by engineers, planners, research organizations, universities, NGOs, and other government and non-government development authorities who often need LGED's maps.

### **Do I need to sign-up for using this application?**

No, unless you are an admin user. The application is open for all users. So, you won't require to sign-up or sign-in.

### **Can I sign-up as an admin user?**

No, unless you are assigned by LGED. The admin is a very special user who is authorized only by LGED. Role and permission level for admin users will be defined by LGED in the application.

### **What type of GIS maps I can prepare using the application?**

The application structure is specially designed for the LGED's road network mapping, planning and monitoring. These include district, upazila, or project based road mapping, verification, reporting, and some advanced spatial analysis. However, you can also generate maps for other type of infrastructure like schools, growth centers etc.

### **What does it really mean by "Customized GIS Map"?**

For a general user, Customized GIS maps means you can create maps according to your need. You can specify which object layers to be shown, and preferred map area. You can also create some special maps such as the road density map. For more details on the mapping features, consult Section 2 of this User Guide.

### **Which features of this application are used in project planning and monitoring?**

In general, you can create GIS maps for any project area (covered by LGED) in Bangladesh. Besides, this application provides some advanced maps and analysis tools which you can use for planning, monitoring, and even for budgeting your project tasks. Some of these advanced uses are:

- Duplicate road identification
- Road served area identification and population estimation
- School served area identification
- Twofold symbology view of the road layer, one based on road type and another based on a special property among AADT, IRI and CVD
- Road density map generation for whole Bangladesh
- Multiple attribute based road search option on the map
- Road cross section view
- Several types of road inventory report generation

Consult Section 3 of this User Guide for more details.

### **What type of reports I can generate using the application?**

You can generate following types of reports for the mapped network in the application.

- District road summary report
- Upazila road summary report
- Project road summary report
- Project road inventory
- Single road inventory
- Attribute list of a select road or any other object
- Road cross section diagram

Consult Section 4 of this User Guide for more details.

**Can I add/remove/edit shape files with their attribute fields in the layer panel?**

No. As a general user, you can only view them on the map. However, you can switch on/off a particular layer to control its visibility on the map.

**How can I define map extent?**

You can set map extent based on district or upazila administrative boundary. More than one upazila can be selected under a particular district.

**Can I edit layer symbology and styles?**

No. As a general user, you can only view them on the map.

**What does it mean by “Twofold Road Layer Symbology”?**

Only the road layer in the application has twofold symbology and style viewing option. The base symbology classification for the road layer is according to the road type e.g. whether it's a district road or a village road. The second level symbology classification is based on its one special property among AADT, IRI and CVD, whichever specified. The second level symbology and style is shown overlaid on the base level symbology. However, you can also specify not to view the second level symbology. Consult Section 3 of this User Guide for more details.

**Can I provide aliases to a layer or an attribute field of that layer?**

No. As a general user, you can only view aliases already configured by the authorized admin on the map.

**What does it mean by the “Road Served Population”?**

Road served area is a polygon boundary generated around a selected road for a user defined buffer distance value. It defines the influence zone of that road. All settlements fallen within that zone boundary are assumed to be served by that road. Under this assumption, the number of population served by that road is estimated by the application using census data of population density. Note that the served area boundary depends on the buffer distance.

**What does it mean by the “School Served Area”?**

Similarly to the road served area, school served area is a circular polygon generated around all schools on the map for a user defined buffer distance value. It defines the influence zone of the schools. All settlements fallen within the zone boundary of a school are assumed to be served by that school. Note that the served area boundary depends on the buffer distance.

**What is a Road Density Map?**

Road density map shows you percentage distribution of paved road in all upazilas of Bangladesh for a particular year.

**Which map projection system is used by the application?**

All layers in the application are projected in Lambert Conformal Conic (LCC) which is currently used by LGED in their GIS mapping system.

**Can I download the shape files to my computer from the application?**

No, you can download only the map layout as a pdf file.

**Can I use the application when offline or without internet?**

No, you must have internet connection in your computer in order to run the application.

**If there is any update, how can I know?**

With any update in the central GIS database, mapping attributes used in the application will be automatically updated. The admin may notify the update history in LGED's home page in such case.

**How can I contact or provide my feedback/issue/query/suggestions for the application?**

You are most welcome on providing valuable feedbacks. It will help continuous improvement, usability and significance of the application. Please write to [info@lged.gov.bd](mailto:info@lged.gov.bd) to provide your feedbacks.