User Manual of

M/S TUKINCORP Pvt. Ltd. Make WEB-GIS Application v1.0

Provided to

Government of India

Southern Railways

Signalling and Telecommunications

Project Unit

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WEB-GIS Application

Tukincorp has developed a WEB-GIS application for Hosting **1,728 RKm (In a Measurable Aerial Image) of S&T Engineering Assets and KAVACH Data**. This application is now hosted by the **TPJ Project Unit** and is available within the **Railway Intranet (Railnet)**. The application can be accessed through the designated internal link (http://10.185.41.59:3000) (accessible only via Railnet).

In addition, the WEB-GIS application is hyperlinked in:

SR Railnet Home Page -> Signalling and Telecommunication Project Webiste -> Other links -> TPJ Unit -> Sidebar -> WEB-GIS

The application provides an interactive interface for the **visualization of high-resolution ortho maps,** measurable along the railway corridor, overlaid with accurately georeferenced **railway asset layers**. Key functionalities of the application include:

- **Point-to-point distance measurement**
- **Linear (line) measurement**
- **Area measurement tools**

These tools support efficient remote analysis and planning by enabling users to perform geo-spatial assessments directly within the application.

Subsequent sections of this document provide a detailed walkthrough of the complete set of functionalities offered by the WEB-GIS application.

User Manual

1) Layer Panel with Attribute Table

The **Layer Panel** enables users to efficiently manage and interact with map data. It provides the following functionalities:

i. **Opening a Layer Panel:**
Clicking the **Layer icon** (refer Fig. 1) opens a panel with **Layer Panel**.

ii. **Loading Layers onto the Map:**
By Clicking on the layers (refer Fig. 1.2) loads them onto the map, allowing users to view Topo or Ortho layers. Multiple layers can be selected and via checkbox.

iii. **View Attribute Tables:**
Each Topographic (Topo) layer includes an attribute table detailed metadata and properties, enabling users to analyse associated spatial data.

iv. **Viewing Attribute Information for a Layer in the Layers Panel:**
Click the Layer Table to display the Attribute Table for the selected asset layer (refer fig 1.4).

v. **Use the Search Panel to Locate Layers:**
The Layer panel's search bar (refer Fig. 1.3) helps users quickly find layers by name.

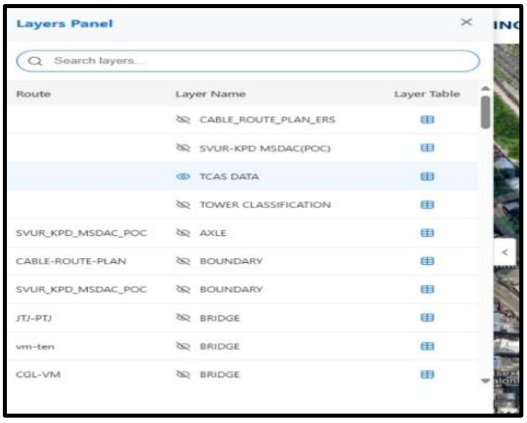

Fig 1.1. Layer and Attribute selection and loading panel location.

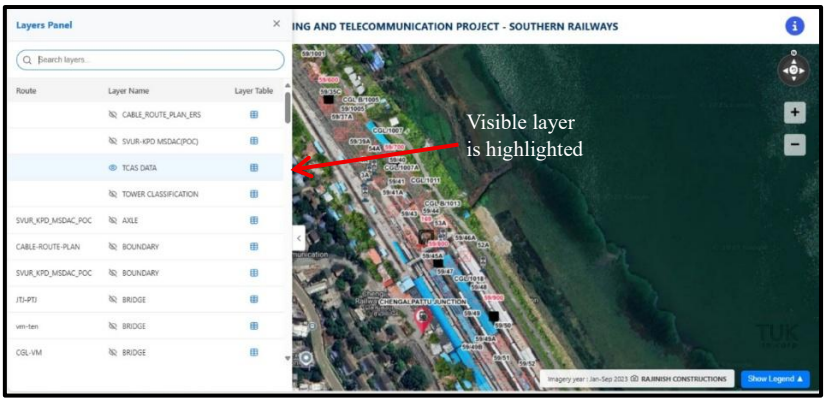

Fig 1.2. Clicking on a Layer to Load it onto the Map (Active layer highlighted).

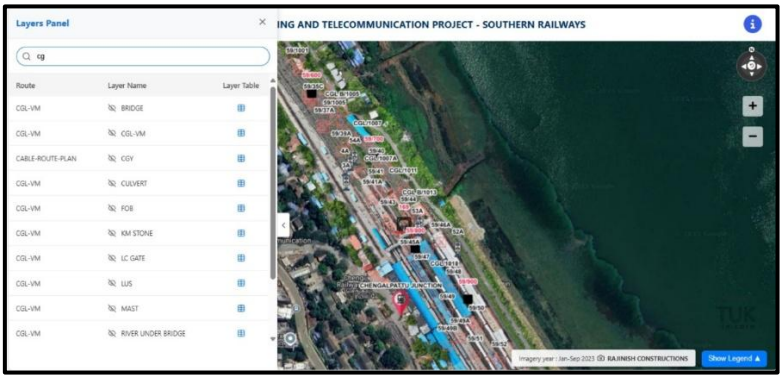

Fig 1.3. Search Layers Within the Panel.

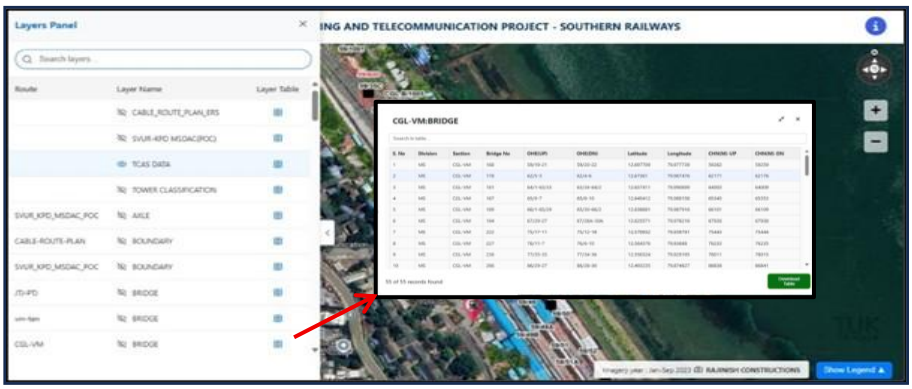

Fig 1.4. Viewing Attribute Table from Layers Panel.

1.1. Attribute Table

The **Attribute Table** provides a structured view of the data associated with each layer. It offers the following features:

i. **View and Filter Data**: Users can browse the attribute data and apply filters to focus on specific records based on defined criteria. The search items will be highlighted (refer Fig. 1.1.2) for easy identification.

ii. **Interactive Data Inspection**: Clicking on a specific layer zoom to the corresponding map extent.

iii. **Export to Excel:** The attribute table can be downloaded in Excel format (refer fig 1.1.3), enabling offline analysis and reporting.

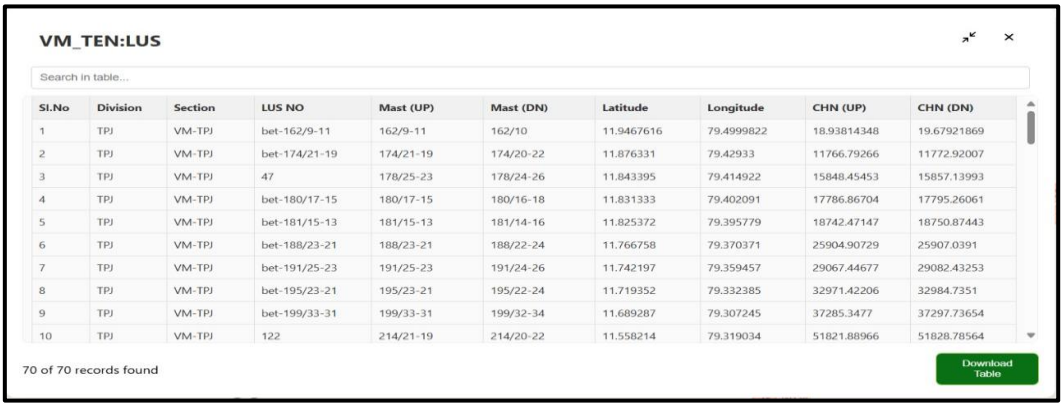

Fig 1.1.1. Loading the Attribute Table.

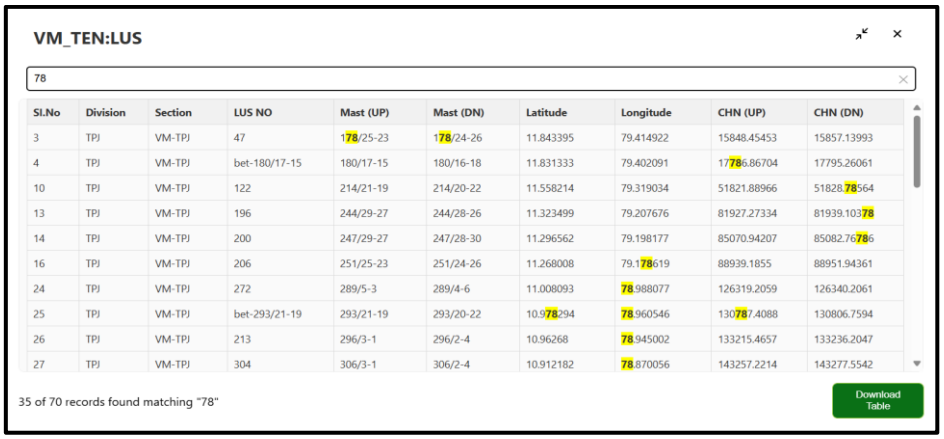

Fig 1.1.2. Searching for the Data in attribute table.

	A	B	C	D	E	F	G	H	I	J
1	Sl.No	Division	Section	LUS NO	Mast (UP)	Mast (DN)	Latitude	Longitude	CHN (UP)	CHN (DN)
2	1	TPJ	VM-TPJ	bet-162/9	162/9-11	162/10	11.94676	79.49998	18.93814	19.67922
3	2	TPJ	VM-TPJ	bet-174/2	174/21-19	174/20-22	11.87633	79.42933	11766.79	11772.92
4	3	TPJ	VM-TPJ	47	178/25-23	178/24-26	11.8434	79.41492	15848.45	15857.14
5	4	TPJ	VM-TPJ	bet-180/1	180/17-15	180/16-18	11.83133	79.40209	17786.87	17795.26
6	5	TPJ	VM-TPJ	bet-181/1	181/15-13	181/14-16	11.82537	79.39578	18742.47	18750.87
7	6	TPJ	VM-TPJ	bet-188/2	188/23-21	188/22-24	11.76676	79.37037	25904.91	25907.04
8	7	TPJ	VM-TPJ	bet-191/2	191/25-23	191/24-26	11.7422	79.35946	29067.45	29082.43
9	8	TPJ	VM-TPJ	bet-195/2	195/23-21	195/22-24	11.71935	79.33239	32971.42	32984.74
10	9	TPJ	VM-TPJ	bet-199/3	199/33-31	199/32-34	11.68929	79.30725	37285.35	37297.74
11	10	TPJ	VM-TPJ	122	214/21-19	214/20-22	11.55821	79.31903	51821.89	51828.79
12	11	TPJ	VM-TPJ	124A	215/13-11	215/12-14	11.55137	79.31911	52576.49	52585.56
13	12	TPJ	VM-TPJ	bet-223/1	223/13-11	223/12-14	11.48905	79.28523	60636.34	60651.8
14	13	TPJ	VM-TPJ	196	244/29-27	244/28-26	11.3235	79.20768	81927.27	81939.1
15	14	TPJ	VM-TPJ	200	247/29-27	247/28-30	11.29656	79.19818	85070.94	85082.77
16	15	TPJ	VM-TPJ	202	249/25-23	249/24-26	11.28452	79.18735	86879.97	86894.33
17	16	TPJ	VM-TPJ	206	251/25-23	251/24-26	11.26801	79.17862	88939.19	88951.94
18	17	TPJ	VM-TPJ	210	253/11-9	253/10-12	11.25722	79.17134	90405.53	90423.95
19	18	TPJ	VM-TPJ	222A	262/27-25	262/26-28	11.21348	79.0969	99955.52	99971.92
20	19	TPJ	VM-TPJ	226	264/1-35	263/36-2	11.20475	79.08932	101243.3	101256.4
21	20	TPJ	VM-TPJ	248	272/9-7	272/8-10	11.13705	79.06202	109404.5	109419.7
22	21	TPJ	VM-TPJ	253	275/27-25	275/26-28	11.1122	79.04331	112954.4	112972.9
23	22	TPJ	VM-TPJ	262	281/25-23	281/22-24	11.06119	79.03044	118795.5	118811.7
24	23	TPJ	VM-TPJ	bet-284/9	284/9-7	284/8-10	11.0418	79.01702	121391.5	121409.4
25	24	TPJ	VM-TPJ	272	289/5-3	289/4-6	11.00809	78.98808	126319.2	126340.2
26	25	TPJ	VM-TPJ	bet-293/2	293/21-19	293/20-22	10.97829	78.96055	130787.4	130806.8
27	26	TPJ	VM-TPJ	213	296/3-1	296/2-4	10.96268	78.945	133215.5	133236.2
28	27	TPJ	VM-TPJ	304	306/3-1	306/2-4	10.91218	78.87006	143257.2	143277.6
29			VM-TPJ	360	331/27-25	331/26-26	10.87505	78.74190	158963.5	158984.3

Fig 1.1.3: Exporting the Attribute Table to Excel

1.2. Info feature

Detailed information about specific assets displayed on the map can be accessed directly, facilitating precise identification and supporting informed spatial analysis (refer fig 1.2.2).

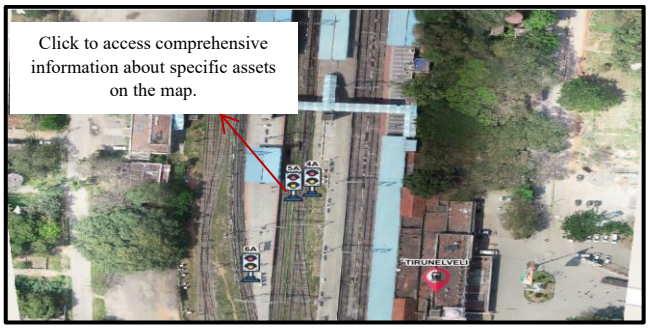

Fig 1.2.1. Click on Asset to View Information.

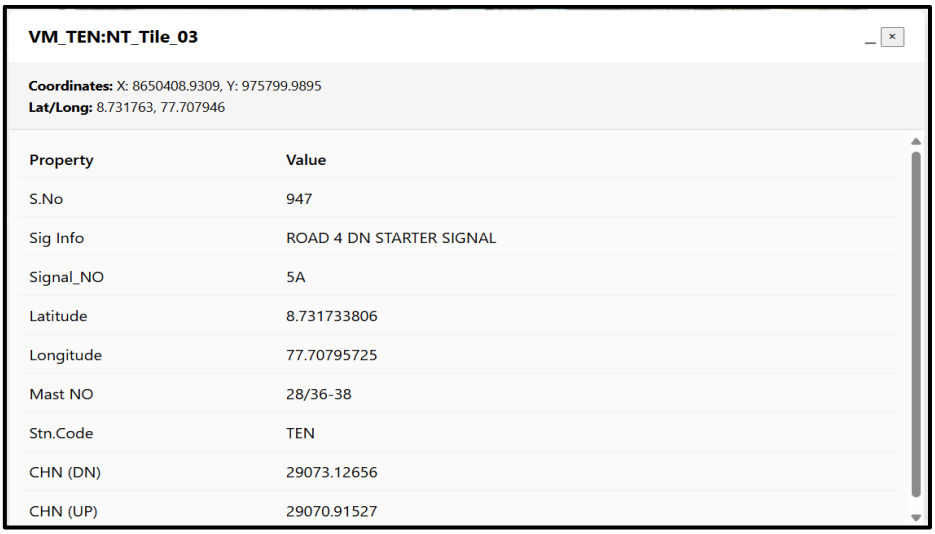

Fig 1.2.2. Viewing the Info for the Station5A.

2) Measurement

The **Measurement Tool** enables users to measure distances and areas of specific assets on the map. Results can be viewed in various units, such as meters, feet, square meters, acres, and more, providing flexibility for different analysis needs.

How to Use the Measurement Tool:

1) **Starting and Stopping a Measurement:**

- Click to begin drawing your measurement.
- To stop drawing at a specific point, simply double-click at that point.

2) **Clearing Specific Measurements:**
To remove all area measurements (e.g., polygons), right-click anywhere on the map and select **"Clear Area"** (refer fig.2.4)**.** This will delete all area-based measurements.

3) **Exiting Measurement Mode:**
To stop drawing and exit the measurement mode, right-click anywhere on the screen and select **"Exit Measurement"** (refer Fig. 2.4).

4) **Clearing All Measurements:**

- To remove all measurements from the screen, right-click and select **"Clear All Measurements"** (refer fig 2.4)**.**

Fig 2.1. Selecting Measurements from the Dropdown Menu.

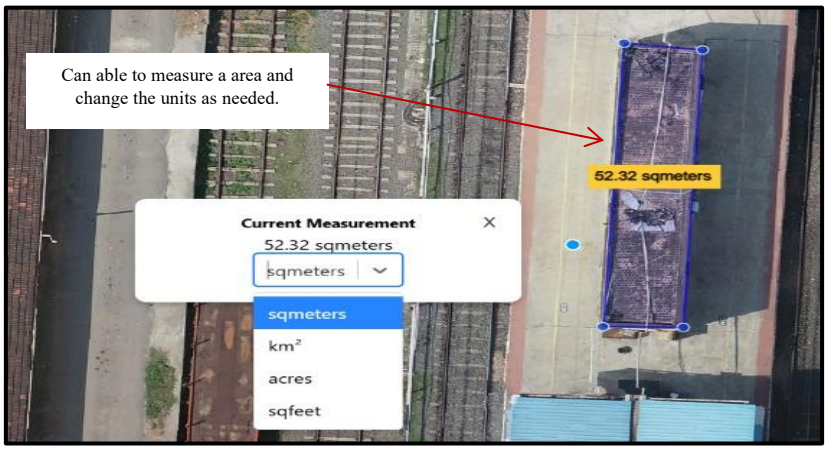

Fig 2.2. Measuring Area on the Ortho Map.

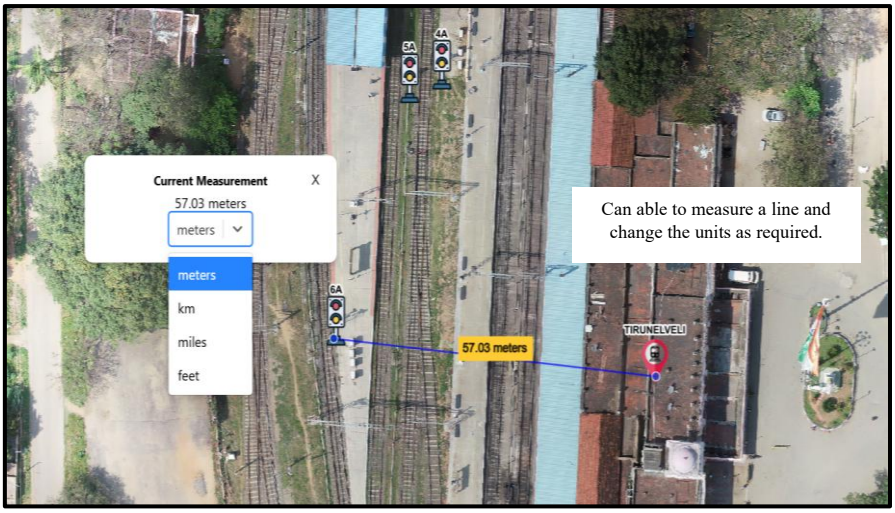

Fig 2.3. Measuring Line on the Ortho Map.

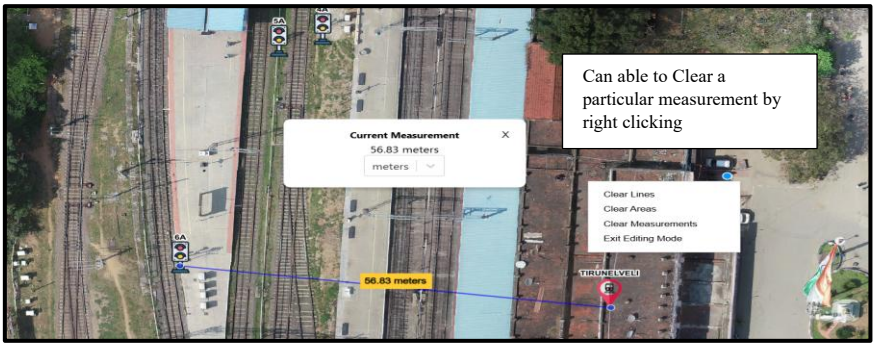

Fig 2.4. Using Right-Click to Clear Individual Measurements.

3) Switching Map Views

Users can seamlessly switch between **OpenStreetMap (OSM)** and **Satellite View** to suit their mapping and visualization preferences. This allows for enhanced contextual understanding based on the selected basemap.

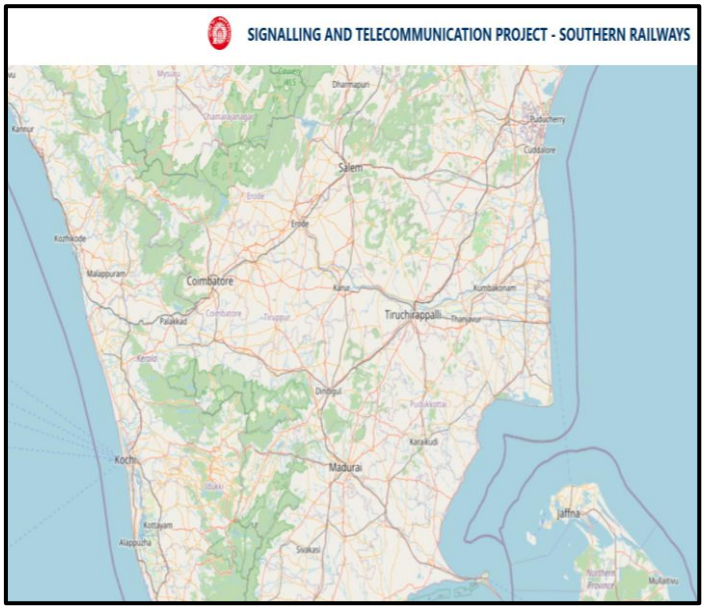

Fig 3.1. Map Displayed on OpenStreetMap (OSM).

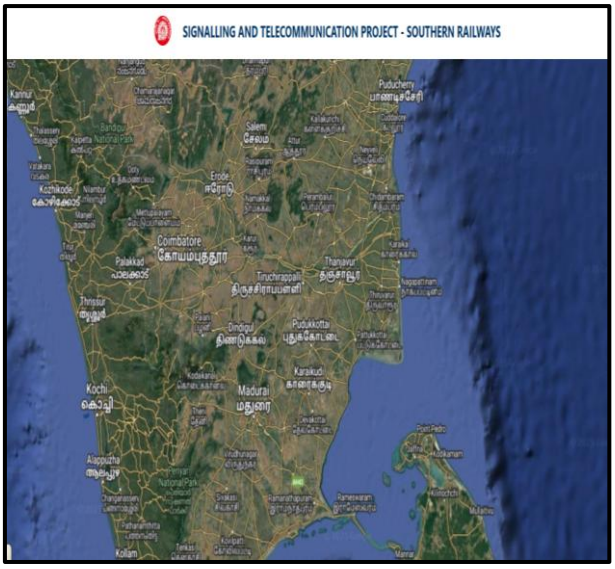

Fig 3.2. Map displayed on Satellite View.

4) Rotate Button

The **Rotate Map** button enables users to adjust the orientation of the map for better spatial perspective and alignment with specific viewing requirements.

Fig 4.1. Rotating the Map for Better Orientation.

5) Zoom In and Out

The **Zoom Controls** enable users to adjust the map view by zooming in or out (refer fig 5.1 & 5.2), allowing for precise navigation and detailed spatial exploration.

Fig 5.1. Zoom in for enhanced ortho view.

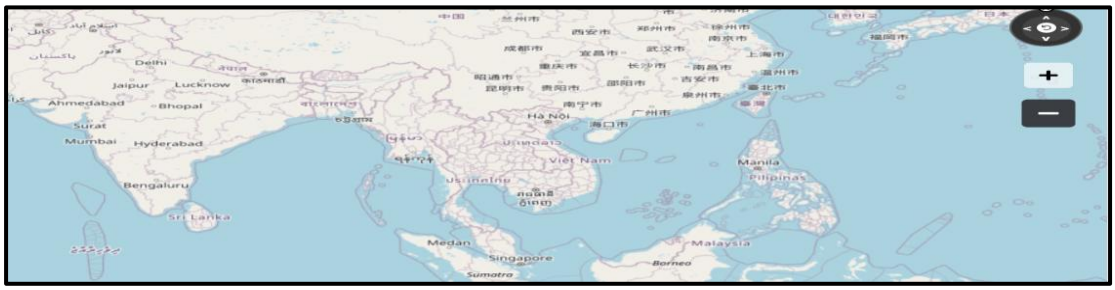

Fig 5.2. Zoom Out on the map.

6) Legend

Displays all layers currently loaded onto the map, allowing users to manage visibility and perform effective spatial analysis.

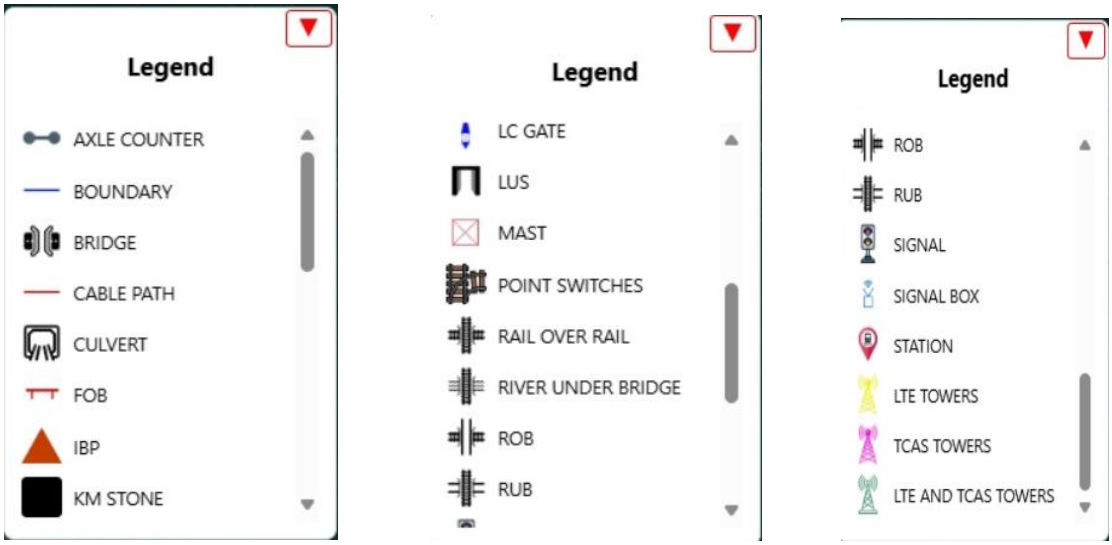

Fig 6. Legend Displaying Loaded