**Title: National Highway Map of Gujarat and Rajasthan**

Data Source:

* Mapathon 2020\_Data that includes India State and District Boundaries.
* Bhuvan portal for Water Reservoir Data, Administrative Boundary Layers, Major Transportation Data
* Google Earth, Open Street Maps

Software Used:

QGIS, Google Earth Pro, OSM, Microsoft Word, Microsoft Powerpoint

Steps in GIS:

1. Load The required data in QGIS
2. Set the Datum and perform Georeferencing Operations.
3. Perform clean up operations such as Clip operation to obtain Gujarat’s and Rajasthan’s State and District boundaries and other features specific to the area of interest.
4. Load the Open Street Map in QGIS.
5. Create new Shapefile.
6. Digitise the National Highways and Road Network for the area of interest taking OSM as reference.
7. Edit the Attribute Table or Import csv/txt file to update the Attribute Table.
8. Organise the layers.
9. Assign Color and transparency to each layer so that every layer is cleary visible.
10. Then, Label the features accordingly by using Single Labelling/ Categorised labelling / Graduated Labelling.
11. Then using Print Layout Option add legend, title, north arrow, scale bar, etc. Finally, export the map in the required desired format(jpg/pdf).

Complexities:

* Performing Clip Operations requires atmost care.
* Using “add WMS/WMTS layer” to import few required features from Bhuvan Portal as base layers.
* Digitizing of Highway and Road Networks at curves and bends, thus by providing sufficient nodes at each change in direction.
* Checking and editing entered data in the Attribute Table.
* Importing Data from txt file to Attribute Table.
* Merging Data Layers of Two States.
* Assigning color and adjusting Transparency for each feature to be visible.
* Placement of labels which are placed slantly.
* Adjusting Scale of the Map for the final Print Layout

Applications of the Map:

1. Facilitates for providing access to employment, social, health and education services
2. It can be used as an efficient highway transport map as a pre-requisite for the sustained economic development.
3. Useful for the [Availability of ambulance and cranes in case of](https://image4.slideserve.com/7837843/mini-and-availability-of-ambulance-and-cranes-l.jpg) an emergency.
4. A good transport system in logistics activities could provide better logistics efficiency, reduce operation cost, and promote service quality.
5. Facilities for Quick and Easy Transportation Routes.
6. Information about the Surrounding area of the National Highways can be obtained easily.
7. Provides insights on further expansion of the Road network.
8. Helps in designing new highways & roads for areas that lack connectivity and commutation is more.
9. To help passengers to get information about the shortest route.
10. To calculate incurring cost for new roads or re-development of existing roads as GIS provides length of the road network.
11. For controlling of traffic movements
12. Facilitates information about single lane or multi lane roads.
13. In case of emergencies such as floods, accidents, etc to find alternative routes.
14. To connect spatial data with its non-spatial data such as the attributes to obtain instant information about any particular Highway /Road network.