FOSSEE GIS-Mapathon 2023

Road Network Map: Nagpur Municipal Corporation (NMC) Plight Map

Team - Nakashegar

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1 | Methodology

Tools used for data collection are QuickOSM(for bus stands and police stations), Metro data spreadsheet (from NMRDA), OnlineMaps portal from a survey of India for NMC polygon and road data.
Operations: Loaded Administrative Maharashtra and Road shapefiles from the OnlineMaps portal into QGIS. Basic clipping of NMC from Maharashtra map, by select feature. Road Map clipped from this clipped shapefile of NMC. QuickOSM query of police stations and bus stops from the later extent of NMC shapefile, point data was obtained for bus stands and police stations. The spreadsheet from NMRDA was georeferenced (WGS 84) and imported into QGIS by adding a Delimited Text Layer. Methods used to find the distance- perpendicular projection to the road from each origin and destination to (major/minor) roads from the nearest hub tool and added that to road length between those projections. Distance is calculated from a distance Matrix for the projected coordinate system. Length of road calculated from field calculations. The final sum is done from a simple query in the attribute table. Statistics obtained from the Distance Matrix of Police stations and bus stands are similar for railway stations as well taking $k = 2$. Basic statistics are obtained from the statistics menu and attribute table data. Final map was obtained from the print option in the project menu.

2 | Applications

A Plight Map that highlights the proximity of police stations, bus stands, and railway stations can provide valuable insights into the accessibility of public services in a given area.

- Urban Planning:
  Plight maps can be useful in urban planning by identifying areas that may require improvements in infrastructure or public services. For example, if there are several densely populated neighborhoods that are far from police stations, it may be necessary to build new stations in those areas.
- Emergency Management:
  In the event of a natural disaster or other emergency, a Plight Map can help emergency responders identify areas that may require additional resources or assistance. For example, if there is a major flood and several neighborhoods are cut off from transportation hubs, emergency services may need to set up temporary transportation services in those areas.
- Public Health:
  Plight Maps can be useful in identifying areas with inadequate access to healthcare services. For example, if several neighborhoods are far from the nearest hospital or medical clinic, public health officials may need to consider building new clinics or providing mobile healthcare services in those areas.
- Crime Prevention:
  Plight Maps can help law enforcement officials identify areas with high crime rates that may require additional policing resources. By analyzing the proximity of police stations to crime hotspots, officials can make more informed decisions about where to allocate resources.