

Urban Road Network Connectivity and Accessibility Analysis Using RS and GIS: A Case Study of Chandannagar City

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Abstract : The road network of any area is the most important indicator of regional planning. For proper utilization of urban road networks, the structural parameters such as connectivity and accessibility should be analyzed and evaluated. This paper aims to explain the application of GIS on urban road network connectivity and accessibility analysis with a case study of Chandannagar City. This paper has been made to analyze the road network connectivity through various connectivity measurements like the total number of nodes and links, Cyclomatic Number, Alpha Index, Beta Index, Gamma index, Eta index, Pi index, Theta Index, and Aggregated Transport Score, Road Density based on existing road network in Chandannagar city in India. Accessibility is measured through the shortest Path Matrix, associate Number, and Shimbel Index. Various urban services, such as schools, banks, Hospitals, petrol pumps, ATMs, police stations, theatres, parks, etc., are considered for the accessibility analysis for each ward. This paper also highlights the relationship between urban land use/ land cover (LULC) and urban road network and population density using various spatial and statistical measurements. The datasets were collected through a field survey of 33 wards of the Chandannagar Municipal Corporation area, and the secondary data were collected through an open street map and satellite image of LANDSAT8 OLI & TIRS from USGS. Chandannagar was actually once a French colony, and at that time, various sort of planning was applied, but now Chandannagar city continues to grow haphazardly because that city is facing some problems; the knowledge gained from this paper helps to create a more efficient and accessible road network. Therefore, it would be suggested that some wards need to improve their connectivity and accessibility for the future growth and development of Chandannagar.

Keywords : accessibility, connectivity, transport, road network

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