

Analyzing Spatio-Structural Impediments in the Urban Trafficscape of Kolkata, India

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Abstract : Integrated Transport development with proper traffic management leads to sustainable growth of any urban sphere. Appropriate mass transport planning is essential for the populous cities in third world countries like India. The exponential growth of motor vehicles with unplanned road network is now the common feature of major urban centres in India. Kolkata, the third largest mega city in India, is not an exception of it. The imbalance between demand and supply of unplanned transport services in this city is manifested in the high economic and environmental costs borne by the associated society. With the passage of time, the growth and extent of passenger demand for rapid urban transport has outstripped proper infrastructural planning and causes severe transport problems in the overall urban realm. Hence Kolkata stands out in the world as one of the most crisis-ridden metropolises. The urban transport crisis of this city involves severe traffic congestion, the disparity in mass transport services on changing peripheral land uses, route overlapping, lowering of travel speed and faulty implementation of governmental plans as mostly induced by rapid growth of private vehicles on limited road space with huge carbon footprint. Therefore the paper will critically analyze the extant road network pattern for improving regional connectivity and accessibility, assess the degree of congestion, identify the deviation from demand and supply balance and finally evaluate the emerging alternate transport options as promoted by the government. For this purpose, linear, nodal and spatial transport network have been assessed based on certain selected indices viz. Road Degree, Traffic Volume, Shimbel Index, Direct Bus Connectivity, Average Travel and Waiting Time Indices, Route Variety, Service Frequency, Bus Intensity, Concentration Analysis, Delay Rate, Quality of Traffic Transmission, Lane Length Duration Index and Modal Mix. Total 20 Traffic Intersection Points (TIPs) have been selected for the measurement of nodal accessibility. Critical Congestion Zones (CCZs) are delineated based on one km buffer zones of each TIP for congestion pattern analysis. A total of 480 bus routes are assessed for identifying the deficiency in network planning. Apart from bus services, the combined effects of other mass and para transit modes, containing metro rail, auto, cab and ferry services, are also analyzed. Based on systematic random sampling method, a total of 1500 daily urban passengers' perceptions were studied for checking the ground realities. The outcome of this research identifies the spatial disparity among the 15 boroughs of the city with severe route overlapping and congestion problem. North and Central Kolkata-based mass transport services exceed the transport strength of south and peripheral Kolkata. Faulty infrastructural condition, service inadequacy, economic loss and workers' inefficiency are the most dominant reasons behind the defective mass transport network plan. Hence there is an urgent need to revive the extant road based mass transport system of this city by implementing a holistic management approach by upgrading traffic infrastructure, designing new roads, better cooperation among different mass transport agencies, better coordination of transport and changing land use policies, large increase in funding and finally general passengers' awareness.

Keywords : carbon footprint, critical congestion zones, direct bus connectivity, integrated transport development

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