

An Assessment of Suitable Alternative Public Transport System in Mid-Sized City of India

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Abstract : The rapid growth of urban areas in India has led to transportation challenges like traffic congestion and an increase in accidents. Despite efforts by state governments and local administrations to improve urban transport, the surge in private vehicles has worsened the situation. Patna, located in Bihar State, is an example of the trend of increasing reliance on private motor vehicles, resulting in vehicular congestion and emissions. The existing transportation infrastructure is inadequate to meet future travel demands, and there has been a notable increase in the share of private vehicles in the city. Additionally, there has been a surge in economic activities in the region, which has increased the demand for improved travel convenience and connectivity. To address these challenges, a study was conducted to assess the most suitable transit mode for the proposed transit corridor outlined in the Comprehensive Mobility Plan (CMP) for Patna. The study covered four stages: developing screening criteria, evaluating parameters for various alternatives, qualitative and quantitative evaluations of alternatives, and implementation options for the most viable alternative. The study suggests that a mass transit system such as a metro rail is necessary to enhance Patna's urban public transport system. The New Metro Policy 2017 outlines specific prerequisites for submitting a Metro Rail Project Proposal to the Ministry of Housing and Urban Affairs (MoHUA), including the preparation of a CMP, the formation of an Urban Metropolitan Transport Authority (UMTA), the creation of an Alternative Analysis Report, the development of a Detailed Project Report, a Multi-Modal Integration Plan, and a Transit-Oriented Development (TOD) Plan. In 2018, the Comprehensive Mobility Plan for Patna was prepared, setting the stage for the subsequent steps in the metro rail project proposal. The results indicated that from the screening and analysis of qualitative parameters for different alternative modes in Patna, it is inferred that the Metro Rail and Monorail score 82.25 and 70.50, respectively, on a scale of 100. Based on the initial analysis and alternative evaluation in the form of quantitative analysis, the Metro Rail System significantly outperformed the Monorail system. The Metro Rail System has a positive Economic Net Present Value (ENPV) at a 14% internal rate of return, while the Monorail has a negative value. In conclusion, the study recommends choosing metro rail over monorail for the proposed transit corridor in Patna. However, the lack of broad-based technical expertise may result in implementation delays and increased costs for monorail.

Keywords : comprehensive mobility plan, alternative analysis, mobility corridors, mass transit system

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