

Improvisation of Public Transport System in Ahilyanagar City

Ar. Ankit Bhagwan Avhad

Department of Planning, COEP Technological University, Pune, India

Dr. S. G. Sonar

Department of Planning, COEP Technological University, Pune, India

Abstract

Due to the legacy of radial network topologies and fast, uncontrolled urban development, public transportation in India's mid-tier cities is frequently characterized by systemic inefficiencies. The serious transit deficiencies in Ahilyanagar City, Maharashtra, which presently depends on an unsustainable modal share of 53.7% for private two-wheelers, are the focus of this study. Using Geographic Information Systems (GIS) for Catchment Area Analysis (CAA) and primary Origin-Destination (O-D) surveys to identify significant "Transit Deserts" where 79.3% of the population lives beyond the 500-meter statutory Service Level Benchmark (SLB) accessibility buffer, the study uses a mixed-methods approach to diagnose these inefficiencies.

By using demographic forecasting alongside density-based coefficients, the research identifies a 50% spatial and operational shortfall across the existing municipal transit fleet. To mitigate this, the study suggests a phased shift from the current hub-and-spoke radial setup, toward a more decentralized, integrated "Trunk-and-Feeder" network. In that approach, the deployment of newly sanctioned Electric Buses, or E-Buses, is handled via dynamic headway analytics that lean on density rules, with a Cd application included. It also sort of formalizes how Intermediate Public Transport, IPT, gets woven in, to cover the last mile connectivity gaps that always pop up. Overall, the results lay out a framework that other mid-tier cities can reuse, so they can align ecological sustainability with operational efficiency, and still give municipal corporations clear action steps over a 10-year planning horizon.

Keywords

Ahilyanagar, Electric Mobility, GIS Spatial Modeling, Trunk-and-Feeder Network Service Level Benchmarking, Urban Transit Planning.