International Journal of Science and Research (IJSR)
ISSN: 2319-7064
Impact Factor 2025: 7.089

Public Transportation of India

Rohit Subramanian

Jain Deemed to be University

Abstract: ***This study investigates the impact of challenges from rapid congestion in big cities and calls for integrated, smart multi-modal systems, focusing on improved quality and frequency, sustainability, transit-oriented development, unified ticketing, shared mobility, and proper first and last mile connectivity in all Indian cities is necessary. It reviews initiatives and identifies research needs, highlighting the gap between immense travel demand and inadequate infrastructure. The study reviews existing policies and proposes research directions for planning effective, sustainable, and integrated public transport systems, emphasising the need for holistic frameworks to address the complex challenges of mobility in developing economies like India, moving beyond just adding bigger vehicles to creating true public transportation systems. This paper shows that the fare structure should be affordable to all people, which can significantly impact the ridership and the path of moving towards Viksit Bharat.***

Keywords: urban mobility, public transport planning, integrated transit, sustainable transport, Indian cities

1. Introduction

India's public transportation has evolved from colonial-era rail systems and state-owned bus services to a complex mix of buses, metros, suburban rail, and informal transit. Following independence, State Transport Undertakings (STUs) expanded their bus networks to connect rural and urban areas, linking almost every village in India.

It is a critical component of its urban and rural mobility landscape, serving billions of trips annually. With rapid urbanisation, India's metro rail systems, buses, and intermediate modes such as auto-rickshaws and e-rickshaws have evolved rapidly.

States like Delhi, Maharashtra, Uttar Pradesh, and Gujarat have pioneered metro expansion, while the government has prioritised sustainable electric bus deployment under schemes like PM-eBus Sewa. Despite progress, challenges remain in affordability, last-mile connectivity, infrastructure gaps, and environmental impacts as the country moves toward mass transit modernisation by 2030.

Research Gap

Despite significant investments in metro systems and electric buses, India's public transport suffers from limited coverage in smaller cities, inadequate bus network quality, and weak integration between modes.

The environmental impact of shifts to electric vehicles and non-motorised transport in India's context is under-examined, especially lifecycle analyses of new technologies. Data on informal/paratransit modes (auto-rickshaws, e-rickshaws, unregulated minibuses) are fragmented, and their roles in the overall mobility system are not fully quantified.

Policy implementation gaps also stand out: many studies note that ambitious policies (e.g. NUTP, TOD guidelines) are not fully realised on the ground, but detailed evaluations of these failures are lacking. In short, current research often focuses on individual modes or technologies, whereas integrated system-level analysis (interactions of policy, infrastructure, user behaviour, environment) is relatively unexplored.

General Objectives

- To investigate the current state of public transportation in India, evaluate the effectiveness of recent government initiatives, and identify key challenges and opportunities for sustainable and integrated urban mobility.
- To provide a comparative analysis of India's public transportation system, covering historical evolution, current status, and future trends.
- To evaluate the performance, accessibility, and sustainability of major transit modes (buses, metro, suburban rail, paratransit, RRTS).

Specific Objectives

- To analyse the development and expansion of metro rail networks in major Indian cities.
- To assess the growth and impact of electric bus fleets under national schemes such as PM-eBus Sewa and FAME Scheme.
- To evaluate the role and integration of informal transit modes like auto-rickshaws and e-rickshaws.
- To identify gaps in last-mile connectivity and service quality across different Indian states and union territories.
- To propose recommendations for policy and infrastructure improvements to enable sustainable and equitable public transportation.
- To examine the degree of coordination between the different modes of public transport, including physical (connectivity), fare (e.g. unified ticketing), and information (journey planning) integration, like Mumbai One App.
- To assess how well different socio-economic groups and peripheral/rural areas are served by transit, identifying gaps in network coverage and barriers to use, like RRTS and Suburban rail.
- To analyse travel demand patterns and mode choice factors (cost, convenience) to inform demand-responsive planning (e.g. shifting trips to transit).

2. Significance of the Study

India's rapid urbanisation – 35% urban population and growing – makes efficient public transport critical for economic growth, environmental sustainability, and social equity. As cities expand, reliance on private vehicles would

worsen congestion and pollution; strengthening public transit is key to meeting climate targets and reducing health costs.

This research is important for *sustainable development*: expanding and electrifying mass transit directly supports India's goals (e.g. National Electric Mobility Mission). Moreover, by focusing on accessibility and equity, the study addresses social inclusion: affordable transit improves livelihoods for the poor and marginalised. Insights into policy and planning gaps can guide cities to meet Sustainable Development Goals (e.g. SDG 11: sustainable cities) and national missions (like Smart Cities, AMRUT) more effectively.

The research highlights pathways to enhance mobility for millions, reducing congestion and pollution, and facilitating inclusive urban development aligned with India's 2030 urbanisation goals.

In sum, a systematic examination of public transportation is crucial for shaping India's future mobility – making it greener, more inclusive, and better integrated with urban growth and infrastructure.

Comprehensive Operational Framework for Public Transportation in India

- **Physical co-location:** Build multimodal hubs where trains, buses and IPT (autos/e-rickshaws) converge within short walking distance. Clearly marked pathways, sheltered walkways, and wayfinding signage ensure easy transfers.
- **Fare integration:** Implement a single payment media (e.g. National Common Mobility Card, mobile QR/UPI) for all transit modes. Allow free or discounted transfers between modes (transfer tickets) and fare capping (daily/weekly caps). Integrated fare structures (one ticket covering a complete trip) encourage ridership.
- **Information integration:** Publish joint network maps and timetables. Provide "one-app" journey planning with real-time arrival data for all modes. Display synchronised departure boards at interchanges.
- **Paratransit and micro-mobility:** Recognise autos/e-rickshaws as feeder services. Designate auto-stands at stations; integrate their routes into trip planners. Share data so app-based e-rickshaw services can be planned as feeders.
- **Unified fare media:** Deploy interoperable smart cards or mobile wallets (e.g. India's NCMC, mobile QR) accepted on buses, metro, trains and even tolls. Move towards *open-loop* systems (cards/wallets issued by banks) so that any passenger payment instrument works on transit.
- **Interchange stations:** Design large hubs with separate bays/platforms for each mode, ample space for boarding/alighting, and covered connections. Ensure universal accessibility, like elevators, ramps, tactile paving and audible signals for the visually impaired. Provide clear signage and information displays.
- **Network layout:** Adopt grid or radial layouts with transfer points every 3–5 km. High-demand corridors should have the most frequent service. Where demand is low, use demand-responsive transit or IPT. Balance coverage (distance to nearest stop) with directness of routes.
- **Transit hubs:** Invest in multi-modal terminals (bus depots adjacent to rail stations). These terminals should have amenities (waiting areas, ticketing counters, real-time displays), as well as parking for bicycles and feeder vehicles.
- **Reliability:** Enforce on-time performance and headway adherence targets. Use AVL/GPS to monitor vehicles; intervene (dispatch spares, re-route) when delays occur. Maintain a reserve fleet for breakdowns.
- **Frequency and capacity:** Set high frequencies on trunk corridors (e.g. headways of 5–10 minutes peak on BRT or metro lines) and adequate capacity (enough buses/cars per trip). Off-peak frequency can be lower, but it must avoid unreasonably long waits. Analyse ridership data to adjust service levels according to the time of day.
- **Fleet utilisation:** Optimise vehicle size (standard vs. articulated buses) per route. Monitor load factors to decide where larger vehicles are needed.
- **Intelligent Transport Systems (ITS):** Equip buses and trains with GPS/AVL so operations centres can track vehicles in real-time. Implement Transit Management Systems to optimise dispatch, regulate headways and manage interruptions. For example, Delhi's bus app and traffic control centre use GPS data to manage frequency.
- **Traffic Integration:** Extend ITS to the road network: traffic signal priority for buses, adaptive signals near depots, and traffic monitoring to re-route buses in congestion.
- **Unified Transport Authority:** Establish a city-level body (UMTA) comprising state and local officials, transit operators and stakeholders. This authority would coordinate route planning, fare policy (including integrated ticketing), and infrastructure projects across jurisdictions. Delhi and other cities (Bangalore, Kochi) are moving to set up such UMTAs.
- **Multi-Level Roles:** *Central Government (MoHUA)* sets policy (e.g. NUTP), provides funding/grants, and enforces standards. *State Governments* manage state-run bus fleets, fund metros and regional rail. *City or Local Authorities* handle urban roads, traffic regulations, and city buses (often through municipal corporations). Formal mechanisms (committees or joint ventures) should ensure these levels collaborate.

3. Theoretical Framework:

Transit-Oriented Development (TOD) Theory

- Essence: High-density, mixed-use development concentrated around transit nodes increases transit ridership and reduces travel distances.
- Why it fits India: High land pressures in Indian cities make TOD a lever for achieving compact growth and boosting mass-transit viability.
- Operational focus: Land-use mix index around stations, population/employment density within 500–800 m of transit nodes, pedestrian connectivity.

Mobility-as-a-Service (MaaS) / Integration Theory

- Essence: Seamless integration of modes (ticketing, information, scheduling) and digital platforms reduces "friction" in multimodal trips and shifts mode choice.

- Why it fits India: Fragmented operators (STUs, metro, paratransit) and growing smartphone use make unified platforms promising for India.
- Operational focus: Existence/usage of unified payment systems, trip-planner availability, transfer penalty (time/cost).

Accessibility Theory

- Essence: Accessibility (opportunities reachable within time/cost constraints) is a better predictor of social and economic outcomes than mere infrastructure counts.
- Why it fits India: Equity, livelihoods and access to services (health, jobs, schools) depend on real accessibility- critical for peri-urban and low-income groups.
- Operational focus: Number of jobs/services reachable within 30/60 minutes by public transit; proportion of population within 500 m of a stop.

The National Common Mobility Card (NCMC)

- It is the practical manifestation of the 'One Nation, One Card' vision. This policy aims to enforce nationwide standardisation using an open-loop system, enabling users to pay for transit, toll tax, and retail shopping with a single card.
- The success of NCMC in achieving true inter-modal interoperability (e.g., Chennai Metro and MTC buses) serves as the blueprint for integrating the fragmented transport ecosystem.

Unified digital ticketing

- The "Mumbai One" app is the city's new integrated ticketing system, allowing users to book a single QR-based digital ticket for various public transport modes, including the metro, monorail, and buses, via their smartphones.
- Developed by the Mumbai Metropolitan Region Development Authority (MMRDA), this unified platform aims to eliminate the need for multiple apps or tickets, though suburban train season and return tickets cannot be booked through the app currently.

4. Review of Literature

1) In this paper, the impact of the IoT environment on the public transportation system is discussed, and a new framework of the intelligent public transportation system based on IoT is proposed. The deployment of the elements, the communication network and the three-tier architecture of the system are described in detail. The modules of the dynamic vehicle scheduling and controlling system, which is a kernel part of the whole public transportation system, are presented and analysed.
2) In order to ensure mass mobility, public transportation should be a priority. A multi-modal and integrated transit system comprising pedestrians, bicycles, buses, metro, and rail is to be created. To monitor the sustainable development of the city, use an integrated mass-transportation system as a planning mechanism. Adopting more economical, sustainable and environmentally friendly technologies to mitigate air quality problems in Ahmedabad and Delhi. (CNG vehicles,hybrids, electric vehicles, etc.)
3) In this study, the significance of a regular feeder system - cycle rickshaws and e-rickshaws to enhance the accessibility of mass urban transit system is highlighted. The use of e-rickshaws is increasing gradually as the last mile transport option in Ranchi City.
4) Sustainable urban transport is a widely discussed topic in the literature, but very few studies are available in the case of India. This paper tried to evaluate the issues of sustainability of major metropolitan cities of India, and more particularly Bengaluru. The paper differs in the approach by adopting four-dimensional principles of sustainability rather than the three pillars of sustainability, which are commonly used in the wider literature. By bringing institutional sustainability as its fourth dimension, the paper measured the sustainability issue of Bengaluru city.
5) The metro rail has the potential to reduce the environmental burdens of urban commuting, but must be deployed with impact-reduction measures and in a configuration that endorses high ridership. We have identified the life cycle hotspots that influence the modal performance: (i) auxiliary and traction power demand; (ii) the fossil fuel intensity of the electricity mix; (iii) train ridership; (iv) construction of underground stations; and (v) access/egress automobile trips. Modern trains with regenerative braking systems should be deployed on metro rail lines to reduce the traction power demand. Similarly, the adoption of energy-efficient equipment and closed ventilation systems for metro stations can reduce the auxiliary power demand.
6) Thus, the study is an outline to bring forth the idea that efficiency measure of urban activities against energy dimension can be a good indicator of urban system functioning. This could help understand which determinant in the urban system makes it inefficient, and relevant action can be taken. Also, the measure across various cities would help in comparing cities through various indicators, to understand their performance towards energy usage in various dimensions.
7) The study states that the fare restructuring of the BMTC bus service and introducing BRT lanes will help decongest the roads in Bengaluru as well as reduce vehicular emissions. The paper suggests the revision of bus fares after analysing the present-day travel pattern by different modes and finding out that there is a requirement to reduce the rate of increment of bus fares for the trips of small and medium distances. The modelling shows the positive effect of restructuring the BMTC fares as it is increasing the mode share of the buses by more than 2% and also increasing the revenue by more than 15%.
8) The future objective is based on a few factors identified as an outcome of this study. For instance, it highlights the importance of outlining the LMC's boundary that has to be planned. The boundary can be categorised as station area-based, city-based, regional development, or any other suitable category applicable to the context. It also classifies the need to create a framework for evaluating the scope of LMC in the context of India. An existing framework will ensure smooth application standards and an effective, sustainable project. It also enables detailing the inspection criteria even during the project's implementation phases.

9) This article has proposed a methodology to identify transport gaps in Flanders, Belgium. While previous studies generally do not consider the temporal variability in accessibility levels at multiple origins, this study shows the importance of modelling time-continuous, schedule-based public transport accessibility to identify public transport gaps. To that end, an index of public transport needs (IPTN) and one for its provision (IPTP) was developed.
10) The three most important performance-defining features of a transit system are cruising speed, vehicular capacity, and boarding rapidity. We define cruising speed as the speed that vehicles can sustain in their guideway and ROW environments without stopping at stations. For levels I and II ROWs, cruising speeds are determined by the ROW environment, including speed limits and traffic. As such, these speeds are usually on the order of 20–30 km/h. For level III systems, speeds are determined by the vehicle and guideway technology. Urban rail systems will typically achieve somewhere between 50 and 100 km/h, and level III LRT systems between 30 and 100 km/h.
11) The National Transport Development Policy Committee (NTDPC), established a working group on urban transport and published a report on urban transportation in March 2012. It identifies a great need for ITS applications in urban transportation and explicitly emphasises that people's expectations and demands of service quality have changed significantly with the availability of maps, GPS systems, etc., people plan their routes based on distance, time and cost. Therefore, Information and Communication Technology (ICT) enabled transport management systems have been stressed. This will improve functional efficiency through better data collection and analytics, leading to better decision-making in urban transport planning and management.
12) The purpose of this study was to identify the criteria for a sustainable transport system in metro cities and suggest a framework for the selection of the most sustainable transportation system in NCR Delhi, India. We have used AHP to illustrate the proposed framework. This study has been done for policymakers in designing sustainable transportation in an existing metro that has severe traffic congestion. In the present situation, the development of a sustainable transport system is a challenge. In this study, three alternatives of transport are considered in the context of NCR Delhi, India. These are state-run buses, pooled cars and *Shuttl*. This study is trying to illustrate a framework for the selection of sustainable transport.
13) Sustainable urban transport is a widely discussed topic in the literature, but very few studies are available in the case of India. This paper tried to evaluate the issues of sustainability of major metropolitan cities of India, and more particularly Bengaluru. The paper differs in the approach by adopting four-dimensional principles of sustainability rather than the three pillars of sustainability, which are commonly used in the wider literature. By bringing institutional sustainability as its fourth dimension, the paper measured the sustainability issue of Bengaluru city.
14) Transport demand in most of the Indian cities has increased substantially due to an increase in population as a result of both natural increase and migration from rural areas and smaller towns. Availability of motorised transport, increase in household income, and increase in commercial and industrial activities have further added to it. Unfortunately, public transport systems in Indian cities have not been able to keep pace with the rapid and substantial increase in travel demand. Rail-based public transport services and well-organised bus transport services are limited to a few big cities only. Qualitatively, the available public transport services are overcrowded, particularly during peak hours and involve long waiting periods. As a result, there is a massive shift towards personalised transport, especially cars and two-wheelers, and also the proliferation of various types of intermediate public transport modes, such as auto-rickshaws and taxis.
15) The comprehensive evaluation provides valuable insights into the project's tangible impacts and replicable elements. The innovative approach blends sustainable practices, operational resilience and community engagement, serving as a model for cities seeking sustainable, equitable and efficient transportation solutions. This research article clearly mentions the water metro in Kochi.

5. Methodology

This study proposes a methodology for transitioning from private transit to shared-based transit, aiming to reduce traffic congestion and pollution, and to adopt a sustainable and eco-friendly mode of transportation. It optimises viable routes and high-frequency timings, integrating proper and efficient last-mile connectivity with full affordability for all citizens in all Indian cities.

The sampling is Purposive sampling, and the research design is qualitative. Our focus is on targeting the common middle-class people of India who rely on carpooling and public transportation for daily commute purposes, whether for work or leisure, across all Indian cities, whether tier 1, tier 2 or tier 3 cities.

Statistical Data
India's public transport saw massive metro expansion (1,013 km by May 2025) and growing ridership (over 1.12 crore daily), alongside increasing private vehicle usage impacting roads, while railways focus on freight efficiency with DFCs, with overall trends showing tech adoption, e-bus growth (OEMs surpassing ICE makers in 2024), and shifting passenger preference towards affordable, green options, despite infrastructure gaps.

Road Transport & Buses:
- Growth: Road network expanded significantly, but infrastructure quality and maintenance remain challenges, contributing to congestion.
- Electric Buses: 2024 saw e-bus OEM production surpass diesel, supported by PLI schemes, with new players gaining 30% market share.
- Private Vehicles: Rapid growth in auto manufacturing (28.4 million vehicles in 2025), increasing road dominance.

- National Highways: Network grew ~61% (2014-2025), from ~91k km to ~146k km.
- Capital Expenditure: MoRTH budget grew 5.7x (2013-14 to 2023-24).
- Rural Roads: 7.8 lakh km completed under PMGSY (2014-2025).

Emerging Trends & Challenges:
- Shared Mobility: Ride-hailing (Uber/Ola) grew rapidly (4x ridership 2015-16), disrupting traditional transport.
- Technology: Increased adoption of tech in public transport services.
- Passenger Shift: Growing preference for public transport due to affordability, congestion, and environmental awareness.
- Energy: Transport sector faces high energy demand growth; push for efficient mobility solutions.
- Infrastructure Boom: Major push across all modes from 2014-2025, aiming for a "Viksit Bharat" (Developed India).
- Increased Investment: Budgets for metros and highways saw substantial increases.

Metro Rail:
- Expansion: From 248 km (2014) to over 1,000 km by May 2025, India is third globally in metro networks.
- Ridership: Grew from 28 lakh (2013-14) to over 1.12 crore daily by 2025.
- Investment: Annual budget increased significantly, from ₹5,798 crore (2013-14) to ₹34,807 crore (2025-26).
- Network Expansion: From 248 km (5 cities) in 2014 to over 1,000 km (23 cities) by May 2025.
- Commissioning Pace: Increased from ~0.68 km/month (pre-2014) to ~6 km/month (2014-2025).
- Ridership: Grew from 28 lakh (2013-14) to over 1.12 crore daily.
- Budget: Annual budget rose from ₹5,798 crore (2013-14) to ₹34,807 crore (2025-26).

Railways:
- Freight: Focus on Dedicated Freight Corridors (DFCs) to boost freight traffic to 3.3 billion tonnes by 2030.
- Cost: Rail freight (₹1.06/tonne-km) is cheaper than road (₹2.5/tonne-km).
- Electrification: Reached nearly 98% by 2025.
- Locomotives: Had over 17,000 locos (electric, diesel, steam) by late 2025.
- Passenger Focus: Significant revenue from the passenger segment.

UDAN Scheme:
- Airports: 88 operationalised under UDAN, facilitating regional connectivity.
- In India, the number of operational airports dramatically increased from 74 in 2014 to over 150 (around 157-163) by 2025, driven by government schemes like UDAN to boost regional connectivity, with a vision to reach 350-400 airports by 2047.
- 2014: 74 operational airports.
- 2025 (approx.): Around 157 to 163 operational airports.
- Ude Desh Ka Aam Nagrik Scheme was launched in 2016.
- This initiative focused on reviving underutilised airstrips and developing new airports for affordable regional travel, significantly expanding the network.
- Greenfield Airports: New airports like Durgapur, Shirdi, Kannur, and Mopa (Goa) became operational, adding to the total.
- Government Vision: The government aims to further expand this infrastructure, with targets of 350-400 airports by 2047, notes the Press Information Bureau (PIB).

Key Statistics
- Road Passengers (2015): ~8.225 billion annually.
- Rail Passengers (2020): ~8.09 billion annually.

6. Analysis

This research study provides a clear analysis of fleet strength and utilisation rates in urban areas, as well as capacity utilisation and the availability of organised public transport. It broadly discusses the high frequency, high possibilities, and reliable timings. Analysing the fuel economy of the fleet, along with service quality and less overcrowding, with a cheap and affordable mechanism, encouraging the last and first mile connectivity from a person's residence to the desired destination with effectiveness and efficiency, including the shared mobility and non-motorised transport. It also clearly shows that there is a need to switch from private vehicles to public transport, which eventually has a higher capacity of people per hour. It should be disability-friendly, especially for senior citizens, physically challenged and disabled people, to travel smoothly without any jerks. Analyses the sufficient seating and standing capacity in all kinds of public transport in India, along with regional connectivity like the Regional Rapid Transit System, which provides fast, affordable and reliable services as compared to other modes of transport, especially for inter-city commute.

7. Conclusion

Public transportation is critical for reducing traffic congestion, pollution, and a low carbon footprint. The integration of all modes of transport in one app in phone and one open-loop card, that is, the National Common Mobility Card, which is common for all Indian cities. By providing efficient, effective, accessible, and affordable public transportation, it generates employment opportunities for all cities, especially for low-income groups, and reduces the likelihood of migration from small and medium-sized cities to big cities. Despite demand, public transport faces numerous challenges, such as last-mile connectivity, failing to meet modern standards, policy gaps, and financial struggles, which significantly restrict the potential growth of public transportation in India. With growing incomes and an increase in vehicle ownership, public transport share continues to decrease in most cities despite making heavy investments in constructing and operating metro systems across India.

8. Recommendations

The government should mandate financial autonomy, enhance creditworthiness, prioritise the volume of bus fleet and the sufficiency of metro trainsets, and implement the

project as soon as possible without any delays, with full viability and high potential ridership. An operation control centre should be established to monitor the performance of the public transportation. Public awareness needs to be improved to encourage people to use public transport and carpooling rather than using private vehicles. It should focus on quality, like investment in a modern fleet, regular maintenance, implementing robust frameworks for safety, and fair price structures, potentially through public-private partnerships. Create dedicated bus lanes (BRTS), prioritise buses at junctions, and improve bus stops to make buses faster and more reliable than private cars.

References

[1] Ministry of Urban Development, Government of India. (2006). *National Urban Transport Policy*. Ministry of Urban Development, Government of India.
[2] Tiwari, G., & Advani, M. (2006). Demand for Metro Systems in Indian Cities (TRIPP working paper). IIT Delhi.
[3] Joshi, R., Deshpande, P., Borah, S., & Sharma, M. (2023). *Informal and shared mobility: Status and opportunities in India*. Volvo Research and Educational Foundations (VREF).
[4] Verma. A, Vajjarapu. H, Karmakar, O. (2019). *Sustainable Urban Transport Policies to Improve Public Transportation System*: A Case Study of Bengaluru, India, Elsevier, 220-230.
[5] Shende, S. & Bhashakhetre, C. (2018) *A Review on Design of Public Transportation System in Chandrapur City*. Journal for Research, Vol. 4(1), 230-240.
[6] Mohapatra, S. & Mohanachandran, D. (2023) *A Comprehensive Study on the Sustainable Transportation System in India and Lessons to Be Learned from Other Developing Nations.* Energies, Vol. 2(3), 240-250.
[7] Maitra, B. & Sadhukhan, S. (2013) *Urban Public Transportation System in the Context of Climate Change Mitigation: Emerging Issues and Research Needs in India*. Springer.com, Vol. 4(1), 75-91.
[8] Kumar, M. & Anand, V. (2016) *Public Transport Service Quality and Passenger Satisfaction: A Case of UPSRTC, Agra, India*, Pacific Business Review International, Vol. 8(11), 27-35.
[9] Pathak, P. & Singhal, A. (2021). *Intelligent Transportation System in India*. Publishing India.com, Vol. 1(3), 28-40.
[10] Ghosh, T. & Kantikar, T. (2023). *Affordable and sustainable transportation: Key drivers and policy choices for a megacity in India*. Elsevier, Vol. 13(1), 30-50.

Research Interview:

1) How often do you use Public transport?
2) How is the service quality in Public transport?
3) What are the biggest problems with public transport in your city in India?
4) Do you prefer a unified ticketing system?
5) Do you face disabilities while travelling for long distances?
6) How effective are current multi-modal integration efforts (bus-metro)?
7) What are the biggest obstacles to improving public transport?
8) What is the long-term goal for urban mobility in India?
9) Are policies regarding public transport in India Inclusive?
10) What do operators face in the daily operational hurdles?
11) How do you collect and act on passenger feedback?
12) What are the main funding constraints and barriers to implementing the new technology?