



CEPT CONFERENCE
URBAN
TRANSPORT
IN INDIA

COMPENDIUM / 2023

ORGANISERS

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URBAN
TRANSPORT
IN INDIA

28th NOVEMBER 2023

COMPENDIUM
/2023

CEPT CONFERENCES

CEPT Conferences aim to promote knowledge exchange, collaboration, and interdisciplinary research in urban design, planning, and policy and management. By bringing together stakeholders from diverse backgrounds, the conferences facilitate the advancement of sustainable and equitable urban development. The platform provides a forum for unbiased discussions, advances knowledge and new ideas, influences positive change in public policy, exposes students to professionals and policymakers, and offers networking opportunities. CEPT Conferences are dedicated to working towards solutions to India's urban challenges through collaboration and collective action.

The CEPT Conferences are organized by CEPT Research and Development Foundation (CRDF), the research arm of the University, engaged in research projects, advisory assignments and capacity building initiatives aimed at solving critical problems in the built environment and human habitats.

#CeptConferences
#UrbanTransportInIndia

ABOUT

CONFERENCE ON URBAN TRANSPORT IN INDIA

The Urban Transport in India Conference is designed to delve into the complexities of implementing urban transportation projects and how they contribute to shaping resilient and sustainable cities throughout India.

The event opens a collaborative platform where students, academicians, professionals, decision makers and various stakeholders can converge to engage in discussions, share insights, and exchange experiences related to urban transport planning in the country.

Transportation is an integral component of urban planning, and it plays a pivotal role in shaping the design, functionality, and sustainability of cities. It encompasses a complex network of transportation modes and infrastructure designed to facilitate the movement of people and goods within urban areas. The efficiency, sustainability, and accessibility of urban transport systems are crucial for the overall well-being of a city's residents and its economic growth. The conference intends to explore a wide range of themes, including integrating public transport systems, smart urban transport technologies, inclusive and accessible transportation infrastructure, policy and governance for sustainable urban transport, strategies for effective demand management and many more.

This conference features key highlights from the speaker presentations and ideas that emerged during the panel discussion.



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OPENING ADDRESS

CEPT University is committed to delivering excellence in teaching, creating new professionals and conducting applied research. In the year 2023, CEPT University commenced an annual CEPT Conference series in collaboration with CEPT Research and Development Foundation with the objective of providing a platform where practitioners could share experiences of recent projects in respective domain areas and deliberate on the key learnings from them. Planning in India is continuously evolving, therefore experience sharing is crucial as we as planners have to address real-world problems.

The CEPT Conference series began in May 2023 with a conference on Urban Planning in India, followed by another one on Urban Design in India. This conference focuses on Urban Transport in India.

We are all aware of the crucial role transportation plays in our cities. Transportation provides access to different parts of the city for both passengers and goods and is integral to productivity and efficiency of the cities. It is important to look at different policies and projects that the cities are implementing and reflect on what is working or not working. We therefore have invited practitioners who have been engaged in such policymaking and/or projects to present their experience, insights and learnings from such projects on processes, innovative practices, key challenges faced.

I hope that we all will seize this opportunity of knowledge exchange and discover innovative ways to enhance transportation systems in our cities.

Bimal Patel
President, CEPT University

OVERVIEW OF THE CONFERENCE

An efficient transport system in a city is key, not only for the ease of movement of people and goods, but also for its economic development. However, transport also has adverse impacts like road accidents, pollution, greenhouse gas emissions. So, if we want our cities to work, transport definitely needs to work.

The theme of the conference this year is “Making Transport Planning Work” which aims to deliberate on the diverse set of transport projects and policies being implemented in Indian cities and learn from them.

In India, the transport scenario is rapidly evolving with a widened focus on a range of projects besides road network and capacity enhancement works. We have BRT and metro rapid transit projects implemented in several cities. Also, with the growing realization that quality city bus services are the backbone of any public transport system, several interventions like Intelligent Transport Management System, e-buses, smart card ticketing, as well as initiatives focusing on better streets, non-motorised modes etc. are being taken. We also see progress in data analytics to improve transport system performance, traffic enforcement, provision of real time travel information and many more applications. Along with this, several efforts towards minimizing pollution, reducing road accidents and planning for inclusive transport system.

Today we will attempt to cover these diverse set of initiatives through the three sessions focusing on implementation of different public transport modes, frameworks and analytics for system management and initiatives in safe, inclusive and green transport. We are delighted to have speakers who have worked on a wide range of projects and policies in India from planning to execution.

Shalini Sinha
Sr. Associate Professor
Program chair (Urban Transport Systems)
Faculty of Planning, CEPT University



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CONFERENCE AGENDA

28th November 2023 | 9:00 a.m. to 5:30 p.m. IST

Venue – Balwantrai N. Brahmbhatt Lecture Hall, CEPT University, Ahmedabad

9:00 a.m. – 9:45 a.m. **Registration**

9:45 a.m. – 10:00 a.m. Address by Dr. Bimal Patel, President, CEPT University
Program Overview by Dr. Shalini Sinha, Sr. Asso.
Professor, Faculty of Planning, CEPT University

10:00 a.m. – 11:00 a.m. **Session 1: Implementation of Sustainable Transport Modes**

Dr. Rajesh Pandya
Deputy Municipal Commissioner (Retd.), Surat Municipal Corporation

THEME Instituting an Integrated Public Transport System - A Case of Surat city

Mr. Abhishek Ranjan Prasad
Senior Public Transport Specialist, Directorate of Urban Land Transport

Mr. Ramesh Gudarradi
General Manager (Civil), Hubballi Dharwad BRTS Company Ltd

THEME Hubli Dharwad BRTS - From a Highway to a Bus Priority Project

Dr. Amit Gupta
Chairman, Railway Recruitment Board-Ahmedabad

THEME Implementing a Metro System to Improve the City Commute: Perspectives from Ahmedabad Metro

11:00 a.m. – 11:15 a.m. **Q&A**

11:15 a.m. – 11:40 a.m. **TEA BREAK**

11:40 a.m. – 1:00 p.m. **Session 2: Improving City Bus Operations, Data Analytics and Management**

Mr. Pradeep Kumar G.P
Executive Director (Operations & Administration), Kerala State Road Transport Corporation, Trivandrum

THEME Trivandrum Route Rationalisation and ETRAM Monitoring

Mr. Vishal Khanama
General Manager, Ahmedabad Janmarg Limited

THEME Ahmedabad Electric Bus Operations -Experiences and Lessons

Mr. Sathyanarayanan. N
Managing Director, Central Parking Services

THEME Automated Parking Management in Bangalore

Mr. Vivek Ogra
Partner, Ernst & Young Private Limited

THEME Analysing Logistics Ecosystems in India- LEADS Framework

1:00 p.m. – 1:15 p.m. Q&A

1:15 p.m. - 2:30 p.m. LUNCH BREAK

2:30 p.m. – 3:30 p.m. Session 3: Safe, Inclusive and Green Transport

Ms. Mitali Nikore
Transport Specialist (ET Consultant), The World Bank

THEME Mainstreaming Gender Inclusive Urban Mobility and Public Spaces in India

Dr. Navdeep Asija
Director, Punjab Road Safety and Traffic Research Centre

THEME Road Safety Initiatives in Punjab

Mr. Sayan Roy
**Programme Manager (Clean Air and Sustainable Mobility),
Centre for Science and Environment**

THEME Graded Response Action Plan – Delhi

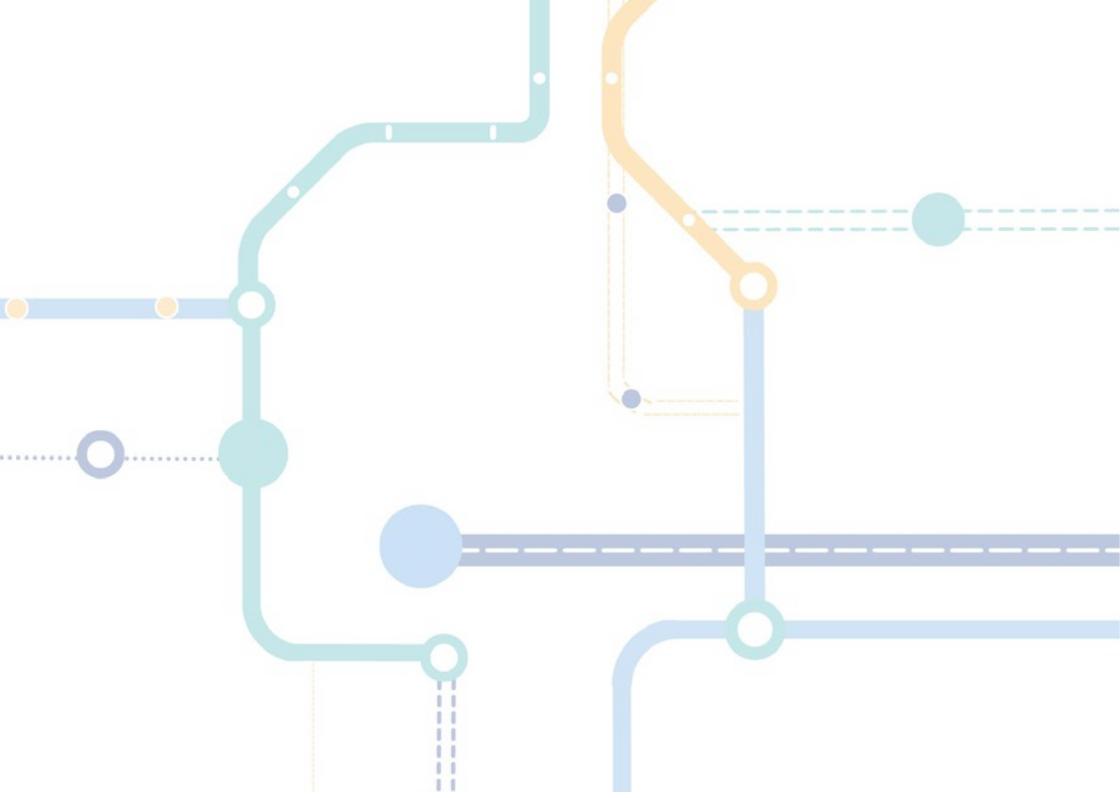
3:30 p.m. – 3:45 p.m. Q&A

3:45 p.m. – 4:15 pm TEA BREAK

4:15 p.m. – 5:15 p.m. Panel Discussion with all speakers on the podium:
**Moderators: Prof. H. M. Shivanand Swamy and
Dr Shalini Sinha**

5:15 p.m. – 5:30 p.m. Concluding Remarks by **Prof. H.M. Shivanand Swamy,
Professor Emeritus, CoE-UT, CRDF**

CEPT University Winter Exhibition Tour



Session 1: Implementation of Sustainable Transport Modes

Overview:

The first session of the conference focused on “Implementation of Sustainable Transport Modes” highlighting unique initiatives aimed at enhancing a city’s public transport operations. Presently, urban centers are rethinking their approach to transportation, moving away from extensive flyovers and road widening project while embracing sustainable public transportation solutions. Numerous cities are adopting mass rapid transit systems to address diverse challenges in urban mobility. In this session three speakers shared their unique experiences in implementing three different public transit systems - the City bus service, BRTS, and a metro, in three different Indian cities.



Dr. Rajesh Pandya
Deputy Municipal Commissioner (Retd.), Surat Municipal Corporation
Instituting an Integrated Public Transport System - A Case of Surat city

Mr. Abhishek Ranjan Prasad
Senior Public Transport Specialist, Directorate of Urban Land
Transport

Mr. Ramesh Gudarradi
General Manager (Civil), Hubballi Dharwad BRTS Company Ltd
Hubli Dharwad BRTS - From a Highway to a Bus Priority Project

Dr. Amit Gupta
Chairman, Railway Recruitment Board-Ahmedabad
Implementing a Metro System to Improve the City
Commute: Perspectives from Ahmedabad Metro

THEME: INSTITUTING AN INTEGRATED PUBLIC TRANSPORT SYSTEM - A CASE OF SURAT CITY



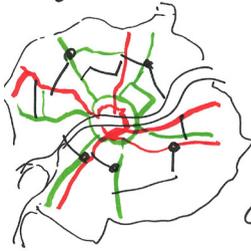
Dr Rajesh Pandya
Deputy Municipal Commissioner (Retd.)
Surat Municipal Corporation

Working with Surat Municipal Corporation since more than 33 years in different capacities, with special mention to tenure of 13 years as Town Planner and Town Development Officer. As the Deputy Municipal Commissioner, he headed the departments of Traffic, BRTS, and Public Parks & Gardens of the urban local body of the vibrant and dynamic city of Surat.

He has been a part of the team which has strategically planned and implemented BRT System in Surat. It is a successfully operating, longest BRT system in the country and a well-integrated public transport system. He also held the posts of General Manager of Surat Smart City Development Company and DREAM City Company as well. He was the Managing Director of the Sitilink Company and after retirement he was associated with SMC as an advisor for special projects.

As an Adjunct Professor at Sardar Vallabhbhai National Institute of Technology (SVNIT), he is actively associated with academics and research work in urban planning and urban mass transport area. He has published a number of research papers in national and international journals and has participated in various workshops and conferences in India and abroad.

City Profile.



> 95% Population Coverage.

HMC Network
BRTS Network
City-Bus Network.

RAJESH PANDYA

Deputy Municipal Commissioner

SURAT
MUNICIPAL CORPORATION

CMP 2046

Comprehensive Mobility Plan

Integrated with Development Plan.

71 km of METRO

196KM BRTS

899 KM BUS NETWORK.

FLYOVER CITY

avoiding this "not solving issues"

SAFE
ACCESSIBLE
RELIABLE
ADVANCE
LOW CARBON

Efficient & Effective

REAL TIME MONITORING
SPV **SITILINK**

ITS System

Integrated System

Institutional Integration.

Fare Integration

Physical Integration

Infrastructure Integration

SHARE THE INFRASTRU*

QR, M-ticket.

BRTS SMC

Payment, Pay-Integration, Travel card

PT system.



Instituting an Integrated Public Transport System - A Case of Surat city Dr. Rajesh Pandya

Despite its reputation as the “Flyover city,” Surat acknowledges that flyovers do not solve traffic issues but merely shift them in time and space. Surat’s transport system has undergone a significant transformation, evolving from a limited public transport options to a seamless integration of PT systems such as BRTS, city buses, and the High Mobility Corridor.

This journey began in 2007 with the inception of the city’s PT system, followed by the establishment of Sitalink, BRTS implementation, alignment of the Comprehensive Mobility Plan (CMP) with the Development Plan, planning of metro system, and adoption of various sustainable transport initiatives.

A **unique feature of Surat’s PT system** is its multi-level integration: institutionally through Sitalink; physically, - different networks complement one another; infrastructure-wise, -shared bus stops serving all bus-based PT systems. In addition, fare integration with a single ticket for multiple services enhances user experience and the Intelligent Transport System (ITS) allows dynamic bus rescheduling. Currently, this integrated system covers 95% of the population and features a rapid transit network spanning 0.33 km/sqkm - comparable to leading global cities like London and Tokyo.

The **continuous PT system performance assessment** for operations, ridership, and gathering user feedback are pivotal in continually enhancing the system’s efficiency and effectiveness in Surat. With upcoming developments like Multi Modal Transport Hub and High-Speed Rail (HSR) projects, the city is now planning to expand its PT infrastructure, integrate the bus-based PT system with the metro and HSR, electrify the fleet, and enhance the last mile connectivity through public bicycle sharing, Pink Autos and by developing safe pedestrian facilities.



Figure 1: Public Transportation system Surat

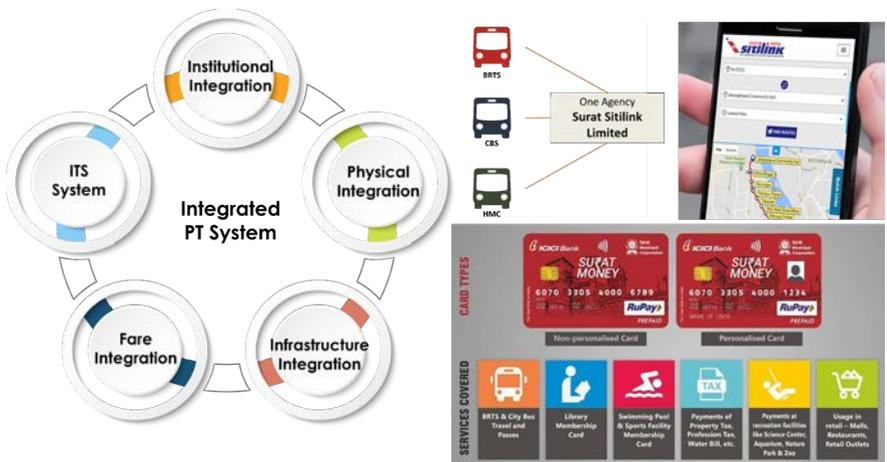


Figure 2: Illustration of PT integration in Surat, IT system and, single card for travel and shopping

THEME: HUBLI DHARWAD BRTS - FROM A HIGHWAY TO A BUS PRIORITY PROJECT



Abhishek Ranjan Prasad
Senior Public Transport Specialist
Directorate of Urban Land Transport

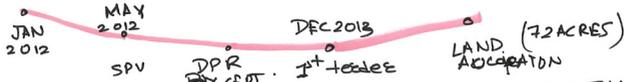
With a post-graduate degree in Transportation Engineering from BMS College of Engineering Bengaluru. He has about 14 years of experience in transport engineering, operations, and design. He currently holds position as the Senior Public Transport Specialist at the Directorate of Urban land Transport (DULT), Government of Karnataka.

During his long service at DULT, Mr. Abhishek has involved in planning and implementation of key public transport projects in Karnataka like Hubballi-Dharwad Bus Rapid Transit System, Bus Priority Lane at Kalaburagi, Comprehensive mobility plan etc. He has also worked on city bus service evaluation of several tier- II cities in Karnataka.

He has been involved in Hubballi-Dharwad Bus Rapid Transit System since the inception of the project report and has overseen aspects of design; land acquisition; construction of the corridor, bus stops, terminals, depots and operations.

Prior to joining DULT, he worked as a Transportation Engineer at SECON Pvt. Ltd and as Design Engineer at Geodesic Techniques Pvt Limited.

Hubballi-Dharwad BRTS

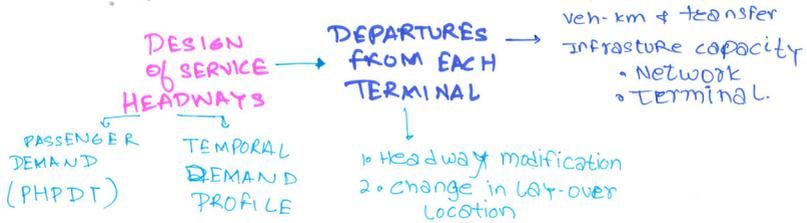


CHALLENGES

- * PRIVATE VEHICLE > BUSES

- * WHAT IS BRTS EXPERIENCING
- * HOW TO MAKE COMMUTER Retain
- ↳ Reduction in FARE

OPERATIONS PLAN & Infrastructure PLAN.



CITY SAMPARK. TOD DEV. UNDER TOZ. → DEVELOPMENT OF PT.

297 lakh
RIDERSHIP

6136 lakh
TOTAL REVE. NUC

6837 lakh
TOTAL COST.

THEME: HUBLI DHARWAD BRTS - FROM A HIGHWAY TO A BUS PRIORITY PROJECT



Ramesh Gudaraddi
General Manager (Civil)
Hubballi Dharwad BRTS Company Ltd

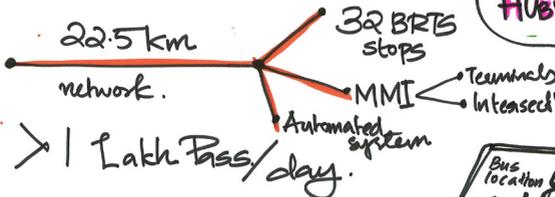
With a graduate degree in Civil Engineering from B.V. Bhoomaraddi College of Engineering and Technology Hubli, he has worked in the Public Work Department Government of Karnataka and retired as an Executive Engineer.

He had served 37.5 years in various departments like Irrigation, Public Works Department, National Highway. He executed highway works under World Bank aided in Karnataka State Highway Improvement Project and Karnataka Road Development Corporation Ltd. He is closely associated with Hubli Dharwad BRTS Project (HDBRTS) for a period of 5 years and executed works like Mixed Traffic Lane & BRTS road works, Road Over Bridge, Grade Separator etc.

Presently he is working as General Manager (Civil) HDBRTS Co Ltd, Hubballi.

CHIGARI SAMPARKA

GOVT. OF KARNATAKA



RAMESH GUDARADDI

AND

ABHISHEK RANJAN PRASAD

HUBBALLI-Dhanwad BRTS

- accessible
- safe
- Inclusive
- comfortable.
- Equitable.

IT IS NOT ABOUT MOVING VEHICLES BUT FOR MOVING PEOPLE

Bus location

Real-time monitoring

Payment

Ticketing System.

WHY BUS?

Corridor ridership → 1.7 Lakh

→ 70% Passengers intercity commuters

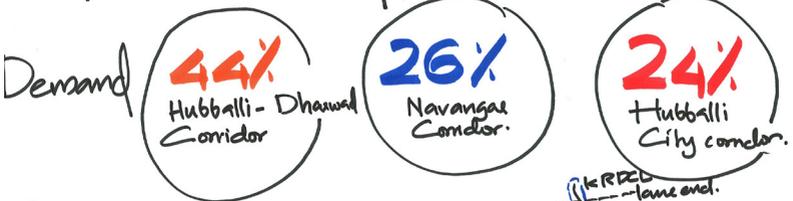
→ 19-23 km/h

Passenger Demand PHPDT

Temporal demand

SERVICE & INFRASTRU.

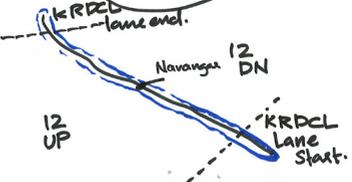
Design of Services → Departure from each terminal



Target ridership → 1.25 Lakh

Daily ridership → 85,000+

Daily revenue → ₹ 8.00 Lakhs +





Hubli Dharwad BRTS - From a Highway to a Bus Priority Project Mr. Abhishek Ranjan Prasad and Mr. Ramesh Gudaraddi

Hubli- Dharwad BRTS is a unique project depicting transformation of a road widening highway project into a bus priority project, incorporating urban transformation initiatives. This comprehensive approach includes development of BRTS corridor, infrastructure design, along with complete street and junction improvement.

Challenges during BRTS implementation: The project encountered several challenges, including acquiring support from the public and political representatives, complexities in land acquisition and fixing of the compensation rate, court cases, coordination hurdles with stakeholders, regular transfer of the officials, commuter retention, operational challenges, and maintenance of existing infrastructure.

Affordable fare structure and reduced travel time to sustain high passenger demand: The fare structure of the BRTS was aligned with that of normal buses. This strategic decision helped in attracting passengers from competing modes to a high-quality service. In addition, the 22 km BRTS corridor has significantly reduced travel time from 50 minutes on mixed corridor bus services to 35 minutes. The system achieved a daily ridership of approximately 85,000 passengers, generating a daily revenue of around 8 lakhs INR.

Urban transformation initiatives to improve the attractiveness of BRTS: The project included various initiatives such as maintaining existing buses for feeder service, introducing a pram sharing system, development under flyover spaces, establishing lactation centres in terminals, and adopting TOD at central plaza, all of which helped in improving the travel experience for the commuters.



Figure 3: BRTS corridor

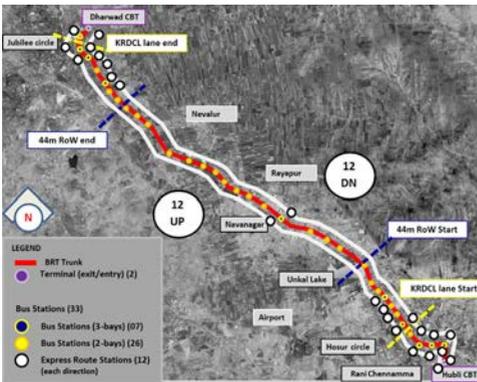


Figure 4: BRTS service plan and feeder service plan



Figure 5: Urban Transformation initiatives

THEME: IMPLEMENTING A METRO SYSTEM TO IMPROVE THE CITY COMMUTE: PERSPECTIVES FROM AHMEDABAD METRO



Dr Amit Gupta
Chairman
Railway Recruitment Board - Ahmedabad

He belongs to the Indian Railway Service of Mechanical Engineers (IRSME) and he had joined the Railways in 1991 after completing course of Special Class Railway Apprenticeship and has a rich experience of working in Train Operations, Diesel Locomotive Maintenance, Coaching Stock Maintenance, Spring Manufacturing and implementation of projects like setting up of maintenance workshops, mechanised laundries, modernization of maintenance workshops, contract management and M & P procurement.

He holds Masters in Business Administration from Management Development Institute and was the winner of the Prime Minister's Gold Medal for topping the programme. Recently, he also completed his PhD in Transport Economics on Metro Rail policy.

He has served in several zonal railways like Eastern, Central, North Central, North Western, Western, Railway Board & as Divisional Railway Manager, Vadodara. While his deputation to Gujarat Metro Rail Corporation (GMRC), he was appointed as Chief General Manager, Corporate Planning, GMRC, where he was closely involved in the commissioning of one metro rail line and the sanction of Ahmedabad Metro Project Phase II & the Surat Metro Project. He has extensive experience in land acquisition & resettlement and rehabilitation of project affected families and has dealt with several multilateral development banks for financing of metro projects.

AMIT GUPTA

Metro Ahmedabadi

AHMEDABAD METRO

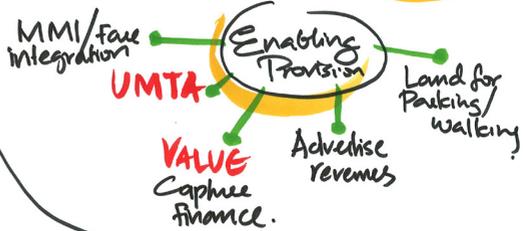
PROJECT DESIGN



Public Transport share in AHMEDABAD Then & Now

17% 2013

10% 2023



SUGGESTIONS!



01 Clear vision and Policies for making Public transport attractive

02 Captive ownership through TOD

03 Use Green Energy

04 One Agency for all transportation

08 Demand side management

07 Affordable fares through subsidy

06 Value Capture finance through develop. rights.

05 MMI

? FUNDING SKILLS

2



Implementing a Metro System to Improve the City Commute: Perspectives from Ahmedabad Metro Dr. Amit Gupta

The planning for the metro system began as early as 2003, but due to funding challenges, the project could not proceed. Meanwhile the Bus based Rapid Transit System (BRTS) was chosen, with future complementary planning for the metro network. Subsequently, over the next seven to eight years, new alignments were considered for the metro, leading to project approval and the commencement of construction in 2015. The key learnings from the project implementation are-

Optimal use of railway corridors: Utilising area along existing railway corridors for 8.5 km of the metro network minimised the need for acquiring private land, reducing legal complications and court cases related to land acquisition.

Consideration of heritage areas in metro network planning: Adherence to the Heritage Conservation and Preservation Act 2010 led to a shift from initially planned elevated metro construction to an underground approach in the old city area. Although more costly, this decision preserved the heritage sites and contributed to Ahmedabad earning the Heritage City tag in 2018.

Addressing contract challenges: The project faced significant hurdles due to contractor failures. Instead of engaging in time-consuming and potentially costly processes of re-contracting, the project team implemented an ESCROW account system and engaged multiple subcontractors. This ensured direct funding to the locally based project unit and suppliers, facilitating timely financial support.

Direct engagement with project-affected families: Significant delays caused by legal proceedings on disputes surrounding land acquisition were mitigated through direct negotiation with affected families.

Affordable fare structure for enhanced ridership: Ahmedabad's comparatively lower fares (₹5 for 2.5km) helped to attract an impressive daily ridership of approximately 85,000 passengers. This surpassed ridership figures in cities like Jaipur (₹6 for 2.4 km) and Lucknow (₹10 for 2.4 km), which recorded 55,000 and 75,000 respectively.



Figure 6: Utilising railway land for laying down metro network.

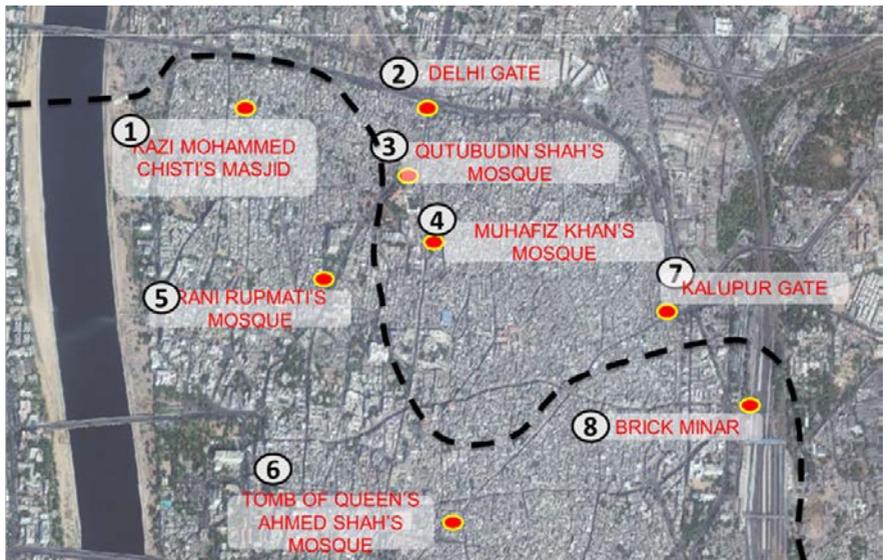
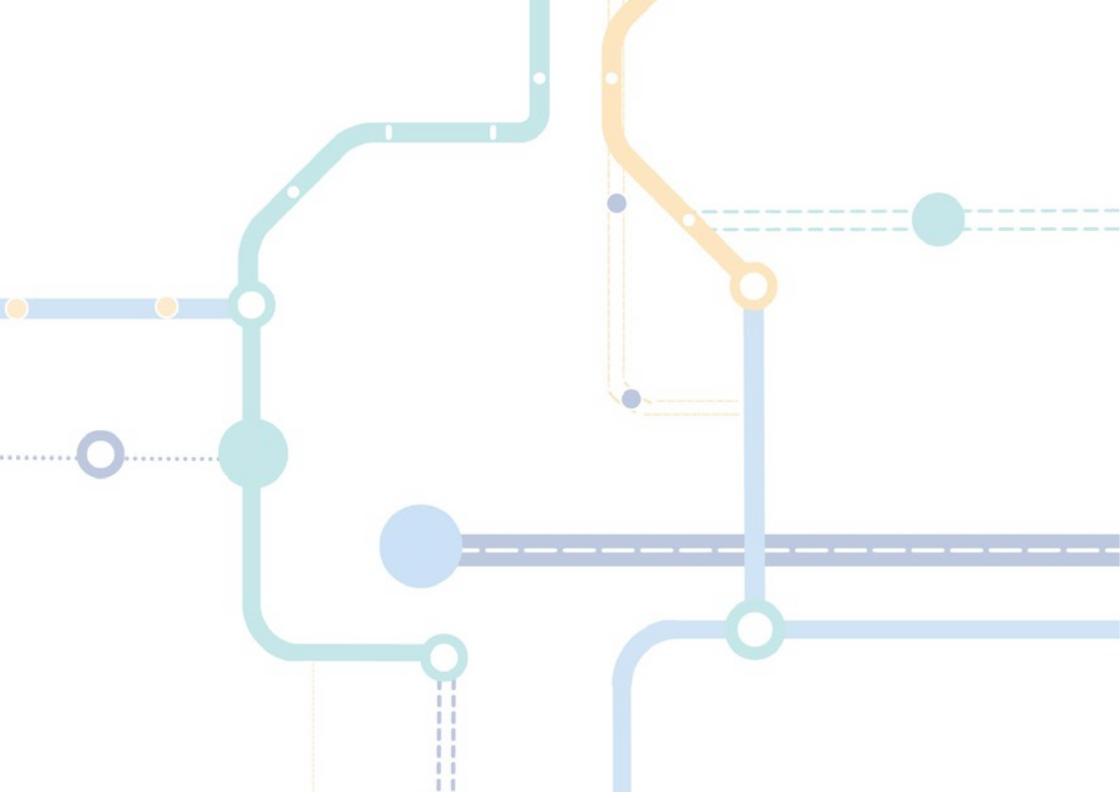


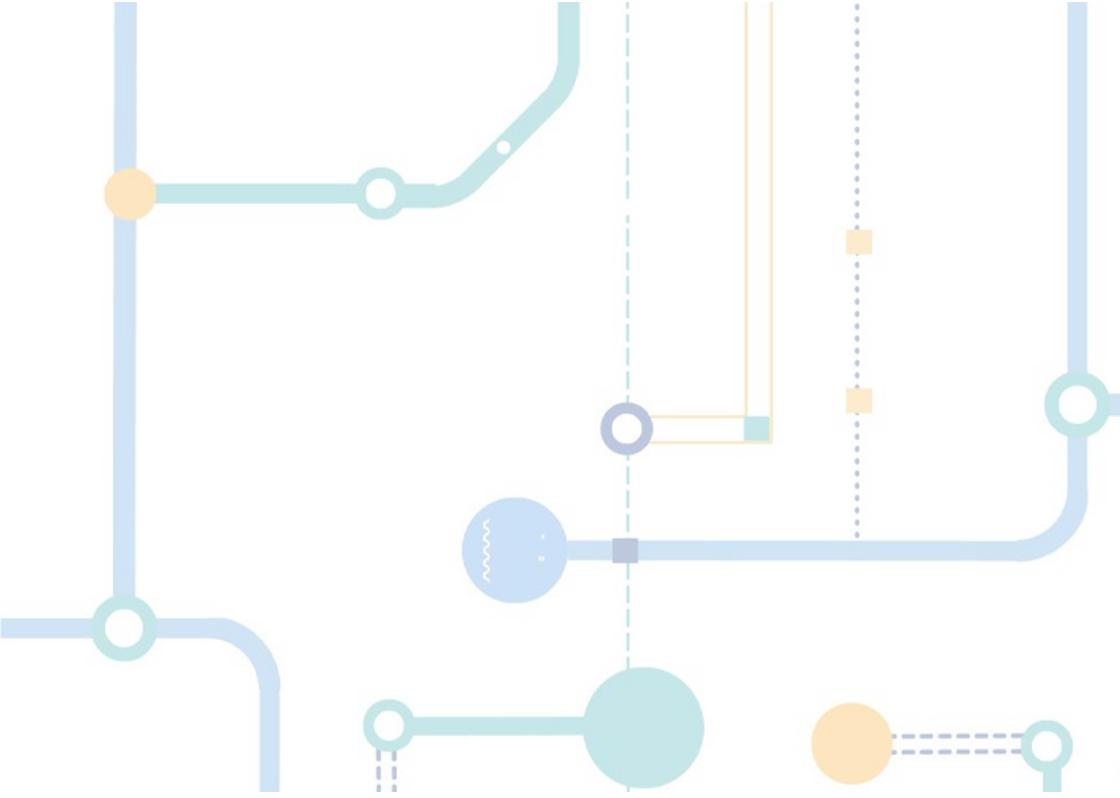
Figure 7: Heritage sites along metro alignment



Session 2: Improving City Bus Operations, Data Analytics and Management

Overview:

Cities are at the forefront of adopting innovative approaches to navigate the complexity of urban transport. With the emerging technologies, transport planners are exploring inventive solutions to optimise the efficiency of the mobility system. The second session covered unique initiatives undertaken in "Improving City Bus Operations, Data Analytics and Management", highlighting their pivotal role in developing data-driven solutions for the city's evolving need. In this session four speakers shared their experience about working in such unique projects.



Mr. Pradeep Kumar G.P
Executive Director (Operations & Administration), Kerala
State Road Transport Corporation, Trivandrum
Trivandrum Route Rationalisation and ETRAM Monitoring

Mr. Vishal Khanama
General Manager, Ahmedabad Janmarg Limited
Ahmedabad Electric Bus Operations -Experiences and
Lessons

Mr. Sathyanarayanan. N
Managing Director, Central Parking Services
Automated Parking Management in Bangalore

Mr. Vivek Ogra
Partner, Ernst & Young Private Limited

THEME: TRIVANDRUM ROUTE RATIONALISATION AND ETRAM MONITORING

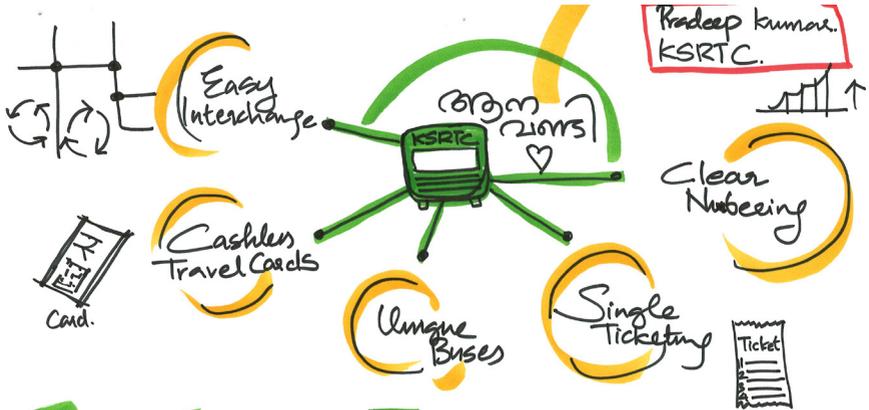


Pradeep Kumar G. P.
**Executive Director (Operations &
Administration)**
**Kerala State Road Transport Corporation
(KSRTC)**

He boasts an impressive 28 years of experience in various pivotal roles within the State Transport Undertaking (STU). He is a highly accomplished professional with a multifaceted background. He has pursued a comprehensive academic journey, MBA in HR & Finance from the University of Kerala (IMK Trivandrum), a B Tech. in Mechanical Engineering from the Government Engineering College in Thrissur, Kerala, and a Diploma in Automobile Engineering.

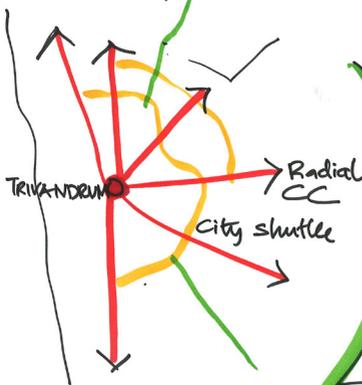
His professional journey started with the Border Roads Organization (GREF) in 1994, serving in challenging locations such as Pune and Arunachal Pradesh (Tawang) and he gained valuable experience in diverse terrains. At KSRTC, he is overseeing operations, maintenance, commercial activities, and administrative functions.

In addition to his academic and professional achievements, he completed a Diploma in Automobile Engineering and participated in the 1st Leaders Program (1 year) conducted by the Ministry of Urban Development (MoUD), World Bank, and CEPT University during 2012-13. The international exposure of Singapore and South Korea as part of a leadership program and the UITP conference in Switzerland and Austria, has further enriching his understanding of global public transport practices.



DATA ANALYSIS → ETRAM TOOL

1.1 Planned transport routes.



- ✓ Telescopic fare
- Overall summary
 - Ridership → Gender Based
 - Revenue Buildup
 - Route Optimizations
 - Load factor calculations
 - Avg. trip length.
 - Temporal Distribution (30min interval).
 - BA stops & OD demands



OUTCOME

- Diesel → Electric
- from loss → profit 2022-23.
- ₹.35/km.



Trivandrum Route Rationalisation and ETRAM Monitoring Mr. Pradeep Kumar G.P

The route rationalization project in Trivandrum aimed to address the challenges faced by the city bus services in Trivandrum city. The challenges include centralised and overlapping routes, regional bus route serving urban demand, low frequency, supply and demand mismatch, bus bunching, etc.

The proposed route rationalisation strategy includes segregation of urban routes and regional routes, consolidation of overlapping routes based on demand analysis, and ensuring high frequency in smaller urban nodes.

A data analysis tool (E-TRAM) was developed and used for route modification and daily monitoring of operations. Trivandrum city bus service has observed significant improvements in ridership, revenue, and a reduction in pollution levels after the route modifications.

Segregation and classification of city bus service: Segregating city bus services from regional bus services is important as the nature of urban demand is different. With the classification of city bus services into shuttle, circular and radial has aided Trivandrum public transport to have better connectivity, more predictability and reduction in waiting time which eventually improved the ridership to 80,000 passengers per day.

Planned and structured public transport is operationally viable and financially sustainable: The route rationalisation in Trivandrum demonstrates a journey of a service that was in loss with operational inefficiency to a profitable public transport services in a city.

Strategies to make the intra city bus journeys more attractive: it is important to implement strategies like clear route number, single ticketing, unique buses, cashless cards, installation of route map and transit signages and easy interchanges.

Data analysis tools to improve operational efficiency: Using a simple Power BI tool, operators can monitor service quality and make data-driven decisions to reschedule services, thereby improving operating efficiency.

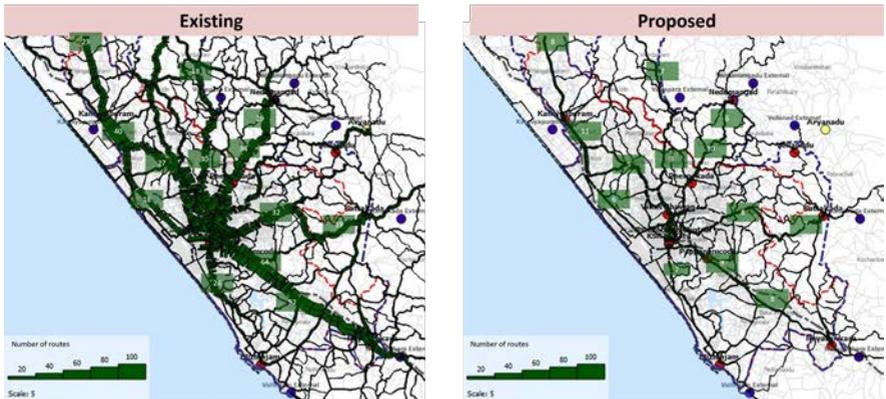


Figure 8: Number of routes before and after route rationalisation



Figure 9: City Circular (CC), City Shuttle (CS), City Radial (CR) buses with unique colour and Transit Signages

THEME: AHMEDABAD ELECTRIC BUS OPERATIONS -EXPERIENCES AND LESSONS

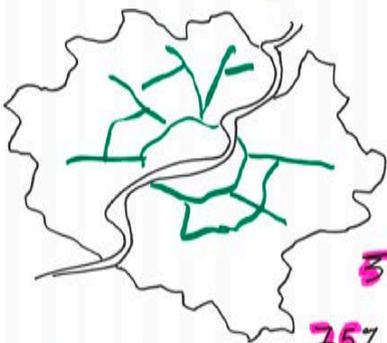


Vishal Khanama
General Manager
Ahmedabad Janmarg Limited

In-Charge Deputy Municipal Commissioner in Ahmedabad Municipal Corporation and currently posted in North Zone of Ahmedabad city and also holding additional charge of General Manager of Ahmedabad Bus Rapid Transit System (BRTS).

He joined Ahmedabad Municipal Corporation in 2009 and in his 15 year career span, he held various assignments and projects related to providing basic services like water, drainage, sanitation, road developments, town planning road opening and other infrastructure projects. He anchored the designing and roll-out of the housing possession to economic weaker section people.

He is committed to provide a clean, comfortable and pollution free public transportation for the citizens.



96% developed area cover

93% population coverage

53% population coverage

30% BWS Housing

P = 56 lakh (2011) to 90 lakh (2021) ↑

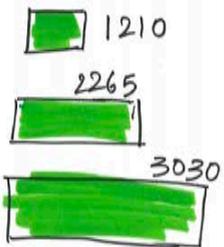
No. of Buses 1314 (2011) to 1045 (2015) ↓

75% slum locations High Frequency.

ELECTRIFICATION OF BUSES AS A MEANS TO IMPROVE PUBLIC TRANSPORT.

30%

PT SHARE IDEAL
Fleet/req. 3020**
~~30 BUSES PER LAKH.~~

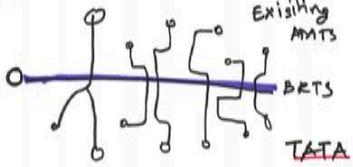


LEARNINGS CO₂ ↓
GHG Emissions reduction

An Integral Component of PT Strategy 2031

↳ BUSES ECONOMICALLY VIABLE

01 ABC

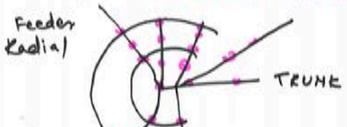


For Users

ASHOK
LEHMAN

- SEAMLESS EXPERIENCES
- HIGH FREQUENCY OF BRTS
- HIGH COVERAGE
- LOW INFLUENT SETTLEMENT

02. Radial Route.



For Transit Agencies.

- Creates opportunity.
- Improving ridership.



Ahmedabad Electric Bus Operations -Experiences and Lessons Mr. Vishal Khanama

Ahmedabad is the first city in India to deploy electric buses for urban services. The journey of introduction of E – buses as a mechanism to improve public bus transport operations started in 2018. There was a need for PT electrification strategy at city level due to the slow uptake of electric vehicles in India, absence of strategic plans for accelerating EV adoption at local level, lack of awareness, procurement challenges, financial barriers, technological barriers, and infrastructural augmentation challenges. The project provides a roadmap to the fleet enhancement targets and strategies for 2031. The PT strategy 2031 looks at improved fleet size along with improved service quality such as accessibility, waiting time, quality of services, comfort would improve the attractiveness of services. The focus of AJL is on improving the quality and comfort of the service using E buses.

Impact of electrification: Electrification alone, without fleet enhancement, does not have a significant impact on GHG emissions reduction. An improved fleet size, complemented with enhanced service quality, including accessibility, waiting time, quality of services, comfort would help attract more ridership. E-Buses are more economically viable in future.

Strategies to enhance PT services: Integration of city bus services, route rationalization and improved last mile connectivity are important to enhance public transport services.

Optimizing operational efficiency: Depot location planning is essential to bring operational efficiency. Additionally, implementing terminal-based opportunity charging and interoperability of chargers can improve schedule flexibility, minimize dead kilometers, and increase revenue kilometers. Deploying a fleet with mixed battery size with careful planning can reduce the overall cost.

Energy efficiency and routes: operators should identify energy efficient routes for piloting E buses. Regular driver training is important to improving the energy efficiency of operations.

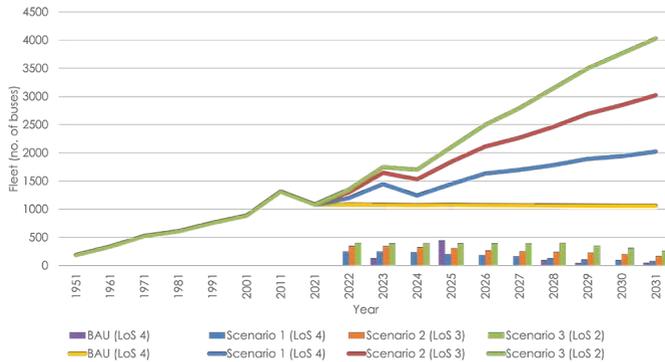


Figure 10: Fleet Procurement Trajectory & Phasing



Figure 11: E-buses in BRTS corridors of Ahmedabad

Four different types of E-Buses are in operations.

| | 2018 | 2019 | 2021 | 2022 |
|-----------------------------------|---|---------|---------|---------|
| E-bus type | 64 kWh | 120 kWh | 347 kWh | 196 kWh |
| Fleet size | | 18 | 33 | 90 |
| Weight (tons) | Discontinued in 2019 and replaced with 120kWh plug-in buses | 12 | 17 | 10 |
| Energy efficiency (kWh/km) | | 1.1 | 1.4 | 0.9 |
| Range (km) | | 90 | 245 | 215 |
| Range (km) At 20% SOC | | 75 | 185 | 160 |

Varying battery sizes and range
Depot based charging – Overnight + Opportunity
Deployment on BRTS routes on a Gross Cost Contract

Figure 12: E-buses in BRTS corridors of Ahmedabad

THEME: AUTOMATED PARKING MANAGEMENT IN BANGALORE



Sathyanarayanan. N
Managing Director
Central Parking Services, Banaglore

Sathyanarayanan is a first-generation entrepreneur who started Central Parking Services (CPS) in the year 2005 to support the evolving parking requirements of India's booming retail segment.

A Graduate in Electrical & Electronics Engineering from Coimbatore Institute of Technology, Chennai.

He has gone on to further enhance his skills by undergoing a specialized training in Traffic & Parking Management from Institute of Parking Management, USA.

He has over 32 years of professional experience in building services & infrastructure facilities, was employed with M/s. Voltas & Honeywell prior to founding of Building Control Solutions, a firm that was set up to design and build smart homes in 1996.

It was at that point when the country was being swept by the retail revolution, that he discovered the potential of a lesser-known industry of parking management and established CPS. Since then, he wisely combined his ardor for technology with the parking industry to offer intelligent solutions that have refined India's parking scenario.



Satya narayanan
CPS Mobility Service.

ENTER PARKING
BAY NO.

104

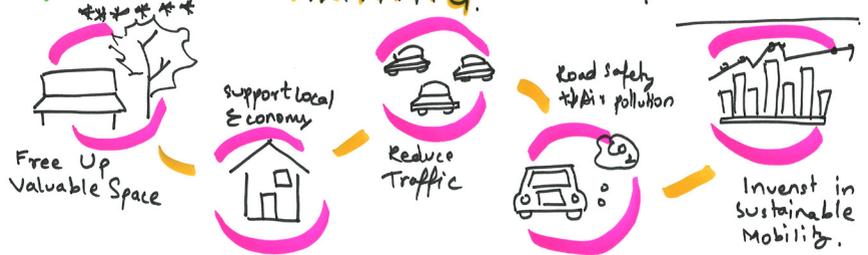


SMART

1st
 Pioneered India's
 Organised Parking
 Industry.
 30 Cities in 13 states.

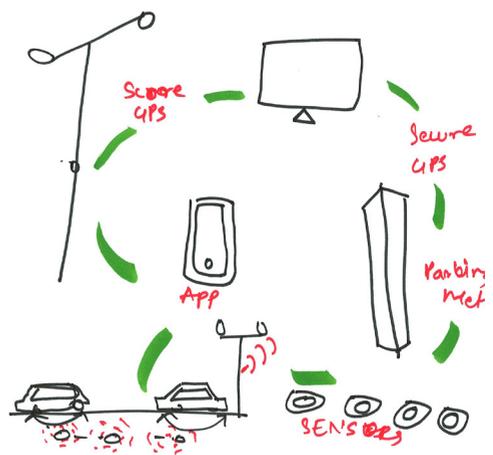
Select Parking How
 1 ↓

ENTER MOBILITY
PARKING.



SYSTEMS

1. On Street parking with parking meter
2. off Street parking management system
3. Intelligent parking guidance
4. Smart Enforcement system
5. parking App
6. Central control & command center





Automated parking management in Bangalore – (CPS mobility services) Mr. Sathyanarayanan. N

The parking policy 2.0 prepared by DULT for Bengaluru city adopted by Bruhat Bengaluru Mahanagara Palike (BBMP) in 2020 aimed to address the chaotic parking scenario in Bengaluru. One of the major objectives of the policy is to organize the parking arrangements and implement a paid parking system. In adherence to the policy, Area Parking Plans have been devised for the 8 zones, encompassing all the arterial and sub-arterial roads in these zones.

As a pioneering initiative aligned with this policy, a smart parking system by CPS was implemented in a few areas in Bengaluru for better parking management and enforcement. This technological solution can not only facilitate efficient parking but also free up public spaces, support local economy, reduce vehicle traffic, congestion, and time, and consequently generate revenue for the ULB to invest in sustainable mobility and urban improvements. The roadmap for effective implementation of such system includes various steps namely, formulation of parking policy, parking tariff optimization, coordination with traffic department, grid identification for pilot, citizen outreach, and correction of road infrastructure.

The smart parking system offers on-street and off-street parking management systems. It has space sensors connected to the parking meters, a parking guidance system, and Namma Bengaluru Smart Parking app with end-to-end integration. Using the app, commuters can find free parking spaces and pay using UPI, credit, or debit cards. Encouraging digital payments has ensured preservation of integrity of revenue by better revenue management with minimized pilferages.

Real time signages and static signages about the availability of parking slots are provided along the roads. The system reduces the driving time that people spend to locate free parking space. The roads are manned by enforcement marshals to prevent illegal parking and assist drivers in navigating the system. When payment expires, the enforcement officer is automatically directed to issue an infringement notice.



Figure 13: Smart parking systems



Figure 14: Enforcement pictures, Figure 16: Namma Bengaluru Smart Parking Launch



Figure 15: Signages

THEME: ANALYSING LOGISTICS ECOSYSTEMS IN INDIA - LEADS FRAMEWORK



Vivek Ogra
Partner
Ernst & Young

A transportation and mobility systems expert with over 25 years of experience, specialising in the areas of transport systems, smart city design, e-governance, disaster management systems, transit management systems, and so on. He has worked on a number of international projects as a technology specialist. His recent consulting assignments have been with several governments in the Middle East, Africa and India to develop a system for Bus Rapid Transit System. He has led some of the flagship transformation programmes globally involving emerging technologies, project management, test environment validation, and developing standard operating procedures for transport management and roll-out strategies.

Recently, he has been working in areas of strategies and frameworks for AI in transport to achieve efficiency, safety and resilience, specialising in innovation-based transport systems, product design and architecture.

Vivek Ojra
Partner
Ernst & Young

LEADS 2023

PERFORMANCE ASSESSMENT OF LOGISTICS ECOSYSTEM OF STATES

1. Indigenous Benchmark.



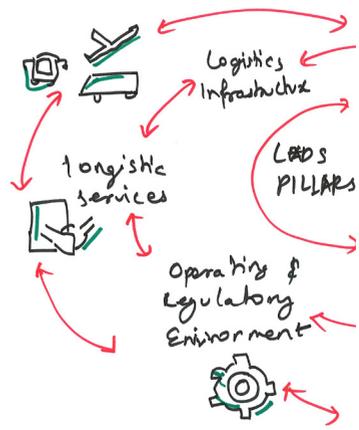
2. Perception Data.

3. Annually published



4. Improve overall logistics ecosystem

5. Private stakeholders
Govt. Stakeholders.



Objective Ques. state/UT (8)

Perceptive Indicators Private Sector (Survey based) (17)

Objective Assessment State / Central Ministers (20)

LEADS 2023 INDEX

Business Reforms Action Plan (BRAP) DPIIT (1)

GROUPS

Coastal

Hinterland / Landlocked

North - Eastern

Union Territories



PERFORMANCE CATEGORIES

Achievers

Fast Movers

Aspirers

PUBLIC BUSES - INNOVATE SPACE TO BECOME A DELIVERY PARTNER.



Analyzing the Logistics Ecosystem in India – LEADS Framework Mr. Vivek Ogra

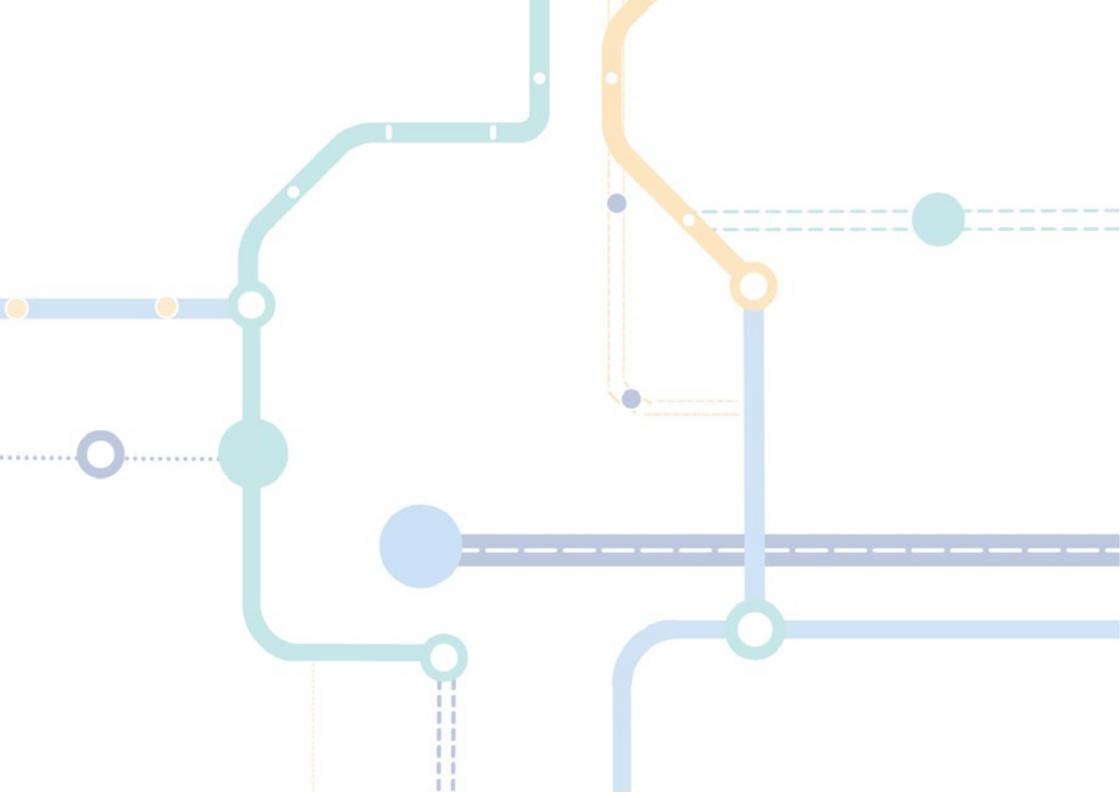
Logistics plays a crucial role in a country's transformation, directly impacting its economic vitality. National initiatives like 'Atmanirbhar Bharat' and 'PM Gati Shakti' focus on streamlining logistics for economic growth. The Logistics Ease Across Different States (LEADS) framework, initiated in 2018 by Ministry of Commerce and Industry, recently launched its 5th edition in December 2023, serves as a benchmarking tool. It enables comparative evaluations of states and union territories, fostering competitive federalism.

Efficient logistics is not about one state versus another; it's about collaborative efforts among states to ensure an efficient end-to-end journey. The LEADS framework aims to leverage each state's strengths to enhance overall logistics efficiency. This data-driven index assesses logistics efficiency using both private stakeholder perception data and government objective data.

Private stakeholders' perception data comprises ratings on logistics infrastructure, services, and operating and regulatory environments, while government objective data includes state initiatives for logistics enhancement, available infrastructure and services, and Business Reforms Action Plan (BRAP) data.

States and union territories are categorised into Coastal, Landlocked, North-Eastern, and UT groups. Performance assessments within each group determine tags such as achievers, fast movers, and aspirers. The assessment, carried out annually, involves revising framework indicators every year.

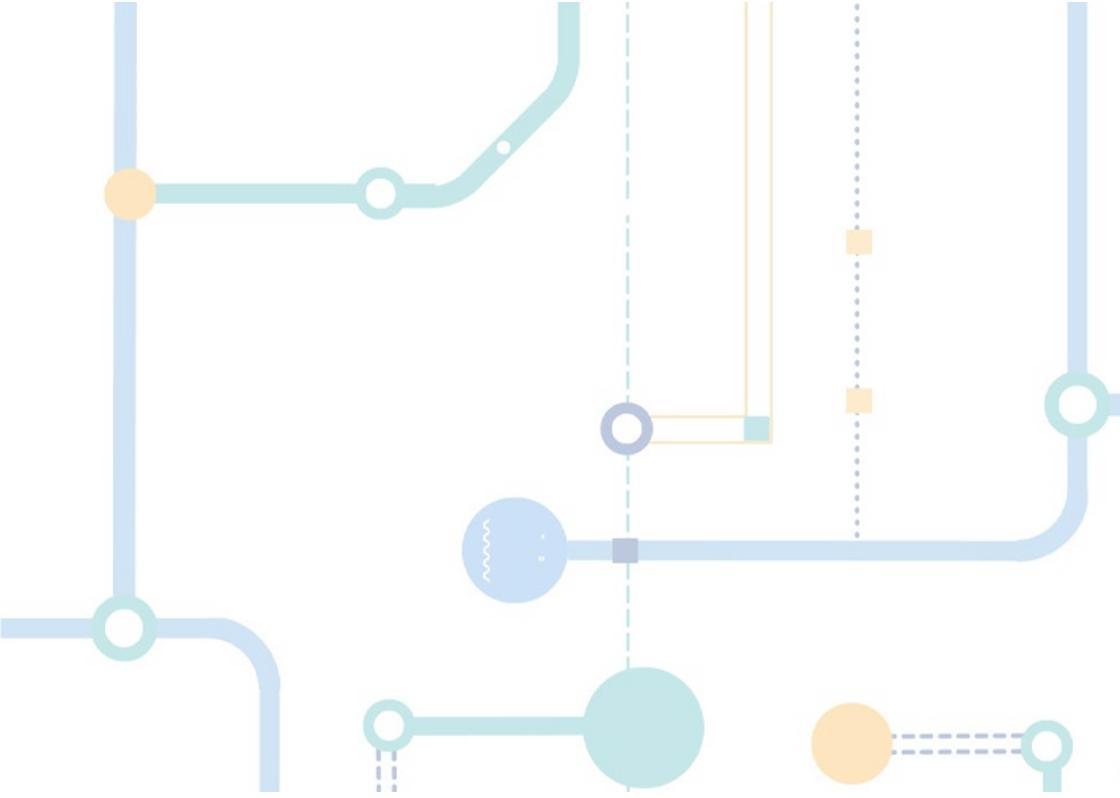
The LEADS framework ranks the states on the score of their logistics services and efficiency that are indicative of economic growth. It empowers the governments of each state and UTs with region specific insights for informed decision making to enhance the logistics performance.



Session 3: Safe, Inclusive and Green Transport

Overview:

Initiatives promoting gender inclusivity, road safety, and air pollution control underscore the need for a holistic approach to urban mobility challenges. The third session, titled “Safe Inclusive and Green transport” emphasized the significance of such initiatives in ensuring that all individuals, regardless of their background or abilities, can access and use transportation services without fear or discrimination, thereby promoting equity and social well-being. The three speakers shared their success stories from the impactful projects they have been involved in, contributing significantly to the positive transformation of the transport sector.



Ms. Mitali Nikore
Transport Specialist (ET Consultant), The World Bank

Mainstreaming Gender Inclusive Urban Mobility and Public Spaces in India

Dr. Navdeep Asija
Director, Punjab Road Safety and Traffic Research Centre

Road Safety Initiatives in Punjab

Mr. Sayan Roy
Programme Manager (Clean Air and Sustainable Mobility), Centre for Science and Environment

Graded Response Action Plan – Delhi

THEME: MAINSTREAMING GENDER INCLUSIVE URBAN MOBILITY AND PUBLIC SPACES IN INDIA



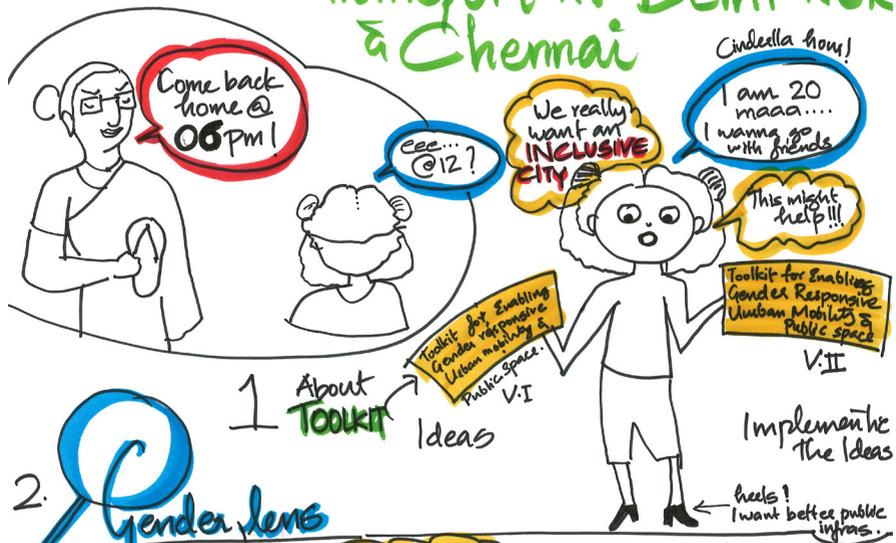
Mitali Nikore
Transport Specialist (ET Consultant)
The World Bank

A pioneering economist with more than 12 years of experience in gender mainstreaming, development finance, and policy advisory. She advises leading international organisations such as the World Bank, GIZ, UN Women, and also the founder of the think tank, Nikore Associates. Her experience spans several countries in Africa and South Asia, as well as the United States and the United Kingdom. She is the lead author of the World Bank's flagship publication, a toolkit on enhancing gender responsive urban mobility and public spaces in India. She has been working in several cities, most notably Chennai and Delhi to create more gender responsive urban mobility ecosystems.

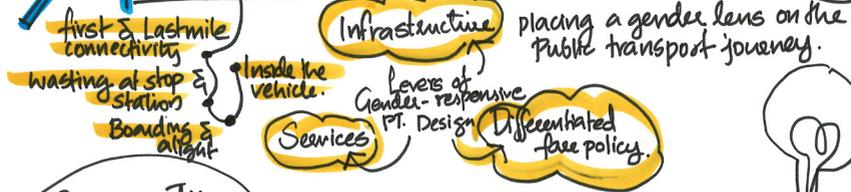
In recognition of her work, she was felicitated with the India UK Achievers Honours, selected amongst 75 Indian women in STEAM by the Government of India and named one of the 22For2022 industry leaders by Forbes magazine. She has been a TEDx speaker and named among the LinkedIn Top Voices for Gender Equality. She is also a widely published researcher and writer with the Times of India, Hindustan Times, and Indian Express. She has provided her expertise on multiple news segments, including BBC News, NDTV, ET Now, DW News and NewsX. She holds a Master of Economics from the London School of Economics and Political Science and a Bachelor of Economics from the University of Delhi.

PLACING A GENDER LENS ON
URBAN & MOBILITY & PUBLIC
SPACES IN INDIA

Gender in mainstreaming Urban Transport in Delhi-NCR & Chennai



2. Gender lens



Programmatic approach to identify key projects.

3. FOUR PILLAR FRAMEWORK

- 1 Access the Ground situation
- 2 Strengthen Planning & Policies
- 3 Build capacity & raise awareness
- 4 Improve Infrastructure Services.





Placing a Gender Lens on Urban Mobility and Public Spaces in India Ms. Mitali Nikore

Lack of safety deters women's mobility, limiting their access to education and employment opportunities. Men and women have different mobility patterns. Women travel shorter distances, with dependents, using PT and NMT as the main modes, during off-peak hours, and prioritise safety and convenience. While men tend to travel solo, cover longer distances, during peak hours, and use personal transport. Providing gender-sensitive public transport is crucial to ensure the safety of citizens whenever they step out of their homes.

Tailoring PT systems to address safety concerns involves strategies like a differentiated fare policy for increasing women ridership, infrastructure enhancements like more lighting and visibility, and additional services like last mile connectivity service. Some of the prevailing initiatives with a gender lens in India include-

Gender lens in policy: Approaches such as reducing the bus driver height requirement from 5'9" to 5'2" in Delhi, resulted in a notable increase in women applicants and led to a rise in the number of women drivers.

Frontline workers ensuring safety: Initiatives like deploying marshals within Delhi's public transport system have proven effective in addressing issues such as harassment or discomfort faced by commuters on the spot.

Service measures for women's safety: Hyderabad's initiative of the request bus stop service after 7 pm allows women to request bus stops at midpoints, enhancing last-mile connectivity. This provides women with increased safety and flexibility in transportation.

Gender and Policy Lab: Chennai's Gender and Policy Lab actively implements solutions for women's mobility challenges, conducts capacity-building programmes, and participatory events safety audits, and night walks to reclaim the city at night.

Moreover, the World Bank has launched a 'Toolkit on Enabling Gender Responsive Urban Mobility and Public Spaces, India,' with the aim of suggesting ways to make PT in Indian cities more inclusive of women's travelling requirements.

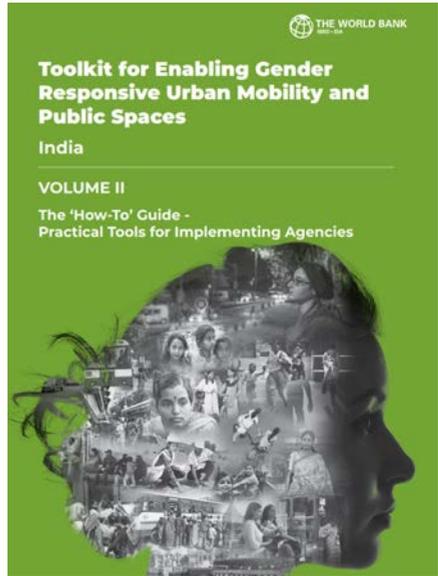
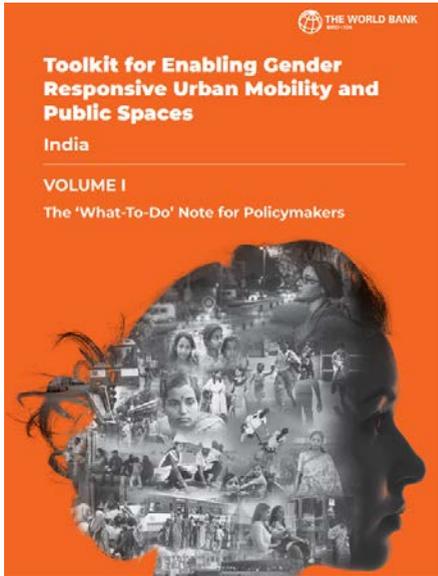


Figure 19: Toolkit for gender mainstreaming



Figure 20: Assessing the ground situation and building capacity and raising awareness.



Figure 21: Gender toolkit in action by the Chennai Gender and Policy Lab

THEME: ROAD SAFETY INITIATIVES IN PUNJAB



Dr Navdeep Asija
Director
Punjab Road Safety and
Traffic Research Centre

An esteemed civil engineer, a renowned road safety expert, and a dedicated social activist who hails from Fazilka, Punjab, India. Holding a PhD in road safety from the prestigious Indian Institute of Technology Delhi, he currently serves as the Traffic Advisor to the Government of Punjab and he is the Director of the Punjab Road Safety and Traffic Research Centre. He has been a pioneer in advocating for the car-free movement and the promotion of non-motorised transport in Punjab.

Notably, he played a pivotal role in establishing India's very first car-free zone and champions the "right to walk" as an integral aspect of the "right to life" under Article 21 of the Indian Constitution. He is the visionary behind the innovative dial-a-cycle rickshaw concept known as Ecocabs, which received national acclaim and earned him the prestigious National Award of Excellence in 2011 from the Ministry of Urban Development, Government of India.

His exemplary work has made a profound impact in the field of road safety and sustainable transportation, earning him numerous awards and recognitions, including the Best Citizen Award and the Volvo Sustainable Mobility Award, among others. His unwavering dedication to creating safer and more sustainable roadways has rightfully earned him a place among the 30 Extraordinary Indians making a difference in India.

Road Safety Initiatives in Punjab

Navdeep Asija
Director
Punjab Road Safety & Traffic Research Centre.

Challenge in Road Safety



Lack of Institutional framework.



Lack of Coordination



Institutional Memory.

Institution Based Pragmatic Solution.



Skilled workforce



Infrastructure deficiency & Regulatory framework

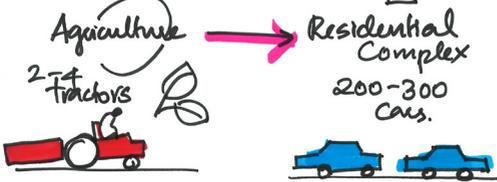
Political will & Backend reform.



1st TRAFFIC POLICE TASK FORCE

Decentralization of Data & Decision making

Change in Land Use. → more traffic police/control



D2D

Data to Decision



Children Chalk Book

20% helmet parents → 90% helmet parents



Road Safety

DGP Punjab

ADGP (Traffic)

Traffic Advisor Punjab

Institutional Research & Dev.

Organisational Research & development

Departmental Resource & training facilities



Road Safety Initiatives in Punjab Dr. Navdeep Asija

Punjab witnessed an average of 12 daily fatalities in road accidents in 2021, contributing 3.3% to India's total road accident count. The state has underscored the socio-economic loss of ₹15,176 crore due to road accidents.

There are significant gaps nationwide within the Traffic Department. Despite the majority of accidents occurring after 6 pm, the duty hours of traffic police officers end by this time. Moreover, there is an absence of guidelines regarding the adequate number of traffic personnel required concerning population, and city size. Punjab is taking proactive measures to address the road safety concerns. The key initiatives include-

Data-driven decision making: Punjab Road Safety and Traffic Research Center has been established which utilises AI, GIS, and other technologies to devise traffic policing strategies and oversee their implementation.

Educational reforms: Punjab has restructured the academic curriculum for civil engineering candidates to incorporate a subject on traffic management and road safety. Moreover, an added course in traffic equipment management has been introduced in ITI programmes, to encourage development of local capabilities to maintain the infrastructure like traffic signals.

Empowering planning within the traffic department: First Traffic Police in country to deploy road safety professionals within the traffic police to devise safety plans, such as traffic diversion and junction improvement plans, instead of relying on external planning agencies.

Other key initiatives include the introduction of a 'Children Chalan Book', the enforcement of the 'Right to Walk' as a fundamental citizen's right, pedestrian safety awareness campaigns, an accident black spot identification and rectification programme, implementation of AI-based barricades, and the establishment of a dedicated Road Safety Force to prevent accidents proactively.

Adopting a data-centric decision-making approach, Punjab has seen a consistent decline in road accident fatalities.

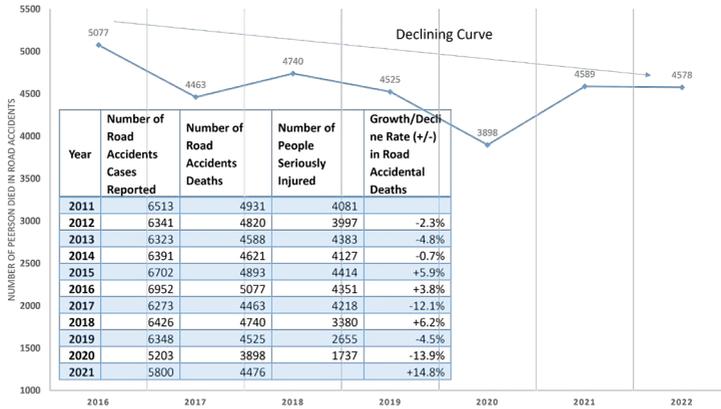


Figure 22: Road accident fatalities in Punjab (2016-2022)



Figure 23: Road Safety and Traffic Research Center, Punjab

THEME: GRADED RESPONSE ACTION PLAN – DELHI



Sayan Roy
Programme Manager (Clean Air and Sustainable Mobility) Surat Municipal Corporation
Centre for Science and Environment

Working as Programme Manager for Clean Air and Sustainable Mobility Division in Centre for Science and Environment (CSE), New Delhi. He is a transport professional with more than 10 years of experience towards promoting sustainable and green mobility. His present work involves policy research, advocacy and capacity building activities at national as well as state level to influence the decision makers to build consensus towards decarbonizing transport by promoting public transport, Intermediate Public Transport (IPT) and implementing vehicle restraint measures.

Before joining CSE, he had worked with various public bodies in Bhubaneswar to improve the mobility scenario of the city. Some of the notable projects include Bhubaneswar Smart City Plan and Bhubaneswar City Bus Modernization Project.

He is a transport planner by academic qualification and earned his master's degree in urban transport planning and management from CEPT University, Ahmedabad.

GRAP

Graded Response Action Plan.

→ Actions & pollution level defined in stages.

990⁺ microgram/m³
16 times than standard

→ Great Delhi Smog 2016

Sayan Roy
Programme Manager
CSE



Revision of GRAP

Poor AQI
201-300
Stage 1

Very Poor AQI
301-400
Stage 2

Severe AQI
401-450
Stage 3

Severe + AQI
450
Stage 4

• Dust Control & Management cells.



• Enforcing PUC regulations

• promoting Public transport



IMPLEMENTATION OF GRAP MEASURES

• Control of fire incident (73 model wards)

• CAAP (Comprehensive air Action Plan)

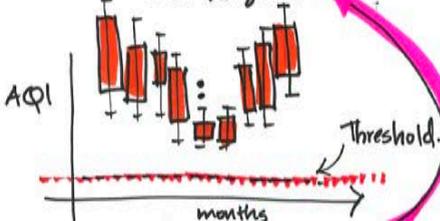
• CAQM (Commission for Air Quality Management)

ONE DELHI ONE RIDE



Incentivising

Mobility's contribution is the highest



What more to be done?

- Public Transport
- Integration MMI
- Parking Management
- Congestion Prices/ Low emission zone
- TOD, compact city
- PUC program - remote sensing technology



Graded Response Action Plan (GRAP) – Delhi Mr. Sayan Roy

The PM_{2.5} level in Delhi spiked to over 990 µg/m³ in November 2016, surpassing standards by 16 times. To combat air pollution in the National Capital Region, the Graded Response Action Plan (GRAP) was introduced by the Union Ministry of Environment and Forest. Initially launched on October 15, 2018, GRAP underwent revisions by the Commission of Air Quality Management (CAQM) in 2022. It now classifies pollution into four stages (poor, very poor, severe, and severe+), based on the Air Quality Index (AQI) that measures eight pollutants, including PM_{2.5}, PM₁₀, SO₂, NO₂, Ozone, Benzene, Carbon Monoxide (CO), and Ammonia. The key GRAP measures include-

Dust control: Employing anti-smog guns, water sprinkling, road paving, and greening to manage dust from construction, roads, and open areas. During severe conditions, C&D activities are banned in the NCR region.

Fire incident control: Addressing waste and crop residue management-related fires. Segregating waste at its source, enhancing waste-to-energy plant capacities, and using machines for waste segregation. Crop residue management involves in-situ methods, subsidies for machinery, and bio-decomposer spray promotion.

Transportation pollution control: Actively enforcing PUC regulations and promoting PT. Restricting vehicles from entering Delhi based on fuel norms and category when pollution exceeds limits. Increasing PT fleet, electrification, and enhancing PT integration.

Other measures: Bans on firecrackers, industrial waste monitoring, and diverting through truck traffic.

Additionally, the government has established a citizen grievance redressal system, partnered with local media to disseminate pollution-related information, banned older vehicles, and is promoting EVs to reduce pollution.

Delhi has achieved some improvements in air quality through these measures. Besides crop residue burning in surrounding regions, the transport sector stands as the primary contributor to local pollution. Recognising its significance, there's a necessity to boost PT usage, integrate different modes, and encourage compact city development.



Figure 24: GRAP stages

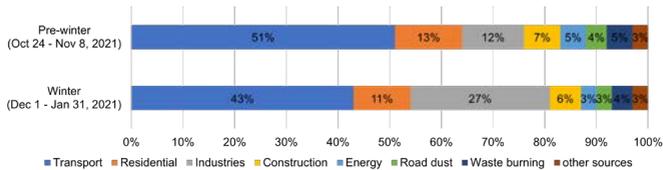


Figure 25: Source of Delhi's local pollutions (2021)

(Source: CSE's analysis based on Decision Support System for Air Quality Management in Delhi of IITM)



Figure 26: Improvement in Delhi's Air Quality

PANEL DISCUSSION

The panel discussion with the session speakers, centered around the key theme of 'Making Transport Planning Work in Indian Cities'. Moderated by Prof. HM Shivanand Swamy and Dr. Shalini Sinha, the discussion primarily focused on the approach for transport planning in India, defining the roles of multiple agencies, and integrating safe, inclusive, and green transport perspectives into mainstream practices.

The focus on urban transport is relatively recent, marked by numerous initiatives and a strong push by the central government in terms of policies and funding to steer away from the traditional road capacity enhancement initiatives. Over the past decade, there has been a notable shift with several new projects being undertaken in the areas of sustainable transport such as city bus improvements, introduction of rapid transit modes (BRTS, metro), introduction of green vehicles (e-buses), multi-modal integration, and non-motorised transport projects across many cities in India with funding support of the central government.

The first discussion was on this project-focused approach and how well this would be able to lead to the development of a sustainable transport system in our cities and if there is a need for modifying this approach. The discussion highlighted that there has been some change in the thinking and traditional road focus that the cities had, and we are rather following a mixed approach of road capacity enhancement along with some sustainable transport initiatives. While the project focused impetus has helped widen the understanding of cities towards other interventions, as we move forward, a comprehensive strategy towards transport system in the city would be crucial. Efforts should extend beyond sustainability in mobility alone, aiming for a gender-inclusive, universally accessible public transportation system. Key insights from the deliberations are:

- Delhi serves as an example with its robust PT network including metro and city buses. Presently, both systems are undergoing enhancement and expansion via a project-based approach. However, to maximise their effectiveness, a shift toward a comprehensive strategy formulation is essential. This involves integration between the two transport modes to ensure they complement each other rather than compete.

- In planning any PT system, the objective should not be to recover costs from commuter fare box revenues. Instead, comprehensive project planning should be adopted which considers all externalities and benefits related to travel time savings, accidents, pollution, and health impacts, to assess the project's viability. The implementation of the 2017 Metro Policy led to transition in sanction process from solely considering financial internal rate of return to incorporating economic internal rate of return, marking a significant step toward sustainable transportation.
- While urgent cases, such as addressing accident hotspots at intersections, may require a project-based approach for immediate solutions, a comprehensive long-term vision through plans like Comprehensive Mobility Plans (CMP), Development Plans (DP), and their integration is crucial for an overall urban development.
- From a gender perspective, the focus should be to make the city safe rather than just making a transport system safe. Several women in Delhi have affirmed the safety of metro system but expressed their safety concerns when stepping out of the metro. There is a need for coordination between different agencies in addressing these safety concerns.

Despite the importance of a comprehensive and strategic approach to sustainable transport, the current reliance on a project-based model persists due to the presence of multiple institutions. For instance, the development and implementation of a bus or metro system are overseen by separate authorities. When coordination is needed between these agencies, challenges arise. Good governance is highlighted as key for efficient delivery of any system. The second round of deliberation focused on the challenges posed in governance due to multiplicity of organisations and financing constraints in planning, operations and management of transport systems and need for role definition of different tiers of government in city's transportation system.

Key insights from the speakers included:

- The discussion highlighted the roles of three tier administration model, which involves the union government focusing on policy matters and guidelines, the state government overseeing implementation agencies, and local government and State Transport Authorities (STAs) acting as implementing agencies.
- Financing of developing projects emerged as an important consideration.

A collaborative funding approach was proposed, where the central government can take on the responsibility of providing initial capital component fund. Subsequently, the state would cover ongoing operational and management expenses, while the local government would contribute to the effective project management.

- To ensure good governance and sustainable development, Karnataka state government has established a State Urban Transport Fund administered by DULT (Directorate of Urban Land Transport). DULT, in turn, is mandated to develop sustainable design, planning, and policies. The creation of committees, including an empowered committee and a steering committee with major stakeholders, ensures a thorough review process for project implementation. Property and vehicle taxes are allocated towards sustainable urban development initiatives, including place-making, footpath creation, and public buses operations and procurement.
- The formation of city level coordinating bodies similar to the gender and policy labs in Chennai, to provide more emphasis on the gender aspects, is important considering the significance of gender inclusivity and coordinated planning in urban transportation.
- At a local level, establishing an institution such as Unified Metropolitan Transport Authority (UMTA) and providing adequate power to the body for institutionalizing its activities, could serve as a viable strategy for addressing the issue of multiplicity of institutions.

The consensus was that effective coordination, clear three tier administration model, collaborative funding for financial sustainability, empowered committees, and a focus on gender-inclusive and coordinated planning are vital for successful urban transportation planning and implementation.

The panel further deliberated on the need for initiatives on road safety, environment management and gender inclusion to be brought to centre stage. The panel provided valuable insights on how one brings such initiatives to centre stage in planning.

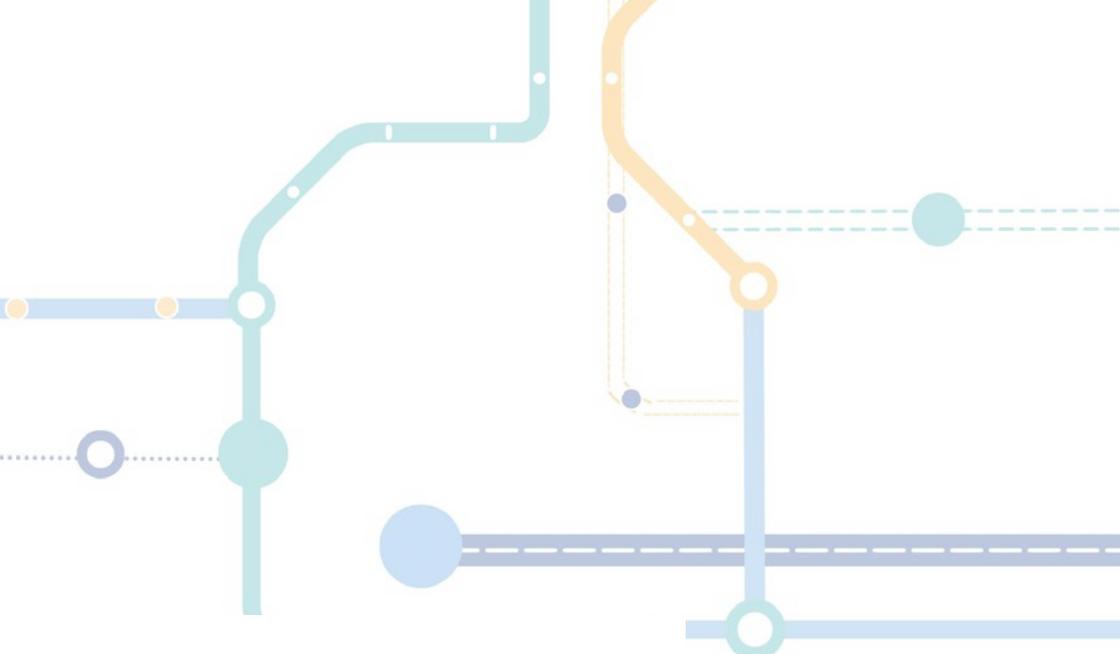
Key insights from the speakers included:

- Creating a gender action plan as a part of Comprehensive Mobility Plan (CMP) as the first step in bringing a gender lens to the strategic approach. Many cities are expressing interest in developing such Gender Action Plans as they allow for clear monitoring. By collecting gender-

disaggregated data, cities should not only monitor mobility patterns but also assess women's usage of public services, satisfaction levels, and safety concerns.

- Incorporating gender action plans into City master planning is also important. Need for sensitization and capacity building in this area was highlighted. Beyond focusing solely on women, the panel stressed the significance of considering multiple genders. This includes planning for universal access for people of all genders, particularly those with different forms of disabilities.
- Importance of safety and environment considerations in all the transport proposals was highlighted. Implications of any project on different user groups including the pedestrians need to be analysed and built into the project design. Similarly impact on environment and GHG emissions should be assessed and should be an important consideration in project finalization and design.
- Creating a knowledge-driven society and providing information to the public is essential. Including the public in the decision-making processes would enhance the quality of the decision and provide a sense of ownership among the citizens.

The panel discussion concluded with an understanding that a strategic and comprehensive approach is essential for sustainable urban transportation. Coordination among institutions, inclusivity, and a focus on long-term visions were identified as crucial components to address the evolving challenges of urban mobility. The insights shared during the discussion would serve as valuable input for shaping future policies and practices in the field of urban transportation.



KEY INSIGHTS & TAKEAWAYS

The conference helped in sharing the recent practice insights by the speakers and offered a unique opportunity for students and participants to connect with industry experts and deliberate on transport planning approach and initiatives in Indian cities. A diverse and engaging array of topics, with a central focus on learnings from implemented projects in transport like new public transport mode introduction, technology applications, improvement in bus system and logistic operations, cross cutting projects on inclusion, road safety and air pollution. Recognizing the challenges encountered in executing these projects and their disruptive impact on the status quo, the key takeaways underscored the critical importance of identifying key issues and action areas through a comprehensive baseline analysis. Additionally, there was a compelling need to explore innovative approaches beyond the traditional methods.



As the landscape of transport practice continues to evolve and departing from the status-quo is essential but not easy. Presently, we are following a project focused approach. While this has proven beneficial for a short period of time, a more strategic and holistic approach is required for sustainable development with greater and enduring benefits for the city. Given the inherently multi-stakeholder nature of transport projects, the conference emphasized the importance of achieving better integration among various institutions involved. The success stories shared during the sessions highlighted the pivotal role of improved coordination among these institutions, showcasing how such collaboration significantly enhances the implementation of projects.

Despite the increase in ridership resulting from improved public transport services, it was noted that the impact on the private vehicle numbers in overall composition was not as significant as desired. Mode shift to sustainable modes is a complex issue in the case of choice riders. Changing habits is difficult. To address this challenge, the conference emphasized the importance of improving the last mile connectivity along with effective demand management strategies. These measures are essential to facilitate a successful mode shift toward sustainable modes.

Adequate funding is crucial for the successful implementation of any project. It is not just about the initial capital; it should also cover the ongoing operations and maintenance. This approach ensures the project's stability, durability, and ongoing effectiveness.

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