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UITP INDIA

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BANGALORE METROPOLITAN TRANSPORT CORPORATION

TRAINING REPORT

TRAINING PROGRAMME ON EMERGING PRACTICES IN ELECTRIC BUS MANAGEMENT AND SUSTAINABLE OPERATIONS

MARCH | 2025

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INTRODUCTION

The UITP India organised a Capacity Building Training programme on "Emerging Practices in Electric Bus Management and Sustainable Operations" on March 6-7, 2025 in Bengaluru with the support of Bangalore Metropolitan Transport Corporation (BMTC). This training, under UITP India's project - Advancing Electric Buses in India, responded to India's rapidly evolving electric bus (e-bus) landscape, where cities are increasingly transitioning their public transport fleet to electric vehicles, especially e-buses.

India has set ambitious targets for e-bus adoption, planning to deploy thousands of e-buses across various cities in the coming years. This large-scale transition necessitates specialised knowledge and skills in managing e-bus operations, which differ significantly from traditional diesel bus fleet. Therefore, the training programme addressed this crucial need, covering a wide range of topics essential for successful e-bus implementation. These topics included Financial Planning Strategy, Optimisation of Planning and Operations, Charging Infrastructure and Optimisation, Battery Management, Manpower Training, Digitisation and Data Driven Approaches in E-Bus Planning.

The two-day training programme featured presentations from both international and Indian experts, offering a blend of global best practices and local insights. The training programme witnessed 47 participants from 18 organisations, including 12 public transport authorities from different parts of India.

The training programme commenced with the welcome address by Ms. Rupa Nandy, Head of UITP India. She introduced the participants to UITP and set the tone of the training programme by providing a brief context on the project "Advancing Electric Buses in India". This was followed by an inaugural address by Mr. Prabakar Reddy, Chief Traffic Manager – Operations, BMTC, the supporting partner for the training.

KEY SESSION OUTCOMES: DAY I

SESSION 1: SUSTAINABLE PLANNING AND OPERATIONS OPTIMISATION

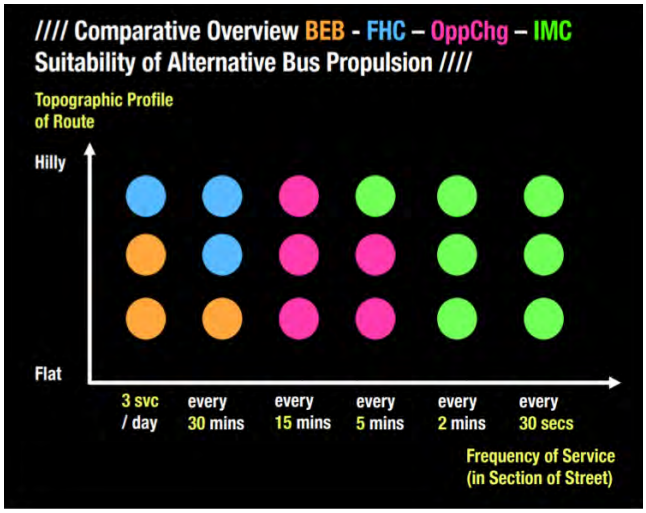
Mr Arnd Bätzner, Founder - Baetzner Metropolitan, Switzerland, led the first session of the day. He began his session by giving an overview of the evolving landscape of electrification of public transportation and understanding on comprehensive charging strategies crucial for successful e-bus deployment. He shared profound insights into the multifaceted world of e-bus charging technologies and infrastructure development.

The session showcased how the fundamental challenge in e-bus adoption lies in developing robust charging methodologies that balance operational efficiency, cost-effectiveness, and technological innovation. The analysis showcased revealed three primary strategic approaches: avoid, shift, and improve. These strategies were stated to be pivotal in transforming traditional public transportation systems into sustainable, technologically advanced networks. He stated how the charging technologies can be categorised into two primary interfaces: conductive and inductive charging methods. Each method presents unique advantages and operational considerations that transportation planners must carefully evaluate.

The presentation highlighted critical trade-offs between different charging regimes. Overnight depot slow charging offers operational simplicity but requires larger, more expensive battery capacities and potentially significant power grid investments. Conversely, opportunity charging enables smaller, lighter batteries but introduces higher infrastructure costs and operational complexity. Understanding these nuanced differences is essential for developing optimised e-bus management strategies.

The presentation further elucidated how energy management emerges as a critical component in successful Battery Electric Bus (BEB) implementation. Advanced Computer-Aided Dispatch/Automatic Vehicle Location (CAD/AVL) systems and smart charging solutions play a transformative role. These technologies provide real-time data on vehicle status, charging station availability, and range information, ultimately facilitating smoother electric vehicle operations and helping reduce utility and investment costs.

The session concluded discussing the global market trends that demonstrate a clear trajectory towards e-bus adoption, with charging infrastructure increasingly standardising around CSS Type 2 DC and AC fast charging strategies. Sustainable power generation, infrastructure upgradation, and innovative storage mechanisms are becoming integral to modern mobility ecosystems. Mr. Bätzner's comprehensive overview underscores the importance of holistic planning, technological integration, and strategic investment in transitioning public transportation towards a more sustainable, electrified future.



Mr A Shrinivas Rao, Assistant General Manager (TE), Brihanmumbai Electric Supply and Transport Undertaking (BEST) led this session, sharing best practices for charging infrastructure and optimisation for e-buses, focusing on the case study of Mumbai. He detailed the comprehensive strategy encompassing e-bus management, digital transformation, and innovative infrastructure development that serves as a model for modern urban transit systems.

At the core of BEST's approach is a holistic electric bus management framework that addresses critical aspects of large-scale electrification. The strategy integrates sophisticated funding models, including Operational Expenditure (OPEX) and Capital Expenditure (CAPEX) approaches, with public-private partnerships and power purchase agreements. Environmental sustainability is a key driver of BEST's strategy. The organisation aims to dramatically reduce carbon emissions by transitioning to a fully e-bus fleet. By 2027, BEST plans to deploy over 5,000 e-buses, with an innovative renewable energy infrastructure that includes installing solar photovoltaic panels across 27 bus depots. This approach is expected to generate more than 60 million units of clean energy annually and reduce greenhouse gas emissions by 26,280 tons of CO2.

The technological implementation extends beyond simple electrification. BEST has developed a sophisticated Command and Control Centre that integrates various technological modules, including vehicle tracking systems, passenger information systems, and comprehensive data analytics. The mobile application provides passengers with live bus tracking, real-time arrival information, and seamless ticketing options, enhancing the overall transit experience. It improves the operational efficiency and user experience with the National Common Mobility Card (NCMC) further streamlines the transportation experience, enabling seamless, cashless travel across multiple transport modes.

The business model for this ambitious project follows an OPEX approach, where third-party solar developers will finance, install, and lease solar equipment to BEST for 10 years, with ownership transferring to BEST thereafter. This innovative approach ensures financial flexibility and technological advancement while maintaining long-term strategic control. As a conclusion, BEST's approach demonstrates how sustainable digitalisation can transform urban mobility, creating a more efficient, environmentally friendly, and user-centric public transportation system that serves as a benchmark for cities worldwide.

SESSION 2: FINANCIAL PLANNING STRATEGY FOR E-BUS

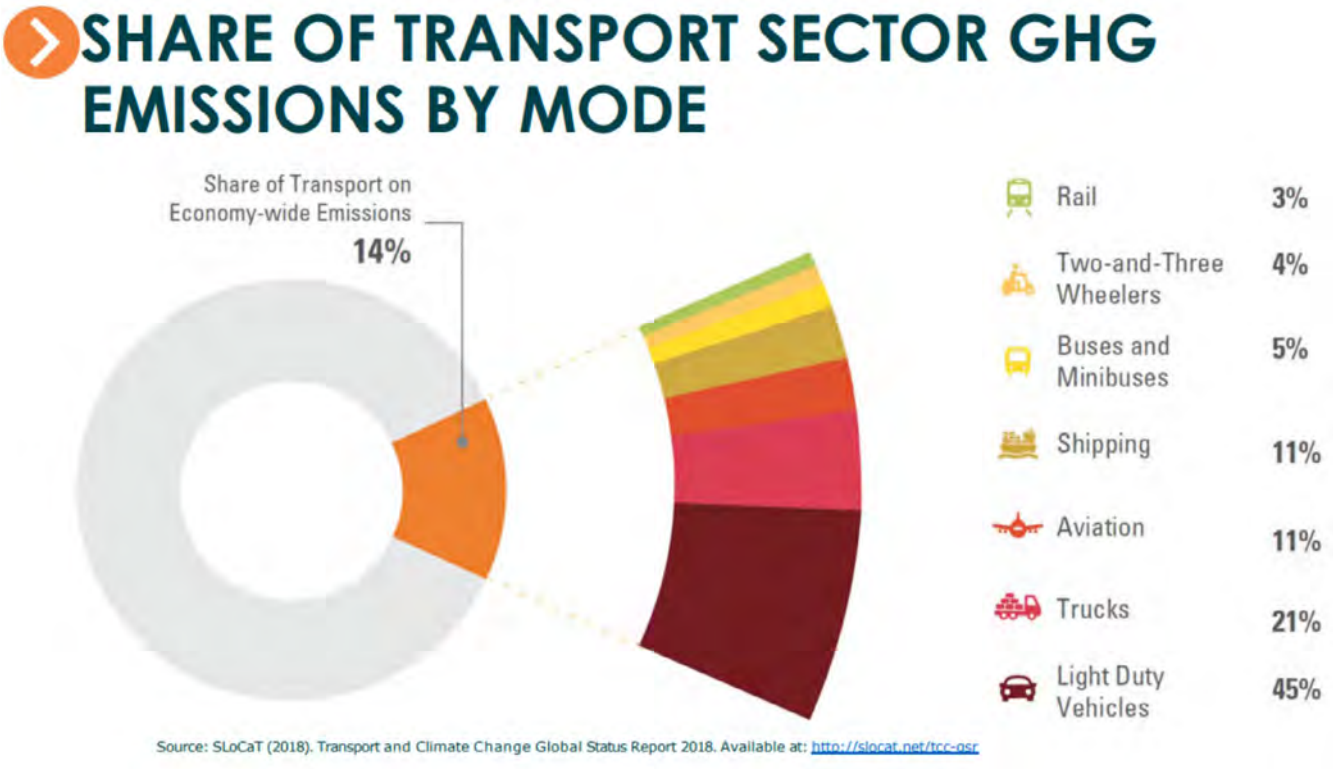
Mr Arnd Bätzner began the session by providing a comprehensive overview of e-bus electrification, emphasising that this transformation extends far beyond simple vehicle replacement. The presentation critically underscores that planning and financing are fundamentally local, with no universal "one-size-fits-all" approach to implementation. The global market trends reveal that buses constitute approximately 83% of all public transport journeys worldwide. The transition to e-buses is driven by multiple interconnected factors including legislation, renewable energy deployment, technological advancements, and policy priorities focused on reducing carbon emissions and improving urban air quality.

Charging infrastructure emerges as a critical strategic component. The presentation explores diverse charging concepts, with fast charging technologies demonstrating significant potential. The evolution of charging technologies suggests progressively reducing charging times, from current 30-minute 40% State of Charge (SOC) to potential 15-minute 75% SOC in the coming years.

Carbon Credits represent a particularly innovative financial mechanism for offsetting high capital costs. The presentation detailed how carbon credit trading can be leveraged as a mitigation strategy for e-bus investments. By quantifying and monetising emission reductions, transport authorities can create additional financial incentives for electrification.

The maintenance profile of e-buses presents substantial advantages over traditional diesel vehicles. With minimal complex mechanical systems, e-buses eliminate routine maintenance like oil changes and feature simplified brake systems through regenerative braking technologies. The emerging business models like "e-Bus-as-a-Service" and "Charging-as-a-Service" provide flexible alternatives to traditional procurement processes. These models offer integrated mobility and energy solutions, addressing the comprehensive needs of e-bus implementation beyond mere vehicle acquisition.

The presentation concludes by highlighting the transformative potential of e-buses, noting that every 1,000 e-buses can potentially displace 500 barrels of diesel per day. This statistic underscores the substantial environmental and economic impact of e-bus adoption, positioning it as a critical strategy for sustainable urban mobility.



Mr A Shrinivas Rao presenting the case of Mumbai, emphasised on the financial planning strategy for e-buses presented by BEST Undertaking represents a sophisticated approach to managing the economic aspects of urban electric transportation. At the core of this strategy is a detailed Total Cost of Operation (TCO) analysis that provides a comprehensive view of the financial implications of transitioning to e-buses.

The cost structure is meticulously broken down into several key components. Vehicle acquisition costs include not just the purchase price of the bus, but also critical infrastructure investments like charging stations. For a 12-metre AC e-bus, the cost is approximately Rs. 1.9 crore, with significant subsidies available - Rs. 55 lakh from FAME-II and Rs. 20 lakhs from the Maharashtra State Government.

The financial model considers multiple revenue and cost streams. Operational expenses encompass driver and conductor salaries, maintenance, insurance, and fuel costs. Interestingly, the analysis demonstrates the economic viability of e-buses under different scenarios. With government subsidies, the cost per kilometer reduces significantly, from Rs. 83.92 to Rs. 66.20, making the e-bus option more financially attractive.

To diversify revenue streams, BEST has identified innovative non-fare box revenue sources. These include selling CNG and diesel to private vehicles, generating advertisement revenue on buses and bus stops, and potentially monetising carbon credits from e-bus operations. A critical aspect of the financial strategy is risk mitigation. This involves performance security deposits, bank guarantees for subsidies, performance monitoring, and maintenance agreements with Original Equipment Manufacturers (OEMs). The strategy includes provisions for substitution agreements in case of default, ensuring financial protection and operational continuity.

The life cycle cost-benefit analysis provides a comprehensive economic evaluation. It considers initial investment costs, operating expenses, maintenance costs, and end-of-life disposal expenses. The analysis employs sophisticated financial tools like Discounted Cash Flow (DCF) analysis and Net Present Value (NPV) to provide a holistic view of the economic feasibility of e-buses.

Notably, the financial planning extends beyond immediate costs. It incorporates long-term sustainability goals, including the development of renewable energy infrastructure. The proposed solar photovoltaic installation across 27 bus depots is estimated to cost Rs. 320 crore, with the potential to generate over 60 million units of clean energy and reduce annual electricity expenses by more than Rs. 60 crore.

This financial strategy demonstrates a forward-thinking approach that balances economic considerations with environmental sustainability, positioning BEST as a leader in innovative urban transportation financing.

SESSION 3: CHARGING INFRASTRUCTURE AND BATTERY MANAGEMENT FOR E-BUSES

Mr Diego Fuentes, Planning Manager, Metbus, Chile presented Santiago's transformative journey in e-bus transportation, showcasing Metbus as a pioneering operator in electromobility. The public transport system in Santiago comprises a robust metro network of 143 stations spanning 149 kilometre and a fleet of 6,900 buses, with 2,500 already electrified.

Metbus has been at the forefront of e-bus adoption, progressively expanding its electric fleet from just 2 buses in November 2017 to 358 buses by October 2023. This rapid electrification is supported by a comprehensive charging infrastructure consisting of 9 terminals equipped with approximately 300 chargers, boasting a total installed capacity of 24 megawatts.

The deployment of e-buses has not been without challenges. The organisation confronted issues such as slow charging mechanisms, minimum state of charge requirements (20%), challenging terrain with slopes up to 14 degrees, and variable power dynamics. To address these complexities, Metbus developed an integrated smart charging system characterised by low depth of discharge, implementing two daily charges with a maximum state of charge of 90%.

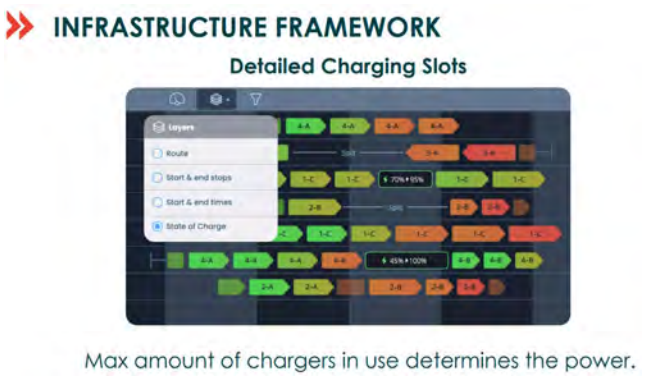
Operational resilience is maintained through a strategic fleet management approach. Out of 798 e-buses, 50 are kept as reserve, complemented by 75 diesel buses to ensure continuous service. This ensures uninterrupted public transportation while mitigating potential operational disruptions. The economic and operational benefits of electrification are substantial. Energy costs have been reduced by 67%, with an average energy consumption of 1.3 kWh per kilometre. Maintenance efficiencies have also improved dramatically, with scheduled maintenance time reduced threefold and overall maintenance time halved compared to diesel counterparts.

The charging infrastructure is meticulously managed through a sophisticated framework that consider power capacity, charging windows, and operational flexibility. Advanced information systems, including a depot platform, mobile application, and dispatch system,

enable real-time monitoring and management of buses and charging infrastructure.

Battery performance has been remarkably consistent, with only the initial two buses from 2017 experiencing a minimal autonomy reduction of less than 5%. This indicates the robustness of e-bus technology and effective battery management strategies.

The presentation by Mr. Diego provides a comprehensive blueprint for successful e-bus fleet management, emphasising the critical role of integrated charging infrastructure, strategic planning, and advanced digital management systems in enabling sustainable urban transportation.

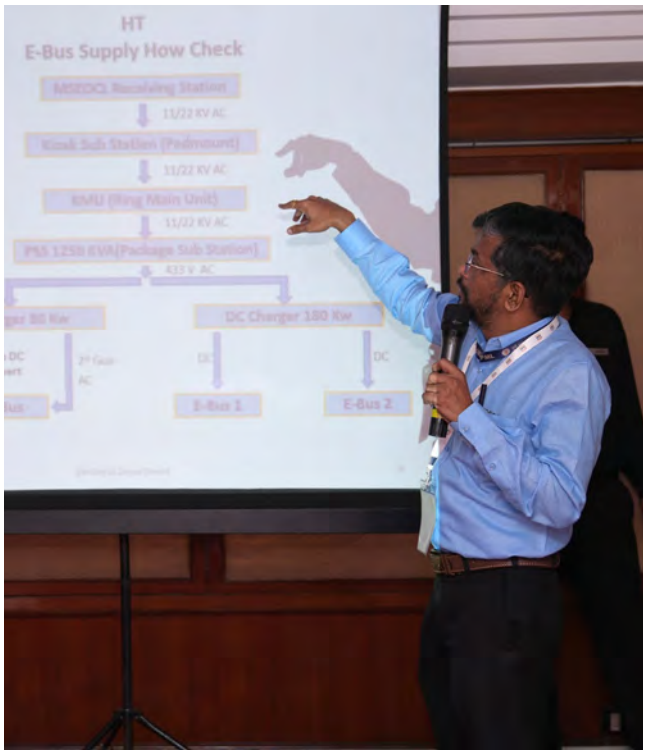


Mr Prashant Kolekar, Electrical Engineer, Pune Mahanagar Parivahan Mahamandal Ltd. (PMPML) briefed on the comprehensive electrical infrastructure strategy to enhance its e-bus charging capabilities across various depots in Pune. The initiative focuses on creating robust charging stations with advanced electrical systems to support the city's transition to electric public transportation.

The charging infrastructure spans over multiple depots, including Bhekrai Nagar, Bhakti Shakti, Wagholi, Pune Station, Nigadi, Charholi, Hinjawadi, and other key locations. Each depot is equipped with sophisticated charging technologies, featuring both AC and DC charging capabilities. The charging stations are designed with high-capacity power systems, including Ring Main Units (RMU), Package Sub Stations (PSS), and specialised electrical connections.

The technical specifications of these charging stations are impressive. They utilise 1250 KVA power systems, with charging capacities ranging from 80 KW AC chargers to 180 KW DC chargers. The infrastructure supports varying bus capacities, with some depots prepared to handle up to 115 buses, while others are in various stages of operational readiness. Deployment of e-buses have demonstrated significant positive impact on the environment. As of January 2025, the fleet has saved approximately 6,77,302 kilogram of CO2 emissions, travelled 20,08,665 kilo metres, and eliminated the need for 30,24,619 litre of diesel fuel. This represents a substantial contribution to reducing the carbon footprint of public transportation in Pune.

The electrical department has implemented strategic measures to optimise electricity consumption, including online bill management, prompt payment discounts, and energy-saving awareness programs across their facilities. The charging infrastructure is carefully planned, with considerations for load capacity, power supply management, and future expansion. While some charging stations are fully operational, others are still in various stages of development. The project shows a phased approach to e-bus integration, with different depots at different levels of implementation. This strategic rollout allows for gradual infrastructure development and learning from each deployment.



GROUP ACTVITY

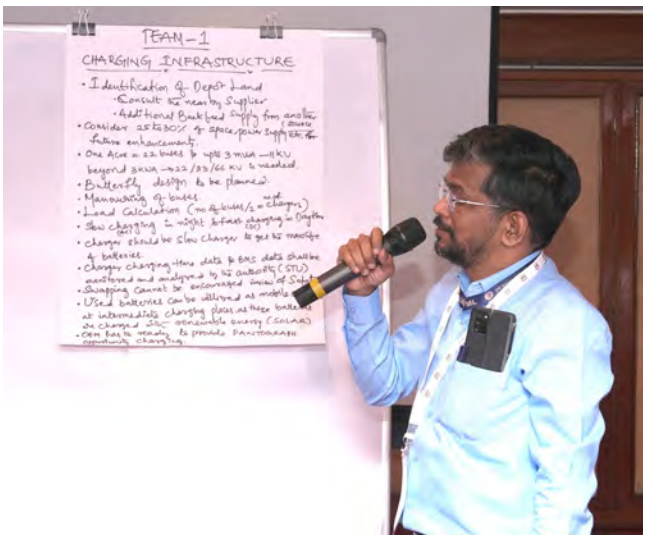
The training programme included a group activity that was moderated by the UITP India team. The group activity served as a platform for participants from different organisations to get together and brainstorm on the different scenarios given to them. Based on the lessons learned during the technical sessions, the participants presented their case of best solution for e-bus management under the topic that was given to each group.

Group 1: Charging Infrastructure Optimisation

The charging infrastructure strategy focuses on creating an efficient and scalable e-bus deployment model. By allocating 25-35% of depot area specifically for charging facilities, the plan ensures optimal space utilisation and operational flexibility. The proposed ideal ratio of 22 e-buses per acre demonstrates a carefully calculated approach to depot design and capacity planning.

A central butterfly depot layout emerges as the recommended configuration, strategically minimizing operational disruptions and maximizing spatial efficiency. This innovative design allows for seamless bus movement and charging integration. The proposed charger composition of 70% AC and 30% DC chargers per 100 buses reflects a nuanced understanding of charging technology requirements, balancing rapid charging capabilities with cost-effective infrastructure development.

The layout prioritises operational continuity, ensuring that charging infrastructure does not impede daily transportation services. By carefully distributing charging points and maintaining a balanced technological approach, the strategy aims to create a robust and adaptable e-bus ecosystem that can evolve with emerging technological advancements.



Group 2: Cost-Benefit Analysis and Financial Strategy

The financial approach for e-bus deployment emphasises a comprehensive evaluation beyond traditional lowest-bid selection. The Group recommended the Gross Cost Contract (GCC) wet-lease model as the most financially prudent strategy, focusing on long-term collaborative benefits rather than short-term cost savings.

A transformative operational cost reduction pathway is proposed, demonstrating how strategic subsidies can dramatically lower per kilometre expenses from INR 88 to INR 55. This significant cost optimisation represented a breakthrough in making e-bus fleet economically viable and attractive for public transportation systems.

The analysis presented by the Group went beyond mere financial calculations, considering broader economic implications such as reduced environmental impact, technological innovation, and long-term sustainability. By prioritising collaborative models and innovative financing mechanisms, the strategy aimed to create a financially sustainable e-bus ecosystem that could be scaled up and replicated across different urban transportation networks.

Group 3: Risk Management and Operational Safety

Risk mitigation emerges as a critical component of the e-bus implementation strategy. The group emphasises comprehensive driver training programmes as the foundational element of operational safety. A carefully calibrated penalty system was proposed by the Group, with penalties not exceeding 50%, ensuring accountability without overly punitive measures.

Maintaining a 20-30% spare vehicle fleet provides operational flexibility and ensures continuous service delivery. This buffer allows for unexpected maintenance requirements, battery charging cycles, and potential vehicle downtime without compromising overall

transportation efficiency. The strategy explicitly discouraged driver overtime, recognising it as a potential safety risk. By prioritising driver well-being and implementing structured operational protocols, the approach aimed at creating a safety-first culture that protects both personnel and passengers.

Group 4: Data-Driven E-Bus Operations

This Group's strategy centred on leveraging data as a transformative tool for e-bus operations. A long-term perspective was adopted, with a recommended 15-year vehicle lifespan and mandatory battery warranties extending a minimum of 5 years. The approach ensured technological reliability and financial predictability.

Technological innovation was emphasised through automated processes like charger cleaning and strategic charger placement in shaded areas. Internet of Things (IoT) technologies were recommended for real-time data collection, enabling proactive maintenance and operational optimisation.

An open data policy was proposed to enhance transparency and passenger safety. By creating APIs, dashboards, and mobile applications, the strategy aimed to democratise transportation information. Anonymised passenger data was proposed to be utilised to optimise charging schedules, improve operational efficiency, and create a more responsive public transportation system.

KEY SESSION OUTCOMES: DAY 2

SESSION 5: CHARGING INFRASTRUCTURE AND MANPOWER PLANNING FOR OPERATIONS

Day 2 began with the session taken by **Mr Diego Fuentes** that focused on the need for training of e-bus drivers in Santiago city and that training for e-buses must be specifically tailored and distinct from diesel or petrol bus training. Introduction of new technologies require greater cultural shift amongst drivers. He also highlighted some of the major challenges faced by this industry in Santiago and how these challenges can be solved through well-planned training. He emphasised on the importance of training though three major pillars i.e., operations, safety and efficiency. Training should be provided to all staff across hierarchy through development of specific courses, electronic communication methods, workplace activities and information. The highlighted the kind of training which would be given to each category of workers in details.

He also threw light on training of drivers in Santiago through specially designed course of University of Chile. Only the best drivers from the course were allowed to drive e-buses. He gave an overview about the Metbus School which focuses on courses for both drivers and non-drivers along with a specially designed course for new drivers. He also showcased the simulators that work in their training centre, and how hands on training is provided. Infrastructure maintenance training is critical to efficient e-bus operations. It was stressed upon how Chile improved operational efficiency significantly through enhanced maintenance practices, extending scheduled maintenance intervals from 10,000 kilometre to 15,000 kilometre (50% improvement). He highlighted the importance of maintenance procedures that account for impact on battery health, especially State of Charge (SoC), need for depot activities and maintenance to be in compliance with ISO standards, the crucial role played by enhanced training and technology advancements, and requirement for developing specific technical guidelines based on continuous research and operational experience.

Mr C.K. Goyal, President-Operations, PMI Electro Mobility Solutions Private Limited, presented in the session elucidating from the perspective on an OEM. In this session, he spoke about the importance, meaning, component and process of management of charging infrastructure. The session highlighted the operational requirement of charging infrastructure, how load assessment is done for different depots of PMI in the cities of Nagpur and Delhi, and the challenges which the authorities face and some of the solutions for the same.

Battery Management System (BMS) was discussed in detail in this session. During charging BMS determines that the power consumption from all batteries is normal while the vehicle is moving and display any battery related issues on the instruments cluster. The various components of BMS and the current challenge of thermal heating which is observed in many cases was further explained. The potential risks the e-buses face compared to diesel and CNG bus face was explained along with highlighting suggestion on the equipments which all bus depots should keep during its operations. The session also showcased differences between manpower requirement for conventional Internal Combustion Engine (ICE) buses and e-buses.

BATTERY MANAGEMENT SYSTEM.. CHALLENGES VS SOLUTION)

Challenge:

- Battery High temperatures-can lead to reduced battery life and efficiency

Solution:

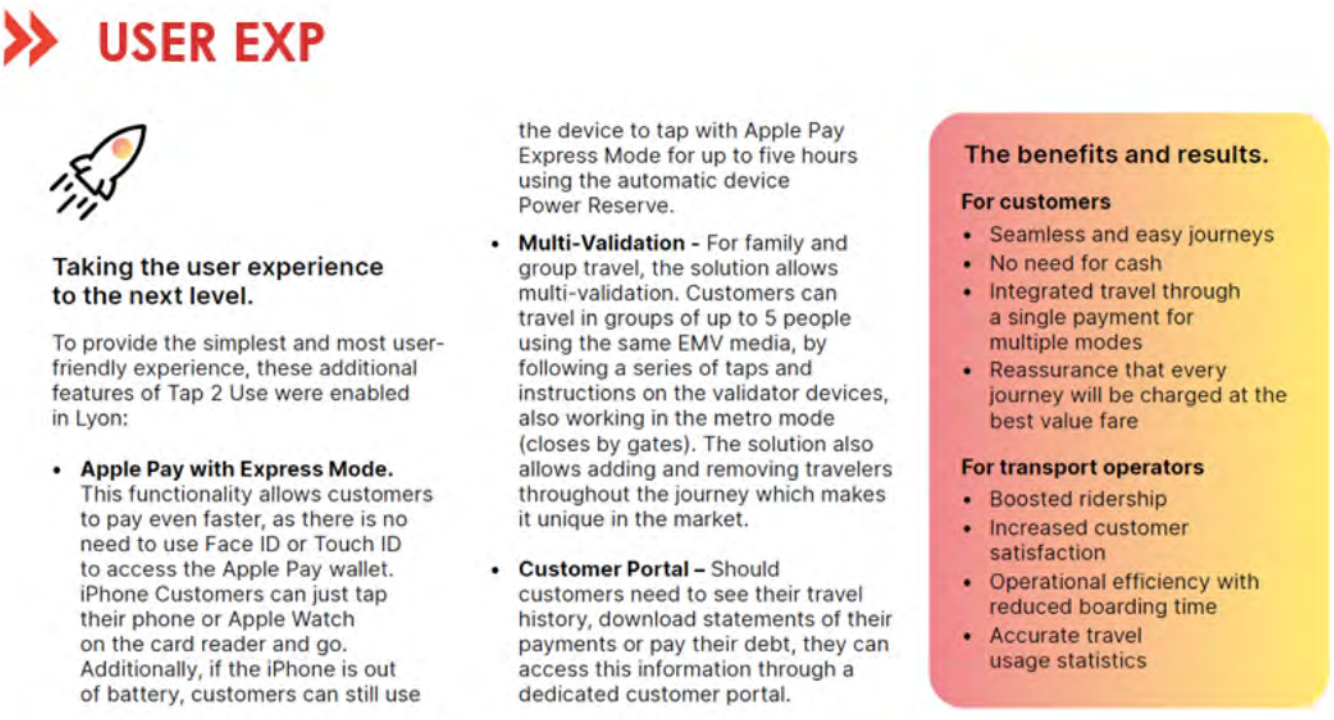
- Advanced Battery Management Systems (BMS)
- Auto-cut feature controlled through software
- Live fault code monitoring through CAN data by OEM
- Thermal Management System- integration of advanced cooling system integrated in Battery Cooling System

Mr Goyal also engaged with audience for questions and answers session at the end of presentation and he recommended the following to audience:

- ThInstalling a step-down transformer at depots (from 11kV/33kV to 415V), though 20% costlier, ensures consistent and efficient power delivery.
- Dual-gun chargers (e.g., 90x2, 180x2) are recommended for flexibility and efficiency.
- Power load calculations must incorporate an additional 20-50% margin to ensure operational reliability.
- Charging speeds decrease significantly between 80% and 100% SoC to prevent battery overheating and fire risks.
- Battery Management System (BMS) data, usually retained by OEMs for Research and Development purposes, should be shared periodically with STUs for informed decision-making.

SESSION 6: DIGITALISATION AND DATA DRIVEN APPROACHES IN PLANNING E BUSES

Mr Kiran Deshmukh, Product Manager, Worldline presented the evolution from cash to contactless cards in the payment mechanism across the world. He focused on how payments can effectively be managed via EMV devices. His presentation highlighted challenges associated with tap-in/tap-out systems that can be addressed using IoT-enabled devices, such as smartphones. He mentioned how consolidating passenger data from different modes of transportation into a single file, with costs calculated at journey/day-end, enhances user convenience. Several examples from across the world on how digital payments are done was showcased. For example: New York transitioned from metro cards to omni-payment systems for improved passenger convenience. London's system pre-authorises a £30 charge, later adjusted based on actual travel, with automatic refunds processed the same day for unused amounts and a manual refund of 1%. Lyon as an example was also focussed upon, where he illustrated the challenges faced by the city and the solution currently implemented. its features and the experience of users from the perspective of both customers and operators.



Ms Anindita Ghosh, Senior Researcher and Ms Divyanka Dhok, Researcher, UITP presented about UITP India's current research project on 'Advancing Electric Buses in India' and its findings. The presentation highlighted the importance of the study that UITP is conducting and how it is providing technical assistance to the three Indian cities of Bengaluru, Chandigarh and Thiruvananthapuram.

The session showcased the analysis done for the case study cities, where the cities in the initial stage of the project mentioned the challenges they faced in e-bus

deployment, and these formed the problem statement, based on which the UITP team decided the scope of work for each city. UITP is supporting Chandigarh Transport Undertaking (CTU) and BMTC with financial planning for e-bus deployment in the respective cities. In the case of Thiruvananthapuram, UITP is optimising the charging schedules for the city circular routes. She showed the methodology and the current problems in charging schedules for the e-buses in the city.

VALEDICTORY SESSION

The technical sessions of the training programme concluded successfully with participants engaging in holistic discussions and active interactions, creating the perfect forum for knowledge sharing. The UITP team collected feedback from the participants to help design future training programmes. In the valedictory session, Ms Rupa Nandy addressed the participants, presented mementos to the trainers, and awarded certificate of participation to the trainees.

TECHNICAL VISIT

The two-day training programme concluded with a technical visit to BMTC Head Office and Depot 3 of BMTC. The visit was supported by BMTC officials. The objective of the technical visit was to provide participants with practical exposure to the e-bus depot layout, the functioning of the charging infrastructure, and the features of e-bus.

At the Head Office of BMTC, the Director of Safety and Security, BMTC and Chief Traffic Manager, BMTC briefed about the organisation and operations of BMTC. He also highlighted some special initiatives taken by BMTC for retaining and motivating their staffs. The trainees were also asked to share their experience on e-bus operations in their respective states. This interaction fostered exchange of ideas on the various initiatives undertaken by various State Transport Undertakings (STUs) across the country.

The trainees then taken to Depot 3 of BMTC in an e-bus of BMTC. The Depot Manager welcomed the participants and highlighted the nitty-gritties of the depot, and the safety features present. He gave an overview of the number of buses, charging stations, and scheduling in the depot. He guided the participants through the depot workshop area and explained the maintenance practices in the depot, including routine inspection, corrective, and predictive maintenance. The participants shared their insights on how their respective depots function, therefore creating an ideal platform for exchange of knowledge.

This is an official Report of UITP, the International Association of Public Transport. UITP has more than 1,800 member companies in 100 countries throughout the world and represents the interests of key players in this sector. Its membership includes transport authorities, operators, both private and public, in all modes of collective passenger transport, and the industry. UITP addresses the economic, technical, organisation and management aspects of passenger transport, as well as the development of policy for mobility and public transport worldwide.

This Report was prepared by UITP India.

MARCH | 2025

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