Latin America Regional Training 2022 – Towards the advancement of e-mobility in the region

Key elements for a successful e-bus operation

Aida Abdulah, Senior Manager, Bus Unit, K&I, UITP

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no 875041

26/10/2021

THE INTERNATIONAL ASSOCIATION OF PUBLIC TRANSPORT

WHO WE ARE

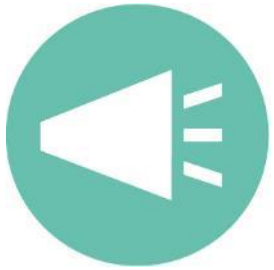
We are the only **worldwide network** to bring together all public transport **stakeholders** and all sustainable transport **modes**.

+1,800
MEMBER COMPANIES

FROM
100
COUNTRIES

14
OFFICES

WHAT WE DO

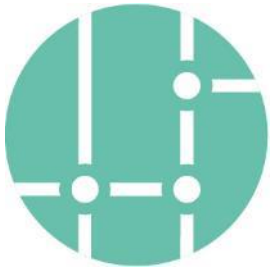


ADVOCACY

We engage with **decision makers** and key **international organisations** to promote sustainable mobility solutions.

KNOWLEDGE

We inspire **excellence** and innovation by generating cutting-edge **knowledge** and expertise.



NETWORKING

We bring people together to **exchange** ideas, find solutions and forge **partnerships**.

Electrification of bus fleets

What does it means for cities?

01

Increasing urban quality of life: air quality and health

- Environmental challenges: pollution, noise, congestion
- Societal benefits: citizen's health, drivers working conditions
- Energy transition and energy crisis require high level commitment

02

Improving image of urban bus and city attractiveness

- Rethinking mobility for a strong PT system
- To revamp the image of the urban bus (innovation, comfort, environmental friendliness, noise reduction)
- Gain back passengers' trust on PT in the post-pandemic period

03

Strengthening cooperation with bus sector

- Redesigning vehicle and its stations
- Improve the interface between the bus and the city

https://www.uitp.org/publications/design-charter-for-innovative-electric-buses/

Electrification of bus fleets

Key factors for successful operation

From vehicle to system procurement	•Vehicle – charging infra – new operations
Understanding your TCO	•CAPEX: vehicle, infrastructure, depot upgrade, power supply •OPEX: charging, maintenance, new skills
Standardisation & interoperability of e-vehicle charging	•High power fast charging (up to 600 kW) •Impact on battery life and grid stability
Smart charging strategies & energy storage systems	•Savings potential on energy bill by applying smart charging algorithms. •Depot upgrade (energy needs and power capacity, access to grid, etc.)
IT intelligence for optimised fleet operation and its integration with charging infrastructure	•Telematic diagnosis, scheduling and dispatching, eco-driving, real-time passenger information, etc.
Strong cooperation among & early involvement of all stakeholders	•To find common solutions •Know-how & best practice exchange with peer cities

Access to the grid, peak shaving, self-production of energy

Second life of batteries concepts

E-bus fleet upscale for any bus service, including BRTs

Electrification of bus fleets

Key factors today & in the future

Higher upfront costs	•CAPEX: vehicle, infrastructure, depot upgrade, power supply •OPEX: charging, maintenance, new skills
Standardisation & interoperability of e-bus charging	•High power fast charging (up to 600 kW) •Impact on battery life and grid stability
New ways of operating: vehicle vs fleet	•Smart energy management and charging strategies •IT intelligence for optimised fleet operation and its integration with charging infrastructure
New ways to procure vehicles & equipment	•Business models that allow fair risk split
Strong cooperation energy & bus stakeholders	•Integrate fleet electrification in the energy transition strategy •Cooperation with other modes to ensure energy supply (tram-metro-bus)
Know-how & best practice exchange with peer cities	

Access to the grid, peak shaving, self-production of energy

Second life of batteries concepts

E-bus fleet upscale for any bus service, including BRTs

Sharing existing PT infrastructure for energy supply

Benefits

- Standardisation and interoperability are key to enable fleet upscale and meet the needs of cities and public transport companies in terms of e-mobility strategies and plans
  - Push for standardisation and interoperability of the charging infrastructure
- Take advantage of existing electric infrastructure (tram/metro) for shared use at transport hubs
- The energy grid: reinforcement might be needed
- Explore if and how to make charging infrastructure available for other users

https://eliptic-project.eu/sites/default/files/ELIPTIC%20Policy%20recommendations_FINAL_LowRes.pdf

Planning new operations

Main aspects

1. Planning & system design
   - Different charging technologies – different impacts on scheduling
   - Cooperation with all stakeholders is essential
2. Operations management
   - Line characteristics and impact on range
   - Additional buses needed?
3. Training new skills and safety aspects
   - New skills for drivers, maintenance staff
   - Importance of the safety and training skills
   - Training first responders on the specificities of e- buses and charging technologies

Recommendations for Cities and Operators

Back up the e-mobility project

1. Integrate your ZE mobility strategy in your mobility plans
2. Engage stakeholders and set up cooperation at each stage of the project (planning, installations and operation)
3. Consider the space needs and impacts of charging infrastructure
4. Identify public space suitable for opportunity charging
5. Standardise the charging infrastructure and ensure interoperability, for other bus operators and other e-mobility services
6. Explore shared infrastructure for bus operators and other e-mobility services
7. Provide guidelines for PT infra (bus stops, charging points, power substations and transformers, etc.) to support compliance with the city visual identity

Recommendations for Cities and Operators

It is time to learn, plan and deploy!

1. Identify the suitable solution based on the city's characteristics and bus operations needs
2. Know local regulations and policy framework for efficient planning and deployment process, avoiding delays (permissions & connection points)
3. Upgrade fleet to full electric according to the city's needs and strategy and/or its electric mobility strategy, setting the frame of the e-bus deployment plan
4. Consider the strategic positions of bus depots for efficient operations
5. Be aware of the long-term financial impact in terms of health benefits compared to the financial cost of the system
6. Exchange with peer experienced cities: the technology is mature, and the knowledge is there

Thank You!

aida.abdulah@uitp.org

https://cms.uitp.org/wp/wp-content/uploads/2020/06/UITP-policybrief-June2019-V6-WEB-OK.pdf