



REPORT TO: CITY MANAGER

TO BE REFERRED BY THE OFFICIAL TO MAYCO VIA THE *URBAN MOBILITY SECTION 79* COMMITTEE [AFTER CONSIDERATION BY CITY MANAGER]

1. ITEM NUMBER

2. SUBJECT

FEEDBACK ON THE INTERNATIONAL/OUTSIDE THE BORDERS OF THE RSA TRIP UNDERTAKEN FROM 18 – 20 SEPTEMBER 2024 TO ATTEND THE UITP EURASIA CONFERENCE IN KAYSERI IN TURKEY

ISIHLOKO

INGXELO EMVA KOHAMBO KUMAZWE APHESHEYA/NGAPHANDLE KWEMIDA YASEMZANTSI AFRIKA EQHUTYWE UKUSUSELA NGOWE18 UKUYA KOWAMA 20 KWEYOMSINTSI 2024 UKUZIMASA INKOMFA ENGE- UITP EURASIA, ESE KAYSERI, ETURKEY

ONDERWERP

TERUGVOERING OOR DIE REIS NA DIE BUITELAND/BUITE DIE GRENSE VAN DIE RSA ONDERNEEM VAN 18-20 SEPTEMBER 2024 OM DIE UITP EURASIA-KONFERENSIE IN KAYSERI, TURKYE BY TE WOON

R1065

3. EVENT SUMMARY

EVENT DETAILS	
CONFERENCE/SEMINAR	UITP EURASIA CONFERENCE
OTHER	Craig Swain, Manager: Public Transport Fleet Management currently oversees the asset management of MyCiTi Phase 1 buses, which are diesel-powered. In anticipation of the MyCiTi Phase 2 roll-out in 2027, he has initiated a tender process for the Supply and Delivery of Battery Electric Buses (“BEB”). Given the branch's extensive familiarity with the operational and maintenance aspects of diesel-powered buses, this training course was aimed at enhancing the Department's understanding of Electric Buses within the operational framework of the MyCiTi bus service. The training course was an in person event and not available virtually.
DATE	18-20 September 2024
VENUE	Kadir Has Congress and Sport Center
TOTAL COST TO THE CITY	R63 695,89
CITY	Kayseri
COUNTRY	Turkey
ATTENDEE DETAILS	
NAME AND SURNAME	DESIGNATION
Craig Swain	MANAGER: PUBLIC TRANSPORT FLEET MANAGEMENT
PROVIDE SUMMARY OF HOST ORGANISATION / CITY	
UITP (“Union Internationale des Transports Publics”) is the International Public Transport Association and a passionate champion of sustainable urban mobility. Established in 1885, with more than 135 years of history, it is the only worldwide network to bring together all public transport stakeholders and all sustainable transport modes.	

4. OBJECTIVE

The conference is an ideal opportunity for the City of Cape Town (“the City”) to gather the required knowledge as the Urban Mobility: Public Transport Fleet Management branch (“PT Fleet”) is currently embarking on a tender to procure Electric buses for the roll out of MyCiTi milestones in the Metro South East area.

The City’s rollout of Electric buses in future E-bus operations and battery capacity are closely linked, requiring specific technical requirements based on schedules and conditions. E-bus operations differ significantly from traditional buses, including line management, maintenance, training, and safety. Proper planning is crucial, as battery electric buses have different autonomy and may need a larger fleet. Studying operational needs and designing lines based on energy supply and usage is essential for successful e-bus implementation

The analysis of battery management when deploying e-buses requires a systematic approach, including Life Cycle Cost (LCC) analysis to calculate the Total Cost of Ownership (TCO). This involves accounting for vehicle acquisition, operational, maintenance, and other costs (financial, insurance, licensing, administrative) over the e-bus system’s economic lifetime. Calculating TCO for various options helps decision-makers to perform informed economic choices.

The battery management system is the critical and most valued part of the asset and the life expectancy should be lengthened as far as possible and understanding the lessons learnt in other countries and organisations who have had years of experience would benefit the City to prevent those mistakes and achieve maximum battery life.

5. OUTCOMES

Over the course of the conference two workshops, four sessions and a guided tour had been convened as follows:

Workshop 1: Life Cycle Cost Analyses (LCCA) for different options of E-Bus:

The workshop focused on total cost of ownership using the following inputs by providing scenarios to determine best business model for EVs:

- Operational Data
- Tender data
- Tender information that is mandatory to be provided by Bidders in order to determine TCO

The objective of the group focus was to determine which EV business model was best suited to determine the following:

- How many additional EV buses required to replace the same amount of diesel buses using the same (Routes, km travelled daily/yearly and well as shortest routes within a cycle)
- The workshop centred around Energy consumption Kw/km (LD=1) which is referred to line difficulty / terrain that equates to energy or power consumption
- Energy consumption with Air-conditioning
- Energy consumption using the heaters
- Average battery replacement cost/km

- Average battery disposal cost/km
- Maintenance cost per km

The group needed to identify the suitable EV Business models that is currently being applied globally with new models emerging due to the cost of ownership relating to batteries and infrastructure:

Direct Procurement models:

Known as outright procurement models. The model is City of Cape Town model whereby the authorities own all assets (bus and infrastructure).The authority directly procures, maintains e-bus and the charging infrastructure and the cost associated.

Bus as a service:

In this scenario, the bus is leased from the manufacturer, which includes maintenance. Means the manufacturer owns the buses and rent to the authority to operate.

Battery as a service:

In this scenario, the manufacturers sell the bus without the battery packs. The responsibility to operate, repair, replace and dispose of battery packs resides with the manufacturer.

Charge as a service:

In this scenario, authority own the buses, in this model. However, all chargers and charging infrastructure supplied by third party energy providers. They charge the authority a rate per km or kW.

Gross cost contract:

In this scenario, private operators own all the assets and take all business and industrial risk. Authority pays operators as per bus km. Therefore, a simplified approach to understanding Life Cycle cost consist of adding the following cost:

$$LCC=IC+RC+SC+OC+MC+EC+INC$$

<i>Life Cycle Cost</i>	<i>Investment</i>	<i>Renewal</i>	<i>Sale</i>	<i>Operation Cost</i>	<i>Maintenance cost</i>	<i>Energy cost</i>	<i>Other cost</i>	<i>Disposal</i>
<i>LCC</i>	<i>IC</i>	<i>RC</i>	<i>SC</i>	<i>OC</i>	<i>MC</i>	<i>EC</i>	<i>INC</i>	<i>D</i>

Workshop 2: Route analysis & Battery capacity:

The group focus was to analyse operational data of each route and line to identify the battery capacity and the type of bus to provide the same level of service as that of a diesel bus. Analysing the battery capacity you will need to consider charging strategy i.e. charging at the depot, night charging, fast charging, slow charging or charging at the end of the routes (Opportunity charging) the feasible economic solution needed to be.

The group needed to consider the following when making a determination:

- Battery health

- Degradation
- State of charge (SOC)

The use of specific battery types (NMC and LFP batteries) which are slow charging and the SOC taken at 75% which means that at all times only 75% of battery will be available for operation. This affected the range of the battery as at fully charged only 75% could be used as it would ensure battery life is achieved which is critical as 30% of the asset value is the battery cost. Therefore, if a battery range on a full charge is 250km only 75% of the 250km is available for the operation. The impact of these calculations affected the amount of chargers required at the depot and on routes. The bus type required to service these routes as well as the pantograph charges at each end of route. The amount of dead km or off route km as well as traffic deviations will affect km availability.

The following outcomes were achieved by understanding these core information including passengers using the service on average.

- How many e-buses could be used
- The type of e-buses (9M . 12M or 18M)
- The battery capacity you will need to run the these buses on the scheduled routes
- How many charges would be required at the depot and route ends
- How many opportunity chargers required to service these routes

Session 1: Policies using clean energy vehicles in public transport

The official conference day brought together transport experts, city officials, and industry leaders to discuss the latest trends in public transport and clean energy. Key topics included the electrification of public transport fleets, the necessity of shifting from private cars to public transport, and how high-level policy can support this transition. Speakers emphasised the wide-ranging benefits of public transport, such as improved safety, public health, job creation, and reduced congestion. The message was clear: public transport is not a cost but an investment with numerous societal and economic benefits.

The keynote speech was delivered by Mohamed Mezghani, UITP General Secretary, who highlighted the growing political support for public transport worldwide. He noted that public transport requires institutional backing to expand, as it is a public service that delivers significant benefits. Mezghani stressed that people will only move away from private cars if comfortable public transport alternatives are provided, and that the goals of the Paris Agreement cannot be met without clear objectives for the introduction of clean transport.

Kayseri Mayor Dr. Memduh Büyükkılıç announced the city's upcoming renewable energy projects: a 21 MW wind power plant and a 1.8 MW rooftop solar plant both set to launch by the end of 2024. These initiatives will produce twice the energy needed for public transport, helping reduce 15,000 tons of carbon emissions annually. Already, 40% of Kayseri's public transport operates on clean energy, and the city's Climate Change Action Plan aims to achieve carbon neutrality by 2028.

Mücahit Arman, Head of Strategy Development at Turkey's Ministry of Transport and Infrastructure, shared that Turkey is working to reduce carbon emissions by increasing the share of rail transport from 5% to 22% by 2053, with investments totalling \$273.8 billion. Turkey aims to pioneer rapid transport development in the region.

UITP sees its role in providing expertise and raising awareness of public transport's contribution to national decarbonisation plans, highlighted Mohamed Mezghani. Leading cities like Paris, which has doubled its public transport network and introduced dedicated electric bus lines, and Vienna, where 80% of trips are made via public transport, serve as examples of best practices.

Orhan Solak, Deputy Director of Climate Change at Turkey's Ministry of Environment, Urbanization, and Climate Change, confirmed that Turkey is rolling out programmes at both national and local levels. While 12 Turkish cities currently have urban rail systems, plans are underway to expand rail transport to cities with populations below 500,000.

Session 2: Transitioning to clean energy Vehicles: Financing and procurement

The discussion shifted from politics to finance and procurement, led by Jaspal Singh, UITP Senior Director of Membership & Global Operations. Tali Trigg, Principal for Green Cities and Electric Mobility at the EBRD, showcased projects supporting public transportation infrastructure, emphasising the need for proactive planning to avoid congestion. Ragub Garazade, Transport Specialist at the World Bank, noted that the WB is the largest provider of development financing for sustainable mobility, with a transport portfolio exceeding \$34.2 billion. Nevzat Bayrak, R&D Centre Manager at Metro Istanbul, explained how companies are solving procurement challenges by focusing on innovation, localisation, and technology transfer, particularly through Industry Cooperation Projects. The session also featured insights from India, where Kahini Ojha, Researcher on Low Emission Zones and Electric Buses, shared developments in transitioning to clean energy vehicles. Participants were invited to the upcoming UITP India Bus Seminar in New Delhi on 20-21 November 2024.

Session 3: Clean energy vehicle solutions and implementation for urban public Transport Session

Feyzullah Gündoğdu, Head of UITP Eurasia, provided an overview of solutions for implementing clean vehicles, highlighting the growing popularity of hydrogen fuel cell electric buses. Mehmet Canbulut, CEO of Kayseri Ulaşım A.Ş., expressed concerns about technological risks but remained optimistic about future financial opportunities for investment in new bus technologies.

Session 4: Experience sharing from Operators using e-bus

Transport policy formulation should be prioritised. Electrification is essential in combating climate change, but a modal shift is equally crucial. High-level policies should encourage the public to shift from private vehicles to public transport. Public transport contributes significantly to societal well-being by improving safety, public health, job creation, and economic growth and should be viewed as an investment, not a cost, due to its long-term benefits. Cities should ensure that land-use planning aligns with transportation goals to maximise efficiency and sustainability. Public transport systems must be resilient to address broader urban challenges beyond electrification. Stronger collaboration between central and local governments is essential for effective policy implementation at the municipal level.

Kayseri Bus depot tour and City guided tour: Technical visits to the Kayseri bus depot and control centres:

The final day of the conference was dedicated to technical and cultural site visits in and around Kayseri. Participants enjoyed a guided tour of the city's historical landmarks, providing a glimpse into Kayseri's rich cultural heritage. The visit also included a trip to the Kayseri Transport LRT Depot, where attendees observed the city's modern light rail transit system and efforts to integrate e-buses into the urban fleet. The day concluded with a journey to Cappadocia, a UNESCO World Heritage site known for its stunning landscapes and ancient cave dwellings. This cultural excursion offered a unique opportunity for attendees to reflect on the conference discussions and consider how public transport can support sustainable tourism and regional development.

6. ACTIONS REQUIRED

The conclusion of the conference did not necessitate any further obligations. Instead, the experience provided the much-needed insight required for the efficient battery management and the knowledge to effectively manage and maximize the use of electrical bus charges.

Key conference takeaways:

- Electrification is essential in combating climate change, but a modal shift is equally crucial. High-level policies should encourage the public to shift from private vehicles to public transport.
- Public transport contributes significantly to societal well-being by improving safety, public health, job creation, and economic growth and should be viewed as an investment, not a cost, due to its long-term benefits.
- Cities should ensure that land-use planning aligns with transportation goals to maximise efficiency and sustainability.
- Public transport systems must be resilient to address broader urban challenges beyond electrification.
- Stronger collaboration between central and local governments is essential for effective policy implementation at the municipal level.

Lessons learnt from other City Operators:

- The battery cost is approximately 30% of the bus cost and there is no clear framework or international guidelines of how to discard or recycle
- The majority of batteries are being manufactured in China and very few in the European countries
- The challenge faced by bus drivers was the fear of not having enough charge to complete their duties and need to be convinced through a change management process of training
- Local parts manufacturing is a challenge especially when all parts are manufactured internationally with lengthy lead times
- The supply of spare parts lead times, specifically electronic parts were between 8 -12 weeks
- The repairing of electrical parts is a challenge and 80% unable to be repaired
- The stock holding of critical spares will be important however, the additional cost will have a major impact on initial set-up cost

- Power interruptions may be a challenge as it affects the fleets i.e. certain countries having mild earthquakes had major challenges especially with back – ups.
- Initial cost of ownership was a major challenge (Bus and infrastructure cost) i.e. Infrastructure cost of 31 000 Euros per charger
- Cities are considering different models whereby manufacturers take care of battery model as illustrated in the scenario above
- Planned Services is critical and transferring of skills to local companies is important
- Electricity companies needed to be part of the process from the start in order to ensure the transferring from Diesel to EVs is seamless

7. IMPLICATIONS

7.1 **Constitutional and Policy Implications** No Yes

7.2 **Environmental implications** No Yes

7.3 **Financial Implications** No Yes

7.4 **Legal Implications** No Yes

7.5 **Staff Implications** No Yes

7.6 **Risk Implications** No Yes

7.7 **POPIA Compliance**

It is confirmed that this report has been checked and considered for POPIA Compliance.

NOTE: POPIA Section MUST be completed otherwise the report will be returned to the author for revision.

Contact your Directorate POPIA Stewards should you require assistance.

The City has a contract in place with Izani Embassy Joint Venture for the safe-keeping of Traveller's personal information as required by the POPI Act.

8. RECOMMENDATIONS

It is recommended that the feedback report on the trip to attend the UITP Eurasia conference in Kayseri, Turkey undertaken by Craig Swain on 18-20 September 2024 **be considered and noted.**

IZINDULULO

Kundululwe ukuba **makuthathelwe kwaye kuqwalaselwe** ingxelo engasemva kohambo ukuzimasa inkomfa engeUITP Eurasia, eseKayseri, eTurkey, oluqhutywe nguCraig Swain, ukususela ngowe18 ukuya kowama20 kweyoMsintsi 2024.

AANBEVELINGS

Daar word aanbeveel dat die terugvoeringsverslag oor die reis onderneem deur Craig Swain van 18-20 September 2024 om die UITP Eurasia-konferensie in Kayseri, Turkey by te woon **oorweeg en daarvan kennis geneem word.**

9. GENERAL DISCUSSION

The City has set certain targets and made climate change commitments on carbon reduction and the adoption of green energy. These are contained in the Council-approved documents titled Carbon Neutral 2050 Commitment and the Climate Change Action Plan (CCAP).

The CCAP contains several actions that relate to the MyCiTi IRT system:

Action 20.1: Develop a procurement strategy for low-carbon emission vehicles and fuel technologies towards carbon neutrality.

Action 20.2: Develop the necessary policy and regulatory environment to promote the uptake of electro-mobility freight and electric passenger transport (including public and private vehicles and minibus taxis) and manage risks to the electricity grid.

Action 20.3: Show City leadership and gather real-world data from Electric Vehicles (EV) pilot programs such as the installation of publicly accessible demonstration chargers and the procurement of EVs for the City fleet.

The denoted procurement strategy is in furtherance hereto and the attended training seeks to provide the City with the insights required to meet these commitments.

The City therefore stands to gain from the practical implementation of lessons learnt during the course, contributing to the enhancement of the MyCiTi bus service.

10. ANNEXURES

Annexure A: Approved Travel Report

FOR FURTHER DETAILS, CONTACT:

DATE	02 October 2024		
NAME	Craig Swain	CONTACT NUMBER	021 400 3094
E-MAIL ADDRESS	Craig.Swain@capetown.gov.za		
DIRECTORATE	Urban Mobility	FILE REF NO	
SIGNATURE :			

EXECUTIVE DIRECTOR

DALENE CAMPBELL

COMMENT:

The ED's signature represents support for report content and confirms POPIA compliance.

SIGNATURE:

NAME

DATE

MANAGER: INTERNATIONAL RELATIONS

DR. DENVER VAN SCHALKWYK

COMMENT:

SIGNATURE:

DATE

REPORT COMPLIANT WITH THE PROVISIONS OF COUNCIL'S DELEGATIONS, POLICIES, BY-LAWS AND ALL LEGISLATION RELATING TO THE MATTER UNDER CONSIDERATION.

LEGAL COMPLIANCE

NON-COMPLIANT

COMMENT:

NAME _____
TEL _____
DATE _____

CITY MANAGER

NOTED

REFER TO THE MAYORAL COMMITTEE VIA THE RELEVANT SECTION 79 COMMITTEE

DATE _____

COMMENT:

