

MEETING OF THE US-MEXICO TASKFORCE ON ELECTRIFICATION OF TRANSPORT: ELECTROMOBILITY IN CITIES

November 30 - December 1, 2022 | [Online Workshop](#)

Day 1 Speakers

- **Isabel Studer**, UC Alianza MX
- **Martha Delgado**, Undersec. for Multilateral Affairs and Human Rights, Mexican Ministry of Foreign Affairs
- **Carina Arvizu**, Cities Director, Mexico & Colombia, World Resources Institute (WRI)
- **Gil Tal**, Director, Plug-in Hybrid & Electric Vehicle (PH&EV) Research Center, Institute for Transportation Studies at UC Davis
- **Andrés Flores**, Director of Climate Change and Energy, WRI México
- **Diana Guzmán**, General Director for Climate Change Mitigation Policies, Mexican Ministry of Environment
- **Guadalupe Contreras**, Intl. Relations Specialist, U.S. Department of Transportation
- **Laura Sima**, Director of the Department of Energy Office, U.S. Embassy, Mexico City
- **Leticia Pineda**, International Council on Clean Transportation (ICCT)
- **Sydney Vergis**, Division Chief for Mobile Source Control Division, California Air Resources Board (CARB)

In the face of the rapid global transition to zero-emission vehicles (ZEV), Mexico finds itself at a critical juncture. As a producer of vehicles for export to the United States, it plays a key role in the development of a cross-border green economy in the auto industry. However, it is also capable of taking a more direct approach to confronting climate change within its own borders by implementing new technologies to increase electromobility in cities.

As part of the activities undertaken by the **US-Mexico Taskforce on the Electrification of Transport and the North American Auto Industry**, the Electromobility in Cities Working Group held a two-day online workshop in November-December 2022 to discuss the binational outlook for sustainable mobility in the area of public transport.

E-Mobility in Public Transport: Opportunities and Barriers in Mexican Cities

As a key partner of the working group, the **World Resources Institute (WRI)** team in Mexico shared information on their support for the country's transition to electromobility, with a focus on the deployment of electric buses across major cities and states. Several notable examples showcased the diverse range of options available to local leaders:

- *Mexico City* has implemented all-electric trolleybuses
- *Puebla* has initiated a pilot project (MoveUp) to implement electric minibuses
- *Yucatán's* IE-TRAM project includes plans to complete an all-electric Bus Rapid Transit (BRT) System in late 2023

Despite these advances, the working group also noted that electromobility faces major barriers in Mexico (*see page 2*).

Overcoming these challenges to pave the way for more widespread adoption of EV public transport will require greater collaboration among stakeholders, including government entities, financial institutions, industry organizations, and technology providers. The specific benefits of this collaboration include greater social inclusion, stronger promotion of the green economy, more rapid fleet renewal and formalization, reduced maintenance costs, and greater local manufacturing opportunities.

California Electromobility in Cities: The Role of Transit Electrification

To achieve a zero-emission vehicle fleet, California officials have implemented a range of actions affecting mobility, including regulations, subsidies, and infrastructure development. State leaders have set a goal of completing 100 percent of the transition to EV public transport by 2040 and mandated electric batteries for new vehicles. The Zero Emission (ZE) Fleet Standard for airport shuttle buses, public and private bus fleets, cutaway shuttles, and passenger vans also aims to electrify 66 percent of the fleet by 2031 and 100 percent by 2035.

Given these ambitious standards, the working group meeting highlighted the importance of choosing the most suitable technology for electrification. Battery electric buses remain the predominant option despite high battery prices and the need for infrastructure expansion. Hydrogen fuel cell technology is also being explored, although its cost and suitability vary based on specific circumstances. And regardless of the specific technology, optimization models will be vital to maximizing efficiency that meets the state's objectives.

Day 1 Takeaways

Looking ahead, the next steps in the EV transition for public transport include comprehensive **infrastructure planning** and **utility upgrades**. Accelerating the transition requires **adequate funding**, while collaboration among government, private sector, and other stakeholders is key to seizing new and emerging opportunities.

Barriers to Electromobility in Mexico

Energy: Electric buses require access to reliable and affordable energy. Further knowledge and expertise are needed to optimize energy management and infrastructure for efficient EV operations.

Finance: Many companies operating public passenger transport services in Mexico struggle to access funding, especially since some of these companies operate semi-formally or informally. They are often ineligible for conventional financing schemes, hindering their ability to invest in EV transport infrastructure.

Operations: It is crucial to build long-term relationships with suppliers and access maintenance information for EV public transport. Each city's business model must align with its unique operating requirements, as these can vary from one location to another.

Public Policy and Governance: The electromobility transition, requires a robust legal framework that includes components dedicated to energy, education, fiscal, infrastructure, social, and technology policy.

Technology: Local markets face incompatibilities between different brands and technological developments in the electric vehicles sector.

Research Supporting the EV Transition

Research plays a pivotal role in supporting the development of new technologies key as well as providing evidence to inform leadership and policy decisions. Day 2 of the workshop focused on insights from several research initiatives in California and Mexico that promise to support the EV transition.

Electrical Transport and Sustainable Mobilities: An Ecosystem for Mexico

Addressing sustainability challenges such as those related to demographic growth (see *page 4*) often requires a multi-dimensional approach to mobilization. When these problems are not neglected, local policy responses can still be defensive, leading to political debates and controversies or policy hedging that does not necessarily support access to sustainable transport options. The greatest potential for change lies in promoting diverse strategies for local communities based on their needs and capabilities.

One working group partner, **El Colegio de Sonora**, is organizing a project designed to create an ecosystem for electric transportation and sustainable mobilities that includes collaborators from academic institutions, research networks, environmental agencies, and civil society organizations in Cuernavaca, Morelos, and Hermosillo, Sonora.

These cities have implemented "green routes" in vulnerable areas that are heavily reliant on public transportation, thereby reclaiming public space to encourage eco-friendly transportation. Participants have also conducted workshops to identify and support community leaders driving sustainable mobility initiatives, as well as environmental monitoring with a focus on heat islands, particulate matter, and GHG emissions.

As the project expands, designers have recognized the need for systematic education across various sectors, including students in the public education system as well as municipal and legislative leaders. In addition to continued focus on establishing green routes, their efforts now include an additional focus on community engagement to foster knowledge and awareness and obtain public support in the fight against climate change.

Day 2 Speakers

- **Isabel Studer**, UC Alianza MX
- **Gil Tal**, Institute for Transportation Studies at UC Davis
- **Alex Covarrubias**, Professor, TEAMs Interdisciplinary Group on Transportation and Sustainable Mobilities, El Colegio de Sonora
- **Ana Alcántara**, Transportation Team Lead, Mexico Partnership for Net Zero Cities
- **Gabriela de la Torre**, Leader of the TUMI E-Bus Mission project for Mexico and Colombia, World Resources Institute (WRI)
- **Ilse Cervantes Camacho**, Head of the Automotive Innovation Research Network, National Polytechnic Institute
- **Salvador Monroy**, Director of International Motor Transport Services, Mexican Ministry of Infrastructure, Communications & Transportation

Challenges of Demographic Growth

Demographic growth in cities presents several challenges for the implementation of electro-mobility. Addressing these challenges requires a comprehensive and coordinated effort from government officials, private sector stakeholders, and civil society to implement tailored strategies.

Charging infrastructure: Expanding charging station capabilities and disaggregating electricity supply within cities are key to providing sufficient charging options for EVs.

Collective mobility: Using public transport rather than private vehicles can reduce congestion and emissions in growing urban areas.

Ecosystem and smart cities: A successful transition relies on the development of an ecosystem that supports EV public transport options and the integration of smart technologies.

Relevant authorities: Beyond the local level, key federal and state actors play essential roles in the electrification of heavy commercial vehicles in urban areas, which complete trips that have their origins and destinations in cities but require additional infrastructure supports beyond local jurisdictions.

EV buses also pose various challenges, especially for long trips on federal interurban roads. The transition must address issues such as bus autonomy, charging infrastructure, and required charging times.

Innovative Design Elements of Electrification

The working group also noted that Mexico will require significant upgrades to its electricity systems to support a complete zero-emission transition in public transport networks. Although the Energy Transition Law sets a goal of producing at least 35 percent of Mexico's total energy via renewable sources by 2024, its energy supply continues to rely heavily on non-renewable sources without a clear plan to achieve this goal.

Day 2 discussion of technologies to support electrification reviewed several potentially innovative changes to infrastructure and utilities in the design of public transport networks, particularly for EV buses:

- **High Power Density Converters:** Increase vehicle autonomy by ensuring high power density and efficiency, reducing the weight of the powertrain
- **Plug & Play in Smart Cities:** Incorporate intelligent systems and AI for enhanced safety monitoring
- **Passive safety:** Protect against crash scenarios and mitigate risks associated with explosive electrical equipment like lithium batteries.
- **Advanced battery safety measures:** Include anti-explosion technology such as detection of defective batteries and systems to predict risks during charging
- **Multi-rate charging stations:** Minimize stress on batteries and the grid during charging

Looking ahead, working group members noted that storing energy in hydrogen instead of batteries could also present a valuable alternative for energy savings, including a reduction in the water required for extraction.

Day 2 Takeaways

Although the EV transition for public transport faces significant **technological challenges**, potential solutions are available through well-designed public policies and regulations that **stimulate adoption of sustainable practices**. Collaboration among key stakeholders should be supported by an extensive **research agenda** that informs leaders and allows them to take measured risks and make timely decisions.