LEDS GP's ELECTRIC MOBILITY COMMUNITY OF PRACTICE – MOVILILAC - CASE STUDY

The importance of having a sustainable mobility strategy in place

3 sustainable mobility strategies supported by MoviliLAC through technical assistance

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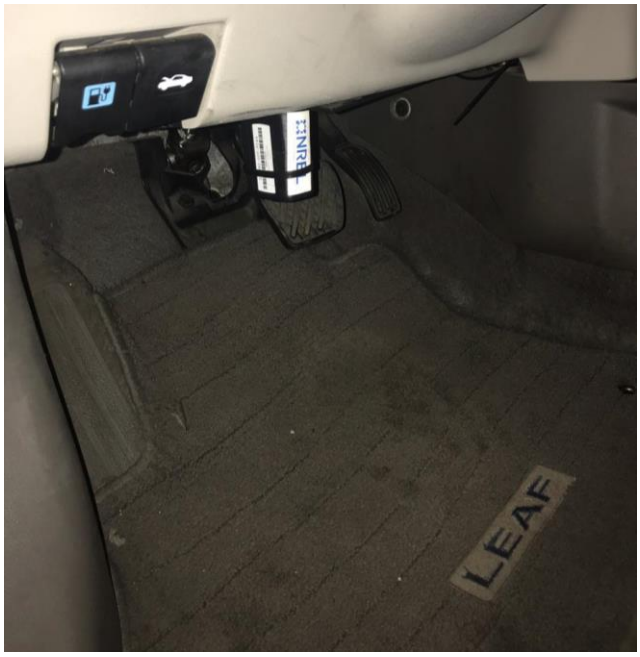
January 2020

The LEDS GP's transport experts advised the Cities of Bogotá, Colombia; Mexicali, México and Curridabat, Costa Rica on sustainable mobility strategies and provided the groundwork for decision-making on low-carbon technology, sustainable modes of mobility, pilot projects, among others. The city governments have now specific roadmaps to meet their particular goals on sustainable mobility as a result.



NREL datalogger installed in an electric taxi in Mexicali, Baja California, Mexico

["Thanks to the MoviliLAC's technical assistance, we identified the elements that have not been successful in the electric taxi pilot project and now we have the necessary elements to consider in its redesign" Adriana Macías, City of Mexicali.]

Key Take-aways

- MoviliLAC delivered three technical assistance in 2019: 1) formulation of a technical annex for contracting an electric mobility strategy in Bogotá, Colombia; 2) foundations of an electric mobility strategy in Mexicali, Mexico; and 3) development of a sustainable mobility strategy in Curridabat, Costa Rica.
- A sustainable mobility strategy is key to identify the necessary steps to be taken in order to meet specific mobility goals. This includes the stakeholders and institutions to be involved in the delivery of specific actions, information to be gathered for decision-making and resources needed for implementation, among others.
- The technical teams of the cities do not have technical knowledge about electric mobility, which are necessary to make decisions for the massification of low carbon mobility. The support of NREL experts was key in all three technical assistance, but it is necessary to generate greater capacities at the local level.
- There is a significant amount of information available in the cities that is relevant for decision-making regarding mobility. However, there is no specific information to make decisions on sustainable mobility at the project level. The technical assistance provided by MoviliLAC to Mexicali implemented dataloggers in electric taxis as an innovative approach to gather information on the covered areas by these vehicles and make decisions about potential locations of charging infrastructure.
- Sustainable mobility solutions vary from one city to another, but in general these depend on five key factors: 1) local infrastructure and city design; 2) mobility patterns and dynamics; 3) electricity demand curves and composition of the generation matrix; 4) technology options available in the market; and 5) weather conditions.
- MoviliLAC members prioritized the generation of knowledge in electric bus systems. However, in the delivery process of the technical assistance, other high-use-transport-modes appropriate to each context were identified, such as electric taxis and bicycles, walking, garbage trucks, school buses, among others.
- The strategies or elements for the development of a sustainable mobility strategy developed in the framework of MoviliLAC's technical assistance are replicable to other Latin American cities. These documents consider necessary elements for the promotion of low carbon mobility, which can be adapted to the context of any city with relevant information and

stakeholder involvement.

- In Costa Rica and Mexico, MoviliLAC is seeking to replicate the technical assistance in other municipalities in order to build a sustainable mobility strategy at the city or state level with a bottom-up approach.
- The success factor of these three technical assistance was the leadership and political commitment demonstrated by the cities. The involvement of the local government in defining the scope and implementation of technical assistance was always at the level of the mayor's office or the secretariat of mobility.
- A central element in the formulation of electric mobility strategies is stakeholder participation and dissemination, which can be implemented in different ways. In Bogotá, the local government preferred face-to-face meetings for design validation, while in Curridabat and Mexicali closed webinars were implemented to disseminate the results of technical assistance to other municipalities.

Context

The Electric Mobility Community of Practice (CoP) of the LEDS GP Transport Working Group – MoviliLAC - is an interactive network comprised of national and subnational governments, technical institutions, academia, private companies, not-for-profit and other international organizations addressing real-time policy, financing and technical barriers and solutions related to electric mobility in Latin America and the Caribbean. It is a platform for ongoing collaboration to allow peer to peer learning, a deeper understanding of the options available to overcome barriers, continuous access to tools and expert assistance, and to foster leaders that will serve as coaches for other countries in the region. MoviliLAC is designed with a bottom up approach in order to address the main barriers for the transition to electric mobility in the LAC region and to offer support to countries to do so.

MoviliLAC's kick-off activity consisted of a survey to gather information on barriers and priorities for electromobility in the region. The results indicated the need to have an electric mobility strategy in place and the generation of knowledge about electrification of bus systems as the main barrier and priority, respectively.

As part of the 2018/2019 activities of the LEDS GP Transport Working Group, MoviliLAC delivered technical assistance to three cities. The recipients were selected through an open call where applicants should identify support needed to overcome a specific barrier to sustainable mobility. Those applications aligned with MoviliLAC's main priorities in 2019 were selected. These are:

Bogotá

In Colombia, GHG emissions from the transport sector account for 11% of the national total (Third National Communication on Climate Change, 2016). Bogotá is also the city with the largest share of

emissions from the transport sector in the country, accounting for 58% of total emissions at the city level. In this regard, Colombia included as part of its NDC measures related to electromobility covering buses, taxis, motorbikes and private vehicles. In response to these challenges, Bogotá established tax exemptions for electric vehicles, implemented pilot projects (Decree 566 of 2011), formulated the Technological Escalation Plan for the Integrated Public Transport System and signed an agreement for technological reconversion of public and private transport fleet in Bogotá (Agreement 002 of 2015). The City Government also aimed at designing a zero-emissions mobility plan, including electric mobility technology options, among others. Therefore, the Mobility Secretariat opted to hire a consulting firm to collect the necessary information and design the strategy. However, the city lacked the technical expertise on electromobility in order to ensure proper ownership of this process by government officials.

As a result, the technical assistance provided by MoviliLAC consisted of designing the technical annex to be included in the terms of reference for this consulting process. The technical annex was developed by NREL and focused on the electric mobility pillar of the broader Zero-emissions Mobility Strategy.

Mexicali

Motorization rate in Baja California is about 419 vehicles per thousand inhabitants, mostly consisting of second-hand vehicles imported from the United States (almost 7 times the total number of domestic vehicles) (IEGEI 2015). Therefore, the transport sector in Baja California accounts for 50% of CO2 -equivalent total state emissions (IEGEI 2015), 64% of carbon monoxide emissions and 79% of PM10 emissions (PROAIRE 2011).

The Government of Mexico has made progress on implementing the National Strategy on Climate Change, including the use of sustainable modes of transportation and the use of public and private electric transport. In 2017 formulated the National Air Quality Strategy (Spanish acronym PROAIRE) requiring all states to define short-, medium-, and long-term measures to reduce air pollutants related to the transport sector. The National Government also formulated the National Electric Mobility Strategy, establishing the guidelines to promote electromobility at national level. At subnational level, the city also made significant efforts in order to implement the NDC and the National Air Quality Strategy at the local level, by formulating the PROAIRE 2011–2020, which aims at reorganizing transport routes, renewing the fleet and improving energy efficiency, among others. The City of Mexicali also signed an Agreement with public-transport companies to annually renew 10% of the total fleet. Signed an agreement with the Autonomous University of Baja California to receive support from engineering faculty students to deliver the aforementioned actions.

Despite efforts made both by the national and subnational governments, barriers still exist that limit the transition to sustainable mobility, such as the advanced age of the public and private transport fleets, lack of capacity to generate strategies and regulatory frameworks necessary to encourage the introduction of zero-emission technologies in the transport sector, and lack of capacity of the grid to support large numbers of EVs. Therefore, the technical assistance supported Mexicali by generating the foundations of an electric mobility strategy, following the guidelines of the National Strategy for

Electric Mobility.

Curridabat

In Costa Rica, public transport has been traditionally underregulated by the National Level and delivered by the private sector, resulting in outdated services in terms of quality and safety for users and disconnected from other transport services. As a result, people choose private modes of transport increasing motorization rate at 2,71% on a yearly basis (ECLAC 2015). Therefore, the transport sector accounts for 46% of total energy consumption and generates 31% of GHG emissions at national level (Third National Communication on Climate Change 2014). It is projected transport-related emissions will increase by 187% by 2021.

Costa Rica, through its NDC, has committed to reduce by 44% the GHG emissions referring to a Business as Usual (BAU) scenario and to reduce by 25% referring to the GHG emissions levels of 2012. The National Energy Plan 2015-2030 outlines actions to strengthen the Efficient Vehicle Acquisition Program (PAVE) and generate the technical and normative conditions for the diversification of public transport the fleet, among others. The National Climate Change Strategy lays out, for the transport sector, a strategy for technological renovation and modernization of vehicle fleet and the mandatory development of Sustainable Mobility Plans (SUMPS). At sub-national level, the City of Curridabat formulated the Strategy of Access to desired destinations in order to improve the overall travel experience by strengthening non-motorized infrastructure and enabling alternative modes of transport.

Despite all the efforts made by the National and Subnational Governments, there are still barriers limiting the transition to sustainable mobility, such as the high cost of technology, cultural aspects related to vehicle-ownership and lack of capacity to develop and implement integrated strategies for sustainable mobility. The technical assistance supported the Municipality of Curridabat by developing a Sustainable Mobility Plan as part of the broader “Strategy of Access to desired destinations”.

High-Impact Activities

Mobility plays a key role, both in the economy, for its participation in foreign and domestic trade, as well as in social welfare, satisfying the demand for goods and services, as well as allowing social integration (Rodríguez Tornquist & Cruz 2015). However, transport implemented in a disjointed and fragmented manner has resulted in negative externalities that affect quality of life and competitiveness. Therefore, it is essential to have a long-term perspective that makes sustainability the central elements of the future of mobility (World Bank 2017).

In fact, lack of planning tools for sustainable mobility was identified a common challenge among the MoviliLAC members. For this reason, MoviliLAC, as part of its 2018-2019 activities, supported three cities in the formulation of sustainable mobility strategies, which were adapted to their particular needs and priorities:

1) Development of a technical annex to tender an electric mobility strategy in Bogotá, Colombia

The Bogota's District Mobility Secretariat has the obligation to formulate the Integrated Sustainable Mobility Plan (PIMS)[1] and to meet the goals of technological conversion of vehicles established in both the District Plan for Risk Management and Climate Change[2] and in the Technological Escalation Plan for the Integrated Public Transport system[3].

To meet these obligations, Bogotá is moving forward with the formulation of the PIMS with a zero emissions approach and considering different technological alternatives for each mode of transport. One of these alternatives is electric mobility, since both the District Risk Management and Climate Change Plan and the Technological Escalation Plan consider the electrification of taxis, buses and private vehicles. Therefore, the city needed to develop an electric mobility strategy in order to develop this component, considering the lessons learned from pilot projects developed previously in the city.

In response to this public policy framework and the political intention to move advance in electric mobility, Bogotá was selected as one of the recipients of MoviliLAC 2018/2019 technical assistance. The Mobility Secretariat had the task of designing the technical requirements to launch an international tender for the design of the electric mobility component of the PIMs. However, the technical team of the Secretariat did not have specific knowledge in electromobility to ensure that the consulting firm to consider all the necessary elements for the development of an electric mobility strategy for the city.

The technical assistance consisted in assigning one expert in electromobility to develop the technical requirements of the tender (technical annex). This document should detail all the activities to be carried out by a consulting firm in order to develop an electric mobility strategy, that is: (i) the information to be collected / generated, (ii) the analyzes to be developed, (iii) the deliverables, and (v) the consultation and outreach process with stakeholders. The progress of this document was consulted with the Secretariat's team in biweekly calls to ensure the appropriate consideration of the city's energy systems, market conditions, mobility culture and patterns, and infrastructure. Once a preliminary version of the technical requirements document was available, it was consulted with the Mobility Board (created by district agreement 663 of 2017) in order to ensure engagement of key stakeholders and collectively define a vision of mobility for the city that goes beyond the particular barriers of each economic sector.

The District Mobility Secretariat will open the bidding process in 2019/2020. The technical assistance was provided by the team of the National Renewable Energy Laboratory of the United States (NREL), with the support of the NGO Asociación Sustentar.

2) Foundations of an electric mobility strategy in Mexicali, Mexico

[1] Stated as mandatory by the Decree 037 of 2019
[2] Agreement 002 of 2015
[3] Decree 477 of 2013

In response to high air pollution4, the municipality of Mexicali has the obligation to implement the Management Program to Improve Air Quality (PROAIRE 2011-2020), comply with the objectives of the "Right to a Clean Environment Strategy" within the framework of the Mexico - United States border environmental program 2012-2022 and to implement the National Climate Change Strategy and the National Electric Mobility Strategy.

To comply with these obligations, Mexicali signed a technology conversion agreement with public transport companies5, implemented a pilot project for electric taxis and signed an agreement with the Autonomous University of Baja California to reorganize public transport routes and design a BRT line (express line 1). However, although these policy strategies consider electromobility as a key element for the reduction of air pollutants, these efforts were being carried out as isolated initiatives, without a planning framework, coordination mechanisms and common goals.

The city had a clear need for an electric mobility strategy in order to consider electrification in a more comprehensive way. For this reason and for having public policy background in place, Mexicali was selected as one of the recipients of MoviliLAC 2018/2019 technical assistance. As Mexicali's team did not have the enough technical capacity and resources develop an electric mobility strategy to meet the goals established in the different policy instruments and to consider their broader aspects, such as the involvement of key actors, development of regulations and infrastructure, generation of markets and technical capacity, prioritization of modes of transport, among others.

The technical assistance consisted in assigning a set of three experts in mobility and electromobility for the design of the foundations of an electric mobility strategy in Mexicali. The document details all the studies and considerations necessary to further develop electric mobility in Mexicali and support decision-making regarding transport electrification, that is: (i) assess the benefits, (ii) evaluate the energy matrix and energy demand to generate recommendations on vehicle charging and identify additional generation needs, (iii) electrification of public transport, not only massive transport but also individual and last-mile modes, (v) identify early adopter that could support market development, (vi) identify charging needs and generates recommendations on infrastructure development, and (vii) makes recommendations on capacity building. This document was developed by the set of experts based on secondary information already existing in Mexicali and primary information, collected with a datalogger that was installed in an electric taxi. Both the document and the analyses were reviewed and discussed in biweekly calls with the Mexicali team to ensure a better understanding of the local context by the experts and at the same time to build capacities in the subnational government.

The final document of the strategy and the analysis developed for electric taxis were presented in an online exchange session to MoviliLAC members and representatives of the governments of other cities in Baja California in order to generate interest in replicating the experience, support compliance with national policies on climate change and air quality with a bottom-up approach.

The technical assistance was provided by the team of the National Laboratory of Renewable Energies of the United States (NREL), with additional funding from USAID and the support of the NGO Asociación Sustentar. It is important to note that the team of experts developed the foundations

[4] Mexicali is the most polluted city in Mexico (WHO 2018)
[5] Which aims at renewing 10% of the total fleet on a yearly basis.

of the electric mobility strategy and focused in deep on some elements of it. The other elements will be developed in detail by the Autonomous University of Baja California, thanks to an agreement to support the generation of information, project development and design of policies on sustainable transport. Thus, Mexicali has a roadmap that must continue to be developed to support the massification of transport electrification.

3) Formulation of a sustainable mobility strategy in Curridabat, Costa Rica

The low level of regulation of public transport services in Costa Rica has resulted in a poor level of service that encourages the growth of private vehicle use. For this reason, the National Climate Change Strategy proposes three strategies to promote sustainability in the transport sector and reduce emissions. These are: i) transport demand management, ii) a program for technological renovation and modernization of the vehicular fleet, and iii) development of Sustainable Mobility Plans (SUMPS).

To implement these strategies, the municipality of Curridabat is developing the Strategy to Access Desired Destinations with the objective to support local mobility patterns and improve the overall travel experience by strengthening non-motorized infrastructure and enabling alternative modes of transport. However, the municipality has a reduced mobility team, with limited capacity to develop all the components of such strategy.

As Curridabat had in place a clear vision of sustainable mobility, the Municipality was selected as one of the recipients of MoviliLAC 2018/2019 technical assistance. The technical assistance consisted in assigning a set of two mobility experts to design the different elements of the Strategy to Access Desired Destinations. The document identifies the strategic lines to move towards sustainable mobility in Curridabat, the objectives and a project pipeline. This document is expected to establish a roadmap and a priority order for Curridabat to allocate or manage resources for implementation.

Additionally, it was identified that Curridabat had sufficient information for the design of the strategy, which was regularly collected for decision-making regarding mobility issues. This allowed experts to design the strategy without having to collect primary information. However, Curridabat must go through this process when designing in detail each project of the pipeline. Similar to the process followed in Bogotá and Mexicali, the document was reviewed and discussed in biweekly calls with the Curidabat team to ensure a full understanding of the local vision of mobility by experts. However, this task took longer than expected, because thanks to the discussions it was possible to clarify the objectives of the technical assistance and expand the scope.

This strategy can be replicated to other municipalities in San José (Costa Rica) in order to build a city-wide mobility strategy with a bottom-up approach and will be shared with the local mobility teams in a webinar in 2020.

The technical assistance was provided by the team of the National Renewable Energy Laboratory (NREL) of the United States Government with the support of the NGO Asociación Sustentar.

Success Factors

Even though the technical assistance delivered to the three cities was adapted to the particulars needs and context, there are common success factors that were identified. Such as:

Strong leadership by the local teams and high-level engagement. For the case of Bogotá, for instance, the engagement of the advisors of the Mobility Secretary was key, since unlike internal combustion vehicles, electric vehicles still face barriers that involve actors from different economic sectors (such as the Ministry of Transport, Ministry of Energy, Ministry of Industry, etc.) who will move forward in different directions in the absence of a specific actor who takes the lead. In addition, since the deployment of electric mobility will materialize primarily in urban areas, it is key that the city government actors are the most involved to address regulatory, technical and infrastructure barriers, in coordination with the national government.

Permanent calls with the different local teams were key to narrow-down the scope of the technical assistance and clarifying its objectives. This was much more evident in the case of Curridabat, where the original request for technical assistance consisted of an evaluation of different electric bicycle models and thanks to the permanent discussions held with the NREL and Sustentar teams the scope of the technical assistance ended up being more comprehensive and strategic, with replicability potential in other municipalities of San José.

Availability of local resources to continue to build upon the technical assistance. All the three recipients had different resources to continue to work on the final documents delivered by the technical assistance, either to advance in the detailed design of projects or to move towards implementation. These resources differed from city to city and consisted of: i) budget to contract the detailed design of a strategy with primary information collection (as in the case of Bogotá), ii) agreements with universities for detailed studies (as in the case of Mexicali), or iii) resources for implementation (as in the case of Curridabat). The availability of local resources to continue building on the final deliverable gives a dynamic character to technical assistance, as it does not end up being a document that will be outdated in a few months, but will continue to be updated and reviewed over time.

Overcoming Challenges

One of the challenges faced in the process of delivering technical assistance was access to information. In some cases – such as in Curridabat and Mexicali - it was necessary to request a large amount of information to the mobility secretariats to carry out the necessary analyzes for the design of the sustainable mobility strategies. However, in some cases certain information was considered to be sensitive and the Secretariats or Ministries responsible for its generation required confidentiality agreements that could take time, delaying the technical assistance. To be able to move forward, the team chose to use only information that was publicly available, generating recommendations to the

local government to improve the analysis with better quality information.

The other challenge faced was government transitions. In the process of delivering technical assistance, some cities faced government transitions that jeopardized the sustainability of technical assistance in the future. However, this was solved by incorporating the technical assistance into existing processes in the cities. For instance, in Bogotá, it was supported the design of a strategic line of a broader long-term strategy that transcends government terms; in Curridabat, it was supported the vision of the municipality, which is also integrated into the local culture; and in Mexicali, the strategy delivered was aligmned with existing agreements and obligations regarding air quality, which is a priority for the municipal, state and national governments.

Development Impacts

As the technical assistance delivered my MoviliLAC was recently completed, it is too soon to quantitatively and qualitatively assess the medium- and long-term impacts generated in the three cities. However, a priori it is possible to identify that the sustainable mobility strategies developed for Bogotá, Curridabat and Mexicali directly support three of the Sustainable Development Goals (SDGs):

- **SDG 7 - Affordable and clean energy:** contributing with technical and public policy guidelines to double the global rate of improvement in energy efficiency by 2030 (target 7.3) (United Nations 2019).
- **SDG 9 - Industry, innovation and infrastructure:** the sustainable mobility strategies provide a roadmap for the development of sustainable and quality infrastructure to support economic development and human well-being, with a focus on equitable access (target 9.1) (United Nations 2019).
- **SDG 11 - Sustainable cities and communities:** the sustainable mobility strategies have the ultimate goal of providing access to safe and sustainable transport systems (target 11.2) and reducing the impact on air quality (target 11.6) by considering more sustainable modes of transport and technological transformations (United Nations 2019).

Additionally, sustainable mobility, and in particular electromobility, can support the development of local industry that is required for the maintenance of electric vehicles, the installation and service of the charging infrastructure, among others. Also, important health benefits have been identified, by reducing air pollution and thereby associated expiratory diseases.

Best Practices and Lessons Learned

Support the formulation of public policy strategies. The supported cities had in common they had made progress in different initiatives or projects related to sustainable mobility, but they lacked a policy framework to establish the objectives, key strategic lines and steps to follow regarding implementation. Having a strategy that articulates different initiatives allows cities to have a broader impact in the long term, have accountability of the initiatives against a strategic objective, increase

visibility of the efforts, resources and actors involved, and access climate finance resources, which require having a policy strategy in place.

Have a high-level government representative as a counterpart to the technical assistance. The counterparts of the three technical assistance were at the level of advisers of the Mobility Secretary or the Mayor's Office, which allowed appropriation of the project, guaranteeing that the technical assistance would support strategic issues and would have continuous validation of mayors and mobility secretaries. Additionally, it guarantees adequate leadership, as high level advisors are interlocutors with the ability to permanently dialogue with other sectors and levels of government, ensuring effective articulation with stakeholders.

Close monitoring and frequent communication with technical assistance recipients. A good practice to narrow-down the scope of the technical assistance and clarifying its objectives is to maintain permanent communication with the local teams. This also guaranteed that experts in charge of professional and technical support fully understood the needs and the local context to provide the best expert advice and also to build a relationship of trust with the recipients of technical assistance.

Available Resources and Assistance

Become a member. If your city is interested in becoming a member of MoviliLAC, please send an email with your contact details to transport@ledsgp.org

You can also request technical assistance for the design of sustainable mobility strategies and similar topics contacting to:

- The LEDS GP Climate Helpdesk to http://ledsgp.org/assistance/?loclang=en_gb
- The National Renewable Energy Laboratory (NREL) to Sanjini.Nanayakkara@nrel.gov
- NGO Asociación Sustentar to pscarpinelli@asociacionsustentar.org
- The Partnership on Sustainable, Low Carbon Transport (SLoCaT) to angela.enriquez@slocatpartnership.org

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