Sector Study on Mobility in Mexico

Urban mobility, smart-mobility, e-mobility, safe-mobility, sustainable mobility

Panteia

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1 Executive Summary

Mexico has one of the most complex urban dynamics in Latin America, where the growth of the urban sprawl in metropolitan areas hinders universal access to basic services, such as mobility. Mobility schemes in Mexico are focused on the use of car transportation, a phenomenon that is increased by the low offer and low quality of public transport systems and systems and infrastructure for cyclists and pedestrians. To counter these problems, initiatives are promoted all over the country, to improve the sector, including the promotion of non-motorized transport systems; maintenance and expansion of public transport routes that reach the peripheries of the metropolitan areas and plans for the transition to electromobility in Mexico.

The following document presents a study on the current situation of mobility in Mexico through an analysis of the market and an analysis of the main stakeholders and financial structures in the sector. It focuses on two axes:

- Short term (1 to 2 years): traffic signs and signals (traffic control systems, traffic signals, traffic lights, variable traffic signals, etc.) and bicycle mobility challenges (planning, implementation, technologies, systems of shared bicycles, etc.)
- Medium and long term (3 to 5 years): Public transport (planning, implementation, technologies, bike & ride, park & ride, etc.) and electro-mobility.

1.1 Study Areas and Regional Characteristics

For this study three main metropolitan areas were studied:

A. Northern region

Laguna (Torreón) and Monterrey
In this region in the north of México the use of the private automobile is notably higher than in other regions: the urban configuration of the northern cities and the expansion they have experienced have caused a predominance of the use of automotive transport. Even though states such as Coahuila and Nuevo León are beginning to have institutional programs and financial transformation actions in favour of sustainable mobility, there are no evident results yet. Underground transportation and public buses have low percentages of use, and the state of Nuevo León has the lowest percentage of commuters that use the bicycle for their daily journeys.

B. Center region

Guadalajara, León, Querétaro, Mexico City and Puebla
In the bigger metropolitan areas in the center of Mexico, such as Ciudad de Mexico and Guadalajara, *there is a more balanced modal share*. Although concession public transport units predominate, modes such as the metro system, buses, and automobile

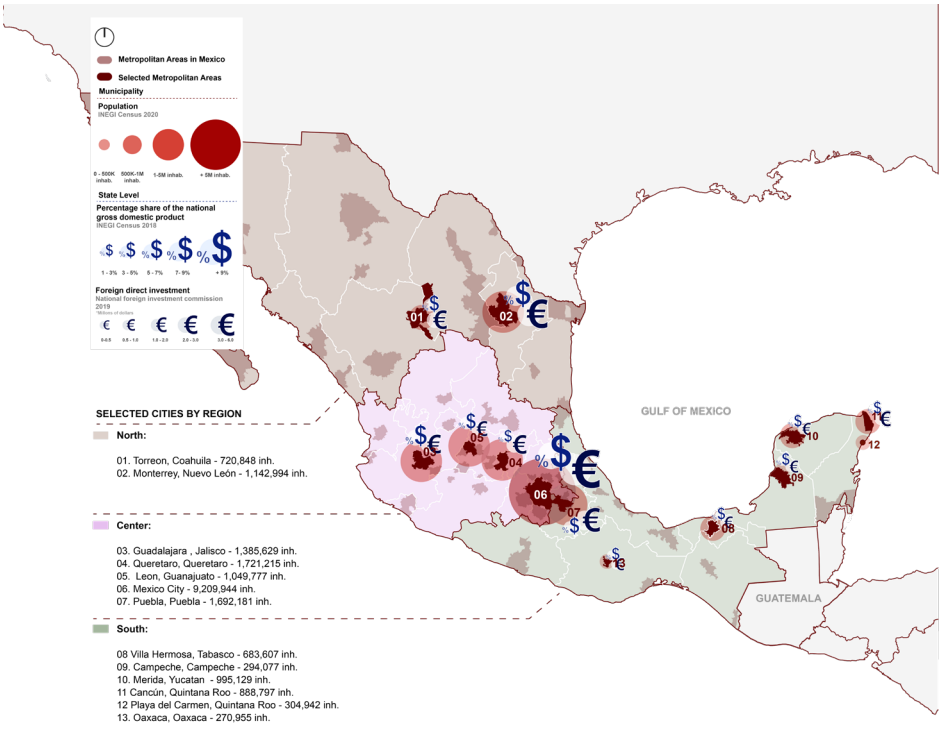
account with more than 15% of use. This is also the second region with the highest use of bicycles as a means of transport, after the southern region.
In the smaller cities of the central region there is an inclination towards collective and intermodal transport. This region distinguishes itself by its institutional regulatory efforts and financing improvements for sustainable mobility

B. Southern region

Tabasco, Campeche, Merida, Cancun, Playa del Carmen and Oaxaca

The only region where the car is not the preferred transport mode. *Bus is the most used transport mode*, and the use of the bicycle predominates over the other regions, despite of the elevated temperatures. States as Yucatán and Campeche have the largest number of users who commute to work or school by bicycle. The southern region has the largest number of journeys made on foot, which is related to the national poverty rates. And within the region Oaxaca and Chiapas have the *highest national percentage of journeys made on foot*, likewise, they are among the states with the *highest poverty in the country.*

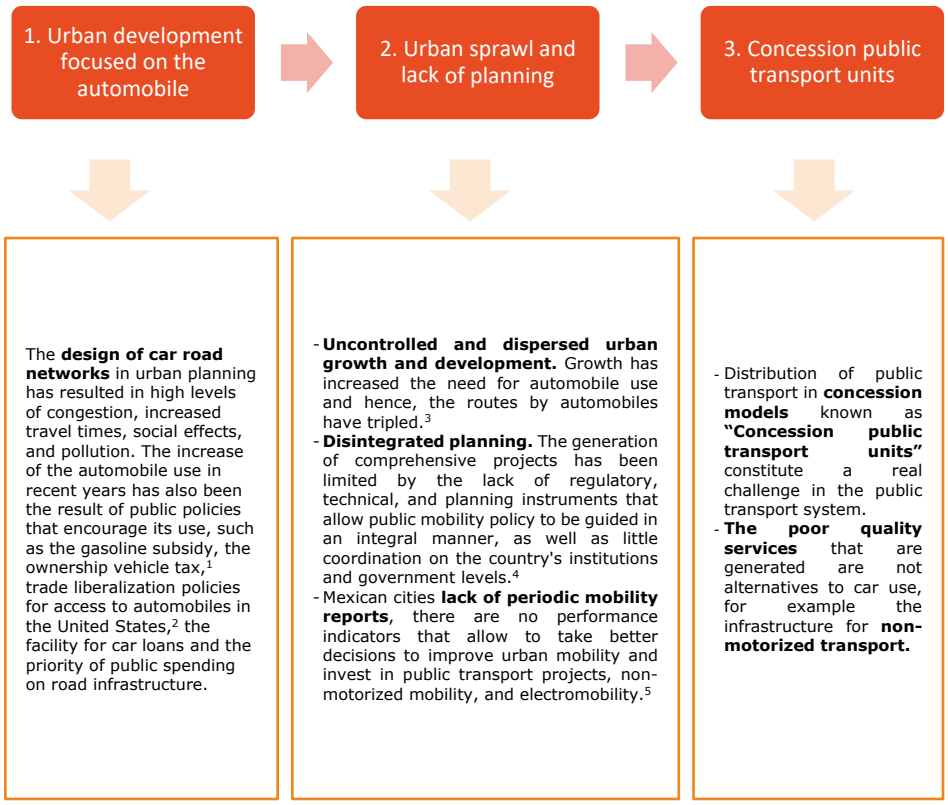
The following Map present the studied areas, population, national gross domestic products, and foreign investment.



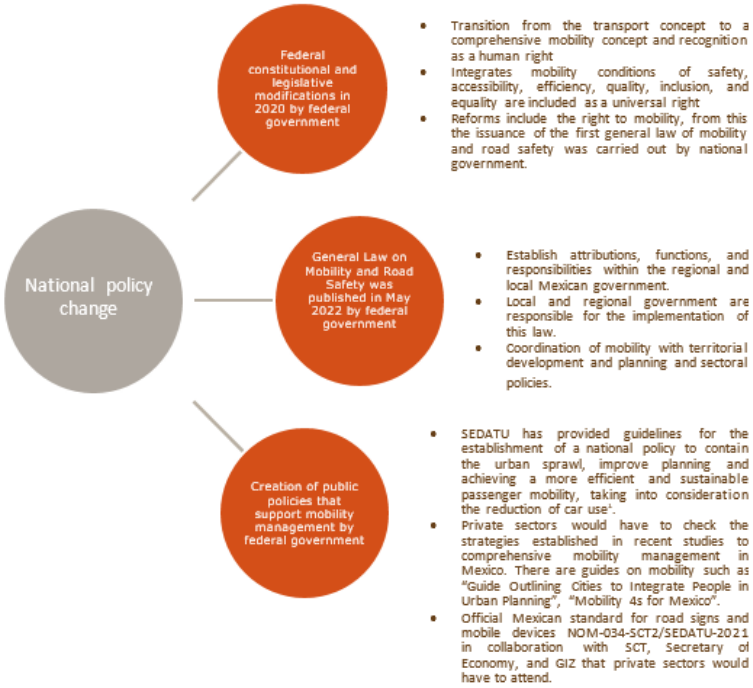
1.2 Description of the mobility marker

A. Main Challenges in the Mobility Sector

The major urban mobility problems in Mexico are widespread and are a consequence of the inefficient and polluting systems. The sector has difficulties in service, connectivity, accessibility, and safety. This is explained in the following figure:



Acknowledging these challenges, more local governments and national sectors are beginning to promote innovative and integral public policies. In these last six years, the national government has been implementing the first foundation for the regulation, organization and increase in investment on sustainable urban mobility. The policy changes in the Mexican government consists of the following components:



For the implementation of actions and new initiatives, different relevant actors are needed. In Mexico they are categorized as: government, international organizations, civil society, and the private sector. Each fulfil an important role in the urban mobility sector.

Government

- First contact for foreign companies in the Mexican market
- Regulators of mobility policies and programs
- Financial support for national, regional and local projects.
- Interest in collaborating with the private sector

Foreign Agencies

- Promoters of policies in favor of sustainable mobility
- Collaboration with government entities
- Alliance with foreign financiers
- High Expertise on the mobility sector

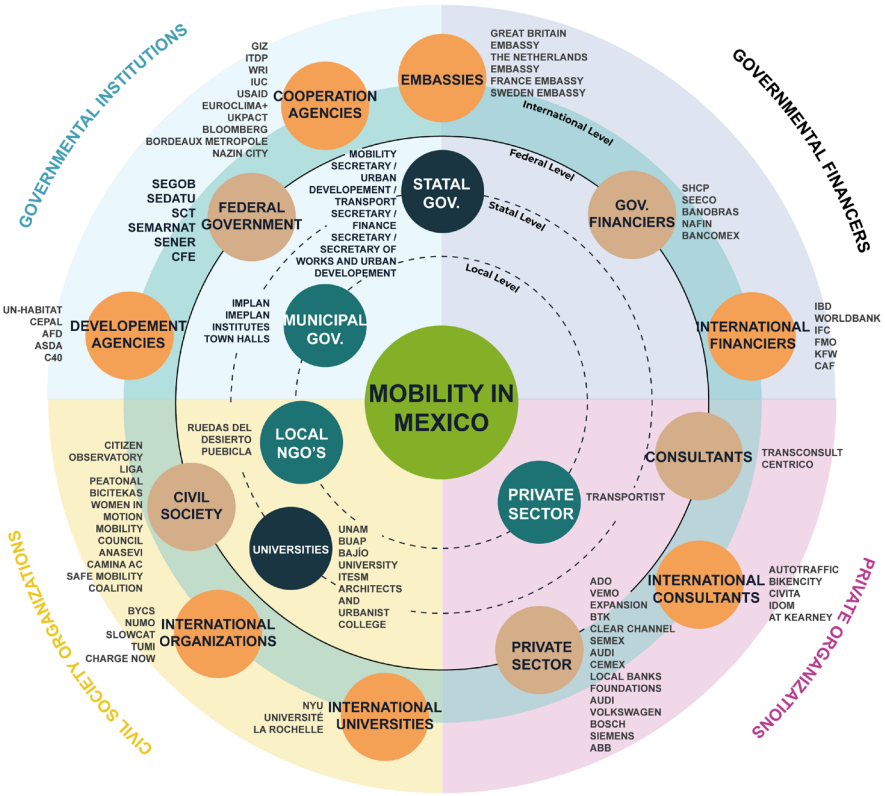
Private Sector

- Promoters of the diversification and innovation of products across the country
- "Know how" on product positioning
- Links with the federal and local governments to support the mobility transition towards new practices

Civil Organizations

- Links with the civil society in order to lobby in the government for better mobility conditions for the general public
- Links with foreign cooperation to articulate particular projects and funding.

The following scheme presents the categorization and organizational mapping of the key stakeholders in the urban mobility setting (focused on the 4 priority topics: cycling, signalling, electromobility and public transport).



B. Financial structures

This complex structure of actors is also reflected on the funding and financial arrangements in the country. Mexican cities design and finance transport and mobility projects based on the situation and their capacity to develop them, as well as their relationship with the different actors involved in the projects. To take the right decisions, it is necessary to consider, for example, the design of the business model and how to increase competitiveness and distribute risks. Financial structures can be divided into (1) Governmental / public; (2) National development bank; (3) Private and (4). International organizations

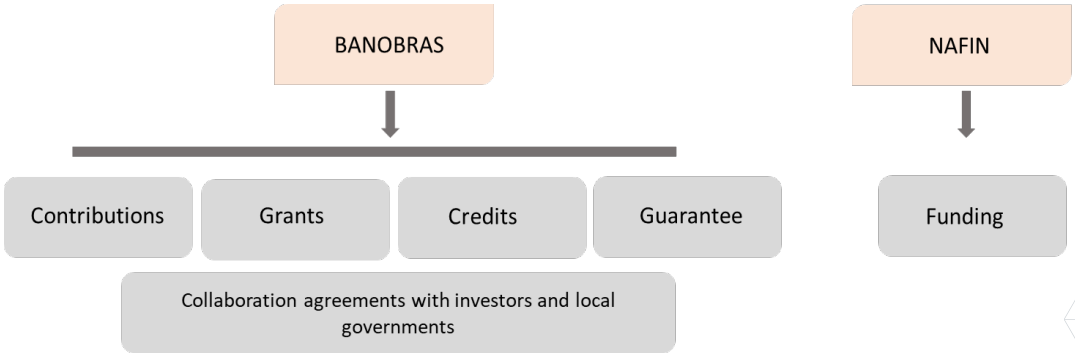
- Governmental / public

Local governments in Mexico have some financing resources to carry out investments that improve the mobility and accessibility of the urban population. However, based on the discussions of the Economic Package for fiscal years 2019 and 2020, the Ministry of Finance and Public Credit (SHCP) opted for an austere spending policy and efficient debt management.

Until 2018, most of the proposals to carry out pedestrian and cyclist mobility in the country incorporated a financial component whose base fell exclusively on participatory federal resources. The state and municipal governments competed from this category of public financing to subsequently secure the necessary amounts through five different sources. The following figure, explains the government financial structure for mobility projects.

- National Development Banks

Mexico has several state banks that support the economic and social development of the nation through various sources and financing mechanisms. However, only two support the deployment of mobility projects: Nacional Financiera (NAFIN) and Banco Nacional de Obras y Servicios Públicos, S.N.C (BANOBRAS). The following scheme presents the types of financial services they provide.



- Investment Funds

In Mexico there is a diversity of investment funds that adapt to different profiles and horizons, allowing access to the stock market and a greater diversification of assets. This has been (so far) the major source for supporting electromobility projects in

Mexico. The work of the "Zero Emission Bus Rapid-deployment Accelerator" (ZEBRA) program has engaged capital providers to participate as investors in electromobility projects. This international alliance is working to secure 1,000 million dollars in investments to deploy more than 3,000 electric buses on the streets of Latin America.

- International Organisations

Bilateral and Multilateral Development Banks are international financial institutions created by national states with the aim of contributing to economic development through investment in mobility and transportation projects. Some of the most active organisations in Mexico are: the World Bank Group, the International Finance Cooperation (IFC), KfW Development Bank, Inter-American Development Bank (BID), Development Bank of Latin America (CAF), North American Development Bank (NADBank), Dutch Entrepreneurial Development Bank (FMO), Dutch Trade and Investment Fund (DTIF).

It is important to mention that the figure of "Green Bonds", a fixed income debt instrument where capital is raised through the debt capital market for green projects, is widely used in Mexico for renewable energy, low carbon transport, forestry, or others that mitigate climate change.

C. Importance of procurement for project acquisition

For transparency purposes, most of the projects in Mexico are tendered or procured. This allows the client to identify the most suitable partner based on its technical knowledge, experience, and financial proposals. Hence understanding how the process works is essential. There are two types of bidding processes:

- ***National procurement processes*** through an online digital system called CompraNet. These have 2 options: *international tenders under coverage of treaties* (applicants must be from countries with which Mexico has commercial agreements) or international open tenders (for all interest parties).
- ***IFIs procurement*** Cities and regions sometimes prefer to ask for loans from IFIs to develop their projects and these will be procured by the IFIs. International bodies such as IDB, CAF, World Bank, European Commission, etc. are the most common participants and lending entities for Mexico. To access the opportunities, the interest party can subscribe to each of the websites procurement sites or pay for one of the online platforms in which all the tenders of all the IFIs are published (i.e. DevelopmentAid).

1.3 Business Opportunities per region

A. Northern region

In general, **short-term** opportunities identified for the northern region of Mexico are related to the improvement of the mobility culture by developing educational programmes and better enforcement of the regulation and the legal framework.

Medium to long-term opportunities start with the public transport project of recovering and developing intercity train systems connecting the whole nation. This in order to create an important mobility alternative and, in addition, generate various transport options for the specific need of every user. Other opportunities can be:

- Transition from the current Metrobus system and conventional auto busses to electromobility and electric taxis.
- The development of apps and infrastructure for Smart Cities including providing the adequacy of existing roads and roads under development to prepare them with all necessary facilities.
- The development of an economic corridor for the North.

Looking into specific city needs:

Both in **Torreon and Nuevo Leon**, among the medium-long opportunities it can be mentioned the creation of a more corporate scheme for the structures and planning and implementing new corridors.

For **Torreon,** the following are the **short-term** opportunities: Implementation of cycling infrastructure, providing technical knowledge, training in road safety culture, intermodal spaces for woman safety, training for public officials, mobility planning workshops and experiences and providing units or renting units.

The **medium long-term** opportunities in Torreon are the following: Active mobility, expanding the bicycle infrastructure network, remodelling the public transportation vehicle fleet, survey origin-destiny, program for the implementation of public transportation trunk access in peripheral areas, technical knowledge and joining schematics app.

B. Center region

Starting with the **general** opportunities, the **short-term** possible related project are related to improving mobility culture and education, better enforcement of regulation and legal frameworks, better sidewalks, and the ability to walk safely in smaller cities, rather than bigger investment projects.

As for the **general medium-long term** opportunities in the center region of Mexico: Firstly, non-motorized mobility and monitoring and evaluation of previous projects in Metropolitan Areas with greater investment feasibility and lower infrastructure coverage. Moreover, as to public transport: recovering and developing intercity train systems connecting the whole nation as an important mobility alternative and, lastly a transition from current fleets of Metrobus and busses to electromobility, electric taxis.

Looking into specific city opportunity areas the **Mexico City's short-term** opportunities are the following: Public transport planning and connecting higher areas of the city in an intermodal way as well as maintenance and remodeling of units of the collective subway system, implementing and renovating of new stations of bicycle mobility systems, encouraging cycling, implementing shared bicycles systems development and implementation of mobility studies for any project, improving vehicles and maintaining

the integrated system to coordinate between transport systems including bicycle, technical and regulatory training of authorities and relevant actors, workshops for citizen participation, training of technicians specialized in mobility and sustainability, integrating schemes of connection in mobility and traffic signs for cyclists.

The **medium to long-term** opportunities in Mexico City are: Modernizing the command-and-control station of the system, which implies the automatization of these. In electromobility, implementing electric scooters in crowded areas and electronic public transport. Ensuring walking in the city and implementing projects and technologies for carpooling apps and solutions to optimize the use of parking lots and systematization of transports.

The **short-term** opportunities in **Guadalajara** are the following: technical studies, analyzes and indicators to properly evaluate and monitor projects, micro- mobility systems, and socializing projects (education). The **medium to long-term** opportunities include train and electromobility and electric school transport.
Lastly, **Puebla's short- term** opportunities are shared bicycle systems, cyclist mobility, bike parking, and traffic signs. **Puebla's long-term** opportunities are infrastructure for other forms of mobility other than cars and planning for non-motorized vehicles.

C. Southern region

The **general opportunities** in the **short-term** for Cancun, Campeche, Merida, Playa del Carmen and Tabasco are: the planning and implementing bicycle mobility, implementing road distributors and changes to the asphaltic road surface in Av. Colosio, which connects the Rivera Maya region. The **medium to long-term** opportunity areas are in renewing more eco-friendly units; organizing technology for the government; creating a safe mobility infrastructure for disabled people, pedestrians and cyclists; and technical collaboration that will allow more sustainable development of the area for tourism; resource conservation, mobility and aquifer preservation.

Punctual opportunities for **Campeche in the short-term** is planning bicycle mobility in the city centre. The **long-term** opportunity are the implementation of electric transport units and organizing this technology. **In Cancun**, the **short-term** opportunity areas are also related to implementing and planning bicycle mobility and in the **medium to long-term** is the improvement in public transport and sidewalks, a corridor to link hotel areas. In **Merida**, the **short-term** opportunities are the support with the development of the legal framework for the implementation of an urban logistic system. In the **medium long-term,** support on the transition to electromobility for all modes. As for **Playa del Carmen**, the **short-term** opportunities are shared bicycle systems, cyclist mobility and infrastructure for tourism and population. **The medium to long-term** opportunities are improving pedestrian areas, public transport efficiency and the development of a multimodal station where all services converge in a single point. Lastly, the **short-term opportunities** in **Tabasco** are providing technical training and comprehensive mobility studies. Whereas the **medium or long-term** opportunities are to offer solutions from technology implementation.

1.4 Concrete opportunities for the Dutch Sector

There are four clear paths that Dutch parties can follow to find project opportunities or to acquire funding for new project ideas:

- Tendering process (via the **CompraNet** or other **large international tendering platforms** World Bank, IDB, CAF, DevelopmentAid, etc.) Here all the large-scale projects are presented.
- Small scale projects directly from the municipality by lobbying.
- Projects in which public and private will have a benefit or physical infrastructure projects
- Direct assignments from private parties.

Currently, many of the projects that are developed in the study areas are mainly related to mobility plans, large infrastructure projects and bike sharing related infrastructure. For other projects, the governments still needs to apply for the funding or will be tendered in the coming 5 years. The following table presents an example list of projects that are forecasted to be tendered in the coming months and the next 3 years by a IFIs.

Name of the opportunity	Tendering authority	Field	Budget
Setting the Prices Right for Infrastructure Services	IDB	Electromobility	US 1.350.000
Support for Urban Development Focused on Mobility and Transportation in Mexico	IDB	All modes	US 350.000
Analysis of companies in the transport sector, business models and identification of initiatives for their strengthening and modernization	IDB	Electromobility, new modes and traffic management	US 250.000
Digitac Hub: Digital Hub of Freight Motor Transport	IDB	Traffic and transport management	US 495.000
Challenges to Contribute Closing the Poverty and Inequality Gaps in Urban Mobility in Latin America and the Caribbean (Procurement Plan)	IDB	All modes	US 275.000

In terms of National Procurement there are currently 28 mobility and urban transport projects in Mexico, 11 in the pre-investment stage, 4 in execution and 3 in the tender stage. There are currently 28 mobility and urban transport projects in Mexico, 11 in the pre-investment stage, 4 in execution and 3 in the tender stage. Next table shows tenders related to mobility topics (up to September 2022). However, the projects available for bidding change in short periods of time. Therefore, it is necessary to review the CompraNet website.

Project	Subsector	Investment (millions MXN)	Type of contract
0914 Comprehensive Mobility Model for the South Zone of the Guadalajara Metropolitan Area (Line 4)	Urban mobility	9,725	Tender
0913 Highway "Atlacomulco-Polotitlán"	Roads and bridges	-	Concession
0670 New Port of Veracruz: Mixed Cargo Terminal (general, containers and mineral bulk)	Ports	2,000	Partial assignment of rights

0696 CETRAM Martín Carrera	Urban Mobility	-	Tender
0891 Comprehensive Modernization of the Trains, Control System and Tracks of Line 1 of the Collective Transport System	Urban Mobility	-	Tender

It is important to mention that new regulation on mobility and road safety (approved in May 2022) will oblige all cities in the country to develop strategies, plans and projects that are in line with the goals of the new policy. It is expected that in the coming year or two, cities start deploying tenders (or direct questions) as first steps to fulfil the requirements of this law.

1.5 Conclusions

The most feasible projects for the Dutch sector are the ones related to sustainable urban mobility strategies and projects. These are cycling planning and implementation (infrastructure linked topics) and integration with other modes, public transport corridors and most importantly, knowledge and capacity building in the four topics. Local parties are open to new solutions, but this implies efforts from the Dutch parties to be known in the mobility market since there is a lot of competition already from Mexican and other Latin parties. Innovative, effective, and long-lasting plans and solutions are easier to enter the market. For this, it is essential to have a local counterpart to be able to solve any administrative and cultural challenges.

If the social and cultural barriers are overcome, Dutch consultancies have 4 options to develop projects in Mexico in the coming 3 years in topics related to cycling, traffic management (signalling), public transport and electromobility.

1. The first option is that a Dutch party is approached by a local party to request a particular solution.
2. The second option is a direct project from a city or a region by lobbying. This way the local government gets to know the Dutch unique selling content or product that can be provided.
3. The third option is to implement physical infrastructure (i.e., bike sharing system) by direct request from the municipality.
4. The fourth option is following any of the national or IFI tendering processes.

1.6 Recommendations

Based on the interviews with local and Dutch parties that have previously conducted business in Mexico and in the sector, particular recommendations can be provided. Among them:

- Participate as much as possible in the networking events organized both in the Netherlands and Mexico. Networking is essential to meet prospective clients and partners.

- Take part in the trade missions organized by the RVO. This is the perfect opportunity to find a suitable local partner, understand particular needs of the sector and meet potential clients in their own environment. Although a translator could be provided to most of these missions, having a Spanish-speaking person will help the engagement much more.
- Subscribe to the tender platforms of the national government (CompraNet Mexico) or any of the international IFIs sites. These should be checked constantly since the deadlines for applying are quite short.
- Approach entities such as ITDP, UITP, etc. These are always looking for new partners and allies to develop projects in Mexico.
- In terms of project content, focus should be on providing solutions that have a higher impact in the society, especially in the most vulnerable communities. This will maximize the visibility and potential access to other projects.
- If possible, offer a free trial of the solution, knowledge or product. Some of the locals might not have heard of the new techniques, processes, or concepts, so it is important that these are understood by the possible clients. These can be shown via webinars, small workshops, or panel of discussions. Also, if possible, offer a knowledge exchange program to the Netherlands.

2

2 Introduction

In Mexico there are 32,663,342 people who travel to go to school every day, and 40,620,746 people who travel to work. In total, 46% of these journeys are concentrated in the largest cities, with 23% are in the center of the country, 9% in the north, 8% in the northern border, 8% in the southeast and 4.5% in the touristic cities[1].

In terms of cycling mobility, the highest bicycle rate in Mexico is in the state of Yucatan, in the southeastern region of the country, while you can find the lowest percentage of cyclist in the northern region, with Nuevo León in the last place. States like Nuevo León and Chihuahua, in turn, have the highest use of private cars in the country.

In terms of institutional regulation, the Central and Bajío region, with states like Guanajuato, Queretaro, Aguascalientes, Hidalgo, Jalisco, and Colima, have made efforts to improve mobility policies and financed advances towards sustainable mobility projects.

Guanajuato in particular has made permanent investments in its transport model and in active mobility, and contains one of the largest networks of dedicated infrastructure in Mexico.

Mexico City is a national point of reference in terms of the urban transformation of the Modal Transfer Centers, with programs like the incorporation of the public bicycle system linked to the supply of the mass public transport system, and mass bicycle parking. Unfortunately, these initiatives are implemented only in the central areas of the city, emphasizing a disintegration with the metropolitan systems resulting in an incremented figure for motorized mobility in Estado de Mexico. In the case of bicycle transport this also has to do with geographic issues, meaning topography, as the center of the city is flat in comparison to the outskirts and delegations around it. To avoid this phenomenon, a national level policy is promoted, including programs for the transformation of the population's commuting habits, as well as the improvement of availability of connected, sustainable and efficient ways of transport, favoring their use versus motorized transport. These regulations include federal documents such as: The National Development Plan, The Sectoral Program for Agriculture, Territorial and Urban Development, and The Sustainable Urban Mobility Strategy[2], encouraging the management and design of local public policies that promote the modal change to sustainable, efficient, and safe means.

From these regulations, states such as León, Jalisco, Queretaro, Mexico City, Puebla, and Quintana Roo already contemplate within their legislation the constitution of integrated transport systems. In Guadalajara, Jalisco the integrated transport system includes the subway, the two BRTs systems (Peribus, Macrobus) and the trolleybus routes, while in Mexico City the system is more complex, including the concession public transport units, the cable car transport system (Cablebus), the BRT system

[1] Anatomy of the mobility in Mexico: where are we going? / SEDATU

[2] Alfresco » Programa Sectorial 2020-2024_baja.pdf (sedatu.gob.mx)

(Metrobus), the public bicycle system (Ecobici), the trolleybus routes and the subway system.
Part of the current commitment to change is the promotion of initiatives for new environmental technologies in Mexico, due to a 2018-2030[3] electromobility strategy, where the users of electric vehicles are benefitting through the reduction of taxes and the installation of free charging points. The states with the largest number of electric cars in the country are Mexico City, Jalisco, Chiapas, Nuevo León, and the state of Mexico. The implementation of electric public transport is also proposed, although currently only Mexico City has implemented new technologies into the old trolleybus infrastructure.

The following report presents the first findings on the market analysis and financial structures for our focus topics:

- Short term (1 to 2 years): traffic signs and signals (traffic control systems, traffic signals, traffic lights, variable traffic signals, etc.) and bicycle mobility challenges (planning, implementation, technologies, systems of shared bicycles, etc.).
- Medium and long term (3 to 5 years): Public transport (planning, implementation, technologies, bike & ride, park & ride, etc.) and electromobility.

[3] Business opportunities for Dutch companies in the Mexican renewable energy sector (rvo.nl)

3

3 Market Analysis

3.1 General scope of the project

Every metropolitan area has their own distinct urban mobility issues, however, in the case of Mexico we have identified 4 general topics relevant to all metropolitan areas. We have selected these topics because they present potential opportunities for Dutch businesses in the Mexican market. The topics are traffic signalling, cycling, public transport and electromobility. Below, we explain for each of those four topics the situation in the Mexican urban areas. In addition, we relate which improvements are necessary, and how Dutch expertise can assist in achieving said improvements.

3.1.1 Traffic signalling and cycling

The first of these topics is traffic signalling, which, as stated, can be improved on a relatively short time scale. A shortcoming of traffic signalling in Mexico is the absence of induction loops which can monitor traffic and dynamically adjust traffic lights to the intensity per direction. In addition, integrated and connected traffic lights, which would allow green waves, are not present and could improve traffic flow. These green waves reduce emissions from traffic, fuel consumption, and waiting times. Furthermore, they can improve the time pedestrians have to cross the street. This kind of traffic signalling also considers safety for other users; for instance, by giving cyclists and pedestrians a 3 to 5 second head start, you allow them to already be on the intersection when motorized traffic starts. The absence of induction loops and integrated traffic signalling is an opportunity for Dutch expertise to improve Mexico's cities' traffic operation.

Image 1. Ecobici. Source: The City Fix Learn.

The second topic is cycling, which can also be considered short term as it is relatively cheap and simple to improve bicycle infrastructure. For example, the Public Fund for Cyclist and Pedestrian Assistance in Mexico City allocated 45 million pesos (2.2 million euros) to pedestrian and bicycle infrastructure in 2020[4]. Cycling in Mexico has developed rapidly in urban areas as separated bicycle lanes have been built that allow safe and convenient cycling. Especially the state of Guanajuato has invested in separated infrastructure. However, despite these recent developments cycling is not yet widely adopted, with bicycle journeys to school having a modal share of only 1.5% of the total. Journeys to work see a bicycle modal share of

[4] The uphill path of the bicycle in times of pandemic in Mexico City

5.4%[5]. This is comparable to countries like Italy and Poland[6]. The very low share of bicycle journeys to school can have many causes (long distances, uphill etc.), but it seems likely that safety is the main concern. In Mexico City public bike sharing by ECOBICI has seen some success, although its area of operation is limited to the central part of Mexico City which inhibits metropolitan integration.
Cycling seems to be more popular in the southeast, particularly the Yucatan peninsula, than in the north. In other cities bicycle sharing facilities have also popped up (e.g., MiBici in Guadalajara, in San Luis Potosi). There is still much to be gained in urban cycling though, as safety is still a concern[4] and separation of modes (e.g., separated bicycle infrastructure) is not fully realized.
Regarding safety there is knowledge on how to separate forms of traffic through the concept of `sustainable safety,' which has been the backbone of Dutch infrastructure planning for over two decades. Organizing bicycle parking is also part of this expertise and is an important aspect, especially when considered in conjunction with public transport.

3.1.2 Public transport and electromobility

The third topic of interest is public transport. Mexican cities are generally served by extensive public transport systems where special attention should be given to the adoption of Bus Rapid Transit (BRT) systems as these have proven very successful. This success can be found in high occupation, high frequency, separated right of way and CO_2 reductions as well as a reduction in other pollutants (like PM 2.5). These BRT systems can be found in Chihuahua, Ciudad Juarez, Guadalajara, León, Mexico City, Monterrey, Pachuca, Puebla, Tijuana, Queretaro, Acapulco, and Villahermosa. In addition, the cities of Torreon, Oaxaca de Juarez, San Luis Potosi, and Tampico are currently constructing BRT lines. The extent of these systems varies but they are on high demand corridors and connect to other forms of public transport. These other forms of public transport are other buses, informal bus transport, metros (in large cities) and trains. Public transport has a high modal share of 34%, which is higher than any EU country. At the same time, due to this success many systems are experiencing high levels of occupation leading to overcrowding on transport vehicles[7]. While the central part of cities are well served by a dense and frequently running public transport network the peripheral areas remain underserved, resulting in long commute times. Additionally, public transport can play a role in improving air quality. This is especially

Image 2. Mi Macro, BRT Guadalajara. Source: UITP.

5 Anatomy of the mobility in Mexico: where are we going / SEDATU
6 European Cycling Federation: Cycling Data Map
7 ICLEI: The role of public transport in tackling air pollution and accessibility

important in the case of Mexico City where local topography holds emissions captive in the valley. The city has often ranked poorly on air quality indexes. While other cities in Mexico do not score as poorly on-air quality, emission reduction will also improve air quality there, and help achieve climate goals. All these issues are similar to those faced by Dutch public transport and in some issues, such as cleaner vehicles, there has been significant progress in the Netherlands.

Lastly, electromobility. Currently, electric car sales are relatively low in Mexico although hybrid cars have seen an increase in recent years[8]. Still, they represent a low fraction of the total vehicles sold. Like in other places, the high cost of an electric vehicle compared to a combustion engine vehicle with similar characteristics is an important obstacle. Through the 2030 Electromobility Strategy the Mexican government has created benefits for users of electric vehicles through tax benefits and free charging stations (among other measures).

Image 3. Micromobility example Mexico. Source: Lime.

These measures, that have both public transport and electric mobility as main focus[9], should result in strong reductions of GHG emissions and also assist in improving air quality in cities. Other forms of electromobility, such as (shared) scooters and e-bikes, have found their way to Mexican cities as well (Grin, Lime, Bird, MOVO, Instigo etc.). Issues that arise from these mobility services, such as wrongly parked scooters and dangerous traffic situations are similar to those faced in the Netherlands. Solving these issues requires contact with the companies providing these services and this has proven challenging in some situations. As these services continue to grow and new players enter the market these issues will undoubtedly need to be addressed and combining knowledge in this field will improve the ability of cities to effectively deal with them.

3.2 General description of the market niche and value chain

3.2.1 Study area, regions and general data

A. General data

Mexico is the third most populous country in the American Continent with 126,014,024[10] inhabitants and the Spanish-speaking country with the largest population. The GDP shows an annual growth of 4.8% (2021), reaching 1.29 billion dollars, of which Foreign Direct Investment has a 2.9% share[11]. Mexico has 74

[8] Business opportunities for Dutch companies in the Mexican renewable energy sector (rvo.nl)
[9] Electric mobility strategy will reduce polluting emissions
[10] INEGI 2020
[11] World Bank, Mexico data

metropolitan areas, where 79% of its population is concentrated. The most important metropolitan area is the Metropolitan Area of the Valley of Mexico, with 22 million inhabitants and it is the most populous region in Latin America. In second place is the Metropolitan Area of Monterrey with 5.34 million inhabitants which is the tenth most populous area in Latin America, and finally the Metropolitan Area of Guadalajara with 5.26 million inhabitants.
In 2020, a foreign direct investment of 29,079.4 million dollars was reported in Mexico. Of this 3.5% (1,024.1 million dollars) came from the Netherlands. Likewise, in the total balance of millions of dollars accumulated in investment from the Netherlands in Mexico, from 1999 to 2022 it was reported that the entity that has received the largest investment is the state of Nuevo León (5,797.2 million dollars), followed by Mexico City (5,464.4) and Estado de Mexico in third place, followed by Veracruz, Jalisco, Quintana Roo, Tamaulipas, Baja California, Morelos, and Querétaro.

A.1 Modal share in Mexico

In terms of mobility, Mexico City is ranked 23rd among cities with the highest traffic congestion, with a total of 67 hours lost per year per person in traffic jams. The City of Monterrey is ranked number 36th [12]. Road congestion is a consequence of the increase in private vehicles: in 2020, 50,347,569 automobiles were in circulation in the country, 26% more than in 2015.

Most of the population travels to work by public transport (concession public transport units, taxi, combi or collective) and to school by foot. The state with the largest number of people who walk to work is Chiapas, while the central region is where the majority of the commuters use public transport to travel to work. The bicycle is the least used means of transport, with 1.5% of people commuting to school and 5.4% to work using this mode. The state with the highest number of cyclists is Yucatán[13].

The frequency of use of the different transport modes is directly related to the travel purpose: buses and cars are used both daily and occasionally, for leisure, work and/or education purposes, while bikes, taxis and motorcycles are occasionally used mainly for family journeys or leisure purposes.

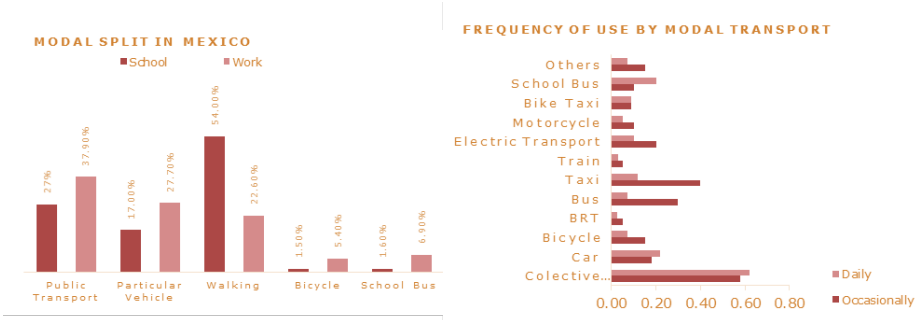


Figure 1. Modal Split in Mexico and Frequency of use by modal transport. Source: own.

[12] 2021 INRIX Global

[13] Anatomy of Mobility in Mexico. SEDATU, 2018

A.2 Public transport characteristics

Public transport can be divided into structured, semi-structured and unstructured. Structured transport operates with high-capacity systems such as the metro or trolleybuses and has partial or total participation of state governments, which guarantee operational and fare regulation.

The different ways of structured public transport in Mexico are the following: suburban train; electric tram; metropolitan light rail; urban trains and metro systems; bus rapid transit (BRT). Currently, only eight cities (Mexico City, Guadalajara, Monterrey, Puebla, León, Chihuahua, Ciudad Juárez and Acapulco) have an integrated transport system, where in addition to having public transport concessions, there are alternatives such as BRTs or collective transport systems.

The unstructured system operates with low or medium capacity concession public transport and receives a minimal participation from state or local governments. Here responsibilities are assigned to private operators. Despite being transportation systems that present inefficiencies and low quality and low security standards, they are very flexible and the most used since they cover a large part of the demand for public transportation in Mexico.

The concentration of the total national journeys is as follows:

- 46% of journeys are concentrated in the metropolitan areas of the Valley of Mexico, Guadalajara and Monterrey
- 23% of journeys are concentrated in the center of the country
- 9% of journeys are concentrated in the north of the country
- 8% of journeys are concentrated on the northern border
- 8% of journeys are concentrated on the southeast of the country
- 4.5% of journeys are concentrated in tourist cities

A.3 Electromobility

The process towards electromobility in Mexico has been much slower than in other countries. It was not until 2018 that the National Electric Mobility Strategy was carried out, which intends to have the electrification of all transport by 2030. The aim is to introduce at least one means of electric public transport in the cities with the highest pollution index[14] and so help to reduce up to 5 million tCO_2 to 2030.

On the other hand, Mexico has the largest infrastructure of electric chargers installed in the central region. Between early 2016 and 2019, 305 electric vehicles were registered, 1,339 plug-in hybrid vehicles and 23,964 conventional hybrid vehicles all over Mexico[15]. The highest percentage in terms of the acquisition of electric cars in 2021 was in Ciudad de Mexico, followed by Estado de Mexico, Jalisco and Sinaloa[16].

[14] National Electromobility Strategy

[15] Electric Mobility: Status, Latin America And The Caribbean And Opportunities For Regional Collaboration 2019.

[16] Electromobility Transition in Mexico

Figure 2. Percentage of new car sales in 2021 per state. Source: own based on INEGI.

Regarding public transportation, Guadalajara and Mexico City have implemented electric trolleybus systems; Mexico City had 193 electrical units in 2020 and the initiative to end the presidential administration with 500 units. Mexico City stands out in Latin America for its progress in terms of electrification of public transport buses in 2020[17].

Guadalajara, Monterrey, and Hermosillo are committed to green initiatives, such as electrified public transport corridors, metro lines or BRT route sections. In Mexico City there are also many shared electric vehicles, such as bicycle rentals, scooters and the Ecobici program which also has electric bicycles. Querétaro is another state that has shared transportation.

A.4 Mobility public spending

Although between 2015 and 2017 the different state governments increased their participation in mobility projects, investments for private vehicles (cars) are still the main priority: in 2018 74% of public spending on mobility was allocated to road infrastructure or otherwise directed to the automobile, 16% for hydraulic or electrical networks, and only 9.68% for pedestrian infrastructure. 6.73% of spending was allocated to collective transport, despite being the most used mode of transport, and 2.94% to public space.

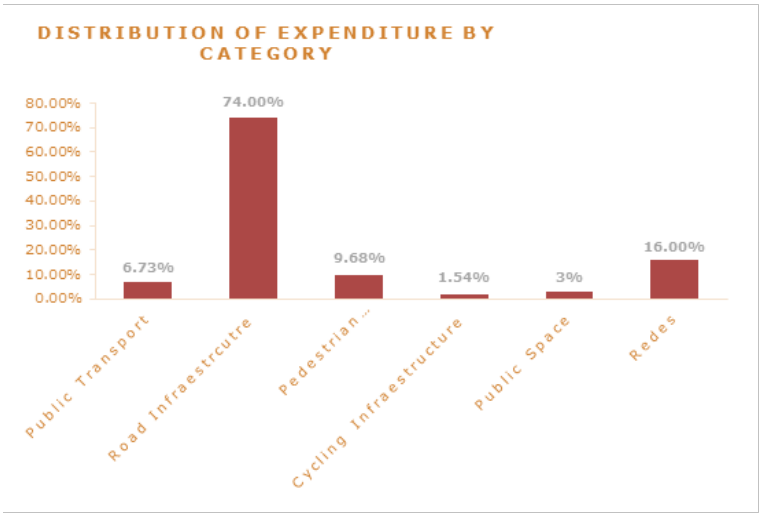


Figure 3. Expenditure distribution by category. Source: own based on INEGI data

[17]Electric Mobility: Advances in Latin America and the Caribbean 2020. United Nations Environment Program, Office for Latin America and the Caribbean, Panama

In terms of public investment on mobility, the states with the highest total public spending at the federal level are Puebla, Mexico City, and Jalisco, while those with the lowest total federal public spending are Colima, Quintana Roo, and Zacatecas. The states that invest more in public space, pedestrians' infrastructure, cycling, and public transport are:

- **Public Space:** Mexico City, Puebla, Tlaxcala and Baja California
- **Pedestrian Infrastructure:** Mexico City, Jalisco, State of Mexico, and Puebla
- **Cycling Infrastructure:** Jalisco, Guanajuato, and Puebla
- **Public Transportation:** Mexico City, Coahuila, and Jalisco.

B. Study area and regional mobility

Within the 74 metropolitan areas, from a division by North, Center and South regions, 12 Metropolitan Areas and the city of Playa del Carmen were selected for this study. The Metropolitan Areas that were studied are the following:

Northern Region:
1 Laguna (Torreon)
2 Monterey

Central Region:
3 Guadalajara
4 León
5 Queretaro
6 Mexico City
7 Puebla

Southern Region
8 Tabasco
9 Campeche
10 Merida
11 Cancun
12 Playa del Carmen
13 Oaxaca

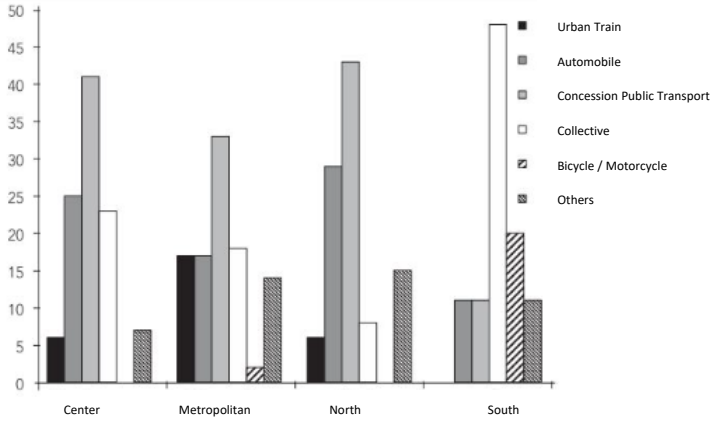


Figure 4. Modal Split per Regions. Source: Between my house and my destination, national mobility, and transport survey, UNAM.

The following section presents the current investments situation of the regions and metropolitan cities. The graph shows the population[18] of each study-city in relation to investments by the federated state in terms of percentage of the national GDP[19], as well as the foreign investment[20] received in recent years[21].

[18] INEGI 2020

[19] Producto Interno Bruto por Entidad Federativa

[20] Foreign Investment in Mexico

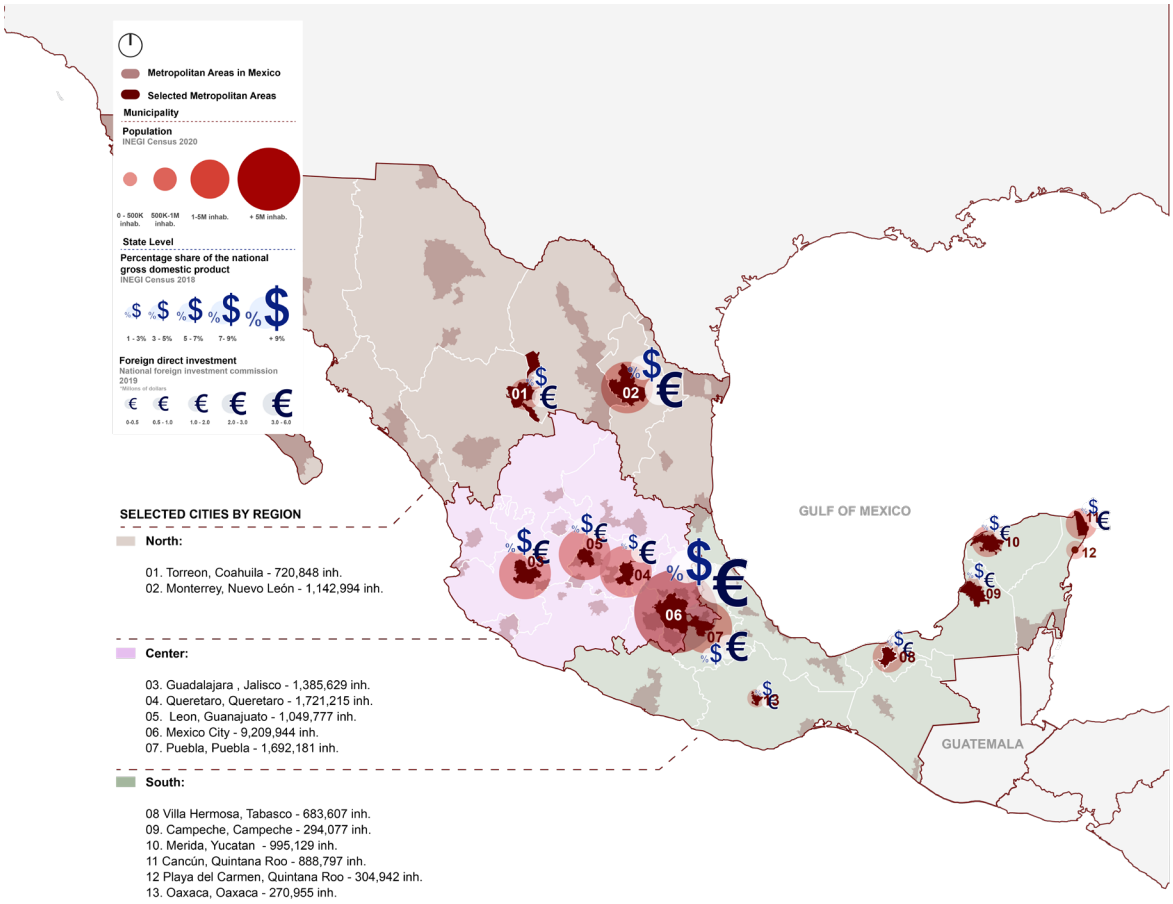


Image 4. Regional analysis. Source: Own, based on INEGI and statistical report on behavior of foreign direct investment in Mexico data.

B.1 Northern Region

In the northern region of the country, the use of the private automobile is exponentially higher. The urban configuration of the northern cities and the expansion they have experienced facilitate the use of automotive transport. Despite the fact that states such as Coahuila and Nuevo León are beginning to have institutional, programmatic and financial transformation actions in favour of sustainable mobility, there are no evident results yet.

The use of the subway public transport units and buses have low percentages of use, and the state of Nuevo León has the lowest percentage of bicycle users for normal commutes.

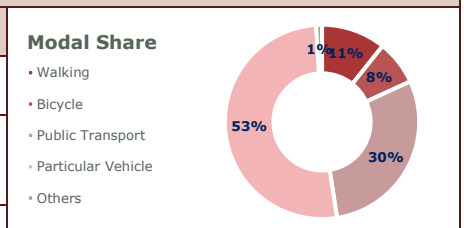
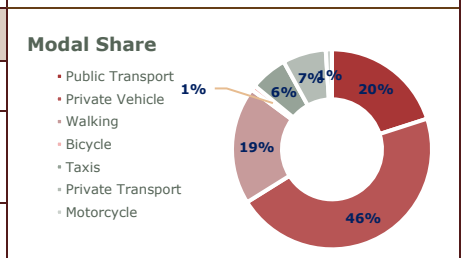
Study areas

The north of the country solidifies its economy through industry. The city of **Torreón is home to some of the most important textile, technological and automotive industry at the national level,** which is why, even though its population is less than a million inhabitants, it maintains a strong flow of foreign investment.

To the northeast of Mexico, **Monterrey** stands out because it has the most national industries in the country, as well as international ones. It is the second largest business and finance center in the country. It serves as the main industrial, commercial, and economic epicenter for the north of Mexico.

In the Metropolitan Area of Monterrey, there are 11.3 million daily journeys, of which almost 29% is within the Municipality of Monterrey itself. For almost half of the total number of journeys made, the preference is for the private vehicle. This is followed by public transport and journeys on foot. In the peak period of the day the average travel time is 38 minutes; about 33 minutes by car, 68 minutes by public transportation, and 14 minutes on foot[22]. The following table presents a summary of each the main macroeconomic indicators and mobility figures of the north region.

Table 1. Summary in Figures North Region

Summary in Figures North Region				
Torreon, Coahuila (La Laguna Metropolitan Area)				
Municipality	**Metropolitan Area**	**State**		
Municipal Population	Growth percentage	% of Federal GDP	Foreign Investment in 2019	
720,848 inhabitants	1.1%	3.42%	1,444.1 million dollars	
Monterrey, Nuevo León (Metropolitan Zone of Monterrey)				
Municipality	**Metropolitan Area**	**State**		
Municipal Population	Growth percentage _	% of Federal GDP	Foreign Investment in 2019	
1,142,994 inhabitants	2.2%	7.77%	3,260.9 million dollars	

B.2 Central Region

The central region, shows most diversity in modal transport in the bigger metropolitan areas such as Mexico City and Guadalajara, and although concession public transport units predominate, modes such as the subway, buses and automobile also account for more than 15% of use. After the southern region, this region is second in the use of bicycles as a transport mode. Although the modal split in the smaller cities of the central region is similar to that in the large metropolitan areas, there is a tendency towards collective and intermodal transport. This region stands out when it comes to its efforts and institutional, regulatory, and financing improvements for sustainable mobility projects.

Study areas

The Bajío Mexicano is in the central region, with cities such as Guadalajara, León and Querétaro. The Mexican Bajío is in the midst of an economic development wave and there is plenty of foreign investment: The states of Guanajuato, Querétaro and Jalisco

account for a total of 12.4% ($71,400.6 million dollars) of direct foreign investment in Mexico between 1999-2019, mostly through the automotive and manufacturing industries: Guanajuato managed to become the entity with the highest production in the Bajío, 10.2% of the national total, thanks to the arrival of automotive firms.

Guadalajara is the third most important economic center in the country and finds its niche between commerce, industry, and the development of technological solutions. The public transport modalities of the Metropolitan Area of Guadalajara are: The Urban Electric Train System (SITEUR), which is made up of three systems: Mi Tren (three Light Rail lines), Mi Macro (BRT line) and Sitren (four bus lines). Through the "My transport" platform, schedules, and services of all these mobility systems can be consulted. In terms of cycling, there is a 271km bike lane network, 14.6km of which were implemented in 2020 during the health contingency of COVID-19. The *"Mi Bici"* public bicycle system reached 300 stations in 2020 and 25 new stations are planned[21].

The city of **León** is a pioneer in proposing initiatives to improve mobility. In 2003 the Integrated Transportation System *"Optibus"* was launched, being the first of its kind in the entire country, even before the Metrobus in Mexico City and currently numbers 10 lines and 78 stations. In León, the first urban planning institute (IMPLAN) was also founded and currently they also have the UNEBUS intercity transport system and the Inclusive Urban Transport system "TUI". According to the *Municipal Program for Urban Development and Territorial Ecological Planning 2020*[22], the mobility problems to be solved in León include insufficient infrastructure for pedestrians and cyclists, long waiting times for public transport and little integration within the various transport modes.

Querétaro has 1.6 million total journeys per day (2016), with an average travel time of 52 minutes by public transport, 34 minutes by car and 18 minutes on foot[23]. Querétaro has the BRT Qrobus that has 20 stations and 2 lines. Querétaro is one of the states in which a very small part of its population travels to school or work by bicycle, only 2% of their journeys are made in this way.

Talking about the central region, **Mexico City** exceeds by far the rest of the country in demographic numbers, with 99% of its population living in urban areas. It is in fact one of the largest urban concentrations in the world. It is the main political, economic, social, academic, financial, business, tourism, cultural, communications and entertainment center of the country and has the highest Human Development Index. Being the fourth largest city in the world and the largest metropolitan area in Mexico, it has the most extended metro network and it has one of the largest Electric passenger transport networks; the Trolleybus, Light Rail and Cablebus.

The city of **Puebla de Zaragoza** has a mobility approach focused on the private car use. Within the Puebla-Tlaxcala Metropolitan area, 3,724,530 daily journeys are made, of which 1,651 million journeys are done by private car[24]. Puebla has a 6% increase in registered motor vehicles annually. Despite the state interest and the fact that most of

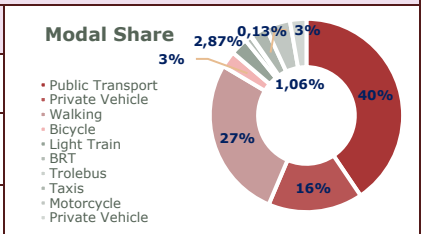
[21] Metropolitan Strategy for Emerging Urban Mobility
[22] Municipal Program for Urban Development and Territorial Ecological Planning 2020
[23] Mobility Plan 2026
[24] Transport Sector Program 2020

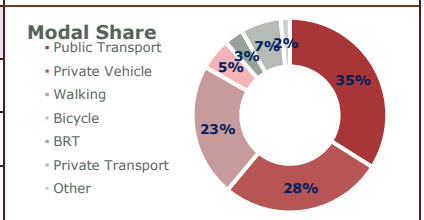
the public spending is allocated to vehicular infrastructure, the majority of students go to their schools by foot, followed by public transport, and in third place the use of private vehicles. The city of Puebla de Zaragoza has the *BRT network (*RUTA) which has 3 lines and 102 stations.

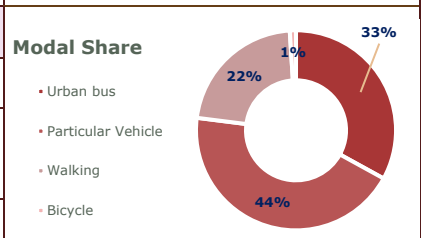
The following table presents a summary of each the main macroeconomic indicators and mobility figures of the central region.

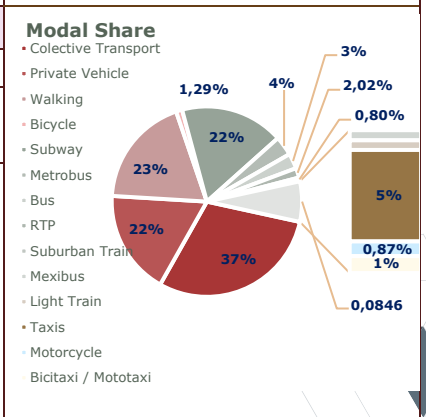
Table 2. Summary in Figures Central Region

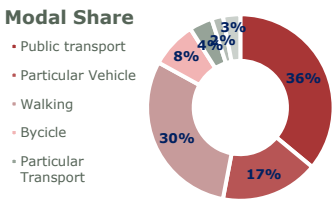
Summary in Figures Central Region			
Guadalajara, Jalisco (Guadalajara Metropolitan Area)			
Municipality	**Metropolitan Area**	**State**	
Municipal Population	Growth percentage _	% of Federal GDP	Foreign Investment in 2019
1,385,629 inhabitants	1.6%	6.87%	1,556.8 million dollars
León, Guanajuato (León Metropolitan Area)			
Municipality	**Metropolitan Area**	**State**	
Municipal Population	Growth percentage _	% of Federal GDP	Foreign Investment in 2019
1,721,215 inhabitants	2.0%	3.97%	828.3 million dollars
Querétaro (Metropolitan Zone of Querétaro)			
Municipality	**Metropolitan Area**	**State**	
Municipal Population	Growth percentage _	% of Federal GDP	Foreign Investment in 2019
1,049,777 inhabitants	2.8%	2.28%	1,203.3 million dollars
Mexico City (Metropolitan Zone of the Valley of Mexico)			
Municipality	**Metropolitan Area**	**State**	
Municipal Population	Growth percentage _	% of Federal GDP	Foreign Investment in 2019
9,209,944 inhabitants	0.8%	17.73%	8,311.3 million dollars
Puebla de Zaragoza, Puebla (Puebla-Tlaxcala ZM)			
Municipality	**Metropolitan Area**	**State**	
Municipal Population	Growth percentage _	% of Federal GDP	Foreign Investment in 2019









1,692,181 inhabitants	1.6%	3.37%	2,042.7 million dollars	

B.3 Southern Region

The southern part of the country shows a modal distribution contrary to the northern region and is the only region where the car is not the protagonist. The bus is the most used transport mode, and the use of the bicycle predominates over the other regions, despite of the high temperatures. States such as Yucatán and Campeche have the largest number of users who commute to work or school by bicycle. The southern region has the largest number of journeys that are made by foot, which is directly related to the national poverty rates. This applies mainly to Oaxaca and Chiapas which are among the states with the highest extreme and moderate poverty in the country[25].

Study areas

The southeastern region of the country has great economic and developmental deficiencies. However, it also has one of the most relevant attractive aspects for the Mexican economy: **the tourism sector.** The southern region contains the most visited tourist destinations in the country. The Mexican Caribbean, where the cities of Cancun and Playa del Carmen are located, is the most visited tourist destination in Latin America. In addition, the city of Oaxaca, in the south of the country between mountain ranges, is an often-visited tourist destination as well, for its cultural offer.

In the municipality of **Campeche**, there is a problematic discrepancy between areas of urban growth and the necessary urban services. The center is moving away from the city, directly affecting mobility flows for journeys to work, housing and educational centers. This phenomenon has encouraged the use of the automobile. The City of San Francisco de Campeche shows an 18% increase in the use of private vehicles from 2011 to 2013[26]

Mérida exceeds the national percentage in terms of bicycle use. In spite of this, there are infrastructure problems, such as a lack of road design, low connectivity, and no consistent use of road signs in high-speed zones, which leads to accidents for pedestrians and cyclists. The public transport network in Mérida is composed mainly of minibuses and buses. These have not been able to unify their way of operating, nor have they been able to consolidate an integrated mobility system that allows for easy transition between different modes of transport.

[25] Multidimensional Measurement of Poverty 2016-2020. CONEVAL

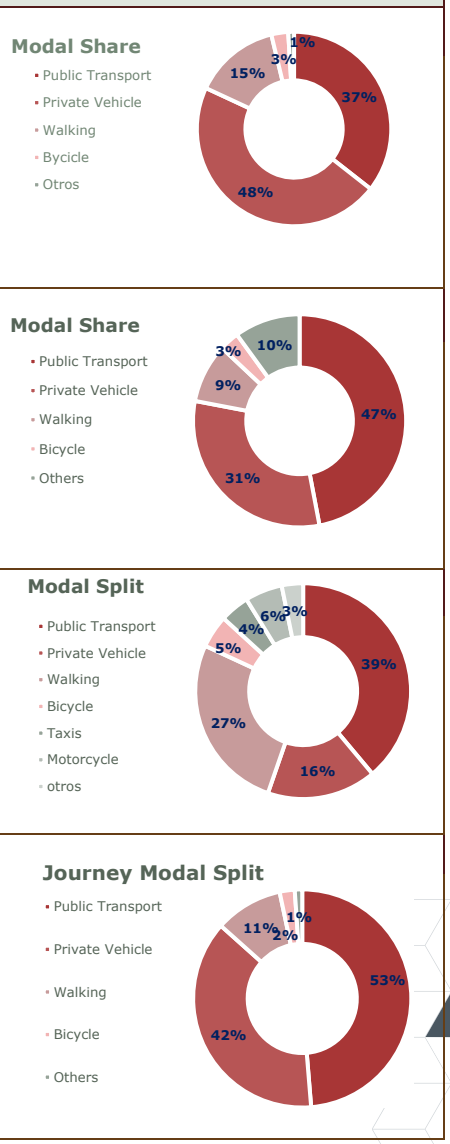
[26] Municipal Urban Development Plan

The state of Quintana Roo has a tourist and economic centers in process of growth such as **Cancun and Playa del Carmen**. In the municipality of Benito Juárez, almost 60% are cars for official, public, or private use, the remainder constitutes of motorcycles, cargo vans and concession public transport units[27]. In the hotel zones there are 2 public transport routes (R1 and R2) that have new units and are in good condition, while the public transport options that make journeys to the outskirts of the hotel zone is outdated and does not provide the best quality.

The following table presents a summary of each the main macroeconomic indicators and mobility figures of the southern region.

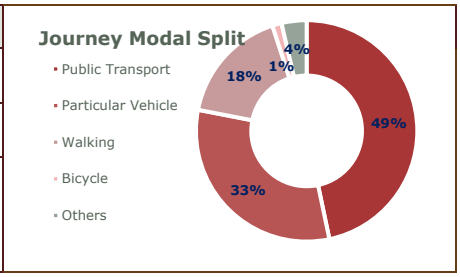
Table 3. Summary in Figures South Region

Summary in Figures South Region			
Campeche, Campeche (Metropolitan Zone of Campeche)			
Municipality	**Metropolitan Area**	**State**	
Municipal Population	Growth percentage _	% of Federal GDP	Foreign Investment in 2019
294,077 inhabitants	1.9%	2.93%%	141.3 million dollars
Merida, Yucatan (Merida Metropolitan Area)			
Municipality	**Metropolitan Area**	**State**	
Municipal Population	Growth percentage _	% of Federal GDP	Foreign Investment in 2019
995,129 inhabitants	1.8%	1.49%	158.6 million dollars
Oaxaca, Oaxaca (Metropolitan Zone of Oaxaca)			
Municipality	**Metropolitan Area**	**State**	
Municipal Population	Growth percentage _	% of Federal GDP	Foreign Investment in 2019
270,955 inhabitants	1.7%	1.43%	55.4 million dollars
Cancun (Metropolitan Zone of Cancun) and Playa del Carmen, Quintana Roo			
Municipality	**Metropolitan Area**	**State**	
Municipal Population	Growth percentage _	% of Federal GDP	Foreign Investment in 2019
Cancun: 888,797 inhabitants Carmen beach: 304,942 inhabitants	2.5%	1.64%	636.5 million dollars



[27] journeys Development Plan

Villa Hermosa, Tabasco (Metropolitan Zone of Villahermosa)			
Municipality	**Metropolitan Area**	**State**	
Municipal Population	Growth percentage _	% of Federal GDP	Foreign Investment in 2019
683,607 inhabitants	1.8%	2.54%	489.3 million dollars



3.2.2 Overview of recent market developments, policy changes and local innovation

A. Challenges of the sectors in terms of mobility

The main challenge in relation to public transport and cycling transport system are:

- There is an inadequate quality of public transport nationwide, and it is mostly only used by lower or middle classes without access to private cars. In 2015 at the national level, only 5.8% of the total fleet registered for collective public service belonged to transport operating companies or companies considered formal economic units, thus representing 87.76% of low-capacity transport, which operates under concession public transport units model. This model also represents low service quality standards for users
- It is worth mentioning that to increase investments in sustainable mobility, solid structures are required in the legislative, programmatic and institutional framework. This is necessary to facilitate coordination between institutions with different groups of actors to achieve concerted decisions, cross barriers, and regulate the participation of the sector.
- Government budget allocated to pedestrian mobility, cycling and public transport is an economic hurdle. Currently, these modes have not been pressured in the distribution of economic resources.
- The percentage of mobility spending dedicated to vehicular infrastructure projects between 2011 and 2015 was an average of 33.8%, reaching its maximum in 2011, when 74% of federal funds for mobility were spent on projects for the private automobile.
- Investment in Sustainable Urban Mobility is under stress due to the following:
    - A restructuring of the Zero Base Budget that does not contemplate sustainable urban mobility.
    - A budget cut that affects federal funds and ministries that invest in sustainable urban mobility.
    - A public investment programme that prioritizes the use of the private car, a situation that will be reflected in the inequity and regressivity of public investment, greater barriers for GHG mitigation and adaptation to climate change in the transport and urban mobility sector. Increase in other negative indications associated with car use (air pollution, traffic congestion, accidents, among others) and in a

negative impact on the quality of life in the country's metropolitan areas.[28]

    - Year after year, this investment has been concentrated in works that benefit the use of the automobile, generally exceeding 60%, and in 2015 it reached 86%, when only 31% of journeys to work and 25% of journeys to school were made by car. A distribution of public investment that is both unsustainable and inequitable.[29]

- Municipal governments do not always have in house expertise in the field of urban mobility that does not allow them to address mobility needs and their attention at the local level directly.
- Frequent administration changes become a significant risk, because despite the fact that large national strategic projects are underway, administrations and sub-projects are changed or cancelled.
    - There is a lack of technical capacities on the part of local authorities and a not always financing available for projects.

On the other hand, the national challenges regarding electromobility in Mexico are caused because there is no regulatory framework of laws, rules, regulations and programs where a roadmap is defined to be drawn to promote investments in electromobility.

Other aspects are:

- Changes in executive (president) branch priorities.
- Low generation of alternative energy sources.
- Market mistrust towards the electromobility supply chain.
- Blockages and impediments between different levels of government.
- Creating the urban infrastructure demanded by electromobility not yet high on the agenda.
- Economic policies that favor the production and consumption of fossil fuels.
- Absence of incentives for the purchase and use of electric motor vehicles.
- Acquisition of electric bus fleets because of high initial investments. The Strategic Plan for Electromobility considers that the manufacture of these units in national territory could represent a possibility to reduce acquisition costs. Therefore, one of the main challenges of the Dutch market is the implementation of solid financial structures which easily allow the renovation of units at an affordable cost.
- Innovative mobility alternatives such as MOBIKE, VBIKE, MOVO, LIME, positioned themselves in Mexico City as private shared bicycle systems without anchorage. However, they were largely removed from the market due to the lack of regulations and when the redrawing of government employment charged for operation the vast majority left. Currently in Mexico City it operates with 579 bicycles without anchorage from the DEZBA company. On the other hand, the GRIN company, the only one that was able to obtain the concession permit for electric scooters, after it was delivered in 2019, left the market due to the high number of thefts of the units.[30]
- It is worth mentioning that the Bajío region, Mexico, maintains a key place in the world production of vehicles and auto parts. The country has the potential,

[28] Investment to move – ITDP 2015

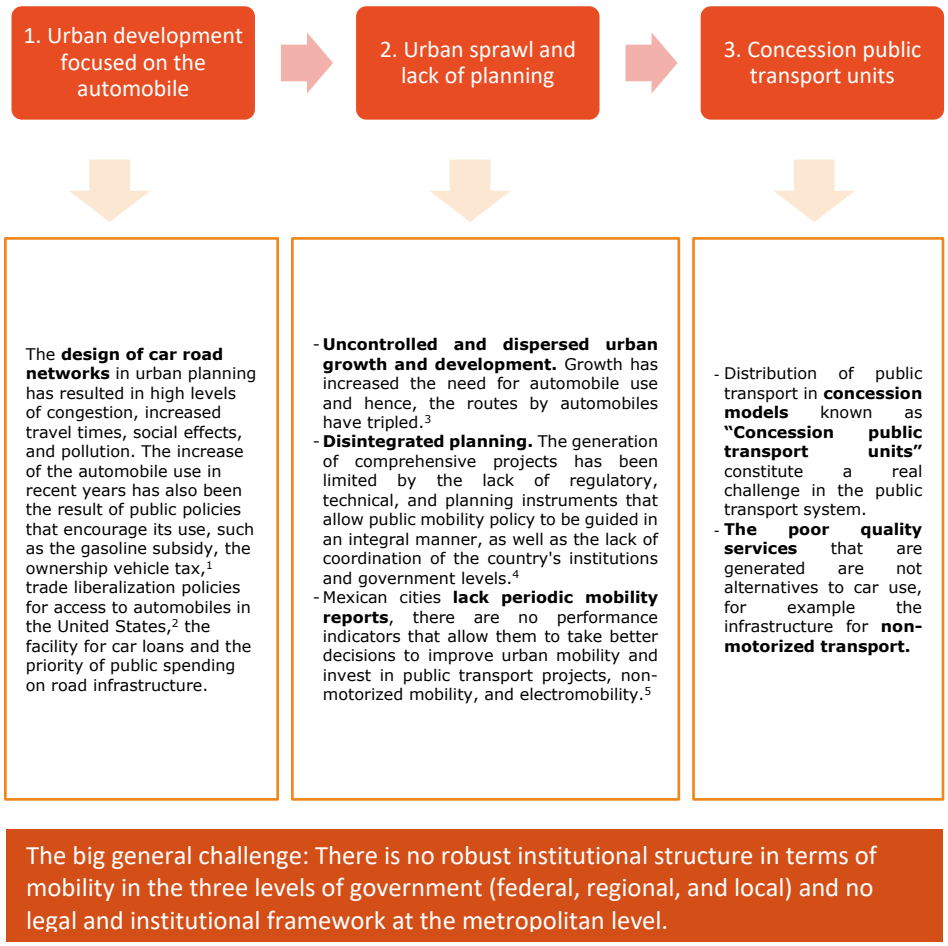
[29] ibid

[30] Excelsior

and recently, through the National Strategic Plan for Electromobility, the vision of venturing the production of electric buses. This contributes not only to sustainable development, but also to economic development.

In summary, in Mexico the major urban mobility problems are widespread and faced by the inefficient and unhealthy systems.

This is explained in the following figure:



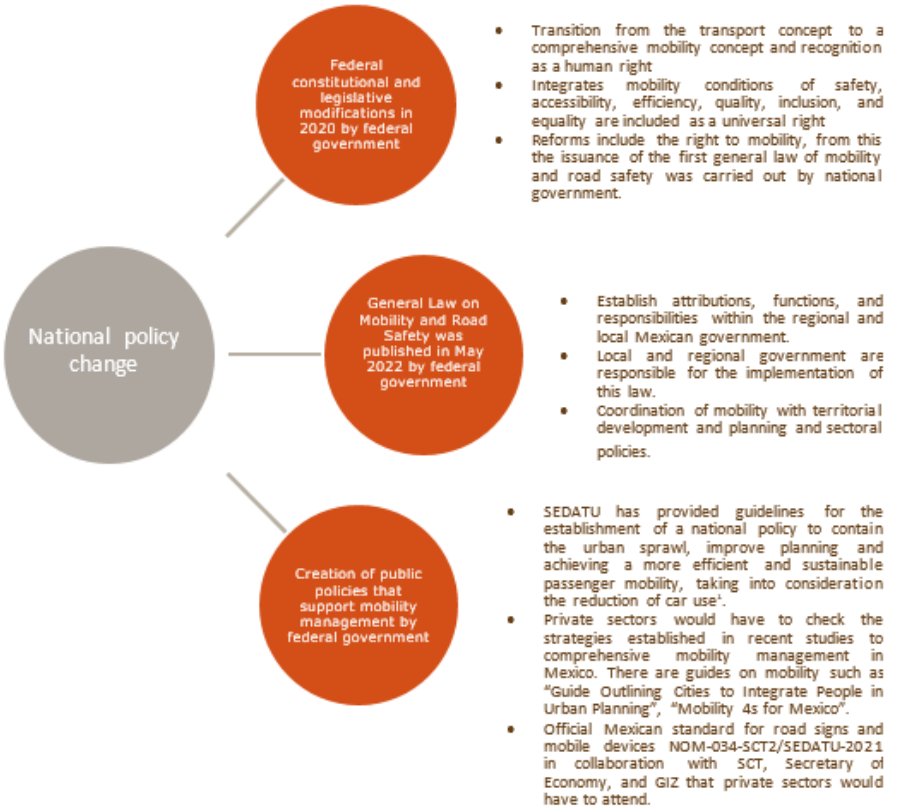
1 **The amount is around 3% of the value of the car and the tax has been eliminated in some states; in Mexico City, Colima, State of** Mexico, Guanajuato, **Guerrero, Puebla, Querétaro, Tlaxcala, Veracruz and Zacatecas this tax is still in force.**
2 After the signing of the North American Free Trade Agreement (NAFTA), the opening of Mexico to the importation of used cars from the US. During 2005, all restrictions on the importation of vehicles between 10 and 15 years old were eliminated, thereby allowing the entry of 2.5 million used private cars.
3 This is estimated from index Kilometre Vehicle Routes (KVR).
4 TOD Transit Oriented Development. Regenerar las Ciudades para mejorar la movilidad – ITDP 2013
5 Investing for mobility. DIAGNOSIS OF INVESTMENTS IN MOBILITY IN METROPOLITAN AREAS, 2011-2015 – ITDP 2015

Figure 4. Main problems and challenges of mobility in Mexico. Source: Own based on TOD Transit Oriented Development. Regenerar las Ciudades para mejorar la movilidad – ITDP 2013 and – ITDP 2015. For more information check annex.

In the Annex, the particular challenges per region, city and mobility sector are presented.

3 Policy changes

In Mexico, more local governments and sectors are beginning to promote innovative and integral public policies. In these last six years, the national government has been implementing the first foundation for the regulation, organization and increase in investment on sustainable urban mobility. The policy change in Mexican government consists of the following components:



[1] Based on the elaboration of the following programs that establish the bases of sustainable urban mobility: National Territorial Planning Strategy (ENOT), National Program for Territorial Planning and Urban Development (PNOTDU), National Housing Program (PNV), Guidelines for the elaboration of Municipal Urban Development Programs , Methodological Guide for the Elaboration of Metropolitan Zone Programs.

Figure 5. Main mobility policy changes in Mexico. Source: Own base on National Territorial Planning Strategy (ENOT), National Program for Territorial Planning and Urban Development (PNOTDU), National Housing Program (PNV), Guidelines for the elaboration of Municipal Urban Development Programs, Methodological Guide for the Elaboration of Metropolitan Zone Programs. For more information check annex.

Goals and challenges of sustainable urban mobility programs in federal government programs

National Development Plan (PND) 2019-2025

The PND does not establish a guideline on mobility, it establishes the importance of the connectivity of municipal capitals through the construction of rural highways, mainly in Oaxaca and Guerrero.
The highest priority projects of the government are the construction of the Mayan Train, being the most important infrastructure project for the rail connection for passengers and goods in the southeast of the country.
The Program for the Development of the Isthmus of Tehuantepec in Oaxaca and Veracruz, being a rail infrastructure modernization project for the mobilization of merchandise, as well as the construction of a gas pipeline to supply companies and domestic consumers.

National Territorial Planning Strategy (ENOT) 2020-2040

The "Objective No. 15" of the ENOT addresses issues of sustainable mobility, by establishing that by 2040 access to affordable, accessible, sustainable, and safe transportation systems must be guaranteed. The main challenges and ambitions at the national level are:

- Improvement of the National highway Network including the expansion of the highway system in the States of Guerrero, Oaxaca, and Chiapas.
- Development of a national and international airport network.
- Establishment of mobility system of people and articulated goods.
- Strengthen the railway transport and merchandise system.

Therefore, its priority objective is the structuring of the national territory through the promotion of a mobility policy, the management of urban development and the improvement of daily mobility towards the main urban centers.

National Program for Land Management and Urban Development (PNOTDU) 2021

The PNOTDU establishes as a strategy the promotion, integration, and complementarity of urban and rural settlements, where they promote the following specific actions:

- Transit-oriented development (TOD).
- The construction of roads and highways that connect the scattered human settlements with nearby cities.
- Sustainable mobility within metropolitan areas.
- Implementation of projects that comprehensively address the main urban and environmental problems in terms of public space, equipment, and mobility.
- Establishment of a regulatory framework that promotes mobility and Transit Oriented Design, policies with universal accessibility criteria and that includes citizen participation.

Figure 6. Main goals and challenge of sustainable urban mobility programs in Mexico. Source: Own on National Territorial Planning Strategy (ENOT), National Program for Territorial Planning and Urban Development (PNOTDU), National Housing Program (PNV), Guidelines for the elaboration of Municipal Urban Development Programs, Methodological Guide for the Elaboration of Metropolitan Zone Programs. For more information check annex.

4 Best practices identified per topic

The best practices registered for the management of traffic and demand of public transport were the following

EcoPark – Mexico City

This is a parking management system program that established the implementation of parking meters. 30% of the resources obtained are redirected to the improvement of the urban environment. Similar practices are found in iParkMe in San Luis Potosí, MoviParq in Pachuca, parking meters in Torreón, parking meters in Veracruz, virtual parking meters "Here is a place" in Guadalajara.

Mass Bicycle Parking – Cuautitlán Izcalli, Mexico City

The first massive bicycle parking in the country, which safeguards 817 bicycles. It promotes intermodality as it is located at the Cuautitlán Suburban Train station. Similar practices are identified in bike parking at the Tultitlán (268 places) and Fortuna (235 places) stations of the Suburban Train in the State of Mexico, massive bike parking Pantitlán (416 places) and La Raza (408 places), La Villa (80 places) and Buenavista (128) in Mexico City.

Cycle lanes – CDMX

Cycle lane-type cycling infrastructure network that seeks to promote bicycle movement in the city and is accessible to pedestrians, cyclists, users of public transport and private motorized vehicles. It is required that other types of cycling infrastructure be incorporated into the cycling network, taking into account the volume and speed of streets, such as bike paths, bus-bike lanes and shared lanes. Mérida (interurban), Guadalajara, Hermosillo and León are the cities that have implemented cycling infrastructure as a network.

Mass public transportation systems (BRTS, cable cars, etc.)

The Metrobus of Mexico city is an example of the successful transformation of public transport services from concession public transport units to a structured system of public transport. This has become a quality public transport system at a low investment cost, which also has high accessibility.[31]

A BRT corridor intervention has been implemented in Oaxaca, Aguascalientes, Culiacán, Tuxtla Gutiérrez, Villahermosa, La Paz, Colima, Tlaxcala, Los Mochis and Ciudad Obregón. These cities are medium-sized with fewer than 500,000 inhabitants whose travel demands are lower and do not require operating models in exclusive corridors. The same cities are beginning to present proposals for the structuring of integrated transport systems (ITS) in order to include infrastructure to optimize the operational design of the routes. The construction proposals for the main mass transport systems, mainly BRTs and metro lines, are:

- Optibus in León: The first Integrated Transportation System in the country promoted by the municipal, state, and federal governments in coordination with the concessionaires.
- Tezobus in Pachuca: In 2008, the Hidalgo State Government proposed a rapid transit bus system, as part of a Regional Urban Mobility Project for the Pachuca Metropolitan Area.
- Acabus in Acapulco: The Acabús was promoted by the Government of the State of Guerrero, attending to the social demands on the deficiency and conditions of the public transport service.
- RUTA lines 1 and 2 in Puebla: The Urban Network of Articulated Transport (RUTA) is a rapid transit bus system or BRT trunk feeder service located in the Metropolitan Area of Puebla passing through the municipalities of Puebla, San Andrés Cholula and Amozoc in the state of Puebla implemented by the disappeared former governor of Puebla Rafael Moreno Valle Rosas in 2013.
- Ecovía Line 1 in Monterrey: Ecovía is an Integrated Transportation System with Modern Buses, type BRT or rapid transit bus that provides service to the Monterrey Metropolitan Area. Its control and administration is in charge of the Government of the State of Nuevo León.
- Expansion of Line 1 Light Rail in Guadalajara: The Urban Electric Train of Guadalajara, colloquially known as the Light Train or My Train, is a metropolitan rail collective transport system, fully financed by the federal

[31] Transforming Urban Mobility in Mexico. Towards Accessible Cities Less Reliant on Cars - ITDP 2012

government and operated by the decentralized public body Urban Electric Train System (SITEUR), which provides its service to the city of Guadalajara (Mexico) and the surrounding municipalities. It currently operates with three transport lines.

- Nochebus (NightBus) in Avenue Insurgentes in CDMX: a model that seeks to manage the demand of public transport night corridors and apply improvements to the route to increase user demand through access and certainty of information. There are no practices like Nochebus, even though night transport systems are a necessity that all the cities of the country present.
- Mexicable Cable Car Transport System – Ecatepec, Metropolitan Area of Mexico City: it was the first cable car-type mass transport system in the country that was implemented to improve public transport service in areas of difficult access. Currently the Metropolitan Area of Mexico City has four cable car lines, two in the State of Mexico and two in Mexico City. A cable car can reach areas where the urban topography is complicated and it is a service that directly benefits people who live in irregular urban settlements. However, it is necessary to assess whether access to transport can be solved with the same investment at the street level.

MIBICI – Guadalajara

MIBICI is a bicycle system in Guadalajara that covers the municipalities of Guadalajara, Zapopan, and Tlaquepaque which promotes the use of bicycles as a mode of transport and intermodality. It was one of the first systems that allowed you to take a bicycle in at one point and to leave it in another. These shared bicycle systems have been implemented by: Ecobici in Mexico City, Huizi in Toluca, Quiero bici in Querétaro and BiciPuebla in Puebla. It is necessary to expand this cycling infrastructure in cities, since it has been noted that the system has a demand that is up to four times greater than its supply. The arrival of dockless bike systems is likely in cities that currently have bike share systems.

The best practices registered related to technology initiatives are the following:

Citizen Mapaton – Mexico city

In Mexico City there is little overview on the part of the dependencies that provide the public transport service about the number of concessions and units that circulate, as well as knowledge of routes and schedules. Citizen Mapaton seeks to serve as a tool to get information. It is a citizen exercise that consisted of mapping the public transport routes with the aim of generating an open data platform. In the short term it aims to know the routes of the city, in the medium term to update the routes, and in the long term for the development of a mobility study that allows for identifying and generating improvements for the service.
Technological companies can provide this type of platform for mapping information through the support of dependencies for the use of the data collected in the planning and reorganization of collective public transport.

CECI: Equitable City, Inclusive City – National

It is a training platform for officials on the planning, management, and execution of sustainable urban mobility projects. Since its launch, it has been used by officials from

28 states, 132 municipalities, as well as of the federal government. The modalities which are of the greatest interest to the users are Street Complete and Integrated Transportation Systems. It is desirable that the platform migrates to the servers of the federal government, providing technical support, and that an area is designated that can moderate its impact.

ProTaxi - Puebla

ProTaxi was an application for mobile devices of the Secretary of Infrastructure, Mobility and Transportation whose purpose was the modernization and improvement of the taxi service for users. This platform was used by 291 registered drivers and 159 active drivers, and the cost of planning and execution was $6,000,000 MXN.
In a first stage, the application was used in the municipalities of Puebla, San Andrés and San Pedro Cholula. Unfortunately, due to lack of resources from the interim government, on January 15, 2019, it ceased to function. For each journey, 1% was allocated as government contribution and was charged to the Username. In this manner, 100% of the cost of the journey went to the driver.

3.3 Stakeholder analysis

3.3.1 Overview of governmental and non-governmental structures

In Mexico institutions are a fundamental part of the constitution and management of projects and public policies in favor of urban sustainable mobility. For the implementation of actions and new initiatives, different relevant actors are needed. In Mexico they are categorized as: government, international organizations, civil society, and the private sector.

A. Governmental

Federal Government: highly relevant actor in the implementation of mobility projects given that it has the power to convene and organize regional and local governments to carry out common objectives. Concentrating technical knowledge and link with foreign cooperation to develop guides, manuals, and preparation of plans

Figure 7. Governmental Stakeholders Organization. Source: own.

Regional Governments: with different capacities than the federal governments, the Regional Governments, in cooperation with governmental financiers and non-governmental entities, can manage economic resources to strengthen local governments to fulfil their goals and responsibilities in cooperation with governmental financiers and non-governmental entities.

Municipal Governments: They are the most important actors for the implementation of immediate actions on a local scale, because

of their knowledge of the site, proximity to the population and their capacity to carry out the socialization for planning and evaluation projects.

B. Non-governmental

International Organizations: Carry out projects through the alliance with national, state and local governments. International organizations can collaborate through technical or financial assistance to strengthen local institutions.
International organizations can be categorized as development agencies, cooperation agencies, embassies, and financing agencies. There are also international civil organizations, foreign consultancies and transnational companies involved in mobility projects.

The participation of international organizations in mobility projects is mostly as follows:

Civil Society: Important actor for carrying out projects that, focused on social needs, are fundamental for the diagnosis, monitoring and evaluation of programs. Having the civil society engaged strengthens and legitimizes projects, since citizen collaboration is guaranteed.
The actors can be academics, groups, organizations, or the general population.

Private Sector: Companies involved in the construction of the city, such as real estate agents or companies that provide services. This actor seeks to maintain its interests within future projects and programs and must integrate its interests with the groups of civil society. Their participation as a financier is extremely important for emerging projects.

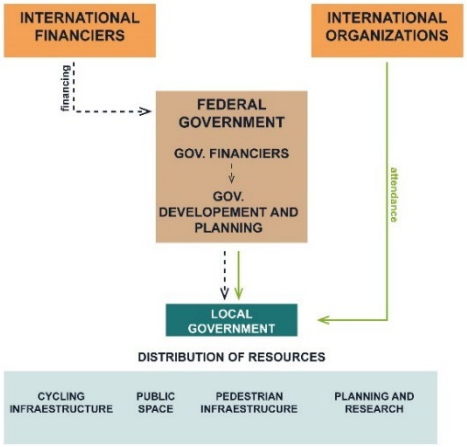


Figure 8. International and National Stakeholder's organizations.

3.3.2 Stakeholder characteristics

To have a wider view of the regional situation, interviews were conducted with relevant people in the field of mobility. The following table present the interviewed actors.

NORTH	**Laguna (Torreon)**	José Antonio Ramírez Reyes Ihanelly Hernandez	General Director IMPLAN Torreon Técnica en IMPLAN Torreión
	Monterrey	Alicia Guajardo Alejandro Ramos María Guadalupe López Marchant	Master Urban Planner - Cities Design, Urban Infrastructure Projects Mobility Coordinator - Mobility Secretary, Nuevo León Subsecretary of Mobility and Planning Institute, Nuevo León.
CENTER	**Guadalajara**	Jesús Carlos Soto	Mobility Director, Guadalajara
	León	María de la Paz Díaz Infante Aguirre	La Salle Bajío University -Master Coordinator in Architectural Design
	Mexico City	Jesús Hernandez Alejandro Gonzalez Morgado Oren Tatcher / Bruno Arancibia Areli Carreon	Professional C specialist in mobility projects for fully planned centers - FONATUR Associate Investment Officer - International Finance Corporation OTC - Senior Mobility Consultor Safe mobility Coalition
SOUTH	**Puebla**	Armando Pliego Ishikawa	Head of the Department of Road Culture and Promotion of Sustainable Urban Mobility City Hall of Puebla, Mexico
	Campeche	Juan Antonio Vázquez	Citizen Observatory - DRO/Architect/Urbanist
	Merida	Everardo Flores	Cicloturixes _ AC
	Oaxaca	Claudina de Gyves	Liga Peatonal - Casa de la Ciudad
	Tabasco	David Gustavo Rodriguez David Montiel	SDET (Secretariat of economic development and tourism) ONG Ciudad Verde Tabasco
	Cancún	Aldo Jiménez Alanis	Director de Movilidad y Transporte en el Municipio de Benito Juárez
	Playa del Carmen	Francisco de Anda Francisco Diego Martínez	Mobility Council, Playa del Carmen Mobility Director, Solidaridad Municipality
	National	Miriam Tellez Ballesteros Bernardo Baranda Sergio Andrade Ivan de la Lanza Luisa Bonilla	UNAM - Mobility Expert ITDP México Estratégia Misión Cero Active mobility Expert - BID CAF/WRI Consultor Manager for Mexico and Central America - UITP Liaison office

Table 4. Stakeholder's interviews.

From the investigation of official documentation and mobility manuals, as well as through the interviews with the above-mentioned stakeholders, the most relevant actors were detected. To better understand the role that each stakeholder plays in the mobility sector in Mexico, the actors were established in two categories:

- **Political hierarchy:** Foreign, national, state, and municipal entities.
- **Sector of participation**: Government Institutions, Government Financial Institutions, Private Organizations and Civil Society Organizations.

The following scheme presents the categorization and organizational mapping of the key stakeholders in the urban mobility setting (focused on the 4 priority topics: cycling, signalling, electromobility and public transport).

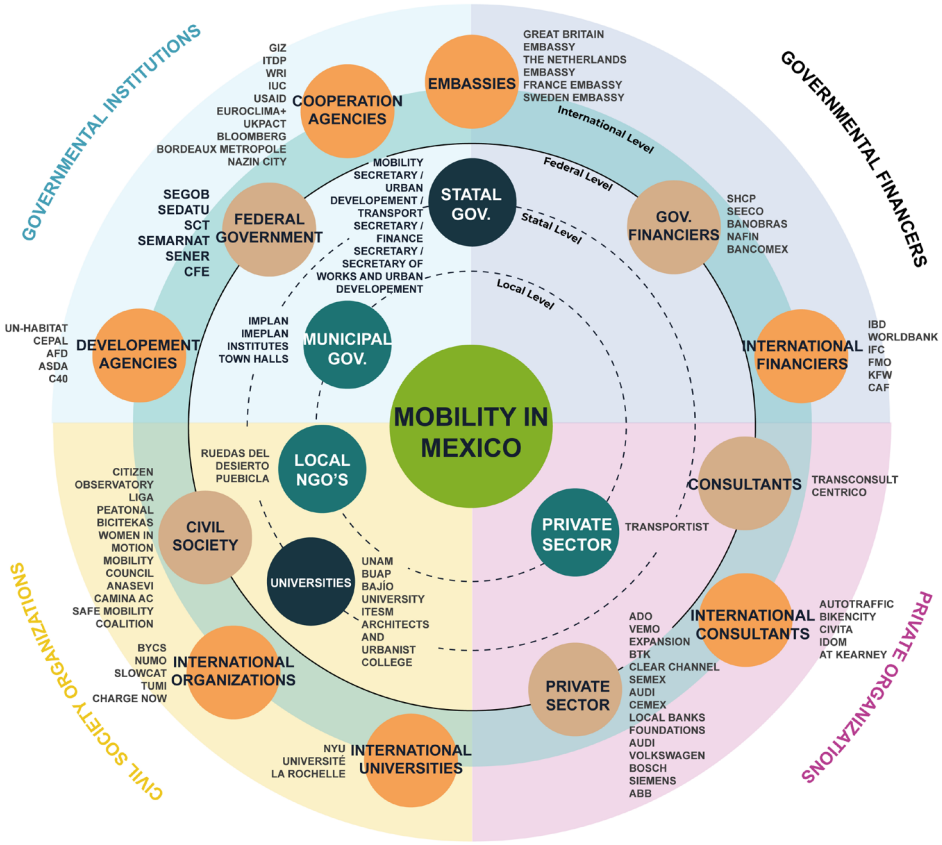


Figure 9. Organizational mapping. Source. Own

In order to map stakeholders, it is important to carry out an analysis of each one and their strengths and weaknesses, as well as their levels of influence. The following sections present the characteristics of each one of the sectors of participation that were contemplated and are briefly described in general terms. The analyzed stakeholders will be measured in terms of economic wealth, political authority, and ability to influence decision-making and information and communication.

A. Government entities

The strongest sector, as it has the **highest degree of political authority**. Its value lies in the orientation and coordination to offer tools to local governments. Government entities design public policies according to the subject in which they specialize so that they accompany local governments in their compliance. It has a high power in terms of economic wealth but its resources are limited to the funds granted by government financiers.

The Ministry of the Interior is the government institution with the highest political strength**,** obligated to comply with constitutional precepts and generate laws. In terms of mobility, the Secretary of Agricultural, Urban and Territorial Development (SEDATU) has the greatest expertise in carrying out projects, manuals, and guides. The complementary institutions that cover the issue in a comprehensive manner are the

Ministry of the Environment and Natural Resources (SEMARNAT) in promoting non-motorized transport, public transport renovation programs, and support for electromobility; and the Ministry of Communications and Transport (SCT) for the coordination of road and highway infrastructure.
In the southern region, one of the most influential institutions is the National Tourism Fund (FONATUR), as it carries out one of the largest infrastructure projects of the current administration: the Maya Train.

B. Government financiers

The government financial entities have the highest economic wealth, since they are the ones in charge of distributing the federal budget to the different institutions. By having the greatest economic power, they are also given high power in terms of political authority and the ability to influence decision-making.
The largest government entity is the Ministry of Finance and Public Credit (**SHCP**) since it is dedicated to collecting and distributing the public budget. The Ministry of Economy is another important government financier.
A further type of federal financiers is national banks such as the National Bank of works (**BANOBRAS**) or the Nacional Financiera (**NAFIN**) that have funds, subsidy, and financing programs for mobility.

C. Foreign financiers

Foreign financiers have high economic wealth power, but low political authority and low decision-making power. Foreign financiers work by financing specific projects, to improve the social development of a region, state or municipality. Its objective is to provide financial assistance through funds and credits without interest at a bank level.
Some international financial institutions are the Inter-American Development Bank (IDB), the World Bank and the International Finance Corporation (IFC).

D. Foreign cooperation agencies

Foreign cooperation agencies promote public policies and specific programs in coordination with local governments for the sustainable and ecological development of cities. Likewise, they provide technical advice to federal governments for the creation of manuals and research studies. Cooperation agencies have little power in general, since they are external institutions that provide support.
Foreign cooperation can be carried out through embassies, depending on the level of involvement they have with the other stakeholders (mentioned above) and the civil society. The **British Embassy**, the **Embassy of the Netherlands** and the **French Embassy** have participated in the creation of several manuals in conjunction with federal entities.
In terms of mobility, the foreign cooperation organizations with the greatest participation are: the German Society for International Cooperation (**GIZ**), the Institute for Transport and Development Policy (**ITDP**) and World Resources Institute (WRI) at the national and federal level, as they engage with federal institutions. Agencies such as EuroClima+ are especially involved in the Metropolitan Area of Guadalajara and Puebla, and the French Development Agency is involved in the central region of the country, in cities such as León. It is important to highlight that GIZ can also select other parties to cooperate in projects, especially in tender procedures.

E. State and Municipal Governments

State governments have less economic power, but high power in terms of political authority, ability to influence decision-making, and information and communication.
At the state level, departments of urban development, public works and services, mobility, finance, and the environmental department are the ones in charge at the of the generation of integral policies fot the promotion of mobility projects
As for the municipal governments, it is the municipal planning institutes, together with the city councils, that oversee making decisions on the projects. The cities that have mobility and planning institutes are the following:

Table 5. Mobility and Planning Institutes by Region and City. Source: own

	State	Municipality	Planning Institutes
NORTH			
Coahuila	Secretariat of Infrastructure, Urban Development and Mobility of the Government of the State of Coahuila	-	IMPLAN Torreon
Nuevo León	Secretary of Mobility and Urban Planning	Secretariat of Urban and Sustainable Development (Monterrey)	IMPLANI Monterrey
CENTER			
Jalisco	Secretary of Transportation	Ministry of Mobility (Guadalajara)	IMEPLAN (Metropolitan level)
Querétaro		Ministry of Mobility (Querétaro)	IMPLAN
Guanajuato	Mobility Institute of the State of Guanajuato	-	IMPLAN Leon
Mexico City	Mobility secretary	-	
Puebla	Secretariat of Infrastructure and Transportation	Ministry of Mobility and Infrastructure (Puebla)	IMPLAN Puebla
SOUTH			
Campeche	State Transport Institute	-	
Yucatan	Institute of Mobility and Territorial Urban Development	-	IMPLAN Merida
Oaxaca	Mobility secretary	-	IMPLAN Oaxaca
Quintana Roo	State Mobility Institute	-	IMPLAN Cancun
Tabasco	Mobility secretary	-	

F. Private sector

The value of the private sector is based on the financing that it may or may not grant to different projects. Even though they have little political authority in themselves, it is important to have an investor for the development of any program. Private investors have the power to finance projects, implement technologies, or promote changes according to their participation, and could be taken the form of national or foreign investors.

At a national level, the most relevant private sector stakeholders are the **Transports Providers** since they carry out the operation of public transport. In the south of the region, a company of great relevance is **ADO**, since it is involved in the operation and support of a large part of public transportation. As for the central area, an important company is **Grupo Expansión**, a media agency that oversees advertising the entire "ECOBICI" bicycle rental system. In terms of traffic lights and signalling, **SEMEX** is the company that covers more than 50% of the national territory.

G. Civil organizations and Academy

Civil associations have low power in general. Despite this, their value lies in the connection with citizens and the pressure exerted on federal governments for the approval of public policies and improvement programs.
In Mexico, **the Coalition for Safe Mobility** and **Women in Motion** are two of the civil organizations that have helped the most to approve public policies and non-motorized transport programs.
Academies, on the other hand, have medium power in terms of the ability to influence decision-making, since in some cases they are linked to local and federal governments, specifically, state universities. At the federal level, the Autonomous University of Mexico has a special place, since it also carries out many studies and documents that help develop policies. UNAM also has a large number of specialized experts in mobility. At the central region level, the Universidad del Bajío and the Benemérita Universidad Autónoma de Puebla (**BUAP**) also have a high degree of participation in mobility programs and studies, while in the North zone it is the Instituto Tecnológico de Estudios Superiores Monterrey (**ITESM)** which has the strongest link to the authorities and institutions, since it also acts as a private sector and investor.

3.3.3 Key actors and state of play of currents actors influencing the value chain

Although the dynamics between the actors of interest is almost the same in the three regions of the country, there are some that are more relevant in some regions than in others. Below is a categorization of the persons of interest at the national level, as well as actors that highlight in specific regions, according to the interests of this study: traffic signalling, bicycle mobility, public transportation and electromobility.

Table 6. Key actors for the four priority topics of this study. Source: own.

FEDERAL GOVERNMENT	FEDERAL FINANCIERS	INTERNATIONAL FINANCIERS	FEDERAL ENTITY / MUNICIPAL GOVERNMENT	COOPERATION AGENCIES	ONG	PRIVATE SECTOR	KEY REGIONAL STAKEHOLDERS
Bicycle Mobility							
+ Secretariat of Territorial, Urban and Agricultural Developement (SEDATU) + Secretariat of enviroment and Natural Resources (SEMARNAT)	Federal Government	+ Interamerican Developemtn Bank (IDB) + KFW Developement Bank	+ Mobility Secretary + Secretary of Administration and Finance + Urban Developement / + Urban Planning Institutes (IMPLAN) + Metropolitan Planning institutes (IMEPLAN)	+ONU HABITAT + GIZ + ITDP + BYCS + WRI + British Embassy - UKPACT + Netherlands Embassy	+ Liga Peatonal + Bicitekas + women in Motion + Safe Mobility Coallition + BikenCity + Mision Zero	+ CityBanamex + Santander Group + Local Banks + CEMEX	**North:** + DistritoTec + Instituto Tecnológico de Estudios Superiores Monterrey (ITESM) + Universidad Autónoma del Noroeste + Nazin City + NYU + Ruedas del Desierto **Center:** + BKT Bici Pública + 5 M Dos + BKT BiciPublica +Vetelia+ Bsystems+ InTouch + DEZBA - MasterCard + Vetelia + Bordeaux Metropole **South:** + Biciplaya + Cicloturixes + Université La Rochelle
Traffic Signalling							
+ Secretary of Transportation and Comunication (SCT) + National Council for Accident Prevention + Health Secretary	+ Secretary of Finance and Public Credit (SHCP)		+Works and Urban Developement Secretary + Secretary of Administration and Finance / + Urban Planning Secretary +TownHall + Secretary of Administration and Finance	+ SafeKids Mexico	+ National Alliance for Road Safety (ANASEVI)	+SEMEX	**North:** + Cactus Traffic + Traffic Lights **Center:** + Auttotrafic + Eyssa Mexicana **South:** + Vixionere

Electro Mobility							
+Energy Secretary (SENER) + Federal Electricity commision (CFE) + CONUEE + Economy Secretary	Federal Governmet	+ Interamerican Developemtn Bank (IDB) + Interamerican Developemtn Bank (IDB) + KFW Developement Bank + Green Climate Fund	+ Mobility Secretary + Urban Developement + Secretary of Administration and Finance + Secretariat of economic Development/ + Urban Planning Institutes (IMPLAN)	+ GIZ + British Embassy + Copper Alliance +WRI	+ ANPACT + AMIA + Alliance for the Elecetro Mobility in Mexico + Carbon Trust	+ VEMO +EV Ready +CityBanamex + Testla +BMW +Siemens + Nissan +HSBC +Bosch +Audi + Solar Beat + Charge Now	**Norrth:** + Grupo Lazcano **Center** + Charge Now **South:** + Irizar E Mobility
Public Transport							
+ Secretariat of Territorial, Urban and Agricultural Developement (SEDATU) + Secretariat of enviroment and Natural Resources (SEMARNAT)	+ BANOBRAS + NAFIN + FONADIN	+ Netherlands Developement Finance Company (FMO) + Interamerican Developemtn Bank (IDB) + WorldBank + IFC	+ Mobility Secretary + Urban Developement / + Urban Planning Institutes (IMPLAN) + Townhall	+ GIZ + British Embassy	+ Taxi Drivers Union	+ Transportist + Mobility ADO + Local Banks + VEMO	**Norrth:** + Fabricación, Asesoría y Mantenimiento Industrial **Center** + MIVSA + Alexander Dennis + Corredor Insurgentes **South:** + ADO

3.3.4 Competitor analysis

Based on the previously presented analysis of stakeholders in the mobility sector in Mexico, strategic competitors in the field were identified.

The different competitors and their characteristics are explained below:

EMBASSIES
Competition Factors
+ Direct support to federal and local governments
+ Comprehensive network of consultants, NGOs and financiers to carry out projects (UK PACT, ITDP, International Climate Finance)
+ Alliances with key actors in the private sector

BRITISH EMBASSY IN MEXICO

GERMAN EMBASSY IN MEXICO

Level of Relevance	**Collaboration:**
High economic power Low power of Political Authority Low power of decision Low communication power	+Federal Secretariats +Private sector +Foreign cooperation agencies +Consultants +Civil Society Organizations

COOPERATION AGENCIES
Competition Factors:
+ Positioning and links with local and federal governments
+ Presence throughout the Mexican Republic
+ Market share since 2006
+ Budget for development of research and manuals
+ Bilateral participation with other international agencies (part of Euroclima+ complementary agencies)
+ Strong alliances with the private sector

GIZ / German Society for International Cooperation

Level of Relevance: Cooperation International High	**Collaboration:**
Mid Economic Power Low power of Political Authority Low decision power High Communication Powers	+ Federal government, states, municipalities +Consultants +Embassies +Private Sectors

Objective:
Accompany Mexican counterparts towards sustainable development . The joint goal is to advise Mexico on achieving the goals of the 2030 Agenda and the Paris Agreements with a focus on protecting the environment, combating climate change and improving the quality of life of the population.

+Collaboration in mobility manuals, central project evaluation, support for the implementation of energy transition in Mexico, Pop-up bike lanes

EUROCLIMA+ AND COMPLEMENTARY AGENCIES	
Level of Relevance: Cooperation International High Mid Economic Power Low power of Political Authority Low decision power High Communication Power	**Collaboration:** + Federal government + Local Governments and Municipalities +Consultants +Embassies +Private Sectors
Objective: EU flagship program on environmental sustainability and climate change with Latin America, to reduce the impact of climate change and its effects in Latin America by promoting mitigation and adaptation to climate change, resilience and investment. +Collaboration in mobility manuals, Integral Sustainable Urban Mobility Plans for the Guadalajara Metropolitan Area	
COMPLEMENTARY AGENCIES	
SPANISH AGENCY FOR INTERNATIONAL DEVELOPMENT COOPERATION	
FRENCH DEVELOPMENT AGENCY	

3.3.5 Strategic alliance and market competitor's identification.

For the positioning of companies in the mobility market in Mexico there are certain actors of interest that can function as strategic allies.

Below are the different allies categorized by regional alliances.

A. National alliances

GOVERNMENT ALLIANCES	
SRE / Secretary of Foreign Affairs **Stakeholder Relevance:** + Main link between foreign companies and the Mexican government	
Level of Relevance: Governmental High High power economic High power of Political Authority High decision power High communication power	**Collaboration:** Embassies Private Sector
Objective: Coordinate matters outside the country with; enforce the governmental principles in international relations, represent the Mexican government in global and regional forums and organizations; run the foreign service, and embassies, consulates, business offices and permanent missions	
SEDATU / Secretariat of Agrarian, Territorial and Urban Development **Stakeholder Relevance** + Connection with the mobility sector in Mexico, in charge of mobility programs + Promoter of manuals, initiatives and mobility schemes + Close link with foreign cooperation + Interest in the private sector for the promotion of programs and strategies	
Level of Relevance: Governmental High High power economic High power of Political Authority High decision power High communication power	**Collaboration:** +Foreign organizations to receive technical advice on the implementation of projects and programs +Foreign financiers, to subsidize programs +Local governments: advice and facilitation in the implementation of public policies
Objective: Design, execute and coordinate public policies on land tenure, productive use of the national territory and urban planning. Disseminate and create manuals for local governments, as well as develop urban improvement agendas. + 4S mobility, Simplified Guidelines for the preparation of municipal Urban Development plans or programs, Regulatory Diagnosis on Mobility, Guide for the elaboration of a report on the metropolitan impact of projects eligible for financing, Manual of Streets	
CFE / Federal Electricity Commission **Stakeholder Relevance** + Player of greatest value in the energy field +In charge of the electrical infrastructure of the country + Financial Solidity + Constantly looking for allies in the private sector	
Level of Relevance: Governmental High High power economic High power of Political Authority High decision power High communication power	**Collaboration** +Local Governments +Private Sector +Foreign financiers, to subsidize programs +Local governments: advice and facilitation in the implementation of public policies
Objective: Supply energy inputs and goods required for the productive and social development of the country in an efficient, sustainable, economic and inclusive manner, through a policy that prioritizes security and national energy sovereignty and strengthens the public electricity service	

FOREIGN AGENCIES

Stakeholders Relevance

+ Main promoters of policies in favor of sustainable mobility
+ Collaboration with government entities and foreign cooperation
+ Alliances with embassies, foreign financiers
+ High expertise on the mobility sector in Mexico

ITDP / Institute for Transport and Development Policy

Level of Relevance: International Cooperation Medium	**Collaboration:**
Low economic power Low power of Political Authority Low decision power High communication power	+Consultants +Local and national authorities

Objective:

Promote transportation solutions that reduce greenhouse gas emissions, environmental pollution, poverty, travel times, traffic events, and thereby improve economic development and quality of life

+Collaboration in mobility manuals, Bike-Share System Planning Guide, Bike-Share Systems Planning Guide, Street Manual: Road Design for Mexican Cities

WRI / World Resources Institute

Level of Relevance: International Cooperation Medium	**Collaboration:**
Low economic power Low power of Political Authority Low decision power High communication power	+ Federal Authorities + Local Authorities

Objective:

Creation of conditions of equity and prosperity through the sustainable management of natural resources

+Collaboration in mobility manuals, Building Efficiency Initiative, Metrobus Mexico City: Conceptualization, design and accompaniment, Optibus : Leon, Guanajuato, Macrobus : Guadalajara, Jalisco, Road Safety Audits in Public Transport Corridors

PRIVATE SECTOR

VEMO

Stakeholders Relevance

+ Presence in the three most important metropolitan areas of the country (Mexico City, Monterrey and Guadalajara)
+ Integral System with Product diversification (Vehicles, charging infrastructureTechnology and data intelligence for fleet management)
+ Collaboration with multinational companies

Level of Relevance:	**Collaboration:**
Mid economic power Low power of Political Authority Low power of decision Low communication power	Statal and local governments Private sector for collaborations Financiers for founding

Objective:

Mexican cleantech with an innovative model that integrates the entire clean mobility ecosystem including: Vehicles, charging infrastructure, Technology and data intelligence for fleet management as components that make up the clean mobility ecosystem

CLEAR CHANNEL

Stakeholders Relevance

+ Important element for positioning within the public bicycle scheme that includes three actors: Advertising, Sponsorship and Bicycles
+ Experts in public bicycle schemes from the collaboration for 10 years with EcoBici
+ Links with government entities
+ Alliance with national and international companies, as well as financial actors
+ Coverage in Mexico City, Guadalajara, Monterrey, Puebla, Cancun, VillaHermosa, Queretaro

Level of Relevance:	**Collaboration:**
High economic power Low power of Political Authority Low power of decision High communication power	Statal and local governments Private sector for collaborations Financiers for founding

Objective:

Outdoor advertising company

CIVIL ORGANIZATIONS

Stakeholders Relevance

+ High expertise on the mobility sector in Mexico
+ Links with foreign cooperation
+ Link with civil society that legitimizes mobility programs and projects

COALITION FOR SAFE MOBILITY

Level of Relevance:	**Collaboration:**
Low economic power Low power of Political Authority Low power of decision High communication power	Federal government States, municipalities Citizens

Objective:

Promote the creation of regulatory, institutional, and financial mechanisms that ensure the implementation of effective actions from the three levels of government.

Approval of the National Law on Mobility and Road Safety

B. Regional alliances

NORTH REGION	
LOCAL GOVERNMENTS AND INSTITUTIONS ALLIANCES **Stakeholder Relevance** + Promoter of manuals, initiatives, and mobility schemes + Close link with foreign cooperation + Interest in the private sector as investors or service providers + Entities interested in improvements for public transport, as well as for non-motorized mobility + Technical advice for bidding and project competition	
Level of Relevance: Local Government High Mid economic power High power of Political Authority High decision power High communication power	**Collaboration:** +Foreign organizations to receive technical advice on the implementation of projects and programs +Foreign financiers, to subsidize programs +Private sector such as carriers for coordination of public transport systems or sponsors and advertising agencies for bicycle rentals +Municipal Government: implementation of public policies +Municipal development institutes: development plans and sustainable mobility.
MOBILITY AND URBAN PLANNING SECRETARY NUEVO LEON	
ENVIROMENT SECRETARY	
IMPLAN TORREON URBAN / PLANNING MUNICIPAL INSTITUTE	
ACADEMIC ALLIANCE **Stakeholder Relevance** + Great participation at the state level + Link with state and local governments + Economic strength + Infrastructure developers + Participation in urban planning programs	
INSTITUTO TECNOLÓGICO DE ESTUDIOS SUPERIORES MONTERREY / ITESM	
Level of Relevance: High economic Power Low power of Political Authority Mid decision power Mid communication power	**Collaboration:** +Local Governments +Foreign organizations +Private sector
Mobility Projects + Strategies within Distrito Tec Program	

CENTRAL REGION	
LOCAL GOVERNMENTS AND INSTITUTIONS ALLIANCES **Stakeholder Relevance** + Promoter of manuals, initiatives, and mobility schemes + Close link with foreign cooperation + Interest in the private sector as investors or service providers + Entities interested in improvements for public transport, as well as for non-motorized mobility	
Level of Relevance: Local Government High Medium economic power High power of Political Authority High decision power High communication power	**Collaboration:** +Foreign organizations to receive technical advice on the implementation of projects and programs +Foreign financiers, to subsidize programs +Private sector as coordinators of public transport systems or sponsors and advertising agencies for bicycle rentals +Government of Mexico City for the management and operation of collective transportation systems.
SEMOVI /Secretary of Mobility Mexico City	
MOBILITY DIRECTION LEON GUANAJUATO	
PRIVATE SECTOR	
CORREDOR INSURGENTES SA DE CV **Stakeholders Relevance** + Expertise in BRT operation + Collaboration with the private sector for products and services	
Level of Relevance: Mid economic power Low power of Political Authority Low power of decision Low communication power	
Objective: First operating company in Mexico City in the BRT modality	

SOUTH REGION	
LOCAL GOVERNMENTS AND INSTITUTIONS ALLIANCES **Stakeholder Relevance** + Promoter of manuals, initiatives, and mobility schemes + Close link with foreign cooperation + Interest in the private sector as investors or service providers + Entities interested in improvements for public transport, as well as for non-motorized mobility	
Level of Relevance: Local Government High Medium economic power High power of Political Authority High decision power High communication power	**Collaboration:** +Foreign organizations to receive technical advice on the implementation of projects and programs +Foreign financiers, to subsidize programs +Private sector as coordinators of public transport systems or sponsors and advertising agencies for bicycle rentals +Government of Mexico City for the management and operation of collective transportation systems.
INSTITUTE OF CONSTRUCTION AND CONSERVATION OF PUBLIC WORKS – YUCATAN	
SECRETARIAT OF ECONOMIC DEVELOPMENT OF QUINTANA ROO	

3.4 Financial structure analysis

Mexican cities design and finance transport and mobility projects based on the situation and their capacity to develop them, as well as their relationship with the different actors involved in the projects. To make the right decisions, it is necessary to consider, for example, the design of the business model and how to increase competitiveness and distribute risks.[32] Financial structures can be divided into:

- Governmental / public
- National development bank
- Private
- International organizations

3.4.1 Overview of regional and local governmental financial structures

Local governments in Mexico have some financing resources to carry out investments that improve the mobility and accessibility of the urban population. However, based on the discussions of the Economic Package for fiscal years 2019 and 2020, the Ministry of Finance and Public Credit (SHCP) opted for an austere spending policy and efficient debt management.

Until 2018, most of the proposals to carry out pedestrian and cyclist mobility in the country incorporated a financial component whose base fell exclusively on participatory federal resources. The state and municipal governments competed from this category of public financing to subsequently secure the necessary amounts through five different sources.

[32] C40 Cities Finance Facility

Figure 10. Governmental financial structure in terms of mobility. Source: Own based on DOF 2020, 2021, 2022.

National development Bank

Mexico has several state banks that support the economic and social development of the nation through various sources and financing mechanisms. However, only two support the deployment of mobility projects: NAFIN and BANOBRAS.

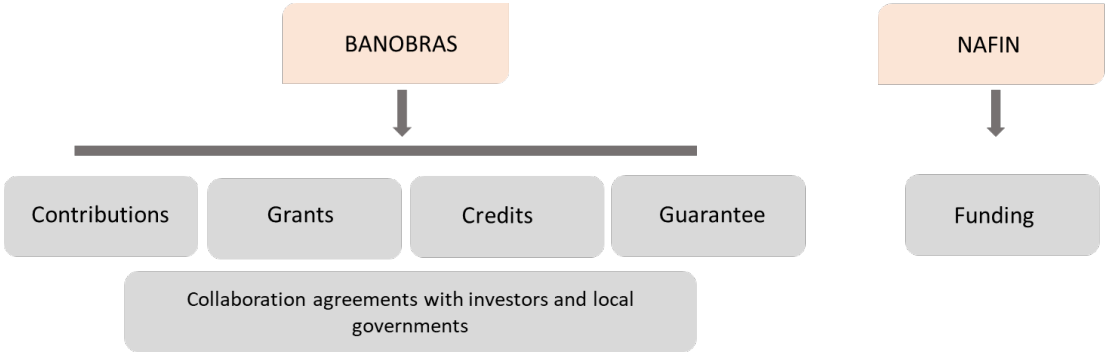


Figure 11. **National development bank scheme. Source: Own.**

BANOBRAS

BANOBRAS is a Mexican development bank for public infrastructure promoted by the Federal Government. It develops financing schemes to promote the participation of the private sector and commercial banks in long-term infrastructure and public services

projects and provides financing and technical assistance to cities, states, and decentralized public organizations.[33]

BANOBRAS provides financial guarantees, also known as Timely Payment Guarantees (GPO), which can support operations with the stock market, commercial banks, or other financial intermediaries, with the aim of mitigating project risks and thus facilitating their financing.[34]

NAFIN

NAFIN is a Mexican development bank created to support access to financial products for micro, small and medium-sized enterprises (MSMEs) with the goal of promoting innovation, improving productivity, competitiveness, job creation and regional growth.[35]

Among the sectors it serves are the environment, energy, health, finance, education, agriculture, tourism, social and labor sectors. NAFIN is financed with international lines of credit and federal resources. It has cooperation agreements with international organizations such as: KfW, the European Investment Bank (EIB) and the China Development Bank (CDB).

The PROTRAM program (Mass Transportation Support Program) is part of NAFIN; whose objective is to grant financial support for Urban Mass Transportation projects and Suburban in co-investment with the states and private participation, in cities with more of 500 thousand inhabitants. Also, to strengthen the institutional capacity of local transport authorities in planning and regulation and promoting the business organization of public transport operators.

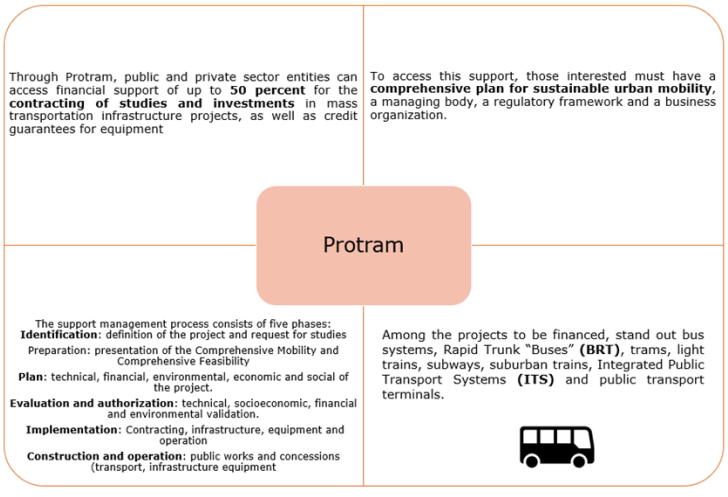


Figure 12. PROTRAM Scheme. Source: Own based on NAFIN

[33] Banobras 2022

[34] Transparency Banobras

[35] Nafin 2022

NAFIN also acts as a financial agent between financial organizations, agencies, and the federal government, such as the Inter-American Development Bank (IDB), the French Development Agency (AFD), and the World Bank IBRD IDA.

3.4.2 Overview of private financial structure

A. Investment funds

Investment funds are collective vehicles capable of capturing, managing, and investing investor resources, also through administrators known as investment fund operators, with the aim of acquiring financial instruments. The investor who contributes money acquires shares representing the assets of the investment fund and, consequently, a proportional part of the portfolio or securities portfolio.

In Mexico there is a diversity of investment funds that adapt to different profiles and horizons, allowing access to the stock market and a greater diversification of assets.

Electromobility projects have generated the interest of investors that are traditionally not linked to the transport sector. The work of the "Zero Emission Bus Rapid-deployment Accelerator" (ZEBRA) program has engaged capital providers to participate as investors in electromobility projects. This international alliance is working to secure 1 billion dollars in investments to deploy more than 3,000 electric buses on the streets of Latin America.

As part of the commitment, the manufacturers will expand their electric bus offerings in Latin America within 12 months, with a specific focus on cities in Brazil, Chile, Colombia and Mexico. Likewise, the financiers will make investment funds available for projects of zero emission buses. ZEBRA announced the signing of a joint commitment with six private funds, including: AMP Capital, ARC, Ascendal, Ashmore, John Laing and NEOT.

Other investors and investment platforms with an interest in e-mobility projects are:

- Siemens Financial Services
- Summation
- Background
- Acumen Latam Capital Partners
- Responsibility

Although the investment selection criteria, as well as the financing conditions, are established by each company, cities, municipalities, local and federal government can use this initial list of partners to explore possible synergies in the search for resources for their zero emission bus projects.

3.4.3 International organizations

Cities are beginning to choose new types of commercial agreements to mitigate the risks associated with mobility and transport projects. Bilateral and Multilateral Development Banks are international financial institutions created by national states

with the aim of contributing to economic development through investment in mobility and transportation projects.

Table 7. **International Organizations. Source: Own. Based on C$) Cities Finance Facility Socially Responsible Financing**

Organization	Description
World Bank Group	The World Bank is present in Latin America through the International Bank of Reconstruction and Development (IBRD), a global development cooperative owned by 189 countries. IBRD **offers loans, guarantees, risk management products, and advice to low- and middle-income countries with credit capacity** (IBRD, 2020) and has **supported sustainable transportation programs** throughout Latin America.
International Finance Corporation IFC	An institution of international development **dedicated exclusively to the private sector in developing countries.** It offers development solutions adapted to the needs of clients, **applying resources financial resources, technical knowledge, global experience and innovative capacity** to help the partners of its member countries to overcome their financial, operational and political challenges.
KfW Development bank	Among the objectives of KfW is the **planning, financing and implementation of mobility concepts sustainable in addition to strengthening public and non-motorized transport**, reducing the amount of GHG gases and other harmful emissions and reduce the number of accidents. **KfW funds are transferred via a national development banking institution, with who has an agreement In Mexico**, KfW is in the process of signing an agreement with NAFIN to support the vehicle fleet renewal program aimed at public transport entrepreneurs.
Inter-American Development Bank IDB	The IDB **seeks to promote projects of electric vehicles providing technical support, financing, risk management** and access to concessional loans. Among the projects it supports are energy clean, strengthen transportation systems and expand access to financing (IDB Invest, 2020). Investment funds: support for both private equity funds and private credit funds that provide capital and promote the expansion and modernization of companies with potential for growth, financial institutions and projects that promote development and sustainability in the region. **Support for the construction and modernization of infrastructures and transport services**. Transportation in areas such as ports, highways, airports, subways and railways. (IDB Invest, 2020).
CAF Development Bank	CAF **provides advice and financial support to companies in the public and private sectors** of the shareholder countries and generate knowledge **to strengthen public policies and thus improve the quality and impact of their projects** (Development Bank of Latin America, CAF, 2020).
NADBank Development Bank	Regarding financing, NADB has the following tools (NADB, 2020): **Credit programs: public or private entities can access**. Supports are designed depending on the characteristics of the projects and their financial needs. T**he products that can be offered are direct loans, revolving lines of credit and participation in issuance of municipal bonds**. Community Support Program (PAC), which provides non-reimbursable financial support to infrastructure projects in marginalized populations whose promoters have Little borrowing capacity. **Border Environmental Infrastructure Fund** (BEIF): supports with non-reimbursable resources for the execution of priority municipal infrastructure projects for drinking water, sewage and sanitation, which are located within the 100-kilometer strip on both sides of the border between Mexico and the United States.
FMO Development bank	FMO is the Dutch entrepreneurial development bank, invest in over 85 countries, supporting Jobs and income generation, and improving people´s lives in those parts of the world where this makes the biggest difference. FMO Works with financial institutions for a world where finance is more sustainable and accessible. FMO finances long-terms projects which power economies, promote the transition to a low-carbon system and safeguard energy security. **FMO offer a full range of financing solutions - (syndicated) loans and equity investments - for energy generation and distribution projects, off-grid solutions, refurbishments, and efficiency improvements.** FMO initial investments often motivate other development finance institutions and commercial banks to participate in the financing of such projects.

Dutch Trade and Investment Fund (DTIF)	This fund is meant for Dutch companies wanting to invest in or export to foreign markets. **DTIF offers support through loans, guarantees, and direct or indirect shares with repayment obligation**. Companies can apply for financial support up to EUR 15 million for each project. This business support instruments.

A. Green bonds

A green bond, like any other bond, is a fixed income debt instrument where capital is raised through the debt capital market. The key difference between a "green" bond and a regular bond is that the issuer publicly states that the bond proceeds are used to fund "green" projects, assets, or business activities with an environmental benefit, be it renewable energy, low carbon transport, forestry, or other options that mitigate climate change.

In the terms of mobility and the promotion of non-motorized mobility, the compromises of financing have been endorsed in the subsequent climate summits. At COP 22, in Marrakech, Morocco, countries were urged to expand their financial contributions to the pre-agreed goal of 100 billion dollars for 2020 and to achieve a better balance between adaptation and mitigation.[36]

In general, it is the developed countries that provide new and additional financial resources, as well as technology transfer to developing countries, for the fulfilment of their obligations. There are different types of sources of climate financing distinguished into different scopes: global, multilateral, regional, bilateral, and national.

Table 8. International Funds related to climate finance in terms of mobility and transportation. Source: C40 Cities Finance Facility, 2021

Fund	Administrator
Clean Technology fund	BID / World Bank
Global Climate Change Alliance	European Commission
Global Energy Efficiency and Renewable Energy Fund	European Commission
Green Climate Fund	World Bank
UK´s International Climate Fund	UK Government
Germany´s International Climate Initiative	German Government
Japan´s Fast Start Finance- Public Sources	Japan Government
Mgd Achievement Fund – Environment and Climate Change Thematic Window	PNUD
Norway´s International climate And Forest Initiative	Norway Government
Scaling -up Renewable Energy Program for Low Income Countries Special Climate Change Fund	World bank
Special Climate Change Fund	Global Environment Facility
Strategic Climate Fund	World bank
MDL (NMDLF)	World bank

3.4.4 Importance of the tendering process

For transparency purposes, most of the projects in Mexico are tendered or procured. This allows the client to identify the most suitable partner based on its technical knowledge, experience, and financial proposals. Hence understanding how the process

[36] Carbon Trust Mexico S. A. de C.V. for INECC, 2016.

works is essential. Types of procurement processes identified in Mexico are explained below:

A. National procurement processes

In Mexico, bidding for infrastructure projects is carried out by the federal, state or municipal agency that promotes each project. At the federal level, the bidding processes are completely public and transparent, through an online digital system called **CompraNet**. Derived from the Energy Reform, the state Productive Companies developed their own platforms for the bidding processes. The bids classification are the next:

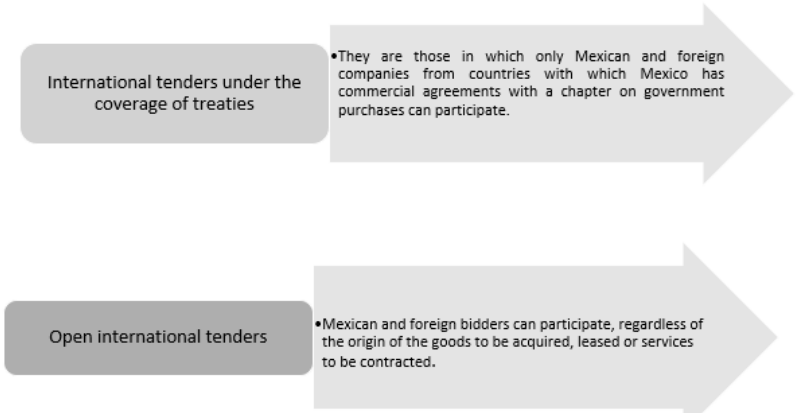


Figure 13 Project Mexico 2022

Both National and International tender opportunities published by the government follow similar processes. The following figure presents the general process.

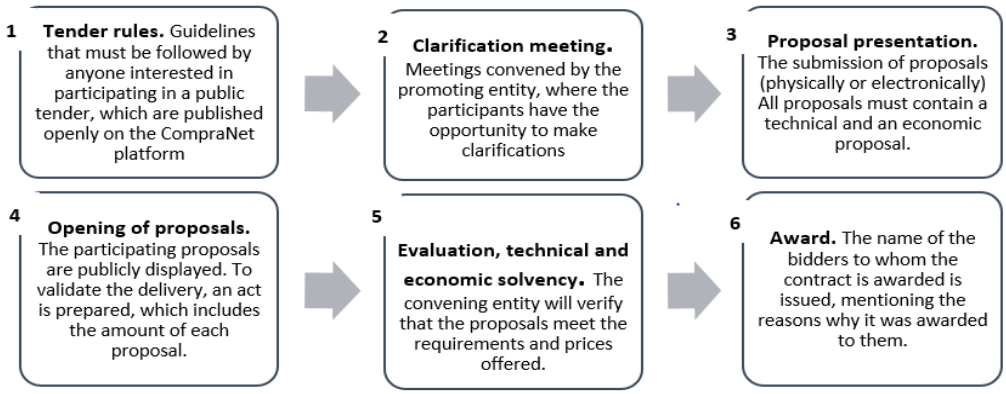


Figure 14. Tender general process Source: Own, based on Projects México (2022)[37]

[37] https://www.gob.mx/shcp/documentos/lineamientos-con-las-disposiciones-para-determinar-la-rentabilidad-social-y-conveniencia-de-llevar-a-cabo-un-proyecto-app

1. Planning. - Based on the objectives and strategies defined in the National Development Plan and the National Infrastructure Program, the SCT and SEDATU prepare short-, medium-, and long-term sectoral programs for the development of transportation infrastructure, seeking to promote a policy of sustainable mobility.
2. Identification. – Based on the planning documents, the state and municipal governments, in coordination with the SCT and SEDATU, identify the urban transport projects to develop.
3. Structuring. – Local governments carry out studies and analyses for the structuring of projects.
4. Registration. – The SCT, through the General Directorate of Rail and Multimodal Transportation (DGTFM), sends the Investment Unit of the SCHP the request for portfolio registration of projects that require federal public resources.
5. Prioritization. – Projects that require federal budget resources must be analyzed by the Intersectoral Commission for Public Expenditure, Financing, and Disincorporation (CIGFD). The CIGFD prioritizes projects based on a) socioeconomic profitability, b) reduction of extreme poverty, c) regional development, and d) concurrence with other programs and investment projects.
6. Authorization. – Projects with PEF resources are authorized by the Chamber of Deputies; projects with FONADIN resources are authorized by the decision-making bodies of said trust
7. Promotion. - In charge of local governments.
8. Tender. - In charge of local governments.
9. Financing. - There are various sources of financing depending on the particular characteristics and financial structuring of each Project, such as: PEF, FONADIN, BANOBRAS, commercial banks and private developers.
10. Execution and operation. – It is carried out by the awarded operators and developers, who are supervised by the local governments according to the terms of the contract.

In the case of programs and projects that are intended to be executed under the Public-Private Partnership (PPP) scheme, an analysis of the advisability of carrying it out under said scheme must also be carried out, which considers, among others, the public comparator -private and "value for money."

The programs and projects registered in the investment portfolio that require public budgetary resources are analyzed by the Intersecretarial Commission for Expenditure, Financing and Disincorporation (CIGFD), which will determine the priority for inclusion in the Federation Expenditure Budget project as well as the order of their execution, the foregoing to establish a hierarchy of all investment programs and projects as a

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Agreement Establishing the Rules for the Determination and Accreditation of the Grade of Content National, in the Case of Procedures of Contracting of a National Character. https://www.gob.mx/cms/uploads/attachment/file/50539/A162.pdf

The Rules for Holding international Public Tenders Under the Coverage of Free Trade Agreements signed by the United Mexican States https://dof.gob.mx/nota_detalle_popup.php?codigo=5172684

whole and maximize their impact in increasing the benefit of society, mainly observing the following criteria:

- Socioeconomic profitability.
- Reduction of extreme poverty.
- Regional development.
- Concurrence with other programs and investment projects.

Public-private partnerships (PPPs) are projects carried out under any scheme to establish a long-term contractual relationship between the public and private sectors (concessions, leases, PPS, financed public works) for the provision of services to the public and in in which infrastructure provided totally or partially by the private sector is used. PPPs seek to increase investment levels in the country and improve efficiency in the provision of public services.

The Law of Public-Private Partnerships (LAPP) regulates the schemes for the development of projects under the modality of public-private associations. It was enacted in January 2012 in order to have specific regulations for the development of this type of project and, at the same time, provide transparency and accountability mechanisms in the exercise of public resources.
This law (LAPP) establishes:

- Conditions that must be met for the development of projects.
- The required pre-investment studies.
- Regulations for Unsolicited Proposals.
- Characteristics that contracts must contain.
- How the risks are transferred wholly or partially to the private sector.
- The causes of termination or early expiration.
- Types of PPP projects: pure, mixed and self-financing.

Guidelines with the Provisions to Determine the Social Profitability and Convenience of Carrying out a PPP Project establish the provisions to determine the convenience of carrying out a public-private partnership project.[1]

B. IFI's procurement

International Finance Institutions (IFIs) tendering or procurement can be a great opportunity for the Dutch mobility sector. Cities and regions sometimes prefer to ask for loans from IFIs to develop their projects and these will be procured by the IFIs. International bodies such as IDB, CAF, World Bank, European Commission, etc. are the most common participants and lending entities for Mexico. To access the opportunities, the interested party can subscribe to each of the websites procurement sites or pay for one of the online platforms in which all the tenders of all the IFIs are published (i.e. DevelopmentAid).

The tender procedure consists of three stages, each consisting of different sub-stages.

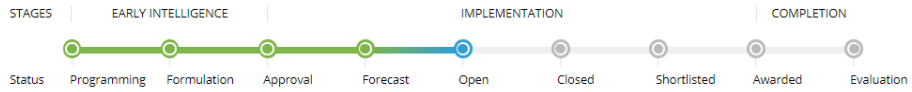


Figure 15. Procurement process. Source: DevelopmentAid.

1. During the early stages, the interested party will be informed that there is a tentative of project procurement. During this stage the IFI will study the proposed project of the city.
2. Implementation comes subsequently. Once the loan is secured, the selection of possible candidates to deploy the project begins. This is done firstly by the Expression of Interest phase in which the consultant/joint venture submits basic documentation of the firm, examples of projects they have performed and team capabilities (i.e. CVs or short profiles). Based on these documents the IFIs will publish a short list of the candidates they believe can send a technical and financial proposal.
3. Based on the quality of the proposal, key staff, and financial offer, the IFI together with the city/region will choose the winning party. This is called the completion and awarding stage.

Section 5.3 will present some examples of current tendering opportunities for both National and IFIs processes.

4

4 Challenges and opportunities

5.1 Regulatory framework and foreseeable changes

Derived from the publication of the General Law on Mobility and Road Safety, the foreseeable changes that are expected in Mexico where Dutch companies could play a role are the following:

- Contribute to the build-up of the new National Policy and Strategy for mobility and road safety; new modifications to local and state laws and regulations to include the issue of mobility; build-up of new regulations, guidelines, programs, and actions on the matter at the local and regional level; new studies to assess the impact on mobility and road safety, this in order to analyze and evaluate the alterations due to the performance of new infrastructure works, private and public activities.
- Provision of infrastructure and technology for construction of the National and Regional System of Mobility and Road Safety; the National and Regional System of Territorial and Urban Information; and National security systems with national and international standards for vehicles commercialization.
- Provision of traffic control devices and road safety devices progressively, in accordance with international evidence and national standards.
- Provision of a registry and information in pre-hospital medical care platforms (date and time of traffic emergency call, arrival at the accident site, kinematics of the trauma, number of victims involved and the characteristics of the injuries)
- The prioritization of new government actions and resources in terms of mobility and road safety can give Dutch companies opportunities to assist in:
    - Improvement in infrastructure for non-motorized and pedestrian mobility.
    - Actions for the integration and strengthening of the public transport service
    - Improvement in infrastructure for mobility, ancillary services and transportation that promote universal design and road safety
    - Policies to reduce traffic accidents
    - Implementing strategic infrastructure projects for mobility and road safety
    - Implement planning programs for mobility and road safety, studies for innovation, technological and IT development to promote non-motorized mobility and public transport in centers of population with lower incomes. Information, education and research programs on awareness, education and training on mobility and road safety, and others that allow compliance with the law
- The new government regulation of the automotive industry based on the establishment of information requirements for manufacturers, importers and concessionaires of new vehicles, trough new Official Mexican Standards, will give Dutch companies a clear framework to export a new transport base on electromobility systems.

5.2 State of play in the mobility market

5.2.1 Opportunities for the Dutch business community

A. Northern region

Several opportunities can be identified for the northern region of Mexico. These can be short-term or medium to long-term and more general and applicable to the whole region or to a specific city. Specifically, Nuevo León and Torreon.
In general, **short-term** opportunities identified for the northern region of Mexico are improving mobility culture by expanding education in mobility and better enforcement of the regulation and the legal framework.
Medium to long-term opportunities start with the public transport project of recovering and developing intercity train systems connecting the whole nation. This in order to create an important mobility alternative and, in addition, generate alternative mobility forms for the specific need of every user. Other opportunities can be:

- Transition from the current Metrobus system and conventional auto busses to electromobility and electric taxis.
- The development of apps and infrastructure for Smart Cities including providing the adequacy of existing roads and roads under development to prepare them with all necessary facilities.
- The development of an economic corridor for the North.

Looking into specific city needs:

In **Torreon and Nuevo León**, there are a couple of **medium-long** opportunities to be found in creating a more corporate scheme for the structures and planning and implementing new corridors.
As for **Torreon,** the following are the **short-term opportunities**: Implementation of cycling infrastructure, providing technical knowledge, training in road safety culture, developing intermodal spaces for women's safety, training for public officials, offering mobility planning workshops and experiences and providing units or renting units.

The **medium long-term** opportunities in Torreon are the following: Active mobility, expanding the bicycle infrastructure network, remodeling the public transportation vehicle fleet, survey origin-destiny, program for the implementation of public transportation trunk access in peripheral areas, technical knowledge and joining schematics app.

B. Center region

The opportunities of the center region of Mexico can also be categorized as short-term, medium to long-term, and more general and applicable to the region as well as to specific cities. These cities are Mexico City, Guadalajara, and Puebla.
Starting with the **general** opportunities, the **short-term** opportunities are improving mobility culture and education, better enforcement of regulation and legal frameworks, better sidewalks, and the ability to walk safely in smaller cities, rather than bigger investment projects.
As for the **general medium-long term** opportunities in the center region of Mexico: Firstly, promote non-motorized mobility and the verification of the Metropolitan Areas

with greater investment feasibility and lower infrastructure coverage. Moreover, as to public transport: recovering and developing intercity train systems connecting the whole nation as an important mobility alternative and, lastly a transition from current fleets of Metrobus and busses to electromobility, electric taxis.

Looking into specific city opportunity areas. **Mexico City's short-term** opportunities are the following: Public transport planning and connecting higher areas of the city in an intermodal way as well as maintenance and remodeling of units of the collective subway system, implementing and renovating of new stations of bicycle mobility systems, encouraging cycling, implementing shared bicycles systems development and implementation of mobility studies for any project, improving vehicles and maintaining the integrated system to coordinate between transport systems including bicycle, technical and regulatory training of authorities and relevant actors, workshops for citizen participation, training of technicians specialized in mobility and sustainability, integrating schemes of connection in mobility and traffic signs for cyclists.

The **medium to long-term** opportunities in Mexico City are: Modernizing the command-and-control station of the system, which implies the automatization of these, in electromobility, implementing electric scooters in crowded areas and electronic public transport, ensuring walking in the city and implementing projects and technologies for carpooling apps and solutions to optimize the use of parking lots and systematization of transports.

The **short-term opportunities in Guadalajara** are the following: technical studies, analyzes and indicators to promote projects, micro- mobility systems, and socializing projects. The **medium to long-term** opportunities includes train and electromobility and electric school transport.

Lastly, **Puebla's short- term** opportunities are shared bicycle systems, cyclist mobility, bike parking, and traffic signs. Puebla's **long-term** opportunities are infrastructure for forms of mobility other than cars and planning for non-motorized vehicles.

C. Southern region

In Mexico's south region, there are several areas of opportunity, both short-term and medium to long-term. These can be general or specific to the following cities: Cancun, Campeche, Merida, Playa del Carmen and Tabasco. The **general** opportunities in the **short-term** are in the planning and implementation of bicycle mobility, implementing road distributors and changes to the asphaltic road surface in Av. Colosio, which connects the Rivera Maya region. **The medium to long-term** opportunity areas are in renewing more eco-friendly units, organizing technology for the government, creating a safe mobility infrastructure for disabled people, pedestrians and cyclists and technical collaboration that will allow more sustainable development of the area for tourism, resource conservation, mobility and aquifer preservation. Concerning the areas of opportunities in specific cities. **Campeche's short-term** opportunity area is planning bicycle mobility in the city center. The **long-term** opportunity areas in Campeche are electric transport units and organizing technology. **In Cancun, the short-term** opportunity areas are also in implementing and planning bicycle mobility and the **medium to long-term** areas are in public transport improvement of sidewalks, a corridor to link hotel areas and urban corridor of the urban zone and hotel area. Another specific city where opportunities were identified is **Merida**, where **short-term** areas are to cooperate with the legal framework and assistance with logistics and **electromobility in the medium long-term areas**. As for **Playa del Carmen**, the **short-term** areas of opportunity are shared bicycle systems, cyclist mobility and infrastructure

for tourism and population. In addition, the **medium to long-term** opportunity areas in Playa del Carmen are improving pedestrian areas, public transport efficiency and a multimodal station where all services converge in a single point. Lastly, the **short-term** opportunities in **Tabasco** are providing technical training and comprehensive mobility studies, whereas the **medium or long-term** opportunities are to offer solutions from technology implementation.

5.2.2 Matrix of identified opportunities for the Dutch mobility sector per region/city and key topics

Based on the identified challenges throughout the study (and presented in the above chapters), the following matrix with opportunities for the short, medium/long term are presented. These are classified per region, per city and per key topic. Some of them are applicable for the entire region.

Opportunities in the Northern Region				
City	**Topic**	**Term**	**Opportunity**	**Applicable to the region as a whole**
Torreon	Bike Infrastructure	Short	• Implementation of cycling infrastructure through tactical urbanism. • Expand cycling infrastructure network to encourage active mobility. • Implementing 274km of bike routes. In Carretera Torreon Matamoros, El Boulevard Independencia, El Boulevard Pedro Rodriguez Tirana y Carretera San Pedro.	Restriction of parking areas on the roads.
	Traffic guide systems		• Technical knowledge and road safety culture. • Training for public officials in the topic including mobility planning workshops and experiences. • Signalling on the crossroads for pedestrians including a better synchronized traffic light system. • Signs for pedestrians and cyclists. • Implementation of pedestrian traffic lights. • Adequate ridges and separate cyclists traffic lights	
	Public Transport	Medium/Long	• Update of origin-destination survey. • Modification of intersections and roads both in operation and physically for them to be safer. • Remodeling public transportation vehicle fleet. • Program for the implementation of public transportation trunk axes in the peripheral areas. • Knowledge and technical exchange on intermodal hubs. • Public transport apps. • Massive transport connecting Ciudad Lerdo with Torreon and Matamoros. The route entails 29km of which 17.59km cross through Torreon's municipality. • Implementing a semi-massive transport system with routes of 132.36km.	Economic corridor for the north. Adequacy of existing roads and roads under development or in the future to prepare them with all the necessary facilities.

Monterrey	Bike Infrastructure	Short	• Building network of bike paths, connected and intermodal in a metropolitan level. • Public bicycle systems and racks for parking. • Reorganizing the road where the Metrobus will operate to redistribute the vehicle area so it will allow cyclist to transit there (Colon and Muzquiz. street Implement a system of complete roads). • Implementation of a total of 2,000 bicycles (500 short term) (400 medium term) (1100 long term). • Implementation of 1,100 bicycle racks (400 short term) (400 medium term) (300 long term). • Construction of infrastructure and parking for bikes in four different stages. • Construction of bike roads connected to intermodal systems of 723km short term, 225km medium term and 255km long term	
	Traffic guide systems		• More flow and efficiency in the road transit of the principal roads. • Smart traffic lights and a security plan through which all set of management action for mobility. • Identification of pedestrian flows. • Improvement of vehicle intersections. • Implement alternatives that allow the increment of the efficiency of the urban logistics. • Systems of technology and information for efficient mobility. Monitoring and control of internal mobility.	
	Public Transport	Medium/Long	• Modernizing public transport units. • Development of an integrated public transport system which includes at least, the following items – Incorporation of quality public transportation system that maximizes supply and optimizes the frequency and type of units. – Building of infrastructure which guarantees intermodality. – Modify and reform public transport stops. – Renovating buses, electric payment, and better bus stops defined by transport mode and with useful information for the user. – Building a modal transfer center. – Reorganizing of routes for them to work together with massive transportation feeder routes, facilitate access and connectivity to north areas. Bus Rapid Transit in center of the city.	Implementation and reactivating massive public transport system in the metropolitan areas

Opportunities in the Central Region				
City	**Topic**	**Term**	**Opportunity**	**Applicable to the region as a whole**
Guadalajara	Bike Infrastructure	Short	• Technical assistance in active mobility and in cultural aspects. • Improve quality and frequency in which maintained is given to the physical state of the active mobility infrastructure. • Construction of more cyclists' paths. Shared bicycle system.	Cultural and knowledge exchange program on public level.
	Traffic guide systems		• Implementation of infrastructure and operation machines of parking meters. • Traffic signs for cyclists. • Innovative products for traffic signals and systems. • Implementing a technical platform for accessible through mobile phones to registry, payment, following and other analogue options. • Auditory Traffic lights. • Analysis of road network to select new corridors. • Calibrating traffic lights times - Intersection renovations. • Adapting railroad crossings to meet universal accessibility and road safety criteria.	
	Electro mobility	Medium/Long	• Electromobility plan: from vision to implementation (this includes changing of regulation, grid planning and support to structure the plan and how to transition). • Electric school transport. • Implementation of hybrid-electric units. • Adaptation of public transport stops for this mode.	
	Public Transport		• Parking for bicycles and access to the station designs. • Integration of train and other massive transport corridors. • Extension of the light rail (Tren Ligero). • Creating a communication channel where the monitoring of the state of the infrastructure is possible.	

Leon	Bike Infrastructure	Short	• Shared bicycle system coordinated with pedestrian routes and touristic areas. • Make cycling investment with hydraulic concrete pavements, implement plastic separators, continuous buoys, and implement multifunctional circuits.	
	Traffic guide systems		• Traffic signs and streetlight integrated system. • Investment in medium term on road signs for 63.4km for roads Boulevards San Juan Bosco and Mariano Escobedo. • Maintenance in a total of 10 corridors • Implement traffic lights and signalling and intervention at conflict points • Modernizing and automatization of the command-and-control stations. In Leon Road Lopez Mateos, section blvd. Francisco Villa to Blv. Morelos, road Venustiano Carranza to blvd. Pase de Jerez. Implementing exclusive lane in Leon (Road Torres Landa, section Paseo de Jerez to glorieta Obrero Mundial)	
	Public Transport	Medium/Long	• Parking systems with access to public transport. • Integrated transportation systems in different scales and modalities. Improve Interurban mobility. • More corporate scheme to the structures. • Planning and implanting new corridors including exclusive lanes for public transport (I.e. BRT). • Areas for loading and unloading goods in the streets transversal to the road. • Maintenance of public transport stops. • Improve the infrastructure conditions, operation, and time of the routes for public transport. More speed, security and prioritizing the bus over private cars.	Recovering and developing intercity train systems connecting the whole nation. Development of apps, all including the appropriate infrastructure and smart cities
	Electromobility		• Transition of current fleets to electromobility. New system of electric school transport.	Mobility alternative including freight transport. Generating alternative mobility forms for every user to be able to pick accordingly to its needs. Transition current fleets of metrobus and busses to electromobility, electric taxis.

Mexico City	Bike Infrastructure	Short	• Implementing and renovating new stations of bicycle mobility systems. • Encouraging cycling and non-motorized modes of travel. • Shared bicycle systems. Encourage cycling and non-motorized modes of travel. • Improve thirty-two intersection of the city, 40 km of bike roads and 15 pedestrian road passage.	Improving mobility culture
	Traffic guide systems		• Development and implementation of mobility studies for any type of projects. • Integration of the local congress for the approval of legislation. • Integrated schemes of connection in mobility and reduction of routes. • Technical and regulatory training of authorities and relevant actors. Workshop for citizen participation. • Integration of automatic traffic light system aimed at facilitating the vehicle flow and protect most vulnerable people. • Integration of parking meters systems with images and one-time payment systems, together with a supervision scheme that guarantees adequate operation and transparency in the recollection of resources. • Web page information about the system operation and resources it generates.	Improving education in mobility. Enforcement of regulations and legal frameworks

	Public Transport	Medium/Long	To integrate 100% of the public transport system (Metro, Metrobus, BTR, and electric transport system) the city wants to develop/implement: • Global positioning systems in the units and interconnection to other control center and mobility innovation. • Route restructuring. • Planning to connect higher areas of the city in an intermodal way. • Maintenance and remodeling of line 1 of the collective subway. • Acquisition of new trains for the metro. • Modernizing the command-and-control station of the system which implies automatization of these. • Implementing projects and technologies for carpooling apps, solutions to optimize the use of parking lots and systematization of transport. • Unified image on the web, a single map with optimized connections between stations of massive transport. • Bus cable extension and building of Metrobus lines. • Implementation of 800 new units in the public passengers' network. • Implementation of exclusive lanes for busses. Improvement in the flow management on peak hours. • Implementation of 2 new Metrobus lines, extension and finishing building 20km of line 5 from the Terminal de Autobuses of passengers to the Glorieta de Vaqueritos.	Smaller cities need better sidewalks and ability to walk safely.
	Electromobility		• Policies and programs focused on fomenting the use of private electric vehicles and on freight systems. • Implement electric scooters in crowded areas in places like UNAM, POLITECNICO and other university cities. • Electric Public Transport. Technology for public transport and electrification. Implementation of around 100 new units in the Electric Transport system (RTE).Existing 203km network of centennial in operation.	

Puebla	Bike Infrastructure	Short	• Shared bicycle systems. • Bike packing and more cyclist infrastructure. • Bike paths with a recreational focus. • Improvement of the coverage of the shared bicycle system. • Plan for non-motorized vehicles.	
	Traffic guide systems		• Traffic signs. • Implementation of intelligent, innovative and geo-referenced unified systems in the metropolis and in the state. • Analysis and monitoring mechanism for the reduction of road accidents. • Better intersections to avoid road accidents. • Optimization of the traffic light system allowing to synchronize the times of traffic lights in road corridors.	
	Public Transport	Medium/Long	• Bus rapid transit system. • 100% integration of the payment systems of the different trunk lines and routes of the Urban Articulated Transportation Network. • A study for the feasibility of the operation of a foreign bus terminal. • Tourist transport system for the historical monuments center area.	
	Electromobility		• 100% replacement of the vehicle fleet from the municipal government by vehicles with high environmental performance. • Infrastructure to recharge vehicles in case they will be hybrid or electric.	

Queretaro	Bike Infrastructure	Short	• Interconnected system for multimodal mobility, covering peri-urban and rural areas. • Develop and implement a manual for the construction of bicycle lanes in the urban and rural areas of the municipality. • Plan for the construction of bicycle lanes as part of municipal infrastructure projects. • Promote bicycle programs with a monitoring system throughout the city, with a focus on inter-institutional coordination and citizen participation. • Prepare a diagnosis of the bicycle lane network for proper maintenance.	
	Public Transport	Medium/Long	• Establishing an interconnected transparent system for multimodal mobility that integrates the peri-urban and rural areas. System should also be count with mobility information. • Studies and implementation for the installation of Modal Transfer centers in high impact areas. • Facilitating passenger mobility between modes of transport.	

Opportunities in the Southern Region				
City	**Topic**	**Term**	**Opportunity**	**Applicable to the region as a whole**
Campeche	Bike Infrastructure	Short	• Planning and implementing bicycle mobility in city center. • Developing a network of cyclist road interconnected with public transport and shared bicycle system. • Tourist bike paths in the historic center. • Develop bike routes in Campeche, 10 connected (Bonfil-Lubna, Lubna-San Luciano, Boloché Cahuich, Tikinmul-Cayal-Crucero Oxa, Chiná-Malecón, Lopez Portillo, Fenix-presidentes-Imi, Alameda hacia Santana).	Sister cities have similar needs
	Traffic guide systems		• Improvement of traffic signs and traffic lights control.	
	Public Transport	Medium/Long	• Organizing technology knowledge exchange course for the government. • Rehabilitating the railway system as a public transport system. • Pedestrianize the old part of the city.	

			• Implementing night public transport vehicles. • Building three stations of urban and suburban transfer (studies and implementation of where these should be). • Improvement of public spaces for the functioning of modal interconnecting of the urban and suburban transport.	
	Electromobility		• Renewing for new eco-friendly units. Electric Transport units.	
Cancun	Bike Infrastructure	Short	• Planning and implementing a bicycle mobility network that takes into consideration the citizens and tourist needs. • Implementing more than 20km of bike networks for the use of the local population and tourists in Parque Cancun and ANP Manglares de Nichupte. • Construction of new bike roads that allow integrating cyclists' roads with public transport. • Planning and analyzing the urban surroundings of the city. • Studies for a bike sharing system with a clear model of operation and design of the stations. These should be installed in at least 26 blocks of the city. • Installation of parking on the stations: 10 to 30 bikes per 1,000 inhabitants.	Improvement of sidewalks and corridor to link hotel areas and urban corridor of the urban zone and hotel areas.
	Traffic guide systems		• Implementing horizontal and vertical signs with traffic lights that are inclusive of pedestrians and cyclists. Improvement of traffic light network.	
	Public Transport	Medium/Long	• Develop a sustainable urban mobility plan (update). • Implementation of aquatic public transport system (Laguna de Nichupte) Implementing suburban train. • Building of multimodal transfer center on the back of the airport. • Implementing new systems of multimodal transport. • Implementing a suburban train (Av. Chacmpol). • Implementing public transport Rapid bus transport in Cancun (Av. Kabah-Tulum-Lopez Portillo). • Rehabilitation of the railway as public transport system. • Building of three stations of transfer both urban and suburban (Adolfo Ruiz Cotines, Gobernadores y Ejercito y en la zona oriente).	There are plans to implement road distributors and changes to the asphaltic road surface in Av. Colosio which connects the Rivera Maya region.

Merida	Bike Infrastructure	Short	• Creation of safe mobility for cyclists. • Create a network of pedestrian and cyclists roads through expanding the already existing networks, complete roads, cross section and pedestrian sidewalks. • Implementing alternatives to mobility services to the public system (i.e. last mile journeys covered by micromobility – MaaS solutions). • Studies and implementation of e-bike systems for logistics.	
	Traffic guide systems		• Cooperation in legal framework and assistance with logistic planning and new alternative modes. • Improvement of the characteristics of the road network to improve urban connections and peri-urban connections. • Integrate restrictive, informative and touristic signs in projects of mobility intervention.	
	Public Transport	Medium/Long	• Integrate all possible modalities and mobility that can be adopted for accessibility of people. • Implementing electronic payment and application which will allow knowledge of routes, stops and schedule.	Creation of safe mobility infrastructure for disable people and pedestrians.
	Electromobility		• Renovate public transport vehicle fleet towards a more energy efficient one (i.e. electrical/hybrid buses). • Establishing park meters with traffic schemes for parking in public roads.	
Playa del Carmen	Bike Infrastructure	Short	• Shared bicycles systems. • Bike master plan and its implementation	
	Public Transport	Medium/Long	• Better system and related infrastructure not only for tourism but also general population.	Improvement of pedestrian areas.
	Electromobility		• Technical collaboration that will allow a more sustainable development of the area, for tourism, resource conservation, mobility and aquifer preservation (including zero-emission vehicles).	
Oaxaca	Bike Infrastructure	Short	• Shared bicycle system. Bike parking.	
	Traffic guide systems		• Legal framework support to implement these sort of systems. • Knowledge exchange about new technologies and applicability to the city.	

	Public transport	Medium/Long	• Active mobility. Fleet renovation. Multimodal station where all services converge in a single point. • Strengthening and modernizing of public transport and private in the metropolitan areas. Simplified and improved control processes of transport. Implementing integral modal system. Studies and projects on infrastructure and use of public roads.	
Villahermosa	Bike infrastructure	Short	• Creation and improvement of infrastructure and increasing the length of these throughout the city of Villahermosa, and in those urban and suburban locations where necessary, to promote sustainable mobility and improve the accessibility of all the people.	
	Traffic guide systems		• Knowledge exchange about new technologies and applicability to the city.	
	Public Transport	Medium/Long	• Developing a proper sustainable urban mobility plan which discourages the use of the car, gives priority to walking, cycling but above all, public transport. • Generating new public transport routes. • Implementing programs for modal transfer for more efficient use. • Incorporation of new technologies which will allow the optimization of public transport and security of the user. • Systematization of real time verification of public transport units behaviour.	
	Electromobility		• Introduce electric mobility accompanied by a rational and realistic redesign of electricity generation and distribution systems. Otherwise, the effects on the city's current infrastructure as well as electricity prices will be severely affected.	

5.2.3 Value of the most relevant sub sectors/regions/states, measured in Dutch business interests

A clearly relevant sub-sector, mentioned in all the regions, is cycling which is one of the core mobility strengths of the Netherlands. Consultancies in the Netherlands are familiar with political influence and barriers as they have experience over long periods of time. This also means that it is common to make long term commitments to projects and goals. This experience makes sure that both parties are well adapted to the capabilities of each other and know what to expect. Because of this, the measurements and standards for bike lanes and other related infrastructure are well known and can be applied directly.

Innovation in cycling infrastructure is always on the agenda. Recent examples are lighting up bike paths by lighting up road markings, water control through asphalt and sub-surface changes, re-use of concrete, fast bicycle routes (like a highway but for bicycles) and integrated solar collectors in the road surface. The goals of these innovations are to make cycling safer, construction more sustainable and to improve traffic flow and conditions for cyclists to make it more attractive to cycle.

Another aspect of the Dutch strategy towards cycling is the use of awareness campaigns. While this is a long-term investment it has been a core element of the Dutch cycling strategy. Campaigns have often focused on stimulating bicycle use in disenfranchised groups such as the elderly and migrants. But there are also campaigns focused on discouraging mobile phone use while cycling and improving safety near school zones. With the advent of the e-bike, campaigns adjusting their programs. For instance, it is now possible to evaluate an e-bike for a week for free and if you buy an e-bike to get some of your money back in some municipalities.

The use of large amounts of data and datasets is a strong aspect of Dutch Traffic management. This means that consultancies in the Netherlands know not just how to work with data but also how to set up systems for collecting data. In 2009 a national portal for the collection of road data from all the separate road authorities in the Netherlands (municipalities, provinces, national) was launched. Such cooperation in data sharing simplifies working together and improves efficiency. All this data is then used to gain insight into the workings of systems and to test how well solutions work in practice. This knowledge is particularly useful for larger scale cities such as Mexico City and Monterrey which want to achieve an optimization of their mobility systems.

Another topic could be the optimization of road design and road traffic management that is mentioned as priority in some regions. Any typical Dutch intersection will have induction loops for measurements and dynamic adjustment of traffic lights. But these loops can also be found on highways and other busy roads to measure traffic conditions. Some new innovations using camera detection are also being rolled out. The advent of the so called iVRI (intelligent traffic management system) has given traffic engineers extra tools to improve intersection throughput and safety. Integration with existing traffic apps such as Waze, Flitsmeister and others has allowed for a more complete dataset on current conditions which can be used to gain a more complete understanding of traffic patterns.

Although electromobility is an incipient topic, it might be interesting for parties in the Netherlands that are pioneers in grid assessment, policy and energy transition. Below some of the Dutch companies that provided insight on the opportunities assessment.

SWARCO– TRAFFIC SIGNALING

EXPERIENCE/ WORK

With more than five decades of experience in the industry, the Austrian traffic technology corporation SWARCO produces and provides a large range of products, systems, services, and turnkey solutions for road marking, urban and interurban traffic management, parking, and public transport. Cooperative systems, infrastructure-to-vehicle communication, e-mobility, and integrated software solutions for the Livable City complement the group's future-oriented portfolio.

INTEREST IN THE FIELD OF URBAN MOBILITY

SWARCO's leading idea is to improve quality of life by making the travel experience safer, quicker, more convenient, and environmentally sound. Over 5000 traffic experts are keen to shape together with all stakeholders in the traffic industry the transition from conventional traffic management to value-added services fit for the traveler in the digital age. Our products, systems and solutions contribute to greater road safety and intelligent traffic management in 80 countries and generate revenues of almost a billion euros.

MOTIVATION/ VISION

SWARCO sees opportunities in Mexico as a large market with similarities to countries they have worked in previously (mainly United States and Colombia). Strong points of SWARCO are innovation in traffic solutions, varied products and tailored solutions to all mobility problems. Previous experience in Mexico was very positive and so SWARCO would want to work with Mexican partners in the future.

MAPTM– TRAFFIC MANAGEMENT

EXPERIENCE/ WORK

Consulting, digital and operational services in the field of transportation. In operation since 2010 and collaborating with partners on dashboards, data portals, ITS, incident management and social traffic management. Knowledge of both traditional and new techniques, processes, and relationships, with a focus on practical feasibility, realization, and operation.

INTEREST IN THE FIELD OF URBAN MOBILITY

Interest in analysis of large amounts of data to control traffic flows, providing insight into this data through portals and dashboards.

MOTIVATION/ VISION

Interest in exploring the market but requires a partner for cooperation.

DUTCH CYCLING EMBASSY– BICYCLE

EXPERIENCE/ WORK

An intermediary between the demand for Dutch cycling expertise and Dutch parties that can deliver. The Dutch Cycling Embassy is a public private network for sustainable bicycle inclusive mobility. We represent the best of Dutch Cycling: knowledge, experience and

experts offered by private companies, NGO's, research institutions, national and local governments.

INTEREST IN THE FIELD OF URBAN MOBILITY
Interest in transportation and urban mobility solely on the topic of cycling. Promoting cycling as an efficient, clean, and reliable means of transport through partnering Dutch companies and foreign partners to improve transportation in cities around the world.
MOTIVATION/ VISION
Great interest in working in Mexico and showing what Dutch companies are capable of in bicycle infrastructure. Has a large network of individuals and companies that can provide bicycle mobility solutions who want to collaborate with Mexican partners.

5.3 Real funding opportunities and financial risks

As mentioned in section 4.3, there are several projects and ideas that the local actors and plans have identified as priority for the short, medium, and long term for cycling, traffic systems, public transport and electromobility. These stakeholders (and the researched plans) agree that these are needed for the development of the cities and regions and that should/will be developed in the coming five years.

In order for these to be developed, funding and subsidies are needed by the local/regional governments which normally come from the federal government, private financial institutions or international organizations such as the ones presented in Section 2.4. For these cities/regions to access the funding, they need to apply officially to any of those institutions by presenting a concrete idea of a project (vision, objectives, results, impact in the society, monitoring and evaluation, etc.). This applies for both studies and implementation of physical infrastructure. Once the cities "assure" this funding, the real "role out" of the project can start and most of these projects are developed by a **tender process**. This is mainly to avoid corruption and direct contract assignments which, in the past, have led to incomplete or non-developed assignments. Tendering is the most common practice in Mexico as mentioned in previous sections.

For large metropolitan areas such as Mexico City and Monterrey which have vast technical teams in the mobility sectionals within the municipality(ies), applying for these funds and tendering are easier since they have the resources to do so. However, the interviewed actors during this study acknowledge that small and medium municipalities (i.e., Villahermosa) do not have enough capacity or financial resources to even develop (or finance) the development of such a document to apply for funding. For instance, in Oaxaca, there is no proper funding for mobility since other topics have the priority (health, social development, security, etc.)

However, some of the interviewed experts mentioned that lobbying (networking) can be an excellent tool to access small budgets directly assigned by the cities, especially if they are innovative topics and particular solutions. These maximum budgets can be from €15.000 to €35.000 depending on the cities' regulations. It can take some time, but it is a great entrance to the local market and to be closer to the decision-making processes. This option is also interesting to be able to provide support and extra

technical capacity by developing the proposal so that the city can apply for larger scale projects from federal government, private financial institutions, or international organizations.

Another option to develop projects directly with the cities, is to provide a solution that will benefit the city/region directly. For instance, a well-developed bike-sharing system plan from which both the private party and the city will receive a profit from the operation.

One can also look for direct assigned sub-contracting projects from a private party that has already won a contract and needs a particular solution. This was the case with the Dutch company DYNNIQ (nowadays Swarco), which was approached by a local Mexican private party (who already had a running contract with the government in Mérida) to deploy their unique traffic management software. This local party had been introduced to Swarco during one of the trade missions to the Netherlands.

Hence, there are four clear chances of finding funding for projects or project opportunities for Dutch parties to develop:

- Tendering process (via the CompraNet or other large international tendering platforms World Bank, IDB, CAF, DevelopmentAid, etc.). Here all the large-scale projects are presented.
- Small scale projects directly from the municipality by lobbying.
- Projects in which public and private will benefit or physical infrastructure projects.
- Direct assignments from private parties.

Currently, many of the projects that are developed in the study areas are mainly related to mobility plans, large infrastructure projects and bike sharing related infrastructure. For the projects presented in section 4.3., the governments still need to apply for the funding or they will be tendered in the coming 5 years. The following table presents an example list of projects that are forecast to be tendered in the coming months and the next 3 years by IFIs.

Table 9. Example of IFI tendered projects forecasted for the coming year. Source: IDB

Name of the opportunity	Tendering authority	Field	Budget
Setting the Prices Right for Infrastructure Services	IDB	Electromobility	US 1.350.000
Support for Urban Development Focused on Mobility and Transportation in Mexico	IDB	All modes	US 350.000
Analysis of companies in the transport sector, business models and identification of initiatives for their strengthening and modernization	IDB	Electromobility, new modes and traffic management	US 250.000
Digitac Hub: Digital Hub of Freight Motor Transport	IDB	Traffic and transport management	US 495.000
Challenges to Contribute Closing the Poverty and Inequality Gaps in Urban Mobility in Latin America and the Caribbean (Procurement Plan)	IDB	All modes	US 275.000

In terms of National Procurement there are currently 28 mobility and urban transport projects in Mexico, 11 in the pre-investment stage, 4 in execution and 3 in the tender stage. There are currently 28 mobility and urban transport projects in Mexico, 11 in the pre-investment stage, 4 in execution and 3 in the tender stage. The next table shows tenders in terms of mobility (September 2022). However, the projects available for bidding change in short periods of time. Therefore, it is necessary to review the CompraNet website.

Table 10. Mobility tenders (September 2022). Source Projects México 2022

Num	Project	Subsector	Investment (millions MXN)	Type of contract
1	0914 Comprehensive Mobility Model for the South Zone of the Guadalajara Metropolitan Area (Line 4)	Urban mobility	9,725	Tender
2	0913 Highway "Atlacomulco-Polotitlán"	Roads and bridges	-	Concession
3	0670 New Port of Veracruz: Mixed Cargo Terminal (general, containers and mineral bulk)	Ports	2,000	Partial assignment of rights
4	0696 CETRAM Martín Carrera	Urban Mobility	-	Tender
5	0891 Comprehensive Modernization of the Trains, Control System and Tracks of Line 1 of the Collective Transport System	Urban Mobility	-	Tender

It is important to mention that new regulations on mobility and road safety (approved in May 2022) will oblige all cities in the country to develop strategies, plans and projects that are in line with the goals of the new policy. It is expected that in the coming year or two, cities start deploying tenders (or direct questions) as first steps to fulfil the requirements of this law.

5.3.1 Financial risks

As previously mentioned, most of the funding for projects comes from an external party and not directly from the cities. Funding to the cities (specially related to resources coming from the federal government) is related to the goals of vison of the lending entity. If the project is not within the priority of the government, it might not be funded. Currently the government efforts are in large scale infrastructure (i.e., Maya Train) and therefore, there is less budget for cities that are not around this project. So, investing in cities that do not have a set budget is always a risk.

Even with cities that do have budgets approved, it does not mean that they will use it or spend it in the proposed period or on the proposed topic. One clear example was provided by all the interviewees in relation to this aspect. Due to the COVID-19 pandemic, a lot of the funding resources were set on hold to solve other health priorities. In other cities, the pandemic gave the perfect impulse to increase cycling journeys and infrastructure, and boosted projects and ideas on bike-sharing systems.

Additionally, local payments directly from the Mexican parties can take a while to come through. A lot of approvals are needed for the payments to be effective which is difficult for a foreign party.

For bike sharing in particular, a great financial risk is the lack of use of the system due to the deficiency of proper cycling infrastructure or personal safety concerns. The consulted local experts agree that some systems have not prospered due to the no proper integrated strategy.

Funding from the government, private financial institutions or international organizations normally required a minimum loan. Therefore, most of the cities/regions develop and gather different project priorities that they want to develop in the new fiscal year and create a group of "packages". These "packages" are a group of projects with a common goal, for instance, "Support in Urban Mobility Development" among which one of the projects can be "Bicycle Master Plan". Once the funding for the package is approved, it does not necessary mean that the project in which the Dutch party is involved will be tendered first. Additionally, even if it is approved, the release of the money can take a couple of months.

Finally, for tenders in particular those for which the budget comes from IFIs and is allocated by a local entity, some of the local clients might ask more than the requested sum in the Terms of Reference in order to approve deliverables and hence, payments. Although not so common, additional requests might be done by the client and the private entity might need to negotiate on how to solve this request, which sometimes costs extra resources.

5.4 Market limitations and barriers

5.4.1 Commercial and cultural differences between Mexico and Dutch

The differences between Mexico and the Netherlands are of great importance when doing business, mainly because of the warmth of the Mexican treatment, so it is important to consider the following aspects when establishing a relationship:

- Although English is widely spoken by businesspeople in Mexico it cannot be assumed that the Mexican counterpart will be fluent in the language. It is a great advantage if the Dutch counterpart speaks Spanish.
- There is no substitute for face-to-face encounters, and this is particularly true in Mexico, so it is essential to visit the country and the local network often. Have multiple face-to-face encounters and engage in small talk before starting business conversations is also a bonus.
- It is important to be courteous and diplomatic while communicating. Mexicans are not very direct in their communication so a "yes" can mean a "no". Therefore, understanding body language is essential.
- Engage local help. In Mexico, having a local representative or partner will be invaluable to solve problems and issues.
- It is important to become familiar with landmarks and prominent features and to take the time to discuss these.
- Do not show up late to a meeting but expect that Mexicans might.

- Although verbal contracts are generally trustworthy, it is better to get agreements in writing to ensure they are completed accordingly.[38]

5.4.2 Social issues in the mobility sector in Mexico

The social problems that affect mobility in Mexico are also key factors to consider, since it is a country with a high rate of poverty and with highly internalized social constructs. Mexican culture continues to associate the automobile as demonstrating improvement and progress, while public transport is associated with poverty, so there is a cultural unwillingness to change to non-motorized modes of transport or collective transport.
Regarding the approval of the new non-motorized mobility projects, there are great difficulties and a strong resistance on the part of the authorities, citizens, pedestrians, and drivers for the adaptation of new circulation systems, leading to the implementation of antiquated transport systems and vehicular infrastructure, reflected in the distribution of the federal budget for mobility projects. Currently, 74%[39] of the resources are destined for vehicular infrastructure projects, segregating the rest from modes of transport.

The social rejection of public transport goes hand in hand with the insecurity it represents: robbery or assault in public transport are in first place in the crime incidence rate, which increased from 9,599 crimes to 11,081 per every hundred thousand inhabitants from 2016 to 2017; while the rate for total or partial vehicle theft is 4,200 crimes in 2016 to 4,489 crimes per hundred thousand inhabitants in 2017.
The same happens with journeys made on foot and by taxi: 34.3 % of people decide not to use a taxi, while 33.4% decide not to go for a walk for fear of insecurity in the country.[40]

Regarding the comparison between the price of public transport services and the income of users, a clear disadvantage is shown for the lower class of the country, since families with lower incomes spend 11 percent of their income on public transport, while families with higher incomes spend only 0.8 percent.
For the majority of Mexican families living in urban areas with more than 2,500 inhabitants, transportation is the second item of family spending with 19.3 percent.[41]

Externalities of the social vulnerabilities

In terms of regional governments, there are not many specialized mobility institutions dedicated to implementing policies in favor of sustainable mobility, some of the current "Secretariats of mobility" are dedicated to the management of vehicular transport and infrastructure.
The responsibilities of the governments are not always centralized in state or municipal governments, so there is not always coordination between the different entities, a great example is the coordination of public transport, which is the responsibility of the municipal governments, which makes it difficult to the federal government to

[38] The Do's And Don'ts In Mexico Business Culture
[39] Expenditure Observatory
[40] INEGI 2016
[41] INEGI, National Survey of Household Income and Expenses, 2016

guarantee the correct operation and coordination of services in the area. The same happens at the metropolitan level, since there are no planning entities -with the exception of the Metropolitan Area of Guadalajara-, limiting decision-making and coordination between the municipalities that comprise them.

Another great challenge in terms of mobility for local governments is that each administration lasts only three years in power. Added to the little autonomy of the institutions, this makes it difficult to plan mobility in cities since each administration has different interests and there can be no guarantee that the projects will continue. This phenomenon makes the relationship with foreign investors difficult, since there is no certainty that the mobility projects will be carried out, coupled with the slow negotiations and processes. The government and even some large private enterprises can have extremely cumbersome bureaucratic processes.

5.4.3 Market limitations of the identified niche topics

In general, Mexico is a well know country for its mobility experts and transport solutions. In the last 20 years several national and international consultancies have been created or established and are quite a big competitor for the Dutch mobility sector. Most of their experts have studied abroad and gained knowledge that is now applied in the country. This is a limitation for the Dutch sector, especially during tendering procedures. Mexican and Dutch experts might have the same knowledge, but the Mexican is chosen due to the reduced fees and better financial proposals. As an example, a Mexican's daily fees for a consultancy project can be €500 to €700 while in the Netherlands this is between €900 and €1200. Hence the importance of having a good complementary local partner.

In terms of cycling in particular, several market limitations for developing successful projects in this matter can be highlighted. The principal one of which is the lack of a sustainable mobility culture concept among the citizens. There is still the mentality of the car as a status symbol. The main goal of the citizens, despite their economic situation, is to acquire a car. Even in cities with established bike systems/cultures (i.e., Mexico City), people still prefer to use the private car or Uber systems, due to the lack of a well connected cycling network in the city, the safety perception (both interacting with the motorized traffic and personal) and increasing accidentally. Furthermore, cycling for many local authorities is not considered a "sexy" mode to be promoted. Hence, projects such as bike-sharing systems might be left behind. Furthermore, fuel in Mexico is still subsidized by the government which discourages the transition to more sustainable modes like the bike.

Public transport is a basic necessity for all the citizens; however, it is not well planned, and the man-truck systems prevent the fast transition to a better organized system. For foreign parties to get involved in the project, they will have to compete with these groups which can be challenging and time consuming. Hence, to deploy for instance electrical buses or construct transport hubs, might be a challenge since there is the need of approval from various actors.

In relation with public transport, electromobility plays a big role. Large cities have for years already counted on electrical rail systems and would like to continue its deployment. However, there are several limitations to be able to deploy a complete e-

mobility strategy. Among them, and most importantly, is the lack of a concrete transition policy towards these modes. Without this instrument, basic studies, and international technologies such as grid assessments, charging connectivity or type of vehicles, have difficulties to enter the market further developed. Even if these were in place, international technologies still need to be validated and tested by the Instituto Mexicano de Transporte (IMT) prior to its further implementation.

In terms of signalling and traffic management, which are considered in this project as possible quick wins, these are considered as important tools for the cities but not priority enough to invest in them aside from specific cases and projects.

Finally, funding is a transversal topic that touches upon all the four topics and that affects the deployment of any project. As seen in section 4.3., there are plenty of proposed projects and ideas for projects to solve the current needs of the cities and regions, however, funding is a major obstacle and more for smaller cities. Applying for funding is a tedious process and can take months and still end up not being approved if the project is not in line with the goals of the federal government.

5

5 Conclusions and recommendations

In general, the mobility situation in the analysed cities presents several opportunities in the key topics of this study: cycling, traffic management, public transport and electromobility. Cities and regions are aware of the need for projects and foreign knowledge and support for planning and implementing projects that will allow them to move faster towards a more sustainable mobility. Although some of the cities/regions have developed different strategies and projects in these target topics and would like to develop them further, some are just starting to solve basic mobility needs such as access to a good public transport. Hence, projects developed by external parties and countries are expected to be a transformative tool toward a society with less disparities.

Although topics such as traffic management and signalling are seen as an important tool for improving the cities'/regions' mobility (and are part of the possible projects that could be developed in the short, medium, and long term), the consensus among the local parties that were interviewed, show that the priority is discouraging the use of the private vehicle, promoting an adequate and efficient public transport and give impulse to cycling as a mode of transport. Thus, it is not very likely to see requests on traffic management in the coming months. In terms of electromobility, cities expect to have more and more public transport modes become completely electric, but it has not been as fast as other Latin countries such as Colombia and Chile and no proper electromobility vision and regulation makes it harder to develop projects in that field.

The most feasible projects for the Dutch sector are therefore in relation to sustainable urban mobility strategies and projects. These are cycling planning and implementation (infrastructure related topics) and integration with other modes, public transport corridors and most importantly, knowledge and capacity building in the four topics. Local parties are open to new solutions, but this implies efforts from the Dutch parties to be known in the mobility market since there is a lot of competition already from Mexican and other Latin parties. Innovative, effective, and long-lasting plans and solutions are easier to enter the market. For this, it is essential to have a local counterpart to be able to solve any administrative and cultural challenge.

Below is a roadmap with the proposed guide on how to develop projects in Mexico in the coming 3 years for the niche topics.

6.1 Roadmap for Dutch companies to do business in Mexico

Based on the interviews, analysis of plans and different documentation, the following graph presents the Road Map for Dutch consultancies to develop projects in Mexico in the coming 3 years in topics for cycling, traffic management (signalling), public transport and electromobility. These are also based in the real funding opportunities for the Dutch sector.

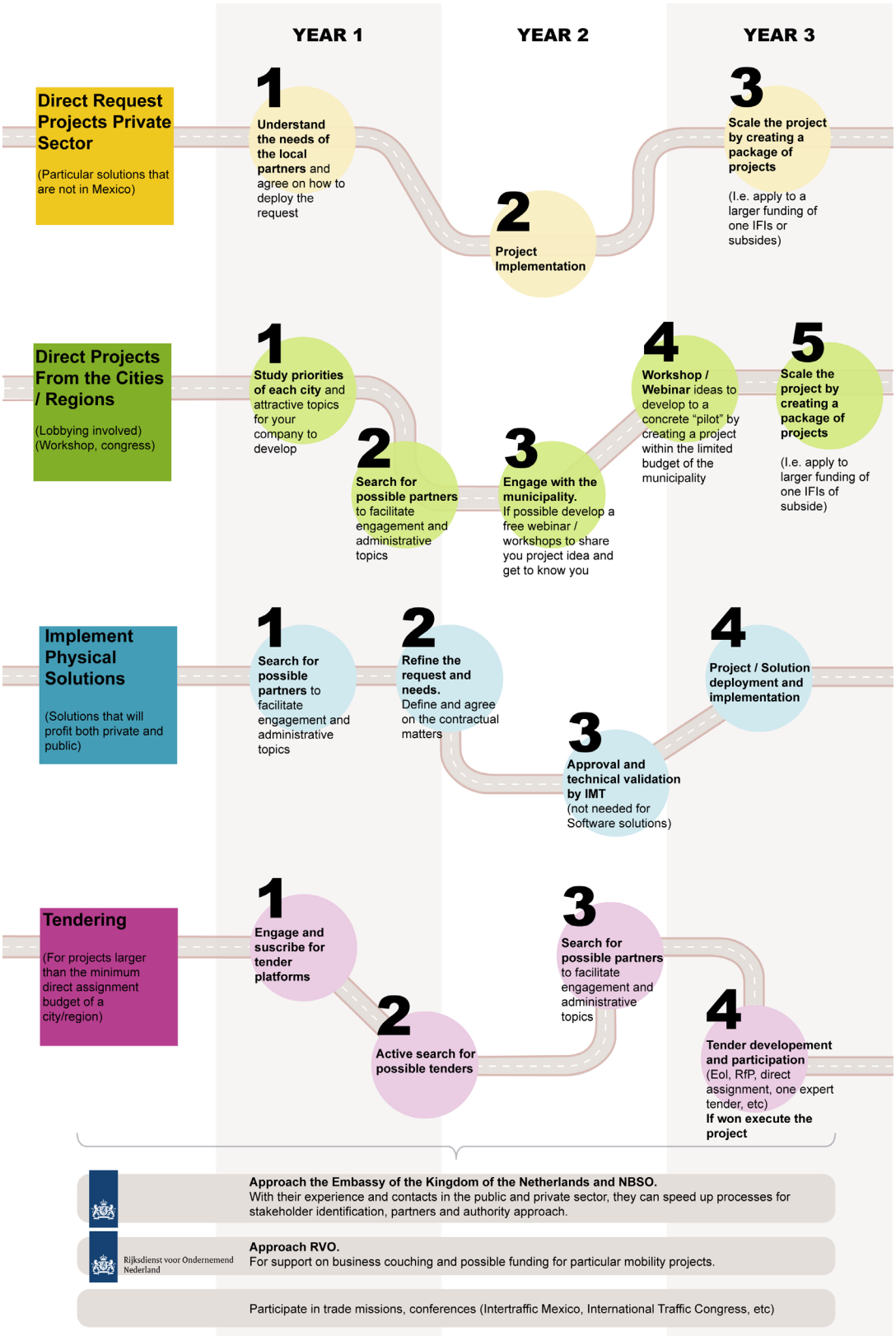
The first option is that a Dutch party is approached by a local party to request a particular solution. The first step is to engage with the local party and understand the needs of the local party. This can take up to six months depending on the urgency of the request. As mentioned in the cultural barriers, time is perceived differently in Mexico. The second stage is the project implementation, this should be done in the second year of the process and finally, if needed, this project can be escalated by lobbying together with the local party for other projects or the cities sending a proposal for another stage funded project to federal government, private financial institutions, or international organizations.

The second option is a direct project from a city or a region offered through lobbying and getting to know the Dutch unique selling content or product that can be provided. The first step is to identify which of the opportunities is attractive for both the party and the city. It is essential to have a local business partner to further develop that idea, hence, step 2 during the first and second year, is to find that partner.
Next, it is important to approach the city/region to introduce the company/consortium and the idea of the Dutch concept, product, and knowledge that can be used to benefit of the area. It is essential that the public authorities understand the idea really well and engage with it, so a free webinar or basic workshop by the Dutch party should be considered. If accepted, the next step is to ask for funding from the city/region to develop a proper workshop to make the idea more concrete so that in the end, funding can be requested from the federal government, private financial institutions, or international organizations.

The third option is to implement physical infrastructure (i.e., bike sharing system) by a direct request from the municipality. For this the first step is to find the local partner, and then, together with the client, refine their needs and wishes and the contractual matters. Once they have approved it, it is important to check with the Instituto Mexicano de Transporte (IMT) if the product needs validation or approval from the Federal government. Once that is approved, the project can be implemented.

The fourth option is tendering, for which the first step should be to engage with and subscribe to all the local and international procurement platforms. Then to continuously search for tenders, while at the same time find a reliable local partner. Once a tender is identified, the procurement stage begins and if the project is won, the last step is to develop it.

Last but not least, is the transversal layer throughout the 3 years (and beyond) which is seen as a recommendation step to approach the Embassy of the Kingdom of the Netherlands, NBSO or RVO for advice. They have a pool of contacts within the country and can assist in finding the right partner for your project/idea as well as better ideas on how to enter the local market. It is also important to try and participate in the trade missions, conferences, expositions of the topic, both in Mexico and Netherlands.
These are perfect settings to find potential clients and bring Dutch products to the attention of a Mexican counterpart.


YEAR 1
YEAR 2
YEAR 3
Direct Request Projects Private Sector
(Particular solutions that are not in Mexico)
1 Understand the needs of the local partners and agree on how to deploy the request
2 Project Implementation
3 Scale the project by creating a package of projects
(I.e. apply to a larger funding of one IFIs or subsides)
Direct Projects From the Cities / Regions
(Lobbying involved) (Workshop, congress)
1 Study priorities of each city and attractive topics for your company to develop
2 Search for possible partners to facilitate engagement and administrative topics
3 Engage with the municipality. If possible develop a free webinar / workshops to share you project idea and get to know you
4 Workshop / Webinar ideas to develop to a concrete "pilot" by creating a project within the limited budget of the municipality
5 Scale the project by creating a package of projects
(I.e. apply to larger funding of one IFIs of subside)
Implement Physical Solutions
(Solutions that will profit both private and public)
1 Search for possible partners to facilitate engagement and administrative topics
2 Refine the request and needs. Define and agree on the contractual matters
3 Approval and technical validation by IMT (not needed for Software solutions)
4 Project / Solution deployment and implementation
Tendering
(For projects larger than the minimum direct assignment budget of a city/region)
1 Engage and suscribe for tender platforms
2 Active search for possible tenders
3 Search for possible partners to facilitate engagement and administrative topics
4 Tender developement and participation (EoI, RfP, direct assignment, one expert tender, etc) If won execute the project
Approach the Embassy of the Kingdom of the Netherlands and NBSO. With their experience and contacts in the public and private sector, they can speed up processes for stakeholder identification, partners and authority approach.
Rijksdienst voor Ondernemend Nederland
Approach RVO. For support on business couching and possible funding for particular mobility projects.
Participate in trade missions, conferences (Intertraffic Mexico, International Traffic Congress, etc)

6.2 Recommendations

Based on the interviews with local and Dutch parties that have previously conducted business in Mexico and in the sector, particular recommendations can be provided. Among them:

- Participate as much as possible in the networking events organized both in the Netherlands and Mexico. Networking is essential to meet prospective clients and partners.
- Take part in the trade missions organized by the RVO. This is the perfect opportunity to find a suitable local partner, understand particular needs of the sector and meet potential clients in their own environment. Although a translator could be provided to most of these missions, having a Spanish-speaking person will help the engagement much more.
- Subscribe to the tender platforms of the national government (CompraNet Mexico) or any of the international IFIs sites. These should be checked constantly since the deadlines for applying are quite short.
- Approach entities such as ITDP, UITP, etc. These are always looking for new partners and allies to develop projects in Mexico.
- In terms of project content, focus should be on providing solutions that have a higher impact in the society, especially in the most vulnerable communities. This will maximize the visibility and potential access to other projects.
- If possible, offer a free trial of the solution, knowledge or product. Some of the locals might not have heard of the new techniques, processes, or concepts, so it is important that these are understood by the possible clients. These can be shown via webinars, small workshops, or panel of discussions. Also, if possible, offer a knowledge exchange program to the Netherlands.

Recommendations to the Embassy and RVO.

- Local authorities (especially smaller ones) are hesitant to innovation and changes. Inviting them to a knowledge exchange in the Netherlands might open some doors for Dutch businesses mainly for cycling and public transport.
- Besides bikes, the Netherlands has so much to offer in terms of mobility, however, the Mexican side are not aware of this. A trade mission to Mexico could support this purpose.
- Having a yearly budget to support Dutch companies to develop business in Mexico can provide an easier entrance to the market and be more noticeable.