

Towards sustainable mobility in Mexico City

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Abstract

This research seeks to understand the way a new modal shift in mobility has become popular among population in Mexico City. The modal mobility system that is studied is the use and popularization of the bicycle, which represent a more sustainable mode of transportation and a new option to give solution to the big mobility problems Mexico City faces nowadays. The research tries to find out what are the main elements that have influenced the population in recent years to use the bicycle and what are the struggles people face while doing this. The research was carried out after a process of field work in Mexico City. The methodology was in part an ethnographic work with active participation, as well as several interviews with bicycle users and with members of Non-Governmental Organizations that work in the defense of cyclist and pedestrians rights in the city.

Last, but not least, the theoretical framework that was used were on one hand, the new Mobility approach, a new aspect that gives element to understand why and how people commutes the way they do; and on the other the Social Practice Theory, which helps a to understand how a social practice is carried out and reproduced. Together both theoretical aspects helped to understand better this new and popular element in Mexico City.

In this research investigation the reader will understand how and why the role of the bicycle has split and is changing in the city as well as what are the factors that contribute towards more or less bicycling in the city.

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Table of contents

1 Introduction	1
2 Racionale.....	7
3 Personal Motivation.....	10
4 The Theoretical and methodological framework.....	11
4.1 Mobility and its relationship with sustainability.....	12
4.2 The choice of the Theory.....	18
4.3 The choice of the Method.....	29
4.4 Methodological challenges.....	34
4.5 Ethical reflections.....	36
5 The urban problematic around mobility: Mobility as a challenge in Mexico.....	38
5.1 Is the car Mexico City's King?.....	43
5.2 The rise of the bicycle.....	46
6 The bicycle. A sustainable change in mobility.....	54
6.1 The bicycle as a tool for social integration and equity.....	56
6.2 Riding a bicycle in the city. A social practice that can be reproduced	61
7 Towards a sustainable mobility in Mexico City.....	65
7.1 Infrastructure matters.....	67
7.2 What is the motor that makes people ride the bicycle?.....	73
7.3 The bicycle in the vox populi.....	76
8 Conclusions.....	81
9 References.....	90
10 Annexed.....	101

List of figures

Figure 1	14
Figure 2	15
Figure 3.....	19
Figure 4	25
Figure 5	40
Figure 6..	41

List of tables

Table 1 Use of transport modes in weekday trips in Mexico City. Source: Connolly Priscilla (2016).Mexico Chapter from The Urban Transport Crisis in Emerging Economies, p. 152.....	16
Table 2 Motor vehicles registered in circulation till 2014. Source: Institute of Geography and Statistics review on line at http://www.inegi.org.mx/lib/olap/consulta/general_ver4/MDXQueryDatos.asp?#Regreso&c=13158	43
Table 3 Historical usage of Eco-Bici since its creation. Source: Eco-Bici statistics at https://www.ecobici.cdmx.gob.mx/es/estadisticas	51

1 Introduction

All of us who have lived in large cities have faced the problematic of road congestion and traffic. Our daily journeys to work, school or any type of activity can become a complete nightmare. One of the reasons for this is the prioritization of motorized vehicles, particularly cars, in a wide range of countries and cities around the world (ITDP & EMBARQ, 2012).

Mexico City is no exception. When a city is urbanized and modernized and the whole process is well planned, the region becomes an attractive place to make business and employment increases. An urban planned city brings with itself better quality of life and greater chances for development. One aspect that becomes important in this process of urbanization is how the development of mobility is carried out, but for this to happen there are several aspects to take into consideration.

In general, population growth in Mexico has gone through three major phases since the onset of the twentieth century. The following numbers are related to such factors as: the economic evolution of the country, concentration of the population in urban areas and territorial distribution of human settlements. The first phase can be considered from 1900 to 1940. In that period the total population increased from 13.6 to 19.7 million inhabitants, which brought with it an increase of urbanization from 10.6 to 20.1 percent (Sobrino 2011, p 1)

The second phase occurred during the next four decades, 1940-1980. The expansive urbanization was the result of natural growth (more births and less mortality) as well as massive internal migration from rural areas to urban areas, due to more and better employment opportunities. “The territorial distribution of the urban population was characterized by its concentration towards the Metropolitan Zone of Mexico City (ZMCM by its acronym in Spanish), where the population amount increased from 1.5 million inhabitants in 1940 to 14.5 million in 1980” (Sobrino 2011, p 1)

The last and third phase began in the 1980s, by then “the degree of urbanization changed from 51.8 to 62.5% between 1980 and 2010” (Sobrino 2011, p 1). According to Sobrino (2011) the main characteristics of the national urbanization in Mexico have been the following and these elements that will be mentioned below give shape to some problematic that Mexico City has been facing in recent years:

- 1) Significant population growth within the range of intermediate cities, especially in the central region of the country.
- 2) Changes in the pattern of internal migration, with predominance of urban-urban flows.
- 3) Consolidation of the metropolitan dimension, favoring a change in the country from being predominantly urban to preferably metropolitan;

Population mobility becomes a very important factor when we talk about internal mobility problems in Mexico City. During the 1980s Mexico City became the main attraction of internal migration in the country and this migration process was mainly due to the job opportunities as was mentioned before.

This process of massive internal migration brought with it an increase in the degree of urbanization, the growth in the size of the urban area and the development of regional systems with new forms of occupation of the territory and with it new interrelationships among human settlements (Sobrino 2011). These new interrelations and interdependencies resulted in the redistribution of population and economic activities and as a consequence a new urban planning, that has not adapted as fast and effective, as the demand of a large population requires to give solutions to the problematic in terms of services, especially in mobility.

Mobility has become one of the issues and priorities to be addressed and resolved in Mexico City. The strategies that have been carried out, in most cases, have failed conditions of well-being and prosperity for the population in urban areas. In this context, the growing motorization and congestion have invested a high percentage of public resources in urban infrastructure for private transport, but not much for non-motorized transportation.

Deficiencies in mobility for the inhabitants of Mexico City have been translated in recent years to long times spent on transfers, high economic cost and the impact on the family budget, as well as insecurity while people commute (Voukas and López 2011). All those elements have deteriorated the life conditions of the population. Which has brought as result a disjointed model of mobility where motor-vehicles are prioritized, as well as all the negative externalities that originated, such as a decrease in productivity, impact on the health of the inhabitants, quality of life and environmental deterioration to name a few.

However, this problematic is not only presented in Mexico City, but this is a problem that happens around the world. This is the reason why talking about how cities can be improved is so important today. Projections by the United Nations suggest that world population by 2050 could reach 8.9 billion, but in alternative scenarios could be as high as 10.6 billion or as low as 7.4 billion. From that number, the urban population of the world has grown rapidly since 1950, changing from 746 million to 3.9 billion in 2014 (World Urbanization Prospects 2014).

Today, the most urbanized regions include Northern America with 82 per cent living in urban areas, Latin America and the Caribbean with 80 per cent and Europe with 73 per cent (2014). These current urbanization patterns are causing unprecedented challenges to the urban realities and one of the most interesting to study is the way those cities have been planned and how to understand and solve the new problematic they are facing.

It is projected that by 2030, the urban population of developing countries will double, while the area covered by cities could triple. Such urban expansion is wasteful in terms of land and energy consumption focused on transportation and living. In 1995, there were 22 large cities and 14 megacities globally; by 2015, both categories of cities had doubled, with 22, or 79 per cent of the megacities located in Latin America, Asia and Africa. (UN HABITAT, 2016)

The Department of Economic and Social Affairs from United Nations has defined Megacities in their World Urbanization Prospects (2014) as those cities that have 10 million or more inhabitants. These are places that are notable for their size and concentration of economic activity. Today, the number of megacities has tripled from 10 cities with more than 10 million inhabitants to 31. In Northern America, more than

half of the population resided in cities with 500,000 inhabitants or more in 2016. Latin America and the Caribbean is the region with the largest proportion of the population concentrated in megacities: of the total population of the region in 2016, 12.7 per cent resided in the five cities with 10 million inhabitants or more. In both Africa and Asia, more than half of the population lived in rural areas in 2016, however this is changing. (UN 2016).

Tokyo is the world's largest city with an agglomeration of 38 million inhabitants, followed by Delhi with 25 million, Shanghai with 23 million, and Mexico City, Mumbai and São Paulo, each with around 21 million inhabitants (UN Department of Economic and Social Affairs, 2014)

As is possible to see, cities are present in developed and developing countries, both cases faces mobility problems, with both cases facing mobility problems, but the solution to these ones can differ a lot in terms of urban planning. As it was mentioned at the beginning with the example of Mexico City, understanding how cities have turned from rural to urban populations leads one to think about how they have handled new challenges such as transport planning, economic, social and environmental dimensions and institutional and governance dimensions (UN HABITAT, 2013).

Mobility is basic for urbanization and its infrastructure is associated with the urban model of the cities. According to last HABITAT Report (2013), in 2005 7,500 million trips were made daily around the world and it is expected that that number will triple or quadruple by 2050. However, despite the increase of the mobility levels around the world, the access to the places, activities and services are becoming hard to reach and here is where we find one of the main problematic of the mobility.

This dramatic shift towards urban life has profound implications in energy consumption, politics, food security and human progress. Although some of this change is positive, poorly planned urbanization can potentially generate economic disorder, congestion, pollution and civil unrest (UN HABITAT, 2016).

However, mobility shouldn't be taken as only a matter of developing infrastructure and transport services uniquely. This is a more complex issue and has to be taken into a holistic perspective, which should concentrate social, economic, political and physical

matters. And these are exactly the perspectives that I would like to take in order to study the transport system in Mexico City.

Mobility is itself an interesting topic and in terms of sustainability it goes beyond an ecological scope. Talking about sustainable mobility also includes talking about a social, economic and institutional dimension, which are elements involved in the decision making of the commuters. In the following work, the reader will find a research done in Mexico City regarding the topic of sustainable mobility taking the bicycle as a new element that have helped to make a shift in the mindset of the population in terms of commuting.

In the same line, the reader would be able to understand through a theoretical and methodological perspective some of the reasons why people in Mexico City commute the way they do and understand the challenges that these commuters have to be face while they ride the bicycle.

In order to develop this research project some research questions were elaborated to give guide to the work:

1. In the context of the mobility challenges facing Mexico City, how and why is the role of the bicycle in the city's modal split changing?
2. How does the bicycle become part of mobility practices in Mexico City, and what factors contribute towards more or less bicycling

These research questions try to understand which is the status of the use of the bicycle in Mexico City and to understand if there has been a shift of mindset in terms of mobility towards the use of the bicycle in Mexico City

The structure of the thesis is based on four chapters plus and Introduction, an explanation of the rationale of the choice of the topic, the personal motivation and conclusions. All those elements seek to lead the reader little by little to understand, starting from a theoretical and methodological explanation, the way the bicycle has started to gain more importance in the mobility in Mexico City and how the acceptance of this non-motorized vehicle can help in many more areas than only improving the mobility in the City.

In Chapter 1 the theoretical and methodological process of the research is explained. Here an explanation on how the field work was carried out, which theoretical framework was chosen and why it was chosen as well as the methodology followed will be explained.

In Chapter 2 the reader will find the background and a geographical description of Mexico City. In this chapter the scope is to describe how the process of urbanization was that Mexico City experienced and to explain why is important to understand how the city was built, because as you will find, there is a connection between the prehispanic and the actual main streets and avenues.

In Chapter 3 how the bicycle can be helpful not only to commute in a more efficient way, but as well as a social integrator is explained. It is as well explained how the social practice of commuting in a certain way can be reproduced and encouraged by some elements that people consider a motor to keep doing a certain practice.

The Chapter 4 attempts to be critical about the elements that are considered obstacles, to riding a bicycle, and can prove that there are other elements that play an important role in the decision taking. It ends up with a perspective of how people in the city perceive the bicycle and the bicycle riders in an exercise to be critical of this transport, since there is not a perfect transport system in cities and as well these are chose depending in particular needs of each individual, and, all these choices are also influenced by the social environment.

Maps and graphics are included to help the reader to visualize in a better way the places, the roads and the population I talk about as well as all the references used to carry out this research project.

2 RATIONALE

As a first starting point, I will start saying that for the purpose of this work the concept of the bicycle will refer to a concept that is related to urban cycling, which refers to the use of the bicycle as a means of transport and not as a sport or a simple vehicle for leisure activity. For this same reason it is necessary to clarify that the bicycle as part of the analysis of this research will be analyzed as an element that can generate trips with a purpose beyond the amusement.

Additionally, is important to mention that in recent years cycling in Mexico City has become an active mode of transportation that integrates different elements that have made the bicycle more popular among the population. Today, it has become an attractive alternative to the automobile as an urban mode of transport. The reasons why cycling has earned more space in the urban sphere is associated with a range of different elements that range from the economic advantage, and a more effective and efficient way of commuting, to environmental reasons related to benefits such as reduced emissions of noise, air pollutants and greenhouse gases; some others elements are related to fashion and trendy reasons and some other are just individual ones that can be related to health benefits or simple lifestyle.

The popularity of the bicycle has been supported by the local government which has in recent years developed several programs regarding sustainable mobility, particularly with the use of the bicycle. These actions were mainly carried out for two main reasons. On the one hand, the local government has been facing a very serious problem of vehicular congestion generated as a result of public policies that have supported infrastructure for the transit of private motor vehicles in the city. As a result of these actions the environmental problematic in the city has increased and this has made living worse for the population that has to face high numbers of polluting gases.

The other reason for which the local government is supporting the bicycle as a transport system is because Mexico City's population has been affected by several cardiovascular diseases and the government has seen that using the bicycle on a big scale has long term benefit, especially economic costs; when directed to the population that does not get

much physical activity, then the amount of money that is invested to for cardiovascular treatments is less. These can give a hint of how the use of the bicycle in the City can increase and improve the way of living of Mexico City's population, not only in terms of mobility.

In order to have a better understanding of how to explain this new bicycle phenomenon in the city I have decided to use two different theoretical frameworks. On the one hand the mobility approach, which can be considered new in the Social Science. This approach started in the 90's and emerged as a new paradigm that was focused on explaining the importance of the movement. This was by giving importance to the study of the movement involved both in the society and among the individuals. This new vision and "new turn" in the way commuting is being carried out in modern societies, has been driven by generally increased levels of mobility and new forms of mobility where bodies combine with information and different patterns of mobility that the mobility paradigm helps to explain in a broader perspective. This new paradigm tries to include new ways of how mobility in the society has been seen "at the center of constellations of power, the creation of identities and the micro geographies of everyday life" (Cresswell, 2011, 551).

This theoretical base resulted very useful for me because it helped me to explain and understand with more flexibility the new phenomenon of the use of the bicycle in Mexico City. Human Geography has studies movement and transport before, but always from the perspective of mobility based on motorized transports; by using the Mobility paradigm I was able to incorporate new elements that comes with commuting in a non-motorized vehicle such as the bicycle.

On the other hand and to give more support to my research I decided to support myself Social Practice Theory. The reason why I did this was because I wanted to understand the elements that were involved in the commuting behavioral change of the population that I decided to study, since this theory helps to determine the link between practice and context within social situations. The mix of those two theoretical elements: the Mobility approach and the Social Practice Theory resulted in a good combo that helped me to provide the theoretical elements to support my research.

In the methodology I decided to use the ethnographic research method while I completed my field work. This was very useful because the ethnographic method helps a lot to observe a social practice, and also allowed me to participate in it. Then I was able to contrast what my interviewees told me to what they do and how they experience it as well when they ride a bicycle. Riding alone or in groups in Mexico City allowed me to have a better understanding of what people face when they decide to use the bicycle and to understand better the reasons why they prefer to use one transport system or another.

The combination of the elements mentioned above resulted in a research where the reader will be able to understand, based on elements such as interviews and bicycle riding experience, some of the reasons why people in Mexico City have started to put aside the private car in some cases and have started to take the bicycle as a transport system in a more popular way. At the same time, it will be possible to know some external factors that have encouraged or stopped the use of the bicycle as a sustainable transport option for the city.

3 Personal Motivation

During the Master program at the Center of Development and Environment I learned that sustainable development can be applied to everything we do. Today, most of the population that lives on Earth is located in cities, which means that the urban population today the majority.

I have lived in a huge city all my life and I have experienced the changes that have led to the problematic we face today in terms of mobility. In order to sustain the quality of life of the inhabitants in the cities we must start thinking about a more sustainable way of living, in other words, we must start to think more about sustainable cities to live in.

The demographic explosion we face today around the world is expected to increase in large amount and during the next decades. Likewise, the problematic that we face today in Mexico City will generate a decrease of the quality of life of the new and the old inhabitants, as a Mexican from Mexico City this topic concerns me a lot.

In the idea of building a new city, or a sustainable city, I see in the citizen an active actor that can transform and give new shape to their environment. Nobody knows better than the citizens themselves what the needs of the space are and how to encourage and make changes in order to improve their living conditions.

4 The Theoretical and methodological framework.

As a scientific researcher it is important to make clear the importance of having a process while doing research, in this sense, the process of researching needs the application of the scientific method which would seek to obtain relevant and reliable information to understand, verify, correct or apply knowledge. Albeit a process to do research, it is important to let clear that the research is very closely linked to humans and this is why having a series of steps to achieve objectivity during the reach process is quite important.

For the purposes of this research work, which focuses on the understanding of how the use of the bicycle in Mexico City has been transformed over time, I have chosen two theoretical frameworks that would help me to better understand the object of study: the Social Practice Theory and the Mobilities approach. These two theories were chosen mainly because I found in them the required elements that can help me to explain how and why people commute the way they do. Thus, these theories would help me to understand not only the social practice of using a bicycle, but also how this practice is reproduced, how it is maintained, how it is established, how it is challenged and, on the other hand, to understand the reasons why the cyclists chose this way of commuting instead of another if it is the case.

The methodology that was chosen to complete this investigative research has an ethnographic approach. I used active participation, which allowed me to have better understanding of how cycling on Mexico City is. I also directed interviews one by one to bicycle users and to active members of Non-Governmental Organizations that work to protect cyclist and pedestrian rights; and, last, I also conducted interviews with pedestrians that coexisted in their day by day with bicycle users.

4.1 Mobility and its relationship with sustainability

I would like to start introducing the concept of sustainability and relate it with mobility before talking about the methodology and theoretical part. This is mainly because mobility is a concept that has been inserted gradually into the debate over environmental sustainability due to the large impacts of fossil fuel consumption, which is the main source of energy in the transport sector, therefore the importance to have it in mind.

I will start arguing that in general in urban systems there are huge amounts of energy and materials that create intense local “hotspots” for pollution, solid waste, congestion, safety problems, and other challenges to livability and sustainability (Golub 2016). Fossil fuel is the main source of energy and “oil is the dominant fuel source for transportation in the cities with road transport accounting for 81% of total energy use by the transport sector” (Chapman 2007, p 355).

This source of energy makes transport a major contributor of greenhouse gases and is one of the few industrial sectors where emissions are still growing. Urban mobility systems work mainly based on this energy source and this is why the cities and the mobility are often a leading cause of these challenges. This is one of the reasons why focusing on urban mobility could lead to an effective approach to solve key sustainability challenges.

The motor car is the second biggest contributor to greenhouse gas emissions in the transport sector (behind road freight) and although there have been several advances in technology, these improvements will be offset by an increased amount of ownership and use (Chapman 2007).

Now, going back to the concepts, it is important to define how the term of mobility will be treated in this paper. Mobility refers to the movement from a point A to a point B, but as Golub (2016) argues, it also refers to the resources and costs on society, “including not only fees or fixed costs, but also time cost, and other costs such as health

or environmental damages” (Golub 2016, p 262). This will be discussed further in the following section.

It has to be said that the different modes of travelling in the cities depend in the support obtained by investments in infrastructure, in the case of Mexico City; the infrastructure has been encouraged by the local government and focused in motorized transportation. Then, travel by a certain mode of transportation is not convenient in the absolute way, but is made convenient by a coordination of investments, by a variety of social actors from households to city governments, the national government, and private industry (Golub 2016).

Now, to have better perspective it is important to have this numbers in consideration: “Only in Mexico City around 22 million of trips are completed daily. Most of those trips are undertake by some motorized transport system. The total amount of circulating cars represents the main factor of pollutant emissions, especially for the Green House Gases (GHG).” (Pérez 2013, p 107). The following map shows the location of Mexico City and the Delimitation of the ZMCM¹ (See Figure 1).

¹ According to information from SEDESOL (Ministry of Social Development) corresponding to 2007, the Metropolitan Zone of Mexico’s Valley (ZMVM in Spanish) is made up of 16 delegations of the Federal District, 59 municipalities of the State of Mexico and one of Hidalgo. It has an area of 7,854 km² and in 2010, it had a population of 20 million 166 thousand inhabitants.



Figure 1

Source: SEDESOL-CONAPO-INEGI (2015a) Delimitation of Metropolitan Areas on Mexico 2010 found at

<https://www.oecd.org/regional/regional-policy/valle-de-mexico-highlights-spanish.pdf>

In Mexico City resides approximately the 18% of the national population, and this leads to the consequence of a higher centralization in terms of opportunities and activities. Many of the tertiary activities, particularly the finance and other production services sectors have been established there, specifically located at the South and West; regions of the city that are mainly planned and built for automobile access. In Figure 2 it is possible to observe in a much clearer way the centrality index in Mexico City's districts.

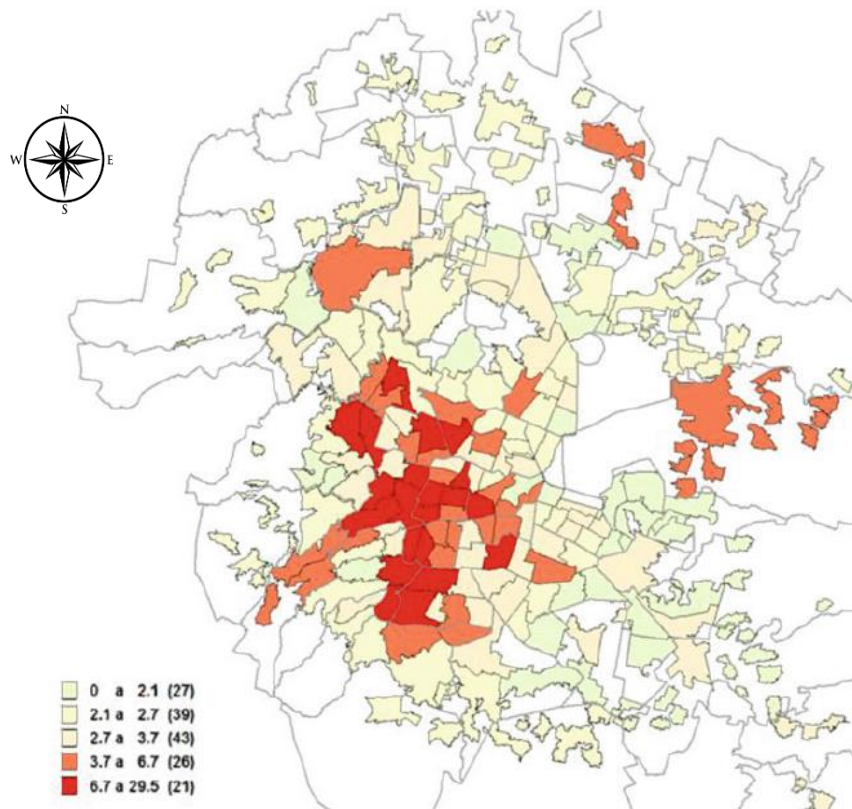


Figure 2
 Centrality index in Mexico City districts.
 The figure shows the regions of the city where are located the main central areas of mobility affluence.
 Source: INEGI/GDF travel survey 2007

In terms of modal split, travel increasingly involves two or more public transport modes. The use of public transport has decreased but still accounts for over two-thirds of travel. “Between 1994 and 2007, trips by car and taxi went up by 30% and 120%, respectively, compared to total increase in daily travel of less than 7%. Nevertheless, the private car is still a minority mode, accounting for less than 30% of total trips in 2007” (Priscilla Connolly 2016, p 149).

However, taxis are cheap and abundant in the City; their use is becoming a necessity for those without access to a private car which has resulted in an increase in traffic congestion. At the same time, there has been an increase in both bicycle and motorcycle use, although their modal participation is still very low representing a very low percentage of trips. The next table shows how the transport mode system is divided in Mexico City (Priscilla Connolly 2016).

Table 1
Use of transport modes in weekday trips in Mexico City.

Mode	%
Colective taxi	51 %
Private car	29 %
Metro	19 %
Suburban bus	10 %
Taxi	8 %
Governalment bus (RTP)	3 %
Bicycle	2 %
Other	1 %
Metrobús (BRT)	1 %
Trolley bus	<1%
Light rail way	<1%
Motorcycle	<1%

From the trips that are made in Mexico City “50 per cent of them have routes of 10 kilometers distance in average” (Suárez Lastra *et al.*, 2008). Distance that can be easily traveled in 30 minutes by bicycle (Pérez 2013), however, many urban mobility systems attempt to create ubiquitous, inexpensive mobility, typically based on the automobile (Cervero 1996). The mobility approach creates significant external costs and unintended consequences that will be discussed later on in the next chapter but that serves as a basis

to start to talk about how people move and the way they do it regardless of the problematic that is increased with the use of the private car.

Despite the existence of a higher demand of individual transport among the population, the different administrations of the city have shown willingness to change this reality to face major urban and environmental problems (Pérez 2013). This has been done with several public programs that encourage the use of a no-motorized transportation system. All these actions have been taken in order to fight against the GEI generated by the fuel combustion which contributes to air pollution and impacts the environment long term and on a global scale

However, the Mexico City administrations have taken actions that can seem contradictory. On the one hand, the Government seeks to discourage the use of the car or motorized mobility and to prioritize public transport and non-motorized mobility, however the actions that the Government has taken regarding infrastructure have been more focused on construction of fast roads, streets, car parking spaces and other works that disinhibited the use of automobile. In addition, recently there was a very dramatic change that affected the vehicular circulation in Mexico City. The implementation of new traffic regulations were published in the Official Gazette of the Federal District, it establishes new strict speed limits of 80 km/h on highways, 50 km/h in primary, 40 km/h in secondary, 30 km/h in traffic calm, 20 km/h in school zones and 10 km/h in parking lots. (SSP 2015)

However, these new regulation have created some criticism among specialist. PhD in Environmental Engineering Ricardo Torres Jardón, researcher at the Center for Atmospheric Sciences of the UNAM, have explained that the excessive speed limitations have caused combustion due to engines do not work properly, so they emit more pollution, since they do not reach the “optimum speed” (Mochán 2016).

Modifying the transport and the way mobility is done means a change in the daily practices of individuals and a strong transformation of knowledge. As Perez (2013) argues, the “change also implies going against the social norm that imposes the use of the automobile” (Pérez 2013, 109) or at least trying to find new ways of mobility that are more sustainable.

4.2 The choice of the Theory

I will start arguing that until recent years transportation geography studies were the main on academic source that studied mobility as a phenomenon which focused mainly on the movement and connections between people, goods and information around the globe. The focus of Transportation geography was not only in the activity itself, but also in the impacts of it such as trade between people, communication and many other activities that were involve on it and that are essential for the development of civilizations.

With the globalization process and the technological advances, the study of the mobility in general and the transport in particular became much more complex to study. “The growth of information and communication technologies is allowing new forms of coordination of people, meetings, and events to emerge” (Sheller and Urry 2006, p 207). Thus, a new turn of studying mobility came into the field, the fact of only studying mobility in the transport sector started to be wider and then mobility started to study all related to the movement and not only mobility related to transportation, then “moving your hand, walking, dancing, exercising, driving to work, moving home, going on holidays, marching, running away, immigrating, traveling, exploring, attending conferences” (Cresswell 2006, p 550).

Historically, mobilities has been presented as the study of bodily mobility, sports, youth movements and even work (Cresswell 2012). However, lately these studies have linked the fact of movement “across scales and in a way that links with the humanities at one end to the science at the other” (Cresswell 2011, p 552), and is precisely here where the Mobilities approach makes its contribution.

Therefore, and based on the new elements that are being added to the mobility equation (such as new technologies for moving and communicating including transport and internet to name some), a new turn in the mobility paradigm is growing. “An effect called *mobility turn* is spreading into and transforming the social sciences, transcending the dichotomy between transport research and social research, putting social relations into travel and connecting different forms of transport with complex patterns of social experience conducted through communications at-a-distance” (Sheller and Urry 2006, p 208)

Since this new perspective of mobility is growing, it is important to point out that in this new paradigm of the *mobility turn*, as Cresswell (2010) states, the motion rather than sedentarism becomes the starting point of the analysis. Thus, the scope of other studies such as Anthropology, Cultural studies, Geography, Migration studies, Science and Technology studies, Tourism and Transport studies (Sheller and Urry 2006) can add to this new paradigm more elements that can help much better in the understanding of how and why mobility is carried out (Cresswell 2011).

The mobilities approach came to offer a new perspective of what we have called movement, in this sense “mobilities research takes a more holistic view that allows it to make some previously unlikely connections” (Cresswell 2011, p 550), which is translated in a better understanding beyond *how people move* to understand *the reasons why they move*.

Studying the Mobilities approach is much more than studying movement itself, “mobility is movement imbued with meaning” (Adey 2010, p 34) and is exactly when movements gain meaning and significance when the production of mobility happens. Thus, ignoring the way movement is entangled in all sorts of social significance is to simply strip out the complexity of reality as well as the importance of understanding those meanings (2010).

That said, now is important to make clear the basic meaning of mobility. Now, in strict sense, movement involves a displacement, which means that it is an “act of moving between locations from a point A to a point B (Figure 3) (Cresswell 2006, p 2). Movement therefore, describes the idea of an act of displacement which means that movement allows people to go from one location to the other (that could be anything from a town, a country or any space in between one point and other).

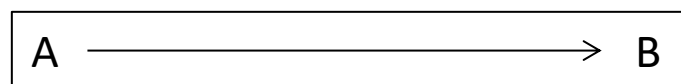


Figure 3
Taken from *On the Move. Mobility in the modern Western World*
(Cresswell 2006, p 2)

Movement is made up of time and space, which are fundamental elements around which life revolves; these two elements (time and space) cannot be taken for granted in the consideration of movement. However, in the Mobilities approach those elements play another role, because both represent the context, a product of movement and place (destination) is the center of meaning (2006) that people experience.

Giving meaning to the movement is central in the Mobility approach, understanding why people move the way they do explains the meaning of the places where they head and this is one of the main differences from the simple movement itself. This makes a complete new perspective of understanding how and more importantly why people moves the way they do and complements much more the geographic studies regarding human movement. In this way, “Mobility makes sense of it through the production of meanings that are frequently ideological” (Cresswell 2006, p. 3). And on the other hand, “the new mobility paradigm suggest a set of questions, theories and methodologies rather than a totalizing or reductive description of the contemporary world” (Sheller and Urry 2006, p 209) which at the end helps us to comprehend the particular meanings of the movement.

Since Mobility seeks to research in partnership with other disciplines, it has become a better tool to give explanation to different phenomena. Thanks to the interdisciplinary approach which puts mobility at the center of the explanation of social and cultural phenomena (Cresswell 2014). Although it seems to be a new stream of study, the reality is that this approach has emerged from the Humanities and Social Science, it works like a link between science and social science to the Humanities and on the other hand, looks at culture and society through the lens of mobility and tries to understand the reasons why mobility takes place on it (Cresswell, Dorow and Sharon 2016).

Another aspect that is important to point out is that although the Mobilities approach considers all forms of movement, it adds a new element to human movement, which is how movement is experienced or in other words how the movement is embodied. Thus, human mobility is an irreducible embodied experience (Sheller and Urry 2006) that is not an isolated act, but the result of several interconnected ways of moving.

On the other hand, is important to mention that human mobility involves a process of making choices, within or despite constraints of society and geography. Therefore,

mobile embodied practices are central to understand how people experience the world and the different kind of practices such as writing, sensing, walking and driving. All our Mobilities create spaces and stories (Cresswell and Merriman 2011) and at the same time, they involve a range of embodied engagements of technologies and infrastructure (2011) that of course have an impact on the way we transform our landscapes, places and experiences constantly.

With this it is possible to say that based on any human activity that involves mobility, a collateral effect is that the space where any mobile practice is done can be transformed. This is a very interesting point that will be discussed further on regarding the changes in infrastructure, and how spaces are taken and appropriated by the people based on their practices. It will be discussed how in the case of Mexico City the practice and use of the bicycle overtime has led to several improvements in the bicycle practice in general and in the infrastructure in particular. In other words, spaces are important, “spaces are not simply contexts, they are also actively produced by the act of moving” (Creswell 2011, p 7).

Mobility is used in a broad ranging generic sense, embracing physical movement, but it not only involves the study of the movement itself, it also involves those immobile infrastructures that organize the intermittent flow of people and information. Moreover, it is important to mention that studies of human mobility “must be brought together with more *local* concerns about everyday transportation, material cultures, and spatial relations of mobility and immobility” (Sheller and Urry 2006, p 212).

In this sense, Mobility has researched widely the transport sector, it has been more focused on examining simple categories of travel, such as commuting, leisure or business, but from distinct perspective. However, with the new turn of the Mobility perspective, it also “involves examining many consequences for different people and places located in what can be called the fast and slow lanes of social life” (Sheller and Urry 2006, p 213).

Thus, research within the new Mobilities paradigm, as Sheller and Urry mention (2006), tries to also examine the embodied nature and experience of different modes of travel and tries to see in them as a study of material and social dwelling-in-motion.

As has been mentioned before, there are several forms of mobility and there are as well several ways of approaching it. The study of mobility focused on motor vehicles or the *automobility* has been so far one of the most popular. This way of mobility has direct impacts “not only on local public spaces and opportunities for coming together, but also on the formation of gendered subjectivities, familiar and social networks, spatially segregated urban neighborhoods, national images and aspirations to modernity, and global relations” (Sheller and Urry 2006, p 209) as well.

Regarding the motorized vehicles, the automobile has been the most popular object of study in this perspective, not only for allowing a relatively convenient, flexible and safe mobility but also because it has also been associated with the feeling of having a much freer mobility while using it (Sheller and Urry, 2000), but also because of the way of use of cars can “reconfigure urban life, with novel ways of dwelling, travelling, and socializing in, and through, an automobilised time-space” (Sheller and Urry 2006, p 209).

But on the other hand, it has been so popular because the car has had the biggest impact on the transport activity in general and it has to be mentioned that the domination of the study of the car in the mobility perspective is influenced because the “car provides a private space for drivers and passengers while allowing for flexibility and comfort in the process of reaching” longer and more destinations (Hansen 2015, p 17).

However, the popularity of the car as a transport system was not always like this, and before its usage was as popular as now, people walked or rode horses; transport was revolutionized by new elements such as the bicycle, which brought a new transportation to the masses by virtue of the low purchase and operating costs (Berggren 2013).

In Mexico around 1950's decade, bicycles were quite popular and widely used especially in the main cities, but with the success of the car the bicycle ridership began to have a precipitous decline. The enthusiasm for cars rose and the popularity of its use led to some poor-choice planning in the cities. As a consequence, the urban space was modified and the streets were reduced and adapted to make room for the automobile (Sánchez 2015).

Today, a growing demand for knowledge regarding a more sustainable transportation system such as cycling is just a reflection of the realization of the consequences of creating automobile-dependent cities and of a transport planning that has led to problems such as car congestion, parking problems, reduced levels of amenities and livability, air pollution, resource depletion, climate change to name some.

It is imminent that interest in transport cycling has grown and “much more interest has been shown by city governments to create a more bicycle friendly urban environment” (Fishman 2016, p 1) to have as result more sustainable cities. But, now let’s talk about what the bicycle offers as a new alternative to the problematics that big cities confront nowadays.

I will start by arguing that is not only a transportation system that has started to be more studied by the Mobilities approach and by the Social Practice Theory. These new perspectives of studies of mobility of the use of the bicycle in cities are also done in terms of the impact that its use can have mostly based on the greater proportion of population that today resides in the cities. It is forecast that the global population by 2050 will be 70% of people living in cities (World Health Organization, 2010), based on that it is possible to understand how important is to study the impact of the use of the bicycle and how it bring about some transformations of social practice in the cities.

Now, studying the increase of the use of the bicycle in Mexico City based on the Mobility approach can help to understand why this shift of transport is taking place in the population. The transformation of mindset towards the bicycle is also studied in this research work and for that matter Social Practice Theory becomes useful to complement the Mobility approach and have a stronger theoretical support for understanding the biking phenomenon in Mexico City.

So, the bicycle can be seen and studied not only as a transport system, it can also be seen as a tool for social justice, a tool to improve and have a better public health, a way to have a more inclusive urban space and in general a good sustainable alternative to the car. The bicycle can be seen as an element that can change and transform the commuting social practice of a determinated population in many other ways.

The Social Practice Theory provides several elements that prove to be quite important in the analysis of a social practice. So the reader may understand more clearly, I will refer to Bourdieu's Theory of Practice formula, in which every element can describe and can help to understand how a practice is different from a social action or behavior and once we make these two concept clear, it will be helpful to understand, as well, how the new practice of cycling in Mexico City is emerging.

Before going on with the Social Practice Theory I will start by arguing the binary opposition between the subjectivism and objectivism, elements that Bourdieu calls the context. "Bourdieu acknowledges that each of these modes of knowledge (subjectivism and objectivism) represent a distinct view of human action" (McGee and Richard 2013, p 652).

In that sense, in the Subjectivism knowledge, the human action is seen as a function of individual choice and decision making. Subjectivism is a stance that takes representations as a point of departure to assert that "reality is the accumulation of acts of interpretation on which people constitute lines of meaningful interaction" (McGee and Richard 2013, p 650). On the other hand, Objectivism stated that a human action is seen as a rule of a behavior; it implies that "the social world is constituted by sets of rules, relations and forces that impose themselves on individuals to determinate conduct and representations" (McGee and Richard 2013, p 650).

These two concepts of knowledge are important to mention in the Social Practice Theory because Bourdieu observed that human action did indeed involve choices and decisions, but he also observed that "choices and decisions were not made according to an individual's free will" (2013). This is indeed quite interesting because these elements can help to understand better how decision making takes place and to understand much better the cyclists that were interviewed, since I found that all of them started to use the bicycle sporadically, but they increased the use of it since they saw that more and more people were riding a bicycle as well and some other elements that will be mentioned further on. So, when it comes to a change of practice such as the phenomenon of more cyclists, the Social Practice Theory gives without doubt elements to better understand it.

Then, the Social Practice theory and Bourdieu's thought in specific make clear how decision making is framed in such social influence. In Bourdieu's words, "individual

action emerged from an unconscious calculation and a strategic positioning in a specific social space to accomplish a social end” (McGee and Richard 2013, p 652), then the individual process of decision making to take any action is always due to influence.

As has been said, this Theory proves very helpful for the purpose of this research, some concepts such as Habitus, Practice, Field and Capital, become useful to understand in the Social Practice Theory. As it comes now, the following formula describes all the elements that Bourdieu has taken as important to make an analysis of a social Practice:

$$[(Habitus) (Capital)]+Field = Practice$$

Figure 4
Taken from Theory in Social and Cultural Anthropology: An Encyclopedia. Chapter “Practice Theory” (McGee and Richard 2013, p 653)

For Bourdieu the habitus is central in the Social Theory practice, he describes the habitus as a “product of the structure, producer of practice and reproducer of structure” (*Ibid*). For Bourdieu, habitus essentially focuses on the way people act, feel, think and as he mentions is a result of how people bring the past into the present to make choices as an ongoing interactive and evolving process. This means that “the choices before any individual are constrained by the current context or field and by the range of choices that are visible to the agent. This vision, in turn, is shaped by past experiences, which are embodied in the agent, and habitus thus informs practices from within” (McGee and Richard 2013, p 654).

Another concept that is important to mention is the field, according to Bourdieu, the field is “that social space in which forces impose regularities and regulations that constrain choices from without” (McGee and Richard 2013, p 653). It is also a social space of struggle and contestation, in which the basis of domination and hierarchy is subjected to disputes that are translated into practices (2013).

In the same argumentative line, Bourdieu finds four different types of capital. Economic, Cultural, Social and Symbolic. The first type of capital is more related with money and assets. The cultural refers to the knowledge and cultural preferences, the

third makes reference to the networks and affiliations and finally the symbolic refers to the capacity of different capitals to be exchanged and converted between fields.

The field is an important element in the equation because it helps to understand the practices, through the acknowledgement of the regularities of each social field. This will provide better understanding of how the regularities and the fields are related to the practical logic of the social agents.

The last element of the equation is the practice, which is the result of a complex dialectic between social externalities and individual externalities. In short, a practice is not thus “the result of one’s habitus but rather of unconscious relations between habitus and one’s current circumstances” (2013). So, riding a bicycle instead of using a car or using the public transport system would represent the result of a complex internal dialogue between personal choices and external influences. Then, a social practice is defined by “an individual behavior change on the one hand, and designing more efficient technologies, production systems on the other. From this perspective, individuals are perceived as being responsible for the “uptake” of more efficient technologies” (Sahakian and Wilhite 2014, p. 25)

Once is explained this part, it has to be mentioned that this research seeks to use this Theory to study how a practice such as cycling is being carry out in Mexico City, but the researcher work will be complemented with a Mobility perspective, which will help to understand how and why people commutes the way they do.

Now, commuting in words of Edensor “can be alternatively conceived as a mobile practice that offers a rich variety of pleasures and frustrations” (Ederson 2011, p 189), which is linked to the idea of experience of some practices and how those practices are perceived by the person. In the case of commuting, it is interesting to notice and understand why people commute the way they do, a situation that can be better analyzed by understanding the experience that the commuter has that actually makes them choose the way they do.

As has been said before, understanding how and why people commute is central in Mobilities, and it implies several elements to take into consideration that commuting belongs to an enormous range of space-temporal context within which multiple rhythms

are produced and interweave” (2011). The rhythms a commuter has can be linear or cyclical, irregular or regular and it totally would vary according to the time and space and many other elements involved.

This would mean that the act of commuting would be experienced differently from one place to the other and from one person to the other. In the particular case of cities, which is the matter of study of this work, it has to be said that cities “are particular dense special formations containing a complex mix of multiple heterogeneous social interactions, materialities, Mobilities and imaginaries which connect through twists and fluxes of interaction” (Amin and Thrift 2002, 30). And at the end, all those interactions are economically, politically and culturally produced through multiple networked Mobilities of capital, persons, objects, signs and information (Urry 2006, ix).

The commuting practice adds to this reality a kind of coordinating in the performance of some rhythms enfolding and clashing with others in the city. In this case, places became the locations where multiple temporalities collide constantly. As a result it happened that commuting has the effect of sewing the places together and produces an itinerary, which is shaped by time as temporalities of movement that are continually inscribed on places and periods of travel en route (Ederson 2011).

This created interaction of different rhythms produces a new way of interaction between individuals in the city. In the particular case of this work I am referring to the interaction created between cyclists, pedestrians, private cars and public transport and which interactions build up a relationship with the places over a span of time.

This interaction that is created is really important to understand because as we will see during this work if the interaction of the involved elements results in a good experience, then the result will be for sure an increase of the use of the bicycle or a preference to use it instead of the public transport, private car or taxi.

Now, on the other hand, it has to be mentioned that these existing rhythms in the cities are shaped by numerous factors that at the same time have an influence on individuals. Some factors can be the mode of transport and its particular affordances, cultural

practices and social conventions, modes of regulation, the distance traveled and the specificities of the space passed through (Ederson 2011) to name some.

However, all the external factors that can be taken in to consideration to make a choice for commuting in one way or the other have another factor to take into consideration, which is the internal experience that commuting produces. Since Mobilities seeks to understand the reasons why movement happens, this perspective will be helpful for this thesis.

In this sense, the experience of how a social practice is done and how it is experienced has a direct relationship on how often a practice is carried out, besides, of course other elements that surround the choice of the practice. Then, commuting by bicycle in Mexico City can offer not only a way of going from one point to the other, but a period of relaxation. In sum, and as Ederson (2011) states, much sensation depends upon the qualities and dispositions of individual commuting bodies as well as how affordable a vehicles and space can be, in terms of quality of transportation.

Commuting is part of a routine and habits that make up daily life and Mobilities approach can help to explain how and why this social practice is done. Based on what has been mentioned before, Mobilities becomes a very useful approach because first it considers all forms of movement from small scale to global flows; second, the variety that can be studied is really wide and third, it considers the role of power in the production of Mobilities and in the constitution of power (Creswell 2012).

This last point about power proves to be interesting, according to Gössling and Nilsson (2010) connects the practices and infrastructures of elite mobility and proves how moving is connected to a social elements and how this can have a big influence in the way infrastructure is provided to them. This is mentioned because during my fieldwork in Mexico City I realized that the public discourse of the government regarding sustainable mobility was a bit contradictory with what people faced every day, this was quite visible, especially in the city's infrastructure focused on highways, long streets and urban works for private cars.

Despite this is now the reality of Mexico City, it is also true that new ways of commuting are being developed. New social practices are taking more power and the bicycle, despite all the lacks of infrastructure that the city can have, is becoming a new moving force.

4.3 The choice of the Method

Once the theoretical part has been explained, now it is important to talk about the methodology that was used for this research work. According to the academic literature, this process is a series of certain techniques and procedures that guide in gathering and analyzing the data related to the research questions.

Now, I will start saying that the methodology refers to the strategy, the plan and action that lies behind the choice and use of a particular method. In the particular case of this work the case study method was the one that was selected in order to have a better understanding on how the use of the bicycles in Mexico City has been transformed. The process I decide to take to get to know the opinions of the people and how do they make their choices to commute was through an interview process to Non-Governmental Organizations (NGO's), bicycle commuters and pedestrians.

The present research seeks to understand how social practices in mobility in Mexico City have been transformed and tries to understand as well the motivations and the motors of this shift to a more sustainable way of transporting by the use of the bicycle.

Now I will talk about how this process was done. According to John Creswell (2007) when a case study is undertaken, the researcher explores a particular entity or phenomenon, this is identified as “the case”, which is restricted by time and a specific activity. The researcher then, collects detailed over a constant period of time. For the purpose of this work, a bicycle commuting movement in Mexico City is the case that is taken in consideration.

One of the reasons why the case study was selected, was because it provides a descriptive account of the entities, experiences, and/or behaviors kept by the researcher through field notes, interviews (formal and conversational as it happened in this research work), survey or just simple observation (Patton, 2002), which matched

perfectly with the Mobility approach to have a better understanding of the motivations of why people commute the way they do.

On the other side, case studies are also based on an in-depth investigation that seeks to explore causation in order to find underlying principles through the collection of qualitative and quantitative data as interviews, direct observation or participant-observation seems to be the better option that fits the theory that was chosen.

I took the decision to not only talk with the people that have a relationship with the topic, but while I was making my fieldwork I realized that I would never be able to understand how easy, difficult, effective or not it would be to commute by a bicycle through the city if I didn't experience it by my myself. Therefore, during my fieldwork in Mexico City, which lasted 2 months (from October 2016 to November 2016), I decided to ride a bicycle every time I had the chance and to prefer it as a mode of transport, before the private car or the public transport; all this in the framework of a conscious decision-making process. Then, I commuted by bicycle almost every day, except when the weather conditions were not good for that, because of the rain or when the atmospheric pollution index were not healthy to carry out physical activities outside, then I traveled by car or by public transport depending of where I was heading.

Besides this active participation in the field, I managed to carry out 20 interviews (see Annex 3). I will explain in the following lines the criteria I chose to select the people I was going to interview. The first element I took in consideration was the geographical area in where they lived. For me, it was more interesting to know the opinion of the people who lived in the south of the city because of the following reasons: First the area is a flat surface situation that encourages the usage of the bicycle; and second the population has a good purchasing power in terms of income. These conditions allow them to have easier access to a private car, which gives them a chance to choose commuting between motor or non-motorized vehicle a situation that will give me the conditions to understand better the way they make choices.

On the other hand, another aspect that was taken in consideration was gender. I consider important that the people that were interviewed should be half females and half males. This was because I was interested in knowing if the interest of using other transport

systems was more common among men or women. This was done to understand better what is the perspective of each group to use non-motorized transport.

Lastly, I also interview people working in NGOs. I manage to have interviews with two different NGOs which work for the defense of the rights of cyclists and pedestrians in Mexico City. The reason of doing this was because I wanted to have a broader vision of what the organized civil society is doing in order to have a more sustainable transport in the city.

Last but not least, I also had talks with pedestrians who live nearby the bicycle lanes or *ciclovías* and with people who have direct contact with cyclists. This was in order to know their perspective of the use of this type of transport. This last group was chosen during the investigation and emerged spontaneously as I realized that in addition to the conflict between motorized and non-motorized vehicles regarding the use of the space in the streets, there was also another one between cyclists and pedestrians.

The interviews were completed in an open-ended question base and some others where long talks I had with the bicycle commuters either while I realized my active participation or some others in their private house. To get to know better who to choose to interview I went to the *Paseo Dominical Muévete en Bici CDMX* (Sunday Ride Move by bicycle in Mexico City) to do so, and I used help of the people I knew from the NGOs and they introduced me to the people that could potentially be interviewed. Then, I placed myself in the south area where the route goes the last Sunday of the month.

As it has been mentioned before having an active participation during the fieldwork made in Mexico City resulted important for two reasons. First, as Stake (1995) states, the case is developed in a relationship between the researcher and informants, inviting them to join in this interaction and in case discovery (Stake, [1995](#)) which in my case results useful in order to hear from their own perspectives which were the main thoughts regarding the use of the bicycle in the city.

But on second hand, as Merriman (2014) argues, “A range of research practices can be invaluable for the investigation of experiences and feelings of movement and mobility” (Merriman 2014, 172) while researching. Thus, I will agree with Merriman regarding the way mobility research should be done. This is because while doing my fieldwork in

Mexico City I was able to experience firsthand the different challenges and what it really means to be a bicycle commuter in the city not only by asking and observing, but by riding a bicycle as well.

As I said before, I was able to get close to the people that were riding and even join them in their day-to-day activities. This is how I was able to face and experience with them the challenges or advantages of using the bicycle in the city. In this sense, a kind of participatory approach was applied since this is an approach that is used for learning and engaging with communities, in this case the cyclist community in Mexico City. This approach combines an ever-growing toolbox of participatory and visual methods with the use of a cultural interviewing technique, which in this case was not complicated since I am Mexican and I was born and raised in this city.

Then, the participatory approach intended to facilitate a process of collective analysis and learning based on the actual participation of the researcher in the field such as I did while riding alone and with my interviewees. This was very useful at the end because having a more active participation in the activity that is being studied, helped me to contrast the information that I received from my informants regarding the challenges they faced daily and to experience them by myself. One example, one of my interviewees is Gloria Núñez, she is a 60 years old woman that has poliomyelitis sequelae and finds the use of the bicycle a faster and more comfortable way to move through the city.

While we were walking and talking about the use of the bicycle I accompanied her to buy some groceries to the closest store, which was located one kilometer from her place. It took us around 15 minutes to walk from the door of her house to the store. And a bit more in the way back because we were carrying some bags. However, she wanted to show me the route that she usually uses to go to her consulting room (She is a Doctor) because she says that she always goes there using her bicycle, even though she is the owner of the car.

I asked her why if it was a long distance she was not taking the car. She smiled back at me and she said:

“Are you crazy? It is going to take us more than 50 minutes to get there, plus the parking payment and I only want to deliver these books that I need to have there”².

Her consulting room was located seven kilometers from her living place, I have to say that I was a bit skeptical about how much time we will need to move through the city, because, in my experience, the problems of traffic jams and mobility are getting worst all the time, and in addition the rush hour was about to start and she was not so fast while we walked. An important fact that has to be mentioned is that the way to her work was very easy to take because it is a flat and straight road to get there.

Despite my skepticism, we both together took our bicycles and rode them from her place to her consulting room. My skepticism disappeared when I started to notice that she was much faster and more comfortable using the bicycle, even though she was carrying a bag full of books that she wanted to leave inside her consulting room. We traveled seven kilometers in 22 minutes and 29 seconds and if I compare that number to the distance and time we walked the same day I was able to notice how the bicycle represented for her a very important tool to improve her way of living and then the reasons why she preferred to use the bicycle rather than her car or public transport made sense.

The active participation in this case allowed me to experience first by the information that is provided by the informant, but then in the moment I was able to experience with her the way she was more productive, active and free to move.

This combined methodology of having a case study with interviews and experience mobility called “go-alone, ride-along” (Merriman 2014, 175) facilitated the discussion with the interviewees and participants of my research and helped me to form the basis of my interviews. This is because before making the interviews I took advantage of a program called *Paseo Dominical Muévete en Bici CDMX* (Sunday Ride Move by bicycle in Mexico City), which is a social program of the Ministry of the Environment of the Government of Mexico City, in which streets and avenues, regularly used by motorized transport, give way to pedestrians, runners, skaters and cyclists to use them instead by closing the access to the cars. They have this vision to make people feel that

² Gloria Núñez interviewed in her house located in Coyoacán in Mexico City the 5th of December 2016.

they can take ownership of their own streets. This program allows people to use public spaces for recreation, encourages physical activity, social coexistence and promotes the use of cycling as a mode of transportation in the city.³ While I cycled the city I started to think about the kind of questions I wanted to ask. Then this experience was enriched with the observation I had during the day time (which is the time people use to bicycle more) and in summary I was able to experience embodied cultural practice, as Merriman (2014) calls it, as an aid to understand this social practice in the city.

4.4 Methodological challenges

During the process of the research the fieldwork phase was the one that is possible to say presented some methodological challenges. First the way I had contact with my first informants was since Oslo. Since I was going to travel a long distance and I had a very specific time to make all my work I had to start to make contact with them from the social media. Facebook was a very useful tool for me, since it helped me to wing time while I established contact with my informants before arriving to the country. So, I started to text with people that belong to some NGOs that work topics related to urban mobility with bicycles. This was positive and negative.

It was positive in one way because starting contact before helped me to gain time to start to talk about I was researching about, so, many of my informants by the time I met them not only provides me the interviews I requested, they even gave and prepared some documents and articles that were really useful to get more knowledge of the topic. I also made some networking and thanks to my first informants I manage to know and contact some other groups of people that became really interesting to interview.

The negative part was what I can call a “cultural issue”. In the Mexican culture is really easy to be social and establish friendship links, it doesn’t matter if the contact is by phone, my social media or in person. If a Mexican is having a good conversation and feels comfortable won’t be strange to assume that the contact relationship can become a friendship, more if the people involve shares the like for some topics. I mentioned all this because what it can seems “nice” and “easy” like establish a contact with an

³Muevete En Bici CDMX Program description can be found in Spanish at this web site: http://data.sedema.cdmx.gob.mx/mueveteenbici/index.php?option=com_content&view=article&id=44&Itemid=34

informant in Mexico can get easily confused with the desire of being more than professional contacts and the potential of having a friendship. Some of my informants, especially the ones I started to contact before arriving to Mexico didn't see me as a Master student making a research about the cyclist movement in Mexico, they saw me more like a friend they were talking in a relax mode about their jobs. So in some interviews the way they talked was more relaxed assuming I knew things that happened in the city because they started to talk to me as a "friend". This situation was very useful, on one hand because thanks to that I manage to participate in a high level meeting with some local deputes when they discussed the new regulation on urban mobility in the city with some other NGO's. But on the other I was sometimes behaving more serious to make them feel that I was doing as well my job.

Another aspect that has to be mentioned as a methodological challenge is the one related to the sample. It is important to take in consideration that Mexico City is a city of 20 million inhabitants (if we count the metropolitan area as well), so a sample of 20 people interviewed can't explain the totality of a phenomena, in this case the bicycle usage in the city. Studying a small part of the population is done with the intention of finding out some characteristic elements of the sample under study.

The reasons why a small sample was taken was due to my stay in Mexico City was for two months only and I had to made all the interviews by my own, so I was limited on time. My budget was limited too so hiring some other person to help me to make more interviews or surveys was not an option besides I wanted to be in control of the trustworthiness and control of the information.

For the reasons mentioned is important to say that this research doesn't seek to be taken as generalization to explain the bicycle phenomenon in Mexico City. The reader will find that this research tries to explain just a part of the entire phenomena and can serve as a guide to understand how a bigger population behaves if the sample becomes bigger.

4.5 Ethical reflections

In the social sciences, research ethics involve the application of fundamental ethical principles to a variety of topics involving research. During the research process, I have to be always aware that during a qualitative research is necessary to have great awareness of the position that I have in the field.

First is important to mention that I enjoy a lot the use of the bicycle, during my life living in Mexico City I tried to encourage the usage of the bicycle in my closest social circle, therefore a passion for cycling can be guessed. So, when someone tries to make a study or a research in a field that the author finds personally interesting is very important to be aware of our previous knowledge, understanding and perspective about the topic.

This means that is very important to be aware in our position while a topic is researched, so pre-conceived ideas and opinions about the topic have to be avoided otherwise the research process and the findings can be influenced and not valid. Therefore, during the process of research I was aware to keep in mind that objectivity was the aim and even though I enjoy the topic I have to be aware of the limitations that the bicycle presents as a transport system and that even I think is a good option is not the final solution for the transport problematic in the city.

So, in order to avoid some obstacles to carry out this qualitative research it was important for me to provide a thick and clear description of what I experienced during the fieldwork, providing concrete details and explications of what I saw, talked, observed and experienced. Then, this reseach seeks to show the reality, rather than telling it, this allow me to creat more credibility and reliable findings.

My research project was written and apporved by my supervisor PhD Arve Hansen at the Centre for Development and the Environment before I realized my fieldwork. Since I carried out my interviews in Mexico City, no permission for data colection was required. All the interviewed people gave full concentment of using their original names and information provided as well as their commuting practices since this was not any information that compromised their integrity or security. One of my interviewees had

poliomielitus secuela and she approved to mention her handicap, since this fact becomes interesting in her reasons why she uses the bicycle.

Everybody was willing to answer the questions or to talk with me about the topic. Some of my informants connected me to some others because some belonged to a cycling community; this facilitated my way to find informants. One of the aspects that helped a lot to better understanding what my informants told me during the interviews was that I belong to the city, so during my fieldwork (interviews and talks) I had pretty much idea about what they mean in terms of local concepts, language and slang.

Since my role was a student of a Master thesis from a foreign university, plus the situation that I am Mexican who used to live in that city, my informants were not intimidated or influenced and they felt comfortable to name the regions, areas or situations in a very natural way and comfort since I knew what and where they were referring and talking about.

5 The urban problematic around mobility: Mobility as a challenge in Mexico.

Urban transport problems are common in big cities, especially in developing countries. While education or healthcare improves as societies become wealthier, the transport problems worsen. It has been known that congestions have come to be a constant in the cities worldwide, however solving this problematic has become a must to make a more sustainable and more human urban livable space.

A report published by the international consultancy *Inrix*⁴ analyzed the situation of 1,064 cities around the world. “The report has showed that several cities in Latin America are in the first places of the list with severe traffic problems.” (BBC 2017) Bogota occupies the fifth place in the ranking; the citizens there spend on average 80 hours a year in traffic jams during “rush hour”.

Sao Paulo in Brazil occupies the sixth place of the same ranking list, this city faces as well serious traffic problems. There are other cities included in the ranking such as Caracas in Venezuela and Mexico City in Mexico.

According with D. Pojani and D. Stead (2017) there are several paths of urban problematic around mobility that are present in big cities and Mexico City is not the exception. D. Pojani and D. Stead in their book *The Urban Transport Crisis in Emerging Economies* (2017) mentioned that under the main urban problematic regarding mobility we can find:

- a) Dynamic urban development processes, led mostly by the private sector, with high construction levels.
- b) Extensive urban sprawl, including peri-urban slums or decaying large housing estates and middle and upper class suburbanization.

⁴ INRIX is a global [SaaS](#) and [DaaS](#) company which provides [real-time traffic information](#), state-wide traffic analytics, [traffic collisions](#), parking data and analytics, connected car services, [traffic count](#) and population movement insights. INRIX works with automakers and government agencies to understand how people and commerce move across the world’s transportation networks. Web page <http://inrix.com/>

- c) Increasing social segregation (for example gated communities for the rich and the middle classes)
- d) Rapidly growing motorization
- e) Inadequate public transport systems
- f) Chaotic traffic patterns, with high car and motorcycle use, and high environmental pollution
- g) Poor pedestrian and cyclist infrastructure
- h) Informality, inefficiency, and/or corruption in the formal planning system.

Unpleasant conditions for pedestrians, high levels of pollution, treacherous road crossings, and unsafe conditions for pedestrians and cyclists, inadequate public transport, and incessant traffic jams are standard without forgetting that these problems are magnified due to the large size of the cities and the frequent lack of resources. What is going to be explained in this section are the different challenges of the mobility that exist in Mexico City from a geographical understanding and from there the reader can have a better understanding of the practice of the use of the bicycle in the city. Once completed, the reader will have better idea of how the city is structured in terms of mobility and will help to understand much better the reasons that were founded why the people prefer commute in one way or the other.

Mexico City's overview

In the book *The Urban Transport Crisis in Emerging Economies*, Priscilla Connolly in her Chapter "Mexico" makes a very accurate historical description of the origins of Mexico City, situation that is important to understand because this explains why the city is planned as it is nowadays. Connolly (2017) dates back to the Aztec origins of the city, there she explains that "many of the major features of the present-day spatial structure and social segregation the structure that the city have today has their origins since that moment" (Connolly 2017, p 148).

It has to be said that the origin of Mexico City is located in the Texcoco lake were Tenochtitlan⁵ was founded (See Figure 5). Over time, the lake dried up during and after the colonial period, “the rich population tended to live on the higher southwestern reaches of the city, which were less affected by perennial flooding and better provided with freshwater. The poorer population occupied the lakebed to the East, prone to dust storms or flooding, depending on the season” (Connolly 2017, p 148).



Figure 5
Pictographic recreation of the Gran Tenochtitlan by Luis Covarrubias. It represents how Tenochtitlan looked before the arrival of the Spanish conquistadors in 1519. It is currently in the Museum of the City of Mexico

With the process of modernization in terms of urbanization, the city took the main routes in and out of it as the base to build later the first metro lines. This is the reason why is not a coincidence that the first metro lines and big avenues that connect the city coincide with the pre-hispanic causeways connecting the island city to the mainland.

The Figure 6 shows an overlap of the old channels and current avenues.

⁵ Mexico City (*Ciudad de México*) was the name given to New Spain’s capital founded on the site of Tenochtitlan, the center of the *Mexica* (Aztec) empire conquered by Hernán Cortés in 1521. After three centuries, New Spain got independent and adopted the name of Mexico and maintained Mexico City as its capital.



Figure 6
 Overlap of current avenues
 Source: Instituto Nacional de Antropología e Historia

The reader may ask how this antecedent can be important, Connolly (2017) points that this way of structuring the city taking in consideration old settlement patterns brings into the discussion that today “the city planning has its antecedent in this segregation pattern of rich people and poor people settling in different areas according to what was more convenient from ones or the others and this made the antecedent of how the infrastructure of the city was planned later on” (Connolly 2017, p 148) thus, this is evident in the way the infrastructure is planned today.

Mexico City became the urban center of the country and as any other urban center it started to attract people looking for opportunities to improve their living level resulting in accelerated growth of urban population. Growth that, as it was mentioned previously, was characterized by “scarce urban planning, which generated a process of expansion, dispersion, fragmentation and exclusion towards the peripheries, diminishing the efficiency of mobility and possibilities of development” (NU-Habitat 2015, p 18)

The antecedent of how the city started to be structured was important to mention because during the process of urbanization, the segregation pattern reinforced investments in roads and other infrastructure that favored the richer half of the city (Connolly 2017), which had different consumer patterns of mobility (this will be discussed further on in the next section) and tended to use more motorized vehicles instead of any other no motorized ones to move across the city.

As a result of this, a “socioeconomic segregation was developed and the proximity between poorer socioeconomic groups within the richer southwestern areas of the city” (Connolly 2017, p 148) became bigger. The segregation was partly determined by the options of transport the population could have to move. Like other Latin American cities, in Mexico City the population that has a better purchasing power tends to live in the central areas at lower densities, while the population with less economic power tend to live in the periphery at high densities (Connolly 2017). This can explain much better the reason why there are so many trips and mobility from the periphery to the center.

Mexico’s City structure compounds four central delegations⁶ (see Anexed 1) which accumulate 19% of the population and generate 53% of the total formal employment and remuneration average per person employed of the city (INEGI, Economic Census 2009). To a certain extent, this explains the high number of trips towards Mexico’s City center, which generates environmental and mobility problems, leading to constant congestion and the increase of the times of transfer. However, it is not only the problematic of crossing from the periphery to the center, in addition it is important to consider the amount of trips that are made in the center using only private cars. It is estimated that one person can invest up to 3.5 hours a day only in transportation, taking into account all the daily trips made (Altamirano 2015). But how the car became the big boss in the city, this will be discussed in the next section.

⁶ Álvaro Obregón, Benito Juárez, Miguel Hidalgo and Cuauhtémoc.

5.1 Is the car Mexico City's King?

The rise in the preference for the auto mobility, in spite of efforts to improve public transport and non-motorized transport options, reflects an upsurge in motorization rates, intensity of vehicle use and gasoline sales in Mexico City. The National Institute of Geography and Statistics (INEGI in Spanish) has registered an exponential increase of auto motors since the year 1980 having the last update in 2014 can be seen in Table 2.

Table 2.
Motor vehicles registered in circulation till 2014

Type of vehicle	Auto mobiles	Passanger busses	Trucks	Motorbikes	Total
Year					
1980	1,601,867	14,487	187,205	66,249	1,869,808
1985	1,614,986	13,617	172,224	32,412	1,833,239
1990	1,768,683	11,106	178,205	19,560	1,977,554
1995	1,919,264	11,372	171,035	30,654	2,132,325
2000	2,308,255	11,611	136,321	55,356	2,511,543
2005	2,528,281	28,514	69,929	69,496	2,696,220
2010	4,028,300	32,387	106,069	-	4,166,756
2014	4,421,797	31,186	74,746	210,020	4,737,749

Mexico's City infrastructure has been planned around the automobile since the early 1930s and has become more geared to cars since then. In addition to the planning and development of the city, it is important to add "the social practices regarding consumption, education, health services and recreation; especially in new housing developments for all social classes where the use of a car has increased, even though two-thirds of the population does not own one" (Connolly 2017, p 154).

As Table 2 shows, the number of private cars registered has nearly doubled in eight years (2005-2014), from 2.6 million to 4.4 million. This problematic has translated into increased congestion and transfer times given the number of cars registered that are circulating in the city. This is without counting some other hundreds of thousands of cars that also circulate entering or crossing the city for different reasons.

However the increase of the use and acquisition of the car is not only increasing its usage in the conurbation area, which are the areas that surround the city and where less mass public transport has been concentrated (Medina 2017), it has also increased in central areas of the city.

On the one hand, the growth of cars has happened not only in the center, but in the west part as well. Delegations such as Álvaro Obregón (see Annexed 1) where there has also been a very strong urban development encouraged by the region of Santa Fe. On the other hand, the enormous construction of road infrastructure that served to all the automobile users added to the lack of public transport are factors that have increased the chaos in the city. The described situation made clear the great failure of urban planning in the capital of Mexico.

In the city 15 million of trips are made every day, and from that total 71, 3% are made by public transport and 21, 5% by car, however that 21, 5% occupies 85% of the road space and the public transport only occupies the remaining 15% (Poder Legislativo de México, 2014). From the 21 million persons living in the city 46.5% of the housing units have at least one car and the ownership of the vehicle is directly associated with the income of the families. That means that the 80% of the higher income households have a car and only 10% of those with less resource have this benefit (Poder Legislativo de México, 2014)

Added to this, the population that tends to use car in central areas of the city tends to do it even though they live in areas where there are more options and it is cheaper to transport as well. Thus, it is basically due to “owing to the preferences and entrenched automobile dependence of their higher income residents” (Connolly 2017, p 154). Thus, is possible to say that the problem of the excessive use of the car doesn't lie in the ownership of private vehicles, but in the excessive use of them to satisfy everyday trips

that could be much more efficient. In this sense, the problem is not the car, is the use that people make of it.

On the other hand, the trips that are made by non-motorized vehicles such as bicycle represent only 0, 8% of the total (Poder Legislativo de México, 2014). If that percentage is transformed into numbers that means that “every day 135,000 of trips of less than 5 km are taken by bicycle and from that total 35,000 trips are made by the Eco-Bici System (which is a public program that provides the service of public bicycles to the users, and about which I will talk more further on)” (El Sol de México, 2017).

In that scenario, the private car is the main source of traffic jams and greenhouse gases emitted in the city, even though they are not used by the majority. In 2010, the most abundant pollutant in the Mexico City was Carbon Monoxide, with emission of almost one million 700 thousand tons per year, an amount that was generated mainly by mobile sources (98%) (Poder Legislativo de México, 2014). Based on all these facts, the mobility in the city has become a major problem and many persons, especially the ones that live in the center of the city have started to question their use and customs in terms of mobility. As an example is what Gloria Núñez said while she was interviewed:

“I don’t like to use my car unless it is strictly necessary. I know I can use it and it is much more comfortable playing music and having more space, however now it is impossible to drive in the city. If I have to move close I use my bicycle, even if I have to carry groceries. It is faster and makes me feel much better. Besides I can enjoy the new roads made for the bicycles”

What Mrs. Gloria Núñez explained is that even though the car is a much more comfortable way of commuting compared to the public transport the reality is that the result of choosing the car instead of the bicycle and the public transport gives more disadvantages for her than advantages while she commutes. She lives in Coyoacán Delegation (see Annexed 1) one of the delegations that are located in the center of the city and that today has been experiencing many transformations regarding infrastructural change and improvement of the city regarding mobility. But, how is it possible that the bicycle has been starting to become a new option in a world where the car is the king.

5.2 The rise of the bicycle

The topic of mobility in Mexico City is quite new. This is mainly for two reasons: First the amount of cars that today exists in the city has never been so big. “During the last two decades there has been an alarming trend in the increase of car usage. The amount of cars has increased by 36% in the city; it changed from 30 million of cars in 1990 to 84 million of cars in 2010. This means that the use of the car has had an annual growth of 5.3%, whereas the population only increased 1.29% per year; that is, more cars are incorporated into the city than children annually” (Poder Legislativo de México 2014, p 82). Secondly, all the problems that comes with the amount of particular cars that are driven in the city every day and the environmental and social problematics that they cause.

It was in 1983 that the General Coordination of Transportation of the Department of Mexico City made a first study Origin-Destination regarding mobility and transportation in Mexico City. However a new quality information regarding transportation in the city was needed, this necessity of having new and qualified information regarding transportation in the City and in the Metropolitan area led to an agreement between the Government of Mexico City and the Government of the State of Mexico (which is the origin of many trips towards the city center). The resolution of this agreement was to carry out a survey that could better picture what the status of the dynamics of the trips that were made between the entities was.

This resolution came because a big percentage of the trips that are made by car depart from municipalities belonging to the State of Mexico and they head towards Mexico City (especially the city center) and work is one of the biggest reasons why people commute. In October 2006 the two entities signed an agreement with the National Institute of Statistics, Geography and Informatics (INEGI in Spanish), in which they established the basis of coordination in order to make a survey named *Encuesta Orígen Destino de los residentes de la Zona Metropolitana del Valle de México 2007*⁷ (EOD) .

The big centralization located in four main delegations as it was mentioned before can explain in part why so many trips are done towards this area of the city. These trips

⁷ Destination of Travel Of the Residents of the Metropolitan Zone of the Valley of Mexico 2007

generate an important amount of environmental and mobility problems which cause constant congestion and of course increases of the times of transfer.

From all the information obtained in the pull, it was possible to visualize the importance of the car and the lack of public transportation in some areas. However, another interesting result was how the bicycle started to gain territory in the commuting aspects of everyday life of the people surveyed. According to data obtained at EOD 2007 only 0.5% of the total bicycle trips were made in the capital at the time of the study.

However, new studies have proven that “bicycles have become more relevant in the modal split, as they now account for 0.8% of total travel routes, this means 0.3% more than in 2007” (Poder Legislativo de México 2014, p 82).

But, on the other hand, in terms of efficiency, using the bicycle seems to be the most efficient mode of transport. For example, “in Mexico City based on the average speed for the bicycles is 16.4 km/h, which is above the car speed (12km/h), especially during the rush hour and even public transport in general” (Van Mead 2015). These numbers were obtained from the Modal Challenge (Desafío Modal in Spanish) held every year in Mexico City.

The Modal Challenge is a simultaneous competition involving citizens, activists, cyclist groups and civil society organizations, in which it is possible to evaluate the efficiency of the different modes of transport in the city on a typical working day.

It works as follows; an exit point is set, in 2016 this was the 314 metrobus station in the north of the city in Gustavo A. Madero delegation (See Annexed 1), and the destination was the Legislative Assembly of the Federal District, located in Donceles and Allende in the Historic Center. The tour was 10 km. which is the average distance traveled daily by the inhabitants of Mexico City. Last year 15 volunteers were accepted, men and women of different ages and occupation. The aim was to commute through the city and avoid the traffic typical of rush hour in the city.

The majority opted for the bicycle, two used a car, three went by public transport, one more participated in skates and only one woman represented the pedestrians so she decided to walk. The results of the Modal Challenge in Mexico City, not only showed the number described above, but also indicated that cycling is the most efficient option

to move at rush hour. The results show that there are other ways to commute in the city, where you can save time and commute more efficient. Spend less money, invest less time and find a commuting way that adapts to your times and preferences.

In addition, another survey's outcome shows that trips made by bicycle are equal to or less than 10 km, are usually done in 30 minutes or less in a cycling trip (Poder Legislativo de México 2014, p 88). This sounds more efficient if you compared to the 3,5 hours that are spent in traffic jams everyday on average by any car driver like it was mentioned before.

The use of the bicycle in the central region of the city has been favored due to the geography that has a mostly flat territory. This data can help to support the idea that it might be possible to find in the use of the bicycle a greater potential for moving differently and more efficiently

In relation to this, Jorge Ramirez, one of my interviewees, made some very interesting commentaries regarding the use of the bicycle and his commuting practices. Jorge is 34 years old guy and he is pretty much used to having a physical activity. He lives in the southern area of the city in Magdalena Contreras Delegation (see Annexed 1). This area is characterized by mountain geography, an area full of hills.

He enjoys using his bicycle every time he has the chance even to make short trips to the grocery store or even to have any kind of tour into the forest (which is close to his place). Jorge works in the Miguel Hidalgo Delegation, which is more in the center and 10 km away from his place (normal for Mexicans to travel this distances to work as it has been said before) and he has a normal Mexican schedule at the office (from 9:00 to 18:00). He is also the owner of a car and when I asked about his commuting habits with the car he answered:

“I only use it during the weekend to go out with my girlfriend, or to visit my mom and friends. During weekends when there is not that much traffic I feel much more comfortable to make longer trips by car. I also use it when I have to make several stops or to buy many things in different places that I need for my place.”

I asked Jorge if he uses his bicycle to go to work and he answered:

“No my bicycle, wish I could but no. Going by bicycle from the place I live to the place I work would be impossible.... I mean, the way down hill will be super-fast I have done that before and is quite fun I can get there really fast... but the way back would take me a lot of time since is a long way up hill, plus there are days that I feel really tired from work to make that long trip back home (more than 10 kilometers). It would be easier if I could put my bicycle in the bus, but well... they don't have capacity to put the bicycles inside”

According to this previous interview, two things are important to mention, the first observation is that people can choose or not to ride a bicycle depending of their physical effort capacity. Even Jorge who is a young man with good physical condition knows that there is some point of the city that it could be impossible to ride a bicycle way back home. The same happens with Gloria Núñez, the 60 year old woman who lives in Coyoacán delegation (a flat place in the city) and has poliomyelitis sequelae. For her, using the bicycle, even for short trips in Magdalena Contreras would be a bit more difficult than in Coyoacán.

The second observation refers to how efficient results for the users to get to the destination with the bicycle in terms of time and how pleasurable it can be to prefer the bicycle instead of another transport system. Even Jorge that is an athletic person recognizes that there are some days that instead of being a thing to enjoy, would be a suffering situation to ride the bicycle to his office, especially on the way back, he says:

“Especially if I have to stay more time at work at the end of the month finishing reports, what I want is to get back home as fast as I can”.

A multimodal system is a system that allows the articulation between different modes of transport, in order to perform a faster and more efficient transportation. Having this infrastructure would make Jorge's life and commuters similar to him much easier, since he would be able to put his bicycle inside a bus when he feels he needs to have a break, but today Mexico's City transport system is not prepared for this.

However the use of the bicycle is becoming more and more popular among the population, not only for the people that live in the center of the city in delegations such as Benito Juárez, Cuahutémoc, Coyoacán and Miguel Hidalgo, where the main business activity is located, but also people that live in the south, where the transport system is

not that efficient and the infrastructure forces the people to get a car to move faster and safer.

Another interview reflects that not just because you live in the south of the city you can't use the bicycle to get to work, people have found ways to move in a much more efficient way. Rodrigo González was another of my interviewees; he lives as well in Magdalena Contreras and works in the Cuauhtémoc delegation. This is a 24 kilometers trip every day. He works for the local government and he also owns a car.

“I have a car because it is easier to move and to transport from home to my working place, my wife has a car as well, she also uses it to go to work. With a car and a family everything is easier. But to be honest...for going to work it is a very bad idea; traffic jams in the city center are really terrible”

The way Rodrigo has found to move easier is by making his trips more efficient. He drives every morning from his place with his two kids to school. He drops them there and then he parks the car close to Copilco metro station which is 10 kilometers from his place and which is the closest to him as well. Due to the geography and topography of the place he lives a metro line is impossible to build, a situation that makes the south of the city only suitable for buses and private cars to move faster.

However since the city center is the place where a lot of government offices are located Rodrigo sometimes has to move from one place to another to attend to some meetings. The way he has found faster is by using the Eco-Bici bicycles.

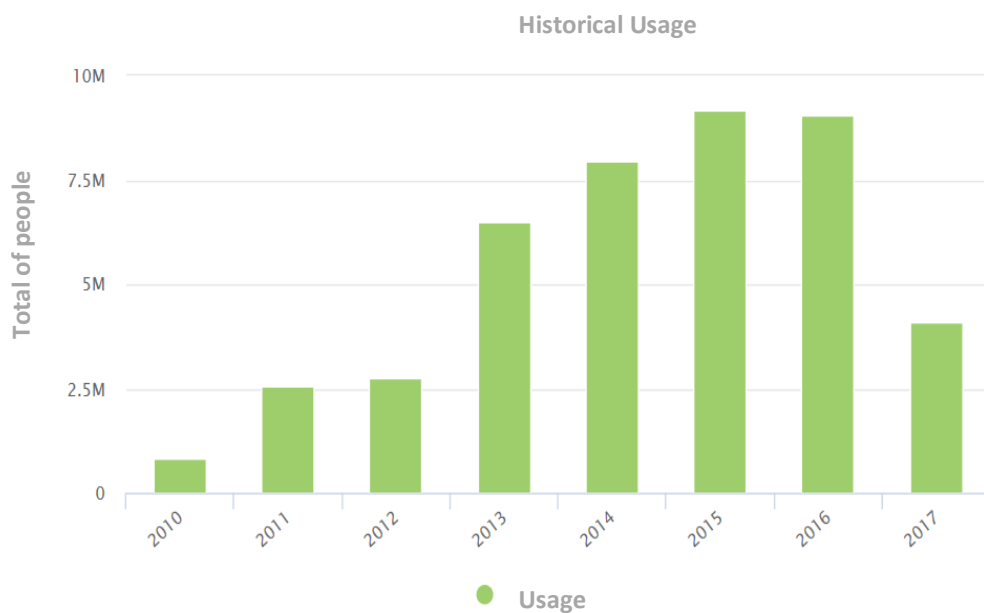
“...is the fastest way to move in the center. I just have to go outside my office building, take a bicycle and in less than 15 to 20 minutes I can get to any of the places we usually have meetings. Driving a car there would take me more time and money, since I have to look for a place to park and move into the traffic... I am really happy we have this option, plus I enjoy the ride while going to the meeting, it is much nicer than feeling trapped in a car with everybody mad around honking the horn”

Eco-Bici is a governmental project that has become an important driver for bicycle use in the city. This is mainly “a public bicycle system, whose main objective is to make bicycles available to the population and promote intermodality with public transportation” (Van Mead 2011). It started in February 2010 with only 84 stations and 1,200 bicycles, but in few years this project has been expanded 400% due to the user demand. This program is a concession and even if is a governmental project it operates

thanks to a company named *Clear Channel Outdoor*, which also operates the systems in Barcelona, Oslo, Stockholm and Milan.

From 2010 to 2016 this project has increased to 452 stations and more than 6,000 bicycles covering 32 km². (ECO-BICI 2016). It is considered the fourth largest in the world after Huangzhou (China), Paris (France) and London (UK) and the first in Latin America. Every day 135,000 trips are made by bicycle in Mexico City and from them 35,000 using the EcoBici program (El Sol de México, 2017) and the usage seems to be increasing as the following graphic shows:

Table 3
Historical usage of Eco-Bici program since its creation



At the beginning the program was settled in various high-income and tourist areas in the city center. However, since the demand has been increasing the number of bicycle stations and bicycles have increased as well. It is possible to say that *Eco-Bici* has had some impact on the way people are commuting, not only on the trips made from the metropolitan area towards the city center, but also the travel behavior in the central

areas. Cyclists in the city have discovered the benefits of preferring the bicycle, either by enrolling in a bicycle rental program, such as Eco-Bici or by owning one.

Although the use of the bicycle has not been easy to adapt to the city, today the use of the bicycle has been pretty much better accepted. Jorge Cádiz is a member of Non-Governmental Organization named Peatónito⁸ and I had the chance to interview him during my field work. During my interview with him we talked a lot about how the use of the bicycle has been increasing in the city, however he mentioned that still today even if there are many projects that encourage more sustainable and non-motorized transport mobilities, the truth is that still today the city has been planned to privilege the private cars:

“Just imagine the last big infrastructure that was built in the city, the Mexico City Super Via cost 6 billion Mexican pesos, meanwhile the five new metrobus lines cost 5 billion Mexican pesos. The Mexico City Super Via only moves 27,000 passengers a day that own or move in a private car, meanwhile the metrobus moves around 920,000 passengers a day. Now you can have better dimension about who is prioritized to move in the city”

With these facts there is no doubt that Mexico City is still a car-orientated city but it is also clear that cycling is increasing:

“At the beginning it used to be that people saw cycling here as something eccentric or crazy”

Says Cádiz:

“People thought that if you use a bicycle to get to work or to school you were crazy or a hippy or even don't have enough money to get a car, but that has been changing now, now it is even considered trendy, especially in the central Delegations of the City, where you are able to see everything from the office employee to the posh girl cycling.”

One thing is true and that is that today the car has been considered the main cause of the mobility problems in the city and more and more people are realizing this. Besides, the private car is an excluding way of commuting that generates social, economic and environmental cost, this is because the energy consumption per passenger is higher than with other means of transport that affect society in the whole.

⁸ <http://peatonito.tumblr.com/>

This is the reason why the bicycle can make a remarkable change towards the mobility situation in the city. On the last survey realized by the Eco-Bici in 2014, 960 users were surveyed and they were asked what their main mode of transportation was and 33% of the people surveyed answered: The car. The same surveyed people that answered that their main transport mode was the car were asked if they would replace their main transport system for a bicycle and 68% replied: Yes (Perez López 2014).

The amount of bicycles in Eco-Bici program has increased and today the cyclist movement is getting bigger, but what the benefits are and how bicycle users are realizing this, Cádiz said that this is the result of two phenomena that are happening. On the one side this a rational decision encouraged by experiences that people have had with the use of the bicycle that is why this is becoming a trendy way of commuting as Cádiz mentioned during the interview. During the following sections more of this will be the discussed.

6 The bicycle. A sustainable change in mobility.

One of the United Nations' programs that have been referred to before in this paper is the one called UN-Habitat. The scope of this program is to put urban prosperity as a topic that has to be discussed in the new vision of the city in the XXI century. This new vision tries to make more livable cities, setting the human being in the center and rescuing values of solidarity, belonging and collectivity in more concrete words a more compact, sustainable and inclusive city for everybody. This new vision of the cities today has to be planned with a reduced energy consumption and emission of greenhouse gases. A more heterogeneous and integrated place that can be able to produce more public goods such as transport, public spaces, recreation and provides the conditions to generate jobs and increase GDP.

For a city to be prosperous, its streets have to attend to all the concepts mentioned above, but as well it is necessary to consider its multiple functions as public space, connectivity, accessibility, habitability and generate conditions of equity. Equity is a very important topic in terms of mobility concept. A city has to be thought of as networks that integrate the different areas, with enough intersections or corners that reduce travel times and make distances shorter and accessible for its habitants.

The excessive use of the car in Mexico City has created today serious damage to the community and impacts the quality of urban life and the living conditions of citizens negatively. It has created negative effects on the environment, generated air and sound pollution especially in the central area. The popularity that the usage of the car has brought has created several negative externalities in terms of health among the population. Some of the negative externalities that have been experienced are an increase of respiratory diseases as well as an increase of allergies, without forgetting lack of road safety.

As a result of this, the road congestion and pollution generated by the large amount of cars that circulate daily, coupled with a not very efficient public transport system, since the offer is not enough for the amount of demand that the city faces, everything translates in an inefficient mobility for the inhabitants, especially during rush hour. However, even though it is a minor group that commutes by private car, this is the group that causes more issues to the city. Therefore, this generates a perfect space to develop a more efficient and inclusive mobility system that includes all ways of commuting motorized or non- motorized.

Then, this is a matter of optimizing the public space in such a way that mobility can be efficient for everybody and according to each necessity. In that sense, the impulse of non-motorized transport such as the bicycle contributes in a way to tackle certain problematic such as space, pollution and socialization. The way people choose to commute gives a lot of understanding of how do they perceive the city they live in. Commuting gives us the chance to be in contact in different ways with the environment of our city as one of my interviewees, Roberto Villegas says:

“When you go out and you decide to move from one place to the other in the city and you make the choice to drive, to use the public transport system or even use a bicycle or just to walk you will find a different city every time. A person that never uses the public transport system and that is always driving will have a different perspective of the city from someone that always use the bicycle to move through”

Roberto Villegas is a member of a non-governmental Organization called Grupo Ciclistas del Oriente (Cyclists of the East Group) and he helped to found one of the first groups called Biciorientados (Bicioriented) and he also worked in another Non-Gubernamental Organization called Rebelión Rodante (Rolling Rebellion). He is a big activist in Mexico City, through his work he tries to make people be aware that by commuting by more sustainable means it is possible to transform the environment of the place people live in.

“The idea of only using one kind of transport system like a car makes you more insensible towards your environment, with this please don't think I am against the usage of the car, is just that I want people to understand that

there are efficient ways of moving and that the bicycle can be a good option, especially for short and medium distances”

Unfortunately in Mexico, the bicycle has been considered a degraded means of transport, little valued and usually considered a way of transport for “poor people”, due to references to people that cannot afford a car. The car has big status among population and is a symbol of people with high economic power (Dávila, Valdés, et.al. 2014). However, something really interesting is happening today, at least in Mexico City and that is that “several measures in terms of public policies, are being carried out in order to increase the use of the bicycle as a means of transportation, especially among the higher income groups” (Dávila, Valdés, et.al. 2014, p 188).

The results of the campaigns and programs that the local government has been developing has started to change the mindset of the people and the bicycle is started to be seen as transport that is more environmentally friendly, like another way of commuting and people are starting to consider taking the bicycles instead of driving their cars to make short trips (ECO-BICI 2012) .

In this sense, since the bicycle is a more accessible transport system in an economical level it is naturally more democratic. Beside, as Roberto says:

“The bicycle is the perfect integration transport system, since it reduces socio-economic differences. Even though someone can have a very expensive bicycle or a very cheap one, the truth is that the simple fact that this transportation system gives more visual and human contact due to people is not all the time inside of a car. It can be said that the bicycle promotes human interaction and social integration, as well as making you more aware of your environment and your city”

6.1 The bicycle as a tool for social integration and equality

In general, in Latin-American´s metropolis the automobile usage diffusion can be a symbol of prosperity, but it can also mean an indicator of the absence of it. This means that prioritizing private mobility ways rather than collective ones only makes evidence the absence of collective well-being. This, at the same time, becomes a vicious circle because “like many other urban devices and practices widely disseminated, prioritizing

the use of the private car and bridging more benefits to this sector only increase the lack of security and the precariousness of the transport and public spaces.” (Cordera 2008, p 209)

In terms of social integration and equality it is well established that in countries and cities with low rates of transport cycling, those that do participate occupy a very narrow demographic—typically young males and, countries with high levels of cycling (for example the Netherlands) have a much greater gender balance (Pucher & Buehler, 2017).

On the first results of the Eco-Bici surveys of 2012 the results have showed that today 63% of the Eco-Bici users correspond to men and the remaining 37% correspond to women and the average age is 34 years (Secretaría de Medio Ambiente del DF 2012). The Eco-Bici results have showed how mobility can be a factor that can segregate the population. While I decided to select the people that I chose to interview my thought was to make half women and half men, however the reality struck me on the face.

While I was selecting my sample to make the fieldwork I noticed that men were using more the bicycle as a daily transport system. Based on that observation I decided to ask my female interviewees if they find any difference in how often men and women tend to use the bicycle or if they think a gender could prefer it more than the other. A woman called Laura Robles who is 36 years old answered me:

“I started to use my bicycle to go to work, I live in Coyoacan and the geography helps me a lot to move faster. I am even planning to adapt my bicycle to take my son Emilio to school, but my husband says I am crazy. I think he thinks I am more vulnerable because I don’t dare to be that adventurous or irresponsible [she laughs] as guys are while they cycle the city. I think that the problem is that sometimes even we have the road to cycle through, car drivers or the public transport drivers don’t respect us. Next month I think I will stop using it to go to work because I would have night shifts and I feel a bit unsafe to use my bicycle. I have talked to my husband, and I think the best will be that he picks me up. It is really a pity because the distance is not that far, but I really don’t feel safe to do it.”

Safety is a very important factor that is taken in consideration to decide to take a bicycle or not especially in a city like Mexico City, where the amount of cars is massive and the laws are not much respected by the drivers in general. The last Eco-Bici survey (2012)

showed that 40% of the Eco-Bici users tend to circulate in the *Ciclovia*⁹ and the 35% of the users tend to circulate in local streets. In the same survey the people that answered why they preferred to circulate in the local streets 70% of them answered they did that because they felt safer.

In Mexico it is very common that home chores and children care are mainly the responsibility of women; activities such as taking them to school for example can exemplify how easy or difficult it can be for some people to realize this task. It is so that if women like my interviewee Laura doesn't feel safe to take the bicycle in order to take her children to school, then she would prefer a safer way of mobility. In terms of commuting, safety is priority above efficiency even though the infrastructure has been settled. However on the other hand it has to be said that "females feel safe cycling different to men; female potentially require greater separation from motor vehicles" (Fisherman 2016, p 3).

In general mobility literature agrees that women make shorter and multipurpose journeys to more dispersed sites than men (NU-Habitat, 2013), and often at times influenced by the complementarity of the work and home care functions they play. This means that for many women in Mexico City commuting by bicycle means not only a way to move to one place to the other, but as well a useful tool to make all their chores and household duties in a more efficient way, it is like Laura says:

"I live in Coyoacán and sometimes while I forget to buy any groceries I need to for the house the fastest and cheapest way for me is to take the bicycle and cycle only 10 minutes and then be back and keep doing my stuff. It is the same to go to work and is so useful for me, it helps me as well to avoid traffic and save money because I am not refueling gasoline or paying a bus ticket"

Laura owns a car as well, but in her perspective, these kinds of activities are done faster and easier by using the bicycle than if she decides to drive it. In that sense, for those who have had the necessity to move in a more efficient way in terms of time and money, it can be said that the use of the bicycle has started to change some regular users mindset. My argument is based in the last Eco-Bici survey of 2012 where the Eco-Bici

⁹ Is the generic name given to part of the public infrastructure or other areas intended exclusively or shared for the circulation of bicycles. The bicycle lane can be any lane on a public road that has been properly signposted for this purpose or an independent lane where bicycle traffic is allowed

users were asked if in their homes there was a car available to be used instead of the bicycle and 70% of those interviewed answered that at their home there was at least one car available to be used.

On the other hand, based on the same survey launched in 2012, of the total amount of Eco-Bici users, 54% of them have the car as their main transport; but, from those who replied that they used the car as their main transport system were asked if they would swap the car for a bicycle. And a high percentage answered they would. From my 17 interviewees plus three representatives of NGO members, most of the told me they own a car as well. However, as many of my interviewees told me is not only the desire of using the bicycle, either by owning one or using Eco-Bici program it is as well the idea to get in contact with the city. As Regina Martinez said:

“I think that using the bicycle helps us to have contact with the city; it is a fairly fast transport for short stretches and is a good opportunity to exercise and help the environment, even though many people keep thinking it is better to use the car in short distances, but is basically people that prefer not to mingle and stay in their own bubble. I believe that if more people get more in contact with the city in this way we can have a better place to live in by making smart choices”.

It is here where the power of the middle-income population can have access to the contemporary modalities of private consumption and quality public services, they can be numerically dominant and, even if they own a car, they can prefer to use non-motorized transportation system such as the bicycle. This can help a lot to have more and better alternatives for all the population. However, this is just not a generality and even though the population that is starting to prefer the use of the bicycle is growing, the middle classes with effective access to the private car constitutes a minority group. This makes that the public transportation that is used by the majority, becomes a devalued alternative and expression of a marked social division of consumption and public space. In that sense, this is the reason why I argue that the use of the bicycle can help to be a social integrator and stop the segregation of public spaces.

This happened with Rafael Camona, another of my interviewees; he lives as well in Coyoacán and works in the Cuauhtémoc delegation. He works from Monday to Friday from 7:00 to 15:00 in an international financial company which is located 8 km from his

place. For health reasons Rafael has started to use the bicycle and since he is a father of two little kids having time to work out is really complicated to find.

In recent days he has started to use his bicycle to get to work every day, he said that he didn't say anything to his colleagues at the beginning until they started to ask because he has been losing weight, he said:

“At the beginning they called me crazy because for them it looks far to come by bicycle, but I think is not far, is only 30 minutes by bicycle and is all the way flat. Besides, is a very smart way to work out, lose weight, save money and I definitely feel much better. It's a problem that I don't have a proper place to shower or to clean myself when I arrive to the office, but I don't have to deal face to face with costumers so is not a big deal. I don't care if my colleagues mock me, because everybody has a car and for them it's kind of a status thing; but at the end is not me who spends hours in the traffic every day [he smiles]. I will definitely keep it this way.”

As it is possible to read, it is not too stigmatizing the car or its possession, but how people are used to using it, and how the rational use of it is not even mentioned, not even other ways of mobility. Roberto Rojas says:

“We have a “Deification” of the car in the city, we need to change this mindset and I am pretty sure that every day more and more people are being curious about using new transportation systems such as the bicycle. With the bicycle you are able to live your city, to experience it in a very different way than you would experience it if you go by car or even by public transport. I am really happy that more people are realizing about that because that will definitely change our mindset towards the car as a God or the only way of moving at least for the people that own one.”

6.2 Riding a bicycle in the city. A social practice that can be reproduced

Sustainable Mobility recognizes that mobility is a universal and indispensable right to access to other basic rights such as health, work, housing, education (CCRE 2007), in short good mobility helps to have a good living in the cities. In that sense, a good mobility system in Mexico City needs to be prioritized, this either by developing other ways of transport that can be more efficient, increasing public transport or by reproducing different and mixed modes of transport that complement each other.

The amount of people that have started to cycle in Mexico City has increased on one hand because of the individual choices as it has been shown in the interviews, but as well because of the collective influence of the cycling movement that has been encouraged by the local Government and several NGOs, without forgetting, of course, the bicycle sharing system that has been around in recent years as the Eco-Bici program that has been mentioned before.

The bicycle sharing system greatly increases the availability of bicycles, the flexibility of routing, and access to and from public transport. Bicycle sharing systems are continually advancing technologically, thus enabling integration not only with the public transport which provides alternatives to the private car, but also allowing the city to work like a functional integrated mobile system.

From the last records in 2014 “16% of users of the Eco-Bici public bicycle system stopped using their cars as their main transport system and they changed it for cycling. These numbers contrast with the 5% of people that did it in 2012; this means that in two years it increased 300%” (Secretaria de Medio Ambiente CDMX 2015).

However it is not only the Eco-Bici program that works in an isolated environment, there are many NGOs that are working to encourage people to prefer using the bicycle or at least to break with the existing paradigms regarding the use of the bicycle in the city. Bicitekas is one of many organizations. Bicitekas is an urban cycling organization that was born in 1998, driven by a group of cyclists who believed that it was possible to use the bicycle to move in a free way around the city and thus have a positive impact on the welfare of the society. In 1998 the collective started a weekly Paseo Nocturno (Night ride), basically consisting of a “critical

mass-style ride where a group of cyclists meet up on a weeknight and take a four-hour trip around some of Mexico City's busiest roads, staying safe through sheer force of numbers" (The Guardian 2015).

This without doubt was a very revolutionary action despite all the controversy that goes around using the bicycle in a city that was not prepared yet, at least in terms of infrastructure. However, Bicitekas was not the only NGO that started with these actions; Roberto Villegas was as well co-founder of the Movimiento Ciclista del Oriente (Eastern cyclist movement) and they as well started to make something similar as Bicitekas. I asked Roberto what was the motor for him and his colleagues as part of the NGO he worked with to make people see the bicycle as another real option for moving, and he replied:

"For me the bicycle constitutes an example not only of building collective value, but also an icon, a symbol of triumph of the emerging versus the traditional and institutional. The bicycle allows us to talk about cranks, chains, roads and trails while requiring us to redesign cities, transform mobility systems and even re-pose status symbols. We could not wait for someone to say that it is safe to use the bicycles; we had to go out and claim the space that also belonged to us by right, so far I believe it has worked. Today many people are using more the bicycle either in the rental option or by owning one."

All these phenomena started in the late 1990's and when the Muévete en Bici (Move in bicycle) program started as a social governmental program from the Ministry of the Environment of the Government of Mexico City there was a lot of fertile ground for the Government to make it be efficient and at least have more interested people in riding bicycles.

The way the Muevete en Bici program works is that streets and avenues, regularly used by motorized transport, are enabled to give way to pedestrians, runners, skaters and cyclists. This program allows people to use public spaces for recreation, encourages physical activity, social coexistence and promotes the use of the bicycle as a mode of transportation in the city under the umbrella of a public policy. On average it has an influx of 50 thousand people every Sunday (SEDEMA 2017).

The initial route was 10 km and had an average influx of 7 thousand people per event. In 2010 the route was extended towards the north of the city and then they were 24 km

achieved and the number of users increased to 14 thousand people on average every Sunday. In 2013, 3.5 km were added reaching 27.5 km and finally in May 2014, the most important route expansion in the history of the program was carried out, with this extension reaching 48 kilometers. This placed the program in the 5th place of the longest recreational cycle lanes in the world (SEDEMA 2017) and of course made evident that there were many people interested in using the bicycle or at least to prove they could use it if the infrastructure allows it.

On the other hand, it could be said that cycling has started to be a bit more trendy, because it is not only that people take their bicycles every Sunday and go out with it, but as well that the areas where the bicycles pass through, especially the cafes and shops have transformed and modified into a more bicycle friendly area. As Isabel Parra, a user of the program, told me:

“I have noticed that cafes are more bicycle friendly and I think it is natural, I mean if you want to make the whole route in a Sunday you will always like to stop to have lunch or something to eat, so especially places like Condesa and Roma¹⁰ have become much nicer. I use that to convince my friends to come with me and have lunch together, but then they have to come by bicycles, that way everybody enjoys the same”

I also spoke to one of the traffic control assistant that was there while the Muevete en Bici was happening. His name was Arturo and he has been working in the project for some years I was particularly curious when he said he has been working since the Muevete en Bici started. I asked if he has noticed any particularity regarding the car drivers acceptance of the program and he said:

“At the beginning the car drivers where really mad, because we are closing main streets from 9:00 to 14:00, they were mad and even honking the horn a lot. It was really obvious that they were mad at us because they were driving and they are used to do that all the time. Today I can say that car drivers are more used to this every Sunday. And I think it is good, the pace of the city is slower and drivers are more used to seeing people on bicycles, tending to give them more space [saying smiling]”.

¹⁰ Condesa and Roma colonies are considered fashionable, especially among young businesspeople, students, pet lovers and others. There are some wide avenues and lined with trees. It is mostly filled with restaurants, cafés, boutiques and art galleries.

Another of my interviewees was Carina Aspiazu. She is 32 years old and she lives as well in Coyoacán. She recently bought a car because she works far from her job, but she lives as well in a place that is one block from where the Muevete en Bici happens. At the beginning she explained to me that if she wanted to make a plan with her car on Sundays was kind of complicated because she lives just in the middle where all the action with Muevete en Bici happens, so she feels that it is complicated to drive the car to do something at that time:

“At the beginning I felt desperate because I obviously wanted to use my car, my first thought was that was more comfortable to do that. However, over time I was very curious about the program I mean, what was so interesting that I was able to see through my window a lot of people, so one day I said I’m going to leave and rent a bicycle and I followed the route. I had a lot of fun and now I even bought bicycle and even my boyfriend has his own at my place. The truth now is that I enjoy having the bicycle to move that much that I don’t even remember I have car, it’s even like an automatic thought to take the bicycle”

As Carina explained she used to hate the program, however her curiosity took her to give it a chance, besides she doesn’t have another option since the place where she is located is particularly in the middle of where the Muévete en Bici program happens, so she was kind of pushed by the situation, but at the end it happened that now she found in the bicycle another available option to move. She even told me that today she uses the bicycle regularly during weekdays to go to do some grocery shopping instead of driving her car.

This means of transport allows us to build a number of participatory proposals related to mindset change as well as education and governmental. This is basically because the bicycle can be an element that is part of the day to day life that coexists with the citizen in the streets, which allows interdependence and strengthens self-management and self-sufficiency and on the long term brings benefits for the society in terms of health, environment and social aspects.

7 Towards a sustainable mobility in Mexico City

Urban mobility generates social, economic and environmental costs and these are transferred to the society through externalities. On the one hand, emissions of pollutants are causing global warming and have been affecting the environment in the city having a direct impact in the population. This has an impact on the development of the country, for example, “in Mexico City emissions generated by vehicles represent up to 60% of the total pollution” (ONU-HABITAT 2015)

On the other hand, there are many academics that support the idea that cycling is probably the most sustainable urban transport mode, one transport mode that can represent an option for those who are interested in improving their individual way of living, and as an effect improve the living in community. Cycling “is feasible not only for short trips but also for medium-distance trips too long to cover by walking” (Pucher & Buehler, 2008). From an environmentalist perspective it is also possible to say that cycling represents a way to solve in some scale some problems such as the environmental that the city faces nowadays. Likewise it promotes health through physical activity, takes up little space and is as well economical both for the users and public infrastructure costs. In short, cycling is environmentally, socially and economically sustainable.

However, in spite of all the knowledge regarding this transportation system, the reality is that today the bicycle in Mexico City is not a priority. It is true that it has become much more popular, especially in the middle class sector, which is the group that according to the Eco-Bici survey owns a car and has a car as a main transportation system, but for different reasons exposed in this work, the use of the bicycle is growing and now their commuting consumer habits are starting to change.

However, the use of the car and the process of urban expansion, greater travel, road failure and distortion and disarticulation of modes of transport that occurs in a space that is not conducive to this excess are factors that do not help much in making long scale changes. The geography of the city doesn't help much either. It has to be remembered that Mexico's City basin has on its southwest side a mountainous chain

that reaches an average altitude of 3,200 meters with some elevations that surpass the 5,400 meters and that constitutes a natural barrier for the free circulation of the wind and the dispersion of the pollutants. This situation in the basin is accentuated by the phenomenon of frequent thermal inversions occurring in the Valley, which are more than 70% of the days of the year, causing a temporary stagnation of the air masses (FIMEVIC 2015).

On the other hand are the health benefits that come from the use of the bicycle. “An increasing body of evidence has emerged showing the negative health impact of sedentary lifestyles, for example diabetes and hypertension” (Warren et al., 2010), which has been shown to be amplified by practices such as only commuting by car. In Mexico, according to National Health and Nutrition Survey 2016, 14.4% of the adults don’t comply with World’s Health Organization recommendation regarding physical activity, which is equivalent to 15 minutes per week (Padilla 2017).

There are as well studies on the economic impact of cycling that find the largest economic benefit in health. As an example it is possible to mention Götschi, Garrard, and Giles-Corti (2016) who brings together literature that exists on the health issues associated with cycling. In a study done regarding the impacts on health after cycling in the USA, the previous mentioned authors found that population levels of physical activity are falling and cycling for transport provides sufficient activity to protect against sedentary lifestyle diseases. (Götschi et.al 2016, p 3)

The authors also argue that “integrating cycling into daily routines provides a promising approach to increase physical activity, given that many people spend many minutes and more commuting daily, yet struggle to find the extra half-hour to exercise” (Götschi et.al 2016, p. 2). According to the Encuesta Eco-bici from the total of people that was surveyed 82% of them answered that they have noticed changes in their quality of life since they started to use the program. In my interview with Hector Patiño, one of my interviewees and big promoter of the bicycle in Mexico City, he said:

“A key finding is that the greatest health benefit occurs when inactive people become active through cycling; there is where you can see a lot of changes and when people realize about this, then they feel every time more encouraged to keep improving their lifestyles. Those are the successful cases”

The public bicycle system in Mexico City is presented as an alternative to the public motorized transport system for users who use bicycles. This is intended to reduce traffic conflicts and air pollution caused by automobiles in Mexico City, but as well to improve the quality of life of the population in most of the cases.

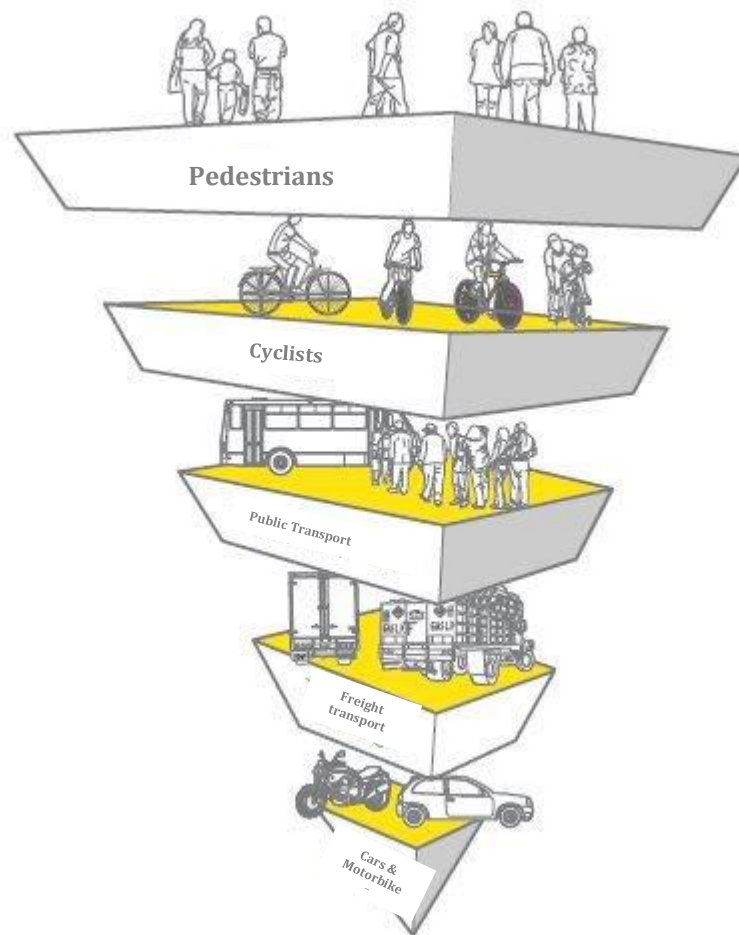
In the case of Mexico City, it is clear that this kind of practices is starting and people are starting to change their choices, however it is not enough. There are several feedbacks that while I was making my field work I faced. Not only from my interviewees but as well from my personal experience while I cycle the city, this will be discussed in the next sections.

7.1 Infrastructure matters

As it has been said before, the rapid growth of Mexico City has generated many challenges regarding mobility. Today, the use of the bicycle as a mode of urban transport has started to represent a solution to some of the problems generated to a great extent by the negative externalities of the excessive use of the private car, as well as the priority that has been given to it in terms of investing in infrastructure for it.

Pedestrians and cyclists lead the hierarchy of mobility (ITDP 2011, p 62) (See Figure 7), a principle which orders modes of transport according to their vulnerability and the positive and negative externalities they create as well as the infrastructure that has to be created for them. This hierarchy states that “the investment, design, and construction of streets and public space must prioritize the protection of vulnerable users in terms of accessibility and road safety” (ITDP México 2016)

Figure 7
Mobility hierarchy



In the Image is possible to see the the sustainable mobility hierarchy
Source: ITDP Mexico 2014

Many researchers hypothesize that if people perceive an increase in safety, they will be more likely to use the bicycle. Some other studies that included surveys of cyclists have found that an increased perception of safety leads to a better acceptance of this transportation system. However, is important to take in consideration that regarding this topic in Mexico City the institutions don't have official data on how many accidents involve cyclists as the victims or the cause of accidents as well.

Cyclists can be considered as a generator of accidents not only as the victims. However the way some cyclists behave has to have a reason and during this chapter I will try to

find out what are the reasons why some bicycle riders can be the cause of some accidents. As a premise, it has to be said that not all the programs that have tried to develop bicycle mobility and encouragement of the use of the bicycle in the city have been accompanied by sufficient infrastructure, strong rules and a comprehensive road education strategy that has as result a new perception of the bicycle movement.

In this section I will try to discuss some of the factors that according to my interviewees and my research set some obstacles to the use of the bicycle and some others that have encouraged its usage. The Ministry of the Environment (SEDEMA) ensures that the objective of its Bicycle Mobility Strategy (Estrategia de Movilidad en Bicicleta or EMB for its acronym in Spanish) is to bring together a harmonious coexistence between citizens, the recovery of public space and the improvement of the health of the citizens. However, many pedestrians consider that the first obstacles to reach these goals are the bicycle riders themselves who do not comply with road rules and do not respect other road users.

While I was conducting my interviews in Mexico City I was able to establish contact not only with the bicycle riders, but as well with some pedestrians that share some parts of the *ciclovía*. Elisa Ramirez was one of them, she is 63 years old and she usually uses the *ciclovía* to keep herself active, since her favorite activity is to take long walks to a beautiful park that is close to her house in Condesa colony. She has noticed that while she goes out for having some walks the bicycle riders sometimes are not careful, especially the younger ones; she mentioned this when I asked her what she thinks about the usage of the bicycle in the city:

“I think the use of the bicycle is amazing, it helps me to keep active. However, I consider some bicycle riders are dangerous, because they do not stop when they see the pedestrians, especially in crowded areas as Condesa. The speed at which they sometimes go is dangerous for us, especially when they pedal in spaces that are not for them”

Elisa Ramirez was hit by a bicycle driver while she was crossing the red light. She said that the Sunday morning of her accident everybody was out because there was a concert in the park and these bicycle riders were competing and they were using some sidewalks to be faster instead of using the *ciclovía*, because a lot of people were walking on it as well.

In the last Eco-Bici survey of 2012 the users were asked two different questions regarding their riding preferences. On the one hand, the bicycle riders were given several options to answer to the question: *Where do you prefer to ride your bicycle?* With 73% of answers users replied that they preferred to circulate through the *ciclovía*. However, when they were asked *Where is the place that you usually circulate?* The answer was divided; 35% of the users answered that they usually circulate through local streets and 40% circulated through the *ciclovía*.

The same survey continued and asked the users that were not using the *ciclovía* *Why do they prefer to circulate through local streets instead of the ciclovía* and 73% of them answered that they felt much more safety by doing so; on the same question, 26% answered that for them it was faster to choose local streets instead of the *ciclovía*.

Here it is important to make a remark in the concept of safety. The users were asked about their perception of safety, but safety understood in terms of safe mobility, meaning not be hit by a car, a bus or to have safe infrastructure to circulate, not in terms of delinquency, which is a different topic. Then the concept of safety that people answered was referring to how safe they feel to commute by bicycle, compared to other ways of commuting. Once said this, the users were asked what their perception of safety was while they ride a bicycle in the city and if they feel ok by doing so compared to another way of commuting. Once this specification is done, it is possible to mention that in terms of safe commuting most of the users found that the *ciclovía* is the safest way to commute, followed by circulating through the sidewalk (here is where they collide with pedestrians) and at the end they consider local streets safe to circulate through.

During my fieldwork process one of the aspects I wanted to understand better was what were the elements bicycle riders found as obstacles to use the bicycle and how they manage to overcome these obstacles based on their experience. Many of my interviewees referred to two main aspects as obstacles; one of them was related to a material element: the infrastructure especially the one focused on cycling and mobility in the city. The other element was related to the lack of traffic education from everybody, but especially the one of the private cars and public transport drivers.

As it is possible to see in the Eco- Bici survey results people are using the bicycles to commute and it seems there is infrastructure to do so, but how the users perceive security is different. It can be said that the first step to solve this kind of problems is to

generate enough infrastructure for cyclists; however this is not enough to succeed. As the Coordinator of Non-Motorized Mobility of the Institute of Policies for Transport and Development in Mexico Alejandra Leal mentioned “due to the absence of safe spaces, many citizens choose to ride on the sidewalk rather than beside the cars, we have to work to improve the infrastructure, remember infrastructure creates culture” (Crail 2016)

The National Council for the Prevention of Accidents (CONAPRA) in Mexico supports as well this conclusion. Besides, there are many other studies regarding the infrastructure that explain that “when you avoid exposing road users to confusing and conflictive situations through streets that are easy to understand and use, a culture of coexistence and security is fostered” (ITDP Mexico 2016, p 19).

However, many citizens like Elisa still see this ideal far away, she mentioned that since she has this accident she became more active, she explained that of course she understands that a bicycle is not as dangerous as a private car or a motorcycle if it hits you in an accident, however it is important that everybody respects the spaces that are assigned for every different commuting system. She says:

“Of course today the coexistence between pedestrians and bicycle riders is better than some years ago, people are more aware. On the other hand I understand that some pedestrians do not respect the *ciclovia* and evidently bicycle riders are as well affected. This is a matter of respect and education, we all live here in this huge city, we have to learn how to coexist, there is space for everybody”

Since the government started to develop different programs regarding non-motorized mobility. The amount of infrastructure for bicycles has increased, but the development of infrastructure for motor-vehicles has not diminished at the same speed. The maintenance of the infrastructure is important as well. During my fieldwork and while I cycled the city I realized that when I was circulating through the *ciclovia*, many informal merchants established their local sales posts occupying the space that belongs to the bicycle riders. This situation forced me, most of the times, to move out of the *ciclovia* and take some stretches where the cars were circulating, situation that made me more vulnerable because I was very exposed to be hit by a car despite taking my precautions; at other times I was forced to move and cycle on the sidewalk and be

close to the pedestrians. It is important to mention that if you do that during lunch time the sidewalks are usually crowded and it is very complicated to cycle and sometimes you have to walk your bicycle.

Along with the infrastructure, clear rules are also required that give sanctions for violating them and, on the other hand, forge civic culture, an aspect that of course depends on the authorities and the citizens, themselves. So it doesn't matter how many "laws, manuals and infrastructure can be generated, if citizens are not responsible for their actions, the mobility of the city will not improve" (Crail 2016) and in that way the sense of security will increase among bicycle riders. This obstacle can lead to discourage the people from choosing the bicycle such as Elisa told me:

"Because of this lack of traffic education, I have decided that when there are concerts in the park close to my house I will walk instead of using my bicycle, because it is literally impossible to feel comfortable to riding it"

The social practice of riding the bicycle in the city during all my fieldwork helped me to understand how the perception of safety is important and affects the choices and desire the users have in terms of choosing how they want to commute, in this case choosing or not the bicycle. As a result, the improvement in infrastructure regarding the bicycle, such as paths, parking and *ciclovía* have been factors that encourage the population to choose to cycle, but at the same time, the lack of traffic education have discourage as well some other part of the population. This is why it is important to accompan the infrastructure with education and a civil program, in order to have more successful programs.

Then, aspects such as long distance, the weather or the geography of the region are not as determinant as the physic and social urban obstacles. The urban physical barriers that present the greatest difficulty for cyclists are primary avenues with a high vehicular density such as road axes and controlled access avenues, this is why the development of the infrastructure has to pay attention to these difficulties.

In 2016 the latest statistic performed by the National Council for the Prevention of Accidents in Mexico (CONAPRA) was released. The results have shown that from 2010 (year when Eco-Bici started) to December 2015 an amount of 1,160 bicycle riders have died in road accidents. In the same period of time 37,121 bicycles were involved in accidents

that left 14,274 seriously injured. In addition, seven out of 10 injured were children and teenagers who have stayed between one and three days in the hospital; and 35.8% of the injuries were in the arms, 24.8% in head (traumatic brain injury) and 22.7% in the legs (CONAPRA 2016).

Today, for many people the bicycle represents an option and a solution to the problems of mobility that the City faces. This is why it is necessary to develop strategies to improve the infrastructure and as a consequence the safety of the cyclists and promote this as another way of transport.

7.2 What is the motor that makes people ride the bicycle?

As it has been described previously, the practice of cycling and the way this activity is carried out and reproduced have many factors to take into consideration. In that sense, this section will talk about some elements that affect the behavioral practice based in the Social Practice Theory (SPT) of cycling and how this affects the perception that society can create towards the use of the bicycle as a transport system.

In order to do this, I will make reference to the SPT. This theory has been explained and discussed in the first chapter, but it is important to go back to it in order to have a better understanding of how the reproduction of the use of the bicycle is carried out. Having said that, let us remember that SPT is not the study and analysis of the “experience of the individual actor, nor the existence of any form of societal totality” (Giddens, 1984, p. 2) which is studied, but a dissection of the practice itself as *carried* out by its performers.

For its better understanding and study the SPT has been usefully deconstructed into “several elements, interconnected to one another” (Reckwitz, 2002, p 249) for purposes of analysis. Although there are many possible ways of configurations, in terms of behavioral change, the one that has been developed by Shove has been found as more helpful. There are three element models to take into consideration; “*images*, which refer to meanings and symbols, *skills* , which are the forms of competence and procedures and finally *stuff* or materials and the technology that are dynamically integrated by

skilled practitioners through regular and repeated performance’’ (Hargreaves, 2011, p. 83).

It is important to mention that all these three elements must exist and they are interconnected in order to have the performance of a practice. An object such as a bicycle is a material element that is a necessary part of a social practice in a particular human behavior, which is commuting by cycling. Then, the bicycle in pure terms is not just a symbol with a meaning, but an object that is “directly implicated in the conduct and reproduction of daily life’’ (Shove & Pantzar, 2005, p. 44).

The idea that the bicycle (as an object) has a meaning refers to the idea that a material element has a meaning because it is linked with a social practice. This social practice is carried out by a group of the population and this idea is strongly related to Bourdieu’s concept of habitus, which suggests that understandings about significance are shared amongst a group, and thus bring the group together (Bourdieu 1984). Then, the habitus makes people from a homogeneous social environment tend to share similar lifestyles, such as riding the bicycle towards work, preferring the bicycle instead of using the car, etc.

Then, the embedded meaning in the objects takes the form of an unreflective sense of what behaviors are ‘right’ or ‘fitting’ (Rettie, Burchell, & Riley, 2012). Related to this sense of being right or fitting, it is important to talk about the “significance of the number of practitioners routinely performing the practice’’ (Spotswood, Chatteron, et.al. 2015, p 24). If people do not engage with a practice and do not see others engaging with it, people can tend to perceive that a particular practice doesn’t have to have space to be carried out or simply that the practice doesn’t fit in the day to day of the city.

In this case the more popular a practice is the more chances of being reproduced it can have. For example, the *Bicitekas* movement in Mexico City was one of the first social civil organizations that started to promote the practice of using the bicycles in the city. They started as a small group of friends in 1998 that started to get together and use their bicycles at night because they share the hobby of riding the bicycles in the city and because at night was when they were available to do so. However, this practice was considered dangerous due to the lack of vial education to respect the riders.

This group of people started to get together more often and started to promote the use of the bicycle not only because for them it meant an enjoyment to do that, but as well they started to see in the bicycle other elements. They started to see in it a capacity of being more socially active and to claim for better spaces for the citizens. Then what started as a social practice of enjoyment and getting together with friends turned into a movement where the bicycle was seen as a way to make public policies in favor of cycling as a transportation option in the city and as a contributing tool. That is to say, the practice evolved and transformed the meaning of how the bicycle was seen by those friends, then the practice started to be reproduced and started to be more popular in the city.

As this first group mentioned some other examples came out during my interviews and field work. It was very interesting to understand and discover how the meaning of riding a bicycle in the city can be different from person to person. Some of my interviewees made reference to meanings identified with the practical benefits of cycling. For some of my interviewees, cycling matched with their requirements for a transport system that was considered fast, efficient and low-cost. This means that for some users, riding a bicycle meant or was related to have economical improvements with its usage.

On the other hand, some other interviewees made more emphasis on the health improvements, taking in consideration that living in Mexico City is *per se* stressful due to the amount of people that live there and the implication that living in a megacity has, then the health was of course one of the reasons why people chose to ride. Comments about feeling less stressed while they were getting to work, coming back home from work or even less frustration while avoiding the traffic or to find a place to park the car were some examples that were mentioned.

Some other interviewees mentioned that the reason why they found riding the bicycle was much better than using a car to move from one place to the other, and especially when the trip is less than five kilometers or the reason why they preferred it was associated with environmental benefits of cycling, many of them (around the 90%) agreed that if people in Mexico City would use the bicycle more than the car, the city would be a better place to live in due to the positive environmental impact that this would have on the environment.

As it is possible to see the reason people use or prefer to ride a bicycle as a social practice can vary depending of the meaning each person has towards it. Another aspect that has to be mentioned regarding the elements people take into consideration to cycle or not to cycle is as was mentioned before, the sense of safety. This can play an important role in how people perceive the use of the bicycles, not only for bicycle riders. A sense of feeling safe on cycle paths, local streets, in the *ciclovía* and in general in the city can determine on big scale if someone can ride or not. As Renata insisted during our interview:

“As I told you, I am not a big fan of using my bicycle at night when I get off of work even if is close to my place. I am worried about my safety and when you are mom you have to think about in everything that you do, because you have people that depend of you”

Of course other elements have to be taken into consideration such as the physical capacity, the weather, the geography of the place and the distance that will be travel as well, even the lifestyle commitment. However one thing pops out and is really interesting. The more the people see people using the bicycle the more curious they behave towards its usage. We can take as an example Carina, who at the beginning disliked the idea of using the bicycle, because she was affected in her normal activities, but at the end she gave herself the chance to try and then she became part of the movement.

7.3 The bicycle in the vox populi

During this work it has been discussed how the use of the bicycle is perceived from its users perspective with the scope of understanding how the bicycle users look at them and what the meaning or the motivation is that makes them choose this type of transportation system. Now, in this section I will talk about how the phenomenon of the use of the bicycle is seen by no-cyclists, this will be done with the scope to give a broader perspective to the research and to point to the urban conflicts that arise from the use of this mobile transport system.

The urban cyclists' phenomenon has appeared in the city little by little and because of this there has been a singular conflict with pedestrians that have been added to the one that already occurred with the drivers of automobiles. But on the other side this cycling

movement has created in the citizens an opinion about the people who decides to ride a bicycle.

It is known that in Mexico City, there are daily encounters between cyclists, motorists and pedestrians: drivers who harass and endanger cyclists, exchange insults, etcetera; but on the other hand the urban cycling has brought with it cyclists who do not respect traffic lights or intimidate pedestrians on sidewalks, as we have seen in previous sections, in short new problematics that defined the day by day of the city.

As an answer to this, solutions have to be implemented, in the best case public administrations have intervened developing manuals and regulations or building infrastructure to facilitate the use of the bicycle. As it was mentioned before, during my fieldwork I had the chance not only to experience cycling in the city, but as well I realized how the relationship is between non-motorized vehicles and motorized vehicles. The urban cycling has appeared and has gained more presence every time and the speed of adaptation among pedestrian, motor vehicles and cyclist may not have been done at the same level. All this in the context of the fact that motor vehicles have had more priority in the city in terms of infrastructure than any other transportation mode.

Every day there are daily encounters between cyclists, motorists and pedestrians: drivers who harass and endanger cyclists, exchange insults; cyclists who do not respect traffic lights or intimidate pedestrians on sidewalks; car doors that open without considering the passage of a bicycle or pedestrians invading bicycle paths; in short entire adventures while you try to commute in a city like this one.

One of the main disagreements that I was able to observe is one that is produced by a lack of infrastructure as it was discussed above. It is caused mainly by the use of sidewalks to cycle with the bicycle, it is common to see cyclists on the sidewalks, some completely ignoring the impact they produce and behaving without civic sense, but as it was discussed on previous sections many of the times this happens because the *ciclovías* are obstructed or there is no other way to circulate.

While I was cycling in the city I noticed that some of the people I started to have talks and interviews with were only bicycle users, but the field work took me to have contact with pedestrians as well. It was there where I realized that it was important to know how

the use of the bicycle was perceived by the other part of the population that were not bicycle users. This was because on the one hand the cyclists have to face many obstacles with the motor vehicles, but on the other hand, cyclists also collide with many other citizens when using the bicycle lanes, which are sometimes invaded by pedestrians as well. Some of my interviewees have expressed as “*adventurous people*” or “*people that are crazy*” towards the people that have decided to cycle as a way of commuting.

As an example Manuel Rodriguez can exemplify better; he is a taxi driver and I had the chance to talk to him during my fieldwork. Due to his job he spends many hours driving in the city, his working area is the city center where a lot of different transport systems collide. Manuel and I talked a lot about mobility issues in the city and he has a lot of experience dealing with bicycle, he says:

“You can find everything. I have seen many bicycle riders that are so nice and they give you a sign when they will make a turn, but sometimes there are people that just don’t care at all and there is where you have the problem, because of course they have priority above me (referring to his car). So, if something happens (referring to an accident) it is the driver that is usually punished”

Manuel has never had an accident involving a bicycle rider, but on his opinion he thinks that some of them behave without education and that makes a problem for everybody. Same thing happens with the pedestrians because he mentioned that many times they use the sidewalk and he has seen that they have hit people as well. Manuel kept saying:

“Sometimes they are going really fast, I mean if they are in a hurry it is better to grab a taxi, and is even safer and faster to do that”

In an interview I had with Susana Morales, a woman that does not use the bicycle to commute and that works in a candy local shop close to where the *ciclovía* passes by. I asked her what was her perception of the people that uses the bicycle to commute in the city, and her answer was:

“I think that people that cycle are a particular type of person, I mean, they need to be super brave and fearless to do that in the city. More if it is only to go to work, I mean, who wants to be tired before getting to work just because of riding. I would prefer to do that during my weekends when I have more time”

These two testimonies of Manuel and Susana made me think as well how people that are far from the context of cycling can perceive this commuting way. For some people the use of the bicycle can mean only an enjoyment or can be associated with cycling for leisurely purposes rather than as a mode of transport, or even not an effective transport system. I wonder what Susana or Manuel would say if I mention to them that one of my previous interviewed (Angel Carmona) sees in the use of the bicycle not only a way to get to work faster, but a way to integrate exercise to his life since he does not have much time during afternoons when he take care of his kids.

Thinking over the different motivations people can have regarding the use of the bicycle, it was interesting to review some numbers. On the last Eco-Bici survey (2012) the results showed that 49% of the trips made have as destination go to work and 29% of them going back home. Then, it is possible to say that the perception that some people can have towards the bicycle riders were it can be seen as fun, for example social bicycle ride on the Muévete en Bici program and cycling seen as a mode of transport such as get to work on time, getting back home, a more efficient transport system, etc..

Despite the idea that the car has been associated with success is as well another idea that popped up during the interviews. Some of my interviewees that were not bicycle users perceived some of the bicycle users as people that can't have access to a car on the one hand or didn't think that it would be possible that if you have a good position and earn good money you would prefer to drive a car unless if that would be a much more efficient option. This is because still today in Mexico, the car has a symbol of high status and economic power. Then, ideas that the bicycle was an element that can be used to enjoy and have fun, that is not an efficient transport system or that is not compatible with a successful job position were some ideas that people mentioned. Some others were related with people that are more free spirited or adventurous or that prefer to be exposed to dangerous situations. Some of the interviewees mentioned that it was a challenge to do that, but any of the made references to the health benefits or the economic or environmental improvements can also come from the use of the bicycle.

It has to be said today that the most popular area where the use of the bicycle is generating more transformations in the city are Condesa and Roma colony. Hector Patiño, who has been mentioned before said:

“Today, all the people that are encouraging the use of the bicycle have an advantage. This is that riding a bicycle is starting to be trendy and people are considering to be a ‘cool’ person if you do that, despite all the negative connotations and ideas people can generate as well”

All these testimonies can tell that there are many different perspectives regarding the use of the bicycle in the city. Then, cycling can be considered culturally incongruous. Now, regarding the negative opinions generated by those who did not cycle, it is possible that these ideas are generated from what people say and repeat about cycling and not from a personal experience, which at the end is an idea that is spread and can influence the way people choose to commute. Shove et al. (2012) explain that “theories of practice emphasize the tacit and unconscious forms of knowledge and experience through which shared modes of understanding and existence are established in the world, through which the purposes are desirable and the rules are legitimate” (Shove et al. 2012, p 32). These adopted ideas and mindset about cycling can always be transformed. “Behavioral change can be initiated by the environment, by others and by the participants themselves” (Kearney, A. and De Young, R., 1995, p 338) that means that the more a practice is carried out and the more people acquire the experience of it, the more familiarized they would be with it.

This means as well that the mindset of choosing a particular way of commuting such as the bicycle is not only based on terms of cost (in terms of economy) and time (in terms of optimization), which are important but not the only factors involved. This is also a complex process that involves social and psychological aspects as well and those factors help to construct a mindset of how people perceive and accept a different way of commuting and the opinion they have about it that is at the same time reproduced.

8 Conclusions

Several factors have influenced the way people have commuted during time. From the decade of the 60's till recent years in Mexico the car has possessed a very important status, not only because it has been considered the king of the transports due to all the infrastructure that has been built around it, but as well because in the mindset of the people, on one hand, the car has been catalogued as a symbol of personal and economic success, an object that many people that have had success aspires to own, but on the other it also mean a way to commute in a more comfortable, convenient and safety way, without forgetting the possibilities it offers to travel bigger distances compared with other main of transports.

This has been a phenomenon that has occurred around the world in many cities. However, the use and abuse of the car have led to important problems that big cities nowadays are facing. Among those problems it is possible to find traffic jams, pollution, and environmental issues, less quality of living and in sum less livable cities. In recent years, the use of the bicycle in Mexico City has become a more popular. It has been presented as another option of transport among population; the reasons why this is happening are diverse. Therefore this research project, as it stands at the beginning tries to understand which are the motivations that take people to choose a bicycle instead of other mains to commute. Understanding that this change has not been on big scale, since the car keeps being the main mode of transport among population.

Coming back to the research questions that drove this work I will come back to them in order to give conclusion to this work. I will start saying that it is a fact that Mexico City faces a big challenge in terms of mobility and in recent years many projects have been developed to try to solve this, either in restrictions to car usage like Hoy no circula program (Today doesn't circulate program in Spanish) or the improvement of public spaces, new regulations of how to commute and even infrastructure development for non-motorized transports.

What I found in my research is that even though the bicycle has been always used in the city there is a inflexion point where the population started to use it a bit more, or at least, the perception that the population had about it as a simple tool to move was

transformed and today the bicycle is seen as a tool that can help to move in a more efficient way. The Eco-Bici program helped to this in a big scale because on one hand it put the bicycles more available for the population, since this is just a program which you have to enroll to and people don't have to pay for a bicycle or the maintenance of it. On the other hand, it helped as well to the people that already owned a bicycle, that way they the owners could also enjoy the infrastructure built for the bicycles.

It is true that this program helped to influence to the population to use this alternative mode of transport and that it influenced not only the people that doesn't own a car, but also the people that owns one or have access to them. According to the Eco-Bici statistics the number of users has increased since 2011 till today and it has also influenced the population to use the bicycles that much that the demand for the service has increased as well as well as there has been an increase in the infrastructure¹¹, especially in the central area of the city. So, answering the first research question regarding how and why is the role of the bicycle in the city's modal split is changing involve many elements.

On the one hand, the amount of people that is using the bicycle has risen, either by Eco-Bici program or by users with own bicycle, however the users only represents 2% of the total trips done in the city a day. This means that the amount of people using bicycles has increased, but not in an exponential number how it is shown in the statistics provided by the transport institutions in Mexico City.

One thing that is true is that even if the amount of people using the bicycle compared to other main of transport is not the biggest, this 2% of trips done every day have achieved to transform the city little by little to give space to other modes of transports. Since Mexico City is a big city, is quite complicated that people that doesn't live in the city center uses only one transport system to commute, therefore, the bicycle has been integrated in the transport system in the city especially for trips from five to 10km distance. In this way the population has perceive the bicycle much more as a tool that can help to avoid commuting problems such as being stuck in traffic jams.

¹¹ Since its inception, Ecobici has grown more than 200%. To date the date has more than 6 thousand bicycles and 444 cycles in an area of 32 km² (see Figure 7)

What I try to say here is that the simple concept of riding a bicycle has been transformed and today it has a new meaning, is more than a way to go from one place to the other, it represents a more effective option to commute, especially in the city center. This transformational mindset towards the bicycle has been triggered by several and different causes that correspond to particular interests of the user.

This leads us to the other research question which refers to the factors that contribute towards more or less bicycling in the City. To be able to understand this I will return a bit to what has been mentioned in the methodological part as a recap. I decided to go to Mexico City as part of my field work and have direct contact with two different groups of people. On one hand I wanted to have the opinion and perspective of bicycle users. For me was more interesting to contact the people that lived in the south of the city, but at the same time, people that have to commute towards the city center for any reason and while doing that they have done that by bicycle either in a full trip or using the bicycle in some parts of it. The reason of this is because in my perspective the more I knew how they commute, this in order to understand better the positive and negative elements that make them to take or not a bicycle in Mexico City.

Before answering this is important to remember the way the sample was selected. First I decided that the people I was going to interview have to have access to a private car, this was basically because I wanted to compare how often they choose to commute on one way or the other, then having easy access to a private car would help me to know it better. Another criteria I considered important was the gender, since it was reviewed before, the sense of safety differs from men to women, this is why I consider important to take a sample that had half women and half men.

On the other hand, the other group that I was interested to have contact with were people working with topics related to mobility, sustainable cities or bicycles, particularly NGO's. This was basically because people that tend to work at NGO's usually have a lot of contact with the civil society and at the same time with the local government. Therefore, they can represent in a more organized way the interest of a particular group, as well as understand better the problematic involved on it. On the other hand, they helped me to have a bigger perspective of how the bicycle movement has been transformed in Mexico City.

All the previous elements, in addition to me riding with my own bicycle in the city, helped me to have a broader perspective of the mobility in Mexico City, in particular with no motorized vehicles. One of the first things that I noticed is that the Eco-Bici program has represents a turning point in the use of the bicycle in the city. The reason I say this is because on one hand this program broke the traditional economical support that the mobility projects had historically in the city. So, for first time, a project supporting non-motorized transport systems was launched. Then, with more and better infrastructure to move by bicycle in the city people can feel more motivated to give a chance to different ways of commuting.

However, not only Eco-Bici implementation or the improvement in the infrastructure has helped to popularize the bicycle. Another aspect is that there have been several initiatives launched by the government that have helped to do so. In this case, is important to highlight the importance of the NGO's that have been included and involved in the planning, consultancy and development of different programs.

For example the Muévete en bici is a huge program that I had the chance to participate in. It started as a group of people that used to meet together and cycle some streets of the city by night many years ago. They started when the use of the bicycle was not that popular; with the time they became more and more active and popular, so they started to promote the urban cycling in an inclusive way of commuting. Their actions generated a positive impact in the population as such a degree that their actions had eco in the local government. Eventually, this practice grew that much that they started to receive help of the local government to protect the bicycle riders that took part every last Thursday of the month. This group founded the Bicitekas organization and today Muévete en bici is part of local government program that has the capacity to collect more than 4,000 cyclists every last Thursday of the month.

This has been an example of how in a massive scale a practice can be reproduced and became more popular. This also helps to see how the amount of people has increased and the bicycle is becoming a bigger phenomenon in Mexico City. But, to understand more the movement in terms of a small scale and to have an approach of how these social practices are reproduced successfully and what has influenced the people to do so is necessary then to remit to the individual interviews that I was able to conduct. This

will make more sense to understand which elements trigger to the people today to use the bicycle.

Now, coming back to the second research question about the positive and negative elements involved that influence people take the decision to use or not a bicycle in Mexico City; It has to be said that among the positive elements and according to my interviewees the elements that were taken in consideration to choose or not certain commuting system are related with economic, efficiency and safety elements. On the economic factor, is possible to mention that aspects like the price of commuting plays an important role when someone decided to commute by bicycle or not. Is quite probably that a person would chose the cheapest option to commute from one place to the other, particularly in a country where the income can be pretty much unequal for the population. However these are not the only elements that are taken in consideration. In terms of efficiency I found that people that chose the bicycle to commute finds on it a much more efficient way to travel from one place to the other, especially when the distances are short and the car represents an obstacle to move fast. This represents a high value when we talk about a city which dimensions are big and the mobility problems such as traffic jams, lack of parking places and lack of security for let the car in a safe place affects.

However, those elements are not selected individually by commuters. The rational process of how people chose what they do is more complicated than that. When a person in Mexico City has decided to ride a bicycle to go to work or to go any other place a mental process is carried out. A combination of elements such as the economic and efficiency of the transportation are present; however those are not the only elements I realized people take in consideration to make a choice.

For example, based in the interviews done during the fieldwork in Mexico City to the cyclists. Many of them mentioned that using the bicycle instead of other transport system was more pleasant experience that produced a better feeling than using other transport system and in some way it influenced their choices, so how people engage with the experiences they have while they cycle matter as well. This means that my interviewees passed through a mental process that involves factors as commodity, efficiency, safety and an economical factor as well, but this choice is modified by

external circumstances and as well different interests that can vary from person to person.

The external circumstances play a very important role, for example, it can happen that one day someone has decided to use the car because it feels much more comfortable doing so. Then after driving to the place you want to go you realize that finding a parking spot for your car can be really difficult to find. Even though you have tried to use the car because it was a comfortable option, at the end it didn't ended up being that practical, because finding a place to park is more problematic that the expected, so what seems a comfortable option to commute, became not that easy.

So, what carries out a mom like one of my interviewees (Laura) to take or not the bicycle to work would take the economic and safety element are a priority rather than placing the efficiency element on first place. Those elements would be different from what Gloria Núñez chose, for her efficiency is more important due to her handicap originated by poliomyelitis sequelae.

This means to say that negative elements can also influence as external conditionings to commute one way or the other. As a result of my interviews I found that there was one main thing that was being consider as a must to decide to commute by bicycle or not. This is the feeling of being safe while people commute. Another finding is that this safe element that my informants mentioned was considered different depending of the gender that was commuting.

For the male gender, commuting during night time was considered possible, and a bit not safe. When I asked what they were referring to not be safe, the informants mentioned that it was more possible to suffer an accident because the motor vehicles usually don't pay much attention during night time, since the traffic is less and there is less people outside, as well because they can be victims of a robbery due to the lake of people and surveillance. So, for them, the risk was more to be injured by a motor vehicle or being assaulted.

However, my female gender informants mentioned other element. The female gender mentioned that it was not only dangerous for them to commute by bicycle at night because of the other motor vehicles can beat them, or they can be assaulted as well, they

also mentioned that in Mexico City as a girl you never know if you will be a victim of only assault or any other attack that can be from harassment to some other violent sexual acts. I have to mention that it was a bit difficult to find enough female informants to be interviewed and when I saw the proportion of Eco-Bici users (63% males compared with 37% females) (Eco-Bici 2012) I realized that the external elements affected different depending the gender as well.

As is it possible to see, the process of making a choice related to a particular commuting way will depend on the necessities of every person. Other elements like geographic place to ride and weather are as well important and taken into consideration, but, they are not so decisive or not influence much due to the main places where people are using the bicycle are mainly flat places and according to official numbers the average annual temperature is 22° C (see Anexed 2). Distance can represent an important element since the city comprises 1,485 km², however according to Eco-Bici survey the most activity is carried out in the center of the city and over distances less than 8 km distance.

On the other hand another finding is that not only elements that concern bicycle riders directly are important. There are other elements that do not concern the riders per se but plays an important role as well. I was notice during my interviews and experienced while I rode through the city, how the infrastructure plays an important role in the process of making decisions. Most of my interviewees answered that the more infrastructure they see and have, the safer they would feel to use their bicycles through the city and therefore the more encouraged they would feel to go out with a bicycle any time of the day, because they related that the danger of being hit by a car was more latent without good roads for the bicycles. The statistics of Eco-Bici have proved that the more they increase the roads, ciclovía and in general infrastructure for the bicycle riders, the more people will have at least the curiosity to try new commuting transportation system and the sense of security will increase.

To facilitate bicycling through appropriate infrastructure (such as bicycle paths and parking), traffic calming, and other supportive measures are important and helpful. But on the other hand, not only the infrastructure is important to encourage the people and to make them feel safe to use the bicycle, it is necessary to have Public policies, training and education programs in an articulated action to have better results. In 2015 Mexico

City Government launched a newer and much more complete Transit Manual, with main scope of regulating and reducing the number of accidents, deaths and injuries due to traffic accidents, and for first time pedestrians and non-motorized vehicles are considered as priority, which means a lot in terms of mobility due to respecting the mobility hierarchy. This, together with the individual elements that have been mentioned lines above have led to bicycles becoming a more accepted form of transport, than a simply amusement activity to move randomly from one place to other.

I will end up by saying that the use of the bicycle as a transport not only offers benefits in particular to the bicycle users while they move from one place to the other, but it has a bigger impact in terms of social scale. The positive externalities of moving in a more sustainable way, especially in Mexico City where we have a lot of diabetes and obesity problems among the population represent an opportunity to the local government because the state of health, of the population can improve in a bigger scale. Many people that were surveyed in the last Eco-Bici survey said that since they started to use the bicycle as a transport system, they felt they have been improving their health condition.

The same perception I was able to recognize in my interviewees, since many of them liked the bicycle with a more healthy living style. They used it rather to lose weight, to keep in shape and even to “at least do some physical activity“, as one of my interviewees answered when he was referring that he didn’t have much time to work out. The possibilities that the bicycle can bring to have a positive impact on the city in terms of environmental improvement like reducing air pollution; for example can be part of some elements that can help to create a better, more inclusive and more sustainable urban development for Mexico City as it has been happening now and people have started to consider the bicycle as a good option, however, this cannot be possible if there is not a plan that includes improvement in infrastructure (bicycle lanes and parking), integration with public transport which would help the programs to have a better reach, education and marketing programs in the civil society, more bicycle access programs and a strong legal framework that can protect the users much better.

However, it is important to take in consideration that there are some other structural negative elements that stop the use of the bicycle and some of them can be studied based in an gender equality perspective. It is important to mention that the results

obtained in this research can't represent or talk about the entire situation of the use of the bicycle in Mexico City; first because the sample that was studied was not representative for the size of the population in the city, however this research can be useful as a thermometer of elements that can be studied in a deeper way, for example the way the cities can be planned to make them more equal and equitable, all this reviewed from a gender perspective. Especially in Latin American cities, where many females don't feel safe to commute alone by different means.

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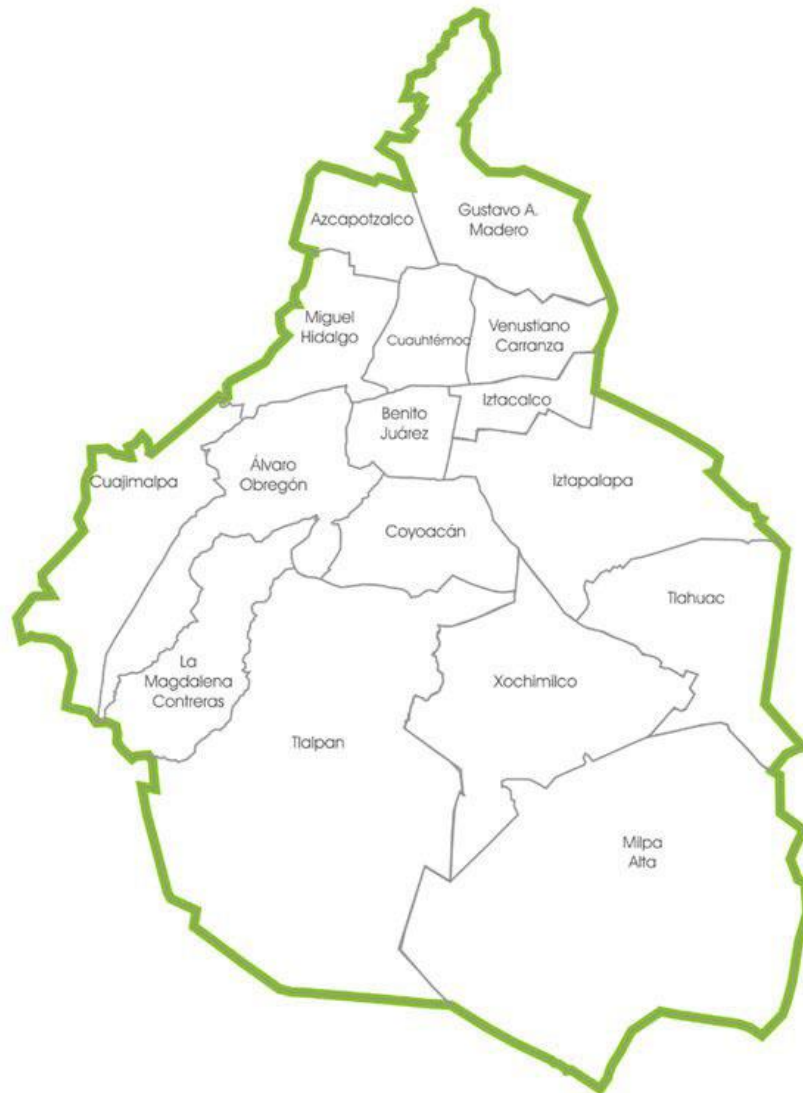
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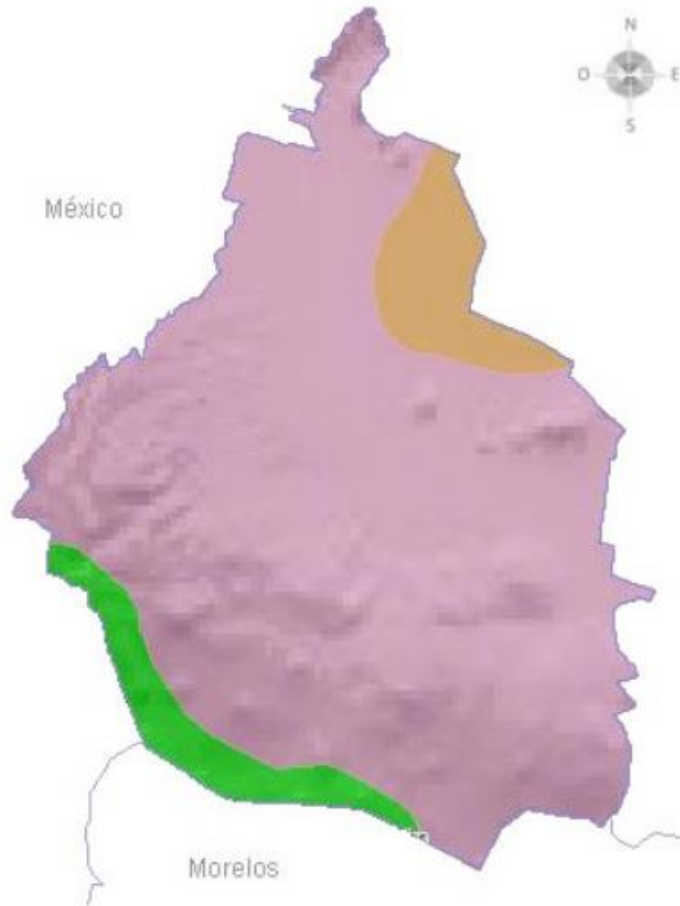
10 Annexed




10.1 Mexico City's political division (Annexed 1)



Source: <http://www.cdmx.gob.mx/cdmx/sobre-nuestra-ciudad>

10.2 Mexico's City types of weather (Annexed 2)



	Dry and Semi dry	7%
	Warm wet	6%
	Subhumid tempering	87%

Source:

Prepared based on INEGI. Climate Chart 1:1 000 000.

<http://www.cuentame.inegi.org.mx/monografias/informacion/df/territorio/clima.aspx?tema=me&e=09>

10.3 Informants' data (Annexed 3)

All the interviews were done during November and December of 2016 in Mexico City. All of them were carried out in Spanish; therefore all the quotes done were translated by the author from Spanish to English.

Gloria Núñez (60)

She lives in Coyoacan Delegation and has poliomyelitis sequelae. She owns a car and bikes all year. She finds in the use of the bicycle a faster and more comfortable way to move through the city.

Jorge Cáñez (31)

He lives in Cuahutémoc Delegation and is member of a Non-Governmental Organization named Peatónito. He doesn't have a car and he cycles all year long. He works actively to protect pedestrian rights.

Hector Patiño (36)

He lives in Coyoacán Delegation, Works in Factibilidad Urbana Total, a company that provides counseling about urban development. He is a cyclist all year long.

Rodrigo González (49)

He lives in Magdalena Contreras Delegation, works for the Local government. He is married and he travels 24 km every day from his house to work. He combines the car and the bicycle to commute in the city, more when he is at work and he needs to move from one place to the other.

Jorge Ramírez (34)

He lives at Magdalena Contreras and he commutes 10 km every day from his place to work, he regularly do that with a bicycle and he also poses a car which usually he uses during the weekends more.

Roberto Villegas (31)

He lives in Iztapalapa Delegation, works at Factibilidad Urbana Total as a counselor in urban development and cycles more than 10 km every day to go to work.

Laura Robles (40)

She lives in Coyoacán, she is mother of two kids and works close to her house. She usually uses the bicycle to make faster home duties like buying groceries. Her family poses a car and when she works night she doesn't use the bicycle because she feels is not safe to do so.

Regina Martinez (22)

She is bachelor student; she lives in Benito Juárez Delegation and uses the bicycle as her main transport system. She says the bicycle have showed her a better way to get to know her city. She does not poses a car.

Rafael Carmona (31)

He lives in Coyoacán Delegation and he is father of two kids. He started to use a bicycle as a way to work out because he has not much time to do so. Today he arrives to work only by bicycle and every day he cycles 16 kilometers in total from home to work and the way back. He as well owns a car.

Carina Aspiazu (32)

She lives in Coyoacán delegation and at the beginning of Eco-Bici launching program she didn't like it at all. However she was forced (due to her location) to use more the bicycle and now she encourage her friends to use it more. She owns a car and she cycles every time she has the chance to.

Elisa Ramirez (63)

She usually uses the *ciclovía* to keep herself active either cycling or walking close to it. She lives in Condesa colony at Cuahutémoc delegation. She was beaten by a bicycle driver while she was crossing the red light one day.

Manuel Rodriguez (42)

He is a taxi driver and he barely uses the bicycle. He has to deal every day with cyclists that according to him are not respecting the signals.

Susana Morales (45)

She works in a candy shop that is very close to a ciclovía track. She considers the cyclist as a danger because they are not respectful of the transit laws.

Esteban López (27)

He is a student and he uses the bicycle to commute everywhere. His family owns two cars, but he always tries to commute by bicycle everywhere he goes, he lives in Coyoacán.

Guillermo Millán (33)

He lives in Cuahutémoc delegation and he works in Benito Juarez. He does not own a car and he commutes by bicycle and by public transport. He mentioned that during the rush hours to have a bicycle is just a blessing.

Pablo Rivera (37)

He lives in Magdalena Contreras and he owns a car, but since he know how is the traffic problematic in the city he agreed with a neighbor and they share a car to get to the city center, once in the city center he is enrolled to the Eco->Bici program and he moves like that in the city.

Edith Ruíz (30)

She lives in Alvaro Obregón delegation. She is mother of a kid and her husband owns a car. She considers herself not that sporty and she has used the bicycle, but she consider is not that functional for her. She prefers her husband drives her to work, but she has admitted she has used the Eco-Bici sometimes during the rush hours and she said they are useful to move more efficient.

Erika Martínez (19)

She is starting the bachelor and she lives in Coyoacán delegation, her university is quite close to her apartment. For her, walking towards university seems a bit dangerous since sometimes she has to take classes after 20:00. The way is too short to drive and too long to walk, that is why she has found in the bicycle a very efficient way to move and feel safe.

Dulce González (45)

She is a dentist and she lives at Cuauhtémoc delegation and she has her consultancy in the same delegation. She owns a car, but since the traffic is sometimes complicated she usually uses her bicycle to move when she doesn't have to bring big things from one place to the other.

Jessica Rodríguez (28)

She works in Cuauhtémoc delegation and she lives at Roma colony, she used to have a car, but she sold it because she recently moved to that part of the city and she found it was quite complicated to move with the car or to find a parking place. She notices that the place she moved to has all the shops she needs so for big distances she can always borrow her dad's car. She cycles every day.