

Disconnected: Investigating the Social and Political Conditions Shaping Mexico City's  
Air Quality Regulatory Environment

by

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A Thesis Presented in Partial Fulfillment  
of the Requirements for the Degree  
Master of Science

Approved April 2018 by the  
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May 2018

## ABSTRACT

Mexico City has an ongoing air pollution issue that negatively affects its citizens and surroundings with current structural disconnections preventing the city from improving its overall air quality. Thematic methodological analysis reveals current obstacles and barriers, as well as variables contributing to this persistent problem. A historical background reveals current programs and policies implemented to improve Mexico's City air quality. Mexico City's current systems, infrastructure, and policies are inadequate and ineffective. There is a lack of appropriate regulation on other modes of transportation, and the current government system fails to identify how the class disparity in the city and lack of adequate education are contributing to this ongoing problem. Education and adequate public awareness can potentially aid the fight against air pollution in the Metropolitan City.

## DEDICATION

To Maria Graciela (Chela) my sister, who influenced me to pursue a college degree and has always motivated me to reach higher and never give up.

## ACKNOWLEDGMENTS

This thesis would have not been possible without the love, support and encouragement of my family, colleagues and friends. Only now have I realize how important it is to have a support system filled with people who are genuine and truly care about you, as your own individual. My parents have always encouraged me to attend college as they did not have the opportunity to do so themselves, and have always reiterated the idea that with a college education, there are many possibilities. I would also like to extend my gratitude to my current supervisor Lisa Lusk, and coworkers who made it possible for me to juggle a full-time job while attending college. Their help and support made it possible for me to continue my education and further my career endeavors.

I also like to thank my committee members, Jennifer Richter, Angela Arzubiaga and Marissa Duarte for assisting me in completing this project. Without their feedback and Professor Duarte's constant encouragement, the fulfillment of this project would have not been possible. Lastly, I would like to recognize Julie Enriquez, a great friend who has always pressured me to persevere no matter what, and to keep moving forward regardless of the obstacles.

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## CHAPTER 1: INTRODUCTION

Mexico City has an ongoing air pollution issue that negatively affects its citizens and surroundings. It is one of many cities that are unable to meet the air quality guidelines set forth by the World Health Organization. Air pollution has been linked to health-related conditions, such as respiratory problems, as well as environmental issues. Public policy literature indicates that the Mexican federal government has attempted to rectify this problem by setting forth several policies and laws to resolve this ongoing issue. Scientists report that the problem stems from an excess of vehicle carbon emissions and the city's quickly growing population. Prior studies conducted on this social issue reveal that the Mexican government has primarily focused on implementing laws and policies, through the Metropolitan Environmental Commission, which is the agency that was created by the Mexican government to regulate this problem and reduce the overall air pollution. However, the focus has remained on private vehicle usage, and creating federal policies and agencies to reduce the amount of vehicles being driven in the metropolitan area. The literature and current legislation process does not identify the implications that other structures or agencies have on this social and environmental issue, or the lack of alternative solutions to resolve the persistent air pollution problem in the City. Therefore, the major questions guiding my research are:

- 1.) What are the major contributing factors to Mexico City's air quality challenges, specifically with regard to transportation?
- 2.) What social and political factors shape Mexico's attitude towards reducing Mexico City's air pollution through regulation of transportation requirements?

Mexico City is known for its cultural abundance and dense population. It is the capital of Mexico, with about 21.2 million residents, 8.9 million of which live in the city (World Population Review, 2018). The city struggles with high levels of smog and high concentrations of air pollution. Mexico City has struggled to keep its air pollution levels below the standardized limits deemed safe and appropriate by the World Health Organization (WHO). Though the Mexican government has implemented several policies and programs to reduce its overall air pollution problem, it has failed to improve air quality. According to Molina and Molina (2002), air pollution and fuel-based emissions negatively impact the environment and contribute to human health issues “by direct inhalation and by other exposures such as contamination of drinking water and food and skin transfer” (14). Mexico City’s air pollution needs to be further assessed so that more effective solutions are identified. This research identifies what the social and political circumstances surrounding this social phenomenon are, and what has been done to resolve this issue. I will accomplish this research by briefly outlining the history and environmental context of Mexico City’s air quality issues from 1980’s year to 2016’s. There will be an in-depth analysis of the current policies and programs created by the Mexican government to improve Mexico’s air quality. Through review and analysis of existing research and literature, interviews with residents living in the city, and an interview with an expert, this research suggests how effective resolutions can be eventually implemented. Essentially, this research shows how the current system infrastructure is not effectively designed to remedy this social issue, and needs to be

improved. If there is no adequate monitoring overseeing this social phenomenon, it will continue to negatively impact the environment and the wellbeing of many individuals.

## MOTIVATION

I am primarily interested in this research project because, as noted by Howard, (2017), air pollution, like other environmental issues, is not viewed as an urgent matter that needs to be resolved. Howard (2017) notes how even fellow scientists fail to note the urgency:

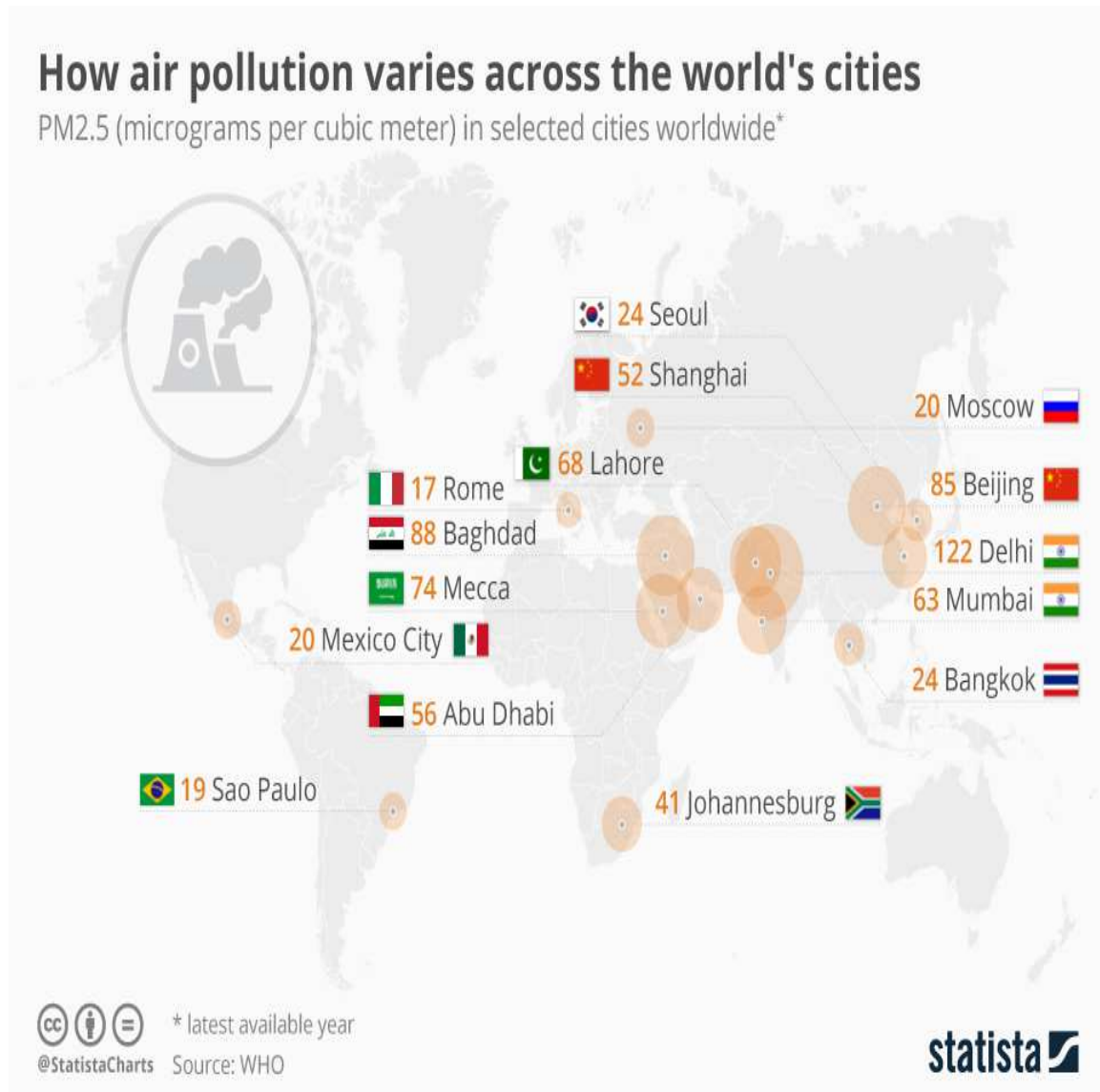
“Despite report after report linking air pollution to deterioration of the lungs, heart and brain, Prof Robert Phalen believes the air is “too clean” for children” (Howard, 2017).

Robert Phalen is an air pollution researcher at the Irvine campus of the University of California and is being nominated by President Trump to become the new lead advisor for the Environmental Protection Agency (Meza, 2018). According to Howard (2017), there are many individuals who are skeptics, and who question the science behind air pollution studies, even in countries where the air is much more toxic. Even though this problem negatively impacts humanity and contributes to a larger problem, for various reasons it is not granted the level of awareness it needs. In 1988, Mexico City’s Ministry of Urban Development and Environment [(SEDUE)], created the general law of ecological equilibrium and environmental protection to combat overall pollution, however it lacked monitoring and enforcement and SEDUE officials seemed unwilling to admit the severity of the city’s air pollution problem (Williams, 2001). Therefore, in order to really understand reasons for this lack of awareness, I decided to focus on Mexico city that continues to struggle with this social dilemma. According to the WHO statistics, Mexico City is one of the many metropolitan cities that deals with an ongoing air pollution problem (McCarthy and Richter, 2016). Figure 1 shows that in the year

2016, Mexico City measured as one of the cities that continues to struggle with air pollution.

Figure 1

World Health Organization, 2016. *How air pollution varies across the world's cities.*



The WHO reports that the average annual particulate matter of less than 2.5 micrometers in diameter should be a total of 10 micrograms (World Health Organization, 2016).

Figure 2 shows the air quality guidelines the WHO created to reduce the health risks associated with particulate matter.

Figure 2

WHO Global Update (2005). Image from *World Health Organization Air Quality Guidelines Global Update*, showing the recommended guidelines for particulate matter.

## WHO 2005 Air Quality Guidelines: Particulate Matter

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PM <sub>2.5</sub>	PM <sub>10</sub>
10 µg/m <sup>3</sup> annual mean 25 µg/m <sup>3</sup> 24-hour mean	20 µg/m <sup>3</sup> annual mean 50 µg/m <sup>3</sup> 24-hour mean

World Health Organization, 2008d



The goal is to have the lowest concentration levels of particulate matter 2.5 (PM2.5) and particulate matter 10 (PM10). The WHO further reports that the average annual particulate matter of less than 10 micrometers in diameter should be 20 micrograms per cubic metre, and 10 micrograms per cubic metre in the annual average emittance of particulate matter less than 2.5 micrometers (World Health Organization, 2016).

Although, the Mexican government has implemented several laws and policies, and has created agencies to combat this issue, it has failed to effectively improve air quality.

According to Malkin (2016), in June of 2016 the City had only registered 20 days of clean air for the year and rest of the days, particulate matter and ozone levels rose above government's limit (Malkin, 2016). I wanted to further research why this is the case in order to get a better understanding of the barriers and obstacles affecting this social issue as well as to provide additional recommendations on how this issue can be further mitigated. Lastly, being of Mexican descent, I wanted to focus on a project that affects the Mexican community and environment.

## BACKGROUND ON MEXICO'S CITY AIR POLLUTION

There are many variables that contribute to the excess of air pollution in Mexico City.

This section reviews known variables and their effects, including the city's topography, rapid population growth, industrialization and the effects of the North American Free Trade Agreement (NAFTA), and popular skepticism about air quality and contaminants. The result of the combination of variables is evident in poor health conditions associated with low air quality.



Geographically, Mexico City is known for its diverse culture, its large population, and for being the capitol of the country. It is the second largest metropolitan city; more than 20 million people live in the metropolitan area. It's highland location makes it a natural crossroads for trade between the arid north, the coasts of the Gulf of Mexico to the east, the Pacific Ocean to the west, and southern Mexico (Encyclopedia Britannica, 2017). The city's geographical location and high population density also contribute to the air pollution issue. The City is located in a valley surrounded by mountains and plateaus and is at a higher altitude than sea level. This causes for there to be less oxygen in the city, which also leads to increased emissions and higher inhaled air pollutants (Molina & Molina, 2002). An additional contributing factor is Mexico City's growth rate, which has been exponential. In the last century, the city grew in magnitude and it began to inhabit more individuals than it could sustain. The transformation from a city of 344,000 inhabitants in 1900 to a vast concentration of 15 million in 1990 has given rise to serious environmental problems, aggravated by the geographical and climatic conditions of the Valley of Mexico basin (Garza, 1996). Essentially, the geographical location of Mexico City cannot support such high population density and the city's expansion. As the city grew, it absorbed agricultural land, which was not suitable for urbanization (Fenn, 2002). As more individuals began to migrate to the city, there was a higher need for resources and development. In order to support the high demand, the government needed to continue to develop the city, and invested in the industrial sector. Industrialization has had detrimental consequences, such as contributing to the overpopulation of the city as well the current air pollution problem.

Mexico City has not always been a megacity focused on industrial and economic growth. During the colonial period (1810-1910), the focus was on agricultural growth and agricultural production. This quickly changed in the late 19<sup>th</sup> century when the city began to expand at an exponential rate. After the Mexican Revolution (1920-1940), the government began to modernize their industrial sector in order to improve their economic sector and also compete with the industrial revolution worldwide. Mexico City began to shift from an agriculturally-based economy, to an industrially-driven economy and focused on improving their means of transportation, increasing their output of fuel, exploitation of coal, increasing foreign investment, and also an increase of small manufacturing companies. According to Lewis (1953), approaching the mid-century, “the latest industrial census showed that Mexico had 53,000 factories, many of them tiny but a good number of them sprawling, modern agglomerations like DM Nacional, Antonio Ruiz Galindo’s industrial city on the outskirts of the capital producing a variety of goods, from office furniture to Fiat cars (Lewis, 1953).” Essentially, manufacturing factories began to flourish and develop around the city causing increased deforestation, and further urban expansion. This ultimately set the platform for Mexico City to be the center of the country’s industrial revolution.

Even though this is no longer the case, many companies and their headquarters continue to be centered in the capital, thus contributing to the air pollution problem. Industries such as CEMEX and automobile companies continue to function out of the city and although they have committed to produce in a more environmentally-conscious method, many still do not abide by the environmental laws. There continues to be

individuals in the industrial sector that do not believe that the industrial sector is a major contributor to the existing air pollution problem in the city.

*Por mis manos pasan muchos documentos sobre los datos a la salud por la contaminación del aire; tengo la impresión de que todos ellos exageran. Si hay ciertos síntomas asociados a ella, pero de ahí un plantear hay una gran diferencia. Yo no tengo las puebinas científicas de esos danos. Por otra parte, la industria tiene cierta participación en la generación de precursores del ozono, quiza tamaño un poco por sus procesos de combustión y algo de tóxicos; pero nada realmente de gran importancia (Lezema, 2000, página 149).*

Through my hands many documents pass about the health damage from air pollution; I have the impression that they all exaggerate. If there are certain symptoms associated with it, but then there is a big difference. I do not have the scientific proof of those damages. On the other hand, the industry has a certain participation in the generation of ozone precursors, perhaps a little bit by its combustion processes and its toxicity; but nothing really of great importance (Lezema, 2000, pg.149).

The main industries in the city are, “maquiladoras specializing in clothing, paper products, and consumer electronics. Chemicals, plastics, cement, and processed foods and beverages are also important” (Mautner, 2017). Furthermore, by 2005 the North American Free Trade Agreement (NAFTA) allowed for multinational corporations to have easier access to conduct business in Mexico. It has also allowed for less restrictive import and export tariffs between Canada, the United States and Mexico, and “negotiations on the North American Free Trade (NAFTA) proceeded to create one of the world’s largest free trade blocs” (Hufbauer, 2005). NAFTA was created to liberalize trade and improve economic growth within North America. This treaty allows lenient restrictions on trade and production between these nations. NAFTA increased the amount of production and manufacturing over the course of the years as well as increased levels of air pollution.

This ongoing air pollution problem has led to detrimental health consequences, which affect those primarily who live in the inner city rural areas. The most vulnerable

populations are the children and elderly who reside in the inner city or slums, and those who have respiratory problems. Those primarily affected are those who are not financially well off as they do not have the resources to relocate or seek medical attention when needed. According to Loomis (1999), it is plausible that children in less affluent countries, and poor, urban children in particular, may be especially sensitive to the effects of air pollution (Loomis et al, 1999). Children living in poverty who may already be suffering from an illness or lack of adequate nutrition, have a higher risk of being affected by air pollution. The smog caused by vehicle car emission pollutants, which contribute to the air pollution issue in this case, has created dire consequences for human health. Eventually, individuals succumb to health-related problems attributed to breathing in these toxins. Pulmonary issues and infant mortality are only a few of the consequences of the air pollution issue in Mexico City (MC). Although pulmonary issues are the most common health-related problem, there have been studies suggesting that air pollution may also lead to cognitive deficiencies. According to Garciduenas and Jardon (2012), by 2008, eight million Mexico City children experienced serious detrimental effects including neuroinflammation, neurodegeneration, and cognition deficits (Garciduenas and Jardon, 2012). The air pollution issue in Mexico City is preventing children from fully developing and thriving. This can potentially cause irreparable damages that can be costly to the individual and a financial burden to the family.

There are other health effects attributed to air pollution, including at the prenatal stage. Some children affected by poor air quality may also be potentially affected in utero. Mothers who are expecting and who are exposed to a high level of air pollution can experience negative effects affecting their baby's lungs and respiratory system. O'Neill et

al (2013) suggests that “although public health interventions that target individual risk factors and behaviors are often emphasized in prenatal care, there is growing recognition that aspects of the environment, including air pollution, can have important consequences for fetal and infant health” (O’Neill et al, 2013). In other words, pre-term delivery can also potentially be a result of the air pollution epidemic in Mexico City. For example, a study of a Czech national birth register in 1991 in 67 districts where at least one pollutant was monitored in 1990 through 1991 indicates that there was a significant correlation between air pollutants and pre-term deliveries (Bobak, 2000). Figure 3 shows evidence from the Bobak (2000) study, indicating numbers of births with data on pollutants, where sulfur dioxide (SO<sub>2</sub>), total suspended particles (TSP), and nitrogen dioxide (NO<sub>x</sub>), each of which appear in high percentages across the trimesters.

Figure 3

Bobak, 2000. Image from *Outdoor Air Pollution, Low Birth Weight, and Prematurity*. showing numbers of births with data on sulfur dioxide, total suspended particles and nitrogen dioxide.

**Table 1. Numbers of births with data on pollutants, and 25th, 50th, and 75th percentile of mean trimester exposures to SO<sub>2</sub>, TSP, and NO<sub>x</sub>.**

Pollutant	Births with data ( <i>n</i> )	Percentile of exposure (µg/m <sup>3</sup> )		
		25th	50th	75th
SO <sub>2</sub>	108,173	17.5	32.0	55.5
TSP	78,148	54.8	71.5	86.9
NO <sub>x</sub>	69,935	23.0	37.7	58.5

The study reported that there was a higher chance of premature birth with a higher level of pollutant exposure to sulfur dioxide, total suspended particles, and nitrogen dioxide. The study data shows that it becomes important to further analyze the overall circumstances surrounding pre-term deliveries, to find a more constructive solution to prevent it (Bobak, 2000). Also, a study was completed in four major Latin American cities to further determine whether premature deaths were associated with air pollution. The data was gathered from 1997-2005, and each city was analyzed through a time span of 5 years for Rio de Janeiro (2001-2005), 8 years for Sao Paulo (1998-2005) and 9 years for Santiago and Mexico City (1997-2005) (Gouveia et al, 2018).

Figure 4

Gouveia et al, 2018. *Summary statistics of daily deaths in São Paulo, Rio de Janeiro, Mexico City and Santiago.*

	<b>Resp&lt;1</b>		<b>Resp 1-5</b>		<b>LRI &lt;1</b>		<b>LRI 1-14</b>	
	<b>n</b>	<b>mean (SD)</b>	<b>n</b>	<b>mean (SD)</b>	<b>n</b>	<b>mean (SD)</b>	<b>n</b>	<b>mean (SD)</b>
<b>Sao Paulo</b>	2177	0.75 (0.94)	763	0.26 (0.51)	1807	0.62 (0.86)	761	0.26 (0.51)
<b>Rio de Janeiro</b>	364	0.20 (0.46)	180	0.10 (0.32)	295	0.16 (0.41)	171	0.09 (0.31)
<b>Mexico City</b>	5808	1.80 (1.90)	858	0.30 (0.50)	4838	1.50 (1.60)	783	0.20 (0.50)
<b>Santiago</b>	413	0.13 (0.36)	113	0.03 (0.19)	368	0.11 (0.35)	124	0.04 (0.20)

Resp = respiratory diseases.

LRI = lower respiratory infections.

*Summary statistics of daily deaths in São Paulo, Rio de Janeiro, Mexico City and Santiago.*



Figure 4 shows that there continues to be a significant correlation between air pollution and premature infant mortality. The results showed that in Mexico City, the average premature death a day associated with a respiratory disease for those younger than one year old was 1.80. Therefore, it becomes important to further evaluate air pollution as it continues to pose health related risks to individuals.

## CHAPTER 2: LITERATURE REVIEW

The following review includes information found in articles, books, online texts, governmental websites, nonprofit organization websites, interviews by residents of Mexico City, as well as an expert on this subject. However, there are several different perspectives and views as to the major contributors to the ongoing air pollution issue in Mexico City. For example, many of the researched texts indicate that the air pollution problem is caused due to an increase of vehicular emissions influenced by the public. Texts that apply this particular explanation outline the different laws and agencies that have been created in order to reduce the amount of vehicle emissions. According to Davis (2008), on November 20, 1989 the Mexico City government introduced a program, *Hoy No Circula* (HNC), which bans individuals from using their vehicles one weekday per week, on the basis of the last digit of their vehicle's license plate (Davis, 2008). This was meant to reduce the amount of vehicle emissions, however, "evidence from vehicle registrations and automobile sales indicates that the program led to an increase in the total number of vehicles in circulation as well as a change in the composition of vehicles being used, and thus higher-emitting vehicles" (Davis, 2008). This program failed to acknowledge other variables contributing to the air pollution, which also contributes to an

ongoing misconception of what may be the additional causes of the problem.

Additionally, some texts fail to recognize that the current law being enforced is only effective to a certain extent, but is not the solution to the problem, in particular as there is no acknowledgement that other factors may also be contributing to the overall issue. This research will attempt to identify these other unnamed factors in order to gain a better understanding of the ongoing problem. It will provide alternative information about how the current policies or laws in Mexico City that are aimed at targeting the air pollution issue are not enough to combat this problem. It will provide some insight on how these laws or agencies are viewed by some of the public, as well as how it ultimately disserves those who it affects. Ultimately, the purpose of the literature review conducted for this project is aimed to get a better understanding of the overall problem and gain more information as to what needs to be further addressed to remedy the problem.

#### LEGISLATION ON THE MATTER

In this section, I will explain the various and current legislation implemented to combat the air pollution problem in Mexico City. The Mexican government is not completely oblivious to the air quality issue in Mexico City. Initially, the Mexican government saw this social issue as municipal issue only, and believed that the pollution derived from the city itself. However, there have been recent studies indicating otherwise. According to Fernandez et al (2013), “scientists have long deliberated about a common airshed in Central Mexico, where atmospheric and geographical conditions suggest that regional air quality is determined by the emissions in all these states” (Fernandez et al, 2013). The Metropolitan Environmental Commission (MEC) has been revamped to monitor the city

and all other surrounding states. The focus is no longer only on the city's pollution, but also on the states surrounding the city.

The Mexican government has acknowledged that they face an ongoing social dilemma that is affecting the public. Though the first air quality program to Improve Air Quality In The Valley of Mexico (PCMA) by reducing vehicle and industrial emissions was implemented in 1979, this program was not enough to address the problem, and thus new regulations were subsequently proposed and implemented (Molina and Molina, 2002). The Mexican government determined that the main contributor of the exerted pollutants of carbon monoxide was from vehicle emissions. According to Nava Escudero (2001), "the 1989 Emissions Inventory for Mexico City identified emission sources by sector dividing them into energy, industry, and services, transport and environmental damage." Thereafter they began to implement several laws that regulated vehicle owners to reduce carbon emissions. However, a description from a 2008 NBC news article says that, "Not long ago, air in this throbbing capital was so bad that cyclists wore surgical masks. Birds fell dead in mid-flight, and children used brown crayons to draw the sky. Ozone exceeded safe levels on 97 percent of days in the year" (Mexico City cleans up its reputation for smog, 2008).

Vehicle emissions are clearly one of the major contributors to the high levels of smog in Mexico City. This is why the government has focused on reducing overall transportation in the metropolitan area. An initiative known as Hoy No Circula (HNC) was implemented in 1989 by the Mexican Government to target the current air pollution issue, and it is in effect to this day. This policy was initiated due to Mexico City having a record of more than 250 days above the standard concentration of ozone levels in the

environment (Rubio and Castaneda, 2016). This program bans cars from being used one day out of the week. This is monitored through the identification of license plates in which the last digit on the license plate number corresponds to a certain day out of the week when it is not allowed to be driven. Since being implemented, this policy has been enforced by the police in all of the metropolitan area. However, only privately-owned vehicles and some commercialized vehicles are subjected to this regulation. Taxis, buses, police cars, ambulances, fire trucks, commercial vehicles operating with liquid propane gas, and commercial vehicles transporting perishable goods are exempt (Davis, 2008).

Furthermore, there are imposed bans and fees if an individual is found to be driving his car during the day he is not allowed to. This holds the driver accountable for contributing to the pollution issue. Although this program is intended to improve air quality and place Mexico City within the appropriate air pollution limits, in practice this law is believed to be counterproductive. According to Davis (2008), HNC actually led to an increase in air pollution (Davis, 2008). Additionally, according to Molina and Molina (2002), “for those who could afford it the answer was to have more than one car, so that old cars were kept at homes as second cars in addition to the new cars acquired” (Molina and Molina, 2002). HNC lacks appropriate enforcement and regulation, as it is primarily aimed at older model vehicles or those that lack catalytic converters (Molina and Molina, 2002). As indicated above, the law is easily circumvented, and people who are able to purchase more than one vehicle, do so. According to Davis (2008), evidence from 1980-2005 indicates that HNC led to an increase in the total number of vehicles registered, and there was an increase of approximately 325,000 vehicles (Davis, 2008). They use one of their other vehicles on the day that they are not supposed to drive, and vice versa. Thus,

this program is aimed at negatively affecting those who cannot afford to have more than one vehicle.

Even though vehicle emissions are one of the major sources contributing to the current pollution dilemma in Mexico City, vehicles are not being properly regulated. Mexico City is a very busy and mobile city; there is constant need for the use of public transportation and taxis. According to Varela (2015), “Public transportation concentrates the majority of trips (58.1%) followed by non-motorized transport (mostly walkers) and private cars (15%). Out of the 24 million daily trips made in public transportation in Mexico City, only 31% are made in mass transport systems like the metro, or Mexico’s BRT system (Metrobus)” (Varela, 2015). However, these modes of transportation are not subject to the Hoy No Circula law, especially if they contribute as much or even more than the allowable carbon dioxide emissions. The commercial transportation sector also contributes to this issue and needs to be addressed. In this section, I provided information as to the different policies and programs that were initiated to combat the air pollution issue. I explained that the first program created was PCMA and it attempted to reduce air pollution by reducing vehicle and industrial emissions, however this did not remedy the problem. I also showed why HNC was enacted and why it is an ineffective air quality program. In the next section, I will explain the science behind the air pollution problem in MC.

## SCIENTIFIC LITERATURE

In this section, I go into detail about what Scientists believe to be cause of the current air pollution problem in MC. Scientists believe that the majority of pollutants in Mexico City are due to vehicle emissions. One of the worst air pollution problems is ozone caused by

transportation (Riveros et al, 2002), leading the government to focus on reducing overall transportation in the metropolitan area. The Federal government has attempted to control this issue through passing of legislation and issuance of ordinances. Currently, the government has implemented several laws focusing on motor vehicle regulations. The inspection and maintenance program, otherwise known as the I/M program, was used as a mechanism to control vehicle emissions. This program monitors vehicle emissions at the tail pipe to ensure that advanced emission control systems installed on modern vehicles work properly (Riveros et al, 2002). However not a lot of cars pass these emission tests, and people continue to use these cars for their everyday use, contributing to the current pollution issue. In 1990, an estimated 3 million vehicles were thought to emit 76% of the total emissions within the Mexico City Metropolitan Area (MCMA) (Bishop, 1997). The I/M program also inspects cars using renovated catalytic convertors. These convertors reduce the amount of emission in carbon monoxide and hydrocarbon. The 1995 vehicle models were emitting 75% less carbon monoxide (CO), 70% less hydrocarbon (HC), and 65% less nitrogen monoxide (NO) than pre-control models (Riveros et al, 2002). However, there is currently a flaw within this program. This program focuses only on privately-owned vehicles and disregards public transportation vehicles that circulate on a daily basis. According to Varela (2015), “The large majority (50.8%) of the trips made by public transport are still characterized by low service quality, poorly regulated and highly polluting minibuses” (Varela, 2015). In this section, I was able to show that scientists continue to believe that the smog in MC is due to excessive vehicle emissions. The evidence reveals that the current methods utilized to reduce the overall vehicle emissions

is flawed and public transportation needs to be better regulated. In the next section, I will explain how international agencies have attempted to reduce worldwide air pollution.

## INTERNATIONAL ORGANIZATIONS

In this section I will explain how international organizations have assisted in reducing overall air pollution and will go over the recommendations as to what they deemed to be appropriate air quality guidelines. In 1992, the World Health Organization (WHO) identified Mexico City as one of the many cities that exceeded the appropriate air quality guidelines and is presently one of the most polluted cities in the planet (Air Quality Surveillance, 2014). To this date, Mexico City continues to be on the radar for exceeding its allowance of air pollutants emitted into the atmosphere. An agency was created by the United Nations to handle health-related issues, which include air quality regulation. WHO is tasked with acquiring information about health-related issues so that they can attempt to mitigate the problem. WHO also determines what the standard is in regard to health-related matters. In this case, it provides air quality guidelines (AQGs) and determines air pollution levels that will cause the least health risks. The WHO AQGs are based on the now extensive body of scientific evidence relating to air pollution and its health consequences (World Health Organization, 2005). This information is utilized to make recommendations and suggestions to nations worldwide.

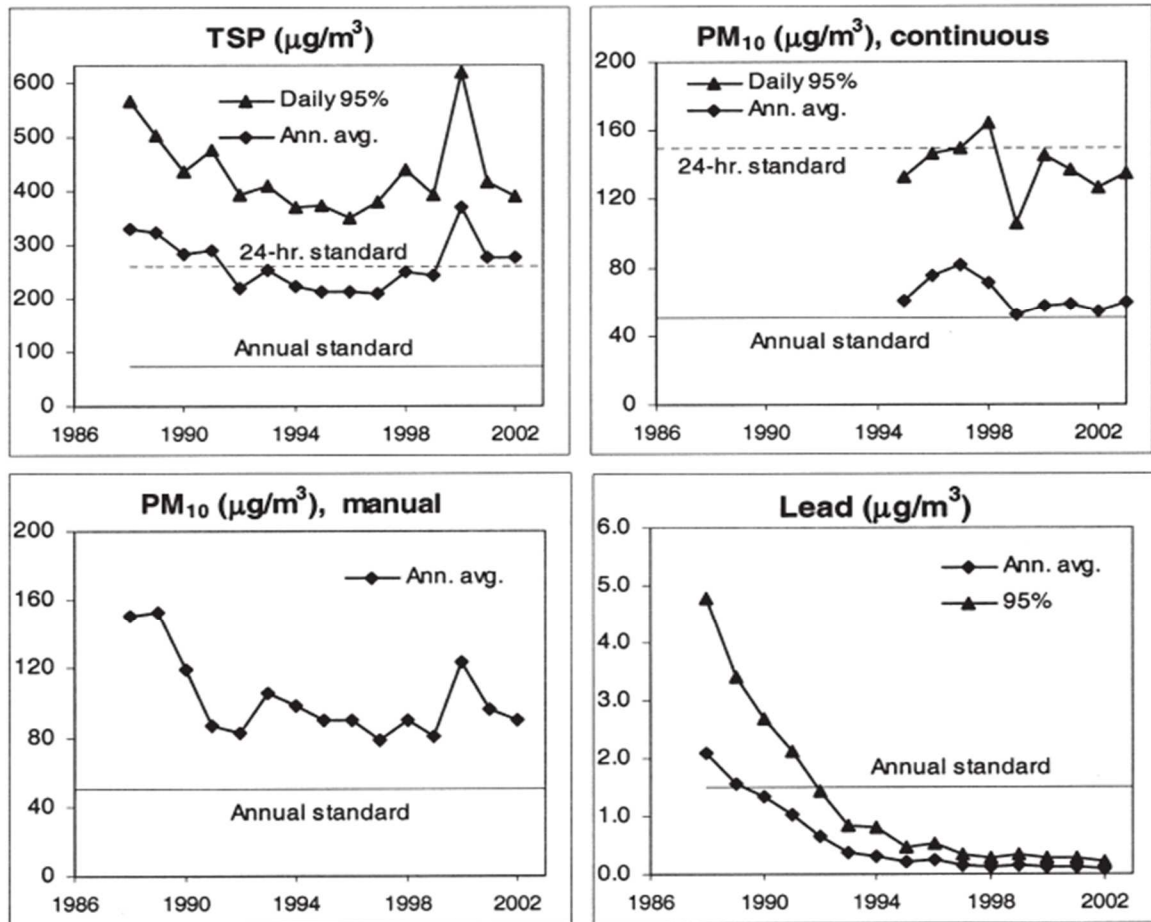
These guidelines are determined by using different levels of measurement, however, they are primarily created based on the depletion of the ozone layer and levels of particulate matter in the atmosphere. Health's risks associated with air pollution and emitted particulate matter are also taken into consideration when drafting these

guidelines. Although, air quality guidelines set forth by the World Health Organization are recommendations, not every country is able to abide by the suggestions set forth, and instead implement their own air quality guidelines. Mexico City is not even close to meeting the WHO guidelines, and nearly doubles the recommended air quality guidelines. Figure 5 shows graphs from a 2002 study examining particulate matter in samples gathered from Mexico City.



Figure 5

Molina and Molina (2002). Graph from *Air quality in the Mexico megacity: An integrated assessment*, showing the annual average particulate matter for Mexico City during 1966-2002.



The goal is to have the lowest concentration levels of particulate matter 2.5 (PM<sub>2.5</sub>) and particulate matter 10 (PM<sub>10</sub>). A study of particulate matter for MC during 1966-2002 shows that from 1990 to 2002 MC surpasses the annual and daily allowable standard of PM<sub>10</sub>- the coarse particulate matter that enters the respiratory tract by nearly double (Molina and Molina, 2002). This same guideline is used to measure the levels of nitrogen dioxide, sulfur dioxide and carbon monoxide.

The high levels of pollution create the pressure to reduce overall carbon emissions. It should be acknowledged, however, that although these guidelines determine what an appropriate level of air pollution is, they are simply suggestions. Each country determines their own air quality index pertinent to their current circumstances and environmental issues. Mexico City is not the exception as they have established their own air quality guidelines, and unfortunately also exceed those guidelines. In this section, I explained why the WHO and UN take on world health related social ills. I explained the WHO's air quality guidelines as well as the associated health risks when exposed to particulate matter exceeding the appropriate air quality guidelines. In the next section, I address the current policies that were created to counteract this issue and discuss the effects of the policies.

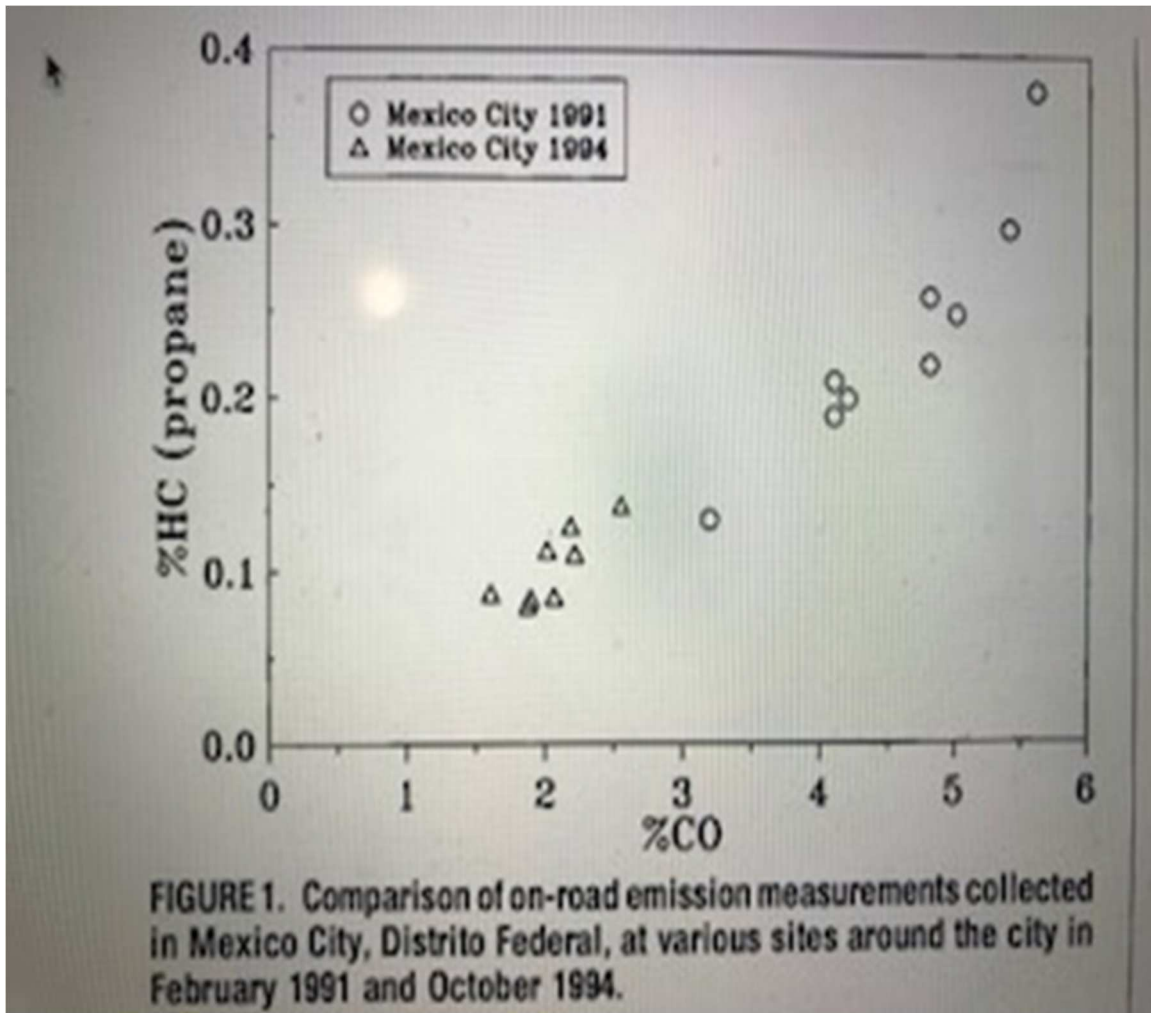
## WHAT NOW?

There was a time when Mexico City managed to improve air quality in the valley of Mexico. With the creation of the Comision Ambiental Metrapolina (CAM), HNC and the Proaire Program, air quality improved. According to Mickinley et al (2005), "the first plan Programa Integral para el Control de la Contaminacion Atmosferica (PICCA)

[Comprehensive Program to Control Air Pollution] was initiated in 1990 and had several major accomplishments, including the introduction of two-way catalytic converters, the phase-out of leaded gasoline, and the establishment of vehicle emissions standards.” This combination led to a decrease of air pollutants being emitted. Figure 6 shows a graph from a 1997 study indicating a decrease of on-road emissions collected at several sites from 1991-1994 (Bishop et al, 1997).

Figure 6

Bishop (1997). Image from, *On-road remote sensing of vehicle emissions in Mexico*, emission measurements collected in Mexico City in 1991 and 1994.



When Mexico City was ranked by the UN in 1992 as one of the most polluted cities in the world, the city was forced to act, and its amount of total suspended particles was cut to 70 percent and ozone levels were dropped to 75 percent (O'Connor, 2010). Although there was some decrease on vehicle emissions in the late 1990s, Mexico City continues to struggle with keeping its air pollutants levels below the appropriate guidelines. It raises the question; will Mexico City risk the gains it made in the 1990s and return to its image as a pollution-choked city? (PRI.org, 2016). In 2016, Mexico City again exceeded the appropriate levels of air pollution standard set by the WHO, which warranted the government to ring the air pollution alarm citywide.

2016 was not the only time that the air pollution levels spiked in Mexico City. The problem can be traced back to the 1980s when the government began to notice that they faced a smog problem. In the 1980s, population growth and economic concentration accelerated air degradation in the Valley of Mexico, which was once poetically referred to as "the region with the most transparent air" (Garza, 1996). However, even prior to this date, there had been already some slight indications that air pollution was starting to become an issue of concern. The government had begun to implement monitoring stations to measure the level of air pollutants, but they were hardly utilized. Although they were increased to 22 stations in the 1970s, they were only used sporadically (Garza, 1996). Furthermore, the increase of population also contributed to the air pollution dilemma. As the city began to grow and get more developed, it became more attractive to those who did not reside there. According to Molina and Molina (2002), by 1950 the metropolitan city was home to nearly three million people, 8.6 million by 1970 and it represented 17.9 percent of the country's population (Molina and Molina, 2002).

Individuals from the neighboring rural areas began to migrate to the city looking for work opportunities and improve their overall lives. However, their migration contributed to the already overpopulated city and depleted its resources, adding to social issues that needed to be address by the local government. Currently this city is unable to meet the demands of its citizens, let alone reduce carbon emissions and improve the air pollution problem.

The literature does not identify the implications that other structures or agencies have on this social and environmental issue. For instance, there is limited information on how major trading manufacturing and transportation infrastructures contribute to the excess of air pollutants in the city. There is also limited information on how the agencies maintaining these infrastructures are being held accountable to ensure that they abide by environmental laws and policies. According to Molina and Molina (2002), from a 1998 preliminary emissions inventory, the industrial sector contributed to 55 percent to the total sulfur dioxide emissions, and 15 percent to the total particulate matter emissions. These emissions were primarily associated with fuel consumption, industrial processes and management of transportation. Pemex was one of the many industries that replaced its industrial gasoil with lower-sulfur diesel, thus decreasing the sulfur content by half of a percent (Molina and Molina, 2002). Since then, Luisa Molina (2017) and other colleagues have continued this research, showing contributions of off-road vehicles and diesel vehicles to particulate matter over Mexico City. Unfortunately, there is limited information as to which other companies have contributed to the air pollution issue and continue to do so. There are many industries that are not registered and therefore there cannot be an exact account for how many industries or which industries are contributing to the air pollution problem.

Additionally, it appears that the Mexican Government is no longer factoring major industries in as a potential contributor towards its current air pollution. In 1995 MC moved its major industries to the northern border of the country and only small to medium sized industries stayed in the center of the city. Also, in 1995 the government implemented SIRG, an integrated system for direct regulation, to oversee and monitor local industry production. SIRG appeared to work with remaining major industries in regulating their pollution emissions, however it failed to incorporate smaller to medium sized industries. Also, by the early 2000s SIRG was in need of improvement when it came to data management (Molina and Molina, 2002). The policy promotes self-regulation instruments to reduce industrial emissions. This allows for companies to complete their own environmental audits in spite of scientific studies exhibiting how industrial development contributes to air pollution worldwide. According to Molina and Molina (2002), there are several other factors that emit air pollutants such as power generation plants, industrial production of goods and services, and the management and distribution of fuels. Furthermore, Thambiran and Diab (2011) state, “globally, the industrial sector is a major contributor to emissions of atmospheric pollution and a significant user of energy” (Thambiran and Diab, 2011). Therefore, it becomes important to continue to monitor and further assess the industrial sector.

Mexico City continues to expand, and soon enough, the city will incorporate other cities nearby as part of its landscape. The industrial sector and commercial sector in Mexico City thrive and add to the current air pollution problem. However, the Mexican government has not completely forgotten about this sector’s role in the environmental community. The government has taken steps to ensure that companies are

environmentally-conscious and has implemented several environmental laws by which companies need to abide to. After Mexico became a part of NAFTA in the 1990s, it created several new policies to ensure that companies were abiding by the established environmental laws. SIRG, for example, encourages companies to participate proactively in preventing and controlling sources of pollution and to incorporate environmental administration systems to allow substantial reductions of emissions and discharges of pollutants into the environment (Aguilar-Alvarez, 2003). Programs like SIRG were established to ensure that companies would not overstep boundaries, and would conduct safe, environmentally-conscious practices. When the Mexican government agreed to take part in NAFTA, the North American Agreement on Environmental Cooperation (NAEEC) was also negotiated and adopted. NAEEC'S purpose is to foster the protection and improvement of the environment in territories of the parties through the Commission of Environmental Corporations (CEC) (Aguilar-Alvarez, 2003). The CEC was created to ensure the protection of environmental and natural resources. If someone felt as though a corporation or industry was failing to enforce the environmental laws, they could file to have that corporation or industry investigated. However, the CEC only makes recommendations, and these are unenforceable, making the recommendations obsolete and leaving companies to set their own environmental standards.

Even though the NAEEC has encouraged many industries to follow environmental guidelines, these types of laws and regulations only apply to those that have some international connection or connection to a nongovernmental organizations (NGO's). According to Raustalia (1997), NGO's are able to submit claims to the treaty secretariat if a party of the NAEEC is not complying with enforcing its domestic



environmental law. However, the reality is that small Mexican companies are not yet able to comply with international standards because they lack the financial resources for cleaner production processes, environmental infrastructure, and technology transfer, among other things (Aguilar-Alvarez, 2003). Small industries do not hold the financial resources, are not equipped to adapt to new laws, and eventually fail to comply with them. According to Chakarbati and Nitra (2005), “the small-scale industry components of the industrial sectors, which contribute significantly to total pollution, are yet to adopt such abatement technology on a wide scale” (Chakarbati and Nitra, 2005). Essentially, small industries have difficulty investing or adopting high tech equipment to reduce its air pollutant emissions. In this section, I was able to provide additional information as to the current programs and policies adopted to combat this problem. I was also able to show how the industrial sector was modified in MC to reduce industrial emissions, however it failed to incorporate all industries contributing to the air pollution. In the next section, I will go over the methodology used to complete this research.

### CHAPTER 3: METHODOLOGY

This research is a qualitative inquiry about air quality issues in Mexico City, specifically with regard to transportation. Methods applied include a brief chronology of the air pollution issue in Mexico City as well as a review of public literature and archival reviews, interviews by an expert on the field and with current residents of Mexico City, and the identification of thematic patterns. The analysis of findings occurs through the lens of a Mexican American woman who advocates for class issues, and is able to discern the link between environment, justice, and class in Mexico City. This project is

specifically important as I have roots in Mexico and I am personally aware of the injustices and class disparity that many endure. Through my interaction with people from Mexico, I have learned to identify what is important to them as well as what is accessible to them. This research is guided by an ethic that is attentive to class and socio-environmental justice in Mexico City.

This research project asks: What are the major contributing factors to Mexico City's air quality challenges, specifically with regard to transportation? What social and political factors shape Mexico's attitude towards reducing Mexico City's air pollution through regulation of transportation requirements?

I accomplish this research through the following steps:

- Briefly outlining the history and environmental context of Mexico City's air quality issues from the 1980s to 2016
- Reviewing scientific literature, public policy literature, websites, and policy papers to identify some of the major actors that contributes to air quality issues in Mexico City
- Interviews with field experts and residents about air quality factors in Mexico City
- Completed an analysis on the findings in regards to the current social and political spectrum shaping the Mexican national government.

Figure 7

Methodological tool used to answer research questions and help with organization.

Research question	Evidence needed to answer research question	Source needed to provide evidence	Methodological tool used to acquire and/or analyze evidence
What are the major contributing factors to Mexico City's air quality challenges, specifically with regard to transportation?	<ul style="list-style-type: none"> <li>-studies of types of different air pollutants,</li> <li>-studies of air quality over time</li> <li>-comparative air quality studies</li> <li>-studies on vehicle emissions and their current contribution to air pollution</li> <li>-studies on environmental regulation of MC's public transport, private transport and manufacturing companies</li> </ul>	<ul style="list-style-type: none"> <li>-newspaper articles,</li> <li>-scientific literature</li> <li>-historical literature</li> <li>-journals</li> <li>-websites</li> <li>-books on the subject</li> </ul>	<ul style="list-style-type: none"> <li>-an analysis of WHO air quality guidelines</li> <li>-an analysis of MC's IMECA Index</li> <li>-interview with field expert</li> <li>-interviews with residents of MC</li> <li>-diagrams</li> <li>-graphs</li> </ul>
What social and political factors shape Mexico's attitude towards reducing Mexico City's air pollution through regulation of transportation requirements?	<ul style="list-style-type: none"> <li>-studies of historical and political background of MC.</li> <li>-studies of current and past legislation to combat air pollution issue.</li> <li>- studies of history of industrialization</li> <li>-studies of health related issues attributed to air pollution</li> </ul>	<ul style="list-style-type: none"> <li>-historical/social literature</li> <li>-political literature</li> <li>-journals</li> <li>-books on the subject</li> <li>-scientific literature</li> <li>-Youtube videos</li> </ul>	<ul style="list-style-type: none"> <li>-an analysis on MC's air pollution history</li> <li>-timeline</li> <li>-an analysis on current legislation and past legislation on the matter</li> <li>-interview with field expert</li> <li>-interviews with residents of MC</li> <li>-diagrams</li> <li>- thematic analysis</li> </ul>

## STATEMENT OF POSITIONALITY

In this section I state my positionality to contextualize why I decided to research the air pollution problem in Mexico City, and how my positionality relates to my methods of research and analysis. I am a current Justice Studies graduate student working towards a graduate degree at Arizona State University. I am primarily interested in learning more about environmental justice, and all of the different parameters that influence this concept. I am also interested in this subject because it affects so many living organisms, and the actions that human beings make as a whole, affect everyone and the environment.

However, from what I have learned through my studies, environmental justice is not a concept that gets a lot of recognition. Environmental justice is a concept that focuses on the fair distribution of goods and environmental risks. It is also the concept utilized to ensure the protection of all individuals, from environmental hazards and access to a healthy environment. According to Agymen et al (2003), “the roots of the US environmental justice movement can be traced to citizen revolts against the siting of toxic waste or hazardous and polluting industries in areas inhabited by predominately minority populations” (Agymen et al, 2003). However, environmental justice is a subject that is often misunderstood and instead is seen by many as a matter of secondary importance. Many even view it as a matter of non-importance because its overall effects are not immediately observed, thus causing many to take for granted a clean environment. These types of issues not only negatively impact the ecosystem, they also affect those who are in a vulnerable position. They primarily affect the general population of Mexico City, specifically those who live in the inner and rural areas of the city. It affects a segment of individuals who are not able to fend for themselves such as children and the

elderly. The individuals who are creating these laws and policies are not the individuals who are primarily affected by them. Oftentimes the proposed remedies are not feasible or realistic.

Therefore, I wanted to focus on this project in order to provide additional research and awareness of poor air quality as a sociopolitical issue. The air pollution issue in Mexico City is a topic that falls within the environmental justice and the social justice realm. It is a topic that needs to be addressed as current policies are not effective. I also wanted to focus on this social problem because it affects a culture that I can relate to. Ultimately, through this research I find that the general population are being placed in a disadvantageous position, in which they are primarily instructed to change their daily routine for a problem that is not only influenced by them. For example, in the policies implemented by the Mexican government for the population residing in Mexico City, the government recommends that the population obtain catalyzed converters in their vehicles, however there is no consideration for the additional expense that this will amount to, and does not take into consideration whether everyone is able to afford it, emphasizing the inaccurate idea that the air pollution problem lies only among the general population, disregarding other more factual possibilities. This research required a fair amount of cultural knowledge, linguistic knowledge, and an understanding of social life and political life in Mexico. Even though as a researcher, I was able to apply my own understanding of Mexican culture, language, history, and politics to help me understand this complex issue, I nevertheless relied on a number of tools to assist me in my research. In the next section, I describe one methodological tool that helped me to better understand the historical and political context of the air pollution issue in Mexico City.

## CREATING A TIMELINE

In order to better understand the persistent Mexican air pollution issue in Mexico City, I began by creating chronological and sociological timelines of the problem. In this research it was important to create these two types of timelines, as it provided a clearer and more thorough understanding of where the issue stems from, as well as what social circumstances influence this issue. Through the creation of a timelines, I was able to view when the problem began to emerge, when it was seen as a problem, and when action was taken by the government to remedy the problem. Through a chronological timeline, I was able to see how urbanization and industrialization ultimately contributed to the persisting problem that Mexico City now has and how it continues to affect it. Furthermore, through the use of a sociological timeline, I was able to identify what organizations have been created to address this type of problem, and how they interact with one another, as well as how they correlate with the state as affected by a certain social phenomenon. This allowed me to get a better understanding of how they influence one another and what their role was in this particular social issue. For example, the World Health Organization is a worldwide agency that was created to address and resolve worldwide health issues, however they hold no enforcement power to enforce these recommendations. They simply can provide suggestions or recommendations on how a certain issue can be resolved. Timelines have been used for centuries to assist individuals to understand a social phenomenon. Historians use timelines to identify critical events and the formation of actors and institutions over policy eras. Sociologists use timelines, “by locating actors as well as categories and network of actors, in time, originators of periodization stories provide macrofoundations for human action” (Katznelson, 2003).

## SOCIOPOLITICAL ANALYSIS

In this research, it was also imperative that an analysis of the socio-political circumstances of the city was completed. A historical, social and political analysis of the social issue is necessary as it portrays the socio-demographics influencing the emergence of the problem as well as what influences its continuation. Through this analysis I was able to see how the policies and programs created to remedy this issue were affected by the current political and social state of the country. Essentially, I was able to visualize how the government prioritizes the issue and how socio-political laws intertwine with one another to ultimately work together in an attempt to remedy the problem. I also researched and reviewed multiple scholarly works including books, websites and scientific reports to learn more about Mexico's air pollution. Through this research I was able to identify the historical context of the problem, major contributors to the problem, the laws and policies that were implemented in an attempt to resolve this problem, and the outcome of it all. However, it also allowed me to see that there is much more that needs to be further evaluated, and that what is being depicted as the main contributor to the excess of air pollution in Mexico, is not just necessarily vehicle emissions.

## INTERVIEWS

I was able to interview a field expert on this topic as well as two residents who are currently residing in Mexico City. These were an important contribution to this research, as they provide a first-hand encounter with this social problem. The field expert, Dr. Cesar Nava Escudero, is also an author of one of the books that I studied, and I decided to research him through Google, and figure out if I was able to contact him. I was able to

locate him and found out that he was currently a professor at the National Autonomous University of Mexico (UNAM). Dr. Escudero is a full time researcher at the institute of UNAM, and focuses on environmental law. I sent him an email asking him if he was willing to provide me with additional information as to Mexico's persistent air pollution problem. He responded in a timely manner and reported that he could, however he would need a list of questions sent to him via email, as he could not complete a phone interview. He indicated that he had a hectic work schedule and could only respond via email. On 10/10/17, I emailed Dr. Escudero a list of questions related to the air pollution issue in MC. I drafted the list of questions with the current information that I had gathered in mind. I wanted to get a sense as to what an expert believed to be the main issue and what recommendations he would have to resolve the problem. I also wanted to know if he could provide me with additional resources or could direct me to another source for more information. On 10/14/17, Dr. Escudero emailed me back with his responses, and a copy of his interview is in the appendix interview transcripts. Dr. Escudero's interview was helpful as it was able to provide me with additional information about this problem as well as aspects that need modification. He reported that the main causes of air pollution are urbanization, population, and lack of adequate public transport. He further reported that if additional information is needed, that I could go review Secretaría del Medio Ambiente (SEDEMA).

On the other hand, the Mexico City residents were able to participate in a telephone interview, and I was able to connect with them through a family friend. I had contacted my sister who is currently living in Michoacan, Mexico. I had asked her if she knew of any one that may live in Mexico City and if they would be willing to speak to



me about the current air pollution problem. She reported that she would check with her husband as he had siblings living in the city, and would get back to me. Her husband then reached out to me and provided me with his sister Olivia's phone number, however he indicated that she normally does not respond to unknown phone numbers, and it was best to send her a message first. I messaged Olivia on 10/03/18, and introduced myself as well as how I was able to obtain her contact information. Olivia reported that her brother had made her aware of this and was glad to help with this research. Prior to the exchange of messages, I had prepared a list of questions, which I believed would provide me with the information needed for this research. I was able to interview Olivia on 10/03/18 at 730pm Arizona (AZ) time. Olivia reported that she is a 44 yr. old female who lives in Mexico City with her son and two sisters. She works in ad advertising and frequently uses her vehicle to go to different establishments around the city to put up ads. I decided to interview Olivia, as I wanted to get information from someone that lives in Mexico City and has directly been affected by the air pollution. I also wanted to know the level of awareness that she had as a Mexican resident of the persistent air pollution problem. Olivia's interview was beneficial as it allowed me to understand the social context of HNC and her viewpoint as to this program. After Olivia's interview was completed, I had asked Olivia if she knew of anyone else that may be interested in speaking to me about this subject. Olivia reported that she had a friend that might be interested and provided me with his contact information. Olivia asked that I messaged him first to schedule a time to complete an interview. I message Olivia's friend Juan on 10/24/17 and introduced myself as well as the purpose of my project. Juan reported that he would be happy to help and we could coordinate a time to schedule the interview. After playing phone tag for a

couple of days, I was able to complete my interview with Juan on 10/26/18 at 830pm AZ time through the app called WHATSAPP. Juan reported that he is 39 yrs. old, and is currently living by himself in Tonante, Mexico City. Juan reported that he is an elementary school teacher and is employed full time. Juan's interview was also useful as he was able to provide me with information as to the lack of education and public awareness of MC's air pollution problem. Juan reported that more education about the subject is needed to really let the public know as to how they too can contribute to remedying the problem. Juan also reported that he did not believe that vehicle emissions are the only source of the problem.

The Mexican residents were able to voice their frustrations at the current program that is in place as they believe that it does not suit to address the actual issue at hand. The goal of the interviews was to discern where the disconnections lay, and how socio-demographics influence their perceptions and thoughts on the matter. In these two interviews I was able to discern that there is indeed a disconnection between what is being addressed and what should be addressed. Although, the residents do believe that vehicle emissions are a contributor to the excess of air pollution in the city, they also believe that is not the only contributing factor. Both of the residents that were interviewed acknowledge that there is an air pollution problem, however they are not in agreement with how the situation is being handled. The Mexico City residents reported that this is not a problem that should be treated as a particular matter, but rather a problem that encompasses many other aspects that are being disregarded. For instance, there is a lack of awareness and education on the matter, and there appears to be limited

resources on educating the public about preventive measures as well additional means of transportation. All of this data was organized through the use of a personal notebook, folder of prior writings, a virtual file of scholarly articles and websites, as well as recorded transcribed interviews and the use of diagrams and identifying terminology. It should be noted that due to time constraints and geography, this is not a representative sample of stakeholder voices. However, the interviews conducted indicate real life social conditions and concerns of residents in Mexico City.

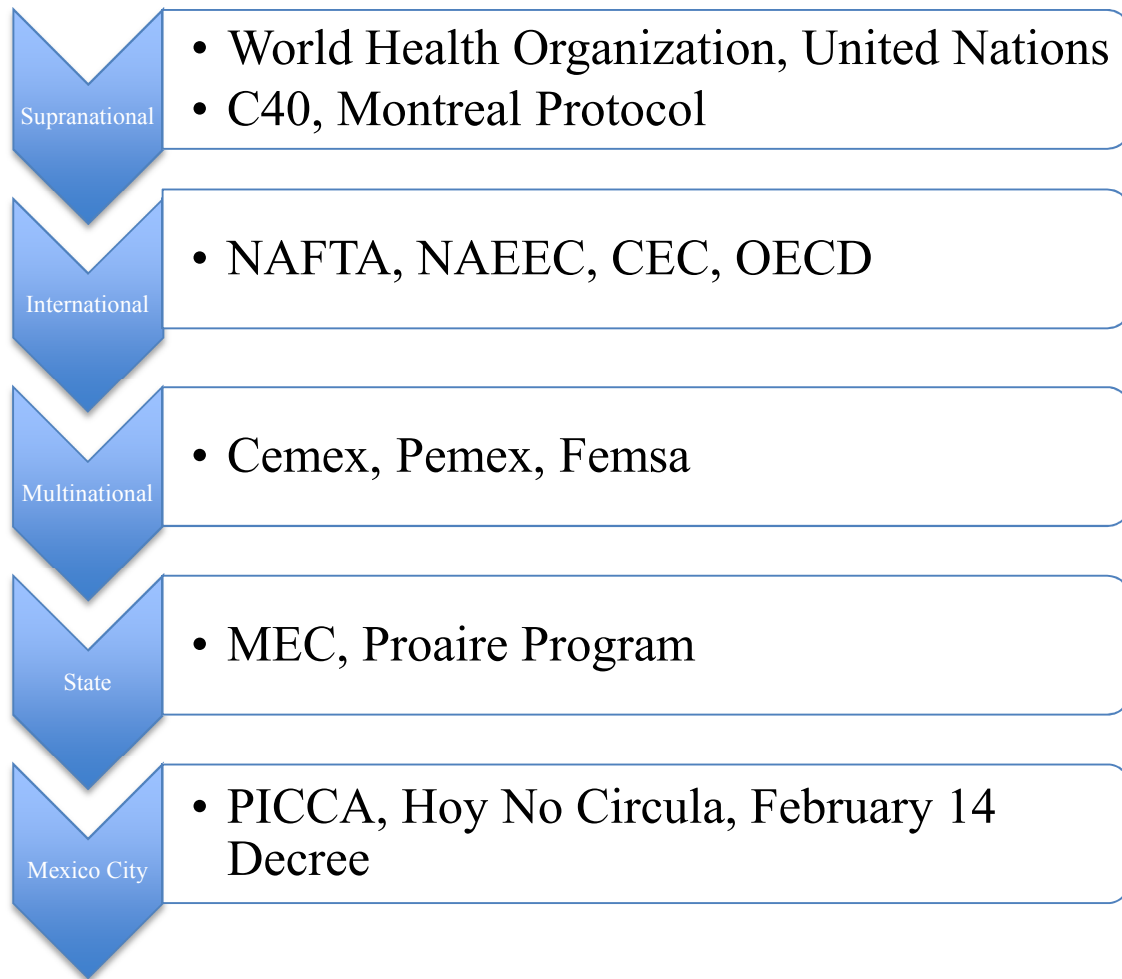
### CREATING SOCIOLOGICAL DIAGRAMS

Lastly, in order to better comprehend a social issue of this magnitude, it became important for me to understand that there are externalities that influence the outcome of the policies implemented to resolve the issue. It was imperative to understand the connections between the agencies that are involved worldwide as well as statewide. Through this technique I was able to identify how these agencies influence one another, what their role is, and the type and level of enforcement they hold. I made the appropriate conceptual connections through the use of a sociological diagram, which I have inserted here in Figure 8. The World Health Organization (WHO), United Nations (UN), Cities Climate Leadership Group (C40), and Montreal Protocol are supranational agencies that oversee worldwide issues. The North American Free Trade Agreement (NAFTA), North American Agreement on Environmental Cooperation, Commission for Environmental Cooperation (CEC), and Organisation for Economic Co-operation and Development (OECD) are international laws and agencies that promote environmental justice and protection. CEMEX, Mexican Petroleum (PEMEX), and Fomento

Economico Mexicano (FEMSA) are multinational corporations that export Mexican goods. Metropolitan Environmental Commission (MEC) and Proaire Program oversees the environmental programs geared to address the environmental issues. Comprehensive Program Against Air Pollution (PICCA), Hoy No Circula (HNC), and February 14 Decree were the policies implemented to combat the persistent air pollution problem in Mexico City.

Figure 8

*Sociological Hierarchical Graph*, some of the several agencies, corporations and laws that govern the air pollution problem in Mexico City.



I first identified the different agencies involved such as the World Health Organization and the United Nations, and where they stood as an agency. I was able to identify additional different types of government and nongovernmental agencies, and placed them in categorical sections through a thematic method scaling from the macro- to the micro-level. I identified the agencies and organizations under the categories of supranational, international, multinational, national, state agencies and city agencies. In this case I was able to identify that there are supranational agencies that embody a duty to address social and political issues affecting those who are marginalized. However, although these agencies may not have enforcement capabilities in many countries, they do place pressure and ultimately can influence the type of policies and laws implemented by a nation. For instance, in this case, Mexico City created the agency called MEC as a result of pressure from the UN and WHO organization. This agency then in turn created the current program currently being used called ProAire, which is overseeing and attempting to reduce the air pollution issue in Mexico City.

Through the use of this diagram I was able to see the lineage that these agencies and programs have between the 1980's to present day, as well as how they intertwine with one another. In order to get further and current information as to how these agencies work with one another, I needed to look up the historical background of each of them. This was not an easy task as there is a lot of information about these agencies and their policies, which created difficulty as far as keeping track of what everything is and what its hierarchical position is.

## THEMATIC ANALYSIS

I was also able to apply a thematic analysis for this research topic. A thematic analysis was useful in this project as it allowed me to see the common themes in the interviews associated with this problem. It appears that there are certain themes that are consistent across all of the different types of literature studied for this project. There were similar patterns across the interview transcripts, audio recordings, files, and research notes that indicate that there are several disconnections that are in fact preventing the reduction of the air pollution in Mexico City. Therefore, it becomes important to highlight these types of disconnections, as they provide additional information to help remedy the problem. Also, this creates additional awareness as to where disconnections occur, and to the fact that there is even more injustice occurring than previously imagined. Essentially, the general population and working class are being identified as the problem and are being treated as scapegoats in this matter, even though they are not the only source contributing to this issue.

## CHAPTER 4: FINDINGS

Results of this research reveal that inadequate public infrastructure and legislative process, ineffective air quality programs, lack of enforcement of regulation of public transport and manufacturing companies, and lack of appropriate regulation on transportation companies are major contributing factors to Mexico City's air quality challenges, specifically with regard to transportation. Results also reveal that class disparity and inadequate public education combine with an inadequate legislative process to shape social and political attitudes towards reducing Mexico City's air pollution through the regulation of transportation requirements. While the following table shows what evidence produced findings per research question, the overall following section describes the abovementioned themes in greater detail.



Figure 9

Methodological table utilized to answer research questions.

Research Questions	
What are the major contributing factors to Mexico City's air quality challenges, specifically with regard to transportation?	<p>Interview with an expert, scientific literature, articles, journals, websites, books, graphs and air quality guidelines by WHO.</p> <p>Ex:</p> <ul style="list-style-type: none"> <li>-The field expert reported that, "El verdadero problema de la contaminación atmosférica es el crecimiento urbano y poblacional junto con el aumento de vehículos y la falta de transporte público adecuado, suficiente, seguro, limpio (Field Expert, pg. 2, question 4).</li> <li>-The field expert reported that, "the real problem behind the air pollution is the increase in urbanization and population along with the increase automobiles and the lack of adequate, clean and safe public transport (Field Exper, pg. 2, question 4).</li> </ul>
What social and political factors shape Mexico's attitude towards reducing Mexico City's air pollution through regulation of transportation requirements?	<p>Interviews with the residents, analysis of policy papers, articles, journals, books, Historical and Political Background of Mexico City, Legislation on the matter.</p> <p>Ex:</p> <ul style="list-style-type: none"> <li>- HNC lacks appropriate enforcement and regulation, as it is primarily aimed at older model vehicles or those that lack catalytic converters (Molina and Molina, 2002).</li> </ul>

In particular, the overarching findings reveal that the current policies governing air pollution in Mexico City, the ProAire Program and Hoy No Circula, have proven to be ineffective in remedying the air pollution issue. Additionally, there are other aspects that contribute to the air pollution problem. In order to reduce the air toxicity in the Mexico City metropolitan area, the findings suggest that there need to be reforms that properly address the ongoing problem. Throughout this research project I discern how the air pollution issue does not necessarily lie within the general population's use of private vehicles, but rather that through the combination of several externalities that also contribute to the augmentation of toxic pollutants in the city. There are socio-demographic aspects that also need to be considered when reevaluating this ongoing problem as they too contribute to the uncontrolled excess of air pollution. Findings show that although, the use of private vehicles is a contributor to the current air pollution, it is not the only contributor that the government should be focusing on. There are aspects that are completely disregarded when evaluating the major contributors to poor air quality. Figure 9 shows how the research questions were answered and what information was utilized to answer each question. In the next section I will go over how the current government infrastructure and legislative process is inadequate to address this persistent problem.

### INADEQUATE INFRASTRUCTURE AND LEGISLATIVE PROCESS

In this section, I will explain how the current governmental infrastructure and legislative process is inadequate to combat the air pollution problem in Mexico City. The expert interviewed suggested that the panel that controls and provides information as to the

nature of the problem should not be made of politicians and governmental officials, but rather scientists and nongovernmental agency experts who have extensive knowledge about the overall problem, as well as social scientists who have ties to the local community primarily affected by this problem. Ideally, international guidelines should not be taken lightly, and should instead be used as measuring unit that all nations strive to abide by. Also, there needs to be more investment in the public transportation sector as well as more regulation for it. The public transportation sector shouldn't be exempted from any policies or laws attempting to regulate the excess of vehicle emissions, as they too contribute to the overall air pollution issue. In this section, I explained that the field expert indicated that nongovernmental officials who have knowledge about the subject should be ones in charge of CAME and international guidelines should be adopted. I also explained, that regulation on public transport needs to be reinforced and implemented. In the next section, I discuss the concerns with Mexico City's air quality programs.

### INEFFECTIVE AIR QUALITY PROGRAMS

The current air quality program is inadequate to address the current air pollution issue in Mexico City. As indicated earlier, organizations such as the UN and WHO hold little to zero enforcement over nations to implement their suggestions and recommendations. The Mexican government instead implements its own guidelines, which are not in compliance with the guidelines set forth by the WHO. In the case of Mexico City, the government created its own monitoring system to monitor its air pollution. The Índice Metropolitano de la Calidad del Aire (IMECA) is the reference value system utilized to monitor real-time air pollutants. Although this system is intended to provide up-to-date information as

to what the level of air toxicity and potential risk to human beings is, it is a system that is flawed: “the authorities in favour pointed out that the Mexican Index IMECA takes into consideration the realistic and particular characteristics Mexico City has and not the ideal ones” (Cesar Nava Escudero, 2001: 143). IMECA is more specific to MC than WHO, but WHO standards are not privileging the drive toward economic development of a country. Although, this IMECA index was created to match the specific characteristics of this country, it was also created to meet its own national goals and to disregard international guidelines. Unfortunately, this does not help as Mexico City continues to exceed the permissible pollutant emissions set forth by the WHO.

Up until recently, air quality management was primarily a function of the federal government. In the early 1990s the local government of Mexico City became more involved in the prevention and control of its air pollution. Although this is the case, the federal government continues to have a significant role and trumps local efforts: “the heavily centralized intervention of the federal government has however been regarded as one of the main factors that has impeded an adequate response to air pollution in Mexico City” (Cesar Nava Escudero, 2001: 190). Accordingly, the local government should be given more legislative and executive power to manage and control the air pollution issue in the city while also adopting and considering international guidelines and recommendations. In this section, I explained how the IMECA Index and HNC is inadequate to combat the air pollution problem in metropolitan area. The evidence shows that the IMECA Index is utilized to meet the national goals of MC and not used to represent ideal goals. In the next section, I discuss the lack of enforcement on public transport companies and manufacturing companies.

## LACK OF ENFORCEMENT OF REGULATION ON PUBLIC TRANSPORT AND MANUFACTURING COMPANIES

Although privately-owned vehicles make up a percentage of the contributors to the air pollution issues in Mexico City, it is not the sole contributor, and should not be treated as such. Public transportation companies and manufacturing companies also emit air toxins and are contributors to the air pollution problem in Mexico City. According to recent statistics, “the city (Federal District) produces around 21.8% Gross Domestic Product of the country” (MexicoCity.com 2018), suggesting that the city continues to be an area that influences the country’s overall gross domestic product. As indicated earlier, the city was at one point in history the core of the industrial sector, and corporations were constructed to be centralized in the valley of Mexico. The government passed laws that focused on the expansion of industrial innovation and aid toward increasing the overall GDP.

*Por lo que respecta al Estado de México, en 1931, el gobernador del estado, Filiberto Gómez, presentó la Ley de Protección a la Industria, que tenía como objetivos: acrecentar el número de empresas e industrias en favor de la promoción del desarrollo de una industria incipiente y propicia la especialización de ramas propias de la región (Rojas y Enciso, 2016, página 119).*

As regards the State of Mexico, in 1931, the governor of the state, Filiberto Gómez, presented the Law for the Protection of Industry, which had as objectives: to increase the number of companies and industries in the entity to promote the development of an incipient industry and promote the specialization of branches of the region (Rojas and Encinso, 2016, pg. 119).

It should be noted, that this was not a Google text translation, but rather a translation of my own, as there are certain words and phrases that do not translate in the correct context if it is translated to a literal definition. In this analysis, it was helpful being bilingual and of Hispanic descent. Rojas and Encinso (2016) indicate that in 1931 there was a law passed by the Mexican government that promoted the increase in corporations and

manufacturing companies within the region, assisting in the creation of the current air pollution problem in the City. Although, a lot of manufacturing companies no longer reside in the city of Mexico, it continues to be a centralized area for other industries: “the main industries of the city are related to construction and the production of iron and steel, textiles and yarn, plastics, furniture and cement” (Mexico City.com 2018). Industries such as CEMEX and automobile companies function out of the city and export their product worldwide. Even though corporations have a commitment to produce in more environmentally-conscious methods, they do not always abide by the environmental laws as they do not believe that their industry is contributing to the air pollution issue. Many individuals in the industrial sector believe that they only contribute to a fraction of the air pollution problem and that personal vehicles continue to be the main source of this problem.

*Cuando se interroga a los miembros del sector industrial sobre las causas que provocan la contaminación atmosférica, estos opinan que, fundamentalmente, se debe al sector del transporte, pero no por el transporte en sí mismo o por un problema que tenga que ver con el uso del vehículo automotor. Se debe a que el transporte privado y sobre todo el público se encuentra en malas condiciones (Lezema, 2000 pg. 149).*

When questioning the members of the industrial sector about the causes that cause atmospheric pollution, they believe that, fundamentally, it is due to the transport sector, but not for the transport itself or for a problem that has to do with the use of the automotive vehicle. It is because the private transport and especially the public is in poor condition (Lezema, 2000, pg. 149).

Essentially, individuals in the industrial sector indicate that the problem continues to rely in the private transportation sector, and that the overall governmental system monitoring this issue, is flawed. In this section, I showed how there is a lack of regulation on public transport and manufacturing companies. The evidence shows that MC continues to be a major contributor to Mexico’s GDP and there are still smaller companies that contribute

to the air pollution problem. In the next section, I discuss the need for appropriate regulation on transportation companies.

#### LACK OF APPROPRIATE REGULATION ON TRANSPORTATION COMPANIES

Since the industrial revolution, Mexico City has embraced a capitalist mentality, which has been reinforced through NAFTA. Industries continue to produce at the rate that is needed to enhance their overall productivity. Currently, public transportation consists of buses, taxis, semis known as combis, and airport traffic. These types of transportation also contribute to the air pollution problem in the city. However, these modes of transportation lack the proper regulations and enforcement: “Again, while private cars are the main source of pollution, they account for only 21.4% of the journeys in the Metropolitan Zone of Mexico City, by mode of transport” (Cesar Nava Escudero, 2017). Escudero explains that although private car usage does contribute to a certain percentage of the air pollution toxicity in the city, it is not the only source of transportation that does so. Figure 10 is an image from Nava Escudero’s study (2001), which suggests that minibuses or combis also comprise a significant portion of city transport.

Figure 10

Departamento Del Distrito Federal (1995). *Journeys in Mexico City by Mode of Transport*, the percentage of transportation made by different modes of transport in the Metropolitan Zone of Mexico City.

<b>Table 7.4 Journeys in Mexico City by mode of transport</b>	
<i>Mode of transport</i>	<i>Distribution of journeys (%)*</i>
Cars	21.4
Buses	3.8
Underground	3.2
Minibuses	42.0
Taxi	3.8
Other (light trains, motorbikes, trolley buses)	5.8
* Overall percentage (100%) is not available	
Source: DDF (1995)	



For the year of 1995, mini buses or combis held 42% of transportation journeys within the city, double the trips made by individual cars. According to Varela (2015), “high-capacity buses have decreased from 42% to 10% of the modal share for public transport trips, and low-capacity buses have increased from 3% to 51% trip mode share for public transport between 1986 and 2007” (Varela, 2015). Even though these minibuses are expected to abide by the current regulation in place, many do not do so. The majority of these vehicles are privately-owned as a result of the high demand in public transport, and during the personal verification process, many drivers are able to bribe their way out of it. According to Segarra and Prasad (2018),

Private owners of Mexico City’s old, high emission public transportation buses have turned into powerful actors who hold political clout. Consequently, public buses are largely unregulated and do not face any kind of emissions restrictions. These proprietors have long engaged in illegal agreements with authorities in order to [act freely](#)” (Segarra and Prasad, 2018).

Figure 11 displays an image of a Combi, also known as pesero.

Furthermore, Juan the Mexican resident who was interviewed for this project reported that there continues to be a lot of corruption in the Verife-Centros. The Verife-Centros is the personal verification process that all cars need to go through to pass the required emissions test. Juan reported:

*Los Verife-Centros en los Estados de México se prestan mucho, decir okay yo pago un poco más de lo que se cobra.. porque mi vehículo pase y pueda circular y entonces digo cierto modo pues es corrupcion” (3<sup>rd</sup> Interview, pg.2, paragraph 4).*

The Verife-Centers in the States of Mexico, [are used in an inappropriate manner, for instance you can] say, okay I pay a little more than what is charged .. [so] my vehicle passes and can circulate and then I [think] in a certain way it is corruption” (3<sup>rd</sup> Interview, pg.2, paragraph 4).

This quote had to be translated in the context being used in Spanish. If I had used Google translate, it would not have made sense. When there are cultural meanings in certain words, they cannot be translated literally. For example, Juan is saying that individuals are able to pay off the people working at the Verife-Centros so that they allow their vehicle to pass the emissions tests and obtain the necessary hologram so that they too can drive, and ultimately this is a type of corruption. However, if this was translated literally, the quote would state, ‘The Verife-Centers in the States of Mexico lend a lot, saying okay I pay a little more than what is charged .. because my vehicle passes and can circulate and then I say a certain way because it is corruption.’ In these types of interviews it is important to understand the cultural sense of the language. Juan’s experience relates to what Altamirano and Ruiz (2016) assert:

the city also engages in a number of practices that actually thwart any attempt at improving air quality: bribery at motor vehicle department offices, public transport in the hands of private business leading to lax regulations, and embezzlement in the administration of Mexico City Metro’s new line, which opened in 2012 and, shortly after, closed for repairs.

Figure 11

Sobre Mexico (2016). *Transportes en Mexico DF*. A Combi, current public mode of transport utilized in Mexico City.



Combis have escaped regulation, as they are not government issued cars, but rather vehicles owned by a private business. Just as privately-owned vehicles would, combis have to go through the process of getting verified through Verife-Centros, in which their emissions would be checked. However, there continues to be doubt as to whether this is being done all the time.

In this section, I showed that private transportation lacks proper enforcement of regulation. The evidence reveals that combis contribute to a major mode of public transport that is not often regulated. The evidence also reveals that corruption happens to be a reason why regulation is not always enforced. In the next section, I discuss how a lack of appropriate public education and class disparity negatively impact the fight against air pollution.

#### CLASS DISPARITY AND INADEQUATE PUBLIC EDUCATION

In this section, I will show how class disparity and inadequate public education contribute the persistent air pollution problem in Mexico City. Poverty is not a cause of air pollution, but rather the government use of misinformation including producing unclear information, contributes to public and industry skepticism about who contributes to poor air quality as well as how the problem should be approached. It is important to acknowledge the various scientific projects revolving around this ongoing problem and how they inform policy; however, these also need to be construed in ways that intertwines with the socio-political demographics of the city. Currently, government authorities and legislators are emphasizing the need for more regulation of privately-owned vehicles through such policies as Hoy No Circula and the promotion of catalytic

convertors in older vehicles. Yet there is no information as to how the government is assisting those who are unable to meet these demands. The majority of the citizens in the city are working class individuals who are making a day to day living. They are not able to accommodate the restrictions placed upon them by the federal government.

There does not appear to be any programs that provide additional incentives to use alternative modes of transportation or incentives to implement a catalyzed converter. Instead, there are foreign investors who advertise their product as the solution to the current air pollution problem. For example, Carlos Slim is a Mexican tycoon who indicates that investing in electric cars are the solution to this ongoing problem. Slim is known for monopoly over communications, real estate development and investments that create Mexico's wealthy upper class (Jong, 2017). Though this may help, Slim is not considering whether members of the general public will be able to afford an electric vehicle. An alternative idea would be if this tycoon were to rearrange his focus and work with the government to implement electric cars as a part of the public transportation system. This could be a type of subsidized investment, and in return, public transportation would become more efficient and environmentally-friendly. This would also reduce fossil fuel combustion in the public transportation sector.

Additionally, findings suggest that the general population being affected by this problem should be able to have a solid input on what gets done on the matter, and public officials should not be the only ones that have say on what gets done to solve the problem. Dr. Cesar Nava Escudero, a professor at UNAM whose focus is in environmental studies, reported that in order to come up with an effective solution to fix this problem, *“que los funcionarios públicos al frente de los entes gubernamentales*

*ambientales no pertenezcan a partidos políticos y que sean expertos en la materia”*

(Escudero Interview, pg. 2 question 5) or, “that the public officials at the head of the governmental environmental entities [do] not belong to political parties and that they are experts in the matter” (Escudero Interview, pg. 2 question 5). Dr. Nava Escudero reported that the governmental officials in charge of making executive decisions in the programs being implemented to address this issue should not belong to a certain political party as this can potentially sway the decision-making, but instead it should be represented by individuals who are knowledgeable about the subject.

The general public also needs to be aware of how they too can help resolve this issue. It appears that there is a lack of awareness as to pollution as a whole. The residents Olivia and Juan who were interviewed for this project reported that they are only reminded of this problem when toxicity levels reach a state that warrants additional measures of precaution. They have been residing in the city for several years now and are somewhat familiar with the city’s pollution issues. When I asked Olivia when was it that she saw more propaganda toward reducing the air pollution problem or using alternative modes of transportation, she indicated that it only occurs during certain seasons:

*Mmm no eso nada más son, ummm, pues, hora si que son por temporadas porque yo le eh visto a principio que es mas (inaudible) cuando hay un exceso de calor porque casi no tenemos nosotros aire que no llueve que no hay nubes es cuando se concentra mas este... la contaminación aquí en la ciudad (1st Interview, PG 5).*

Mmm, not that nothing but are, ummm, then now if they are seasonal because I have seen at first that is more (inaudible) when there is an excess of heat because we almost have no air that does not rain that there are no clouds is when it is concentrated but this ... the pollution here in the city (1st Interview, PG 5).

Olivia states that when there is an excess of heat, and there has not been any rain when there should be rain, the government promotes and tries to reinforce the program Hoy No Circula. This quote also reflects how the Spanish language is translated into English and how it does not make sense if it there is a literal translation. However, this excerpt in Spanish is able to articulate the point of excessive heat when there is an abundance of smog, and I was able to understand Olivia's response perfectly. A program that is not easily explained or articulated to the general population is a program that is bound to fail.

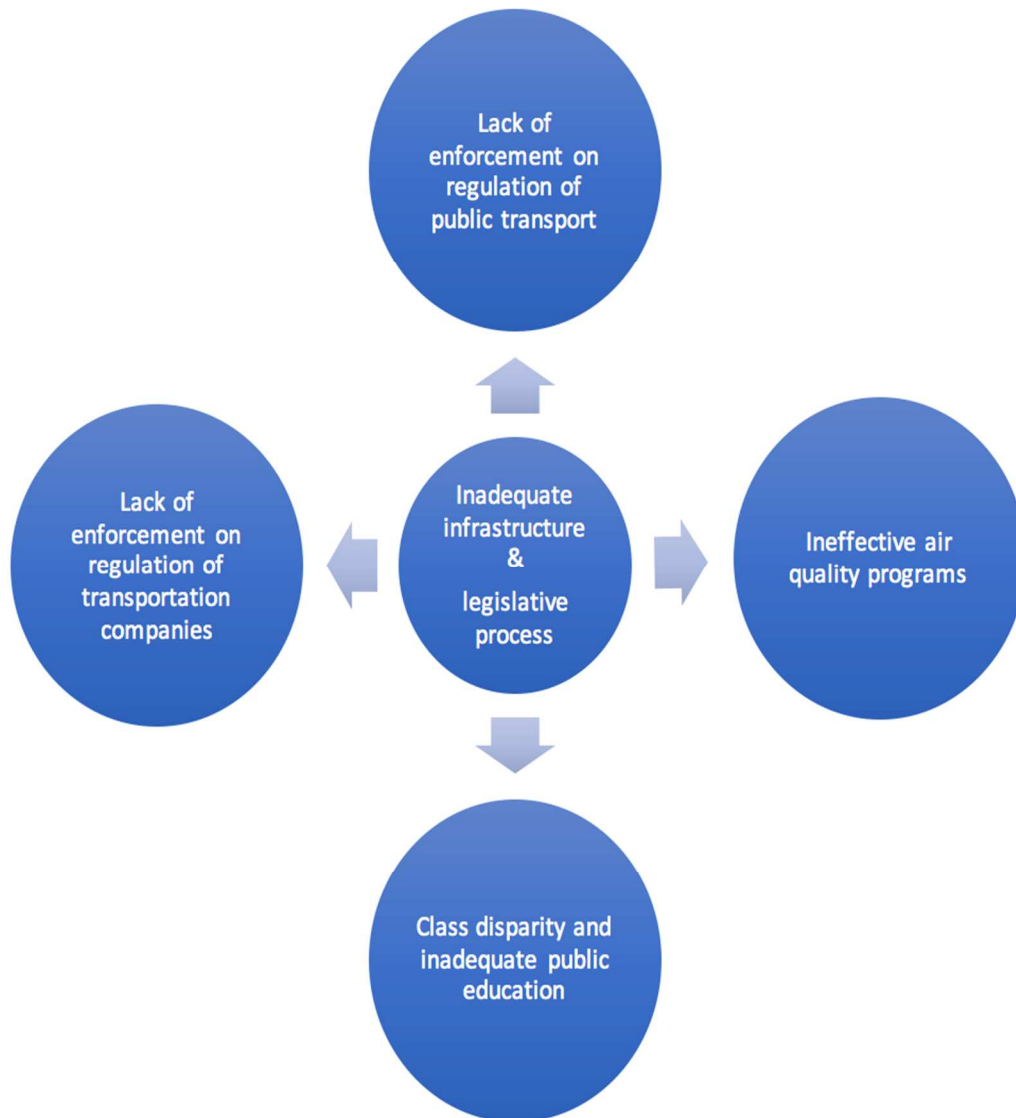
Arguably, people need to be able to understand a problem to be able to contribute to its solution, however I viewed several videos in which many residents of the city stated that they did not believe that air pollution is an issue of concern, but rather another hoax conjured up by the Mexican government. I watched the Youtube videos, *Air Pollution in Mexico City Documentary* (2010), and *Mexico City's Air Pollution* (2013), and "Air pollution alert lifted in Mexico City" (2016). These videos provided visuals of the overall problem and also what some of the residents views on the problem. One of the residents interviewed in the video "Air pollution alert lifted in Mexico City" (2016), reported that the current investment in public transport is insufficient, and that the government has a lot of explaining to in regards with the current use of fossil combustion that is used to produce energy. There also seems to be lack of knowledge among the general population, as well as forms of propaganda. At the moment, the government only utilizes television and radio as methods of transmission for this cause. However, reliable and factual public information is not going to resolve the real issue at hand, which is a lack of adequate research in the matter.

The air pollution problem in Mexico City is not a cause of only privately-owned vehicles, but rather a combination of many interacting socio-political factors. These are: inadequate infrastructure and legislative process; ineffective air quality programs; lack of enforcement of regulation of public transport and manufacturing companies; lack of appropriate regulation on transportation companies; and class disparity and inadequate public education. Figure 12 shows how these factors interrelate. The combination of these conditions reveals that although vehicle-emissions does contribute to the current excess of air pollution and toxicity, it is not the sole cause of this problem and it should not be treated as such.



Figure 12

*Sociopolitical Diagram*, the current factors contributing towards the persistent air pollution problem in Mexico City.



The current figure above reflects the current social and political factors that contribute towards the persistent air pollution problem in Mexico City. Essentially, these factors have a cause-and-effect relationship with one another and create a cycle of ineffective resolutions. The inadequate organizational infrastructure and legislative process leads to ineffective air quality programs and lack of appropriate regulation on all modes of transport, which also results from and in a form of class disparity and inadequate public education on the matter. Essentially, these factors have affected one another, thus resulting in the current air pollution dilemma in Mexico City. Therefore, in order to better comprehend and resolve the problem, all the contributing factors need to be taken in consideration.

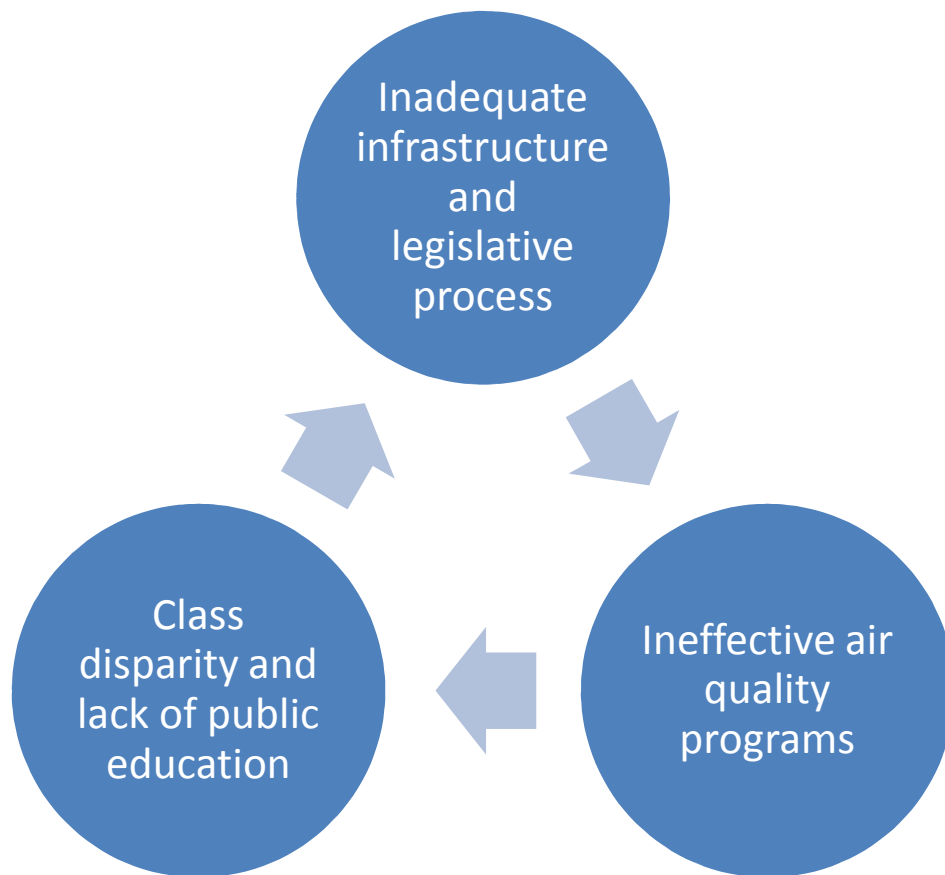
Public transportation is another sector of transport that needs to be further assessed and reevaluated, as it too contributes to the air pollution problem in the state of Mexico. The government has implemented several programs identifying transport as the culprit of this social problem, yet fails to identify what programs have been implemented to regulate public transportation or to better it. The current policy Hoy No Circula appears to only be directed at privately-owned vehicles, however it does not identify how this policy relates to that of vehicles in the public transportation sector. How are buses and combis being regulated, and is it an effective form of regulation? Although, there is information as to potential initiatives being put forward toward investing in alternative means of public transportation, these initiatives continue to be prolonged and extended rather than implemented.

Olivia, the resident of Mexico City who was interviewed for this project, states, *“Servicio de gobierno también lo que es transporte de de de basura, los camiones de*

*basura son los que contaminan demasiado junto con los de servicio público, no tanto es particular*” (1<sup>st</sup> Interview, Page 4, line 52). “Government service also what is trash transport, garbage trucks are those that pollute too much along with public service, not so much is particular (1<sup>st</sup> Interview, Page 4, line 52). Olivia reports that she often sees many vehicles from the public service sector, such as from the waste management department, and they too pollute into the atmosphere, yet are not held to the same standard of regulation as privately-owned vehicles. This resident feels as though the emphasis continues to be placed on the use of particular privately-owned vehicles, which is unfair and unjust. To Olivia, it appears that investing in the public transportation sector is not a priority for the Mexican government. As Olivia stated, the focus continues to be placed on restricting and reducing the amount of privately-owned vehicles and passing laws aimed at regulating this. Ideally, the public transportation sector would be prioritized and revamped, as this would eventually reduce the need to use privately-owned vehicles for transport and would reduce the overall transportation emissions. However, this will only be accomplished when this becomes a topic of priority, rather than just an ideal. In a sense, what this reveals is the cycle among ineffective air quality programs, class disparity and lack of public education, and inadequate infrastructure and legislative process. The interview with the residents indicate that the public would be in favor of a greater participatory role. Figure 13 shows how these form a cycle of ineffective resolutions.

Figure 13

*Sociopolitical Diagram*, the current factors contributing towards the persistent air pollution problem in Mexico City.



In the case of Mexico City, the current inadequate infrastructure is the agency Comisión Ambiental de la Megalópolis (CAME), which is currently governed by politicians and directed by the Federal government. This agency follows legislative processes that may not benefit the real issue, thus leading to ineffective air quality programs. As a result, policies or programs that are not equipped to handle the matter are created, which then leads to a form of class disparity within these programs and policies. This also creates a lack of appropriate public education and awareness on the issue. Considering this cycle, and reviewing these findings in light of this cycle, reveals the need for 1) creating a platform for public engagement and non-partisan expertise; 2) identifying alternative means of transport and pollution assessment; 3) incorporation of a human rights-based model; and 4) adoption of an eco-friendly theoretical approach.

## CHAPTER 5: DISCUSSION

Essentially, there isn't only one contributing factor to the air pollution issue in Mexico City, but rather several factors that contribute to the persistent smog covering the state of Mexico. This research asks two questions. The first question asks, what are the major contributing factors to Mexico City's air quality challenges, specifically with regard to transportation? The second questions asks, what social and political factors shape Mexico's attitude towards reducing Mexico City's air pollution through regulation of transportation requirements? To answer the first question, the findings show that there is lack of enforcement of regulation of public transport and manufacturing companies. There is also lack of appropriate regulation on transportation specifically on combis. To answer the second question, the findings show that the current governmental

infrastructure such as MECA and legislative process is inadequate to combat this problem. Furthermore, the current air quality programs are ineffective as well as there is inadequate education on the matter and class disparity. Therefore, there needs to be solutions created to rectify these issues and it should start by including the public in the decision making process and allowing for CAME to be run by nongovernmental officials, who are experts on the matter.

#### CREATING AN OPEN DIALOGUE AND PLATFORM FOR PUBLIC ENGAGEMENT AND NONPARTISAN EXPERTISE

In order to finally effectively combat this problem, the Mexican government needs to embrace a more environmentally-conscious mentality instead of a capitalist one. The current policies and laws being passed by the politicians in charge of actually accomplishing something in this matter appear to be focused on increasing the GDP instead of improving the air quality in the city. As indicated above many laws and policies have been passed promoting the expansion of industries and corporations at the expense of the environment. Politicians should not be the ones leading the campaign assigned to improve the air quality issues in the state of Mexico but rather individuals who are knowledgeable about the subject and are focused on resolving this matter, and who would not be concerned by partisan political pressures. Furthermore, the level of corruption that exist in this country needs to be mitigated. According to Gan (2016), “the oil and mining industries suffer from poor contract and reporting transparency, ineffective audits and a weak rule of law” (Gan, 2016). Mexico city has a history of dealing with corruption and unless this is diminished, the residents of Mexico City will

not likely partake in a new governmental program. The Mexican residents have lost trust in the government and this is posing a challenge in combating the current air pollution problem. Corruption appears to be a foundation of Mexico City's government and this has led citizens to distrust their government. According to Segarra and Prasad (2016), "any proposed solution will fall short unless the more systemic issue of institutional corruption is not directly addressed."

Also, since this state is a democratic one, it should allow for its residents to be able to contribute to finding a solution to reduce the air pollution. The general population should be able to partake in the discourse as it ultimately affects them as well. There should be a platform or a common ground in which citizens are allowed to provide input on the matter and to learn more about the subject as there continues to be some skepticism as to the problem. Many residents continue to believe that this problem is not an issue at all, but rather another made-up trick by the Mexican government attempting to once again deceive the masses so that they can avoid other socio-political issues at hand such as poverty levels or appropriate healthcare for all. Therefore, educating the masses as to this ongoing issue is an important piece of the puzzle.

The second resident interviewed for this project Juan, indicates that public awareness plays a huge role in making positive social changes.

*Creo que lo que hace falta es más conciencia más conciencia este ambiental y más conciencia cívica ehh aquí en la ciudad. Porque como te comentaba en un momento también hay mucha gente que le da por dejar la basura en la calle y genera la contaminación y eso no es tener ni educación ni la conciencia cívica para pues para mantener una ciudad cívica. Entonces creo, creo así muy muy puntalmente que el gobierno si debería de trabajar mucho en en programas más para cuantificar a la gente de que pues el planeta es uno y no los estamos acabando tristemente (2nd Interview, pg. 6).*

I think that what is needed is more awareness, more conscience, this environmental and more civic conscience, here in the city. Because as I told you in a moment there are also many people who give to leave the garbage on the street and generates pollution and that is not having neither education nor civic awareness for then to maintain a civic city. So I think, I think so very very strongly that the government should work a lot more on programs to quantify people that the planet is one and we are not sadly finishing them (2nd Interview, pg. 6).

This excerpt from the second transcribed interview also needed to be translated to fit the actual meaning. There could not be a literal translation as the excerpt would not make sense. Juan reports that there is a lack of conscientiousness of civic duty, and the general population needs to be more informed as to how they too can contribute to reducing many forms of pollution. Juan reports that there are still many people that often litter, and do not take into account how their actions affect the world. This is not due to any form of malice but instead to lack of proper education and awareness. The government needs to create and implement programs that reinforce the idea of civic duty so that people learn how they are ultimately hurting the planet with their actions.

Although educating the masses is an important step to attempt to lessen the overall air pollution levels in the city, it is not the necessary step that needs to be taken to make an effective change. There appears to be a need for change within the system that is assigned to confront the air pollution problem in the city. The current agency created by the Mexican government, the Metropolitan Environmental Commission (MEC), which is now called Comisión Ambiental de la Megalópolis (CAME), is flawed within itself and is an example of a poorly applied policy that needs to be modified. The governmental infrastructure MEC, originally was designed to resolve this problem only at the Federal District level, which is now Mexico City. However, it did not acknowledge the surrounding cities or states that are also a part of the state of Mexico, and that are affected



by the air pollution. Fernandez et al (2013) notes that, “scientists have long deliberated about a common airshed in Central Mexico, where atmospheric and geographical conditions suggest that regional air quality is determined by the emissions in all these states (Fernandez et al, 2013).” Essentially, additional municipalities surrounding Mexico City are also now a part of the effort to combat the air pollution. This does appear to be a step forward being made by the people in charge of this agency. As the problem is a collaboration among all of the states surrounding the city, and there is now evidence supporting this. However, there needs to be additional support within this system in order to finally make some observable changes.

For example, the Mexican government needs to take into consideration the suggestions and recommendations made by the international agencies. The WHO and the UN are nongovernmental agencies created to address world health issues affecting humanity. Their sole purpose is to come together and find resolutions for social problems affecting all countries. Although, the Mexican government does participate in the conferences held by the WHO and the UN to promote a more sustainable world, there does not seem to be much more action taken thereafter. Essentially, the Mexican government will draft initiatives and show the participants its goals and techniques to create a cleaner environment, yet fail to fully implement its own ideas, let alone implement anything else that is recommended by an outside agency. Therefore, the Mexican government should also take the advice from international nongovernmental organizations instead of dismissing them and not considering them as possible solutions. Although, it is important to construct and implement ideas to fit certain affected areas, the

information provided by these supranational organizations could also be beneficial and effective.

Ultimately, more people that are actually knowledgeable about the subject need to be a part of the collaboration in combating the problem. It is time to stop having polluters run the platforms when it comes to dealing with regional health problems. Although, they are somewhat knowledgeable in the matter, they will always have an ulterior agenda, which always supersede any other issues that need to be resolved. They are ultimately being funded by the same corporations and industries that are not wanting any changes to occur as they would be the primary ones being affected by the change. Having individuals who are knowledgeable and non-biased about the matter running this agency would have more of an influential impact than this agency has had in the last 20 years.

#### IDENTIFYING ALTERNATIVE MEANS OF TRANSPORT AND POLLUTION ASSESSMENT

It is important to identify other solutions or alternatives out there to remedy this social ill. As previously stated, Mexico City has implemented several legislations to reduce the current air pollution that they are experiencing such as Hoy No Circula and vehicle emissions inspections. Unfortunately these laws and regulations are easily circumvented and, instead of helping, they are adding to the problem. It is evident that stronger policies and laws need to be implemented, as well as a better understanding of the overall problem. Not only do they need to be put into place, they also need to be constantly reinforced. Taxis and public transportation vehicles should not be exempt from the implemented policies, and all vehicles should be subject to proper emissions tests.

Although this may help in reducing the amount of pollution in Mexico City, it is not taking care of the problem. Driving restrictions may seem like a sensible alternative because they are relatively inexpensive to enforce and require more sustainable smaller public investments than other alternative policies (Davis, 2008, 41). I believe that the Mexican government needs to start investing in other means of transportation and seeking other sources of energy and fuel. Although vehicle transportation is often a necessity to get from point A to point B, it is not always necessary.

Mexico City should also encourage healthier practices as well as implement them. For example, a cost and benefits model should be created and further evaluated as part of a pathway to a potential solution. The control policy scenario considers the impact of air pollution mitigation measures on the emissions of primary pollutants and the consequent impacts on secondary pollutants (Bell, 2006). The government is currently putting additional resources to fund healthcare initiatives related to the impacts of the current air pollution. However, if this type of model were to be adopted, and the current air pollution issue were to be resolved, these resources could be allocated elsewhere. This model exposes the amount of resources that could be invested into mitigating factors, versus how much resources are being invested into the consequences of the current pollution issue. This model shows that the resources can be properly allocated into finding new forms of energy and fuel, so that the pollution dilemma could be controlled. These are just a couple of solutions that can be taken into consideration as alternative options to remedy this social issue.

## INCORPORATION OF A HUMAN-RIGHTS BASED MODEL

There could still be other alternatives to establish some sort of resolution for this problem. As previously stated, this has been an ongoing issue that the people of Mexico City have had to deal with. The Mexican government has attempted to resolve this problem through implementations of policies and laws that have been unenforced and unsuccessful. I am suggesting that another model be adopted to reinforce the proposed solutions that were previously discussed. This way the Mexican government is more inclined to really deliver and provide an effective resolution. I am suggesting that a theoretical and human rights-based model be incorporated to these solutions so that this issue is no longer left unanswered.

Basic human rights are being violated if nothing efficient is being done to resolve this issue, especially among those who are of low income and cannot afford to move to a new city or state. The children and elderly have become the primary victims that are affected by the lack of appropriate pollution regulation. If non-governmental organizations and the people who are interested in reducing the pollution problem in Mexico City come together and incorporate a human rights aspect to a proposition, then this should expedite the process. These rights include the right to food, the right to work, and the right to an adequate standard of living (Balakrishnan et al, 2016). Currently the population of Mexico can claim that they are not being provided with their right to an adequate standard of living. The environment where they currently reside is filled with harmful toxins. A basic human necessity that the state should be ensuring is currently not being met. Through applying the concept of human rights to a current social issue as well as a proposed solution, I believe that the Mexican government can be pressured into

looking into alternative fuel and energy options. The public will need to mobilize and provide groundwork alongside groups who share common interests. This can be accomplished through the process of networking in person or via social media. This way current infrastructures can be revamped to reflect a more eco-friendly system.

### ADOPTING AN ECO-FRIENDLY APPROACH

Another concept that can provide additional supporting evidence and promote solutions as well as alternatives, is to adopt a more eco-friendly approach. This approach can be utilized to provide awareness to the current pollution issue in Mexico City as well as show how this problem is negatively affecting the environment. Foster (2016) asserts that “today the drive to capital accumulation is disrupting the planetary metabolism at cumulatively higher levels, threatening irreversible, catastrophic impacts for countless species, including our own” (Foster et al, 2016). An eco-friendly approach will provide a foundation establishing that the earth and humans are interdependent, and this should not be taken lightly, reinforcing the idea of preserving the ecology of a healthy ecosystem, and ultimately influencing the government and corporations to utilized more eco-friendly mechanisms when conducting business. Foster (2016) also suggests that the “exploitation of nature will not cease in the future, but man's encroachments into nature will be rationalized, so that their remote consequences will remain capable of control” (Foster et al, 2016). It is important to make connections to critical thinkers and their work as their work proves to be relevant in many aspects of life. The earth is essential for the preservation of humanity, however if humanity continues to exploit it, the earth will also be the destruction of it.

Theoretical approaches provide an additional linkage between human rights and environmental rights. Human rights have finally been acknowledged to be a universal right that every individual holds. However, progress towards acquiring environmental rights has just begun. Therefore, it is imminent to continue to make a connection between sustainability and human rights, as it provides a foundation as to why environmental rights are necessary. We have to understand that “human society exists within the earthly metabolism, continually interacting with its external natural environment in the production of goods, services, and needs” (Foster et al, 2016). This is why it is important to ensure that mankind resolves the issues that we have created through industrialization. There are only so many resources that the earth has, and unless the established institutions modify their way of thinking, the planet will no longer be able to preserve life. This is why it is essential to ensure that issues such as the current pollution in Mexico City are controlled and resolved. An eco-friendly approach will help ensure that there is no further damage being caused to humanity and the ecosystem.

## CONCLUSION

Ultimately, this research provides additional information and clarification as to the existing barriers and obstacles that are currently preventing Mexico City from reducing its high levels of air pollution. As previously reported, there are several factors that contribute to the high level of air toxicity in the state of Mexico. Through this project, I was able to identify that privately-owned vehicles are not the only major contributor to the poor air quality in the city, but rather that there also other externalities that contribute to this problem. There is currently an inadequate system in place that is not properly equipped to fix the problem, and there are other modes of transport that also add to the air pollution issue. Through research of the literature, I was able to identify that there continues to be a common trend in how this problem is perceived. That alone is extremely damaging in resolving the issue as many individuals continue to believe that the problem continues to rely on the fact that the city is oversaturated with personal vehicles.

However, the research shows that this is not the sole cause, and the current programs and policies are ineffective in lessening the air pollution in the state of Mexico. The research revealed that public transportation and vehicles in the commercial and industrial transportation sector are also major contributors to this issue. The current regulation of Hoy No Circula is primarily targeting privately-owned vehicles, and it appears that there are no forms of regulation targeting public transportation or vehicles in the commercial sector, let alone any form investment or innovation to have more environmentally-friendly types of transport. There needs to be a change in the current agency assigned to address this issue, and politicians need to be removed from the

platform of discussion as their decision making is biased and influenced by external opinions. Comisión Ambiental de la Megalópolis (CAME) should be run by individuals who are knowledgeable about the subject, but also able to take advice from international organizations such as the WHO. There also needs to be more investment in public on this subject, and for there to be a more democratic take on the matter, including an approach which is more inclusive of the general population in the decision-making process. Only through this type of collaboration will there be an effective reduction in the overall air pollution in the city. Ultimately, this is necessary as Mexico City continues to be known for its high level of air pollution, and continues to affect those in vulnerable positions. The elderly and children continue to be victims of this social problem, and should not put in a position where they are being exposed to toxic particles and prevented from attending school and living well on a daily basis. Further research on this subject is necessary as there are additional variables contributing to this social issue, and only through knowledge and analysis can there be an effective resolution identified toward addressing conceptual and structural disconnections, and resolving the lingering problem of high air pollution in Mexico City.



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## INDEX

CAME- Megalópolis Environmental Commission, (Comisión Ambiental de la Megalópolis) is the new governmental agency replacing the Metropolitan Environmental Commission.

CEC-Agency created by NAFTA to enforce the environmental laws.

CEMEX- The CEMAX Group is a diversified company of SME Malaysia with diverse and global interests across various business sectors, such as engineering sales & services, advertising & event management, healthcare goods distribution, food & beverage services, and e-commerce (CEMEX.COM)

Cities Climate Leadership Group (C40)- C40 is a network of the world's megacities committed to addressing climate change. They act locally and collaboratively, to reduce both greenhouse gas emissions and climate risks.

February 14 Decree (Policy)- February 14 decree was the first program implemented to counteract the pollution issues in Mexico. This program targeted public transportation vehicles and attempted to renovate them, by replacing old motors with new improved motors, as well create a new transportation system.

FEMSA, Formento Economico Mexicano- is a Mexican multinational beverage and retail company headquartered in Monterrey, Mexico.

Hoy No Circula-Current policy implemented, which prohibits private owned vehicles from being used one time out of the week. (Gov't Policy)

I/M program (Govt. Policy)- A mechanism to control vehicle emissions. This program monitors vehicle emissions to ensure that advanced emission control systems installed on modern vehicles work properly.

MEC-Metrapolitan Environmental Commission that oversees the environmental programs geared to address the environmental issues.

Mexico City-Mexico's capital and a city known for dense population and high air pollution.

Montreal Protocol, (United Nations Environment Programme)-Determined to protect ozone layer by taking precautionary measures to control equitably total global emissions of substances that deplete it.

NAFTA, North American Fair Trade Agreement- is an agreement signed by Canada, Mexico, and the United States, creating a trilateral trade bloc in North America.

North American Agreement on Environmental Cooperation (NAEEC)-Purpose is to foster the protection and improvement of the environment in territories of the parties through the Commission of Environmental Cooperation (CEC).

Organisation for Economic Co-operation and Development- is an [intergovernmental economic organisation](#) with 35 member countries, founded in 1960 to stimulate economic progress and world trade (A United nations observer)

PEMEX- Mexican Petroleum Company, a Mexican state owned petroleum company.

PICCA- In 1990, the Mexico City Government presented the first Comprehensive Program Against Air Pollution, which was a systematic plan to combat air pollution.

ProAire- ProAire II, from 1995 to 2000, the Metropolitan Environmental Commission was created in 1996 to coordinate the combat among the federal and local governments of Mexico City and the State of Mexico. It included strategies for private and public transport, industry, and urban planning, and had time-bound, quantitative objectives.

SIRG-Sistema Integrado de Regulacion Directa, Agency created by the Mexican government that encourages companies to participate proactively in preventing and controlling sources of pollution and to incorporate environmental administration systems to allow substantial reductions of emissions.

United Nations- The United Nations is an intergovernmental organization tasked to promote international co-operation and to create and maintain international order.

WHO-World Health Organization- The World Health Organization is a specialized agency of the United Nations that is concerned with international public health.

APPENDIX I  
INTERVIEW GUIDES



### Questions for Residents/*Preguntas Para Los Residentes*

- 1.) What is your name?
- 2.) How old are you?
- 3.) Where do work? What is your profession?
- 4.) How long have you been employed?
- 5.) What part of Mexico do you reside in?
- 6.) How many people reside in the same household?
- 7.) Can you tell me any information as to Mexico's City air pollution?
- 8.) Are there any other laws or programs that you are aware of that target air pollution aside from HNC?
- 9.) Are there any other programs that support alternative modes of transportation? What are they?
- 10.) Have you seen any type of propaganda supporting the reduction of air pollution?
- 11.) Do you believe the Mexican Government is doing what it needs to do to fix the air pollution issue?
- 12.) Is there any additional information that you would like for me to know?

- 1.) Como se llama?*
- 2.) Cuantos anos tiene?*
- 3.) Donde trabaja? Cual es su profesión?*
- 4.) Cuantos anos lleva trabajando?*
- 5.) En que parte de la ciudad vive?*
- 6.) Cuantas personas viven en su hogar?*

- 7.) *Me puede hablar de un poco de la contaminación del aire en la ciudad de México?*
- 8.) *Hay otro tipo de leyes o programas aparte de HNC que combate la contaminación del aire?*
- 9.) *Hay otro tipo de programas que apoyan alternativos tipos de trasportación?*
- 10.) *Ha visto cualquier tipo de publicación que apoye el reducimiento de contaminación del aire?*
- 11.) *Usted piensa que el gobierno esta hacienda lo suficiente para re solucionar este problema?*
- 12.) *Tiene cualquier otro tipo de información que yo debería saber?*

#### Questions for Expert/*Preguntas para el Experto*

- 1.) What is your job title and what is the nature of the work you do?
- 2.) In your experience of expertise in this problem, how do the environmental regulations laws relate to Mexico City's air quality issues and are they having effect?
- 3.) How does enforcement in the city, by city's officials relate to the federal efforts to improve air quality
- 4.) In my research in this topic, I am noticing that that there are policies, such as hoy no circula, that low income people may not be able to comply with, what is your view on these types of policies?
- 5.) What do you believe needs to happen in order for local government leaders to work more effectively with federal government leaders on this issue to come up with a more effective resolution?

6.) Thank you, if you can recommend anyone else that may provide more insight on this issue, that would be great.

*1.) Cual es su titulo en su trabajo, y cual es el tipo de trabajo que usted hace?*

*2.) En la experiencia que usted tiene sobre este problema, cómo afecta la leyes de regulaciones ambientales con los problemas de la calidad del aire en la Ciudad de México, y si estas leyes están teniendo efecto?*

*3.) ¿Cómo se relaciona las autoridades municipales y las autoridades federales para realizar acabo las acciones para mejorar el medio ambiente?*

*4.) En mi investigación sobre este tema, estoy notando que hay leyes, como hoy no circula, que las personas de bajos ingresos pueden no ser capaces de cumplir, ¿cuál es su opinión sobre este tipo de leyes?*

*5.) ¿Qué cree usted que debe de ocurrir para que los líderes de los gobiernos locales trabajen más efectivamente con los líderes del gobierno federal en este tema para llegar a una resolución más efectiva?*

*6.) Gracias, si usted podría recomendarme a alguien más que pueda proporcionar más información sobre este tema, se lo agradeceré.*

APPENDIX II  
INTERVIEW TRANSCRIPTS

### *First Field Interview*

The 1<sup>st</sup> interview was conducted on 10/03/17 at 7:30pm AZ time. This writer conducted a 21-minute interview with a resident of Mexico City to gather additional information as to the air pollution issue in Mexico City. For the purpose of confidentiality a surname will be given to the interviewee, and she will be referred to as Olivia. Prior to the interview I had exchanged text messages with this resident in order to explain a bit more of the project and the purpose of this interview.

1. **Interviewer:** Perfecto, entonces como te digo me llamo Lucero Garcia, estoy uhh terminando mi uhh maestría con la Universidad de Arizona acá. Estoy haciendo un proyecto sobre la polución que hay en el umm en México umm me puedes decir tu nombre completo?

2. Olivia: Si Rocio Sánchez Bautista

3. Interviewer: Rocio Sánchez Bautista?

4. Olivia: Así es.

5. Interviewer: Okay perfecto.

6. Interviewer: Y cuantos años tienes Rocio?

7. Olivia: 44

8. Interviewer: Okay perfecto, y donde vives?

9. Olivia: En la ciudad de México

10. Interviewer: Y vives sola o tienes, vives con familia, con quien más vives?

11. Olivia: Con mi hijo, con mi hijo y mis hermanas

12. Interviewer: Okay, okay gracias

13. Olivia: Y que um, que es su ocupación, en que, trabajas?

14. Olivia: si así es,

15. Interviewer: Okay en que trabajas?

16. Olivia: ehhh la ocupación?

17. Interviewer: si en que trabajas ?

18. Olivia: este estoy (inaudible) y en lo que es la publicidad de anuncios
19. Interviewer: Okay
20. Olivia: lo que se refiere a lo que es anuncios en todos las oficinas o metro de globo todo lo que se refiere a publicidad?
21. Interviewer: okay todo lo que se refiere a la publicidad, okay, y que tipo de umm publicidad haces para solo una sola agencia, o paras varias agencias?
22. Olivia: es una sola agencia
23. Interviewer: y que tipo de publicidad haces?
24. Olivia: este umm mas que nada hago a lo que es en la pequeñas umm tiendas, pequeñas comercias por decir así que son tiendas, restaurantes, o bares.
25. Interviewer: Okay
26. Olivia: este que son un observancia a los (inaudible) cajas que venden con publicidad.
27. Interviewer: Okay
28. Olivia: En los lados (inaudible)
29. Interviewer: Okay gracias, umm y que me puede decir sobre, que es lo que sabe sobre polución del aire, tienes cualquier tipo de información, o que es lo que tu sabes sobre nada mas en general la polución del aire.
30. Olivia: La polución?
31. Interviewer: Si la polución del aire? Ehhh el aire pues toxico
32. Olivia : ummmm te refieres al afecto en tema (inaudible) o que se puede hacer para que el aire
33. Interviewer: si que es lo que sabes en general pues de la polución de umm que tan dicho a ti algo sobre eso o umm has hablado con alguien umm obviamente en México hay mucha, hay una series de que la po.. el aire puede ser um a veces um toxico verda por toda por.. por uhh
34. Olivia: ahhhh oye
35. Interviewer: No se si te estoy explicando bien

36. Olivia: ahh la calidad del aire

37. Interviewer: si la calidad del, perdón,

38. Interviewer: en México no?

39. Interviewer: si que es lo que sabes sobre la calidad del aire en México?

40. Olivia: este uhh mira lo que pasa, es que aquí básicamente ummm es una ciudad bastante saturada, ya hay muchos autos y cosas que anos atrás no había, oh ya la mayoría de personas tenemos muchos autos, hay muchas fabricas mas que nada alrededor de lo que es la ciudad de México que estamos combinando con los estados, entonces básicamente todas estas ciudades están básicamente ya (inaudible)... la población, entonces lo que hace que deteriorarse, unas fabricas este.. los autos, demanda y entre otras cosas que tiene que ver en cambio del aire, este pues de que se puede decir en ese también de tirar basura, ósea todo incluye son muchas cosas que influyen lo que es la calidad de la... de lo que es el la contaminad lo de que es el aire verdad?

41. Interviewer: mhm..

42. Olivia: es que también mas que nada están iguales por la todo el daño que le estamos hacienda a nuestro país, ósea todo lo que nosotros estamos generando el la decepción de la capa de ozono que contribuye también a la contaminación. En la calidad del aire esta muy mala, muy mala, mas no llueve y no aire pues básicamente no estamos pues este mmmmm quería decirte afectado mas cada día, ano con ano es la calidad del aire esta muy mala

43. Interviewer: mmmm

44. Olivia: y eso así nos puede afectar en muchas cosas umm también no

45. Interviewer: Si correcto

46. Olivia: y pues no se si te había respondido a lo que era tu pregunta o....

47. Interviewer: No si, no no perfecto me respondiste mucho,, uhgg gracias... no umm entonces umm la próxima pregunta es que sabes que es lo que sabes, que es lo que tu ummm como se dice tu..... uh que es lo que tu entiendes sobre las diferente leyes que ha puesto el gobierno de México sobre que por ejemplo hay una ley que se llama hoy no hoy no circula verdad umm que es lo que tu sabes sobre eso... sobre las varias hay varias leyes o nada mas hay una ley? Que es lo que tu comprendes lo que ha puesto el gobierno para poder.. las diferentes leyes que ha puesto el gobierno para poder ayudar ahh con este problema?

48. Olivia: Con este problema que tenemos de la contaminación?

49. Interviewer: Si... de la calidad del aire...

50. Olivia: pues prácticamente no... de eso no yo no le veo el cambio ósea porque nos entorcan nosotros particulares, eh nos exigen nosotros que nos verifiquemos y tenemos que cambiar nuestro, que tenemos cambiar nuestro auto continuamente no,

51. Interviewer: Mhmm...

52. Olivia: tenemos entonces ese tamaño la verificación, para mejorar,

53. Interviewer: uh huh si y puedes hablar un poquito mas despacio porque tengo dificultad en escucharte.... Perdón...

54. Olivia: umm haber no te escucho... a ver

55. Interviewer: uhh si puedes hablar un poquito mas despacio porque no te puedo escuchar muy bien... por favor...

56. Olivia: ah okay estamos igual...

57. Interviewer: Si...

58. Olivia: okay si mira... de hecho yo lo que visto es... el aquí el gobierno de la ciudad de México pues ha implementado lo que es el hoy no circula, no.. este pero yo siento que eso no parece mucho umm no funciona, porque de una manera este los niveles de contaminación no bajan aun con todo aunque pongan un no circula este es eso de contaminación que tenemos porque yo digo pues además viene a tanto el problema de las personas particulares ósea estén en un vehículo particular es algo secundario, en este caso yo siento se genera mas en cuestión en lo que es en la transporte publico porque no tienen un un estricto un reglamento estricto para ellos para poderlos este caucionar porque esto es lo que yo he visto que son los que generan mas este la contaminación..

59. Interviewer: Okay entonces la ley de hoy no circula no es umm implementado al transporte publico?

60. Interviewee: Ahhh ha si si lo es pero es que hay mucha corrupción, hasta mucha corrupción porque muchas veces este pues aunque tengan ellos... el... hecho de verificación este hay mucha corrupción sueltan una lana por delante y pues entonces todos esos vehículos andan contaminando andan por las calles así, ehh entonces ehh nosotros que lo vemos ósea lo que es un servicio de gobierno también lo que es transporte de de de basura, los camiones de basura son los que contaminan demasiado junto con los de servicio publico, no tanto es el particular



61. Interviewer: Mhmm

62. Olivia: Entonces yo siento que las medidas que esta tomando el gobierno de de aqui de la ciudad de México nooo es la correcta ehheh necesita que ser mas estricto en ese aspecto para que pueda mejorar la calidad del aire noo?

63. Interviewer: mhmm okay perfecto..

64. Interviewer: Okay perfecto... y que tipo de ummm como tu dices que tu trabajas para la publicidad y tu pones como serian como ummm posters umm perdón no se como se dice como uhheh umm tu decís que trabajas pues para la publicidad que tipo de de como se dice umm publicidad hay para que pone el gobierno para que ponga una agencia que diga que has visto pues en la ciudad... hay mucha publicidad sobre este problema? O que habla sobre este problema? O que le avisa al publico sobre el problema?

65. Olivia: No de hecho no.. no no hay este... no hay tanta publicidad en esto, mas que los pequeños informes bueno que nosotros ponemos por los que comunican atreves de la televisión o de la radio nada mas publicidad ha si en cierto modo que digan que usen medidas de transportación oh cuestión de cuidar la calidad del aire o cuales son las medidas que veamos o que salgamos por la calle que digan que tenemos que ayudar a la ciudad del tal manera no lo hay ósea.... Físicamente el las medidas de seguridad no las demos de lata ósea una manera por decir... de que..... tenemos un poquito mas de conciencia no para tener una mejor calidad del... de aire.

66. Interviewer: Okay y tu piensas que...

67. Olivia: Físicamente no lo hay

68. Interviewer: Okay.. okay pero en la televisión y en la radio si hay... y es constante los informes? O nada mas es en vez en cuando

69. Olivia: mmm no eso nada mas son ummm pues hora si que son por temporadas porque yo le eh visto a principio que es mas (inaudible) cuando hay un exceso de calor porque casi no tenemos nosotros aire que no llueve que no hay nubes es cuando se concentra mas este... la contaminación aquí en la ciudad.

70. Interviewer: Que tal cuando.....

71. Olivia: Entonces.... en ese aspecto cuando empiezan a tener mas comunicación de que pues la calidad del aire de cómo estamos.... Entonces no es constante... es por por temporadas por decir de una manera

72. Interviewer: umm okay... okay perfecto. Umm okay gracias. Y que tipo de transportación tu usas? Tu manejas?

73. Olivia: Perdón?

74. Interviewer: Okay, que tipo de transportación tu usas, tu manejas o?

75. Olivia: Eh yo un auto particular.

76. Interviewer: Okay tienes un auto particular.

77. Olivia: Uh huh si.

78. Interviewer: Mmm okay...

79. Olivia: de hecho este pues todo hace de que están en poniendo aquí la autoridad, bueno las autoridades que des que desde diez anos para atrás y tu vehículo tiene del ano hacia atrás son diez anos puede circular, no puede circular si ya tienen mas de diez anos de antigüedad tu carro a la fecha no puede circular. Y ya tiene ocho, nueve pues circula todos los días pues entonces es una de las formas que supuestamente el gobierno esta manejando.

80. Interviewer: Okay entonces... Okay Entonces me estas diciendo que los carros que no están que no tienen diez anos... ah que no están mas viejos de diez anos ellos tienen la posibilidad de circular todos los días sin tener que estar registrado

81. Olivia: Así es.

82. Interviewer: Okay perfecto. Entonces umm tu piensas que la transportación es el problema el tipo de transportación particular o el tipo de transportación del publico?

83. Olivia: Pues yo siento que el problema es mas el transporte publico porque pues yo no utilizo la mayoría de la tenemos que pagar una cuota particular y nos movemos en un auto ehh es únicamente para trasladarnos a un lugar por ejemplo a un trabajo por la mañana dejamos el carro y ya por la tarde ya salimos todos. Básicamente es el ir y venir de de la casa al trabajo oh a equis lugar pero no estamos todo el día este... en el auto no entonces yo siento que este problema viene siendo por parte del servicio publico y si hay mucho que si parecen chimeneas y la verdad es humo así que parecen de carbón. Pero si ellos son los que están constantemente yendo y viniendo por solamente por pasaje

84. Olivia: Yo siento que eso es el problema que es el transporte publico

85. Interviewer: ah okay

86. Olivia: ah pues aun así, si te escucho.

87. Interviewer: Y que tal el transporte de comercio? Se ve mucho de eso?

88. Olivia: No te escuche perdón.

89. Interviewer: Que tal el transporte de comercio?

90. Olivia: Este... umm de....

91. Interviewer: Se ve mucho por ahí? Like por ejemplo ummm bueno...como trocas pues esas grandes de que se usan para comercio para...um compañías.. corporaciones.

92. Olivia: Ah ha que hay de circulación no en lo que dices, de por ejemplo

93. Interviewer: Si...

94. Olivia: no se las refrescares, no se los que anden por tiendas asi por las tiendas por decir una forma no?

95. Interviewer: Si se ve mucho de eso en la ciudad?

96. Olivia: Si te escucho.

97. Interviewer: Si perdón digo que si se ve en la pregunta, perdón. Que si se ve mucho de eso en la ciudad?

98. Olivia: Bastante de eso si hay mucho. Mucho transporte de comercio.

99. Interviewer: Y ellos también tienen la misma regla... no se si tu sepas esto la respuesta sobre esta pregunta pero umm ellos también tienen la misma umm regulación que las personas de autos particular también ellos tienen que estar ummm no se si sepas esta pregunta

100. Olivia: umm también ellos?

101. Interviewer: Si de hecho si ese es para todos, se puede decir que es para todos los vehículos que como te lo comente de eh si son autos recientes, (inaudible) circulan igual como si fueran también el transporte publico al igual también de los repartidores de alimentos ósea todos necesitamos a ese programa no

102. Interviewer: mhmmm okay esta bien umm okay gracias. Y la ultima pregunta que te tengo umm bueno tengo dos mas preguntas pero son un poquito mas fáciles umm sabes sobre eh otro tipo de programas o algo algo que el gobierno ah implementado para seguir ayudando o seguir mejorando ese problema pues umm por ejemplo se que hay muchas leyes que hay implementando pero tu dices que no están funcionando verdad?

103. Olivia: Ah ha

104. Interviewer: Umm hay otro tipo de programa, por ejemplo una organización que no sea parte del gobierno que este tratando de ayudar o mejorar la calidad del aire o umm que tu sepas o que te ayeen dicho umm o cualquier tipo bueno para mejorar pues la calidad del aire en la ciudad?

105. Olivia: Este pues no creo que es lo único que aquí el gobierno es lo que ha manejado, no hay alguien en particular o alguien independiente el gobierno no hay propuesto a este... este pues dado una idea por decir así que se implemente aquí como ciudadanos para poder contribuir para mejorar la calidad del aire. No hay nadie más que el puro gobierno, ósea nosotros atracamos nada más lo que dice el gobierno pero alguien en particular pues no nunca se acercado, bueno al menos, nunca se ha sabido del alguien o que se interese para decirnos se puede hacer esto se puede hacer algo particular no por el gobierno

106. Interviewer: Umm okay..

107. Olivia: El gobierno lo único que hizo hace tiempo nada más cuando ya ven que la eh la contaminación... la calidad del aire no baja aun así como un día de hoy no circula ah para todos. Implementa otro día más a la semana ósea ha hemos llegado hasta dos días sin auto a la semana pero aun así con todo no no no ha tenido efecto no habido un resultado favor en cuestión eh de la calidad del aire.. que sea mejor.

108. Interviewer: mmm okay muchas gracias... umm y en unas de tus respuestas dijiste de que hay muchas fabricas alrededor de la ciudad umm que tipo de fabricas hay alrededor? Uh que affec... y dijiste que también afecta ha este problema pero no están tomando en consideración las fabricas.. verdad el gobierno umm

109. Olivia: claro

110. Interviewer: Que tipo de fabricas o a que te referías por eso?

111. Olivia: Ehhh lo que pasa es que ummm no yo me refiero donde yo estoy exactamente este um pues sí ya lo que es límite lo que es la ciudad, por el estado básicamente habido una sola ciudad no entonces es lo que esta afectando, pero son muchos los factores que nos están afectando, que nosotros estamos provocando también igual...

112. Interviewer: Mhmm

113. Olivia: ehhh con el simple hecho de tener menos este mmm arboles o vegetación que puedan también igual para que se mejore la calidad del aire no? Entonces estamos acabando nosotros con esa vegetación de una manera que nos favorecería y en cuestión de las fabricas es que también eh producen mucho... mucho humo no ah eso me refiero a la de las fabricas no es que no hay un control de que yo sepa en cuestión de gobierno que

les imponga algo a o una sanción o un reglamento para que puedan laborar a ciertas medidas en las fabricas pues la verdad no que ellos sepan no las hay.

114. Interviewer: Okay

115. Olivia: Entonces yo creo que tiene que haber algo en el gobierno... bueno ayudar un poquito mas no pare mejorar eso.

116. Interviewer: Ok perfecto. Entonces umm la ultima pregunta es no se si sepas sobre una persona, o otra persona que me pueda ayudar con esto, alguien mas que me pueda hablar con, que tenga también mas información sobre esto? Tengo que hablar con que sea unas dos mas personas y no se si me puedas referir a alguien? Otra persona

117. Olivia: oh ummmm otra, necesitaría ver.... Otra personas este....

118. Interviewer: Si un amigo una amiga oh alguien que también ummm que no sea.... Que parte, sabes que se me olvido preguntarte en que parte de la ciudad, en que umm la ciudad de México per hay una cierta parte, diferente colonia o algo haci? Que se llama?

119. Olivia: ahhhhh okay. Este en que te puede apoyar? Voy a ver aquí en mis contactos y que no este cerca en donde yo estoy pues que sea una diferente colonia no?

120. Interviewer: si a otra persona que no este cerca de donde tu estés que sea, que tenga otro perspectiva, bueno que tenga otra, que viva en una diferente colonia oh otra diferente parte de la ciudad que tu sepas pues.. no es necesario

121. Olivia: Otro punto de la ciudad que vea la la.... Que no vea lo mismo que yo veo al mi alrededor

122. Interviewer: Si correcto... No se si sepas de alguien umm le puedes oh si, no se si les puedas preguntar y luego umm si te dicen que si.. me puedes dar su información umm obviamente si te dan permiso umm si

123. Olivia: si tengo que consultarle yo a pues a ellas si que inclusive creo que ella trabaja en oficinas... ella trabaja creo que en transporte lo que son los medios de transporte

124. Interviewer: uhh si seria perfecto, si..

125. Olivia: Entonces puede ser que ella te da mejores informes como trabajan ellos no? Ósea como ellos cuidan la calidad para no alterar ellos..... el ambiente no

126. Interviewer: si no correcto

127. Olivia: Entonces déjame comentarle yo a ella este... si me da la autorización también igual le voy a decir y hacer (inaudible) porque ella también trabaja.... Para ver que tiempo, que día no se si te urja a ti... para cuando tengas que dar tú

128. Interviewer: Bueno mi papel no lo tengo que entregar, a ver permítame porque voy a terminar ya la la, porque estoy grabándote so voy a terminar la grabación

Interview Ended.

### *Second Field Interview*

This interviewer conducted a second interview with another resident of Mexico City. This interview was conducted on 10/26/17 at 830pm Arizona time. Prior to this interview being completed, I had been communicating with this person via messaging through an app called WHATSAPP. We had been discussing times and dates to schedule the phone interview. For the purpose of this interview and to keep the individuals confidentiality, the interviewee will be referred to as Juan Lopez. This interviewer began by informing Juan through text message about the interview and what it entails.

1. Interviewer: Estoy.. voy a empezar a... a grabar la conversación okay, como le dije me llamo Lucero Garcia, estoy tratando de aprender información para mi proyecto.. umm me puedo decir su nombre completo por favor?

2. Juan: Mi nombre completo es Alfredo Araujo Rivas (Juan Lopez)

3. Interviewer: Perdón... Alfredo?

4. Juan: Araujo Rivas

5. Interviewer: Okay perfecto, y cual umm cuanto anos tienes Alfredo?

6. Juan: 39

7. Interviewer: Okay y en que parte de umm la ciudad de México vives?

8. Juan: Vivo en tonante de la ciudad de México muy cerca de Santa Fe.

9. Interviewer: Okay... okay... y quien vive con usted, vive solo o vive con otra persona?

10. Juan: Eh yo vivo solo

11. Interviewer: Okay.. Ehyy que me puede decir usted sobre la continua... contaminación que hay en en la ciudad de México del aire, que es lo que sabe usted sobre eso?

12. Juan: Okay me... me pregunta sobre la contaminación
13. Interviewer: Si que es lo que ...
14. Juan: Supongo que te refieres a la contaminación del aire o a la contaminación en general?
15. Interviewer: Si la contaminación del aire
16. Juan: Okay mira eh aquí en la ciudad de México ay un programa que se llama hoy no circula no se si has oído hablar de el.
17. Interviewee: Mhmm
18. Juan: Este programa ehh de acuerdo al modelo de tu automóvil, hace que tu auto después de ocho años de uso ehhh no lo puedas utilizar una o dos veces por semana. Pero desafortunadamente hay mucha corrupción en esto y pues a veces tu automóvil puede circular todos los días. En teoría esto disminuirá mucho la calidad, la cantidad perdón, de contaminación que se genera por tanto automóvil. Pero lo que si el país no ase es frenar un poco la contaminación en este caso de fabricas, porque no existe un día sin fabricas por ejemplo. Entonces eso también ayudaría mucho a reducir, por otro lado considero que también es necesario que el país haga realmente una buena inversión una fuera inversión para que para que los automóviles muy viejos y en muy mal estado mecánicamente salgan totalmente de circulación. Y obviamente se queden los automóviles que están en estado conveniente y menos contaminan.
19. Interviewer: Mhmm okay ... y cuando hablaste sobre la corrupción, a que te refieres?
20. Juan: Ehh mira, en teoría aquí los automóviles deben de tener un cierto limite de emisiones contaminantes para poder ehhh pasar obtener el ológrafa que te permite circular ciertos día le semana o todos los días de la semana
21. Interviewer:Ok
22. Juan: Pero hay los lugares que hacen esto tipo de practica se llaman, aquí en México se llaman verife-centros. Los verife-centros en el estado de México se prestan mucho decir, okay yo pago un poco mas de lo que se cobra porque... porque mi vehículo pase y pueda circular y entonces digo de cierto modo pues es corrupción. Aquí en el distrito federal hasta hace hasta este año ehhh los verife-centros entre familias dejaron de hacer no, ahora todo es normal. Y si tu automóvil contamina o simplemente no pasa. Si tu automóvil este esta en buen estado pues obviamente puedes utilizar, circular todos todos los días. Entonces este los días que te corresponden de acuerdo al modelo de tu automóvil.
23. Interviewer: Okay...

24. Juan: Ehh esto afecta en gran medidas porque, pues obviamente no hay un control. Estamos, vivemos en una ciudad que cree que constantemente, pero que también en parte vehicular esta (inaudible) demasiado.

25. Interviewer: Uh huh

26. Juan: Obviamente las clases sociales están muy marcadas aquí en la capital porque hay quien puede comprarse uno o dos o hasta tres automóviles y hay quien al mejor hizo un gran esfuerzo o compro un automóvil y lo traen aquí trabajando eh en muy mal estado pero desafortunadamente el salario que el tiene no es tanto para acceder un nuevo automóvil o a lo mejor uno de... uno mas eficiente

27. Interviewer: Okay

28. Juan: Entonces considero que aquí son muchas cosas realmente las que... las que se están ehh acumulando que obviamente no son los automóviles ni las fabricas como te comentaba ase un momento

29. Interviewer: Uh huh

30. Juan: Eh considero que también ehh la cultura fisica de la gente que de repente tira basura en la calle eh los ríos de aguas negras que hay aquí que a veces no son desazolvados y limpiados y eh todo eso incluye porque al fin de cuentas es contaminación para el miedo ambiente.

31. Interviewer: Correcto, umm y okay gracias y también umm perdón se me olvido preguntarte en.... en en que trabajas, si me puedes decir?

32. Juan: Uh yo soy este profesor de tecnología en una escuela primaria.

33. Interviewer: Oh okay. Oh okay.

34. Interviewer: Y cuantos anos has trabajado allí?

35. Juan: Eh aquí es mi tercer ano trabajando.

36. Interviewer: Okay, okay gracias. Umm okay gracias y me puedes decir um so umm entonces tu habías hablado sobre um la ley de hoy no circula conoces sobre otras leyes que hay? Para ..

37. Juan: Para... específicamente para.. para evitar la contaminación del aire?

38. Interviewer: Si



39. Juan: El hoy no circula tiene unas variantes eh por ejemplo el hoy no circula es un plan de donde la cosa la terminación del numero de placa de tu automóvil deja de circular un día a la semana.

40. Interviewer: Mhmm

41. Juan: Como te comentaba al principio son algunos automóviles que tienen este ...cierta antigüedad por ejemplo los automóviles que son nuevos de agencias eh en los dos primeros años circulan todos los días, después del tercer año obtienen otro holograma igual también circulan todos los días. Pero ehh parece que después de el sexto año empiezan a dejar ósea dejan de circular un día a la semana y los que llevan mas de ocho años dejan de circular dos días a la semana. Los carros ya mas viejos ehh no circulan ningún sábado y descansan un día entre semana también.

42. Interviewer: Okay

43. Juan: Y por ejemplo cuando el nivel de contaminación sube mucho aquí este hay un plan dentro de hoy no circula que se llama doble hoy no circula. Entonces este plan este no se hace (inaudible)

44. Interviewer: Hay perdón... perdón no te puedo escuchar ya se a perdido la señal

45. Juan: Okay... este en donde te quedaste?

46. Interviewer: Si se quedo en donde, en donde dijo que el doble no circula

47. Juan: Okay (inaudible) que los niveles de contaminación son muy altos aquí en la capital eh lo que pasa es que el hoy no circula se modifica y se hace el programa doble hoy no circula. Entonces si por ejemplo tu coche no circulaba el miércoles y el viernes hay un apéndice de contaminación dicen que los autos que no no contaminación, tres y cuatro por ejemplo, que son los de miércoles juntos con lo determinación no entero que son los de viernes, no circulan en viernes.

48. Interviewer: Okay

49. Juan: Eso disminuye todavía el parte vehicular pero lo disminuye entre comidas porque hay gente que digo tiene hasta dos coches entonces pues de nada sirve que deje uno, cuando puede sacar el otro

50. Interviewer: Exacto

51. Juan: Ese es el doble hoy no circula, y de echo cuando la contingencia ambiental sube mas, hay otro plan donde incluso el domingo todos los autos circulan el día domingo. Pero a una vez aquí en la ciudad este se ha implementado este el hoy no circula en el día domingo y si no mal recuerdo que a ella vez le toco a los automóviles que les tocaba

descansar el miércoles. Pero hay veces que el hoy no circula eh se modifica tanto que tu automóvil puede circular solo tres días a la semana, tres de a siete días.

52. Interviewer: De tres a siete días.. por que se modifico verdad?

53. Juan: Así es, entonces en lugar de descansar uno, descansa tres.

54. Interviewer: Umm so es dependiendo de cómo esta el el el la cota.. contaminación y um el aire

55. Juan: Así es

56. Interviewer: La calidad del aire.

57. Juan: Así es. Todo depende de cómo este nuestra autoridades nos indiquen en este caso como esta la contaminación

58. Interviewer: Okay

59. Juan: Y hay muchos este... miden índices a que llaman inetas eh y si los índices son muy altos entonces se pone la contingencia ambiental y se este se hace este el doble no circula o efecto este se queda normal el hoy no circula.

60. Interviewer: Okay..

61. Juan: Pero que haiga otros.. otros me preguntabas si hay otros planes que yo conozca, ningún otro que para los automóvil.

62. Interviewer: Okay.

63. Juan: No hay uno que afecte a fabricas, no hay uno que afecte, no se otro tipo de... de este personas que contaminen

64. Interviewer: Que tal tipos de..umm programas umm para tener pues otro alternativos de transportación?

65. Juan: No no hay, de echo algo en lo que si mucha que yo he visto hay muchos camiones de transporte publico ehhh no hacen el programa este de verificación vehicular

66. Interviewer: Oh okay

67. Juan: Entonces pueden.. pueden contaminar libremente no por así decir

68. Interviewer: Okay entiendo okay umm y que tipo has visto que tipo de propaganda como por ejemplo de publicación hay en la ciudad de México donde el gobierno hace que

que las personas bueno la la personas que viven en la ciudad umm les les hay tipo de publicación o de propaganda para uhh hacerles ver de este problema?

69. Juan: No, no de echo no la hay eh aquí en la ciudad de México eh los meses de abril, mayo es cuando mas calor hace es cuando mas se sufre de esa parte de la contaminación. Entonces es cuando mas se aplica el doble no circula. Este.. y pero... solo en esos meses es cuando se ha visto en la televisión sobre todo y en redes sociales que se aplica el doble no circula o que hay una una modificación adicional y algunos autos se modifica, este no circula que a lo mejor los que tienen placa PAR los que tiene placa NOM. Ese tipo de modificaciones, pero solo en esas fechas en especifico o solo cuando hay contingencia ambiental. Que te los este remarcando, que anuncios, publicitarios o papeles, nada, nada. De antemano aquí los.. los capitalinos ya saben que tienen que terminar los meses para llevar hacer las verificaciones de su automóvil.

70. Interviewer: Umm y tu piensas que el gobierno esta haciendo lo que tiene que.. su trabajo en ummm bueno componer este problema?

71. Juan: Siento que lo hace, pero en partes, no lo hace completamente. Ehh esta parte de que ya no hay soborno por asi decir para obtener un holograma para que tu automóvil en la ciudad de México verifique, pase o no pase, eso me parece magnifico. Lo que si no, no estoy de acuerdo por ejemplo el transporte publico ehh el mismo transporte que apuesto el gobierno de la ciudad este no cumple con esos estándares o no pasa esos niveles de verificación pero ellos asi circulan libremente. Camiones que recojan la basura, contaminan o no pasan verificación. Este transporte publico te decía, igual lo mismo, eh humo, humo, humo y no hay un, siento que no hay una ley para ellos.

72. Interviewer: Okay

73. Juan: Entonces el te digo el gobierno lo hace en partes, ósea para los ciudadanos si nos exigen la verificación. Este las multas están muy altas por no pasarla o por no traer un holograma de verificación. Pero en cambio el transporte publico que pone el mismo gobierno no pase esos estándares ni si quiera tiene un verifi-centro o cosas asi. Contaminan horrible hay muchas imagines incluso en las redes sociales que puedes buscar, eh donde hay eh autobuses del mismo gobierno contaminando eh allá.

74. Interviewer: Okay

75. Juan: El el mismo gobierno es el que no, el pone los planes, pero el no los aplica para si mismo.

80. Interviewer: Oh okay, okay. Y entonces umm, bueno umm creo que ya me has contestado todas las preguntas que tenia, tenia otras preguntas pero ya me los has contestado a las previas respuestas que me diste. Umm como te dije si no sabes ningún de otro programa alternativos para transportación umm quiere, tiene otra información que yo deba de saber sobre este problema o este problema de la calidad del aire.

90. Juan: Yo creo mas bien en que el problema no es tanto el hecho de que circulamos o no circulamos. Creo que lo que hace falta es mas conciencia mas conciencia este ambiental y mas conciencia cívica ehh aquí en la ciudad. Porque como te comentaba en un momento también hay mucha gente que le da por dejar la basura en la calle y genera la contaminación y eso no es tener ni educación ni la conciencia cívica para pues para mantener una ciudad cívica. Entonces creo, creo asi muy muy puntalmente que el gobierno si debería de trabajar mucho en en programas mas para cuantificar a la gente de que pues el planeta es uno y no los estamos acabando tristemente.

91. Interviewer: Okay perfecto, muchas gracias Alfredo, umm tiene cualquier otra persona en que me pueda dar otra, pueda entrevistar y tiene cualquier otro numero, se que roció me dio su información so umm no se si tenga otra persona con la que yo que yo pueda hablar para agarrar otra entrevista?

92. Juan: Ehhh déjame checarlo y creme que con gusto te paso con los datos que necesitas

93. Interviewer: Si como le digo umm

94. Juan: Déjame,....

95. Interviewer: Umm no como le digo es un proyecto que estoy haciendo que todavía no ummm estoy agarrando para horita nada mas estoy en la fase estoy agarrando información umm y ya debo de terminar, todavía tengo que entrevistar otras personas si se puede

96. Juan: Okay perfecto déjame entonces este preguntarle unos compañeros si pueden atender tu llamada y este o que ellos te marquen, no hay ningún problema.

Interview Ended.

### *Field Expert Interview*

This Interview was conducted via email with Professor Cesar Nava Escudero. He is a full time employee at UNAM University in Mexico City. He was unable to complete a phone interview due to his work schedule, however was able to answer a list of questions I drafted. Professor Nava Escudero was able to email me back with his answers to the questions listed below on 10/17/17.

1. Cual es su titulo en su trabajo, y cual es el tipo de trabajo que usted hace?

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CATEDRÁTICO DE DERECHO AMBIENTAL EN LA FACULTAD DE DERECHO  
DE LA UNAM

EL TRABAJO: INVESTIGACIÓN / CATEDRA DE DIVERSOS TEMAS  
AMBIENTALES. DIRECCIÓN DE TESIS DE LICENCIATURA, MAESTRÍA Y  
DOCTORADO. IMPARTIR CONFERENCIAS MAGISTRALES. PARTICIPACIÓN  
EN DIPLOMADOS. ASESORIAS LEGALES

2. En la experiencia que usted tiene sobre este problema, cómo afecta la leyes de regulaciones ambientales con los problemas de la calidad del aire en la Ciudad de México, y si estas leyes están teniendo efecto?

LAS LEYES AMBIENTALES, FEDERALES Y LOCALES HAN AYUDADO A DISMINUIR DE MANERA PAULATINA PERO FIRME LOS ALTOS NIVELES DE COTAMINACIÓN ATMOSFÉRICA EN LA CIUDAD DE MÉXICO. SIN EMBARGO, NO EXISTE AÚN UNA CALIDAD DEL AIRE BUENA, Y CONTINUÁN LAS AFECCIONES Y MALESTARES EN LA SALUD Y ALGUNAS MUERTES PREMATURAS.

3. ¿Cómo se relaciona las autoridades municipales y las autoridades federales para realizar acabo las acciones para mejorar el medio ambiente?

A TRAVÉS DE UN ENTE PÚBLICO METROPOLITANO DENOMINADO "CAME" (Comisión Ambiental de la Megalópolis). EN ELLA SE DISCUTEN LAS POLÍTICAS PÚBLICAS, LOS POSIBLES CAMBIOS LEGALES Y LAS ACCIONES QUE DEBERÁN TOMAR EN CONJUNTO LAS AUTORIDADES LOCALES Y FEDERALES.

4. En mi investigación sobre este tema, estoy notando que hay leyes, como hoy no circula, que las personas de bajos ingresos pueden no ser capaces de cumplir, ¿cuál es su opinión sobre este tipo de leyes?

EL “HOY NO CIRCULA” (EN ADELANTE, HNC) NO ES UNA LEY, SINO UN PROGRAMA. EL PROGRAMA HA SIDO UTILIZADO DE MANERA ERRÓNEA DURANTE MUCHOS EPISODIOS ATMOSFÉRICOS, PUESTO QUE HAS TRATADO DE CORREGIR LOS ALTOS NIVELES DE CONTAMINACION SIN QUE LO LOGRE SATISFACTORIAMENTE. LAS PERSONAS DE BAJOS INGRESOS QUE TIENEN AUTOMÓVIL SON LAS QUE SE VEN MAS AFECTADAS PORQUE SUS CARROS SON MÁS ANTIGUOS Y ESTOS SON LOS QUE SALEN DE LA CIRCULACIÓN. EL VERDADERO PROBLEMA DE LA CONTAMINACIÓN ATMOSFÉRICA ES EL CRECIMIENTO URBANO Y POBLACIONAL JUNTO CON EL AUMENTO DE VEHÍCULOS Y LA FALTA DE TRANSPORTE PÚBLICO ADECUADO, SUFICIENTE, SEGURO, LIMPIO.

5. ¿Qué cree usted que debe de ocurrir para que los líderes de los gobiernos locales trabajen más efectivamente con los líderes del gobierno federal en este tema para llegar a una resolución más efectiva?

QUE LOS FUNCIONARIOS PÚBLICOS AL FRENTE DE LOS ENTES GUBERNAMENTALES AMBIENTALES NO PERTENEZCAN A PARTIDOS POLÍTICOS Y QUE SEAN EXPERTOS EN LA MATERIA.

6. Gracias, si usted podría recomendarme a alguien más que pueda proporcionar más información sobre este tema, se lo agradeceré.

LE SUGIERO ACUDA DIERECTAMENTE A LA SEDEMA, (Secretaría de Medio Ambiente de la Ciudad de México). AHÍ LE PROPORCIONARÁN INFORMACIÓN DE TODO TIPO.

APPENDIX III  
CODEBOOK

Code Name	Definition	Example
Industrialization	A description of the different types of forms of industrialization in Mexico City contributing to the air pollution problem.	<p>“cuestión de las fabricas es que también eh producen mucho... mucho humo no ah eso me refiero a la de las fabricas no es que no hay un control de que yo sepa en cuestión de gobierno que les imponga algo a o una sanción o un reglamento para que puedan laborar a ciertas medidas en las fabricas pues la verdad no que ellos sepan no las hay.” Interview 1, Pg. 8, section 113.</p> <p>“Lo que si no, no estoy de acuerdo por ejemplo el transporte publico ehh el mismo transporte que apuesto el gobierno de la ciudad este no cumple con esos estándares o no pasa esos niveles de verificación pero ellos asi circulan libremente.” Interview 2, Pg. 6, section 71.</p>
Urbanization	A brief description of the landscape of Mexico City and its current population status.	<p>“El verdadero problema de la contaminacion atmosferica es el crecimiento urbano y poblacional junto con el aumento de vehiculos y la falta de transporte publico adecuado suficiente, seguro, limpio.” Expert Interview, Pg. 2, question 4.</p> <p>“es una ciudad bastante saturada, ya hay muchos autos y cosas que anos atrás no había, oh ya la mayoría de personas tenemos muchos autos.” Interview 1, Pg. 3, section 40.</p>
Public Awareness	The different type of awareness or propaganda that is observed in the City as a means to promote the air pollution issue in the City.	<p>“Que te los este remarcando, que anuncios, publicitarios o papeles, nada, nada.” Interview 2, Pg. 5, section 69.</p> <p>“No de hecho no.. no no hay este... no</p>



	Education as to this social issue.	<p>hay tanta publicidad en esto, mas que los pequeños informes bueno que nosotros ponemos por los que comunican atreves de la televisión o de la radio nada mas publicidad ha si en cierto modo que digan que usen medidas de transportación oh cuestión de cuidar la calidad del aire o cuales son las medidas que veamos o que salgamos por la calle que digan que tenemos que ayudar a la ciudad del tal manera no lo hay.” Interview 1, Pg. 5, section 65.</p>
Regulation	<p>Policies or programs identified as a form of combating the current air pollution problem in Mexico City as well the identification of agencies assigned to assist in controlling the air pollution issue.</p>	<p>“CAME” (Comisión Ambiental de la Megalópolis). En ella se discuten las politicas publicas, los posibles cambios legales y las acciones que deberan tomar en conjunto las autoridades locales y federales.” Expert interview, Pg. 1, question 3.</p> <p>“El hoy no circula tiene unas variantes eh por ejemplo el hoy no circula es un plan de donde la cosa la terminación del numero de placa de tu automóvil deja de circular un día a la semana.” 2nd Interview, Pg. 3, section 39.</p>

<p>Socio-Demographics</p>	<p>An identification of those primarily affected by the air pollution issue such as an identification of class issues whether it be economic, age, etc. Also, other socio-demographics that may influence the continued air pollution problem in the City.</p>	<p>“ Pero desafortunadamente hay mucha corrupción en esto y pues a veces tu automóvil puede circular todos los días.” Interview 2, Pg. 2, section 18.</p> <p>“mas el transporte publico porque pues yo no utilizo la mayoría de la tenemos que pagar una cuota particular y nos movemos en un auto ehh es únicamente para trasladarnos a un lugar por ejemplo a un trabajo por la mañana dejamos el carro y ya por la tarde ya salimos todos. Básicamente es el ir y venir de de la casa al trabajo oh a equis lugar pero no estamos todo el día este.” 1st Interview, Pg. 6, Section 83.</p>
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