

THE MEXICO CITY METRO: APPROPRIATION AND ASSIMILATION OF FOREIGN
TECHNOLOGY TO STAY ON TRACK WITH OTHER MODERN CAPITAL CITIES AND
TO PRODUCE A TECHNOLOGICAL AND CULTURAL MARVEL

by

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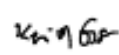
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TABLE OF CONTENTS

LIST OF FIGURES	5
ABSTRACT.....	6
INTRODUCTION	7
The Mexico City Metro: Appropriation and Assimilation of Foreign Technology to Stay on Track with Other Modern Capital Cities and to Produce a Technological and Cultural Marvel.....	7
CHAPTER ONE.....	17
Lance Wyman Pictograms.....	18
Layered Meaning of Iconology.....	20
Icons of the Metro	22
Station Names	27
CHAPTER TWO	53
The Mexico City Metro: Appropriation and Assimilation of Foreign Technology 1968-- Staying on Track With Other Modern Capital Cities	53
Initial Steps to Implementing Public Transportation.....	55
The Mexican Miracle and Political Will	58
Metro Stages and Their Timelines.....	62
Planning and Implementation of the Construction of Phase one	64
Archeology and Construction	71
New Technology and Construction of Later Phases of the Metro: Line Twelve.....	77
CHAPTER THREE	81
How the International Community Viewed the Metro and by Extension how They Viewed Mexico.....	81
Mexico City	81
A Return to Indigenous Roots; the Cosmic Race	83
The Olympic Committee and Selection of Mexico City to Host the Games	83
Showcasing Mexican Culture.....	84
Controversy Strikes.....	85
Preparing for the Games	86
The Games and International Perception.....	87
The Metro Announced	89
The Metro Opens.....	91

A Change in Perception	94
Subway Construction in Other Latin American Countries	96
Was it Worth it?	97
The Metro in Popular Culture and Movies	99
Foreign Perception and Comments on the Internet.....	101
When it Rains	102
The Clean Look of the Metro	103
Modes of Payment	104
Conclusion.....	105
CHAPTER FOUR.....	105
How Ordinary Mexicans Viewed the Metro.....	106
The Fearful Economic Alternative	106
Chava Flores Popular Music and the Metro	107
Not all is Perfect.....	108
Population and Transportation Expansion	109
No Turkeys or Buzzards Here.....	111
Lyrics to Chava Flores' Song "Voy en el Metro"	112
Corridos and Mexican Culture	113
Youth and the Metro.....	114
Metro Gangs	115
The Metro as a Cultural and Artistic Medium.....	116
The Metro is Made of.....	118
Metro Stations as Performance Stage	119
Avoidance of Foreign Intervention.....	119
Anti-Americanism and US-Mexican Relations	120
Questioning of the Mexican Miracle.....	121
The '60s as a Watershed Moment.....	122
Political Policies and the Growth of the Metro.....	123
CONCLUSION.....	125
BIBLIOGRAPHY.....	129
Primary	129
Secondary.....	134

LIST OF FIGURES

Figure 1 Sports Pictograms of The 1968 Mexico City Olympic Games	19
Figure 2 Metro Pictograph	22
Figure 3 Line One Interior Sign	24
Figure 4 Line One Exterior Sign	25
Figure 5 Line One Metro Signs	27
Figure 6 Pantitlan	28
Figure 7 Zaragoza	29
Figure 8 Gomez Farias	31
Figure 9 Boulevard Aereo Puerto	32
Figure 10 Balbuena	33
Figure 11 Moctezuma	34
Figure 12 San Lazaro	36
Figure 13 Candelaria	36
Figure 14 Merced	37
Figure 15 Pino Suarez	39
Figure 16 Aztec Temple	40
Figure 17 Isabel La Catolica	41
Figure 18 Salto de Agua	42
Figure 19 Balderas	44
Figure 20 Cuauhtemoc	46
Figure 21 Insurgentes	47
Figure 22 Sevilla	48
Figure 23 Chapultepec	49
Figure 24 Juanacatlan	50
Figure 25 Tacubaya	51
Figure 26 Obervatorio	52
Figure 27 Map of the Mexican Metro	63
Figure 28	64
Figure 29 Aerial of Mexico City	82
Figure 30 Rubber Tires	92
Figure 31 Diagram of Rubber Tires	93
Figure 32 Codex Mural	118
Figure 33 Subway Affordability Diagram	124
Figure 34 Artistic Metro Car	124

ABSTRACT

This paper provides a review of the construction of the metro in Mexico City and evaluates the metro as a production of culture. The incorporation and Mexicanization of foreign technology allowed Mexico to build and service a metro while making it uniquely Mexican. The naming of the stations and the use of icons to identify them project Mexican culture and power. The art within the stations and the activities travelers see and participate in are also examples of how Mexico's metro is unique to its culture. The use of newspaper articles from major cities from around the world demonstrated that the metro was accepted as a successful technological marvel. Newspaper articles, songs, and local art show that Mexicans accepted the metro as their own. We conclude that the metro was a cultural production that propelled Mexico City to the same level as other modern capital cities.

INTRODUCTION

The Mexico City Metro: Appropriation and Assimilation of Foreign Technology to Stay on Track with Other Modern Capital Cities and to Produce a Technological and Cultural Marvel

“Mexico City is an historical accident. It was built in the middle of a lake because the jealous nations of the Plateau would not let the Aztecs settle any place else.”¹ Lesley Bird Simpson remarked in his book *Many Mexicos*. He predicted that a modern city planner would not have built a massive industrial city in the bed of a lake so high above sea level with no source of sweet water. But there Mexico City stood, with little chance that the city or its population will ever relocate. The ancient inhabitants battled with water, learning how to make floating gardens that produced multiple crops every year and canoes to navigate the water. Spaniards combatted the water as well cursing it when the lake rose every rainy season to force them out of many parts of the city. By 1900, ditches and canals drained almost all the water. Then began the many projects to bring in needed water to satiate the thirst of an exploding population. The diversion of the Lerma and collection of the runoff from the snow of the Las Cruces mountains were but two examples of huge water work projects. All of this was completed to ensure the city had water. There was little or no thought of the effects on the Lerma Valley or the state of Oaxaca that relied on the water from those sources. As the water subsided the city grew. A massive sprawl on a lakebed slowly sinking into the silty lake bottom year by year. People flocked to Mexico City to find a better life, a melding of ancient, colonial, and modern thought and culture.

The Aztecs started there because they had nowhere else to go. As time passed the entire

¹Lesley Byrd Simpson, *Many Mexicos* (Berkeley, CA: University of California, 1967), 359.

country of Mexico seemingly wanted to go to the city. Like the precocious water, human resources were diverted to the city to make it a huge morass. By 1940, nearly a quarter of Mexico's population called the valley of Mexico home. National politics revolved around the city and its needs and valuable monetary resources were siphoned from the rest of the country to support the city.

Transportation to and around the city evolved over the years. Canoes and causeways carried native Aztec peoples. In colonial times horses, mules, trains, and wagons brought goods and people from the port of Vera Cruz to the city. As the city grew and technology improved so did transportation systems. In the modern era, rail lines cut their way through the mountains to connect Mexico City to the rest of the world. By the time of World War II, the city exploded and the surface streets became inadequate to serve the needs of the people. In the years following World War II Mexico saw incredible economic growth. This period became known as the Mexican Miracle. As technology increased mobility, increased mobility enhanced the flow of people to the city. Even with unprecedented expansion, Mexico lacked the technical expertise to build and maintain a metro system. Eventually, the trolley cars, taxis, busses, and motor vehicles became insufficient to carry so many across the city.

Tram systems served the city well but had limitations. The electric grid did not extend to the farthest reaches of the city. Where the electric poles did not go neither did the street cars. In addition, they were not safe, and many people feared using them. The entire system depended on non-Mexican companies to run it. Bus and taxi networks picked up where the street cars left off. Those employed by these transportation services accounted for almost a quarter of voters in the city and therefore had great political power. Surface streets did not meet the needs of the city motor traffic usually moved at a snail's pace.

In the 1960's Mexico City proved to be an urban planner's nightmare. Political, social, economic, and ecological forces conspired to make the capital increasingly unmanageable, overpopulated, unproductive, and insalubrious.² Twenty-five million people drove over three million motor vehicles over a ninety-five square mile city with inadequate surface streets. A city three times the size of New York City. The population produced twelve thousand tons of air pollution a day. Indigenous portions of the city had been subsumed in the rapid sprawling growth. Only museums preserved any relics to be found. Even colonial structures and culture could only be found in small downtown areas. The city, which had long encouraged walking had become too daunting.³ This was the setting in which the city and its leaders began to consider the construction of a mass transit system. One that would reflect the modern, colonial, and ancient aspects of its heritage and people.

The present work will focus on line one. Line one is representative of the other lines and the metro as a whole. I will look at the construction of the metro as a producer of culture. The names of the stations, the decorations and paintings of the stations, the station names the color of the cars, and the colors of the individual metro lines all represent Mexico and its culture. Chapter one focuses on the political and technological aspects of building the metro.

By the middle of the 1960s, Mexico was ready to build a mass transit system in its capital city. Before construction could begin the politicians had to agree on how to do it and whether it should be done at all. The idea that leaders wanted to be connected to huge social projects such as the metro to ensure their immortality did not apply to all Mexico City politicians. Mayor Ernesto Uruchurtu was more concerned with fiscal policy than the production of a very expensive public transportation system. He had been mayor of Mexico City for a long time and

² Jonathan Kandell, *La Capital: The Biography of Mexico City* (New York, NY: Random House, 1988), 528.

³ Ibid 528.

was entrenched. The story of how he finally left office under a cloud in no small part due to his opposition to the metro was essential to understanding the origins of the metro.

Uruchurtu was a PRI insider. He was well-connected and had served as the mayor of Mexico City for many years. Once president Gustavo Diaz Ordaz came to office the two immediately took different sides on the issue of the metro. Uruchurtu aligned with the minibus and taxi drivers' union, a large and powerful voting bloc. Diaz skillfully turned the opinion of this group in his favor and finally ousted Uruchurtu replacing him with a more metro-friendly mayor. Uruchurtu's eviction by bulldozer policy for the numerous shanty towns around the city did not help him either. Many viewed a comprehensive transportation system as a necessity to enter the modern world, and for the capital city to take its place among other modern capital cities. Not all shared that perspective; as metro proposals were repeatedly denied approval. Finally, in the late 1960s, Mexico City started building a metro system that first opened to the public in September 1969.

Local and national leaders had to have the political motivation and courage to inaugurate such a broad project in both scope and cost. Even with the will, Mexico had to rely on imported technology and expertise to build and maintain a functioning metro system. Leaders hoped to use modern technology to create a uniquely Mexican mode of mass transportation that reflected Mexican culture and established Mexico City as a modern capital city. The metro, like the streetcar and train systems that preceded it, would need substantial foreign help. Hundreds of North American and European companies lent support and expertise to the modernization of the Mexican transportation system. The production of what would become known as the metro embodied the best technology the world had to offer and the culture of the people of Mexico. In turn, the combination of technology and culture made the metro both a production of culture and

a technological marvel.

Throughout the process, the collective efforts of engineers, politicians, skilled workers, and technicians solved problems unique to the capital city's geographic location. The city was primarily built on an ancient swampy lakebed which was the site of numerous Mesoamerican populations for centuries. Problems ranged from designing earthquake-resistant tunnels to excavating soil that contained more water than dirt and preserving the many archeological sites uncovered during construction. Once completed, the metro changed the way the city viewed itself as well as the way it used land in and around the metropolitan area. Mexico City had to have the political will and ability to appropriate and assimilate metro technology in order to advance itself onto an equal footing with other modern and technologically advanced capital cities.

Construction of the metro took more expertise than the Mexicans had at the time. The primary Mexican firm involved in the planning and construction of phase one of the metro, *Ingenieros Civiles Asociados (ICA)* went abroad to fill in the gaps. Unlike previous ventures, ICA and Mexican leaders wanted to incorporate the imported technology and make it their own. In essence, they Mexicanized as much as they could. This meant that foreign companies consulted and provided support, but Mexican companies completed as much of the work and manufacturing as possible.

The metro copied the French model for the cars used. Once the first batch was ordered ICA planned to have Mexican companies take over maintenance and further manufacturing. Rubber-tired cars made the metro unique and allowed for slight movement of the track due to the instability of the soil. However, rubber tires went flat and could not achieve safe speeds as high as steel wheels. Mexican engineers faced many problems in implementing the metro. At each

challenge, Mexican firms and planners met the needs of their proposed mass transit system.

The first phase of construction achieved as much as a kilometer a day. This feat had not been nor has since been accomplished. Innovations and techniques that Mexican planners and engineers employed contributed to the speed at which the metro was built. The number of archeological finds encountered during construction overwhelmed Mexican officials in charge of preserving and categorizing finds. Some larger sites, such as the Aztec temple found in station Pino Suarez became part of the station. Engineers also had to avoid colonial buildings and deal with soil that looked and acted more like soup than dirt. New and innovative techniques such as the machinery and building style employed in line twelve helped build the metro.

Metro construction began in 1968 and the last phase finished in 2013. No further metro construction has taken place since that time. Even during the time between 1968 and 2013 long periods lapsed between spurts of construction. In most cases, the pauses had more to do with politics than population growth or necessity. For example, during the time between phase one and phase two, Luis Echeverria was president, and unlike his predecessor Diaz, he did not support the expansion of the metro. More than any other mode of transportation the *Sistema de Transporte Colectivo* (The Collective Transportation System) changed the way commuters traveled within the sprawl of Mexico City. Since that time, the metro has grown to become the second-largest metro system in the Western hemisphere, and the ninth-largest in the world, serving nearly 1.5 billion riders per year.⁴

In chapter two the metro took shape, and the stations needed to be identifiable. The metro held itself out to be the poor man's transportation system. Within Mexico City the average poor man was illiterate. Planners had the task of making a system that users could readily identify.

⁴ Robert Cervero, *The Transit Metropolis: A Global Inquiry* (Washington (D.C.): Island Press, 1998), 380.

Going underground to travel was new to many and disorienting to them. Signage had to convey location in a way anyone, even those that could not read could see where they were at all times.

Lance Wyman provided the key to the signage system. Wyman, who was working on the Olympic committee, helped develop icons to identify game locations. Icons or pictograms did not need explanation, and all understood their meaning regardless of literacy or language spoken. Early in the process, Wyman submitted a proposal to the metro committee. Yet, his proposal did not go far as the emphasis continued to be on the games. Once the Olympics wrapped up, Wyman got the go-ahead and began work on the metro icons. Wyman's icons had layers of information embedded in them. They were not just a picture - they represented history and culture as well as the area the station served.

Erwin Panofsky detailed the levels of meaning icons contain in his theory. Three distinct levels of understanding informed the viewer, or the user of the metro, of icon significance. Level one only needed an artistic appreciation. The icon itself became a work of art and represented a station. Anyone can understand this level of meaning. Level two incorporated a connection between the icon and the significance it had to the area it represents. For example, the icon of an observatory depicted an actual observatory. The rider only needed to connect the icon to the actual place. Level three required a much deeper understanding of history and culture. Connections between past events and people must be made to fully understand the significance and meaning of the icon. Wyman's icons met the needs and understanding of all who saw them.

The icon of each station when paired with the orange letter M, for metro, let people know where they were. Once in the station, directional icons indicated where the trains were headed. The beauty of this system was that even an illiterate person could easily navigate the metro using the icons. Each station had its icon as well as the icon of the station at either end of the line. A

rider could tell by the combination of the two icons where they were and which way the cars were headed.

All metro station names fell into one of three categories, Pre-Columbian, Colonial, and Modern. Each station, therefore, brought to mind a unique era of Mexican history. The present work considers only line one stations; however, the naming of the other stations and their pictograms follow the same conventions as line one. Line one included twenty stations: Pantitlan, Zaragoza, Gomez Farias, Boulevard Aereo Puerto, Balbuena, Moctezuma, San Lazaro, Candelaria, Merced, Pino Suarez, Isabel La Catolica, Salto De Agua, Balderas, Cuauhtemoc, Insurgentes, Sevilla, Chapultaptec, Juanacatlan, Tacubaya and, Observatorio. Every station will receive a brief explanation of its name and why it is historically and culturally significant and to what other modes of transportation they connect.

Chapter three examines how other nations saw Mexico City as a major metropolitan city vis a vis the metro. Planners hoped the metro would propel Mexico City onto the same stage as other major world capitals and showcase Mexican power and culture. The post-war years brought unprecedented growth to Mexico City and all the challenges that come with rapid growth. At the same time, Mexico started to return to its native roots at last distinguishing itself as a nation from other nations. Jose Vasconcelos led the way with his book *La Raza Cosmica*.⁵ Vasconcelos argued that the mixing of European heritage and native peoples made a new distinctive people or a cosmic race. This image found prominence in the production of the metro and in how Mexico held itself out to the rest of the world.

Development of the metro did not happen in a vacuum; other events took place in Mexico that shaped the perception of the metro. Chief among these events was the 1968 Olympic games.

⁵ Vasconcelos José, *La Raza cósmica* (México: Porrúa, 2017).

While the Olympics and the metro were two separate developments, the metro can not be fully understood without taking into account the games. Mexico had tried to host the games before but had failed. In the years leading to the 1968 games Mexico again made a bid for the games and as part of their presentation focused on Mexico's unique heritage and culture. The Olympic committee finally overcame their concerns about the city's infrastructure and facilities and awarded the games to Mexico City. Civil unrest dominated the 1960s. In the United States, many protested the lack of civil rights for minorities, and in Mexico, students protested. The massacre at Tlatelolco became a point of concern for Olympic planners, but in the end, the games began on schedule. Just as the world used the games to showcase its position on the world stage so too did Mexico. Despite all the controversy surrounding the games (the '68 games would go down as one of the most divisive and controversial games of all time) most foreign correspondents and participants said good things about Mexico.

Newspaper reporters from all over the world converged on Mexico City to report on the games. While they visited Mexico, they wrote home about their experiences. Most reviews placed Mexico in a positive manner although not all were glowing. Some pointed out the bad with the good or the areas that needed improvement along with the good. Others solely focused on the negative. Overall, the press coverage highlighted Mexican culture and power. In this atmosphere, the metro was announced, and construction began.

Many of the same concerns expressed about the Olympics surfaced when Mexican leaders announced the metro project. Mexico lacked the technical know-how and expertise to build and maintain such a huge undertaking. Despite all the doubt Mexican leaders began a program to borrow and import what they needed. Once borrowed and imported technology and know-how were then Mexicanized. Import substitution allowed foreign technicians to coach

Mexican personnel and companies to begin the process of taking over maintenance and construction. After the metro opened Mexican know-how was no longer in doubt.

The press again descended upon Mexico City to comment on their newly constructed metro. Many made comparisons between Mexico City and New York. Usually, Mexico City came out on top as a cleaner, newer system. Even today, many visitors comment on how nice the metro in Mexico appears. This caused a change in perception among other nations and Mexico City and Mexico as a nation began to take its place among other advanced nations of the world.

Not only did North America and Europe pay attention to developments in Mexico City but the rest of Latin America took notice also. Buenos Aires built the first subway system in South America and did so years before Mexico. The Mexico City project marked the start of an increase in such large projects in Latin America. Mexico became the example and the standard for other Latin American countries to follow. This again projected Mexican culture and power abroad.

Chapter four examines how ordinary Mexicans viewed the metro. Building a mode of transportation for a population with such a large percentage of illiteracy presented a challenge. Not only did many not know how to read but many did not understand the technology and feared it. Icons addressed part of this concern. Past experience with trams and street cars and their dangers freighted many away from the metro.

Chava Flores captured the public sentiment perfectly in his song “Vo yen el Metro”. He spoke of how fast it was and how quickly one can move across the city. In fact, the metro and subways in general have made their way into the public mind and popular culture. Subways represented a means of cheap transportation but are also often associated with crime. Flores sang how he could leave his home and go everywhere with the metro.

Pollution concerned citizens of the city. The metro provided a way to travel that did not burn coal. Flores also pointed this out in his song. Air quality was certainly better in the tunnels and the speed of movement and low cost won over millions of Mexicans as the metro became the second most used system in the Western Hemisphere. Clogged and congested surface streets could not compete with the ease of the metro.

Many neighborhoods gave or gained their indent from the metro stations that served them. Youth gangs used the metro to set boundaries and travel to fight and confront other gangs. Some gangs even named themselves after their neighborhood station. The metro not only gave Mexico national and international identity and standing among other nations, but it also gave its citizens identity and connection to their homes.

The metro entered Mexican popular culture through corridos, other songs, TV programs, movies, and art. The art contained within the stations was a national treasure. Paintings, murals station designs, and ancient artifacts all reflected national identity and culture. They also tied Mexicans to their unique past and helped to create a distinct Mexican culture. The reflection of Mexican identity and culture can be seen in how the city cared for the metro, its colors. icons station names, and cleanliness all reflected Mexican culture and power.

CHAPTER ONE

The Mexican government used the metro as an opportunity to bring all aspects of Mexican society and history together to showcase Mexican power and culture. The construction of the metro embodied the ideals of the revolution which included widespread affordable transportation for the masses. In order to have effect, the system needed a method of

identification that all could understand. The 1968 Olympics provided the solution. A young graphic designer, Lance Wyman, joined the committee tasked with producing the signage for the Olympic events. The committee chose to use pictograms for the events which succeeded beyond all expectations. Wyman made a name for himself when he used this same method to depict stops along the metro line. The symbols he produced illustrated important events and people in Mexican history. The use of these pictograms helped create and highlight a truly unique Mexican identity and culture.

Lance Wyman Pictograms

Lance Wyman invented the pictograms that had such a profound influence on Mexican identity and culture. He was born in Newark, New Jersey in 1937. Wyman's father worked as a fisherman and typist. His father did not earn enough to pay for Lance's schooling, so Wyman obtained money for school laboring in factories.⁶ In 1960 he earned a degree in Industrial design from Pratt Institute.⁷ He then worked for General Motors and Delco where he designed packaging. Later he studied under two of the best-known industrial designers of the time, George Nelson and William Schmidt.⁸ In 1968 Wyman seized the opportunity of a lifetime when he signed on as one of the graphic designers for the 1968 Mexico City Olympic Games. He collaborated with Eduardo Terrazas and Pedro Ramirez Vazquez on the '68 Olympics project. While employed for the Olympics Wyman approached the Metro committee and asked

⁶ "Lance Wyman," Lance Wyman, accessed June 21, 2018, <http://lancewyman.com/info/>.

⁷ "Pratt Institute," Pratt Institute, accessed September 12, 2018, www.pratt.edu/the-institute/.

Pratt institute is one of the top Universities in the United States in the area of Industrial design. It is located in New York City.

⁸ Accessed September 16, 2018, <http://www.marco.org.mx/index.pl?i=1048>

to assist in the design of their logo and icons for the stations. The committee allowed him to participate in the design process for the metro after he completed the Olympics project. He went on to help design icons for the Washington DC metro the National Zoo in Washington DC. As a result of his work, he became a visiting lecturer at Parsons in 1973. Over the past six decades, Wyman has continued to be a leader in his field.



Figure 1 Sports Pictograms of The 1968 Mexico City Olympic Games

SPORTS PICTOGRAMS OF THE 1968 MEXICO CITY OLYMPIC GAMES. Pictogram. Alphabeta. December 6, 2022. <https://alphabeta.org/oly/1968/pictos.html>.

This image shows examples of the pictograms that Lance Wyman created for the 1968 Olympics.

One of the most important aspects of the pictographs Wyman conceived was their universal translation. Soon after Wyman's first proposal to design for the Metro, the metro committee commissioned a giant mural to promote the project and asked Wyman to contribute. Once active in the design process Wyman quickly moved on to designing icons for the stations.

Wyman stated that if an icon can be understood in any language the translation is built in.⁹ This built-in translation functioned to identify stations to both the illiterate and the foreigner. Many people who live near metro stations have come to think of the icons not only as station identifiers but also as emblems of their communities. As Adrian Shaughnessy pointed out the icons themselves have had great influence and there is an undeniable link between Wyman's work and the layout of an iPhone.¹⁰

Layered Meaning of Iconology

The layers of meaning in Wyman's icons are best described in Erwin Panofsky's work. Panofsky divided the understanding and meaning of icons into three distinct categories. The first, and most elementary level of understanding, is to recognize the icon as a basic form of art.¹¹ Panofsky called this level of understanding primary or natural subject matter. The factual and expressional subject matter of the icon dictates the interpretation of the image. This level of understanding, in the case of the metro, entails a rider viewing the metro sign or pictogram and seeing it as nothing more than a picture or a piece of art. As a result, the station named Candelaria becomes a picture of a duck and the station at Chapultepec becomes a grasshopper.

⁹Adrian Shaughnessy, "Lance Wyman's pictograms for the Mexico City Metro," *Creative Review*, 35, no. 11 (2015): 68.

¹⁰ *Ibid*, 67.

¹¹ Erwin Panofsky, *Studies in Iconology: Humanistic themes In the Art of the Renaissance* (New York: Harper and Row Publishers, 1962), Introduction.

In his introduction, Panofsky analyzes the gesture of a man tipping his hat as he passes another person on the street. The first level of interpretation lets the viewer know that he is being greeted. As the two get closer the observer can then notice the expression on the greeter's face and other characteristics that allow him to know the mood and disposition of the greeter. The third level or intrinsic meaning may require a high educational background and social understanding to interpret. In the case of removing a hat as a form of greeting the observer would have to know that this custom arose from knights removing their helmets as a sign of politeness and nonaggression. This form of communication would not instantly be obvious to someone from Asia or Africa without some study or more than a casual understanding of Western culture.

The rider need not have any knowledge of city toponomy or geography in order to go from the duck to the grasshopper. This is the level of understanding that most tourists in Mexico City will have of the city. While riding the metro a tourist can comprehend directions to go to the duck or the grasshopper. The signage will accommodate their needs whether or not they can interpret Spanish or are familiar with the city.

Panofsky labeled the second level of deciphering the icons iconographic description. Iconographic description requires the viewer to have at least a basic level of historical or cultural understanding. Secondary or conventional subject matter, as Panofsky called it, constitutes the second level of interpretation. At this level of interpretation, the rider will make the connection that a grasshopper refers to the nearby Chapultepec Park. The name Chapultepec is derived from the Aztec word meaning grasshopper. At this level, a person must not have a great depth of comprehension of the culture or the inherent significance the icon has. They only require the ability to make the link that the grasshopper represents the park.

The final level of interpretation in Panofsky's theory is known as iconological analysis. At this level, it is necessary for the metro user needs to have a broad and deep awareness of Mexican history and culture. This allows such a rider to place each icon within the general context of Mexican history and culture. The intrinsic meaning or content informs the viewer of the deeper meaning and connection between the icon and what it represents. Panofsky stated, "It is apprehended by ascertaining those underlying principles which reveal the basic attitude of a nation, a period, a class, a religious or philosophical persuasion – unconsciously qualified by one personality and condensed into one work."¹² This level of understanding of the icons collectively creates a pattern that reflects the essence of Mexican culture, identity, and power.

¹² Ibid, 7.

Icons of the Metro

Each image of the metro symbolizes and carries meaning that can be evaluated at each level of Panofsky's hierarchy of interpretation. For example, the image developed to represent the metro is an orange "M" placed within a black square.



Figure 2 Metro Pictograph

Wyman, Lance. *Mexico City Metro System Graphics*. Pictograph. Lance Wyman. December 6, 2022.

<http://lancewyman.com/brand-project/mexico-city-metro-system-graphics/>.

This figure depicts the icon for the Mexican Metro

The "M" as an object of art is easily identifiable as a sign used to indicate that a metro station is nearby. Nearly all onlookers will find the sign useful at this level of interpretation. At the second level of interpretation, or iconographic description, the metro user with some knowledge of the city and its transportation system will recognize that the "M" is colored orange to imitate the color of the metro cars. In the third level of analysis, iconological analysis, the more in-depth meaning of the sign becomes apparent. The "M" is placed within a black square to illustrate the metro and its relationship to the city square or Zocalo. The "M" itself is a mirror of the first

three lines of the metro which when drawn on paper roughly approximate the letter M. The metro sign not only represents a signpost for the metro but is layered with symbolic meaning.

The iconography of the metro created a type of symbolic communication that every intended user could discern. According to Panofsky and Wyman, this metro system was both rich with meaning and also highly functional, easy to use, and intuitive. The Mexican government built the subway as an expression of their power and as a logical outgrowth of Revolutionary principles. The government intended the metro to be used by the lower and poorer classes of Mexico City. At the time of planning and initial construction of the metro, the population of Mexico City had an enormous illiterate population. According to the Instituto Nacional de Estadística (The National Institute of Statistics, hereafter INEGI), 25.8% of the population of Mexico City over the age of fifteen could not read.¹³ This percentage would have been magnified among likely metro users as the lower classes certainly would have had higher rates of illiteracy. The task of producing signage that functioned without the need for or minimal written language was of paramount importance. Wyman felt that each station required a name and a symbol that could represent the station and be expressed in words. The system he created allowed riders to orient themselves in the underground metro to familiar above-ground monuments, neighborhoods, and city features.¹⁴

Each station and each metro line have distinct identifiers. Typical station signs have three different icons. The image on top of the sign displays the familiar orange M set on a black background. The middle image shows the pictogram identifying the unique station that is

¹³ Cuentame de Mexico, "Analfabetismo," Poblacion, <http://cuentame.inegi.org.mx/poblacion/analfabeta.aspx?tema=p>, accessed March 5, 2014.

¹⁴ Marina Mogilevich, Ben Campkin, and Rebecca Ross, "The Symbolic Simplicity of Mexico City's Metro Signs," The Guardian, accessed March 5, 2014, <https://www.theguardian.com/cities/2014/dec/09/symbolic-simplicity-mexico-city-metro-signs-lance-wyman>.

nearby. Finally, the bottom image contains an arrow indicating the direction of the nearest entrance to the station.



Figure 3 Line One Interior Sign

Kartchner, Stan. *Mexico City Subway 024*. Photograph. March 2, 2022.

This photograph demonstrates the use of Wyman's icons within the metro cars themselves.

More often than not these above-ground directional signs have no written words on them.

Occasionally the word “metro “, is present on top of the images.



Figure 4 Line One Exterior Sign

Kartchner, Stan. *Mexico City Subway 018*. Photograph. March 2, 2022.
This photograph demonstrates typical above-ground signage of the metro.

Once below ground, the pictogram for the station will appear along with the name. Some additional signs adorn the metro such as an exit sign with the word “salida” and an image of a person ascending stairs and an arrow pointing the way to the exit. Within the station, the walls themselves give the next level of orientation for the metro user. In addition to a pictographic map showing all stops of a given line in order, each line, one through twelve, has been assigned a unique color identifier. These colors are not the typical colors used in other metro systems but are colors tied to Mexican society and culture. They tend to be colors associated with plants and minerals native to Mexico. In the case of line one the assigned color is pink. Throughout line one stations a pink stripe has been painted on all the walls with an arrow at one end pointing to the icon of the station at the end of the line. The pictogram for either Observatorio or Pantitlan emerges at the end of the pink stripe and arrow, which indicate the direction of the metro.



Figure 5 Line One Metro Signs

Kartchner, Stan. *Mexico City Subway 053*. Photograph. March 2, 2022.

This photograph shows the pink stripe and arrow that adorns line one of the metro.

Taking these images together a passenger can determine whether he is headed in the right direction. Once a metro user has interpreted these symbols, he can navigate all of Mexico City within the metro without being able to read a single written word of Spanish.

Station Names

The names of the stations fall into one of three groupings, Pre-Columbian, Colonial, and Modern. Each time period constituted a unique era of Mexican history. The present work will

consider only line one stations. The twenty stations of line one include: Pantitlan, Zaragoza, Gomez Farias, Boulevard Aereo Puerto, Balbuena, Moctezuma, San Lazaro, Candelaria, Merced, Pino Suarez, Isabel La Catolica, Salto De Agua, Balderas, Cuauhtemoc, Insurgentes, Sevilla, Chapultapec, Juanacatlan, Tacubaya and, Observatorio.¹⁵



Figure 6 Pantitlan

Wyman, Lance. *Pantitlan*. Pictogram. December 6, 2022. <https://mexicometro.org/metro/metro-line-1/>.
This is the pictogram for Pantitlan in line one of the metro.

At one end of line one, the station Pantitlan can be found. This station's pictogram contains two flags. The flags have their origin in pre-Columbian times when the inhabitants placed flags in Lake Texcoco as a method to aid navigation. At times the winds on the lake blew so strongly that the canoes used for transportation would capsize. The flags acted as a lighthouse, of sorts, warning the canoe drivers to steer clear and stay between the flags. Pantitlan translated literally means between the flags. This name is apt for this station as it is the largest in the entire Mexico City metro system, assisting more commuters than any other station. Four

¹⁵ "Metro De La Ciudad de Mexico, Line one," Ciudad de Mexico, accessed December 16, 2013, <http://www.metro.cdmx.gob.mx/red/linea1.html>

metro lines run through this station, one, five, nine, and A. This station is situated the closest to terminal two of Mexico City's international airport. This station also serves as a point of exchange for many travelers to a Mexibus (line three), as well as the CETRAM bus platforms for Nezahualcoyotl and Chimalhuacan. Terminals are found nearby where travelers have access to numerous bus and minibus routes. In addition to the bus terminal, a train station and a trolley bus line also figure into the overall transportation picture. People who live in The State of Mexico (El Estado De Mexico) all funnel through this station to gain access to Mexico City.

The construction of the Pantitlan station over time has made it a particularly difficult station to navigate. The Pantitlan station first opened as part of line five in December of 1981. In December of 1984 line one was extended to include Pantitlan as its final terminal. In August 1987 Pantitlan expanded to include line nine and in August of 1991 line A became the final appendage to the station. The addition of lines and new construction over time has made Pantitlan one of the most confusing stations in the entire metro system. Signage and pictograms play a crucial part in navigating the station as even travelers familiar with the station can become lost if they do not pay close attention to the signs.



Figure 7 Zaragoza

Wyman, Lance. *Zaragoza*. Pictogram. December 6, 2022. <https://mexicometro.org/metro/metro-line-1/>.
This is the pictogram for Zaragoza in line one of the metro.

The icon for the station named Zaragoza bears the appearance of General Ignacio Zaragoza the military leader who won the battle of Puebla.¹⁶ It takes the name of the neighborhood which it serves. Jesus Fructuoso Contreras sculpted a bronze statue of Zaragoza on the Paseo de la Reforma in Mexico City.¹⁷ The icon for the Zaragoza station received its likeness from this sculpture.

Zaragoza was born in the state of Coahuila y Texas near present-day Goliad, Texas.¹⁸ At an early age, he joined the liberal party which opposed Antonio Lopez de Santa Anna. Zaragoza rose quickly in the movement and in 1855 managed an army that defeated Santa Anna. Santa Anna's loss led to the re-establishment of a democratically elected government. After the voice of the people voted in Benito Juarez President of Mexico, Zaragoza served on the president's cabinet.¹⁹ When the French invaded Mexico Zaragoza left his position in Juarez's cabinet to take command of the army that conquered the French at the Battle of Puebla. Not long after his stunning triumph Zaragoza contracted typhoid fever and died at the young age of 33. The victory at Puebla cemented Zaragoza's reputation as a military genius. At that battle, he defeated a much larger and better-equipped force.

When line one initially opened, Zaragoza was the final station. In 1984 the station Pantitlan became the last station on line one. Although Zaragoza no longer anchors the line it still maintains an important place as it connects many travelers to the many bus lines that leave from Zaragoza headed for nearby destinations in Mexico State.

¹⁶ Manuel Z. Gomez, *La vida del General Ignacio Zaragoza*, (Mexico: Secretaria de Gobernacion, 1962), 17-22.

¹⁷ Patricia Perez Walters, *Alma y Bronce: Jesus F. Contreras, 1866-1902*, (Aguascalientes, Mexico: Instituto Cultural de Aguascalientes, 2002), 72-6.

¹⁸ Fedrico Berrueto Ramon, *Ignacio Zaragoza*, (Mexico: Secretaria de Gobernacion, 1962), 10.

¹⁹ *Ibid*, 331-338.



Figure 8 Gomez Farias

Wyman, Lance. *Gomez Farias*. Pictogram. December 6, 2022. <https://mexicometro.org/metro/metro-line-1/>.
This is the pictogram for Gomez Farias in line one of the metro.

The station Gomez Farias serves the barrio with the same name. The two received their name from the political figure. A book with the number 1857 written in the corner constitutes the icon for this station. The book represents the Constitution of 1857, Gomez Farias is credited as having written a substantial part of that document. The year that the constitution was ratified appears in the corner of the book in the icon.

Valentine Gomez Farias played a critical part in the drafting and adoption of the constitution of 1857.²⁰ Farias received training as a medical doctor but found his way into politics at a young age. Following independence, he initially supported Augustin de Iturbide but subsequently withdrew his support when Iturbide abolished the Mexican Congress. After Iturbide stepped down Farias reentered the political scene as the leader of the radical liberals. He occupied the office of vice president when Antonio Lopez de Santa Anna became president.

²⁰ Lillian Briseno Senosiain, *Valentin Gomez Farias y su lucha por el Federalismo, 1822-1858*, (Mexico D.F.: Instituto de Investigaciones, 1991).

Raul Mejia Zuniga, *Valentin Gomez Farias, hombre de Mexico*, (Mexico: Fondo de Cultura Economica, 1981). Briseno's work details the events leading up to the drafting of the Constitution of 1857 and the inner working of the rise of federalism in Mexico. Mejia on pages 250-267 describes the process of the drafting of the constitution of 1857 and further describes how integral Valentin Farias Gomez was in the initiation of the reform.

Santa Anna, electing to not bother himself with the day-to-day activities of the presidency departed Mexico City to live on his estate. He left most of the actual work of running the country to Farias. While thus empowered Farias moved to limit the power of the church and military. As Farias made liberal reforms, Santa Anna watched from a distance and observed public opinion. Finally, Santa Anna stepped in to denounce his vice president and force Farias into exile in the United States. The first action Santa Anna took reversed the liberal reforms Farias had implemented and overturned the constitution of 1824. Despite these repeals, Farias had set into motion liberal policies and ideas that would carry forward and reemerge. In the 1850s men such as Benito Juarez and Melchor Ocampo would come together to produce liberal reform and with Farias would draft the constitution of 1857.



Figure 9 Boulevard Aereo Puerto

Wyman, Lance. *Boulevard Aereo Puerto*. Pictogram. December 6, 2022. <https://mexicometro.org/metro/metro-line-1/>.

This is the pictogram for Boulevard Aereo Puerto in line one of the metro.

Boulevard Aereo Puerto shares its name with a nearby street. When the metro first opened, this station was in the nearest vicinity to the Benito Juarez International Airport. In the years following the opening of the metro the airport facilities closest to the metro station were torn down and rebuilt some distance from the station. Today the metro station closest to the

airport is the line five station Metro Terminal Aerea. The initial icon for this station contained a picture of an airplane. This icon created a great deal of confusion as the station no longer served the airport in recent years. As a result, officials changed the icon in the 1990s to a pictogram of the street for which the station is named and dubbed the station itself to its present name Boulevard Aereo Puerto from Metro Aereopuerto.

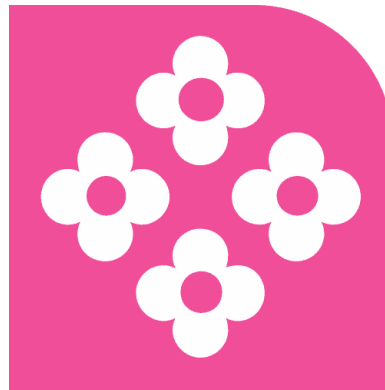


Figure 10 Balbuena

Wyman, Lance. *Balbuena*. Pictogram. December 6, 2022. <https://mexicometro.org/metro/metro-line-1/>.
This is the pictogram for Balbuena in line one of the metro.

The neighborhood of Colonia Jardin Balbuena provided the title and the flowers which represent the Balbuena station. The Neighborhood was built on an area previously known as los llanos de Balbuena and was called after the Spanish poet Bernardo De Balbuena.²¹ The first flight in Mexico took off and landed on this site. Balbuena, born in Spain, lived in Guadalajara and Mexico City as a young man. He later returned to Spain where he earned a degree in theology and rose in rank and stature in the church. He became a bishop first in Jamaica and then in Puerto Rico. In 1604 Balbuena published *La Grandeza Mexicana*, (Mexico's Grandeur). Balbuena wrote *Grandeza Mexicana* in response to a nun's inquiry about Mexico City and its

²¹ Bernardo de Balbuena and Domínguez Luis Adolfo, *La Grandeza Mexicana: y Compendio apologético En Alabanza De La poesía*, (México City: Editorial Porrúa, 2006), 39-44.

people. In his book, Balbuena sang the praises of Mexico City. His verses included information about the geography, climate, and people of the country. The verses in Balbuena's work placed Mexico as the crown jewel in the Spanish Empire and spoke of its people as educated and glorious.²² The flowers in the garden named after this poet make a perfect representation of both the station and of Mexico City and its people as described in Balbuena's work.



Figure 11 Moctezuma

Wyman, Lance. *Moctezuma*. Pictogram. December 6, 2022. <https://mexicometro.org/metro/metro-line-1/>.
This is the pictogram for Moctezuma in line one of the metro.

The Aztec emperor Moctezuma is also honored with a station named after him in line one. The station bears the same name as the neighborhood in which it is found. Moctezuma ruled the Aztecs in 1520 when Cortez arrived. At first, Moctezuma welcomed the Spanish into his city.²³ Soon after their arrival, the Spanish began to offend their hosts. Increasingly the

²² *Ibid*, 93.

In chapter 7 of his work Balbuena extolls the virtue and efficacy of the government of Mexico. It is interesting that when Balbuena speaks of Mexico he is primarily speaking of Mexico City and its surroundings. The tendency to focus on the City of Mexico at the expense of the rest of the county of Mexico started early in colonial times as can be seen in Balbuena's work.

²³ Bernal Diaz del Castillo, *Cortez and the Conquest of Mexico by the Spaniards in 1521*, (Hamden, Connecticut: Linnet Books, 1988).

Page 73 Chapter 13 details the magnificence of the city when the Spaniards arrived. Chapter 14 starting on page 78 details the meeting between Cortez and Moctezuma. Castillo describes in detail how magnificently clad Moctezuma was wearing gold sandals on page 79.

relations between the Spanish and the Aztecs became hostile. In an effort to maintain control over his hosts, Cortez and his men took Moctezuma hostage.²⁴ As the populace demanded that the Spanish leave their city Cortez invited Moctezuma to address his people. According to Spanish accounts, as Moctezuma attempted to calm his people, they began throwing stones at him and killed him. The Aztecs provided a different account stating that Cortez and his men killed Moctezuma as they began their retreat out of the city.

The symbol for Moctezuma station contains a depiction of his magnificent headdress. The headdress made of Quetzal feathers represented the grandeur of the ruler of the Aztecs. Their society has become a symbol of Aztec heritage. Today the actual headdress Moctezuma supposedly wore resides in the Museum of Ethnology in Vienna, Austria.²⁵ The people of Mexico have repeatedly requested the return of this significant cultural and historical artifact. The Austrians have, to this point, refused to return it. This fact remains a stumbling block in relations between the two countries. Despite not possessing the original, the National Museum of Anthropology houses a replica of the headdress in Mexico City.

²⁴ Bernal Diaz del Castillo, *The Discovery and Conquest of Mexico Bernal Diaz Del Castillo, Conquistador*, Translated by A. P. Maudslay, (Da Capo Press: New York, 1984). Starting on page 226 Diaz describes the reasons for and the planning of the capture of Montezuma. This act ultimately led to the death of Montezuma and the expulsion of the Spaniards from the city on what became known as the Noche triste.

²⁵ Welt Museum Wien, "Information," accessed August 1, 2018, <https://www.weltmuseumwien.at/en/information/> This is the official website for the museum. Information can be found here regarding exhibits and displays.



Figure 12 San Lazaro

Wyman, Lance. *San Lazaro*. Pictogram. December 6, 2022. <https://mexicometro.org/metro/metro-line-1/>.
This is the pictogram for San Lazaro in line one of the metro.

The San Lazaro station acted as the primary stop for the Interoceanic railway which linked the port city of Vera Cruz to the Pacific Ocean. The line one metro station closest to the railway station maintains the same name today. The steam-powered locomotive that the Interoceanic railway used provided the icon for the metro station. San Lazaro functions as a station on both line one and line B. The nearby bus station, which is the most easterly of the intercity bus stations serves as the primary departing point for Mexican states such as Puebla, Oaxaca, and Veracruz.



Figure 13 Candelaria

Wyman, Lance. *Candelaria*. Pictogram. December 6, 2022. <https://mexicometro.org/metro/metro-line-1/>.
This is the pictogram for Candelaria in line one of the metro.

The duck icon of the Candelaria stop has a dual meaning. For many years' residents near the station raised ducks for sale in the city's market. The Spanish word pato means duck, it also is slang for those of the criminal element. The criminal element lived near the station as well. The icon for this station has a double meaning that residents of the area will immediately know and understand. line one and line four intersect in this station. In addition to the double entendre of the duck icon this station also has an alternative name, Metro Palacio Legislativo, because of its proximity to the National Legislative Palace. Another unique characteristic of this station is that it houses the only lost and found in the entire metro system.



Figure 14 Merced

Wyman, Lance. *Merced*. Pictogram. December 6, 2022. <https://mexicometro.org/metro/metro-line-1/>.
This is the pictogram for Merced in line one of the metro.

The Merced barrio is one of the oldest in the city. The market center, with the same name, is one of the largest markets in the city. Its origins go back to the Mexica. The neighborhood now known as Merced is believed to have been founded in connection with the founding of the Mexica capital of Tenochtitlan. The area served as a point of commerce as it lay on the edge of the city on the shores of Lake Texcoco. Docks lined the city's edge as goods and foodstuffs arrived daily on canoes. As the lake began to recede the area still served as a major

trade hub via canals and channels that connected it to the mainland.

The area gets its name from a nearby monastery built in the late 1500s, Nuestra Senora de la Merced de la Redencion de los Cautivos. The Mercedarian order built the monastery, the only one the order constructed in New Spain. The Mercedarians official name was Royal, Celestial, and Military Order of Our Lady of Mercy and the Redemption of the Captives. In the 1860s the Reform Laws mandated the destruction of the complex. Today only one building survives. Shortly thereafter the Merced market took the place of the monastery as the primary building in the area. Government officials hoped to centralize the city's commerce in one area. This location made sense as a focal point for commerce and markets. First, the destruction of the monastery left ample space for the market. Second, the area had served as a center of trade since the time of the Mexica.

The line one station nearest the Merced market shares its name. The icon for the Merced Station depicts a basket of apples symbolizing the commerce of the area. The station itself has exits that connect it directly to the markets. Of interest, it is one of the few stations that has a baggage-o-meter. This device is a box that is fastened to the wall at the entrance of the station which indicates the maximum size of baggage one can carry onto the metro. The line five station Terminal Aerea also has a baggage-o-meter; since this station is the primary metro station serving the Mexico City International Airport.



Figure 15 Pino Suarez

Wyman, Lance. *Pino Suarez*. Pictogram. December 6, 2022. <https://mexicometro.org/metro/metro-line-1/>.

This is the pictogram for Pino Suarez in line one of the metro.

The line one station closest to the Zocalo, named Pino Suarez, rests a mere three or four blocks from the city's center. Pino Suarez served the city center until the construction of closer stations in subsequent lines.²⁶ This station emerges from beneath the street with the same name. Both received their names from the once vice president of Mexico. Pino Suarez was born September 8, 1869, in Tabasco. At a young age, he moved to Yucatan. There in the city of Merida, he obtained an education and became a lawyer. While he practiced his trade, he also engaged in writing poetry and in publishing. He started a newspaper "El Peninsular" which focused on exposing social injustices. Suarez also actively participated in the anti-reelection movement and supported Francisco Madero. As a result of his efforts, he was forced to flee the county and take refuge in the United States. There he helped draft the Plan of San Luis Potosi, which assisted in forcing the resignation of Porfirio Diaz. This, in turn, allowed free elections and the people of Mexico elected Madero president.²⁷ Madero chose Suarez as his vice

²⁶ The construction of line two created two stations closer to the city center than Pino Suarez. The stations Zocalo and Allende are both closer to the zocalo. Three more stations, Bellas Artes, (line two), San Juan de Letran (line eight), and Juarez (line three) that are all about as close to the city center as station Pino Suarez.

²⁷ Pepe Bulnes, *Pino Suárez: El Caballero De La Lealtad*, (México: Costa-Amic, 1995), 233.

Bulnes cites the results of the 1911 election published on October 16, 1911. Madero received 19,997,000 votes for president while his nearest competitor received only 87,000 votes. For the office of vice

president.²⁸ The pair only held their offices for a short time as their opposition killed them. The section on station Balderas explains the circumstances of their deaths.

An image of the temple dedicated to the Aztec god Ehecatl represents the Pino Suarez station. During the excavation of the station, workers discovered ruins of a temple built in honor of the Aztec god of wind, Ehecatl. As the construction of the line had tremendous time constraints associated with it, workers and engineers did not take the time to move the ruins but instead incorporated them into the station. Today the ruins form the centerpiece of the station. They are visible from below as well as on the street surface.

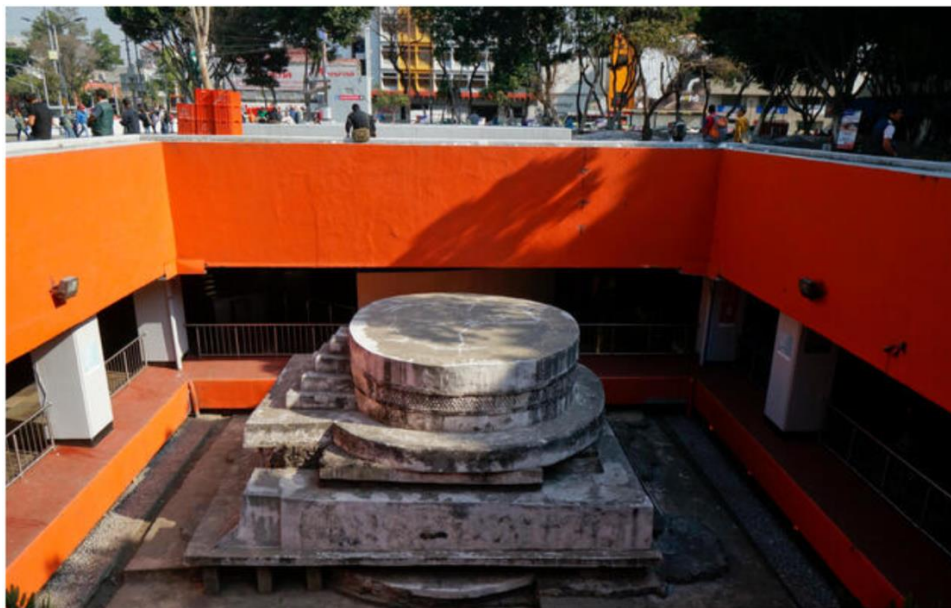


Figure 16 Aztec Temple

Melloan, Cathyrose. *Excavated Aztec temple dedicated to Ehecatl, the Aztec god of wind*. Photograph. Alamy. March 7, 2016. <https://www.alamy.com/stock-photo-pino-suarez-metro-station-in-mexico-city-mexico-excavated-aztec-temple-111251679.html>.

This photograph depicts the temple Ehecatl, the Aztec god of wind. As shown, it can be seen both within the

president, Pino Suarez received 10,245,000 while the second-place contender received 5,563,000 votes. These results show just how popular Madero was. While Pino Suarez was not quite as popular, he was also very well-liked and well-known by the people.

²⁸ Diego Arenas Guzman, *Jose Maria Pino Suarez*, (Villahermosa: Gobierno del estado de Tabasco, 1985), 80. Arenas Guzman explains how both Madero and Suarez wanted to reflect the will of the people in the election and how important the popular vote was in determining Madero's Vice President.

metro station and from the street.

Metro Pino Suarez remains one of the most important stations in the system today. When the system expanded to incorporate line two Pino Suarez became the first transfer station. Today it includes a massive system of tunnels that house many stores, a metro information kiosk, and subterranean tunnels that connect it to the line two station Metro Zocalo. Pino Suarez aids many commuters as line one and line two remain the two busiest lines in the metro system.



Figure 17 Isabel La Catolica

Wyman, Lance. *Isabel La Catolica*. Pictogram. December 6, 2022. <https://mexicometro.org/metro/metro-line-1/>.

This is the pictogram for Isabel La Catolica in line one of the metro.

The station Isabel La Catolica has the same name as the street under which it lies. One of Columbus's three caravels represents the station icon. The street and station are named after Queen Isabel of Castile. The person and name embody a time of exploration and colonization. Queen Isabel married Ferdinand II of Aragon. Together they unified Spain and drove out the Moors. Shortly after the Reconquista Isabela agreed to fund Christopher Columbus's voyage to find the Indies. Instead of the East Indies Columbus discovered the Americas. He returned to Spain with gold and slaves as a hero. As a result of Isabel's leadership and Columbus's discovery, Spain became a world power. Isabel frowned upon the practice of taking natives and

making them slaves. She felt that all people were subjects of the crown and therefore subject to her protection. Unfortunately, these reforms had limited success during her lifetime.



Figure 18 Salto de Agua

Wyman, Lance. *Salto de Agua*. Pictogram. December 6, 2022. <https://mexicometro.org/metro/metro-line-1/>.

This is the pictogram for Salto de Agua in line one of the metro.

Salto de Agua is another station that received its name from pre-conquest origins. The present station emerges at the terminus of an aqueduct that the Aztecs originally built to bring water into Tenochtitlan.²⁹ The Chapultepec aqueduct ended at a fountain called Salto de Agua. The structure of the aqueduct demonstrated considerable engineering knowledge and ability. It originated at freshwater springs nearly three kilometers away from its terminus. While the aqueduct carried water to the people of Tenochtitlan and was commissioned by the leader of the

²⁴ Charles Gibson, *The Aztecs Under Spanish Rule; A History of the Indians of the Valley of Mexico, 1519-1810*, (Stanford, California: Stanford University Press, 1964).

In this book, Gibson gives a good overview of the geography, both political and geographic of the various tribes that inhabited the valley of Mexico just prior to and after the Spanish conquest. While the book primarily addresses the politics and dealings of the native peoples after the conquest it does give an excellent overview of how the people were organized and how great works such as the Great Aqueduct, as the Mexica called it, would have been conceived of and undertaken. It also contains the nomenclature of the various offices and positions of leadership within Mexica society. Both Nezahualcoyotl and Chimalpopoca held the title of Tlatoani, which title designated them as the leader of the people. Specifically, chapters 1, The Valley of Mexico, 2. Tribes and 7. The Political Town address some of the pertinent information of the present discussion.

city, Chimalpopoca, its design came from the ruler of Texcoco, Nezahualcoyotl.³⁰ The initial construction consisted of two pipes built to carry water. In this manner of design one pipe could be under restoration while the other continued to carry water. Repairs never resulted in a disruption of the water supply. The delivery system crossed Lake Texcoco and was elevated to allow boats on the lake to move under it. Shortly after Cortez subdued the people of Tenochtitlan, he divided up the surrounding land to reward his men for their service. Once Charles V realized the importance of the springs and the aqueduct delivery system, he forbade Cortez to award the land containing the valuable asset to any of his men. Instead, he declared that it should be the property of the city. More recently the actual fountain has deteriorated. Architects built a replica based on the original while the remains of the original fountain are exhibited in a museum.³¹

Salta Del Agua is a transfer station linking line one with line eight. The station consists of two distinct build styles, line one's portion is older and shows its age while line eight manifests a more modern appearance. Shops and cultural displays fill the corridors between the two lines. The station also connects to trolley line A. The symbol for Salta Del Agua is a spring of water shooting three streams of water into the air.

²⁵ Miguel Leon Portillo, *Fifteen Poets of the Aztec World*, (Norman: University of Oklahoma Press, 1992), 70-79. Leon Portillo addresses the work and life of Nezahualcoyotl and his work. According to Leon Portillo, few leaders rose to the status of Nezahualcoyotl. Even other rulers wrote poetry in his honor. In the Aztec world men of understanding and learning had the title of Tlamantini or he who knows something. Such men used poetry to record and share their wisdom with others as poetry was viewed as the best means to accomplish that end. As the ruler of Texcoco Nezahualcoyotl certainly had the position to be exalted beyond his ability and Leon Portillo recognizes this fact but also says his fame was well-earned and deserved.

³¹ Chris Humphrey, *Mexico City*, (Mexico City: Avalon Travel Publishing, 2008). This is but one of many travel guides that have been published about the sites of Mexico City. In this work, Humphrey describes the fountain and its restoration. Humphrey lists the arches of the reconstructed colonial period as one of the must-sees of Mexico City. Over nine hundred arches carried water during the colonial period, today fewer than fifty remain. These arches went past the Belen monastery and for this reason this aqueduct is often referred to as the Belen aqueduct.

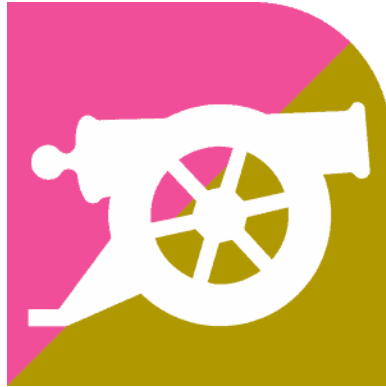


Figure 19 Balderas

Wyman, Lance. *Balderas*. Pictogram. December 6, 2022. <https://mexicometro.org/metro/metro-line-1/>.

This is the pictogram for Balderas in line one of the metro.

A canon represents the station Balderas. The Balderas station lies close to the Plaza de la Ciudadela. The canon icon replicates the colonial era canon that is still there today.³² Despite its ties to the colonial era, this station has more significant meaning in connection with the *decena trágica*, which means tragic descent. The tragic descent refers to a period of ten days in which rebels in opposition to the government of Francisco Madero held up in the Ciudadela. In 1913 Francisco Madero was president of Mexico. Many in Mexico expected a coup against Madero to erupt at any time. On February 9, 1913, the coup began as several hundred rebels assaulted the prison where General Bernardo Reyes and Felix Diaz were imprisoned for rebellion against the Madero regime. Once freed these men took charge of the rebellion and ordered their followers to march on the National Palace located in the Zocalo, the central square in Mexico City. Troops still loyal to Madero held the Palace. The two groups exchanged gunfire killing hundreds of civilian bystanders and wounding over a thousand more. Soldiers devoted to Madero managed to kill General Reyes in the exchange. The rebel forces retreated to the nearby Ciudadela, which

³² Kandell, *La Capital*, 410-416.

housed the armory for the Mexico City garrison.

In what many consider a complete lapse in judgment Madero appointed his old enemy, Victoriano Huerta as commander of the loyal forces charged with dislodging the rebels. The thick walls of the Ciudadela provided both ample cover and protection for the rebels, as well as a good supply of arms and ammunition. Despite his orders, Huerta had no intention of assaulting the fortress. Instead, he allowed the rebels to establish defensive positions, turned a blind eye to convoys carrying food and provisions to the rebels, and sent a secret emissary to Diaz. When Madero confronted Huerta with these reports Huerta soothed Madero's concerns telling him not to worry, "You are in the arms of General Victoriano Huerta."³³ Huerta had not planned to directly attack the rebels. He hoped that a prolonged conflict would further erode Madero's position and force his resignation. Finally, Huerta decided to move on to the fortress. Between February 9 and 18, the two sides unleashed constant cannon and gunfire. The battle killed thousands, primarily civilians, leveled hundreds of buildings, and burnt the city to the ground for a twenty-block radius. By the end of the ten days, the people of Mexico City did not care who took control as long as the death and carnage stopped. Many residents resorted to eating their cats and dogs during this time. The stench of lifeless bodies filled the air and during the short pauses in fighting officials doused corpses with gasoline and burned them in hopes of preventing the spread of disease.

The ruse worked. As the forces of Huerta and Diaz fought and the bodies began to stink many began to call for the resignation of Madero. The rebels received vigorous support from the United States ambassador Henry Lane Wilson who met with representatives from Britain, Cuba, Germany, and Spain to pressure Madero into resigning. The very meeting of officials from the

³³ Fernando Benitez, *La Ciudad de Mexico, 1325-1982*, (Mexico: Salvat, 1981), 26.

various countries began to lend further credence to the rebel's cause. Although Wilson wielded the influence of the United States government, he did not have the full backing of the Taft administration. Once Madero did step down the US government did not recognize the Huerta government despite Wilson's fervent plea that it do so. In fact, Secretary of State Henry Knox would later recall Wilson. This would prove too little too late in the case of Madero and his Vice President Pino Suarez who would both be killed ending the sad tale of the Desena Trajica.

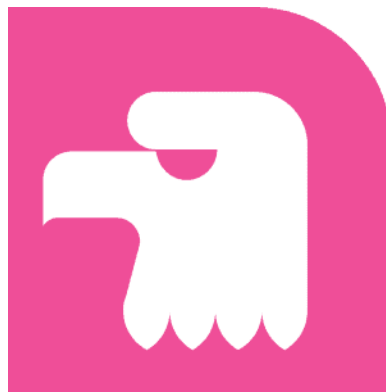


Figure 20 Cuauhtemoc

Wyman, Lance. *Cuauhtemoc*. Pictogram. December 6, 2022. <https://mexicometro.org/metro/metro-line-1/>.

This is the pictogram for Cuauhtemoc in line one of the metro.

The last ruler of the Aztec Empire was Cuauhtemoc. The station bearing his name has an eagle head as its icon. Cuauhtemoc translated from Nahuatl means descending eagle. The remaining Aztec nobles chose him to be their leader after the death of Cuitlahuac, who took charge after the death of Moctezuma II. All three of the last rulers of the Aztecs have a station named after them. Cuauhtemoc and Moctezuma II both have line one stations. The icon for Cuitlahuac station, on line two, contains a battle shield to remind people of La Noche Triste, the battle between Cortez and the Aztecs. In this combat, the Aztecs drove the Spanish out of Tenochtitlan. Shortly after the battle of La Noche Triste Cuitlahuac died as a result of smallpox.

Cuauhtemoc took charge of a people devastated by disease. To further complicate his task the Spanish isolated Tenochtitlan militarily since most of her allies defected to the Spanish. After months of close quarters and vicious fighting Cuauhtemoc finally surrendered to Cortez. Cortez allowed the defeated warriors to leave the city and settle nearby. Sometime later Cortez required Cuauhtemoc to accompany him on an expedition of conquest to the south. While on this excursion Cortez ordered Cuauhtemoc executed for plotting against Cortez. Cuauhtemoc and several others were hung in front of all the men to frighten any would-be plotters. Differing accounts were given by Francisco Lopez de Gomara and Bernal Diaz.



Figure 21 Insurgentes

Wyman, Lance. *Insurgentes*. Pictogram. December 6, 2022. <https://mexicometro.org/metro/metro-line-1/>.

This is the pictogram for Insurgentes in line one of the metro.

The crossing of Avenida Chapultapec and Avenida Insurgentes marks the location of the metro station Insurgentes. A bell represents the station. The iconic bell, the name of the street, and the metro station point back to Miguel Hidalgo y Costilla and his church. From his church, Hidalgo initiated the war of independence from Spain. The church bells sounded to announce the start of the insurgency which lasted eleven years. All Mexicans know the story of how revolted

Hidalgo was at the poverty he found in Mexico which resulted in his famous speech delivered in 1810 known as The Cry of Hidalgo. Today this station serves to access some of the best shopping areas in the city in the part of town known as La Zona Rosa.

The construction of the station incorporates aspects of Mexico's past and of other cultures the builders hoped to emulate. Architects designed the exterior walls of the station to resemble, or at least evoke a connection, to pre-Columbian heritage. Additionally, the walls contain components that designers imitated from the London and Paris metro system. The combination of these elements makes this station one of the most notable and beautiful of all the stations in the Mexico City metro system.³⁴



Figure 22 Sevilla

Wyman, Lance. *Sevilla*. Pictogram. December 6, 2022. <https://mexicometro.org/metro/metro-line-1/>.

This is the pictogram for Sevilla in line one of the metro.

The metro station named Sevilla gets its name from the province of the same name in Spain. It emerges near the Angel de la Refoma and serves the shopping districts near La Zona

³⁴ LatLong.net, "Total Recall Locations," accessed July 20, 2021, <https://www.latlong.net/location/total-recall-locations-1052>. This site contains the filming location of the movie Total Recall, an action movie of the 1990s which was filmed in Mexico City and also used the Metro Insurgentes as one of the major filming locations.

Rosa. The icon representing this station is an aqueduct. While the station Salta Del Agua rests at the end of the aqueduct Metro Sevilla is near the arches that carried the water. Several of the arches remain intact today.³⁵

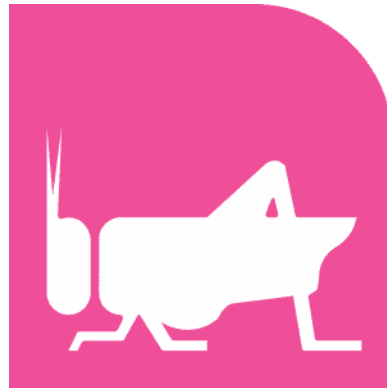


Figure 23 Chapultepec

Wyman, Lance. *Chapultepec*. Pictogram. December 6, 2022. <https://mexicometro.org/metro/metro-line-1/>.

This is the pictogram for Chapultepec in line one of the metro.

Metro Chapultepec has the same name as the major urban park that it serves. Chapultepec Park, also known as El Bosque de Chapultepec, is the largest such park in Latin America and one of the premier urban parks in the world. Its name is derived from Nahuatl and means place of the grasshopper. As a result, the icon for this station is a grasshopper. This site has been inhabited for many centuries and the park contains ruins that predate the Aztecs. In addition to the ruins, the park also serves as an ecological preserve of the city and a place where wildlife can be seen within the huge city.

Attractions such as numerous museums, monuments, Chapultepec Castle, and the

³⁵ Chris Humphrey, *Mexico City*, (Mexico City: Avalon Travel Publishing, 2008).

As mentioned in the footnote regarding Metro Salta del Agua, the ruins of the arches which formed part of the aqueduct the Aztecs originally built and the Spanish rebuilt in 1776 still remain intact. Metro Seville is the station closest to the arches and therefore has the aqueduct symbol as its icon.

national zoo can be found within the park. Some of the museums include the museum of history, El Museo del Caracol, El Museo de Arte Moderno, and the National Museum of Anthropology. El Museo de Arte Moderno contains works from famous Mexican artists such as Diego Rivera, Frida Kahlo, and David Alfaro Siquieros. The National Museum of Anthropology contains one of the largest collections of artifacts of the various indigenous groups of Mexico.



Figure 24 Juanacatlan

Wyman, Lance. *Juanacatlan*. Pictogram. December 6, 2022. <https://mexicometro.org/metro/metro-line-1/>.

This is the pictogram for Juanacatlan in line one of the metro.

A butterfly represents metro Juanacatlan. Juanacatlan means place of the butterflies in Nahuatl, the language of the Aztecs. The station runs beneath Avenida Pedro Antonio de los Santos, which apparently has no connection to the name of the station. Juanacatlan started service on April 11, 1970. Most of the stations on line one started service on September 4, 1969. It would only serve as the terminus of the line until November 20, 1970, when Metro Tacubaya came online. The current terminus for line one, Metro Observatorio, would not begin service until June 10, 1972.³⁶

³⁶ Mexico City Metro System, "Metro Line One," accessed February 2, 2016,

<https://mexicometro.org/metro/metro-line-1/>.

This is the official website for the Mexico City Metro. Under Line One all opening dates can be seen for



Figure 25 Tacubaya

Wyman, Lance. *Tacubaya*. Pictogram. December 6, 2022. <https://mexicometro.org/metro/metro-line-1/>.

This is the pictogram for Tacubaya in line one of the metro.

A water bowl symbolizes the station Tacubaya. This station's name is derived from Nahuatl meaning, where water joins. In ancient times the fresh water Tacubaya provided drinking water for much of the surrounding areas. In the times of the Aztecs, a settlement was built near the site of the present-day metro station to secure the source and protect the distribution of fresh water. At that time the area lay on the banks of Lake Texcoco. Later during colonial times many governors and Viceroy's constructed mansions in the area due to its beauty and scenery.³⁷ In more recent times the neighborhood has deteriorated. It is one of the poorer areas in all of Mexico City and is home to La Ciudad Perdida. La Ciudad Perdida or lost town is a shantytown made of cardboard and other scraps of building supplies. The extreme poverty of the shantytown provides a sharp contrast to the colonial mansions.

Today the metro station is known throughout the city as one of the busiest stations in the entire metro system. Lines one, seven, and nine run through Tacubaya. In order to

each station.

³⁷ Andrés Sosa Ruiz, *Investigaciones Geográficas*, (Mexico City: Universidad Autonoma de Mexico 1967), 150–152.

accommodate the construction of the various lines over time, Tacubaya contains many levels in which escalators and stairs connect. The station itself is a huge sprawl with exits emerging in various sections of the neighborhood. Amazing and detailed murals decorate the long corridors connecting the various platforms and levels of Tacubaya. Of note is the mural of the Stone Mask found in the line one section of the station leading towards Pantitlan.



Figure 26 Observatorio

Wyman, Lance. *Observatorio*. Pictogram. December 6, 2022. <https://mexicometro.org/metro/metro-line-1/>.

This is the pictogram for Observatorio in line one of the metro.

The Westernmost station in line one ends at the National Astronomical Observatory of the Universidad Nacional Autónoma de México. The dome of the observatory constitutes the pictogram for this station.³⁸ The telescopes of the observatory have been moved to a site with less air and light pollution and the housing of the observatory has been converted into a planetarium.³⁹ This station links commuters to the bus system connecting the metro and Mexico City to Western Mexican states such as Jalisco, Mexico State, Queretaro, and Michoacán.

³⁸ Ibid.

³⁹ Universidad Nacional Autónoma de México, “Observatorio Astronómico Nacional, SPM Instituto de Astronomía, accessed March 3, 2017, <http://haro.astrossp.unam.mx/indexspm.html>
This site contains a history of the Observatory.

The twenty stations of line one all have names with significant cultural and historical significance for Mexico. The layers of meaning within each image allow for both a causal or a deep understanding of Mexican geography and history. The metro provides affordable transportation to the masses of Mexico City while at the same time providing the world with a view of Mexico's cultural uniqueness. The metro showcases a technological wonder and a cultural production for the inhabitants of Mexico. It also demonstrates Mexican Grandeur to the world.

CHAPTER TWO

The Mexico City Metro: Appropriation and Assimilation of Foreign Technology 1968-- Staying on Track With Other Modern Capital Cities

In the late 1960s, Mexico City began building a metro system that first opened to the public in September 1969. The *Sistema de Transporte Colectivo* (The Collective Transportation System) has changed the way commuters travel within the sprawl of Mexico City more than any other mode of transportation. Since that time, the metro has grown to become the second-largest metro system in the Western hemisphere, and the ninth-largest in the world, serving nearly 1.5 billion riders per year.⁴⁰

Many regarded a comprehensive transportation system as a necessity to enter the modern world and for Mexico City to take its place among other contemporary capital cities. Not all

⁴⁰ Cervero, *The Transit Metropolis*, 380.

shared that view as metro proposals were repeatedly denied. Local and national leaders had to have the political will and courage to inaugurate such a broad project in both scope and cost. Even with the will, Mexico had to rely on imported technology and expertise to build and maintain a functioning metro system. Mexico would have to bring in and borrow technology from around the world to fill its needs. Throughout the construction process, the collective efforts of engineers, politicians, skilled workers, and technicians solved problems unique to the capital city's geographic location. Mexico City was primarily built on an ancient swampy lakebed which was the site of numerous Mesoamerican populations for centuries. Experts completed feats such as designing earthquake-resistant tunnels, excavating soil that contained more water than dirt, and preserving the many archeological sites uncovered during construction. Once finished, the metro changed the way the city viewed itself as well as the way it used land in and around the metropolitan area. Mexico City had the political willpower and ability to appropriate and assimilate metro technology in order to advance onto an equal footing with other modern and technologically advanced capital cities.

In order to do this, I will use newspaper articles, websites, technical manuals, and archeological studies. Newspaper articles give a good insight of on-the-ground information as to what exactly is happening at the time. Additionally, they demonstrate what other cities and peoples thought of what was happening in Mexico City. I will primarily use *The New York Times*. Several websites such as The Robbins Company homepage and the United States Department of Transportation site present highly technical data on the engineering and specifications of the technological marvels used to manufacture the metro system and its honeycomb of tunnels underneath the city. In her book *Urban Leviathan*, Diane Davis broaches the historical background for the Mexican Miracle as well as the politics behind the construction

of the metro.⁴¹ I will use Robert Cervero's book *The Transit Metropolis: A Global Inquiry*, to examine traditional and common problems large metropolitan areas have in implementing large-scale metro systems such as the one designed in Mexico City.⁴² In addition, numerous studies and articles will provide valuable firsthand accounts of how the metro developed and proceeded over time.

Initial Steps to Implementing Public Transportation

As early as 1856, Mexico City implemented a horse-drawn tramway system to help facilitate movement and transportation within the city. This initial rudimentary public transportation system received a substantial upgrade and improvement in the 1890s with the inauguration of the Federal District Railway Company (FDRC). The local government believed the implementation of a standardized rail transportation system would improve public mobility and health. Up to this time, horses provided the primary means of transportation (besides walking) and movement of goods within the city. City officials hoped an electric streetcar system would not only render cheap easy transportation for all residents of the city but also keep the streets clean of manure.⁴³ Government concessions, along with foreign investment and technology, allowed for the extension of rail lines into almost every suburb of Mexico City. While the desire among politicians and city planners to build a reliable system was strong,

⁴¹ Diane E. Davis, *Urban Leviathan: Mexico City in the Twentieth Century*, (Philadelphia: Temple University Press, 1994).

⁴² Cervero, *The Transit Metropolis*, 122.

⁴³ Jesus Gallindo y Villa, *Historia sumaria de la ciudad de Mexico*, (México: Editorial Cultura, 1925), 237-229. Percy F. Martin, *Mexico of the Twentieth Century*, (London: E. Arnold, 1907), 232.

These two books contain an account of the progression and development of the public transportation system as described in this paragraph.

Mexico lacked the technology and technical expertise to construct and manage an electric streetcar system. Working with the blessing of local governments and the cooperation of local entrepreneurs, the South African firm of Wernher, Beit, and company entered into an agreement with the Mexican-owned FDRC to start the initial project.

In the late 1890s, the Canadian-owned Mexican Light and Power Company bought the tramway and continued the process of transformation from horses to electric streetcars. Once again, foreign investors and technology dominated the improvements. The push for increased use of technology came from Mexico's President Porfirio Diaz⁴⁴. He felt that Mexico had to modernize and take better advantage of technology in order to take its place among the other civilized nations of the world. Diaz viewed the railroad and electricity as a civilizing agent.⁴⁵

Mexico City relied heavily on foreign companies to execute the electric streetcar system. The Mexican Light and Power Company opened the first fully electric line from Guadalupe to San Angel in 1898. In 1900, another line opened that connected the downtown area to Tacubaya. However, by 1906, a British firm acquired and incorporated the tram system into the Mexican Consolidated Electric Company. Consequently, only 90 of the 160 miles of the track actually had electric lines. Electric lines spread slowly throughout the city. The use of gas lamps for light coupled with the fact that many people could not afford electricity in their homes slowed the spread of electricity.⁴⁶ As a result, electric cars continued to share the burden of streetcar

⁴⁴ Porfirio Diaz was president of Mexico for most of the time between the years of 1877 to 1911. This time is often referred to as the Porfiriato. Diaz promoted foreign investment in Mexico. During his time in power, much of the rural land was taken from the small landowners and placed in either foreign hands or in large haciendas. While the stability of his presidency and his open-door policy to investment led to a great influx of capital and development, his policies would ultimately contribute to many of the underlying causes of the Mexican Revolution.

⁴⁵ Michael Matthews, *The Civilizing Machine: A Cultural History of Mexican Railroads, 1876-1910*. (Lincoln: The University of Nebraska Press, 2013), 13.

⁴⁶ Colin M Maclachlan and William H. Beezley, *Mexico's Crucial Century, 1810-1910*, (Lincoln: University of Nebraska Press: 2010), 75.

movement with horses. While the various foreign firms owned and operated the electric tram lines, the actual cars and electric motors came from an American firm, J.G. Brill in Philadelphia⁴⁷. Another US firm, General Electric, manufactured the electric generators used to power the tram cars.⁴⁸

Although the trams provided improved, cleaner service they still did not persuade many of the city's residents to use them. Streetcar accidents occurred daily; pedestrians, in particular, were in danger around the streetcars. Some historians claimed that over one thousand people were either injured or killed in the first year of streetcar operation. While this estimate may be an exaggeration Michael Matthews supplied evidence that, in general, accidents and deaths related to the operation of Mexican rail systems transpired twenty times more frequently than they did in Germany, ten times more often than in France or Belgium, and over five times more often than in England.⁴⁹ These statistics take into account all of Mexico's railroad system and not just the rail lines within Mexico City. Nonetheless, they indicated that the number of deaths and injuries greatly exceeded those of other countries⁵⁰. This was in part due to the random electric surges that hit the cars causing them to accelerate unexpectedly. Also, many of the rails lacked uniformity and had substandard installation and maintenance. Cars derailed frequently, causing delays and injuries to passengers and bystanders alike. In addition, the bumpy, uneven tracks caused the cars to become disconnected from the electric lines and lose power even if they did not derail.

⁴⁷ J G Brill was an American-based streetcar manufacturer. During this time period, it was the largest producer of street cars in the world.

⁴⁸ E. H. Blichfeldt, *A Mexican Journey*, (New York: Thomas Y. Crowell Company, 1912), 217-218.

⁴⁹ Matthews, *The Civilizing Machine*, 144-145.

⁵⁰ The high level of injuries led not only to a reputation that public transportation was dangerous and should be avoided, but also pointed out the lack of technical expertise that Mexico and Mexican companies had in developing and maintaining public transportation systems. Both issues would have to be overcome to effectively implement the metro.

By the late 1920s the electric trolleys, or streetcars, began to lose their dominance as the principal means of transport within Mexico City to motorized buses and taxis. As the commitment of the foreign companies to run and service electric streetcars waned, it opened the door for buses. The advent and mass production of the internal combustion engine led to the demise of the streetcar. Within a short time, the urban bus system replaced the electric streetcar.⁵¹ Buses allowed for a more flexible means of travel. They traveled anywhere there was a street at any time of the day. Along with the rise of the bus as a major form of public transportation in Mexico City came the bus drivers' union of *Alianza de Camioneros* (Bus Drivers Union). This union proved to be powerful and influential in determining the future of the city's public transportation. Murthy Bondada estimated that the total number of privately owned minibusses (buses that carry fewer than twelve people) and taxicabs equaled 5.3 per thousand inhabitants of Mexico City.⁵² These numbers did not include the number of larger buses and their operators. The total number of people employed in the bus and taxi industry constituted a major portion of working people within the city⁵³. This made the Alianza a critical player in local politics. These working men and women had every incentive to oppose the new technology of the metro system as it would certainly bite into their livelihood. Thus, the bus system remained in use into the middle of the century.

The Mexican Miracle and Political Will

⁵¹ Davis, *Urban Leviathan*, 58-59.

⁵² Murthy V.A. Bondada ed, *Urban Public Transportation Systems: Implementing Efficient Urban Transit Systems and Enhancing Transit Usage*, (Reston, Virginia: American Society of Engineers, 1999), 680.

⁵³ The power of the bus and taxi industry can be seen in the implementation of the metro. Many of the stations were placed at major bus and taxi hubs. This was done not only to help commuters but also to take advantage of the already existing public transportation networks.

It is impossible to understand the expansion and development of the metro outside of the context of the Mexican Miracle. Like many countries, Mexico enjoyed tremendous growth in the years following World War II. The nationalization of the oil industry on March 18, 1938, and the student riots resulting in the Tlaltelolco massacre of October 2, 1968 mark the beginning and the end of the Mexican Miracle⁵⁴. Domestic and foreign investment in Mexico during this time spurred extraordinary economic proliferation. With this growth, the population of Mexico City exploded. From 1940 to 1970 population grew from just over 1.7 million to over 9.2 million people, nearly a quarter of Mexico's total population in 1970.⁵⁵ This unprecedented enlargement placed enormous pressure on the local and federal governments for services. They were expected to provide everything from housing, utilities, waste management, shopping, and of course, transportation. The city sprawled and many makeshift squatter villages sprang up all around the city. Likewise, the city experienced the same growth explosion in industry and investment. The economic surge acted like a magnet on rural people who were pulled into the city in hopes of a better life and better jobs⁵⁶.

The question of how to deal with growth in Mexico City dominated local and national politics. Starting in 1952 Ernesto P. Uruchurtu served as mayor for a never before seen term of fourteen years. Uruchurtu commenced his rapid ascension in the PRI⁵⁷ in 1945 as the principal

⁵⁴ On March 18, 1938, then Mexican President Lazaro Cardenas signed an order that expropriated virtually all foreign oil interests and created the state-owned oil interest PEMEX. This move affected primarily US companies and was enabled in part by the coming of World War II. The war and its effects on the world for the years following saw miraculous growth in many economies such as that of Mexico.

⁵⁵ Davis, *Urban Leviathan*, 329.

⁵⁶ The Mexican Miracle saw its greatest effect in Mexico City. It was there that the greatest growth and opportunity took place. Such an opportunity acted like a magnet for many rural Mexicans. This union of both economic and population growth led to an unprecedented need for services in Mexico City. It also contributed to the idea that Mexico City was Mexico.

⁵⁷ The PRI --Partido Revolucionario Institucional (The Institutional Revolutionary Party). Plutarco Elias Calles established this party and its candidate served as president for 71 years in Mexico, Making Mexico effectively a one-party system during that time.

organizer of Miguel Alemán's presidential campaign⁵⁸. Once Alemán won, he named Uruchurtu as the secretary-general of the PRI. He only held this post for a short time and was then nominated as Sub secretary de Gobernación. Given his strong ties and highly visible and influential position within Alemán's cabinet, all viewed Uruchurtu as an insider in the PRI. In 1952 Uruchurtu was appointed mayor of Mexico City.⁵⁹ During his first decade in office as mayor Uruchurtu managed to balance the Federal District's budget, which was no small feat in itself. He worked hard to develop a strong base of support for himself among the working middle class and unions such as the Alianza de Camioneros. By the time Gustavo Diaz Ordaz⁶⁰ became president of Mexico (1963-1970) Uruchurtu had established himself as a popular mayor who looked after the interests of the city's people.

A decisive wedge grew within the PRI as they debated on how to implement a comprehensive metro system, acquire foreign technology, and maintain it. National and local leadership landed on different sides of the metro question. Ordaz immediately declared himself a supporter of the metro while Uruchurtu vehemently opposed it. The fact that a mayor of a large city such as Mexico City combatted a great public work was striking. Usually, the mere association with the construction of public works, like the metro, ensured the immortality of the politicians that initiated their construction. Uruchurtu's hostility towards the metro had even further reaching implications as it marked a split within the PRI and between local and national politics. However, many argued that at this time in Mexico's history there was little or no difference between national and local politics when it came to the Federal District.

⁵⁸ Miguel Aleman was president of Mexico from 1946 to 1952. His presidency saw the most pronounced period of industrialization and growth that became known as the Mexican miracle.

⁵⁹ Davis, *Urban Leviathan*, 122.

⁶⁰ Gustavo Diaz-Ordaz, Born March 11, 1911died July 15, 1979. Diaz was president of Mexico from 1964 to 1970. He supported the metro.

Uruchurtu stood against the new technology of the metro for two primary reasons. First, the metro would cut deeply into the Alianza bus driver union's market. Alianza members came from both the private operating minibuses and taxi sectors as well as the major bus line operations. The total number of operators and employees of this Union, based on Bondada's estimates, would have represented a double-digit percentage of the voting population within the city.⁶¹ Thus, the Alianza composed Uruchurtu's single largest constituency. If Uruchurtu championed the metro, he would lose their political support. Second, the metro would break the city's budget. The mayor had worked so hard to balance the budget which had been an ongoing concern and problem. Engineering and consulting firms predicted that the metro would cost 1.5 billion pesos. The DF would be expected to cover 900 million pesos of the aggregate cost. This amount represented almost three-quarters of the city's annual budget. In addition, annual operating costs would total 136 million pesos each year, which represented just over ten percent of the city's annual budget.⁶² Considering the substantial price tag, it is no wonder that Uruchurtu had managed to keep metro proposals tabled well into the 1960s.

Ironically, Ordaz used Uruchurtu's base of support, the Alianza, to discredit him and remove him from office. The metro project was at the center of the dispute over the direction of the economy.⁶³ Ordaz stepped up his pressure on Uruchurtu, releasing statements that the 1968 Olympics necessitated a metro system. Ordaz further blamed Uruchurtu for all the other problems the city faced. He claimed that Uruchurtu would ultimately be responsible for how the Olympics went and how the rest of the world viewed the city and nation of Mexico. Ordaz also used his influence in the courts to allow a bus strike to continue knowing that the small operators

⁶¹ Bondada, *Urban Public Transportation Systems*, 680-681.

⁶² Davis, *Urban Leviathan*, 153-154.

⁶³ *Ibid*, 160.

could not endure a prolonged strike. Finally, the small companies flipped and began to support the metro project in hopes that it would make legal strikes less likely and shorter, thus affecting their bottom line less. Now, Ordaz could use the issue of urban transportation and urban renewal as a weapon against Uruchurtu. Despite the erosion of his base, Uruchurtu continued to attempt to shore up support. However, his failure to address the urban transportation issue, coupled with his eviction by bulldozer tactics⁶⁴ for squatter communities, signaled his demise and he was forced to resign on September 12, 1966.⁶⁵ Just one week after his appointment the new mayor, Corona del Rosal, announced the plan to construct a metro system and work would begin less than a year later.

Once the metro opened there had to be a new administrative body to regulate, maintain and govern the system. There were already such bureaucracies in place that oversaw other means of public transportation such as buses and taxis. However, the sheer size and scope of the metro project needed something much larger and more complex. Much of this fell on the city as opposed to national oversight. While the metro was a national project the day-to-day operation fell on the city. The chief reasons Uruchurtu opposed the project was due to the administrative burden. It required thousands of people to make it work and ate up more than half the city's operating budget.

Metro Stages and Their Timelines

⁶⁴ Population growth and the lack of services that accompanied the growth often led to the formation of shanty towns. Uruchurtu in the later years of his term often resorted to demolishing these settlements with bulldozers. A policy that was popular with the landowners but not with the poor working classes. These tactics contributed to his downfall.

⁶⁵ Davis, *Urban Leviathan*, 172.

The construction of the Metro proceeded in spurts and stops. The table below contains the various stages of metro construction. Each stage contains a brief description of the years involved as well as some details pertaining to the construction of that stage. I have included a map of the metro as it is now developed. The map shows all the lines and stops as well as each line's relation to the other lines. Reference to this map may be useful in picturing some of the details of the construction process⁶⁶.



Figure 27 Map of the Mexican Metro

Roberts, Jamie. *Transportation Observations in Mexico City*. Graphic. Integrated Transportation Planning. April 30, 2021. <https://www.foursquareitp.com/blog/transportation-observations-in-mexico-city/>.

This image shows the current development of the Mexico metro.

⁶⁶ Doleman Company, Mexico City Subway Map, Nerd Oriented Decor (Buttered Kat, 2021), <https://butteredkat.com/collections/subway-maps/products/mexico-city-subway-map?variant=30717882597508>.

Stage	Years	Description
Stage 1	1967- 1972	This stage included lines one, two, and three contained a total of 41.4 kilometers and 48 stations.
Stage 2	1977- 1982	This stage included the extension of line three and the creation of lines four and five. Line four was the first elevated track due to its construction in an area that did not have many buildings.
Stage 3	1983- 1985	This phase extended lines one, two, and three to their current lengths. It also created lines six and seven. At its completion, the Metro had increased by 25.4 km and had a total of 105 stations.
Stage 4	1985- 1987	This phase extended lines six and seven and added line nine. A portion of line nine is elevated and a portion of it is also a deep track as sections of the tunnel are in excess of 100 feet deep.
Stage 5	1988- 1994	Stage five added line A and line eight. Together these two lines increased the Metro by 37.1 km and 29 stations for a total of 178.1 km and 154 stations. Line A like line twelve used steel wheels.
Stage 6	1994- 2000	This stage added line B.
Stage 7	2008- 2013	This stage added line twelve. Currently, the Metro totals 226.5 km and has 195 stations.

Figure 28

I created this table to demonstrate the seven stages of metro construction.

Planning and Implementation of the Construction of Phase one

While the political intrigue played itself out, other interested parties worked quietly and steadily towards constructing a metro system. The first proposal for an underground transit in Mexico City had been suggested in 1952 but had been discarded as a long shot. Many prominent engineers questioned the feasibility of an underground transit due to the nature of Mexico City's soil. Most of the city rested on the ancient lake bed of Lake Texcoco⁶⁷. As a result, the soil had an unusually high level of water and tended to settle excessively. These problems came in addition to the area's high level of volcanic and seismic activity which produced frequent earthquakes.⁶⁸ Notwithstanding these drawbacks, Mexico's most substantial engineering firm, *Ingenieros Civiles Asociados (ICA)* undertook studies of the world's most extensive metro systems. As the largest and most respected engineering firm in Mexico ICA's findings would be valued. ICA had many holdings and definitely had a financial incentive to tackle such a massive project. Their subsidiaries would help not only in the engineering, but also in the construction of the lines, the selection, the investigation of materials, and the feasibility of the project.⁶⁹ Bernardo Quintana acted as the lead engineer⁷⁰ in the research and proposal subsequently given to the government.

Quintana's findings came at a time when Uruchurtu's street widening proposals stood on their last leg. Mayor Uruchurtu proposed that several important streets and even some of the

⁶⁷ Lake Texcoco by this time had mostly been drained off and settled upon. The effect of centuries of water and sediment associated with the lake created soil that caused many problems for construction. Even today in Mexico City one can see that many of the older buildings have settled significantly. This characteristic of the city created challenges for metro designers.

⁶⁸ Davis, *Urban Leviathan*, 150.

⁶⁹ *Ibid*, 151.

⁷⁰ "Metro De La Ciudad de Mexico," *Ciudad de Mexico*, Accessed on December 16, 2013,

<http://www.metro.df.gob.mx>.

This is the official Metro website, and it contains various detailed information concerning the development and construction of the Metro. The site identified Bernardo Quintana as the lead engineer.

city's oldest streets be widened to allow for expanded bus service. This supplied a substitute for the metro and a solution to the massive transportation dilemma. Many opposed these measures since they would force several of the city's residents to move. It would also require the demolition of multiple historic buildings, ruining the city's colonial image.⁷¹ As a result, Uruchurtu could only pass legislation prohibiting street vendors from selling their goods within the right of way. This measure did open up some additional room for more motorized transportation. However, it proved ineffective in solving the overall transportation problem. Even if it had been successful, it was too late to save Uruchurtu, and it did not prevent the initiation of the metro project.

The convergence of Uruchurtu's dismissal and the results of ICA's studies secured approval of the project, at both the national and local levels. Yet, the technology question still had to be answered. In order to make the metro work, Mexico would have to import technology and expertise. Originally, the system imitated the French metro in Paris and a French-Mexican company undertook the initial construction project.⁷² ICA had to adopt and adapt current technology to produce a functioning metro that would reliably service Mexico City. In many aspects, the production of and work on the metro was Mexicanized.⁷³ Bernardo Navarro described this process as the use of and appropriation of foreign technology and expertise to build the metro but under Mexican companies. ICA itself had many of its subsidiaries join in the construction process as it was a huge vertically integrated company capable of doing everything from design, civil engineering, construction, and electromechanical installations, to laying

⁷¹ Davis, *Urban Leviathan*, 150.

⁷² Cervero, *The Transit Metropolis*, 381.

⁷³ Bernardo Navarro and Ovidio Gonzalez, *Metro Metropoli Mexico*, (Mexico City, Mexico: Universidad Nacional Autonoma De Mexico, 1989), 129-130.

tracks.⁷⁴ ICA participated in the creation of several Mexican companies whose sole objective would be to build, maintain, and provide technical support and parts for the metro. Several companies such as Melmex, Melco, and *Combinado Nacional* had a purpose to locally produce items using foreign, primarily French, technology.⁷⁵ The Mexican government hoped that the use of Mexican companies would incorporate and transform foreign technology into Mexican technology. As the Mexican companies had Mexican personnel working with the data and items needed to run the metro the demand for foreign support and technology would diminish. At least, that was the intention⁷⁶. To ensure that Mexican industry had every advantage, Aléman, “elevated tariffs, applied import controls, devalued the peso, improved public services and introduced countless other measures to improve industrial output.”⁷⁷ In addition, Aléman expropriated land, encouraged industrial park construction, and gave fiscal incentives to spur continued domestic industrial growth. All of these actions benefited, “the new firms embarking on import substitution industrialization.”⁷⁸

New factories to create and maintain the metro sprung up all over the city. Many of them were close to the proposed course of the system. Mexico City benefitted from this boom in building. Factories provided jobs and ensured that the production of metro components became entirely Mexican. ICA played a huge role in setting up these factories and getting them off the ground. In fact, ICA would be accused of profiteering because of the benefit they received in being involved at all levels of planning and construction. The early lines went through established neighborhoods and property values did not immediately change. However, over time

⁷⁴ Davis, *Urban Leviathan*, 151.

⁷⁵ Navarro, *Metro Metropoli Mexico*, 130.

⁷⁶ Part of the Mexicanization process would not only include the incorporation of foreign technology but also the transmission of knowledge from foreign experts to Mexican workers, thus decreasing reliance on foreign technology and know-how.

⁷⁷ Davis, *Urban Leviathan*, 116.

⁷⁸ *Ibid*, 117.

the values of apartments and land near metro stations have increased due to the metro's proximity. In the case of later lines that went through more sparsely populated areas, the metro had a greater and more immediate effect on property values.

Constructora Nacional de Carros de Ferrocarril (National Builder of Railroad Cars, (CNCF) perhaps provided the best example of a Mexican company that modified its business model and construction techniques to take full advantage of foreign technology. CNCF, a wholly Mexican company, had its origins in 1953. The financing for the company came exclusively from Mexican sources, 87.5% of the capital came from National Financing and the remaining 12.5% came from the private sector, from the company Fundidora de Hierro Y Acero de Monterrey (The Steel and Iron Works of Monterrey). Originally, CNCF assembled box cars for the railroad, and along with another company, Diesel International, it also helped manufacture buses. CNCF used Italian and Japanese technology in its production as it worked closely with Toyota and Fiat.⁷⁹ ICA and the Mexican government decided to change the nature of CNCF's production and made it the primary manufacturer of passenger cars that the metro used. Once construction began, CNCF already had the experience to interact with foreign companies and use their technology. In the building process, CNCF used and imported technology from France, Italy, Germany, and the United States. Some of the companies that helped with the technical aspects of the construction of the cars and components included, Siemens, Westinghouse, Schneider, Mitsubishi, Honeywell, Buffalo Forge, Motorola, 3M, Mobile Oil, Dow Corning, Philips, Cutler-Hammer, and Square D to name a few.⁸⁰ The trend to

⁷⁹ Navarro, *Metro Metropoli Mexico*, 125-126.

⁸⁰ *Ibid*, 130- 141.

These pages contain a laundry list of the companies that participated in one way or another in the construction and maintenance of the Metro. There are literally hundreds of companies. Many of them are of foreign origin while many more are of Mexican origin or are the Mexican subsidiaries of foreign companies. See the list contained on these pages to get a full listing of all the companies and how they contributed.

Mexicanize the output of items relying upon foreign technology perpetuated import substitution started in the time of the Mexican Miracle. The ability to locally satisfy a huge demand kept costs down and made Mexico less reliant on expensive foreign expertise and technology.

While ICA had many engineers and technical expertise it would have to import technology and help in order to make the metro feasible. ICA made the decision to use the Paris metro as its model. While much of the work fell to Mexican companies, the French company Alstrom remained in charge of the electro-technology needed to operate the Mexico City metro.⁸¹

ICA positioned itself well to have an influential role in the development and construction of the metro. The original members founded the firm on July 4, 1947 as a primarily construction-oriented company. Within its first years of operation, ICA expanded to include heavy equipment production, real estate investments, and banking. In fact, at the time of the initial construction of the metro, ICA's bank, *Banco del Atlántico*, Bank of the Atlantic, had been the most prominent bank in real estate development in Mexico City. The initiation of the metro was not ICA's first major and innovative building project. ICA had promoted and built the first satellite city, Ciudad Satellite, on one of the major highways circling Mexico City. ICA was also the first and foremost advocate for condominiums. In addition to their residential projects, ICA had also developed several major industrial parks.⁸² As such, ICA had much to gain from the formation of a metro system, and there was no doubt as to why ICA supported such a project.

Once approved, the Mexico City metro necessitated many technological adaptations to operate in the City's unique environment. The passenger cars needed to have rubber wheels

⁸¹ Many sources make reference to the fact that Mexico City chose the Paris metro as a model for their own. Davis, Navarro, Cervero, and the official Metro website all make reference to the choice of the French company of Alstrom.

⁸² Davis, *Urban Leviathan*, 154.

instead of steel wheels. Rubber tires allowed the cars to smoothly ride along the track even when the track had slightly settled or moved due to soil instability. In addition, rubber wheels worked better for the many close stops and short runs that the Mexico City metro made. Tires also reduced noise. Rubber-wheeled passenger cars presented several disadvantages. Flat tires caused many delays on the single-line metro. Steel wheels could achieve a higher safe maximum velocity, which did not matter on most of the lines that had many stops with shorter distances between them.

The cars themselves presented a unique problem for the metro and its operation. Rubber tires required constant maintenance. Metro operators had to come up with a solution that allowed cars to be relocated and added to routes, as needed. To solve this problem, engineers invented a system called rolling stock. In this system, all cars acted interchangeably. Operators could remove any given car that had problems or needed maintenance. The cars themselves were not labeled by number or origin but by the lot of manufacture as they became available for use.⁸³ While the rolling stock method provided flexibility it also created the need for a rail yard that could accommodate the extra cars in storage as well as those needing repair. To meet this need, each line at one of its ends, had a rail yard. The rail yard provided a place for repairs, and an area in which the passenger cars could be moved and interchanged as needed as well as a place of storage. The production of the initial rolling lot proved too demanding for the still retooling CNCF and arrangements had to be made with Alstom for 225 cars and the Canadian company of Bombardier for an additional 180 units.⁸⁴

⁸³ Mexico City Metro System, "Metro Line One," accessed February 2, 2016,

<https://mexicometro.org/metro/metro-line-1/>

The official website of the metro has a page dedicated to explaining the rolling stock system and how cars are numbered.

Davis, *Urban Leviathan*, 223-4.

⁸⁴ Navarro, *Metro Metropoli Mexico*, 131.

The construction of the stations and rail tunnels entailed considerable engineering and technical expertise. Excavation for the first line of the metro commenced in 1967. Many hoped it would open prior to the 1968 Olympics. Once construction started the workforce of the metro manufactured an amazing one kilometer of line per month. This feat has not been equaled on any other subway construction job. In order to accomplish such a quick pace, metro construction employed many people. Ángel Borja of ICA headed up the project as the lead architect. He directed an astounding crew under him which consisted of experts and workers that incorporated civil, chemical, ventilation, water and sanitation and soil engineers, geologists, mechanics, electricians, electronic experts, biologists, architects, archeologists, statisticians, computer experts, accountants, traffic and transit engineers, economists, lawyers, and workers. Somewhere between 1,200 and 4,000 specialists, including several from France, worked on the project along with 4,000 technicians, 3,000 administrators, and 48,000 workers.⁸⁵ With such a huge technical and labor workforce it is no wonder that they laid a kilometer of track per month. The first line of the metro opened on September 4, 1969, and included 12.7 kilometers of track, and 16 stations.

Archeology and Construction

Once construction began on the first line, it proceeded smoothly and the only real surprises came in the form of two archeological finds. As the construction of the Pino Suarez

⁸⁵ Mexico City Metro System, "La etapa," accessed February 2, 2016, <https://mexicometro.org/metro/metro-line-1/>.

Under the section labeled as "1a etapa" the official website has a description of the workers and their numbers.

station advanced, workers found ruins of a shrine dedicated to Ehecatl, the Aztec god of wind⁸⁶. Due to the pressure to complete the construction quickly, engineers incorporated the shrine into the station where it remains to this day. In addition, while workers excavated one of the tunnels laborers found the remains of a giant mammoth.⁸⁷ Archeologists did not expect to find anything like a mammoth. Nonetheless, they were excited and carefully extracted its bone. Likewise, the metro designers assimilated the remains of the mammoth into the Talisman station⁸⁸ for all to see.

After the completion of stage 1, the metro had a six-year hiatus in new construction. President Luis Echeverría (1970-1976), like Mayor Uruchurtu, opposed the metro. As a result, no expansion occurred during his presidency. After 1976, building proceeded consistently with the exception of the years 2000-2008 at which time another pause in construction occurred. This break, however, resulted from a gap in technology that had to be filled before additional needed lines could be built. In 1976, construction could proceed in the same manner as it had proceeded for stage 1. The major difference came not in construction techniques but in archeological concerns.

Once the mayor announced the construction of phase 1, the *Instituto Nacional de Antropología e Historia* (The Institute of Anthropology and History, INAH) went on high alert. The construction of the metro marked the first large-scale (archeological) excavation of the city.

⁸⁶ Ehecatl the god of the wind. While creating the Pino Suarez station, the line 1 station closest to the Zocalo, workers uncovered a temple dedicated to Ehecatl. Due to time constraints, the find was incorporated into the station. Today it can be seen from the underground station as well as from above on the street level. In this manner, the metro took on a decidedly cultural aspect.

⁸⁷ Mexico City Metro System, "La etapa," accessed February 2, 2016, <https://mexicometro.org/metro/metro-line-1/>.

The official Metro website documents the two archeological finds discussed here. Araceli Peralta Flores, *Hallazgos en el Metro de la Ciudad de Mexico*, (Mexico, D.F.: Instituto Nacional de Antropología e Historia, 1996), 22.

⁸⁸ The Talisman station is in Line four of the metro and opened in 1981. The icon for this station is a mammoth.

Officials from INAH declared that all of Mexico is a great museum and that it was their duty to save as much of it as possible. During the process, construction teams delivered 27 tons of debris to INAH.⁸⁹ From this material, workers recovered over 1,500 relics covering over 600 years of human existence in the valley. The speed with which phase 1 took shape and went to construction caught INAH by surprise, which would not happen again.

Archeology remained a central issue for all phases of Metro construction. The entire valley of Mexico contains artifacts of one sort or another as the area has been continuously inhabited for centuries. Everywhere the metro went, colonial or prehispanic peoples had already been. After the construction of the first line, an extensive archeological review occurred in an effort to predict and preserve archeological finds. For example, before the initiation of the construction of line six, a comprehensive examination took place concerning the prehispanic settlement of Atepehuacan.⁹⁰ Before conquest, this village was near Tenochtitlan. Yet, by the 1980s, sprawling Mexico City had swallowed up the ancient town. Archeologists, however, knew the town was there and expected to find remnants and artifacts during the course of construction. As part of the study, experts tracked down and consulted colonial documents pertaining to the location and size of the town. From there, they attempted to determine its size and population. Placing the population geographically remained central to the study. If experts could pinpoint the area of high population on a map they could predict exactly where to expect the highest concentration of artifacts. Once construction proceeded, archeologists carefully examined the excavated soil searching for pottery and other items. Once encountered, high

⁸⁹ HENRY GINIGER, "Mexico City Subway Runs Deep into the Past: Relics of 600 Years in Vast Quantity are being Unearthed Finds Evoke Indian Cultures and Era of Spanish Rule." *New York Times*, Jan 16, 1969, 8. <http://erl.lib.byu.edu/login?url=https://www.proquest.com/historical-newspapers/mexico-city-subway-runs-deep-into-past/docview/118470854/se-2?accountid=4488>.

⁹⁰ Peralta Flores, *Hallazgos en el Metro de la Ciudad de Mexico*, 16.

concentrations of pottery and other artifacts, resulted in an official dig site wherein experts conducted in-depth archeological studies.⁹¹

As the open trenches deepened, archeologists found pottery and artifacts that spanned centuries. From their findings, they drew conclusions about the length and extent of the population as well as the duration of habitation in various areas. Each layer of soil yielded older and older remains. Due to the time constraints on construction, archeologists were forced to work within very tight timetables. Archeologists followed the same process for lines six, seven, nine, and twelve.⁹² For the most part, the archaeology did not present unnecessary or undue delays in the building process.

In several instances, designers moved metro lines from their originally planned paths due to the results of studies experts conducted. In the case of archeological sites, this did not happen frequently. However, lines had to be shifted to protect and preserve historical buildings.⁹³ Experts, such as civil and structural engineers, made the determination that if the construction process presented the possibility of disturbing foundations and other structural aspects of existing buildings, the line had to move. Soil settling also proved a difficult problem to solve. As the majority of the city sat atop the dried-up lakebed the soil settled a great amount. In order to minimize this aspect of construction, engineers built portions of the first lines on top of two of the ancient causeways connecting Tenochtitlan to the mainland.⁹⁴

⁹¹ Peralta Flores, *Hallazgos en el Metro de la Ciudad de Mexico*, 21-23.

⁹² Ibid.

The balance of his book details the studies and results of various lines in the metro system. Of interest are the graphs detailing the different potteries found at different depths of the dig. The depth of the artifacts gave a good indication as to the time and duration of habitation. As the trenches deepened the artifacts became older and older. The depth charts gave archeologists a good idea of what to expect for other lines as well.

⁹³ Davis, *Urban Leviathan*. 247.

Peralta Flores, *Hallazgos en el Metro de la Ciudad de Mexico*, 60.

Lines six and twelve both had delays and changes due to concerns with archeology and the preservation of historical buildings.

⁹⁴ Thomas Wise Sidney, "Mexico City's Metro -- the World's Highest Subway -- Quietly Rolls Along: Mexican

Construction techniques varied in accordance with the needs of the various lines. Many lines employed an open dig system, wherein workers simply dug open pits and trenches for the stations as well as the tunnels. This tactic worked well for archeologists as they could see what came out of the ground and where it actually rested before workers excavated it. However, this method created problems in the construction process as to where to store the excavated material until it needed to be replaced over the completed lines. Once workers arrived at the desired depth, they formed the tunnel walls and prepared to pour and waterproof the structure. Customarily, open digs employed the square or box tunnel known as *tipo caja* construction. Tipo caja construction was easy to use in open trenches but required on-site forming. ICA typically did the work necessary to prepare for the pour, but often other companies supplied the concrete forms.⁹⁵ Tipo caja construction allowed for easy and fast production, in addition, the flat and even top of the box allowed for uniform levels of cut and fill and minimized settling of replaced soils⁹⁶.

Engineers worried about their ability to construct an earthquake-proof subterranean structure. Mexico relied heavily on engineering and technical building details from other cities that already constructed subterranean metros including Tokyo, Japan. Like the Mexico City area, Japan suffered from many earthquakes. By the 1960s Japanese engineers had previously worked out many of the problems associated with making sturdy underground tunnels. Reports

Metro is Rolling Along," *New York Times*, Aug 03, 1969,
<http://erl.lib.byu.edu/login/?url=https://www.proquest.com/historical-newspapers/mexico-citys-metro-worlds-highest-subway-quietly/docview/118474645/se-2?accountid=4488>.

⁹⁵ Navarro, *Hallazgos en el Metro de la Ciudad de Mexico*, 131.
 The Robbins Company, "Mexico City Line 12," accessed on December 16, 2013,
<http://www.therobbinscompany.com/case-study/mx12/> .

⁹⁶ Cut and fill refers to a technique where the tunnel is dug from the surface down. Once the reinforced structure is in place the fill around it can be replaced and compacted. This technique reduces the likelihood of settling. It also is more revealing for archaeology as all the dirt is removed and stored before it is replaced, thus giving archaeologists an opportunity to examine the dirt.

such as the one the Japanese Society of Civil Engineers produced entitled, “Special Task Committee of Earthquake Resistance of Civil Engineering Structures: Japanese Society of Civil Engineers Proposal on Earthquake Resistance for Civil Engineering Structures,” had already detailed findings from other construction projects. Although the committee produced this report in the mid-1990s it reflected what was accepted at the time the Mexico City metro began construction. Specifically, most reinforced subterranean structures were earthquake resistant.⁹⁷ This applied whether the construction was box-type or cylindrical. The report also found that construction using arches or arch-style tunnels are more susceptible to earthquake damage regardless of whether they are reinforced. The Mexico City metro did not use arch-style construction tunnels as a result of such findings. In part, this explains how the Mexico City metro emerged virtually unaffected by the 8.1 magnitude earthquake of September 19, 1985.

As a result of sound construction techniques, the metro survived the earthquake in 1985 with only minimal damage. Engineers claimed that the metro would be the safest place to be in an earthquake due to the nature of metro construction which allowed the energy and movement caused by an earthquake to move through the metro structure without damaging it.⁹⁸ This is due to the tipo caja construction. This claim would be put to the test in 1985, and it indeed proved to be accurate. The New York Times reported, “The city’s subway system that transports more than 4 million passengers a day, shut down and its passengers were evacuated to the streets. The system itself remained generally intact.” The article further announced that the metro restored

⁹⁷ Japanese Society of Civil Engineers, “SPECIAL TASK COMMITTEE OF EARTHQUAKE RESISTANCE OF CIVIL ENGINEERING STRUCTURES JAPAN SOCIETY OF CIVIL ENGINEERS PROPOSAL ON EARTHQUAKE RESISTANCE FOR CIVIL ENGINEERING STRUCTURES,” accessed on December 16, 2013, <http://www.jsce.or.jp/committee/earth/propo-e.html> .

⁹⁸ Thomas Wise Sidney, "Mexico City's Metro -- the World's Highest Subway -- Quietly Rolls Along: Mexican Metro is Rolling Along," *New York Times*, Aug 03, 1969, <http://erl.lib.byu.edu/login/?url=https://www.proquest.com/historical-newspapers/mexico-citys-metro-worlds-highest-subway-quietly/docview/118474645/se-2?accountid=4488>.

partial service the same day.⁹⁹ By September 26, newspapers noted that all subway lines were operating. This was stunning considering the same article disclosed that in the city, 7,000 buildings had been damaged and 450 had been destroyed.¹⁰⁰

New Technology and Construction of Later Phases of the Metro: Line Twelve

As long as the concrete is reinforced it will likely survive an earthquake intact. Reinforcement simply refers to the addition of a grid of steel rebar embedded within the concrete. The US Department of Transportation Federal Highway Administration prescribes very technical and detailed guidelines for construction of underground tunnels.¹⁰¹ The manual details two processes wherein the use of reinforced concrete creates an acceptable tunnel from an engineering perspective. One, once workers excavate the tunnel it may be lined with precast sections of reinforced concrete which are bolted together and sealed on their exterior to prevent water penetration. This process is known as the single-pass system. Two, the double pass system, which is the same as the single pass with the addition of having a formed-in-place interior lining of reinforced concrete.¹⁰² The most recent addition to the Mexico City metro used

⁹⁹ RICHARD J MEISLIN, "EARTHQUAKE ROCKS MEXICO; HUNDREDS ARE FEARED DEAD AS BUILDINGS FALL AND BURN: CAPITAL BADLY HIT HOSPITALS ARE THROGGED AS NUMBER OF INJURED IS PUT IN THOUSANDS MEXICO ROCKED BY QUAKE; HUNDREDS ARE FEARED DEAD," *New York Times*, Sep 20, 1985, <http://erl.lib.byu.edu/login/?url=https://www.proquest.com/historical-newspapers/earthquake-rocks-mexico-hundreds-are-feared-dead/docview/111203810/se-2?accountid=4488>.

¹⁰⁰ JOSEPH B TREASTER, "Hope Fades in Search for Survivors in Mexico," *New York Times*, Sep 26, 1985, <http://erl.lib.byu.edu/login/?url=https://www.proquest.com/historical-newspapers/hope-fades-search-survivors-mexico/docview/111251191/se-2?accountid=4488>.

¹⁰¹ U.S. Department of Transportation Federal Highway Administration, "Technical manual for design and construction of road tunnels--Civil section," Tunnels, accessed on, December 16, 2013. <http://www.fhwa.dot.gov/bridge/tunnel/pubs/nhi09010/10a.cfm> .

¹⁰² InterRed, "Tunnel Solutions for Mexico City," Tunnel, accessed on, December 16, 2013. http://www.tunnel-online.info/en/artikel/tunnel_201202_Tunnel_Solutions_for_Mexico_City_1390005.html.

the double pass system.

Line twelve of the metro system began construction in 2007 and engineers hoped to complete it by 2012. This particular line presented several unique challenges for ICA engineers and work crews. Upon completion, it would extend nearly 25.5 kilometers, making it the longest line to date in the metro system, and has twenty stations.¹⁰³ In addition, it would be the first numbered line to use steel wheels instead of the typical rubber tires. This line would be the first to range into the southern portion of the city. As such, it passes under some of the oldest and most densely built-up areas in the city. Due to the nature of the city under which line twelve passed open trenching would not be an option. Consequently, the line had to wait until the needed technology became available to construct such a line with so many requirements. To meet the tunneling needs ICA employed The Robbins Company. The Robbins Company is an American company headquartered in Ohio that specializes in manufacturing and maintaining tunneling machines. Their machines have dug tunnels for metro systems in Mexico City, Moscow, and Nanjing to mention a few.¹⁰⁴ In addition, the company provides services for sewer construction and expansions in many cities in the US and abroad. The Robbins Company also received the contract to extend the Tunnel Emisor Oriente in Mexico City.¹⁰⁵ This tunnel will be nearly 62 kilometers long, making it one of the world's longest tunnels. Its purpose is to drain

See also, this process is described in the USDOT guide, the article in the Magazine Tunnel, and on Robbins webpage.

¹⁰³ Ibid.

¹⁰⁴ Robbins Company, "Visiting Mexico City's Newest Metro Tunnel: How the Country's Capital is Upgrading its Aging Infrastructure," Robbins, accessed February 2, 2016, <http://www.therobbinscompany.com/case-study/mx12/>.

This is the Robbins Company website and it contains the information of the Robbins company's involvement in the mentioned projects.

¹⁰⁵ InterRed, "Tunnel Solutions for Mexico City," Tunnel, accessed on, December 16, 2013.

http://www.tunnel-online.info/en/artikel/tunnel_201202_Tunnel_Solutions_for_Mexico_City_1390005.html.

rainwater from Mexico City during times of flood so that the sewer system does not become overburdened.

Engineers first completed the twenty stations of line twelve. Next, the Robbins Earth Pressure Balance Machine (EPBM) started at one end and bored its way down the line from station to station. The EPBR required assembly on site in the first station, from there it tunneled to the next station. As it tunneled, the EPBR dumped the excavated material on a conveyor belt and it quickly sped to the surface for removal. The EPBM employed the double pass method. The total diameter of the tunnel equaled 10.2 meters or 33.5 feet. As the machine advanced sections of precast reinforced concrete were put in place with a thickness of 2.1 feet or 65 centimeters. Then the EPBM added an additional 1.3 feet or 40 centimeters of concrete making the walls of the line approximately 3.4 feet or 105 centimeters thick, leaving a total finished diameter of 9.11 meters or 29.9 feet.¹⁰⁶ As the machine tunneled it exerted equal back pressure against the overburden, that is the material above the tunnel. This process is how the EPBM got its name and also how it was able to dig the tunnel without cave-ins or settling of the overburden. This aspect of the EPBM's abilities became extremely important as a portion of the tunnel passed through soil that contained so much water that excavated material had to be pumped out of the tunnel as it was too soupy to remain on the conveyor belt. Without the ability to equalize the ground pressure, the surrounding dirt and mud would have fallen into the tunnel and created a huge sinkhole on the surface. The precision and speed of the EPBM became clear as it steadily moved toward its destination. The line twelve tunnel passed incredibly close to many structures. For example, line twelve passed within twelve meters of the foundations of a 16th-century church, within four meters of a thirteen-foot diameter sewer collection line, two meters of

¹⁰⁶ Ibid.

various building and bridge foundations, and within less than four meters of metro lines two and three.¹⁰⁷

Choosing routes for the lines was no small task. Not only did planners have to consider the needs and location of the riders but they also had to contemplate the lay out of the city and the composition of the soil. In at least one case, a line was placed directly over one of the ancient causeways that the Aztecs used to access their island city. The continued use of this path over the centuries provided a solid base that allowed for easier construction and increased stability. In other instances, the metro moved through and around existing building foundations. Other lines' construction had to be delayed until technology advanced. This was the case with the Robbins company. The first few lines played catch up to existing populations as the city had grown huge. In later lines such as twelve, the system stretched out in anticipation of future growth.

Although the first leg of the metro was not completed in time for the Olympics, its completion shortly thereafter brought Mexico City to the same level as other modern capital cities. The use and Mexicanization of foreign technology demonstrated how Mexico as a city and country willed itself into the modern arena of capital cities and technologically advanced countries. This aspect of design and construction along with the care taken to identify and preserve historic buildings and archaeological finds make the metro a cultural production. The subsequent expansions of the system made it the second largest in the Americas. This demonstrated Mexico's commitment to its infrastructure and its people.

¹⁰⁷ Ibid.

CHAPTER THREE

How the International Community Viewed the Metro and by Extension how They Viewed Mexico.

As the metro emerged it showcased Mexican power and culture. While the construction of the metro was underway, other international events also took place in Mexico City. The metro received consistent and notable press time during both the preparation for and the 1968 Olympics. Additionally, although the massacre at Tlatelolco was a local or national event, various international newspapers also featured stories surrounding the incident prominently. The Mexican government was anxious about how other world powers viewed the country. The Olympics and the metro developed independently of each other, but the government used both to showcase Mexican uniqueness and power.

Mexico City

Mexico City is the heart of Mexico. Many claimed that Mexico is Mexico City, and the city is Mexico. The rest of the country is little more than suburbs and rural areas that merely support the center of the country. The statistics seem to support this argument. During the years leading to the inception of the metro, millions of rural folks moved to the city. Not only did the city's population explode but government spending in the city also followed suit - to the detriment of the rest of the country. While the remnant of the country remained rural and far-flung, the city began to expand. Growth came at a cost, however, increased spending led to an incline in reputation and perception. With the enlargement of the city, its dominance became

certain. Many Mexicans saw the prestige and rise of the city as their means to a better life and they flocked there by the millions.¹⁰⁸ The exponential population surge exacerbated the existing infrastructure problems and necessitated further development of the city. Limited resources ended up in the city instead of the rest of the country.



Figure 29 Aerial of Mexico City

¹⁰⁸ Oscar Lewis, *Five Families* (United States: Basic Books, 1959).

In this work, Oscar Lewis followed the lives of five families. Four in Mexico City and one in a rural area. He describes the culture of poverty which is that people living in poverty lack the skills and resources to lift themselves out of that poverty. The people in his book that moved to Mexico were representative of the millions that had flocked there leading up to the '68 Olympics and the construction of the metro. Poor, far removed from work but living in the city in hopes of obtaining a better life. These are the kind of people that the metro most affected. The introduction of the metro into the city changed everything for the poorest of people. It helped change the culture from one of poverty to one of opportunity. Lewis wrote his book in 1959 prior to the metro but the people of whom he wrote certainly lived to benefit from it.

Arellano, Mónica. *Commercial and Public Spaces: Aerial Photographs and an Interactive Map Help to Explore the Tianguis of Mexico City*. Photograph. ArchDaily. September 20, 2021.

<https://www.archdaily.com/968551/commercial-and-public-spaces-aerial-photographs-and-an-interactive-map-help-to-explore-the-tianguis-of-mexico-city>.

This aerial photograph of Mexico City showcases how cramped and densely populated the city is, necessitating an underground transportation system.

A Return to Indigenous Roots; the Cosmic Race

Mexican culture began to return to its indigenous roots in the decades leading to the 1960s. Jose Vasconcelos's 1948 book, *La Raza Cosmica* illustrated this point.¹⁰⁹ In his work, Vasconcelos painted a futuristic utopia in which education and culture form the central elements of civilization. Vasconcelos' view differed vastly from the view portrayed in Lewis' work. Lewis pointed to the Aztec leader Cuauhtémoc as a representation of Mexican culture and a symbol of true independence, not just political but also moral independence. Through the development and belief in this "national temperament", a new civilization was born - not just a copy of European countries and culture but an entirely new cosmic race.¹¹⁰ Seven of the twenty stops in line one of the metro have indigenous names. Lewis argued that a new race surfaced because of the inheritance of the native culture and the mestizaje, or mixing, of European blood with the native peoples. These two books laid the framework for the reality of the situation and the hoped-for future. The metro and the Olympics played their part in changing the reality and culture of the city.

The Olympic Committee and Selection of Mexico City to Host the Games

¹⁰⁹ Vasconcelos, *La Raza Cosmica*.

¹¹⁰ Vasconcelos, *La Raza Cosmica*, 103.

The Olympic committee used the cultural uniqueness of Mexico to obtain the 1968 Olympics. Many on the Olympic search committee felt that Mexico City, and by extension, Mexico, was too rural and behind the times to effectively host the games. The Mexican delegation did not let this conception deter them. Despite the international view the delegation continued to promote Mexico through Vasconcelos's lens of *La Raza Cosmica*. Many of their presentations focused on Mexican folk music and dance, illustrating the uniqueness of the city and culture of Mexico. It was said that the wives of the Olympic delegation all supported Mexico. After months of auditioning and presenting the delegates cast their votes and Mexico City beat out all the other contending cities. Never before had a city with such a low level of infrastructure and civic development been chosen to host the games.¹¹¹ Looking back, the '68 games were iconic and memorable, but no one could have guessed that would be the case when Mexico City won the bid.¹¹² Once selected, Mexico had a herculean task to accomplish preparing the City and country to host the massive international event.

Showcasing Mexican Culture

The leaders of Mexico were anxious to showcase their county and culture to the world.

¹¹¹ Mexico had previously tried for the 1960 and 1956 games and had failed. At that time Buenos Aires was the only other city from a developing country that had made a run at the games. The other cities in contention for the '68 Olympics were Lyon, Detroit, and Buenos Aires. The vote was taken, and Mexico won by a landslide Buenos Aires two Lyon twelve, Detroit fourteen, and Mexico City thirty. The margin was so great that there was no need for a second round of presentations and voting as typically happened.

¹¹² Kevin B. Witherspoon, *Before the Eyes of the World: Mexico and the 1968 Olympic Games* (DeKalb, IL: NIU Press, 2014), 9.

The '68 games saw the appropriation of black power as Athletes from the United States took the medal stand and protested by raising a fist. Many countries opposed to apartheid threatened not to participate if South Africa was allowed to send its athletes.

Mexican leaders nervously awaited the international attention and coverage the Olympics would bring Mexico. After steady improvement over more than twenty years, the economic growth known as the Mexican miracle propelled Mexico onto the international stage and the '68 Olympics would highlight this. Not only was Mexico a modern and metropolitan country but also a place of culture and refinement. Leaders allocated and spent considerable money on infrastructure and facilities for the sporting event. The effort to showcase the city also attempted to minimize the poverty of many of the residents. The masses of the city did not miss the obvious effort and expenditure of resources which led to protests. While the effort impressed most of the international committee the '68 Olympics would still go down as one of the most controversial in the history of the event.

Controversy Strikes

Even before the games could begin contention struck. The most notable, the Massacre at Tlatelolco; an event that left hundreds of students dead. With the events of Tlatelolco in the background, debates began to emerge about such topics as the elevation of Mexico City. Many feared that athletes would not cope well with the high altitude.¹¹³ To this day Mexico City is the highest city in which the Olympics have been held at 7349 feet above sea level.¹¹⁴ The first

¹¹³ Robert Wood, "Mexico City, 1968 Olympic Games," Topend Sports Website, accessed April 4, 2022, [https://www.topendsports.com/events/summer/hosts/mexico-city.htm#:~:text=Trivia,2%2C239%20meters%20\(7%2C349%20feet\).](https://www.topendsports.com/events/summer/hosts/mexico-city.htm#:~:text=Trivia,2%2C239%20meters%20(7%2C349%20feet).)

This site has many interesting facts about the 1968 games and events that took place in conjunction with the games.

¹¹⁴ Ibid.

The '68 Olympics would see many endurance athletes fare very poorly, but many records would be broken in the short distance events. For example, the long jump record would be broken by 21 inches. These games would also see the introduction of the Fosbury flop.

disqualification for drug use occurred here as well, as a Swedish athlete was excluded for alcohol use. Several countries threatened a boycott if South Africa was allowed to compete because of that country's application of Apartheid. The United States and the USSR also used the games as a nonlethal way of establishing their dominance. Once the games started controversy continued as two American athletes raised their fists as a show of black power.¹¹⁵ Such events led to the '68 Olympics being remembered for bringing attention to the Civil Rights movement. Overall, the Olympics are supposed to bring athletes and countries together, but the 68 Olympics are recollected as being one of the most divisive games in history. The dichotomy of Olympic unity and international competition could not have been played out in a better theatre.

Preparing for the Games

Preparation for the games also brought a high level of scrutiny on Mexico City and its ability to appropriately host the games.¹¹⁶ The perceived lack of infrastructure continued to be a concern until the opening day of the games. The facilities were adequate for the games. Transportation and housing also exceeded expectations. The quality of the venues and the easily understood pictograms directing people to these venues impressed many. The lessons of the Mexican Miracle prepared the leaders of Mexico well to develop, plan, and execute the event at a very high level - a level commensurate with other advanced countries.

¹¹⁵ Witherspoon, *Before the Eyes of the World*.

In his book Witherspoon goes into detail about the divisiveness of the games the how and why it all happened.

¹¹⁶ Castañeda Luis M., *Spectacular Mexico: Design, Propaganda, and the 1968 Olympics* (Minneapolis, MN: University of Minnesota Press, 2014).

The Games and International Perception

Once the games started, many from around the world could not help but see that Mexico City had risen to the challenge. One London newspaper article entitled, “Olympic Round-up From Mexico: Ideals of Amateurism Nearing Their End” stated that the games were carried through with reasonable efficiency by the hosts.¹¹⁷ It continued that all had to acknowledge that the doubts so many had concerning the Olympic Committee’s decision to have that games in Mexico City had to be put aside. The facilities were superb and left little room for complaint. The article even criticized journalists in general for not offering enough accolades. It ended by predicting the 1972 games in Munich Germany would no doubt be better organized. Then again, Mexico was not Germany and Mexico gave the games their own distinctive flavor. In a sentence, this journalist gives high praise but also acknowledges that Mexico still has ground to cover. The fact that the international community would even compare Mexico City to Munich must have thrilled the leaders of Mexico.

The distinctive Mexican flavor was exactly what planners hoped the committee and spectators would see in Mexico City. Sidney Wise noted that a tourist could spend months visiting the archaeological sites in Mexico and not see more than a fraction of what there is to see.¹¹⁸ Each site that required improvements for the games yielded more and more artifacts. Everything from bones, pottery, and temples. The valley of Mexico City supported more ancient civilizations per square mile than any other region of the world. The history and culture of these ancients gave Mexico City its own distinctive flavor. In addition to looking at the impressive infrastructure of the games, visitors could see the extensive ruins. In so doing they wondered at

¹¹⁷ Wise, Sidney. “Secrets of Pre-Hispanic Era.” *The London Times*, (London, UK), Jun. 08, 1974.

¹¹⁸ Sidney Wise, “Secrets of Pre-Hispanic Era,” *The London Times*, (London, UK) 8 June 1974.

the current inhabitants of the area and at their ancestors who had made such impressive ancient civilizations. Tourists viewed the ancient achievements of the city's ancestors, and no doubt connected those impressive accomplishments with the current people of Mexico. The comparison of the past and present showed the world Jose Vasconcelos' *La Raza Cosmica* and highlighted the culture of Mexico.

Clarence Petersen, a writer for a Chicago newspaper, attended the Olympics expecting to see a city just like all the others that hosted the games. When he arrived, to his amazement, it was not so. He wrote, "The very first thing you notice when you arrive in Mexico City is...astonishing: you never saw so many Mexicans. They're everywhere, as if you were in a foreign country or something."¹¹⁹ The idea that these games were going to be like all the others washed away upon arrival. The faces in the street were not the same as in other cities. He further described the children in the street selling chicle and shining shoes. The sites, the people, and the culture differed from previous experiences he had. All these contributed to and reflected what he called, "the grandeur of Mexico's proud history."¹²⁰ And what Vasconcelos would call unique Mexican culture.

The Olympics and the construction of the metro provided the Mexican Government with an opportunity to display and promote the grandeur of Mexican culture and power. Did it work? It did. Many journalists left the games talking about how smoothly they went. Compliments about the weather, buildings, history, culture, and people appeared in many articles printed in the capital cities of Western civilization. This is not to downplay the negative that also found its way to print. However, more often than not the negative was overshadowed by the positive.

¹¹⁹ Clarence Petersen, "One Man's Mexico: Going South with the Sound for the Cultural Olympics MEXICO MEXICO MEXICO MEXICO," *Chicago Tribune*, (Chicago, IL) 11 Aug. 1968.

¹²⁰ Ibid.

Cultural differences and uniqueness also played prominently in articles.¹²¹ The positive wave of publicity that started with the Olympics continued with the construction and completion of the first legs of the metro.

The Metro Announced

When President Ordaz originally announced the metro, he had hoped it would be opened in time for the Olympics. This did not occur, as the first leg of the metro opened about one year after the completion of the games. The lack of a comprehensive subway system was a criticism often leveled against Mexico City as the '68 games approached. "There has long been talk of the need for some kind of rapid transit system, but it is doubtful if anything will be ready in time for the Olympics."¹²² Although this comment appeared in many articles what usually followed was a list of affordable alternatives. The bus system, taxis, and trains all received generally good reviews. These were the alternatives that Mayor Uruchurtu so carefully fostered and developed.

The one concern voiced over and over was the lack of know-how, more specifically Mexican know-how when it came to organizing the games and building the metro.¹²³ Mexican

¹²¹ Barry Bishop, "Won't Cancel Olympics: KEEP OCT. 12 MEXICO CITY OPENING DATE Troops' Hunt for Snipers Goes on Olympics in Mexico OK'd Despite Riots Drama of Death," *Chicago Tribune*, (Chicago, IL) 04 Oct. 1968.

Articles such as this did not normally make the front page. This article chronicled all the problems Mexico was having leading up to the Olympics. It did not gloss over anything but gave detailed accounts including casualty statistics. At the end of the article Bishop stated that notwithstanding all these problems the Olympics would continue as scheduled.

¹²² Henry Ginger, "THE TRIBUNE TRAVELERS' GUIDE: MEXICO CITY GETS READY FOR 68 OLYMPICS HOTEL DEMAND INCREASING," *Chicago Tribune*, (Chicago, IL) 15 Feb. 1967.

¹²³ Frank Litsky, "MEXICO CITY MAKES READY: LAST OCTOBER, MEXICO HELD ITS THIRD CONSECUTIVE LITTLE OLYMPICS AS A DRESS REHEARSAL FOR THE REAL THING. IN SOME WAYS THEY TURNED OUT TO BE MORE UNDRESS THAN DRESS. THE LARGEST OF THE NEW INSTALLATIONS UNDER CONSTRUCTION IN MEXICO CITY IS THE OLYMPIC VILLAGE. AFTER THE GAMES, THESE APARTMENTS WILL BE SOLD AS CONDOMINIUMS. THE MEXICANS ARE SPENDING \$40 MILLION PREPARING FOR THE OLYMPICS...ON

leaders did not let this concern affect their resolve. When it came to the games or the metro, Mexico imported the expertise. This led some reporters to comment that the upper Mexican management together with help from abroad did a superb job as did the legions of soldiers on the ground. They likened the effort to an army with excellent generals and superb privates - but no sergeants.¹²⁴ The expressed concern that the Mexican administration lacked the mid-level administration experience to effectively organize and implement large technical projects was well founded. Indeed, Mexico had never attempted a project on par with the games or the metro. As the process unfolded and the events took place, the rest of the world was forced to admit that Mexico comported itself admirably.

The 1968 games ended as a smash, far beyond what the world had expected. As one Los Angeles Times article stated¹²⁵ “this is a good time to cheer the magnificent staging of the Olympic games by our neighbors in Mexico who conquered almost insurmountable handicaps to put them on in grand style. The Mexicans did everything that a host nation could do to provide excellent facilities and matchless artistic surroundings. Of course, there were problems...but generally speaking the Mexican games were an enormous success and incidents were at a minimum.” World attention focused on Mexico City and as the games wrapped up, the exposure was good. Mexico placed itself on center stage and performed masterfully. The next act in the unfolding Mexican global ascension would be the unveiling of the metro a year later.

It is impossible to discuss the metro without placing it in context with the '68 games. Both constituted a herculean task that many international onlookers felt Mexico was not up to the

BALANCE SHEETS THAT USE ONLY BLACK OR RED INK, IT WILL BE A RED-LETTER YEAR FOR RED. IT SHOULD BE SOME SHOW, FOR THE MEXICANS HAVE STAKED NATIONAL PRIDE ON THEIR ROLE AS OLYMPIC HOSTS...THEY ARE DOING FAR BETTER THAN MOST PEOPLE HAD EXPECTED," *Los Angeles Times*, (Los Angeles, CA) 17 Dec. 1967.

¹²⁴ Ibid.

¹²⁵ "Olympics--A Smash," *Los Angeles Times*, (Los Angeles, CA) 27 Oct. 1968.

task to accomplish. The games and the metro did not come as a package deal. Leaders of Mexico developed and implemented them separately. Both events show that Mexican leaders wanted to improve and compete with other countries. Showcasing their capital city with two separate accomplishments placed Mexico in the same arena. The act of completing both and doing it with unique cultural flair landed Mexico City on par with other modern Western cities.

The Metro Opens

Once the Metro opened in June of 1969 two important shifts took place in relation to how other countries viewed Mexico. First, the focus moved away from the backwardness and lack of technical expertise of the Mexican industry and people. Second, Mexican culture and history became inextricably intertwined with the technological wonder of the Mexico City metro.

Immediately comparisons with other cities began. Mexico has had an interesting relationship with France over the years but when it came to the metro, connection with Paris pleased the developers of the transportation system. The name of the Mexican subway copied the Paris subway, the metro. Much of the technical experience and expertise required to design and build the metro also came from France. The rubber-wheeled system the French metro used was duplicated for Mexico. It was the main reason for the transference of the name. The affiliation between the two systems in the manufacture and in name placed Mexico City on the same level as Paris. Newspaper articles made the link between the two systems and concluded that citizens of each country enjoyed the same level of service and comfort in using their respective metros.¹²⁶ The first leg of the metro only covered about 15 miles. Even though the

¹²⁶ "Mexico City Starts Work on Subway," *Los Angeles Times*, (Los Angeles, CA) 04 Sept 1967.

Mexican metro was in its infancy the narrative from whether it could happen changed to how long it would take to catch up to other modern cities. The question of whether it could be built had been answered.



Figure 30 Rubber Tires

Wall, Allan. *Moving millions through Mexico City's Metro*. Photograph. MexConnect. October 13, 2009. <https://www.mexconnect.com/articles/4064-moving-millions-through-mexico-city-s-metro/>. *This photograph shows the rubber tires that the Mexican Metro still uses today.*

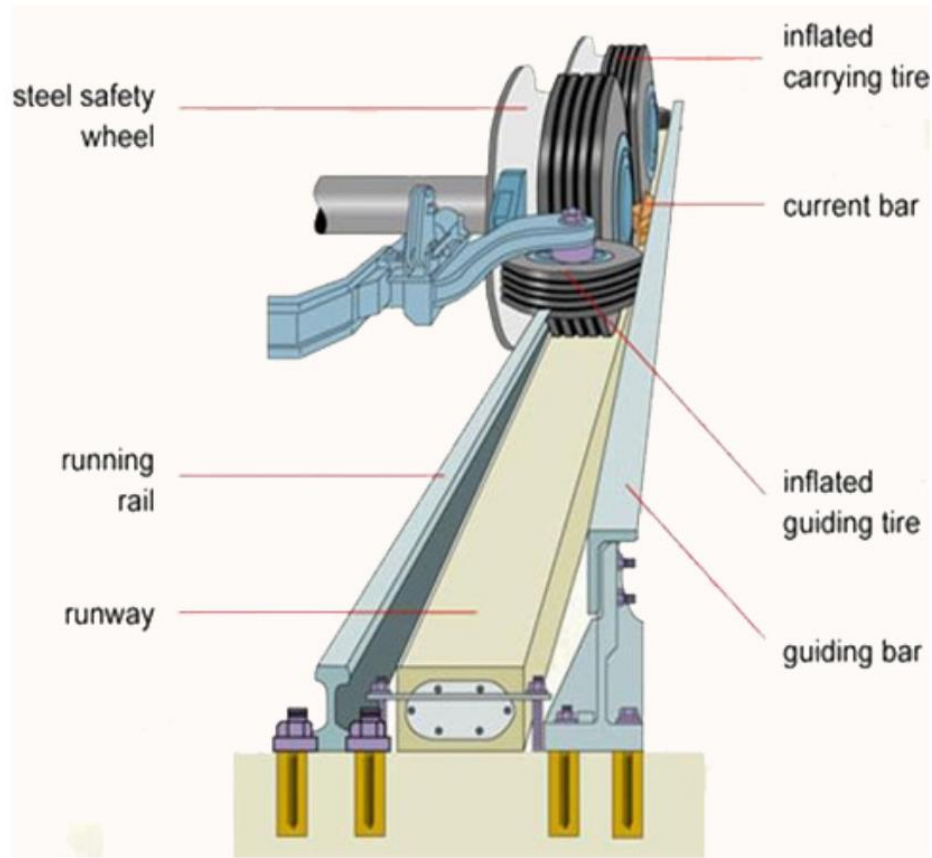


Figure 31 Diagram of Rubber Tires

Rubber-Tyred Metro. Diagram. RailSystem. December 6, 2022. <https://railsystem.net/rubber-tyred-metro-2/>.

This Diagram outlines the system that the Mexican metro implemented, which greatly reduced the noise within the underground system.

The United States watched with anticipation and interest. When President Gustavo Diaz Ordaz inaugurated the metro William J Ronan, the chairman of the Metropolitan Transportation Authority of New York, attended.¹²⁷ The United States contributed little of the expertise required to build the metro. As neighbors, the US and Mexico had not always seen eye to eye on how to develop Mexico and harness its resources. One of the primary reasons Mexico looked to Europe for help was to reduce its reliance on the US. Once the project neared completion the US looked on with a mixture of suspicion and curiosity.

¹²⁷ "Subway in Mexico City is Opened by President," *The New York Times*, (New York, New York) 5 Sept. 1969.

A Change in Perception

“Poor little Mexico so far from God and so close to the United States.” Jim Murray included this quote in his article regarding the metro.¹²⁸ The metro project marked a change in perception, Mexico was no longer the little brother to be at once protected and picked on by its bigger neighbor to the north. Murry described the people of Mexico as the most interesting people found anywhere. There can be no question that at least this author considered the metro on par with the transit systems of New York and other cities. In many ways, the metro was in fact superior. He further said that the metro was clean and ran on time and would not be covered with bubble gum nor overrun by muggers until the year 2000.¹²⁹ This comment directly disparaged the New York subway as it was covered in graffiti and bubble gum as well as rampant with crime. Even in the year 2000 and beyond the metro proved to be cleaner and more crime-free than other world subways. The constant and large police presence was, in part, responsible for this. The culture and pride of the city and its people also accounted for the clean and safe operation of the metro.

Continued associations with the New York subway echoed in many publications. As two of the largest cities in North America, such comparisons could not be avoided. William J Ronan returned to Mexico City in June of 1971 to address the Institute of Rapid Transit, which held its annual convention in Mexico City that year.¹³⁰ Representatives from many modern cities having subways attended the conference. In his address, Ronan stated that the modern rapid transit

¹²⁸ “A salute to mexico: Incomplete source,” *Los Angeles Times*, (Los Angeles, CA) 27 Oct. 1968.

¹²⁹ *Ibid.*

¹³⁰ “Ronan, at Transit Parley, Says Rider is Neglected,” *New York Times*, (New York, New York) 10 Jun 1971.

system had neglected the passenger. Too much attention was placed on cost and technology. The questions of why riders used the system and where they needed to go and when required a closer look. Not to mention the comfort of the ride. How many people were crammed in, the noise the mechanism created, and the bumping and jostling of the ride all play a factor in the comfort of the rider. And then there is the cost. At that time, he announced that the New York City system price hike would be happening soon.¹³¹

Towards the end of his remarks, Ronan contrasted the Mexico City metro to all he had said that was negative about modern mass rapid transit. The metro was among the newest and most modern of the time. At the time that Ronan spoke in 1971 the first three lines of the metro were in operation. None of them were older than five years. This certainly made the system as a whole look better than older systems. But it was not just the relative newness of the system that set it apart. Less noise and more comfort marked the ride in Mexico. Rubber tires made sure of this. The other area in which the metro excelled, and garnered Ronan's attention, had to do with the cost. To be precise the exceedingly low cost. To sum up his remarks Ronan concluded that urban survival counted on not neglecting the rider and the maintenance and operation of a viable subway system. Mexico City and its metro were the standard that he cited for meeting this level of achievement.¹³²

By this time the metro had established itself as a safe and competitive system when compared to other major subways. The maximum speed of the rubber-wheeled cars was fifty miles per hour - the same as the New York City subway. French and Mexican engineers had largely solved the problems of soil subsidence and concerns over earthquakes.¹³³ In a New York

¹³¹ Ibid.

¹³² Ibid.

¹³³ Sidney Wise Thomas, "Mexico City's Metro -- the World's Highest Subway -- Quietly Rolls Along: Mexican Metro is Rolling Along," *New York Times*, (New York, New York) 03Aug 03, 1969,

Times article, the supervising engineer stated that the most secure place to be in the city during an earthquake was the metro. The concern over safety has receded into the background according to the article.

Hundreds of newspaper articles written worldwide contained the same assessments of the metro.¹³⁴ Such praise and world attention, no doubt, put a feather in the cap of the politicians and metro planners. This acclaim not only placed Mexico in the ranks of modern cities but also held it out as a beacon of what could be achieved. People worldwide read articles that declared that New Yorkers may be interested in taking a ride on the metro when in Mexico City. In doing so, they could witness for one peso, eight cents, what a subway can be when given public support.¹³⁵

Subway Construction in Other Latin American Countries

In addition, to receiving attention in North America and Western Europe the metro led the way in a surge of subway construction in Latin America. With the exception of Buenos Aires, Mexico City built the first subway in Latin America. Shortly after the inauguration of the metro, many countries began planning the construction of their own system in Latin America. One Chilean official stated, "We Latin American worry about such things. Each of our nations likes to have certain things—its own airline, its own petrochemicals plant, its own jet fighters and at least one aircraft carrier. Now subways are also in style."¹³⁶ In a *New York Times*

<http://erl.lib.byu.edu/login/?url=https://www.proquest.com/historical-newspapers/mexico-citys-metro-worlds-highest-subway-quietly/docview/118474645/se-2?accountid=4488>.

¹³⁴ I have focused on cited mainly articles from the United States and England. The same types of articles appeared in the newspapers of most major Western European, South American and North American cities.

¹³⁵ Suzanne Donner, "What's Doing in MEXICO CITY," *New York Times*, (New York, New York) 02 Sep 1973.

¹³⁶ Malcolm W. Browne, "Latin-American Cities Experience a Huge Subway Building Boom," *New York Times*,

article Malcolm Browne claimed that having a subway in the capital city was a point of national pride. The Mexican government certainly agreed with his remarks and the Mexican metro acted as a model for other Latin American countries to emulate.

Was it Worth it?

All this praise and emulation did not diminish what many pundits saw as drawbacks to the Mexico City metro. Low fares necessitated government subsidies. In other words, taxes paid for the income shortfall of the fares. Many argued that rural people who had never seen a subway paid just as much in taxes as those who used the metro every day. The massive expenditures on the metro may have yielded better returns and done more good had they been spent on something that benefitted a larger part of the country's population.¹³⁷ In Mexico's case, the capital is the country in so many ways. At the time of the initiation of the metro, it was projected that by 1980 the population of Mexico City would exceed eleven million people. This would account for nearly a quarter of the total population. The counter to this argument was that the city was so large that no other project could have had the same benefit for so many. In addition, transportation problems crippled the city. Further growth would have exacerbated the existing problems. The prestige of the county was in question and no other project would have met these needs, as well as the metro, did, not even an aircraft carrier.

The expensive metro contained stations in and around many areas of slums. Detractors of the metro challenged that the money spent on the metro would have been better spent on

(New York, New York) 28 Jan 1970.

¹³⁷ Ibid.

improving the living conditions of the poor and those who lived in the shanty towns.¹³⁸ The rapid population increase in Mexico City during these years led to the construction of many such slums. Mayor Ernesto Urucurtu employed eviction by bulldozer tactics in an attempt to control the extent of these impromptu settlements. Despite his efforts, the population continued to grow much faster than the necessary infrastructure could keep up. Water, sewer, roads, and electricity lagged far behind demand. Millions moved to Mexico City looking for a better life. They came looking for work.

The work they sought was not in the slums. This point is crucial to understanding the other side of the argument. The metro provided very cheap transportation to the poor. The work that the immigrants could obtain required them to travel. The metro provided cheap transportation to them. The ability to move great distances to work allowed many of the poor to become productive citizens. Most new arrivals did not have cars and could not afford taxis or bus fares. For many poor citizens, the metro was the only means they had to provide a living for themselves. The metro expanded the city and its opportunities to the average person. Ronan observed this and lauded the Mexico City metro as a model for other cities to follow. This fact also clearly contributed to the status of the city and the legacy of the planners and politicians.

Not all shared the vision of the metro as being a benefit to the populace and a technological and cultural marvel. One traveler from Queens wrote a letter to the editor of the *New York Times* that described his perception of the metro.¹³⁹ Michael Schein found the metro to be an “irritable combination of exquisite architecture and thoughtless engineering. It is clean beautiful and virtually useless.” He complained about the layout and the distances between the

¹³⁸ Ibid.

¹³⁹ NORMAN S. SCHEIN SHERMANECILE, "Letters: More Delights of the Vermont Scene: NO COPTER COPOUT Letters to the Editor MEXICO CITY SUBWAY," *New York Times*, (New York, New York) 14 Oct 1973.

stations between lines a passenger must walk to connect. The smell of burning rubber that the tires produced. The lack of seats in the small cars. The inability of passengers to actually see the tracks. The non-twenty-four-hour service. And finally, the lack of actual service to the Mexico City airport. The expansion of the system with subsequent lines resolved that problem. These all made his list of complaints. He even said that the Pino Suarez station was worse than the Canal Street station in New York. In the end, he concluded that the Mexico City metro is nothing more than a “non-functional architectural exercise as unworthy of the tourists’ time as it was of its taxpayers’ money.” While some clearly agreed with Mr. Schein’s opinion, they were in the minority.

At the time the metro opened newspapers and magazines provided the most numerous and most accessible outlets for review and critique of the metro. Since the metro opened, media has progressed with technology. Today the internet and other media outlets provide a platform that millions can access in just a few seconds. Social media has played a major role in presenting the metro to the world and allowing the world to express its views.

The Metro in Popular Culture and Movies

In 1990 Sony released a movie, *Total Recall* that spent six months in Mexico City filming.¹⁴⁰ One of the primary action scenes takes place in a metro station. The line two station

¹⁴⁰ *Total Recall* (Sony, 1990).

This movie takes place around the year 2025. Humans have colonized Mars and can implant memories. The plot of the movie revolves around Arnold Schwarzenegger’s character who had vacation memories implanted. His implanted memories come to life and the viewer is left to wonder what is an implanted memory and what is real. The movie was the fifth highest-grossing film for the year of its release and found critical acclaim both among critics and fans.

Chabacano connected line two to lines eight and nine.¹⁴¹ This station has both underground lines as well as above-ground lines. The network of connecting tunnels and passages was as Michael Schein complained, very extensive. This expansive network made this station a perfect place for the movie scene. In the film, the familiar metro signage changed from the iconic metro icons to similar more generic symbols. The movie producers simply copied the signage but used icons that fit the movie and would not have identified the Mexico City metro. Everywhere a rider would expect to see a directional sign or a map there was a similar sign made to fit the movie. Even the cars were the same except instead of the normal orange they had been painted to a more movie-friendly grey. Moviegoers familiar with the metro took notice of the changes in signage. Several websites described how and why the changes occurred.¹⁴² One such site noted that Wyman's icons were bright and happy while the Eurostyle movie icons were drab and blocky which made the scenes in the movie appear even more dystopian. Wyman and the metro developers knew what they were doing when they developed the bright and happy icons that represent the metro.

The movie setting took place in a dystopian futurist society. The metro station with its many corridors, pipes, escalators, stairs, train cars, signs, and thousands of people made it the perfect place to film. The metro scene can be seen on YouTube.¹⁴³ The station had a familiar feel to it, but it also had a slightly industrial feel that made it seem out of place for today's world. Close enough to home to make it relatable but far enough out of the every day to make it seem

¹⁴¹ Station Chabacano's pictogram is an apricot. The station was named for a nearby street. It is two stations from line one station Pino Suarez. Line one and two share Pino Suarez station.

¹⁴² Roger Strunk, "EXPLORING THE FRONTIERS OF VISUAL IDENTITY DESIGN AS ENVISIONED BY SCIENCE FICTION," *Speculative Identities*, accessed October 24, 2022, <https://www.speculativeidentities.com/research/metro>. This is one of the better sites I found describing the signage in the metro from the movie.

¹⁴³ *Total Recall - Subway Chase Scene (1080p)*, (YouTube Vee XXL, 2017), <https://www.youtube.com/watch?v=DEDTKESQQQc>.

like a future dystopia. Mexico had this same feeling - familiar yet distant and a little disconnected. The filmmakers took full advantage of this when choosing a site for the movie. One unfamiliar with Mexico City would have no idea that the movie took place there. The movie won an Oscar for best visual effects, no doubt in large part due to the contributions the metro made to the overall look of the movie.¹⁴⁴

Foreign Perception and Comments on the Internet

Internet posts have also made the metro more accessible to everyone who has a computer. Hundreds of posts have appeared online describing any and everything about the metro. Many foreigners who live in or visit Mexico City make posts and offer their advice and commentary. These posts allow great insight into how others view the city and the metro system. One such observer from England created an informative post regarding her experiences with the metro.¹⁴⁵ In it, the author, Lauren, gave her advice on how to navigate the metro. Shuffle to the door a few stops early, avoid rush hour, doors open automatically, and people stand where they want, and move about where and when they want and are brazen about it. Lauren pointed out that on the escalators in London standing still on the left side is punishable by audible tut-tuts, but not so in Mexico City. Although she generally had positive things to say she also stated that the Mexico City metro is a lawless place, although it is among the safest modes of transportation in the city.

¹⁴⁴ Chris Morgan, "20 Facts You Might Not Know about 'Total Recall'," *Yardbarker*, accessed October 24, 2022, https://www.yarbarker.com/entertainment/articles/20_facts_you_might_not_know_about_total_recall/s1_37721678#slide_5.

¹⁴⁵ Lauren, "A Beginner's Guide to Using the Mexico City Metro," *Northern Lauren*, accessed October 10, 2022, <https://northernlauren.com/beginners-guide-using-the-mexico-city-metro/>.

When it Rains

When it rains many would be pedestrians flock to the metro causing congestion and other problems. Lauren claimed that as people poured into the metro on a rainy day the cars began to smell like wet chicken.¹⁴⁶ The normal foot traffic migrates underground to avoid getting wet. Additional passengers further congest the system at peak hours. According to her posts, some of the stations will flood if it rains enough. This should come as no surprise since the city was built on a dried lakebed. Flooding is a constant threat. While this rider made a point about the potential for flooding in a subway system, the threat is not unique to Mexico City. New York City subways flood on occasion as well.¹⁴⁷

Excessive water and its effect on the soil under the city is nothing new to Mexico City. Line twelve of the metro system began construction in 2007 and engineers hoped to complete it by 2012. Line twelve presented several unique challenges for ICA engineers and work crews. The line would extend nearly 25.5 kilometers, making it the longest line to date in the metro system, and has 20 stations.¹⁴⁸ In addition, it would be the first numbered line to use steel wheels instead of the typical rubber tires. This line reached into the southern portion of the city, the first line to do so, and as such ran under some of the oldest and most densely built-up areas in the city. Due to the nature of the city under which line twelve passed open trenching would not be an option. As a result, the construction of the line had to wait until the needed technology became available due to so many requirements. To meet the tunneling needs ICA employed The

¹⁴⁶ Ibid.

¹⁴⁷ *Flash Floods in NYC Subway as Hurricane Ida Kills Four & City in Emergency* (YouTube The Sun, 2021), https://www.youtube.com/watch?v=Nndp_HvLrrA.

These YouTube videos show the flooding caused by Hurricane Ida in 2021.

¹⁴⁸ "Tunnel Solutions for Mexico City," Tunnel, accessed December 16, 2013,

http://www.tunnel-online.info/en/artikel/tunnel_2012-02_Tunnel_Solutions_for_Mexico_City_1390005.html.

Robbins Company. The Robbins Company was an American company headquartered in Ohio that specializes in manufacturing and maintaining tunneling machines. Their machines have dug tunnels for metro systems in Mexico City, Moscow, and Nanjing to mention a few.¹⁴⁹ In addition, the company provided services for sewer construction and expansions in many cities in the US and abroad. The Robbins Company also received the contract to extend the Tunnel Emisor Oriente in Mexico City.¹⁵⁰ This tunnel will be nearly 62 kilometers long, making it one of the world's longest tunnels. Its purpose was to drain rainwater from Mexico City during times of flood so that the sewer system does not become overburdened.

Mexico City has a long history of fighting back flood waters. The Mexica built a barrier in the middle of Lake Texcoco to keep flood waters out of their city. In colonial times, colonists undertook extensive earthworks to divert and drain water out of the city. Today, the tunnel Emisor Oriente drains water out of the city on a scale unimaginable to past inhabitants of the city. The unfortunate fact is that the city rests in a lakebed and collects water.

The Clean Look of the Metro

Keeping the water and garbage out of the metro lines made the metro appear clean and modern. Many riders who visit Mexico City admire how the system looks in comparison to other major cities. The effort taken to maintain a large network of tunnels and stations

¹⁴⁹ Desiree Willis, "Visiting Mexico City's Newest Metro Tunnel: How the Country's Capital Is Upgrading Its Aging Infrastructure," The Robbins Company, accessed October 24, 2022, <https://www.robbinstbm.com/mx12-visit/>.

This is the Robbins Company web and it contains the information of the Robbins company involvement in the mentioned projects.

¹⁵⁰ "Tunnel Solutions for Mexico City," Tunnel, accessed December 16, 2013, http://www.tunnel-online.info/en/artikel/tunnel_2012-02_Tunnel_Solutions_for_Mexico_City_1390005.html.

demonstrated the level of pride the people have in their transportation system. This pride is evident to all those who use the metro.¹⁵¹¹⁵² The metro compared well to other systems in modern cities. Many videos show how the metro does not have gum on the floor, the paint is new and not peeling off, and the stations look clean and cared for. The building materials also impressed many visitors who commented on the quality of the building materials such as the floor tile and stonework. The cleanliness and order of the metro were due to the small army of people employed to clean and maintain the stations and the many federal police that oversee the safety of every station. The Mexican government had invested money and human resources to ensure that the metro is clean and safe.

Modes of Payment

The metro has kept up with its modes of payment. Many posts focus on navigating the metro and start with how to obtain a ticket. Every station contains at least one taquillera, a ticket booth. Once purchased, the paper stock ticket is fed into the turnstile and in you go. Every trip needs a ticket which can be burdensome if a passenger buys a ticket each time they enter. Many blogs suggest buying tickets in advance four or five at a time.¹⁵³ Recently rechargeable cards make it easier to enter the metro. The cards have a low limit. Most likely as a deterrent to thieves. Machines read the cards and deduct the fare as the passenger enters the turnstile making it unnecessary to buy a ticket every trip. With a little bit of planning a rider can go all

¹⁵¹ *Diriest Subway? New York vs Mexico City* (YouTube mylungpuppy, 2015), https://www.youtube.com/watch?v=Uus_rs_KJWI&t=283s.

¹⁵² *New Yorker tries the Mexico City CDMX Metro for the First Time POV: No A/C, Hot and Uncomfortable*, (YouTube ActionKid 2019), <https://www.youtube.com/watch?v=J8vOAd0fDJc>.

¹⁵³ Gabriela Hdez, "How to Use Mexico City's Underground System ("El Metro")," Wander Wisdom, accessed October 12, 2022, <https://wanderwisdom.com/transportation/How-to-use-Mexico-Citys-Subway-System>.

over the city with minimal waiting in line and at minimal expense.

Conclusion

Mexico and its leaders pulled together and marshaled their resources to host the Olympics and build the metro in a short time. These achievements placed Mexico City on the same level as other major cities of the world. While the Olympics and the building of the metro were two distinct events, they both highlighted the desire and the ability of the people to advance their capital city to the status of other major cities. Thousands of members of the press flocked to Mexico City to cover the games and conventions and saw for themselves the high level of quality and expansiveness of the facilities the city offered. They wrote about these things in their newspapers and millions worldwide shared in their amazement.

The metro has become synonymous with the city. Most travelers who need to move about the city talk about the metro. There are many guides describing how to navigate the metro. The mass transportation system is similar to that of other cities but is uniquely Mexican. The names, the icons, the manner of construction, and the level of cleanliness all make the system stand out. The metro has also found its way into popular culture. It has been featured in movies and talked about in songs and in news articles. There can be no doubt that the metro is a success and projects Mexican power and culture to all who see it and ride it.

CHAPTER FOUR

How Ordinary Mexicans Viewed the Metro

Mexico appropriated the technology of the metro and used it to highlight its own unique culture and people. For example, the names and the murals on the walls of many of the stations demonstrated Mexican culture. Almost all the stations have a name that portrayed some aspect of Mexican history or culture. The association of famous statesmen or historic events not only taught and reinforced national history and identity but also infused the new, foreign technology with a flavor of home, and a known element. Murals on the walls of stations and archeological remains also resonated with the common Mexican passenger on the metro. The sight of such reminders of the present and past of the community gave the rider a sense that their surroundings were not so strange. Creating such a perception should not be underestimated.

Even if the primary goal of the metro was to showcase Mexican culture and modernity, once built, it still had to appeal to the ordinary Mexican citizen. Many people feared unfamiliar technology. The novelty of going underground to ride to a destination without having familiar visual cues disoriented most. Since a majority of riders were not wealthy or highly educated this problem permeated through the masses of would-be riders.

The Fearful Economic Alternative

As the metro held itself out as an economic alternative for the working class, many of its riders were initially confused and unaccustomed to how the metro worked. This confusion and misunderstanding of technology were not new to the metro. During the Porfiriato¹⁵⁴ many

¹⁵⁴ The period in Mexican history known as the Porfiriato lasted from 1876 to 1910 during which time Porfirio Diaz

Mexicans feared and distrusted the electric trams. At night, sparks flew from the roof of street cars from their contact with the electric wires that gave them power. Strange smells emanated from the cars due to their electric motors and sparks. For these reasons, many felt that the street cars had satanic origins. This same apprehension also manifested itself in *Corridos*, (Mexican folk songs) about the railroad.¹⁵⁵ Although most did not think that the metro had satanic origins many people had difficulty understanding how to use the metro. Going below ground to move from place to place was new for the residents of Mexico City. While the metro provided a very affordable alternative to bus or taxi, commuters had to pay attention to signs and announcements so as to know when to exit. As a result, signs became a key aspect of navigating the metro for those who could not read.

Chava Flores Popular Music and the Metro

Chava Flores¹⁵⁶ highlighted some interesting aspects of the metro to the ordinary person in his song “Voy en el metro.”¹⁵⁷ He spoke of how the metro changed the city and helped it to take its place among the great cities of the world. Flores earned the title of, “El cronista urbano de Mexico de la primera mitad del siglo XX.”¹⁵⁸ Roughly translated, this meant Chava Flores

was the President of Mexico with the exception of 1880-84 when Manuel Gonzalez was president. Notwithstanding Gonzalez’s presidency Diaz was still the primary political figure during that time.

¹⁵⁵ Matthews, *The Civilizing Machine*, 144.

¹⁵⁶ Chava Flores, born Salvador Flores Rivera, was born in Mexico City and spent most his life there. He was born in Tacuba, perhaps this is why he says goodbye to Tacuba in his song. He had many jobs in his early life, everything from a door-to-door salesman, tailor, warehouse manager, food services and deliveryman. These jobs required that he be in the streets and among the people on a daily basis. These experiences with what he saw on the streets, no doubt, affected and influenced his songs.

¹⁵⁷ Chava Flores, “Voy en el Metro,” Colonize Media (on behalf of IM Music Group); LatinAutorPerf, Abramus Digital, Peermusic, LatinAutor, BMI - Broadcast Music Inc., 1994, accessed March 3, 2016, <https://www.youtube.com/watch?v=D8KPM7P0kJg>.

¹⁵⁸ “Chava Flores fue el cronista urbano de México de la primera mitad del siglo XX,” Gobierno de Mexico, accessed October 3, 2020,

was the urban historian of Mexico for the first half of the twentieth century. This moniker came in large part due to his music. His songs often talked about daily life in Mexico City. Every song described and often made light of what made life in Mexico City unique. The humor in his craft came from his listeners intimate knowledge of what he sang. Choosing to sing about the metro said a lot about what he thought of its cultural value and its effect on daily life.

Flores' song delved into more than just humorous commentary on daily life. Some of them criticized political figures and policies of government officials. Mayor Ernesto Uruchurtu had at least one song in his honor, "Gladiolas" which criticized the mayor's policies. Uruchurtu had millions of gladiola seeds spread across the city. Many, including Flores, thought the nice flowers did not do enough to mask the real problems the city faced. "Dos horas de balazos" also called into question the effects of politics on the city. This song launched his career and placed Flores on the national and international stage.¹⁵⁹

In his song about the metro, he sang of how large, fast, and safe the metro was. He also commented on how a passenger could take the metro from common places to their destinations. He said goodbye to his birthplace in Tacuba and reported all of the places the metro took him. All this travel was made possible because the metro went through his neighborhood and only cost one peso. He also lauded the speed of the metro when he stated that if he did not return in two hours, a tomb should be reserved for him. The metro was so fast and efficient in its purpose that the only reason he would not be back in two hours would be because he has died.

Not all is Perfect

<https://www.gob.mx/cultura/prensa/chava-flores-fue-el-cronista-urbano-de-mexico-de-la-primera-mitad-del-siglo-xx?state=published>.

¹⁵⁹ Ibid.

Not everything was perfect with the metro. It was crowded. If you don't throw yourself on within seventeen seconds you won't make it in. If you do make it on, don't go far from the doors. Far enough to let them close but not so far as to let the next passenger come aboard and push you further from the exit. The push and pull of the masses entering and exiting the metro cars is impressive. The lyrics of Flores' song certainly brought visions of what scenes at rush hour look like when so many push to get on and off and sometimes must pull in the last to enter to get them fully into the car. The song in this respect was an accurate portrayal of metro life.

Flores also noted that the metro did not use "carbon" (coal) and was therefore a cleaner form of transportation. The rapid expansion of the city demanded a similar growth in public transportation. Irregular increases in population and utilities paralleled the irregular but predictable growth of the public transportation system. As the city surged so did the transportation system. Most leaps forward relied on transportation that was not clean. Horse-drawn carriages produced manure. Streetcars came with a tangle of overhead power lines and tracks on the streets. Electric cars often jumped the rails and caused injuries, not to mention the eerie sparks and smelly emanations they made. Buses and taxis also presented their own problems. Thousands of taxis and busses clogged the surface streets. Emissions from internal combustion engine-driven transportation produced pollution that sat over the city like a cloud of black smut.¹⁶⁰

Population and Transportation Expansion

¹⁶⁰ Bernardo, *Metro Metropoli Mexico*, 102.

The book, *Metro Metropoli Mexico*, explained the enlargement of public transportation in Mexico City. The authors placed the metro in the context of the unprecedented growth of Mexico City. They made the argument that the expansion of public transportation followed two factors, capital, and geography of population growth. In the case of the Federal District, it began as a highly centralized area that horse-drawn carriages and foot traffic could effectively serve. As the city grew, street cars carried people to their destinations. However, as the city continued to multiply, it outpaced the infrastructure to continue using electric carriages. As the city spread beyond the reach of electric lines gas powered engines served to facilitate movement. Again, problems arose once the volume of cars and busses exceeded the capacity of the surface streets. The metro, according to the authors, was the natural outgrowth of this expansion.¹⁶¹ Mexico City lacked the capital that most Western cities possessed, yet, Mexico had all the problems associated with growth.¹⁶²

Most people in the city would have understood this progression of transportation. Ordinary people lived with the manure and the congestion and the air pollution every day. The words of Chava Flores would have rung true in their ears. No coal, no additional pollution. This point is driven home in the chorus. “Que grandote, que rapidote que limpiote.”¹⁶³ The metro

¹⁶¹ Oliver Oldman, *Financing Urban Development in Mexico City a Case Study of Property Tax, Land Use, Housing, and Urban Planning* (Cambridge, MA: Harvard University Press, 1967), 207.

This book describes a study made of the Federal District around 1960 which outlined the city’s lack of roads, water, waste treatment. Power and municipal buildings. The study names, Plano Regulador was not widely circulated and although its results spelled out what problems the city had and suggested solutions, it was widely ineffective in causing change.

¹⁶² Luis Unkel Spector, *Zona Metropolitana Ciudad De Mexico: A study prepared for PRI’s Center for Political, Economic and Social Studies* (Mexico, D.F., 1965).

Moreno Pérez, “La Urbanizacion y la Zona Metropolitana de la Ciudad de Mexico,” *Comercio Exterior* 16, no. 8 (November 1966).

Two more studies outlining the problems the city was having with lack of facilities and infrastructure. The government and other organizations funded plenty of studies to identify problems. Little or no change came about due to these findings because each of the problems was the responsibility of some other DDF office and branch. Those other departments did not choose to act or could not act to resolve or even lessen the problems.

¹⁶³ Chava Flores, “Voy en el Metro,” Colonize Media (on behalf of IM Music Group); LatinAutorPerf, Abramus

was huge in scope and scale and offered cheap fast transportation to millions who otherwise would not have had access to movement across the vast city. The metro was also clean. Not just the new and shiny kind of clean but clean in its carbon emissions. In this sense, the chorus has a double meaning which would have been readily apparent to all metro users and all inhabitants of the city.

No Turkeys or Buzzards Here

Part of the chorus in Chava Flores' song does poke fun at the metro. It stated, "Que no admiten guajolotes Tamarindos, zopilotes Ni huacales con elotes." Roughly translated: the metro does not allow turkeys, sellers of tamarin (most likely meaning drinks that contained tamarin) buzzards nor people with gourds full of things including corn on a stick. The use of the Nahuatl word for turkey, "guajolote" in place of the word "pavo" pointed the listener back to Mexico's native heritage and roots. Although it did rhyme with elote better than pavo, the pre-Columbian Spanish word for turkey. But Flores could have said the metro does not admit big turkeys (pavotes) and had the same effect. While the song claimed that such things are not allowed, in practice, the metro cars and stations were full of people doing exactly what the song stated. The street fair style of selling things moved underground with the metro. People jumped cars and stations as they offered their goods for sale. This type of behavior had origins in the ancient Aztec cities where street vendors and open markets accommodated the transfer of most needed goods. While Flores seemingly poked fun at the vendors and the metro policy regarding

Digital, Peermusic, LatinAutor, BMI - Broadcast Music Inc., 1994, accessed March 3, 2016, <https://www.youtube.com/watch?v=D8KPM7P0kJg>.

them, all Mexicans would have been familiar with the practice. A practice that was rooted in the unique culture of Mexico.

The insightful critique and observation of Mexico and its culture placed Chava Flores on the same level as others like Gabriel Vargas, Carlos Monsivais, and Salvador Novo.¹⁶⁴ His work captured the essence of what it was like to be in the city and be Mexican. His song also captured the essence of the metro and what it meant to the ordinary people of Mexico City. I have included the words of the song below and a link to Flores performing the song on YouTube.¹⁶⁵ In the opening of the performance Flores stated that the government created the metro to bring Mexico City up to the same level as other cities and that it changed the aspect of the city in general.

Lyrics to Chava Flores' Song "Voy en el Metro"

Adiós mi linda Tacuba
 Bella tierra tan risueña
 Ya me voy de tu Legaria
 Tu Marina y tu Pensil
 Ya me voy, me lleva el metro por un peso hasta Tasqueña
 Si en dos horas no regreso
 Guárdame una tumba aquí

Al bajar a los andenes
 Escuché esta cantaleta
 Al mirar llegar los trenes
 No se aviente para entrar
 Si en diecisiete segundos

¹⁶⁴ "Chava Flores fue el cronista urbano de México de la primera mitad del siglo XX," Gobierno de Mexico, accessed October 3, 2020, <https://www.gob.mx/cultura/prensa/chava-flores-fue-el-cronista-urbano-de-mexico-de-la-primera-mitad-del-siglo-xx?state=published>.

¹⁶⁵ Chava Flores, "Voy en el Metro," Colonize Media (on behalf of IM Music Group); LatinAutorPerf, Abramus Digital, Peermusic, LatinAutor, BMI - Broadcast Music Inc., 1994, accessed March 3, 2016, <https://www.youtube.com/watch?v=D8KPM7P0kJg>.

No ha podido ni se meta
 Ni se baje la banqueta
 Que se puede rostizar

Voy en el metro, ¡qué grandote
 Rapidote, qué limpiote!
 ¡Qué deferencia del camión
 De mi compadre Jilemón
 Que va al panteón!

Aquí no admiten guajolotes
 Ni tamarindos, zopilotes
 Ni huacales con elotes
 Ni costales con carbon

¡Que se quite de la puerta!
 Y luego luego que me quito
 Y siguió la señorita
 ¡Que se arrime más pa' allá!
 ¡Qué no fume! Si ni fumo
 Ya me trae de su puerquito
 Yo por más que me la busco
 No la jallo donde está

Adiós mi linda Tacuba
 Ya pasamos por Cuitláhuac
 Ya pasamos por Popotla
 Y el colegio melitar
 Ya me estoy arrepintiendo
 No haber hecho de las aguas
 Si me sigue esta nostalgia
 Yo me bajo en la Normal

Voy en el metro, ¡qué grandote
 Rapidote, qué limpiote!
 ¡Qué deferencia del camión
 De mi compadre Jilemón
 Que va al panteón!

Aquí no admiten guajolotes
 Ni tamarindos, zopilotes
 Ni huacales con elotes
 Ni costales con carbon

Chava Flores was not the only Mexican singer to commemorate Mexican culture in his songs. Corridos were Mexican ballads whose lyrics related to historical or social events. Mexican musicians wrote many corridos about trains and other modes of transportation. Likewise, many ballads talked about the metro. It is interesting that more recently corridos have reflected the life of criminals. Especially those involved in drug trafficking.¹⁶⁶ This type of song is very powerful and insightful when reflecting on current social and cultural issues in Mexican society.

Youth and the Metro

The metro also changed the way that communities and their youth thought about themselves and organized themselves. In the aftermath of the 1985 earthquake, many youths found themselves homeless and alone. The area of the city surrounding the station named after Benito Juarez is known as the Plaza Garibaldi.¹⁶⁷ The earthquake virtually leveled that part of the city. For years the area remained in ruins. Within the rubble, gangs of homeless boys and girls formed. They used the metro as a means of identification as well as a means to access other areas of town and transportation to markets and health care. The boys of the gang would say, “We are the banda of metro Juarez, because we consider ourselves from metro Juarez.”¹⁶⁸ In

¹⁶⁶ *Chuy Y Mauricio*, YouTube El Potro de Sinaloa Official, 2018, <https://www.youtube.com/watch?v=q2l0dsMoEe4>.

This link contains a song entitled “Chuy Y Mauricio” it is about two men who have engaged in drug trafficking. At the beginning of the song they are happy and have a new Chrysler 300 to drive. They are on their way to get paid. Instead of money they get lead. Les dieron un bolazo.

¹⁶⁷ Roy Gigengack, “The Buca Boys from Metro Juarez: Leadership, gender and age in Mexico City’s youthful street culture,” *Etnofoor*, 12, no. 1 (1999):102.

¹⁶⁸ *Ibid*, 107.

areas like this where reconstruction took years, the constant was the metro as it continued to run. The metro provided a strong sense of identity and belonging. This example of how technology and its fruits changed identity remained constant even when other circumstances changed. In the years since the earthquake, ravaged areas have been redeveloped. The bandas, however, have remained. Youth gangs continued to use the metro as a means of identification and transportation. This can be seen in the YouTube video entitled, “The Subway Gangs of Mexico City.”¹⁶⁹ In this video, the youth identified themselves as members of the “impulsora” gang, after the name of their local metro station. Members distinguished themselves from other youth by the names of their local stations. At one point the leader of the impulsora gang referenced a map of the metro system and talked of the other gangs, attaching each by their station name. He categorized some as friends and some as enemies. The metro itself acted as both transport to, and refuge from rival gangs. The technology of the metro offered alternatives to the youth they did not have before its construction.

Metro Gangs

The gangs or combos as they are known form around the metro stations in their neighborhoods. Members made shirts, flags, banners, and all manner of identifying insignia to let everyone know who they are. They sing and chant. In video interviews, leaders of the combos claimed they are not violent and try to do good not bad. However, sometimes they run afoul of the police. There are times when the group is so large and loud that the police do not let

¹⁶⁹ *The Subway Gangs of Mexico City*, YouTube Vice, 2013, <https://www.youtube.com/watch?v=wYqtawNtsVg>.

them enter the metro stations. An interview with the director of the metro revealed that the gangs are often responsible for harassing other passengers and causing significant damage to metro property. Yet, for the most part, they are a peaceable means for youth to unite and express themselves.¹⁷⁰

The culture of the gangs has entered music. One of the most surprising aspects of the metro gangs is their music. They sing and make chants to identify themselves and express their dominance and superiority over other gangs. Not only do the gang member themselves sing but there are also reggaeton songs about the metro combos.¹⁷¹ The impulsora gang has their own song.¹⁷² These songs receive play time on platforms such as YouTube and radio stations. The culture of the metro gangs extends much further than the neighborhoods of the actual stations.

The Metro as a Cultural and Artistic Medium

The metro represented one of the largest cultural and artistic collections in Mexico. Each station expressed itself through the art it possessed, whether that art came in the form of murals, music, ruins, or displays of Mexican culture.¹⁷³ Within the stations there are more than thirty murals, tons of sculptures, a museum, a planetarium, and a movie theater. The Metro has its own director of culture, Vanessa Bohorquez, to oversee the culture and cultural events staged in the metro. Bohorquez claimed that the metro is the largest museum in Mexico and perhaps the

¹⁷⁰ Ibid, 23:11.

¹⁷¹ *Panamiur f.u.*, YouTube Sherlay Werita, 2013, <https://www.youtube.com/watch?v=jn6eZAsq3zs>.

¹⁷² *Panamiur El Combo mas Cabron!.*, YouTube Mario Alexis Macay Muñoz, 2011, <https://www.youtube.com/watch?v=teN9e7mUw-c>.

¹⁷³ Rodrigo Cervantes, "Mexico City's Largest Museum," 91.5 KJZZ, accessed October 5, 2022, <https://kjzz.org/content/1250586/50-years-mexico-citys-metro-secrets-and-lessons-one-worlds-largest-and-strangest>

entirety of the Americas.¹⁷⁴ The most visited archaeological site in Mexico is contained within the metro. Station Pino Suarez houses an ancient temple dedicated to the god Ehecatl. Nearly twenty-four million people go by this site every year. More recently, the metro has been the host of two art galleries.

On the walls of the station Tacubaya, Guillermo Cinicerros painted the six hundred square meter mural “From the Codex to the Mural.” Tens of thousands of people pass through the station daily but too few stop to admire the work of art in front of them. The mural depicted the flight of the ancient Mexica people from their home in the North, the settlement of the city Tenochtitlan.¹⁷⁵ Portions of the mural show various Aztec deities. The mural contained a historical and cultural lesson within its many brush strokes. The walls of the station come apart in sections corresponding to the various sections of the mural to enable restoration. The mural garnered Cinicerros international recognition and nominations for awards.¹⁷⁶

¹⁷⁴ Ibid.

¹⁷⁵ Mario Yair, “Tacubaya's Subway Mural,” Atlas Obscura, accessed October 5, 2022, <https://www.atlasobscura.com/places/tacubaya-s-subway-mural>.

¹⁷⁶ Ibid.



Figure 32 Codex Mural

Yair, Mario. *Tacubaya's Subway Mural*. Photograph. Atlas Obscura. January 8, 2019.

<https://www.atlasobscura.com/places/tacubaya-s-subway-mural>.

This photograph within the metro showcases "From the Codex to the Mural."

The Metro is Made of

The stations not only provided a stage and a canvas to showcase culture but the materials were also specific to Mexico. The use of stone and granite for flooring and wall coverings stands out. Concrete was used often and there were many metal beams that are common in most subway systems. The use of local Mexican material gave the metro a local authentic texture and feeling to the riders. A foreigner will take notice of the material right away, but it is doubtful that the local user will think twice about the construction as that is what they are accustomed to

seeing in the city and surrounding buildings. The use of color also played a significant role in the metro. Each line had a unique identifying color. The color and icon combination expressed Mexican power and culture.

Metro Stations as Performance Stage

The stations and underground network's connecting lines acted as stages for many to perform. While walking in any station an observer will likely see performances of all types. Many YouTube videos show such performances. One such video depicted a group of musicians playing trumpets and saxophones.¹⁷⁷ The passageways of the metro meld the new and the old the ancient and contemporary together in a way that no other medium could. Ancient ruins and murals stand witness to the new and ever-changing expression of modern culture. Cultural director Bohorquez said, "The culture offer of the metro not only embellishes the city, it also helps bring a friendlier and more peaceful environment."¹⁷⁸

Avoidance of Foreign Intervention

Mexicans were keenly aware of how they appeared to other nations and feared foreign power and intervention in their internal affairs. Above all, the United States represented latent

¹⁷⁷ *the coolest saxophone subway band ever*, YouTube Switch OFF, 2019,
<https://www.youtube.com/watch?v=d77p2Cg1q1Y>.

¹⁷⁸ Rodrigo Cervantes, "Mexico City's Largest Museum," 91.5 KJZZ, accessed October 5, 2022,
<https://kjzz.org/content/1250586/50-years-mexico-citys-metro-secrets-and-lessons-one-worlds-largest-and-strangest>

fear of what could happen if Mexico allowed too much foreign intervention. The War of Northern aggression proved that the US needed little pretext to intervene and take what they wanted.¹⁷⁹ The loss of so much territory deeply affected the psyche of the nation. Even during the years of the Porfiriato foreign investment gave pretext to intervention. The French occupation came about because of unpaid foreign debt. When it came to the metro the Mexicans did want to make the same mistake. This was one of the primary reasons that France and not the US became the model for the metro.

Anti-Americanism and US-Mexican Relations

Anti-Americanism and antiforeignism played a major role in Mexican foreign policy. “Partly of this reason, and keenly aware of the role of history and emotions can play, Mexican leadership finds antiforeignism a ready tool for justifying new policies”¹⁸⁰ The new policy of the metro was Mexicanization of foreign technology and know-how. By not relying too heavily on the US, Mexico could avoid past mistakes. This path allowed Mexico to develop its own unique technological and cultural production without giving the United States an opportunity to dominate its efforts as had happened in the past. The backlash from events in the US had caused riots and looting in Mexico City in the past. Henry Lane Wilson related such an event in Mexico City during his time as the US ambassador to Mexico from 1909 to 1913. Lane recalled a story of a young Mexican being lynched in Texas which resulted in retaliation against Americans in

¹⁷⁹ The War of Northern Aggression is the name the Mexicans gave to what the United States called the Mexican American War.

¹⁸⁰ Frank Brandenburg, *The Making of Modern Mexico* (Englewood Cliffs, NJ: Prentice-Hall, 1964), 327.

Mexico City.¹⁸¹ The people of Mexico esteemed every American present to be an employer of labor or manager of the enterprises that developed the country. The riots destroyed considerable property. These sentiments ran deep in the people of Mexico. Thus, it was critical to develop a transportation system independent of American employers and managers.

Mexico and the US enjoyed two decades of improving relations when the metro project began. Alan Knight explained that the post-World War II environment allowed for and encouraged closer ties between the US and Mexico.¹⁸² The post-Cardenas¹⁸³ period saw unparalleled growth between the two countries. The Mexican Revolution brought about a radical change in the country. By 1964 when Gustavo Ordaz Diaz took office federal military spending had declined from one-third of the federal budget in 1929 to less than one-thirtieth in 1964. Private armies that had been so prevalent in Mexican history had virtually disappeared.¹⁸⁴ The period known as the Mexican Miracle produced great economic growth in Mexico which allowed projects such as the metro, but it also exposed a weakness. Projects like the metro drew attention to the foundation of poverty upon which the Mexican Miracle was built and questioned the benefits of rapid urbanization.¹⁸⁵

Questioning of the Mexican Miracle

The event that best exemplified the process of questioning the government and its

¹⁸¹ Henry L. Wilson, *Diplomatic Episodes in Mexico Belgium and Chile* (Port Washington, NY: Kennikat Pr, 1971), 188.

¹⁸² Alan Knight, *U.S.-Mexican Relations, 1910-1940: An Interpretation* (San Diego, CA: University of California, 1987).

¹⁸³ Lazaro Cardenas was the Mexican president that expropriated US oil interests in March of 1938.

¹⁸⁴ Frank Brandenburg, *The Making of Modern Mexico* (Englewood Cliffs, NJ: Prentice-Hall, 1964), 274.

¹⁸⁵ Kandell, *La Capital*, 529.

policies was the Massacre at Tlatelolco. Student protests turned violent and then deadly as government police forces opened fire and killed many. The students from many of the leading universities in Mexico protested the lack of opposition parties to the PRI.¹⁸⁶ They wanted to make their voices heard in the political process. Reports vary widely regarding how many were killed but most fall between 40 and 300, with over a thousand more arrested.

The '60s as a Watershed Moment

The year of 1968 marked a watershed year for the nation and for Mexico City. The politicians had to manage international events along with internal strife. The protests at Tlatelolco and its aftermath left deep scars on the nation and made waves internationally. This was not unique to Mexico, the 1960s were a tumultuous decade for much of the world. In this backdrop, the PRI had to decide whether to spend limited resources on the city and encourage further urbanization, a natural outgrowth of the Mexican Miracle and post-World War II dynamics or focus on rural needs.¹⁸⁷ The Ordaz administration certainly chose to focus on urbanization. The metro project placed the focus squarely on the city - to the neglect of other regions.

The student protests brought into question Mexico's place of the 1968 games and exposed underlying dissention and strife. Even though the protests occurred prior to the opening of the metro, the students protested in part against the metro. They, like mayor Uruchurtu, saw the metro as a drain on resources that could be better spent elsewhere. Why not use those

¹⁸⁶ The PRI Partido Revolucionario Institucional was the leading and effectively the only political party in Mexico. All presidents since Plutarco Calles had been members of the PRI.

¹⁸⁷ Davis, *Urban Leviathan*, 193.

resources to help solve poverty? These types of concerns were much the same as the protests in the United States that targeted the space program. Why do we need to go to the moon when the resources to do so would be better spent on combatting hunger and poverty?

Political Policies and the Growth of the Metro

The starts and stops of the metro reflected the attitude of the various Mexican presidents. Those whose policies aimed to improve the city, urbanization, and industrialization expanded the metro. Those who focused on rural areas or agrarian concerns did not. The president that followed Diaz, Luis Echeverria, departed from metro development in favor of the enlargement of the transportation system outside of the city.¹⁸⁸ He redistributed land and focused more on rural concerns. As a result, no metro expansion occurred during his presidency from 1970 to 1976.

The shifting political views of the metro also mirrored perceptions of class. The creation of the metro represented a fundamental shift away from the middle class to the poorer masses.¹⁸⁹ The middle class could afford to pay for taxis and buy cars in many cases. The middle class also owned and operated many of the small transportation businesses within the city. A metro was not only not geared to provide them service but also potentially cut into their revenue. The typical resident of the city understood these shifts. Not unlike the deepening levels of understanding in Wyman's icons according to Panofsky, city politics had deepening levels of meaning.

¹⁸⁸ Luis Echeverria died in July of 2022. He lived to be a hundred years old. He was the first and to this point the only Mexican president accused of criminal activity. Recently he was charged with genocide for his involvement in the massacre of Tlatelolco among other things. He was the secretary of the interior in 1968 and many think him responsible for what happened to the student protesters. A judge ruled against a warrant for his arrest citing the expiration of the statute of limitations for his alleged crime.

¹⁸⁹ Davis, *Urban Leviathan*, 170.

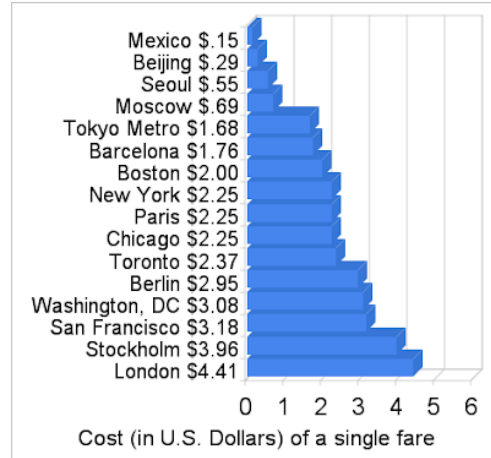


Figure 33 Subway Affordability Diagram

Amid rising costs, how do subways fare? Graph. Lanier Parking. July 6, 2009.

<https://www.lanierparking.com/news/post/amid-rising-costs-how-do-subways-fare>.

This graph depicts the affordability of the metro for the lower class citizens of Mexico City.

Despite the differences between political leaders and the classes, the metro came to embody Mexico City. While many started out apprehensive about the metro time and convenience made them believers. On the metro today one can see people from all walks of life. The metro, its signage, its art, and its color make it uniquely Mexican.



Figure 34 Artistic Metro Car

Redaktion. Fleet modernisation for the 50th Anniversary of the Mexico City metro. Photograph. Urban Transport Magazine. May 14, 2019. <https://www.urban-transport-magazine.com/en/fleet-modernisation-of-the->

[mexico-city-metro/](#).

The photograph of this metro car demonstrates the culture that has been infused into the Mexico City metro.

CONCLUSION

The metro burst forth at a unique time in world and Mexican history. Post-World War II forces that fostered the Mexican Miracle also created circumstances in Mexico that were favorable for the construction of the metro. The advent of mass communication and its widespread use also contributed heavily to this atmosphere. Mass communication created a mass culture that coincided with the Mexican Miracle. All this happened at a time when the Mexican population, economic growth, political leadership, and social demands were in harmony.¹⁹⁰ The harmony of the forces involved increased and decreased over the years which was reflected in the starts and stops of the construction and expansion of the metro.

Mexico gathered its resources and borrowed and incorporated what it lacked. The Mexicanization of foreign technology showed the world that Mexico was ready to join other advanced modern nations. The domination of the landscape and features that made Mexico City a difficult place to build highlighted Mexican determination. Mexican leaders and engineers borrowed and took the best that the world had to offer and made it their own. In so doing they gave its own unique flavor.

The metro was as much a cultural production as it was a technological marvel. The Mexican people were searching for their identity. The production of the metro combined indigenous roots with European heritage. The names of the stop demonstrate this. The choice of color and decoration of the stations also reflected Mexican heritage and presented a new unique

¹⁹⁰ Colin M. MacLachlan and William H. Beezley, *El Gran Pueblo: A History of Greater Mexico* (Englewood Cliffs, NJ: Prentice Hall, 1994), 348.

identity. The three great muralists of Mexico, Rivera, Siquieros, and Orozco helped start a process that displayed and highlighted Mexican culture.¹⁹¹ In 1920 President Alvaro Obregon asked his secretary of state Jose Vasconcelos how to unite the country. Ten years into the Mexican Revolution the country was deeply divided. Vasconcelos suggested art. More specifically, murals as their Mayan and Aztec ancestors had done. The big three all featured prominently in this effort. The promotion of Mexican heritage and culture became the center of their efforts. In like manner, the metro worked in the same way. The muralists received international recognition. So did the metro, but the metro was not only a cultural work but also a cultural marvel.

The cultural work of the metro was a natural continuance and outgrowth of what men like Vasconcelos and the big three had already begun. The metro as a medium of art displayed Mexican civilization to millions of people a day in a way that no other medium could. Tourists and locals alike see the stations and culture of Mexico every time they ride. Siqueiros once said, “The artist must paint as he would speak. I don’t want people to speculate what I mean; I want to understand.”¹⁹² All who see begin to understand that Mexico is unique and has much to offer.

Subways and metros in general have entered popular culture in a way that few other technological wonders have. There are songs and corridos that talk about the metro. Books, magazine articles, and news stories all chronicle events in the metro and daily occurrences there. Hundreds of movies and TV shows have scenes in the metro. In Mexico City as in every other major city that has one, the metro had become a part of everyday life, a necessity. The

¹⁹¹ Diego Rivera was born December 8, 1886 in Guanajuato Mexico, and died November 24, 1957. Jose Oroz Born November 23, 1883, in the state of Mexico died September 7, 1949. David Siqueiros born December 29, 1896, in the state of Mexico died January 6, 1974. These three men were known as the big three internationally. Their work received international attention and brought notoriety to Mexican culture.

¹⁹² “Mexican Muralism Movement Overview,” The Art Story, 2022, accessed September 12, 2022, <https://www.theartstory.org/movement/mexican-muralism/>.

production of the metro In Mexico City lifted the city and nation onto the same level as other major metropolitan centers.

The metro was, by far, the largest, in both cost and scope, of any public works project carried out in Mexico City. It modernized the city making the majority of its geography accessible through mass transit. As such, Mexico City took its place alongside other modern capital cities. As it did so, it relied on borrowed technology to construct its goliath system and at the same time incorporate the technology. I have other questions and factors to consider in this process. Such as the effect on the city of buses and taxis after the completion of the metro. Has the metro changed local and national laws regarding land use? Has the technology of the metro increased undesirable social ills such as crime and vagrancy? While these questions will have to wait to be addressed it is clear that the use of uniquely Mexican art and culture lends a sense of ownership and, belonging to the new technology. The Mexicanization of stations and the production of the components of the technology also produced a sense of mastery over the metro. Mexican engineers and technicians overcame geography and terrain to build a metro that could withstand earthquakes and still serve over four million riders per day. The people and government of Mexico City succeeded in their quest. Additionally, during the process of building the metro, the city discovered a part of its past.

The metro revolutionized the way the masses got to work. In the past, people had to walk or ride a horse. Later, buses, taxis, and then cars took a leading role. Now, it is the metro that gets the working masses to work. Most in Mexico City cannot afford a car and even bus or taxi fares are more than they can spare. The metro provides an essential mode of transportation for the masses not unlike the canoes of Aztec times.

More recently, there has been no additional work on the metro. The last line was

completed in 2012 and there are no further expansions planned at this time. While the metro continues to be a cheap, clean means of transportation the failure to expand the system to keep pace with city growth is probably shortsighted. In addition, the metro has received bad press recently for its bridge failure. In May 2021 a bridge collapsed on the metro killing and injuring many. Investigations show shortcuts in construction directly led to the failure.¹⁹³ President Lopez Obrador stated that things happen, but many are concerned about the cronyism and shoddy workmanship on such a high-profile public work. The nexus of politics and social needs will need to be addressed if the metro will continue to grow. Public confidence is required. Mexican culture, as shown in the metro, will need to focus on the good and stamp out the bad. There can be no doubt that the metro will occupy a central role in the critical need for cheap and effective transportation in Mexico City.

¹⁹³ Natalie Katroeff, "Why The Mexico City Metro Collapsed," The New York Times, June 13, 2021, accessed December 18, 2022, <https://www.nytimes.com/interactive/2021/06/12/world/americas/mexico-city-train-crash.html>.

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