

<https://doi.org/10.23913/ride.v15i29.2093>

Artículos científicos

Planeación territorial a través de la detección de mojoneras al norte de la Ciudad de México

Territorial planning through the detection of boundary markers north of Mexico City

Planejamento territorial através da detecção de marcos fronteirizos ao norte da Cidade do México

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Resumen

En los inicios de la Ciudad de México (CDMX) su configuración territorial fue delimitada por elementos físicos naturales o por el señalamiento limítrofe a través de mojoneras, las cuales son monolitos de piedra. Con el crecimiento poblacional, la gente se fue estableciendo en los límites de la CDMX modificando la configuración territorial planeada en los inicios de esta. Existen por otro lado, factores políticos como la configuración de los distritos electorales que generaron otro nuevo límite, esto trajo problemas graves a la población ya que se presentó una dualidad en su delimitación y definición territorial, (por un lado, ser de la CDMX y por otro del Estado de México). Se partió del supuesto hipotético que la falta de



claridad en la delimitación territorial de algunas comunidades y la conformación de los distritos electorales por el Instituto Nacional Electoral (INE), generaron una doble división política. El objetivo de este trabajo fue identificar la importancia de la aplicación de la planeación urbana y de una clara delimitación territorial, a través de la detección de mojoneras. Además del señalamiento del impacto provocado en la comunidad estudiada, así como algunas condiciones que repercutieron directamente.

Esta investigación es mixta (cuantitativo-cualitativa) por un lado se realizó la identificación de los límites territoriales definidos en la “Ley del Territorio de la CDMX” a través de la ubicación de las mojoneras, contrastando con los límites de la cartografía del padrón electoral del INE, mostrando una dualidad territorial, tal y como se señaló en la hipótesis. Una vez encontrada la diferencia, se pudieron mostrar algunas consecuencias muy negativas para la población estudiada. Se detectó que los predios afectados por esta dualidad, presentan problemas puntuales al no contar con los servicios básicos; así como, de identidad, al estar en los límites de una alcaldía y un municipio a nivel estatal.

Palabras clave: límite territorial, mojonera, planeación territorial, territorio.

Abstract

At the beginning of Mexico City (CDMX), its territorial configuration was delimited by natural physical elements or by boundary marking through boundary markers, which are stone monoliths. With population growth, people settled in the limits of CDMX, modifying the territorial configuration planned at the beginning. On the other hand, there are political factors such as the configuration of the electoral districts that generated another new limit, this brought serious problems to the population since a duality arose in its delimitation and territorial definition, (on the one hand, being from CDMX and by another from the State of Mexico). The hypothetical assumption was that the lack of clarity in the territorial delimitation of some communities and the formation of electoral districts by the National Electoral Institute (INE) generated a double political division. The objective of this work was to identify the importance of the application of urban planning and a clear territorial delimitation, through the detection of boundary markers. In addition to pointing out the impact caused in the studied community, as well as some conditions that had a direct impact. This research is mixed (quantitative-qualitative). On the one hand, the identification of the territorial limits defined in the “CDMX Territory Law” was carried out through the location of the boundary markers, contrasting with the limits of the electoral roll cartography. of the INE, showing a territorial duality, as indicated in the hypothesis. Once the difference was

found, some very negative consequences could be shown for the population studied. It was detected that the properties affected by this duality present specific problems by not having basic services, as well as identity, being in the limits of a mayor's office and a municipality at the state level.

Keywords: territorial limit, boundary marker, territorial planning, territory.

Resumo

No início da Cidade do México (CDMX), sua configuração territorial era delimitada por elementos físicos naturais ou pela marcação de limites através de marcadores de fronteira, que são monólitos de pedra. Com o crescimento populacional, as pessoas se estabeleceram nos limites do CDMX, modificando a configuração territorial planejada inicialmente. Por outro lado, existem factores políticos como a configuração dos distritos eleitorais que geraram outro novo limite, isto trouxe graves problemas à população visto que surgiu uma dualidade na sua delimitação e definição territorial, (por um lado, sendo do CDMX e por outro do Estado do México). O pressuposto hipotético era que a falta de clareza na delimitação territorial de algumas comunidades e a formação de distritos eleitorais pelo Instituto Nacional Eleitoral (INE) gerava uma dupla divisão política. O objetivo deste trabalho foi identificar a importância da aplicação do planejamento urbano e de uma delimitação territorial clara, através da detecção de marcos de fronteira. Além de apontar o impacto causado na comunidade estudada, bem como algumas condições que impactaram diretamente.

Esta pesquisa é mista (quantitativa-qualitativa). Por um lado, a identificação dos limites territoriais definidos na “Lei do Território CDMX” foi realizada através da localização dos marcadores de fronteira, contrastando com os limites da cartografia dos cadernos eleitorais. do INE, evidenciando uma dualidade territorial, conforme indicado na hipótese. Uma vez encontrada a diferença, algumas consequências muito negativas puderam ser evidenciadas para a população estudada. Detectou-se que as propriedades afetadas por esta dualidade apresentam problemas específicos por não possuírem serviços básicos; bem como a identidade, estando dentro dos limites de um gabinete de prefeito e de um município em nível estadual.

Palavras-chave: limite territorial, marco de fronteira, planejamento territorial, território.

Fecha Recepción: Noviembre 2023

Fecha Aceptación: Septiembre 2024



Introduction

Planning as an important stage of the administrative process, it is essential that it is supported by an objective diagnosis, which reflects a reality. CDMX is one of the largest and most overpopulated cities in the world, according to an article in National Geographic magazine in 2021, Mexico City ranks 5th worldwide, only behind cities such as Sao Paulo (BR), Shanghai (CN), Delhi (IN) and Tokyo (JP); (Duarte, 2021) this has been the main cause of the problems that afflict the city, contradictorily with the administrative intention of the Territorial Planning of the area. Taking its territory as a reference and understanding it as

... Article 4. The territory of Mexico City is the one it currently has in accordance with Article 44 of the Political Constitution of the United Mexican States. Its geographic limits are those established by the Decrees of December 15 and 17, 1898 and July 27, 1994, as well as by the Decrees that the Federal Legislative Branch may approve in accordance with the provisions of Article 46 of the Political Constitution of the United Mexican States. (Gobierno de la Ciudad de México, 2020).

It is also important to specify how this territorial demarcation is composed, since the population is a priority in relation to its well-being, in this way in the

...Article 5. The territorial demarcations are made up of inhabitants, towns, original neighborhoods and resident indigenous communities, territory and democratically elected political authorities. They are the order of government closest to the population of the City and their institutions are based on a democratic, representative regime of citizen participation, as well as on the principles of good government. (Gobierno de la Ciudad de México, 2020).

Unfortunately, despite the efforts of this protocol and also normative intention, to the north of Mexico City, bordering the south of the State of Mexico, there have been continuous irregular settlements and, added to this, the lack of services that cover the needs of the population in general, have generated a very strong social problem impacting on great differences and contrasts: political, social, economic; such as lack of identity, economic and cultural differences, among others.

On the other hand, it is necessary to define what an irregular settlement is, understood as that territorial space where a person or community establishes itself outside the limits demarcated by law or by the authorities that regulate territorial planning. These areas are usually located in risky places for the construction of housing and cause disorder in the configuration or territorial limit of a delegation or state. Another important part of this problem is the one

linked to the political aspects of the states, since the electoral register, in its search to cover the largest number of voters, creates a cartography in which it gives an identity to these irregular communities so that they form part of its system and can exercise their right to democracy, but this order lacks the basis to delimit in a precise manner, in which area this community is located, which causes a confusion of identity and/or belonging and, in this case, whether it belongs to a municipality of the State of Mexico or to a Mayor's Office of the CDMX.

It is important to specify that, at the dawn of the CDMX, its territorial configuration was delimited with natural and representative physical elements, these known as Mojones, Mojoneras or Hitos. These mojoneras were elements made with masonry, of different shapes (simple or pyramidal monolith) which demarcated the separation zone between the communities. Unfortunately, over time, they lost their importance, and even with the new Territory Law of Mexico City, they are mentioned, but it is difficult to locate them physically on the site, causing a lack of control in the configuration of the current urban planning. Although this law mentions all the boundaries of the municipalities with boundary markers, coordinates and names of particular places to recognize and identify on a map, this does not exist. This would allow to visualize the dimension of the problem, which is not only of a particular municipality but of the entire Mexico City. In the following research work, a study was carried out on the problem located in the north of Mexico City (Azcapotzalco and Gustavo A. Madero municipalities) that border the south of the State of Mexico.

Urban and Territorial Planning

In this section, the territorial planning and its close connection with human settlements are intended to be taken as a reference. As a first basis, it was considered:

National Planning

Article 3.- For the purposes of this Law, national development planning is understood as the rational and systematic organization of actions that, based on the exercise of the powers of the Federal Executive in the area of regulation and promotion of economic, social, political, cultural activity, environmental protection and rational use of natural resources as well as territorial organization of human settlements and urban development, has as its purpose the transformation of the reality of the country, in

accordance with the norms, principles and objectives established by the Constitution and the law.. (Cámara de Diputados del H. Congreso de la Unión, 2018).

The political division of Mexico has been very varied since its beginnings. Since its independence and as reflected in legal instruments such as the 1824 Constitution, it was divided into states, which changed in size and number according to political, economic and social events in each region. It was with President Luis Echeverría Álvarez that, by decree in 1974, the country was divided into 31 states and a DF (Escamilla, 1992). It is clear that the formation of the Mexican territory and its boundaries were defined by the combination of political, economic and social aspects; these were identified in our history and culture, which is why some conceptualizations are required, considered important for the development of the research.

Mojoneras

According to Sgori (2016) in his book Urban Morphology when he mentions that milestones or boundary markers are reference points that serve as orientation and are identified by most of the people who live in or near the sector; these elements are important for urban planning, since they serve to identify the delimitation of a territory.

Territory

According to what was mentioned by Zoido Naranjo (1991) in his article “Geography and land use planning:

Territory is the geographic space assigned to a being, a community, an entity of any nature, physical or immaterial: the living space of an animal, the area where a plant species appears, the area of diffusion of a language or any other social practice. When it is assigned to a complex human group (a people, a nation, a society) it becomes one of the fundamental components of its common project: a basic support and resource, a living environment, a landscape that is unique and invariant in personal and collective memory. In short, it is the geographic space in which people live and which must be managed and administered for the good of individuals and the community as a whole.

Territorial limit

In his book *Conflict of Limits in the Yucatan Peninsula*, Alonso Velazco (A) (2020) argues that territorial limits must be open borders by global capitalism; he also says that the disappearance of territorial limits is part of the spatial modernization of a new economic and political era of homogeneous societies, the global village. He also comments that there is no disappearance of borders or territorial limits by globalization (borders opened by globalization) but rather it is a problem of a crisis due to historical borders. Historical borders are those named by governments at the end of the 20th century and beginning of the 21st century, declaring them as definitive limits.

Governance

At this point, territorial governance refers to the active participation of the main actors – from both the public and private sectors and the third sector – who have diverse interests in the territory. In order to achieve an adequate delimitation and urban planning that addresses the problems that affect society and the inhabitants of the northern area of Mexico City, which borders the State of Mexico, political intervention is necessary. As Farinós (2008) points out, this intervention is key to facing the challenges that arise in this region.

The borders

This work is also based on the Political Theory of Borders, as expressed in the work of Ricardo Zapata Barrero in his article *Political Theory of Borders and Human Mobility*, which speaks of the Political Theory of Borders where he mentions: (Zapata, 2012).

Territorial borders have ceased to be understood as mere fixed geographic lines and are beginning to be dimensioned as a result of a dynamic process, as a politically and socially constructed reality that is in permanent change in terms of its management of human mobility (Zapata, 2012, p. 40).

Over the years and political and social changes, the delimitation initially indicated in the north of Mexico City and the south of the State of Mexico was lost, mainly due to the process of human mobility and displacement. As a metropolitan area, territorial boundaries were diluted or lost. Given this situation, there was a condition of little clarity in the delimitations, which permeated the sense of belonging to a municipality or mayor's office.

Urban Theories

In the research generated by Navarrete Escobedo (2013), in his article “Forms and concepts of planetary urbanization for a reading of the Latin American city” he comments the following:

Urban planning in Latin America is based on ideas (urban theories) as in the case of Mexico, where in 1976 the Secretariat of Human Settlements and Public Works (SAHOP) was created based on the idea of a European or US urban concept poorly applied in Latin America. (p. 71).

Thus, the rapid and excessive growth of the peripheral areas of Mexico City, especially in the northern zone, has caused irregular human settlements, which are in conditions of high vulnerability, since they are located in mountainous areas, hillsides or protected areas. Specifically related to the subject studied, these human settlements have generated a complex detection of territorial limits, which also produced erroneous electoral districts and problems among the community studied. For this reason, the concept of Urban Image is considered as an internal and external appreciation of the individual.

Urban Image

Kevin Lynch's theory (Valinarq, 2023) details, through a practical study, the way people perceive urban space.

In the Urban Planning and Development Blog, in the document "Elements that make up the Urban Image" (Valinarq, 2023), he details the 5 categories of structuring:

1- PATHS: Streets, roads or paths (people's mobility). 2- EDGES: Elements that limit areas. 3- NEIGHBORHOODS OR DISTRICTS: Areas with similar characteristics (sections of the city). 4- NODES: Strategic points of a city where an observer can enter. Crossing or convergence of paths. 5- MILESTONES, MILESTONES OR MILESTONES: Points of reference that are striking when visualizing them. It is exterior.

In the same way (Flanagan, 2001) mentioned by (Robles-Baldenegro and Moreno-Murrieta, 2020) takes up the structuring of cities as a space-territory and specifically describes it:

... It exposes the personal experience of structuring and Flanagan (2001) takes up Lynch's (1960) who identifies and proposes 5 categories of structuring which serve as reference frames in this work: 1).- Trajectories are the paths people take, the paths they use to move from one place to another within the same city; 2).- Edges. - the edges are the barriers, generally linear, that divide or "border" cities, 3).- Districts are generally

large areas that have a quality and something cohesive, a theme or a characteristic sensation, 4).- Nodes. - They are small public spaces where people concentrate. There may be many nodal points in an urban space. 5).- Landmarks. - what distinguishes the signs, who sees them, what most people experience. (They are places that serve as orientation and are identified by most people who live in or near the sector).

It is important to note that this work also aims to highlight the importance of boundary markers as a territorial boundary, which has a direct impact on the population by having an objective appreciation of the delimited space.

Importance of mojoneras

Currently in the construction of different urban developments, boundary markers are physical markers strategically placed on the ground to indicate boundaries and borders, this is a very important task of the surveyor. Boundaries can be built of concrete, metal stakes or prominent stones; but they are placed by expert surveyors, using high-precision measuring tools, which can guarantee the exact location of these markers (Landrada, 2024).

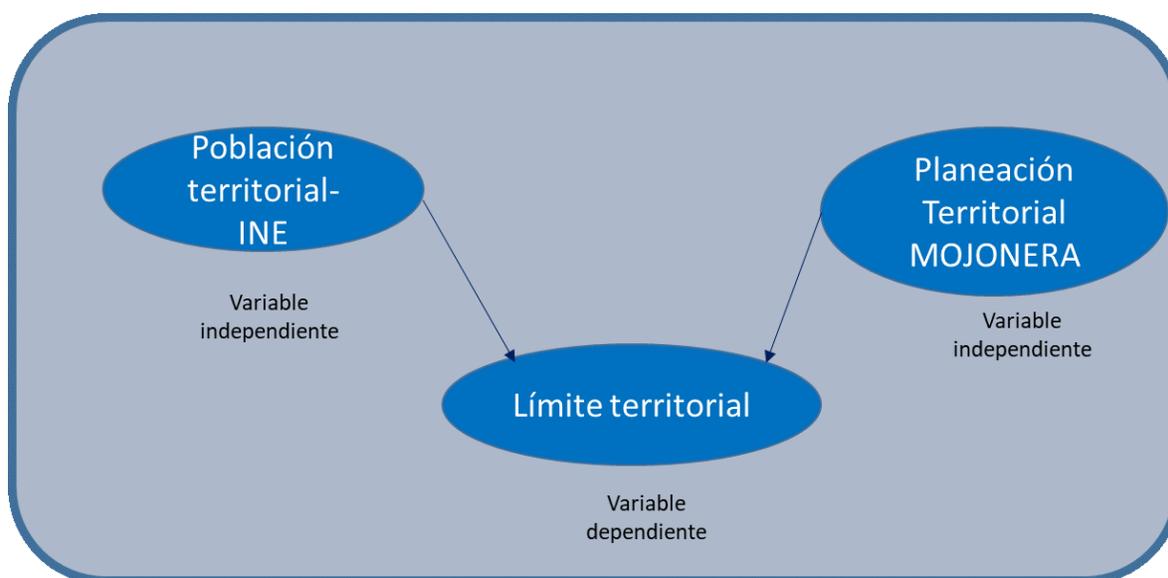
In the digital age, boundary markers have not lost their relevance. Although satellite mapping technologies and geographic information systems (GIS) offer detailed virtual representations, boundary markers continue to be the physical basis that supports accuracy, the relationship between surveyors, boundary markers and land is essential for effective planning and development. (Landrada, 2024).

Materials and methods

By Hernández-Sampieri, *et al.* (2006) In his book *Research Methodology*, the classifications of research methods are defined according to the type of result to be obtained. In this case, the method used was mixed (Quantitative-Qualitative), quantitative through the use of GIS and qualitative since the result was not entirely numerical or exact, but was in relation to the determining factors in the specific problem due to the characteristics of the case study, considering the National Household Income and Expenditure Survey [Enigh], 2020, National Public Security Prosecutor's Office, National Income Survey and National Urban Public Security Survey [Ensu], 2020 and Cuéntame de México, 2020.

The identification of the territorial limits specified in the Territory Law of Mexico City in the northern zone, bordering the State of Mexico specifically the Azcapotzalco and Gustavo A. Madero mayors' offices and the INE cartography, was carried out through ICT (Google Maps, Google Earth and GPS applications). The main problem observed is the dual border between these two municipalities. To identify the differences and indicate their impact on the population located in the study area, the following variables were taken into consideration (Figure 1).

Figure 1. Variables.



Source: self-made

In this sense, the territorial limit is conditioned by the independent variables: Territorial population (cartography), according to the INE registry and territorial planning through the identification of boundary markers (Regulations).

As a complement, to determine the impact in a specific way, several current analysis instruments were considered, such as the surveys formally applied by [Ensu], (2020), Cuéntame de México, (2020) and, which referred in a forceful way to this double delimitation as: income factors, size and conditions of the housing, notable variation in expenses in services and wear and tear of their homes. The most alarming was the growing crime [Ensu], (2020), reflected in various types of theft; the variation and impact at the school level, with data from the Cuéntame de México survey (Inegi, 2020) and the contrasting differentiation in the mayor's offices, all of which has caused a noticeable social decomposition. To identify the double territorial delimitation, the following was done:

I- Mapping based on the Mexico City Territory Law and the Electoral Institute of Mexico City. Using the Google Earth program, location points with coordinates were generated, a table with coordinates was subsequently created in the Excel program for the Azcapotzalco and Gustavo A. Madero (GAM) municipalities.

II- Using the ArcMap program, a georeferencing of the coordinates that had been obtained was done, which correspond to the points marked on the maps, and then the delimitation mentioned in the Mexico City Territory Law was done to make a layer overlay.

III- A search was also carried out for the electoral districts of the Electoral Institute of Mexico City for the Azcapotzalco and GAM municipalities in order to carry out the delimitation generated by this Institute.

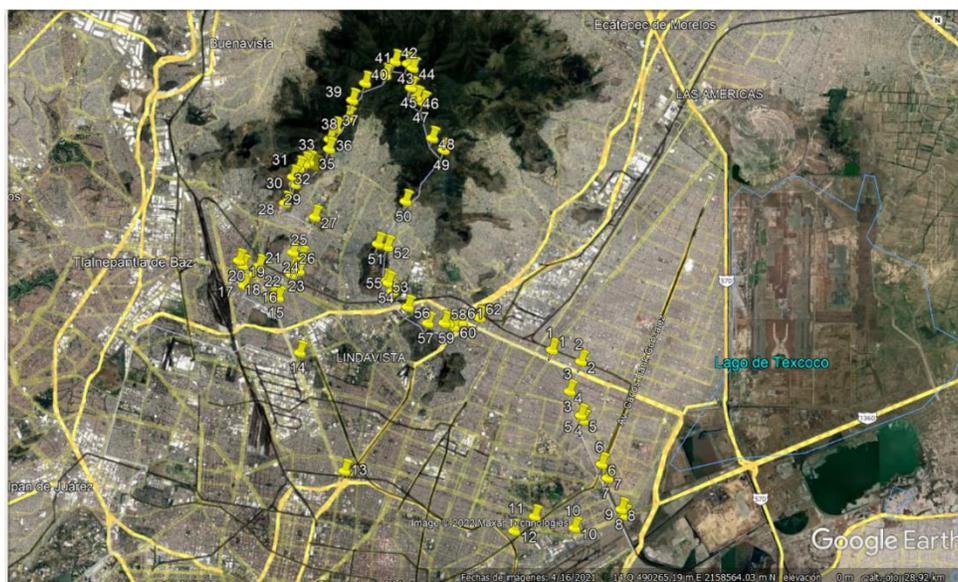
V- Finally, a comparative map was generated with a layer overlay where the delimitations obtained for this study can be seen.

Results

The process carried out to detect boundary markers north of Mexico City is based on what is set forth in the Mexico City Territory Law, which states in Chapter II “On the geographic limits of the territorial demarcations”, Article 8 “the geographic limits of the territorial demarcations” (Government of Mexico City, 2020).

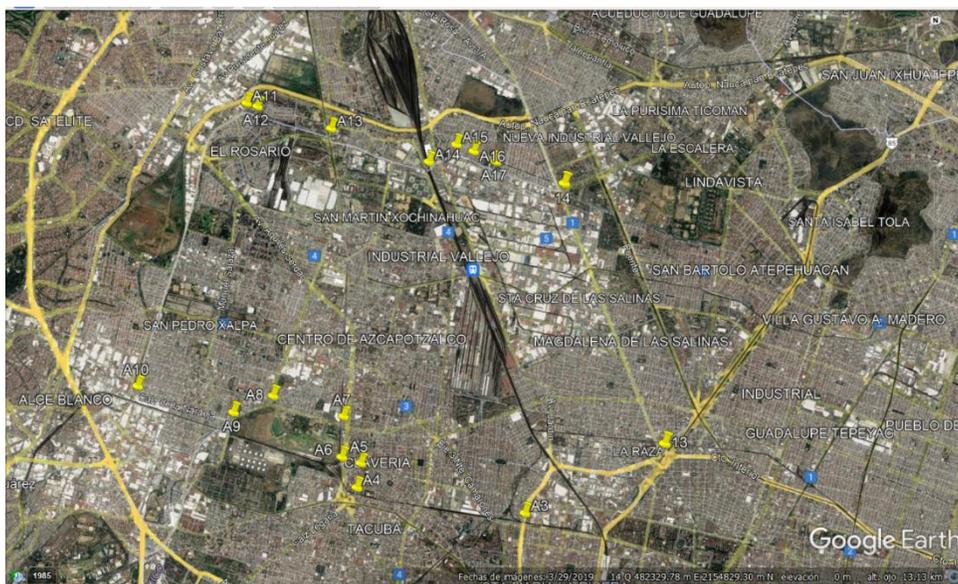
Based on the Territory Law in the Azcapotzalco and Gustavo A. Madero municipalities, the aforementioned boundary markers were detected, as well as the position marks of the intersections of avenues and streets using the Google Earth program. using X and Y coordinates which helped to pinpoint and have specific control of the polygons of the municipalities (UTM projection), as shown in figures 2 and 3. In the GAM municipality, 62 position marks were collected and in Azcapotzalco, 17. It is pertinent to note that these position marks were a reference to generate east coordinates and north coordinates in Zone 14, which is the zone that corresponds to this study.

Figure 2. Position marks in the Google Earth program of the Gustavo A. Madero mayor's Office.



Source: self-made based on the Google Earth program.

Figure 3. Position marks in the Google Earth program of the Azcapotzalco mayor's office.



Source: self-made based on the Google Earth program.

Tables were then created to identify the X and Y coordinates of the points obtained from the boundary markers in order to have a better analysis and precision, see tables 1 and 2.

These tables are a great support for the geolocation process in the Arcgis program and thus obtain an objective result.

Table 1. Result of the coordinates generated with your location ID of the Gustavo A. Madero mayor's office.

ID	X	Y
1	492272.94	2156381.13
2	493275.89	2155963.6
3	492865.01	2154946.15
4	493228	2154109
5	493289.2	2153934.83
6	493920.16	2152414.78
7	494118.15	2151933.93
8	494573.97	2150846
9	494652.31	2150634.47
10	492938.31	2150236.59
11	491569.12	2150658.55
12	490851.97	2150177.89
13	485008.3	2152352.26
14	483537.02	2156453.72
15	482820.07	2158363.84
16	482586.6	2158339.5
17	481651.72	2158802.41
18	482021.81	2159169.53
19	481607.58	2159488.48
20	481485.58	2159662.7
21	482180.1	2159458.4
22	483302.16	2159137.97
23	483549.35	2159268.87
24	483363.11	2159357.68
25	483653.02	2159744.37
26	483361.42	2159912.28
27	484146.58	2161118.37
28	483124.24	2161613.15
29	483470	2162251
30	483416	2162507
31	483622	2162816
32	483822	2162952
33	483972	2163015
34	484175	2162860
35	484684	2163450
36	484710	2163779
37	484934	2164134
38	485361	2164505
39	485521	2165113
40	485977	2165694
41	486683	2165950
42	487027.74	2166419.35
43	487470.08	2166335
44	487634.42	2166180.53

45	487563.05	2165507.46
46	487740.68	2165166.94
47	487973.54	2164985.46
48	488267.61	2163754.66
49	488655.72	2163337.03
50	487304	2161594
51	486317.39	2160145.08
52	486638.85	2160037.56
53	486572.25	2158868.54
54	486649.41	2158798.12
55	486794.21	2158501.22
56	487303.25	2157957.9
57	487994.88	2157384.22
58	488564.53	2157381.38
59	488705.76	2157375.02
60	488885.71	2157251.99
61	489149.43	2157410.57
62	489780.92	2157536.64

Source: self-made

Table 2. Result of the coordinates generated with your location ID of the Azcapotzalco mayor's office.

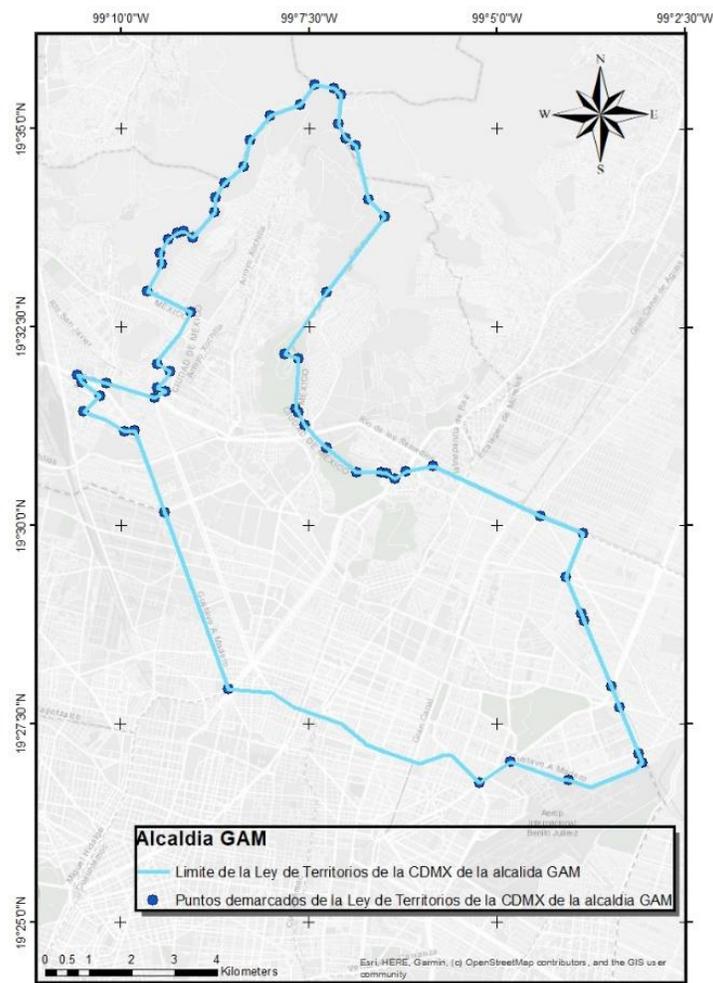
ID	X	Y
1	483537.00	2156453.00
2	485008.00	2152352.00
3	482809.07	2151338.09
4	480213.94	2151829.84
5	480263.42	2152159.09
6	479989.38	2152253.12
7	480012.75	2152882.05
8	478887.22	2153214.52
9	478291.88	2152981.41
10	476795.51	2153407.41
11	478525.42	2157841.96
12	478697.32	2157785.10
13	479858.60	2157412.74
14	481405.56	2156850.39
15	481846.96	2157116.27
16	482119.89	2157004.58
17	482465.79	2156834.48

Source: self-made

Using the Arcgis program, maps of the Azcapotzalco and Gustavo A. Madero municipalities were created, where the boundary markers and intersection points mentioned in the Territorial Boundary Law of Mexico City are indicated, as shown in figures 4 and 5.

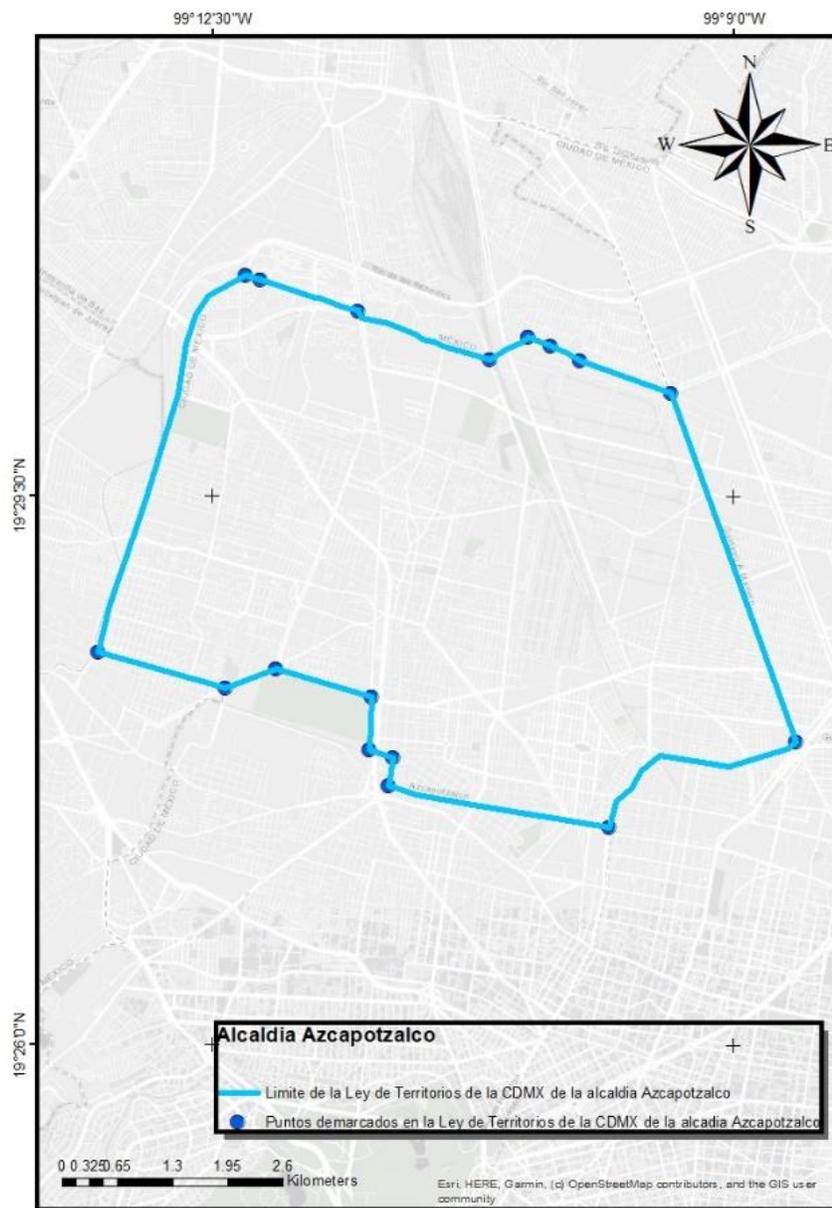


Figure 4. Map of the Gustavo A. Madero mayor's office indicating the delimitation of the CDMX Territory Law.



Source: self-made

Figure 5. Map of the Azcapotzalco mayor's office indicating the delimitation of the CDMX Territory Law.

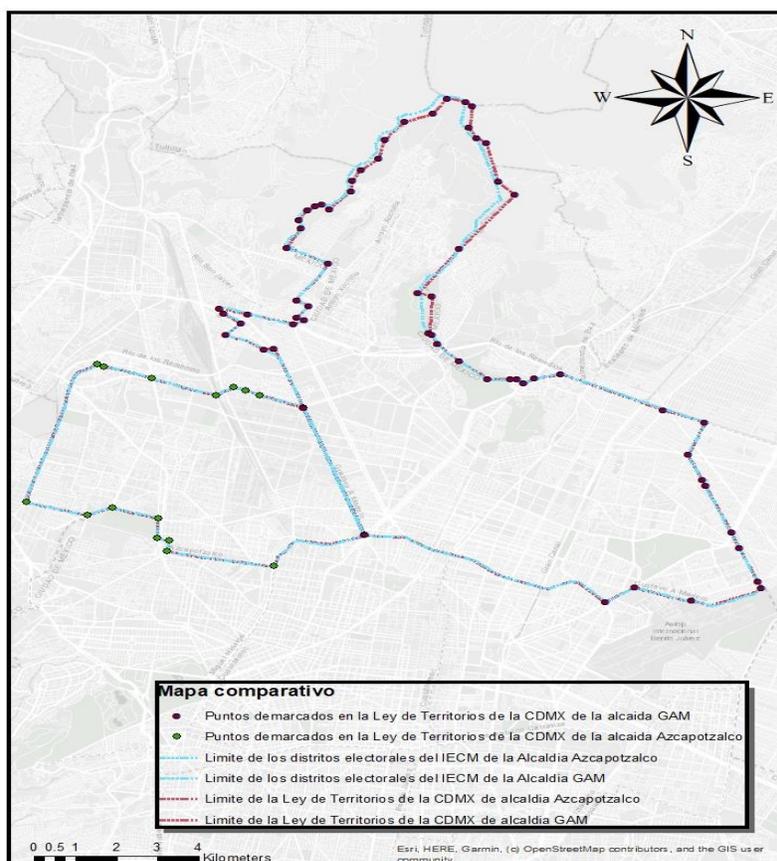


Source: self-made

These figures show the existing boundary markers mentioned in the CDMX Land Law and, in turn, how the north of Mexico City is delimited with the State of Mexico. To identify the affected homes between the polygons established by the CDMX Land Law and the IECDMX, the two maps were joined together. Since they do not match, other small polygons are displayed, observing that they are in protected areas and others in inhabited areas, which can be identified with the CDMX land registry in the Mexico City Open Geographic Information System (SIGCDMX) portal, where it provides information on the neighborhood

and property number. The mapping was done through the ArcMap program, in the Shapefile file of each municipality. Specifically, it can be inferred that the affected properties (new small polygons) have a relevant role in the electoral process, being involved in the border zone of CDMX. As noted at the beginning, population growth coupled with a lack of follow-up in urban and territorial planning has been a condition that has directly impacted the living conditions of the population studied. To visualize the impact, an analysis of the data obtained from various official sources is presented. According to INEGI, there was an increase in population in the last decade, which can be observed in the following table (3) and visually in figure 7 of population, where the population stain is detected in the periphery of the Azcapotzalco and Gustavo A. Madero municipalities bordering the State of Mexico, municipality of Tlalnepantla.

Figure 6. Comparative map of the limits demarcated in the Law of the Territory of CDMX and the IECDMX.



Source: self-made

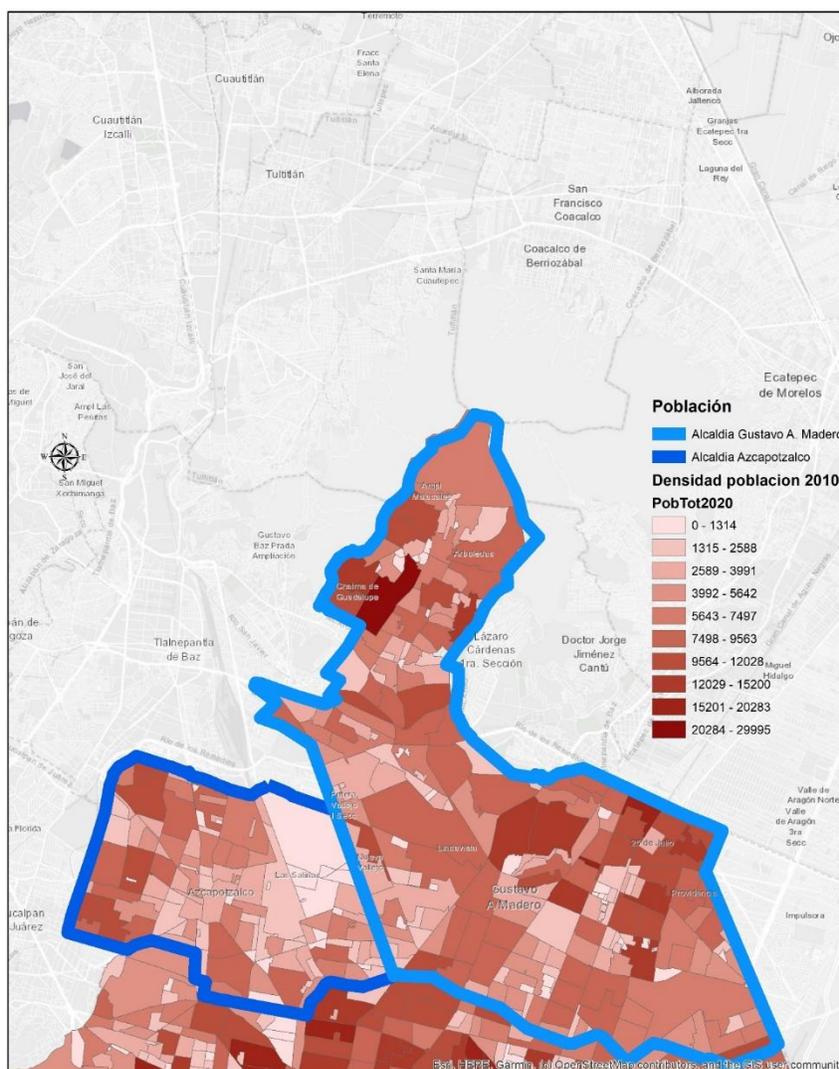
In Figure 6, it can be seen that the boundaries demarcated in the Territory Law of Mexico City and the boundaries demarcated by the Electoral Institute of Mexico City do not coincide and this is the main problem that citizens face when they want to carry out an administrative procedure or enjoy basic services. This problematic condition is generated by living right on the border of two entities.

Table 3. Total population by federal entity.

National Institute of Statistics and Geography (INEGI)							
Total population by state and five-year age group according to sex, series of census years from 1990 to 2020							
Federal Entity	Five-year age group	2010			2020		
		Total	Men	Women	Total	Men	Women
CDMX	TOTAL years	8,851,080	4,233,783	4,617,297	9,209,944	4,404,927	4,805,017
	0 a 4	618,245	314,701	303,544	479,904	242,877	237,027
	5 a 9	658,948	334,885	324,063	563,907	286,280	277,627
	10 a 14	660,345	334,674	325,671	608,962	309,140	299,822
	15 a 19	723,372	363,265	360,107	650,389	331,109	319,280
	20 a 24	753,404	372,368	381,036	714,605	359,049	355,556
	25 a 29	726,696	352,969	373,727	752,289	372,081	380,208
	30 a 34	702,642	335,988	366,654	743,611	363,448	380,163
	35 a 39	722,214	341,865	380,349	705,850	340,545	365,305
	40 a 44	629,563	295,151	334,412	670,307	317,312	352,995
	45 a 49	555,481	256,078	299,403	668,945	313,846	355,099
	50 a 54	506,310	230,325	275,985	623,483	286,394	337,089
	55 a 59	392,186	179,065	213,121	526,447	239,651	286,796
	60 a 64	315,793	141,010	174,783	469,514	209,065	260,449
	65 a 69	227,625	99,910	127,715	356,196	157,245	198,951
	70 a 74	179,329	75,227	104,102	267,744	115,130	152,614
	75 a 79	124,499	50,795	73,704	175,215	74,210	101,005
	80 a 84	85,121	32,012	53,109	117,480	46,094	71,386
	85 a 89	47,170	17,062	30,108	66,316	24,278	42,038
	90 a 94	17,225	5,529	11,696	28,780	9,308	19,472
95 a 99	5,797	1,688	4,109	9,066	2,725	6,341	
100 and more	1,089	321	768	1,308	357	951	
not specified	198,026	98,895	99,131	9,626	4,783	4,843	

Source: INEGI (2020) (B)

Figure 7. Population of the Azcapotzalco and Gustavo A. Madero municipalities.

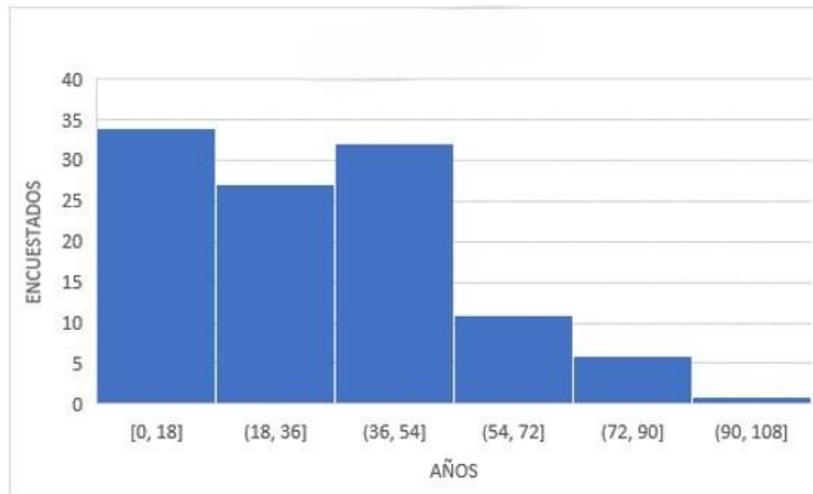


Source: self-made

The data obtained from Enigh from the characteristics file of the homes inhabited by the members of the household (housing) are from the Azcapotzalco, Gustavo A. Madero and Tlalnepantla Municipalities (Inegi, 2020, (B)). As a complement, some direct consequences of this problem were analyzed: income factors, number of rooms in the home and age of the home, among others.

These are the results of the analysis by municipality, considering the population studied by municipality and municipality. In Azcapotzalco, housing was found as follows:

Figure 8. Age of housing of the Azcapotzalco mayor's office

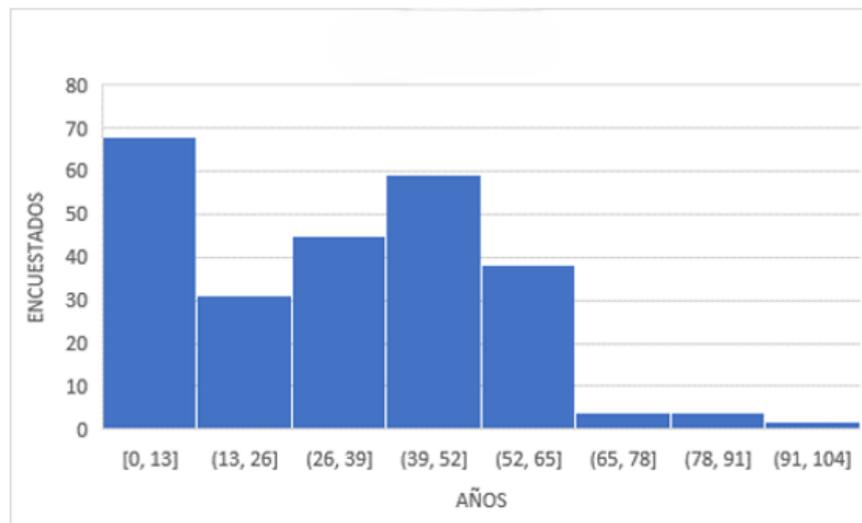


Source: self-made based on Enigh (2020).

Here, the survey of 110 people from the Azcapotzalco Municipality was considered, which shows the following results: the averages were 40.78 years of residence, 4 rooms per residence, \$4,202.94 of monthly rent and \$6,050.54 of estimated rent payment.

The results of the analysis of the Gustavo A. Madero Municipality are shown in Figure 9.

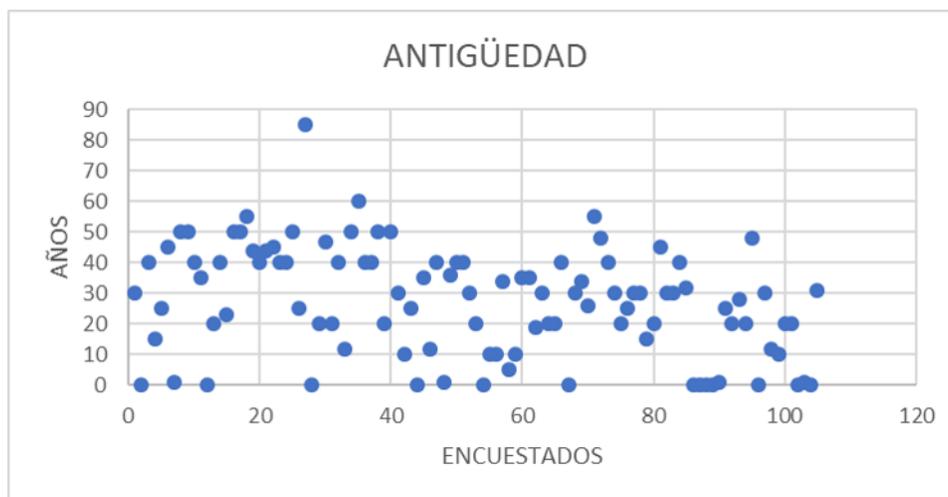
Figure 9. Age of the Gustavo A. Madero mayor's office.



Source: self-made based on Enigh (2020).

The survey was conducted on 250 people from the Gustavo A. Madero Municipality, which showed the following results: the averages of 39.71 years of housing, 4 rooms per dwelling and \$5,021.05 estimated rent payment. In the Municipality of Tlalnepantla, the following was observed:

Figure 10 Age of the house in the municipality of Tlalnepantla



Source: self-made based on Enigh (2020).

The survey was conducted on 104 people and showed the following results: averages of 31.13 years of housing, 4 rooms per dwelling, \$4,452.38 of monthly rent and \$4,695.18 of estimated rent payment.

Thus, after the analysis, it was considered that the Azcapotzalco municipality has an average of 40.78 years of housing age, surpassing the Gustavo A. Madero municipality, with 39.71 years, and the municipality of Tlalnepantla, with 31.13 years. In all three cases, a similar average was also found in terms of the number of rooms per dwelling. The average monthly rent in the municipality of Tlalnepantla (\$4,452.38) is higher than the municipalities of Azcapotzalco (\$4,402.94) and Gustavo A. Madero (\$3,706.67)

And the estimated rent payment in the Azcapotzalco municipality (\$6,050.54) is higher, contrasting with the Gustavo A. Madero municipality (\$5,021.05) and the municipality of Tlalnepantla (\$4,695.18).

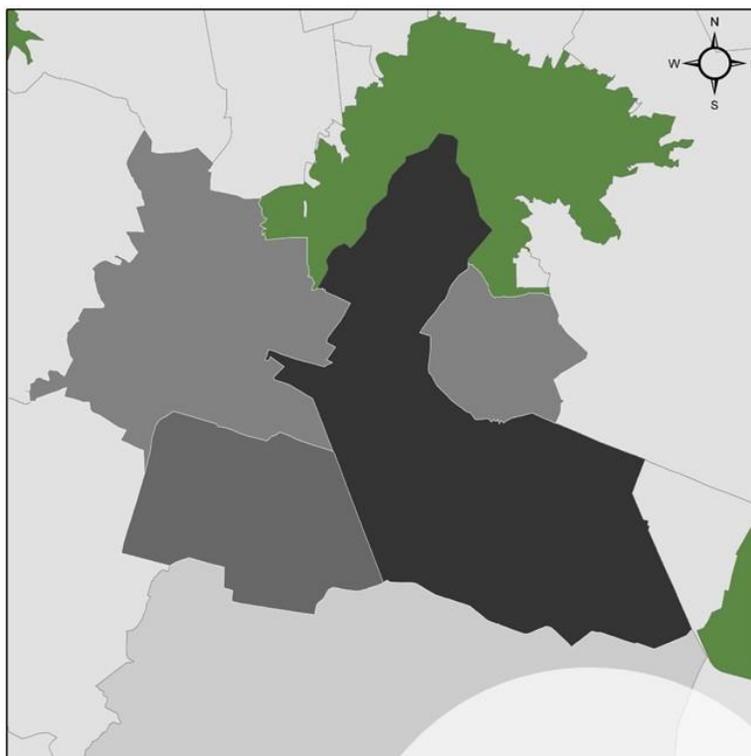
Delinquency

Another aspect observed due to the lack of control was crime and considering what was stated by the National Public Security Prosecutor's Office, in the National Urban Public Security Survey [Ensu], (2020), the file was downloaded to be able to do the crime analysis of the Azcapotzalco, Gustavo A. Madero municipalities and the municipality of Tlalnepantla:

- Gustavo A. Madero 271 people
- Azcapotzalco 262 people
- Tlalnepantla 260 people

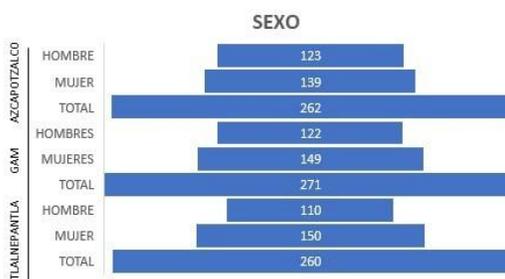
Figure 11. Map of crime respondents.

MAPA DE ENCUESTADOS SOBRE DELINCUENCIA



Datos

- Estado de México
- Municipio Tlalnepanitla
- Area verde
- Ciudad de México
- Alcaldia Azcapotzalco
- Alcaldia Gustavo A. Madero



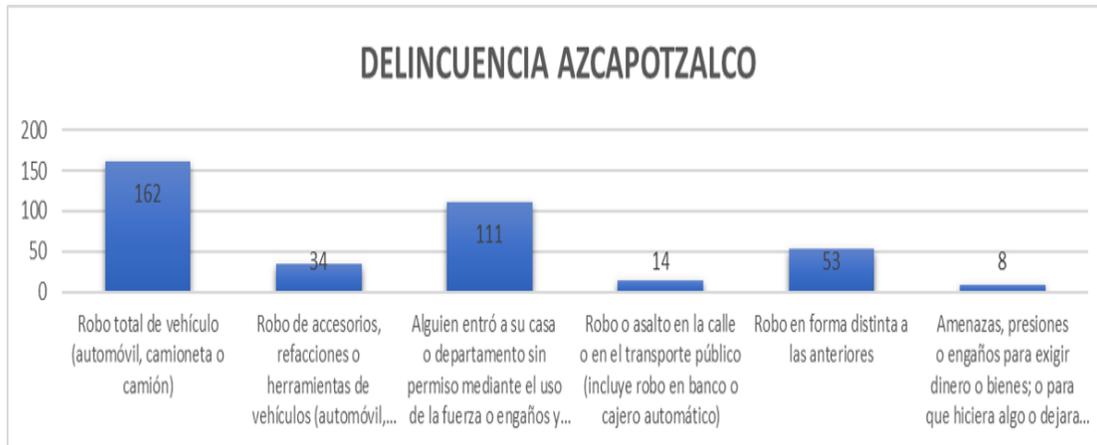
Source: self-made based on Ensu (2020).

It is very interesting to note the questions asked in relation to the robbery, as they were very direct and specific:

1. Total theft of a vehicle (car, van, or truck).
2. Theft of accessories, parts, or tools from a vehicle (car, van, or truck).
3. Someone entered your home or apartment without permission using force or deception and stole or attempted to steal something.
4. Robbery or assault on the street or on public transportation (includes bank or ATM robbery).
5. Robbery in a manner other than the above.

6. Threats, pressure, or deception to demand money or property; or to get you to do something or stop doing something (extortion).

Figure 12. Azcapotzalco crime.



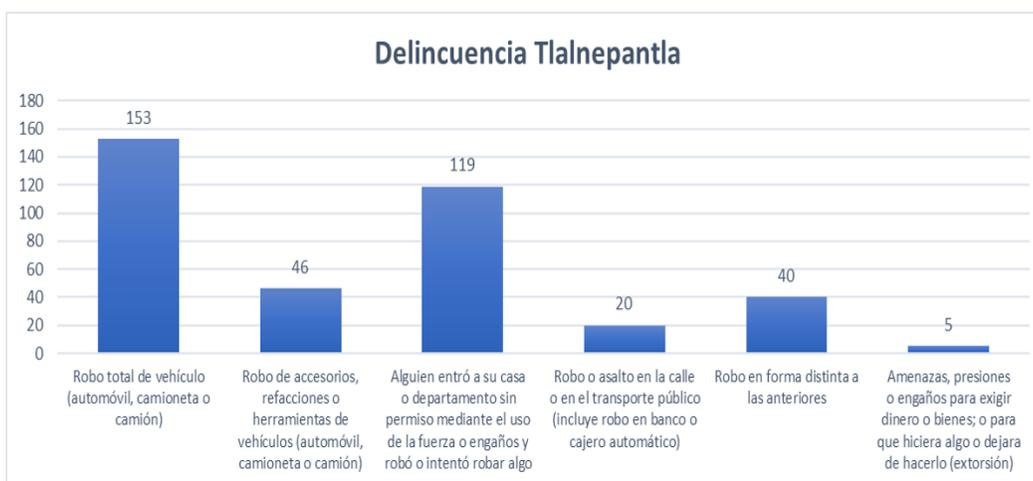
Source: self-made based on Ensu (2020).

Figure 13. Gustavo A. Madero crime.



Source: self-made based on Ensu (2020).

Figure 14. Tlalnepantla crime



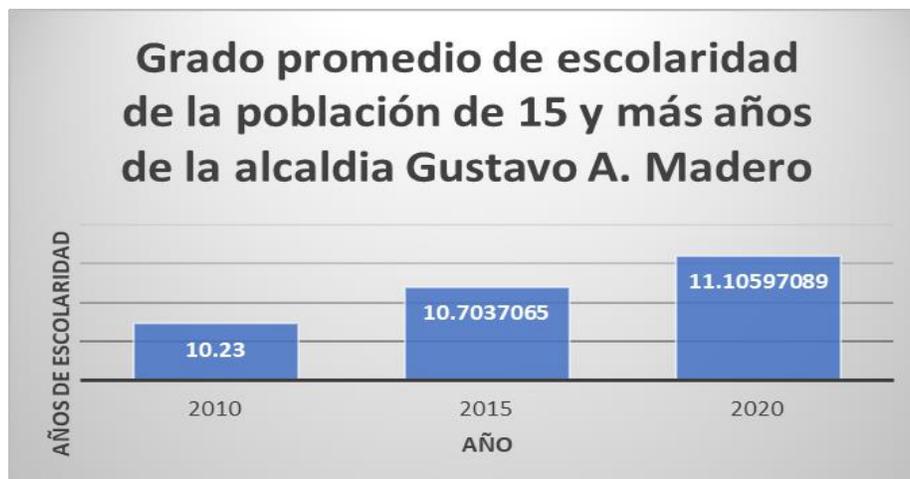
Source: self-made based on Ensu (2020)

These graphs show that in the municipalities of Azcapotzalco, Gustavo A. Madero and the municipality of Tlalnepantla, the main theft is of vehicles, followed by theft from homes or apartments.

School grade

Based on the hypothetical condition that the more years of schooling, the greater awareness of our behavior, the Cuéntame de México survey (Inegi, 2020) was considered, the schooling file of the Azcapotzalco, Gustavo A. Madero municipalities and the Tlalnepantla municipality was downloaded, where every 5 years the increase in the degree of schooling can be seen.

Figure 15. Average level of education, Mayor Gustavo A. Madero.



Source: self-made based on the Cuéntame de México Survey.

Figure 16. Average level of education, Mayor Azcapotzalco



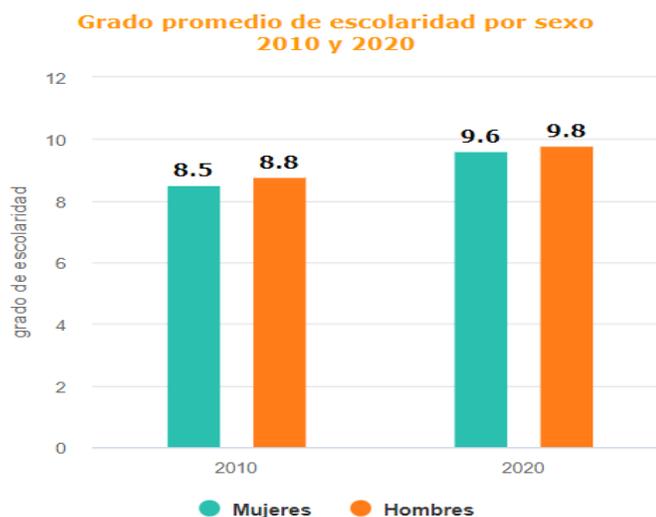
Source: self-made based on the Cuéntame de México Survey

Figure 17. Average level of education, Tlalnepantla municipality.



Source: self-made based on the Cuéntame de México Survey.

Figure 18. Education level by sex at the national level



Fuente: INEGI. Censos de Población y Vivienda 2010 y 2020.

At the national level, men have a higher level of education with 9.8, women have a level of education of 9.6, which is reflected in an equivalent of second year of high school. Even though in the two municipalities and analyzed municipalities they exceed the number of years, the difference is very small and this is reflected in the social dynamics at a general level and also the vulnerability to social decomposition. The Azcapotzalco municipality is at the highest level since it has an education level of 11.90 with an equivalent of second year of high school; the Gustavo A. Madero municipality is in second place, since it has an education level of 11.10 with an equivalent of second year of high school, the municipality of Tlalnepantla is in third place, since it has an education level of 10.92, an equivalent of first year of high school. It is worth mentioning that the two mayoralties and the municipality have a good five-year increase, with the Gustavo A. Madero mayoralty having the greatest reach in the last ten years.

Discussion

Urban and territorial planning is considered to be of utmost importance to guarantee the well-being of the community and safeguard its integrity. Hernández (2010) points out that one of the main tasks of territorial planning is the knowledge and timely evaluation of land use, considering natural and socioeconomic attributes on which its development will depend.

In this case, as care has not been taken to respect this territorial limit and its cadastral and political location, it has caused a negative impact on the development of the population analyzed and also the inability to guarantee its safety and integrity. On the other hand, Sanabria, in a study where he contrasts the compact city with the diffuse city, states that the important thing is not to insist on it, but on the method or the way of how to conceive this in the theoretical assumptions that must support the assumptions and of course in the knowledge of the new economic geographies, which reinforce their growth trends, complying more with the material and population conditions than with assumed and imposed ideals (Sanabria and Ramírez, 2017).

In 2019, Escallón and Pava point out that not considering territorial expansion spontaneously will continue to maintain a condition far from planning and from spontaneous, unassisted, isolated and inaccessible development (Escallón-Gartner and Pava-Gómez, 2019). This is a situation that has happened with this northern area of CDMX. Regarding the boundary duality between the State of Mexico and CDMX, Alonso (B) (2020) in a study carried out on the borders of Campeche and Quintana Roo, defines the population's perception of their territorial dispute and its impact on their daily lives. In this case, a prototype of territorial governance with a multi-level and multi-actor approach is proposed here in order to establish an open dialogue between all those involved, under the premise of participatory management in local governance and of a mixed nature where projects are worked on regardless of ideologies, economic limitations or periods of government. In this case, it would be with activities that involve the entire population with a self-managed attitude, based on the basic principles of respect and human coexistence, this should be promoted by public administrators. However, there should not be a double territorial location of a home.

Conclusions

The territorial delimitation that was created for the planning and layout of Mexico City worked at the time due to its population density. As the population increased in an uncontrolled manner and the extensions of the urban areas in the city to the north were not as visible, it became what we call the Metropolitan Zone of the Valley of Mexico, where the territorial delimitations ceased to be visible and identifiable, until they became one in the territorial space, but in the normative and political sphere, the territorial limits must be respected and social obligations must be fulfilled before the federal entity in which they reside.

The population settled on the outskirts of the Azcapotzalco and Gustavo A. Madero municipalities seeking greater ease in mobility, shortening travel times, reducing service and housing costs. It can be analyzed that the Gustavo A. Madero municipality has a larger population due to its size and also due to its geographic location and its exits to highways leading to other northern states, where the population began to live in irregular settlements and social housing located on the outskirts of the city.

When urban planning for Mexico City was carried out, the rapid growth of the urban area towards the north of the city with respect to the increase in population was not visualized. If this were the case, preventive actions would have been taken to avoid irregular settlements and thus the population would not be in vulnerable conditions and especially in danger of landslides, since they live in hilly areas without any urban organization.

The houses are already old in relation to the average life expectancy, as for the average monthly rent they exceed \$5,500.00 per month, which is largely more than 30% of their income, considering that a household with income equal to or less than \$14,239.52 (CONEVAL, 2019) is considered to be in poverty.

As observed, the main repercussions are related to the double territorial location of some people, given the population growth and the lack of precise territorial planning, irregular settlements are more vulnerable due to the lack of infrastructure and services, resulting in the most serious of risks, crime and insecurity.

Therefore, the hypothesis from which the study starts is accepted: "The lack of clarity in the territorial delimitation of some communities and the formation of the electoral districts by the National Electoral Institute (INE), generated a double political division."

It can be clearly stated that by having the boundary markers identified, a correct territorial delimitation could be carried out, taking as a reference what is indicated in the Territory Law

of Mexico City and being able to make a comparison with what the IECDMX states through its electoral districts. With this, the properties located in specific areas could be made visible and their problems in relation to services, equipment and infrastructure could be identified; but the most serious thing was the identity, since, being on the limit of a mayor's office and a municipality at the state level, it generates conditions of exclusion in some aspects. It can be seen that the new small polygons generated by superimposing the maps are located in a vulnerable situation by being in risk zones and exclusion from some services.

Future lines of research

It is proposed as a way to properly regulate the layout of polygons and based on the Territory Law in the Azcapotzalco and Gustavo A. Madero municipalities, to detect the boundary markers in the Google Earth program using X, Y coordinates, pointing out the precise spaces. With the Arcgis program, make the maps, in this case of the Azcapotzalco and Gustavo A. Madero municipalities, where the boundary markers and intersection points mentioned in the Territorial Boundary Law of Mexico City are indicated, identifying the affected properties and regulating their situation, based on their cadastral designation.

Regarding social differences, the role of the public administrator will be that of a neutral mediator, to facilitate community life and joint work.

Acknowledgements

To the National Polytechnic Institute (IPN) for its support in carrying out the SIP project “The Administration of Material and Natural Resources, its impact on human development: Planning, Infrastructure, housing and urban mobility, key 20221625”.

References

- Alonso-Velazco, I. (A) (2020). Conflicto de límites territoriales en la Península de Yucatán. Plumas negras editorial, (122), 203-207.
- Alonso-Velasco, I. (B) (2020). Percepción poblacional de una disputa por límites territoriales entre las entidades federativas mexicanas de Campeche y Quintana Roo. *Perspectiva Geográfica*, 123-144.
- Cámara de Diputados del H. Congreso de la Unión. (2018). Ley de Planeación. Cámara de Diputados. https://www.diputados.gob.mx/LeyesBiblio/pdf/59_160218.pdf
- Consejo Nacional de Evaluación de la Política de Desarrollo Social (Coneval) (2019). *Medición de la pobreza 2008-2018*. CDMX: CONEVAL. <https://www.coneval.org.mx>
- Duarte, M. C. (2021). Estas son las quince ciudades más pobladas del mundo en 2021. National Geographic. https://viajes.nationalgeographic.com.es/lifestyle/estas-son-quince-ciudades-mas-pobladas-mundo-2021_17453
- Escallón-Gartner, C. y Pava-Gómez, A. J. (2019). Planeación y gestión espontánea en Bogotá. *Informalidad urbana, 1940-2019*. *Bitácora* 30(1), s/p. DOI: <https://doi.org/10.15446/bitacora.v30n1.82586>
- Escamilla-Herrera, I. (1992). Papel de la división político-administrativo de México en la ordenación del territorio. Instituto de Geografía
- Farinós-Dasí, J. (2008). Gobernanza territorial para el desarrollo sostenible: estado de la Cuestión y agenda. *Boletín de la A.G.E*, 11-32.
- Fiscalía Nacional de Seguridad Pública. (2020). Encuesta Nacional de Seguridad Pública Urbana [Ensu]. <https://www.fgjcdmx.gob.mx/>
- Gobierno de la Ciudad de México. (2020). Ley del Territorio de la Ciudad de México. https://data.consejeria.cdmx.gob.mx/images/leyes/leyes/LEY_DEL_TERRITORIO_DE_LA_CIUADAD_DE_MEXICO_1.pdf
- Hernández, J. L. (2010). Intensidad Geomórfica del Relieve Noroeste del Estado de Chiapas, México: Un enfoque para la Planeación Territorial. C. y G., 79-98.
- Hernandez-Sampieri, R., Fernández-Collado, C. y Baptista-Lucio, M. (2006). Metodología de la investigación. México DF: McGraw Hill.
- Instituto Nacional de Estadística y Geografía (Inegi) (A). (2020). Cuéntame de México. <https://cuentame.inegi.org.mx/>

- Instituto Nacional de Estadística y Geografía (Inegi) (B). (2020). Encuesta Nacional de Ingresos y Gastos de los Hogares (Enigh). <https://www.inegi.org.mx/programas/enigh/nc/2020/#Microdatos>
- Instituto Nacional de Estadística y Geografía (Inegi) (2021). *Encuesta Nacional de Ingresos y Gastos de los Hogares (Enigh.2020)*.
- Landrada. (20 de 06 de 2024). Topógrafos, mojoneras y terrenos, Landrada. Landrada, blog: <https://blog.landrada.mx/articulo/topografos-mojoneras-y-terrenos-transformacion-del-entorno-con-conciencia>
- Navarrete-Escobedo, D. (2013). Formas y conceptos de la urbanización planetaria para una lectura de la ciudad latinoamericana. *Andamios*, 69-90.
- Robles-Baldenegro, M. y Moreno-Murrieta, R. (2020), Nodos y mojoneras: una exploración de los trayectos del centro urbano de la ciudad. Academia Journals y el Tecnológico Nacional de México.
- Sanabria-Artunduaga, T. H. y Ramírez-Ríos, J.F. (2017). Ciudad Compacta vs. Ciudad Difusa. Ecos antiguos y recientes para las políticas de planeación territorial y espacial. Cuaderno Urbano. Espacio, Cultura, Sociedad, 22(22) 29-52. <http://www.redalyc.org/articulo.oa?id=369251998002>
- Sgori, A. (2016). *Morfología urbana*. Universidad Nacional de la Plata, 1-19.
- Valinarq. (03 de enero de 2023). Imagen Urbana, elementos que componen la imagen urbana Valinarq, Editor. de <https://www.youtube.com>
- Zoido-Naranjo, F. (1991). Geografía y Ordenación del Territorio. *Scripta Vetera*, 19-31.
- Zapata-Barrero, R. (2012), Teoría Política de la Frontera de la movilidad humana, Revista Española de Ciencia Política (29), pp. 39-66.

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