

HOUSING PARADOX

A Thesis

by

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## ABSTRACT

This thesis explores the abandoned housing in Reynosa, Mexico. Reynosa is the fifth highest city in Mexico with the most abandoned housing, with more than 8,000 abandoned dwellings. This study focuses first on the political changes and housing policies leading to the mass abandonment. Secondly, INFONAVIT, a Mexican institution in charge of administering a housing fund for workers since 1972. Finally, an ongoing drug war and rise in violence. Through a mixed methods case study approach, 4 zones and 18 communities in Reynosa Mexico become the center of this research. The research analyzes housing policies, architectural design of social housing, direct observations, document analysis, crime data statistics, and own photographs and architectural drawings. The findings of this research contribute to a deeper understanding of the abandoned housing problem in Mexico. This thesis aims to be important not only for researchers, but also architects, policy makers and city planners as this can help in their decision-making.

## DEDICATION

To God, family, friends and my wife.

## ACKNOWLEDGEMENTS

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## CONTRIBUTORS AND FUNDING SOURCES

### **Contributors**

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## NOMENCLATURE

AGEB	Basic Geostatistical Area Area Geoestadística Básica
CIDOC	Centre of Documentation and Research of the House Centro de Investigación y Documentación de la Casa
CONAVI	National Housing Commission Comisión Nacional de Vivienda
ECUVE	Qualitative Assessment of the House and its Environment Evaluación Cualitativa de la Vivienda y su Entorno
ENSU	National Urban Public Security Survey Encuesta Nacional de Seguridad Pública Urbana
FOVI	Housing Operation and Finance Fund Fondo de Operación y Financiamiento Bancario a la Vivienda
FOVISSSTE	ISSSTE's Housing Fund Fondo de la Vivienda del ISSSTE
INEGI	National Institute of Statistics and Geography Instituto Nacional de Estadística y Geografía
INFONAVIT	Workers' National Housing Fund Institute Instituto del Fondo Nacional de la Vivienda para los Trabajadores
PCU	Urban Containment Perimeters Perímetros de Contención Urbana
PND	National Developmental Plan Plan Nacional del Desarrollo
RUV	Unique Housing Register Registro Único de Vivienda
SEDESOL	Ministry of Social Development Secretaría de Desarrollo Social
SHF	Federal Mortgage Society Sociedad Hipotecaria Federal

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## 1. INTRODUCTION

Abandoned housing is a global phenomenon. One can visit the boarded row houses in North America (Earle, 2019), the abandoned buildings for student housing in Europe (Cascone, Sciuto, 2018), and the vast abandoned housing in Latin America (Rojas, 2019). This study chooses to explore the abandoned housing communities in Reynosa, Mexico.

While abandoned housing is a multi-faceted intricate phenomenon and its causing factors vary, many factors tend to overlap. Abandoned housing is a big issue in many countries, one of the countries being Mexico. This thesis aims to explore the factors that lead to the abandonment, as well as the present factors shaping a specific city in Mexico: Reynosa,. Reynosa, Mexico sits as the fifth city in Mexico with the most abandonment, with over 8,000 abandoned homes (Campos, 2017). Various researchers and institutions such as the Instituto del Fondo Nacional de la Vivienda para los Trabajadores or from here on, INFONAVIT (Workers' National Housing Fund Institute in English in English is the "main Mexican state institution for ensuring that families can exercise their constitutional right to decent housing" (former Mexico President Enrique Pena Nieto, 2016) are conducting new research to prevent future home abandonment by understanding the present conditions of home abandonment.

## 1.1 Background

Abandoned structures have the potential of creating a negative catalyst effect in the surrounding environment. Abandoned communities influence on several levels (two of them being):

Social: quality of life diminishes for the remaining residents, rise in crime in the neighborhood, and negative connotations may affect global perception of the city

Economic: property values surrounding the abandoned houses plummet, local businesses become affected, neighborhoods with high concentration of poverty, and governmental interventions become costly (Mallach, 2018).

Table 1.1 recalls some of the recent studies done and the findings pertaining to abandonment triggers in different contexts. The reason as to why abandoned housing exists varies, but throughout the different studies we can witness the overlapping elements such of crime, distance, and economic factors.



Study and Year	Geographic Focus	Abandonment Triggers Found
(Hillier, et al. 2003)	Philadelphia, Los Angeles, Chicago, New York	Proximity to abandoned housing, Property ownership, vacant lot proximity, proximity to demolished properties, years of rent.
(Basset, Shwestzer and Panken 2006)	Flint, Michigan	Socio-economic factors, income level, employment status, owner/renter tenancy, race, educational attainment, crime and safety.
(Sanchez and Salazar, 2011)	Mexico	International migration, housing finance policy, and housing oversupply.
(Fuentes and Hernandez, 2014)	Ciudad Juárez, Mexico	Housing overproduction, crime and delinquency do not play a role.
(Enriquez, Bernal, 2013)	Sonora, Mexico	Economic crisis, income and habitability conditions: housing location, housing quality, and security.
(V, Morckel, 2014)	Various cities and countries	Population loss, declining population, property taxes, decline in property value, decline in income, widespread of suburbanization, location, accessibility, and proximity to city centers.
(Ackermann, et al. 2015)	Various Mexican cities	Financial vulnerabilities of credit-holders.
(CIDOC, 2015)	Mexico	Without access to public services, transit infrastructure, no urban amenities, long commute to job centers
(Lara, 2016)	Tijuana, Mexico	Social demographics, and educational attainment.

**Table 1.1** Recent studies about abandonment and their findings.  
Source: Own table based on data from Campos, 2017.

### ***1.1.1 Defining Housing Abandonment***

Throughout academic literature the operative definition of Housing Abandonment is not consistent (Bassett, Schweitzer, & Panken, 2006; Hillier, Culhane, Smith, & Tomlin, 2003). In Table 1.2 we can analyze the different definitions found regarding abandonment (not a comprehensive list, simply highlighting the most popular in the U.S.). Despite the same term is used in various studies, different meanings might be implied in the studies. Conveying the meaning of an abandoned housing in various manners can bring confusion but can also create a problem in its attempt to generalize the study.

As we continue the term being used in this research will be the one appropriated by INFONAVIT as this connects better with the region studied (Reynosa, Mexico). In Mexico the term *abandoned* for the purposes of this study will be: an urban phenomenon in which housing has been completely deserted, as the owners stopped paying, taking care of the property and possibly decided no return, (Campos, 2017). This abandonment is collaborated through INFONVAIT's records of unpaid credit loans. If abandonment occurs, two forms may occur: literal abandonment, this is when the owner disappears without a trace or connection to the house, and *constructive abandonment* (uninhabited) this is where the owner is connected to the house (pays taxes, utilities, other sorts of connections) but permitted the house to deteriorate (Mallach, 2018). For the purpose of this study constructive abandonment will not be the focus.

Study and year	Operational definition	Geographic focus
Accordino and Johnson (2000)	A building or lot that has been vacant for two years or more as identified by city officials	Nationwide
Arsen (1992)*	In rem properties (properties in which the city was engaged in a tax default foreclosure)	New York, NY
Bartelt and Lawson (1982)	Not defined	New York, NY
Bassett et al. (2006)*	Structures identified as being “Other Vacant” by the US Census Bureau, structures that appear on the Environmental Block Assessment (a physical survey done by local university students), and structures that are tax delinquent or state-owned	Flint, MI
Bender (1979)	A property where the title was forfeited and the structure demolished	Chicago, IL
Cohen (2001)	Not operationally defined. Uses Keenan et al. (1999) to define an abandoned house as a chronically vacant and uninhabitable unit whose owner is taking no active steps to bring it back into the housing market	Baltimore, MD
Fraas and Lutter (1996)	Uses the operational definitions of White (1986) and Arsen (1992)	New York, NY
Greenbaum (1993)	An abandoned house is one that remained vacant for two or more successive years	Kansas City, KA
Hillier et al. (2003)*	A property declared to be imminently dangerous	Philadelphia, PA
Keenan, Lowe, and Spencer (1999)	No operational definition is given. Abandonment is defined as the process by which residential units in either the public or private sectors become detached from the housing market	Nationwide (also includes the UK)
Leavitt and Saegert (1988)	A city-owned property acquired through tax foreclosure	New York, NY
Lieb, Merel, Perlin, and Sadoff (1974)	No operational definition is given. Abandonment is defined as that point at which the owner decides to give up any remaining interests (either de jure or de facto) that he may still possess in the building itself	Nationwide (examples from Chicago, IL)
Mallach (2006)	A property whose owner has stopped carrying out at least one of the significant responsibilities of property ownership, as a result of which the property is vacant or likely to become vacant	Nationwide
Marcuse (1985)	A property where the owner is willing to surrender title to it without compensation because of the absence of effective demand for its continued use or reuse	Nationwide (examples from New York, NY)
Mardock (1998)*	A structure that is boarded and vacant	Minneapolis, MN
Metzger (2000)	No operational definition is given. Describes how others characterize abandonment	Nationwide
Morckel (2013)*	A property identified as being abandoned by city officials or other stakeholders	Columbus, OH and Youngstown, OH

**Table 1.2** Definitions of housing abandonment used in U.S. studies. Reprinted from “Predicting Abandoned Housing: Does the Operational Definition of Abandonment Matter?” by Victoria Morckel, 2014.

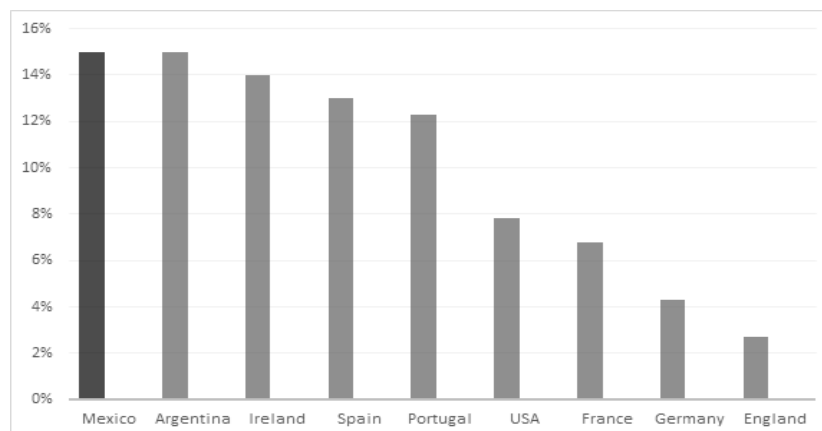
Study and year	Operational definition	Geographic focus
Morgan (1980)	A response of yes to the question “Are there any vandalized or abandoned buildings or any buildings with boarded-up windows or doors on the respondent’s block on either side of the street?” or an indication that abandoned buildings or other empty buildings are a problem in the respondent’s neighborhood	Nationwide
O’Flaherty (1990)	Not defined	Nationwide
Reiss (1996)	No clear operational definition is given. However, it is clear that the author classifies some <i>occupied</i> properties as abandoned, as well as all city-owned properties	New York, NY
Scafidi, Schill, Wachter, and Culhane (1998)*	A property vested by the city (presumably, a property where the lien-to-value ratio is greater than one)	New York, NY
Sternlieb, Burchell, Hughes, and James (1974)*	A building that is either vacant or standing or has been removed for reasons of public hazard, with no replacement forthcoming	Newark, NJ
Van Allsburg (1974)	A building which is vacant and for which the titleholder has no immediate plans for use or reuse	Detroit, MI
Wallace and Wallace (1990)	Not defined	New York, NY
White (1986)*	A property in tax arrears for 18 months to 3 years	New York, NY
Wilson, Margulis, and Ketchum (1994)	A property that has been tax delinquent for a long period of (unspecified) time	Cleveland, OH

\*Studies that use regression models to predict abandoned housing.

**Table 1.2** Continued

### 1.1.2 Mexico: Abandoned Housing

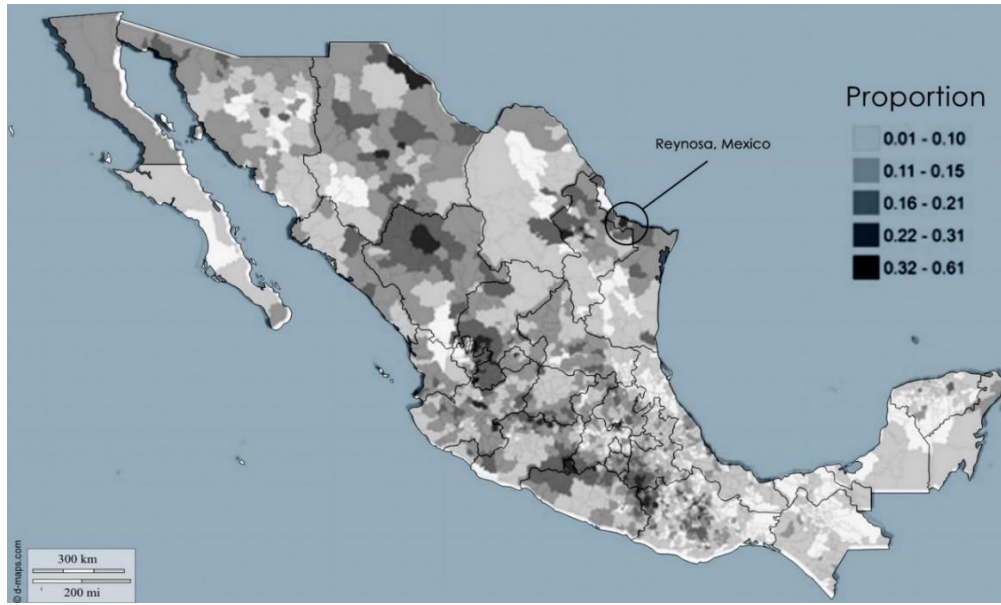
In the following chapters, the different policies and conditions of housing in Mexico, particularly in Reynosa, Tamaulipas will be discussed. Mexico leads in abandoned housing (see Figure 1.1), Table 1.3 shows how the percentage of abandon homes in Tamaulipas (the area of this study) increased in recent years (2005- 2010) and Figure 1.2 shows how Reynosa has one of the highest proportions of uninhabited dwellings (uninhabited dwellings exist all over Mexico). These statistics are known by many politicians, architects, urban planners, and policy makers and a new discussion about abandoned dwellings has begun. It is important to understand that since Mexico's birth, housing has remained a relevant topic. The housing discussion has been going on for decades. A recent change occurred in 2001 when Former Mexican president Vicente Fox began the 2001-2006 "Plan Nacional de Desarrollo" or the National Development Plan (from here on PND) to address the housing deficit. This led INFONAVIT to increase their number of credits, to ease the accessibility of home ownership (see the 2001 spike in Figure 1.3).



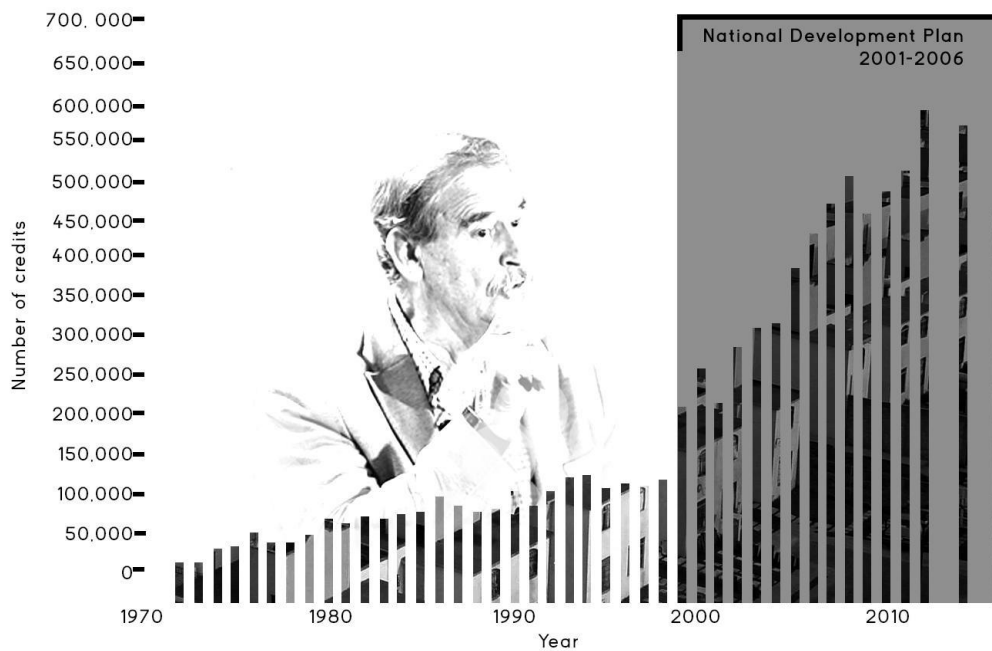
**Figure 1.1** Selected countries percentage of abandoned housing in 2015.  
Source: Own graph based on data from "Atlas del Abandono", 2015.

	2005				2010			
	total private homes	private homes visited	uninhabited homes	% of uninhabited homes	total private homes	uninhabited homes	% of uninhabited homes	
Aguascalientes	303,201	242,602	48,209	16	360,374	56,875	16	
Baja California	176,711	130,069	28,758	16	227,014	34,385	15	
Baja California	914,615	688,178	128,878	14	1,131,024	214,705	19	
Campeche	224,863	182,251	26,778	12	254,239	25,133	10	
Chiapas	1,081,233	892,406	119,903	11	1,267,673	128,078	10	
Chihuahua	1,080,183	815,345	176,987	16	1,194,835	229,210	19	
Coahuila	778,186	616,417	113,288	15	887,999	131,042	15	
Colima	197,489	144,373	36,471	18	228,470	33,232	15	
Distrito Federal	2,540,072	2,220,281	205,086	8	2,679,944	211,245	8	
Durango	470,613	353,567	87,516	19	518,688	93,700	18	
Guanajuato	1,328,444	1,037,503	225,088	17	1,581,231	241,224	15	
Guerrero	931,107	691,352	161,430	17	1,088,575	178,990	16	
Hidalgo	725,293	552,144	117,079	16	886,003	152,339	17	
Jalisco	1,992,485	1,539,317	317,941	16	2,288,177	358,453	16	
México	3,788,055	3,104,746	408,667	11	4,434,698	538,220	12	
Michoacán	1,223,115	898,296	233,784	19	1,399,791	238,951	17	
Morelos	546,282	387,366	90,531	17	641,616	99,339	15	
Nayarit	324,479	240,949	58,166	18	382,781	63,315	17	
Nuevo León	1,228,288	997,042	156,652	13	1,509,866	230,677	15	
Oaxaca	1,046,531	793,689	156,981	15	1,224,151	168,179	14	
Puebla	1,482,695	1,181,763	203,957	14	1,717,345	239,612	14	
Querétaro	452,331	350,411	70,646	16	569,470	83,895	15	
Quintana Roo	340,490	250,811	41,752	12	470,217	78,295	17	
San Luis Potosí	691,620	552,867	103,501	15	778,894	109,551	14	
Sinaloa	806,334	623,417	138,633	17	895,712	136,994	15	
Sonora	789,654	600,514	130,004	16	898,928	140,219	16	
Tobasco	549,556	468,401	58,149	11	654,372	69,701	11	
<b>Tamaulipas</b>	<b>996,125</b>	<b>769,196</b>	<b>161,528</b>	<b>16</b>	<b>1,135,418</b>	<b>211,746</b>	<b>19</b>	
Tlaxcala	286,983	231,604	39,645	14	334,520	43,081	13	
Veracruz	2,121,655	1,763,700	258,988	12	2,398,856	288,556	12	
Yucatán	543,940	427,875	66,919	12	634,360	78,097	12	
Zacatecas	449,377	323,086	99,372	22	494,288	90,767	18	
National Total	30,412,005	24,071,538	4,271,287	14	35,169,529	4,997,806	14	

**Table 1.3** Percentage of uninhabited homes in Mexican cities and states in 2005 and 2010.  
Source: Reprinted from “Lo que dicen las viviendas deshabitadas sobre el censo de Población” by Sánchez, & Salazar Cruz, 2011.



**Figure 1.2** Mexico map showing proportions of uninhabited housing per municipality in 2010. Source: Own figure based on similar figure found on “Lo que dicen las viviendas deshabitadas sobre el censo de Población” by Sánchez, & Salazar Cruz, 2011.



**Figure 1.3** Number of credits given by INFONAVIT per year since 1972. Source: Own elaboration based on data from Ricardo Martinez Campos, 2017.

To be able to accommodate the spike in credits given, INFONAVIT had to make some changes (discussed in future chapters). Despite the PND was ambitious, setting massive goals such as building 1000 homes a day, its intention was to help thousands of families in Mexico. Unfortunately, a series of events such as an economic crisis, policy changes in INFONAVIT (until 1997 INFONAVIT focused in building and supplying housing with minimal impact on credit allocation vs 1997 reform on the INFONAVIT Law, INFONAVIT became a financing institution focused on credit allocation (Ordenez Barba and Reyes Santos 2006, Camara de Diputados del H. Congreso de la Unión 1972) and rise in crime, led to the “failed vision” of the PND (Marosi, 2017). Instead of providing housing for many, it created a surplus of housing that eventually became abandoned. Abandoned communities and neighborhoods can be seen in **Figure 1.4 Own photograph of an abandoned community in the periphery of Reynosa, 2019.**Figure 1.4, which shows a complete neighborhood of abandoned houses in the periphery of Reynosa, Mexico.



**Figure 1.4** Own photograph of an abandoned community in the periphery of Reynosa, 2019.



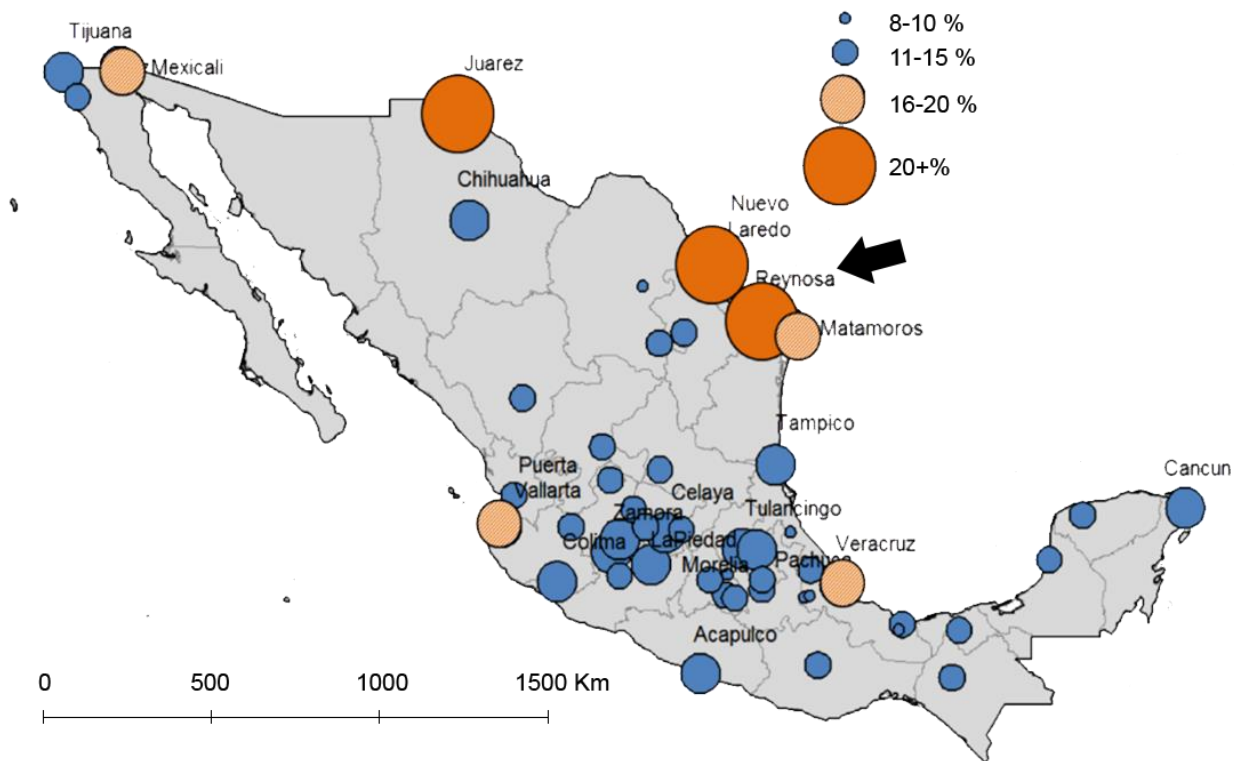
INFONAVIT began to identify an increasing number of individuals not paying their loans or paying their mortgages (INFONAVIT, 2015). With time it was evident the housing abandonment phenomenon had affected Mexico as a whole. Mexico still lacks housing for many and is constantly building new communities but at the same time thousands of homes are abandoned, this is the paradox. This is the paradox: a country needing houses for many homeless individuals, while simultaneously having abandoned houses to offer. This study will choose to focus on the abandoned side of the paradox.

Mexico became a country with millions of homeless individuals and millions of empty houses. This resulted in many researchers and reporters to address this topic, investigating the reasons to the high number of abandoned housing. The most common findings were homes which: lacked resources in their environment (transportation, water, electricity, gas), and built far from work, schools, and recreational centers (Reyes y Cabrera 2013, Salinas Cesireo 2015, Arias 2015, Monroy, 2016).

As the years progressed abandoned housing remained constant in Mexico. In 2010 five million homes were uninhabited or abandoned (15% of the total housing inventory), which 500 thousand of them were vandalized (INEGI 2010, Iracheta 2016). Six years later, in 2016, 70,000 homes were found abandoned by INFONAVIT, which approximates to a loss of 90 million Mexican pesos (4.6M USD) of unpaid loans (INFONAVIT, Campos, 2017). This clashes with the evident housing deficit data, highlighting the housing planning paradox in Mexico (Campos, 2017).

### 1.1.3 Site: Reynosa

The abandoned housing situation is happening at a national level in Mexico. Affecting some cities more. Reynosa with more than 8,000 abandoned houses is currently one of the top cities in the country with this issue. In Figure 1.55 one can notice some of the urban zones with the highest percentage of uninhabited and abandoned home. In 2010 Juarez, Nuevo Laredo and Reynosa represented the top three urban zones with above twenty percent abandonment. This study will focus on the housing problem of Reynosa Mexico and its contributing factors.



**Figure 1.5** Map of Mexico showing percentage of abandoned housing per urban zone in 2010. Source: Own figure based on similar figure based on Atlas del Abandono, 2015.

Reynosa, Mexico, once a vibrant city, is facing an urban crisis. This crisis spreads into the other aspect of the social life of the residents. Where one grows up becomes part of their identity. I grew up in McAllen, Texas, which is the border sister city with Reynosa, Mexico. As a child, I visited Reynosa on a weekly basis, for food, shopping, and family visits. Traveling to Reynosa was safe and easy. The border relationship between Reynosa and McAllen has been friendly and beneficiary to both parties, economically, culturally and socially. Now the narrative is a little different as safety precautions have been placed between these sister cities. The American government began to advise Americans of visiting these parts of Mexico (Reynosa). Government regulations at the international border bridge have made traveling to and from harder, increasing wait time and security inspections. This is due to an ongoing drug war in Mexico. Mexico in the last years has suffered from a rise in violence and homicides. Some parts have become more affected, such as Reynosa. Many home owners earn the minimum and when they are faced with the decision of living in a not secure house near a gunshot zone; the decision to flee becomes plausible. Thousands of “casas INFONAVIT” or “INFONAVIT homes” have become abandoned over the last decades and different factors have had a great influence in this, such as the ones mentioned above.

I was interested in architecture, and as I visited Reynosa, I noticed the homes my family resided in. They were small and most families would spend their time outside in their front porch. Architecture can showcase the stories of the inhabitants. The stories told by the architecture begin to tell the story of the city. I noticed a pattern with these small homes, as they were called “Casa INFONAVIT”. At the time, I thought it was the nickname for a small home or the name of the neighborhood.

INFONAVIT is a major home lender development in Mexico. The establishment of INFONAVIT in 1972 led to the availability for workers to build homes with private capital, helping workers at a national scale. In 1992 INFONAVIT went through some political changes evolving into more of a banking institution. INFONAVIT began to allow the build process to be taken over by the private sector resulting in a free market approach of maximizing profits. Residents began to complain about the quality and infrastructure of their homes, INFONAVIT dismissed or began a trail of paperwork. Many families possess limited incomes and these homes will be the only home they will be able to own. This work is about the stories of the abandoned housing and the people with limited choices and conflicted by living in a perpetual state of fear. In the next chapter, the research focus and scope of research will be explained.

## **1.2 Research Focus**

The number of abandoned housing in Reynosa, Mexico seems to grow every year. A series of factors have contributed but this research will focus on, crime data, mobility (proximity to specific centers) and typology. This research is not meant to state a reason as to why this is happening but used a mixed methods approach of a case study to gather data and information leading to the current state and its effects on the architecture of the city. This city spread abandonment of housing has created greater negative effects across the city. This problem can be found in other parts of Mexico. Architects, Urban Planners, Politicians and Social Activists have started to raise questions and concerns as this problem increases. This research will gather information of Reynosa, Mexico but focus on specific zones as well. Each zone is categorized by several factors: demographic, socio-economic status, house typology and urban geolocation. Many limitations occur in a city where a drug war is occurring and overtaken by drug cartels

(gangs). Therefore, some zones are limited or off limits. In each zone photographs will capture the various typologies. This topic is relevant and important as Reynosa, Mexico can be used as a case study for what is happening in other parts of Mexico. This is an important topic, as it is also influencing the American side due to its proximity.

### ***1.2.1 Research Statement and Question***

This research explores the conditions of sub-municipalities areas with the greatest amount of abandoned housing within the municipality of Reynosa. Reynosa, Mexico was the focus of this study. Several variables were tested as indicators that capture aspects of housing. The aim of this research is to understand the factors leading and the present factors contributing to the grand abandonment of social housing in Reynosa, Mexico focusing on data from 2006 to 2019, which led to the following research focuses:

1. Describing factors regarding the abandoned social housing in Reynosa, Mexico
2. Exploratory observations of the city, its housing typology and the abandoned housing in the city that could be used to build a future research study.

## **1.3 Structure of the Thesis**

### ***1.3.1 Literature Review***

This will be a series of literature reviews of different topics pertaining to Reynosa, Mexico and the policies, key players, highlighted contributing factors and the situation regarding abandoned social housing. This chapter will introduce the city of Reynosa, Mexico, highlighting specific time periods, policies and the overall change of the city. This chapter will try to reveal the uniqueness of being a border town, its economic infrastructure, and the living conditions. The selected historical developments do not extensively describe the history of Reynosa, but rather will direct the understanding of the changes leading to the extensive social housing

abandonment. Another important topic discussed in the Literature Review will be INFONAVIT. One of the contributing factors to abandonment is crime and security. This chapter will also introduce the ongoing drug war in Mexico. This is a war between the government and the various cartels overtaking the city. This chapter will describe the policy changes dealing with the drug war in the last years. Data will illustrate the rise in violence and homicides that create an atmosphere of fear.

### ***1.3.2 Methodology***

This chapter will present the mixed method approach of a case study, an interactive and interpretive autoethnographic approach and photo-elicitation. This chapter will help understand the qualitative and quantitative methodological approach of this study and explain how the data was chosen. Data such as self-photographs, direct observation to gather data and primary secondary data. The safety precautions and limitations will be addressed in this chapter as well.

### ***1.3.3 Findings***

This chapter highlights the results and analyzes them. This study was not meant to answer the questions completely but rather shed light on the issue. In this chapter the questions will be attempted to be answered. The photographs and new media will be analyzed. Each of the four different zones specified will be compared with each other and get a simplified holistic view of Reynosa and the abandoned housing problem.

### ***1.3.4 Conclusion and Future Work***

This chapter will summarize the findings of the previous chapters, conclude with a view of the future, and suggest possible ways this study can be applied to other cities in Mexico and other countries.

## 2. LITERATURE REVIEW

### 2.1 Housing

The abandoned housing issue is a social, economic, ideological, and political problem that no country has been able to provide a definitive satisfactory response (Peralta, 2010).

Housing is interconnected with, government policies that understand housing as a right, with landowners, industrial sectors, marketers and financial builders among others (Peralta, 2010).

Not only is abandoned housing an issue, but housing in general is a problem. There is a growing demand for housing worldwide. As the need for housing arose, many organizations, laws and global initiatives were born to help with the need for affordable housing. Laws/

Initiatives such as:

- (1948) Universal Declaration of Human Rights in 1948 promoted the right to an adequate standard of living (McTarnaghan et al., 2017).
- (1996) The Habitat II was ratified to ensure safe and adequate housing
- (2016) The United Nations Human Settlements Program (UN-Habitat) focused on the idea that a priority and sense of urgency must be given to housing and their types, housing longevity, economic aspect and the types of construction available (McTarnaghan et al., 2017).

The urban housing growth responds to a growing population with lower death mortality (Peralta, 2010). In recent years (2009) the urban population has been growing, surpassing the rural population (for an overview of the literature of housing global initiatives see McTarnaghan et al., 2017). The consequence of this growth is a higher demand for affordable, safe, and

adequate housing worldwide. As Mexico is the focus of this study, data shows that in 2008 approximately 63.2 percent of the population in Mexico needed help to get a home in the form of credit or loan, with an average fifteen to thirty-year span to complete the loan (Campos, 2017). The growing demand for housing and for land did not have a proper response in many countries as many slums, “colonias” and degraded neighborhoods began to arise. An example of this improper planning is in the site of this study, Reynosa, Tamaulipas. In Tamaulipas, 10.5 percent of the population lives in homes whose standards are below adequate and built with materials such as; wood, cardboard, sheets and plastics. These informal settlements began to surface due to: limited affordable housing, economic factors, the fast-paced population growth and individuals' refusal to use shelters (Hirschberg, 2009).

Many residents in Reynosa lack the resources to purchase a home, and those who do end up purchasing a home are only able to purchase a home in the periphery or in communities lacking many resources. Electricity is limited in the *colonias* (housing communities with low resources), water is unsuitable for drinking or cleaning, and the road infrastructure is not suitable for transportation. As people migrate to Reynosa, Mexico, they take any land available. Yet, this study acknowledges many residences in Reynosa are in good conditions, and not lacking any resources. The fact that many in Reynosa need housing is important because it exemplifies the paradox of the current condition. A country needing housing for many, while having existing housing that is abandoned. This study will not focus on the people in need of housing but rather on the already existing housing that became abandoned.



### ***2.1.1 The Roots of Housing Abandonment in Mexico***

Simplifying the developments leading to the abandoned housing in Mexico, is a difficult task, because it cannot be associated to one thing. It is also hard to attribute the level of importance of each factor. Yet this study will highlight the most relevant and common among studies in recent years (1994-2019). Some of the conditions of abandoned housing find their roots in: the way credit institutions operate, how and where private developers develop new housing, and how affordable housing planning is done at the municipal level. Some of the highlighted reasons leading to the abandonment are shown below (Ricardo Campos, 2017):

1. (1994) The Mexican economic crisis.
2. (1997) INFONAVIT went through a major change, and become more economic based
3. (2001-2006) President Vicente Fox had enacted the National Development Plan to overcome the housing deficit. Implemented housing supply strategies. The plan failed.
4. (2001) INFONAVIT increased dramatically the number of housing credits to meet the goals of the PND, contributing to the failure of the PND.
5. (2001-present) an ongoing drug war, that increased fear and homicide rates in some states
6. (2009) Mexico Recession was a major factor, stalling a big part of the construction, and limiting the ability for owners to pay their credit, thus abandoning the home

As stated, before it is hard to give a weight to one of these factors, but many researchers focus on the 2001, “Plan Nacional de Desarrollo 2001-2006” or PND. This plan strengthened the relationship between the public entities and social housing programs, promoting the right of adequate housing for all, regardless of the workers’ earnings (<http://planeacion.uaemex.mx>). Its goal was to eradicate the housing deficit in Mexico and provide housing for every individual. This led to a mass production of housing, which brought problems along the way. Researchers, such as Dr. Esther Maya Pérez, a professor in Urban planning in Mexico, believes this initiative led to abandonment as it sacrificed quality for quantity, mass producing homogeneous housing all over Mexico, building with unreliable materials and techniques and affecting the housing production (Maya, 2008). In 2004 close to 300,000 homes were built (CIDOC, 2014). This

oversupply remained abandoned in many parts of Mexico as many were not able to afford the housing after initially purchasing (Maya, 2008). In Summary Maya believes that the Mexican state became a financial state, shifting the housing production responsibility to the private sector, rather than a governmental responsibility. Arguing the private sector capitalized on the housing market rather on the needs of the users or the city. Homogeneous housing typologies emerged, with no regard to local environments. The mass production led to unplanned urban growth that affected cities, and thus leading to a greater number of abandonment (Maya, 2008). The PND allowed us to see and understand its effects in the city of Reynosa, Mexico.

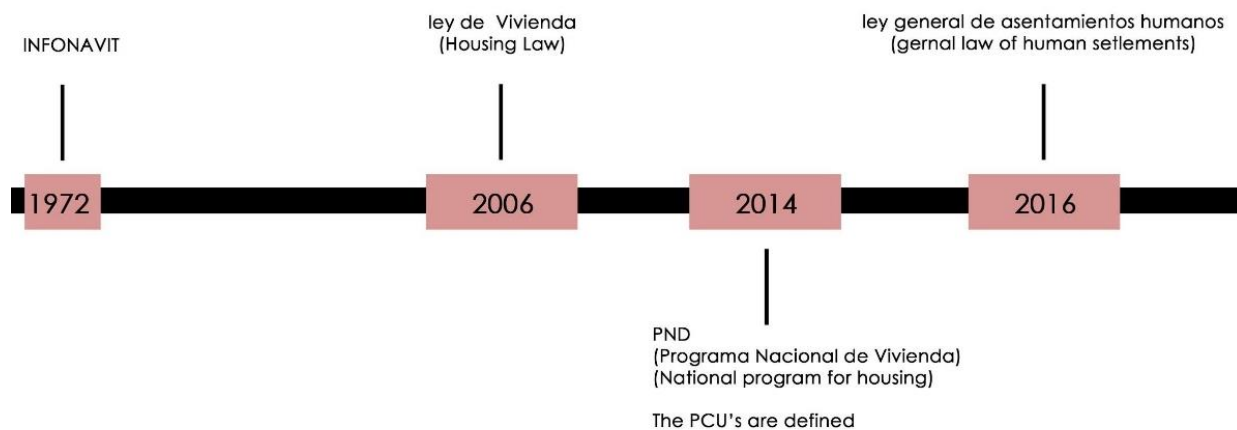
### ***2.1.2 Other Housing Initiatives***

As this thesis develops, it is important to understand the initiatives and consensus declared for decent and adequate housing and compare this to the living conditions in Reynosa. One that will be used to compare is the “Seven Basic Principles of Adequate Housing” by the Office of the United Nations High Commissioner for Human Rights and UN-Habitat (Table 2.1).

<b>Seven Basic Principles of Adequate Housing</b>	
Security of Tenure	The security of permanence and legal protection against threats of evictions.
Availability of services, materials, facilities and infrastructure	The availability of basic services for living (water, sanitation, energy, waste disposal, drainage)
Affordability	The price should be affordable for all and not compromise the daily activities of the occupants.
Habitability	The home should become a shelter against the natural environment that provides a safe environment.
Accessibility	The availability of housing should be a right for all class groups.
Location	The housing locations should be accessible to main work, education, medical and commerce centers and in sanitary and safe zones.
Cultural adequacy	The housing representation should reflect its culture identity.

**Table 2.1** Seven Basic Principles of Adequate Housing.  
Source: Own iteration based on the Office of the United Nations High Commissioner for Human Rights and UN-Habitat, 2009, “The Right to Adequate Housing”.

Despite it is important to understand a global perspective, it is also relevant to see a contextual response. This will present a short summary of some of the policies regarding housing in Mexico (Figure 2.1 represents a timeline of key policy changes for this study). Mexico's constitution (1917) states the obligation of each business owner to provide housing for the workers, the companies should create a national housing fund in which they deposit funds allocated for the workers, create a financial system that allows workers to receive these credits to be used for their housing, and finally this law regulates the procedure in which the workers will be able to work to own their housing ([ordenjuridico.gob.mx](http://ordenjuridico.gob.mx)). For a full summary please go to “La promoción privada y los grandes conjuntos habitacionales: nuevas modalidades de acceso a la vivienda” Cervantes, Jorge & Maya, Esther & Esquivel Hernández, María Teresa (2007).



**Figure 2.1** Timeline of key and recent housing initiatives.

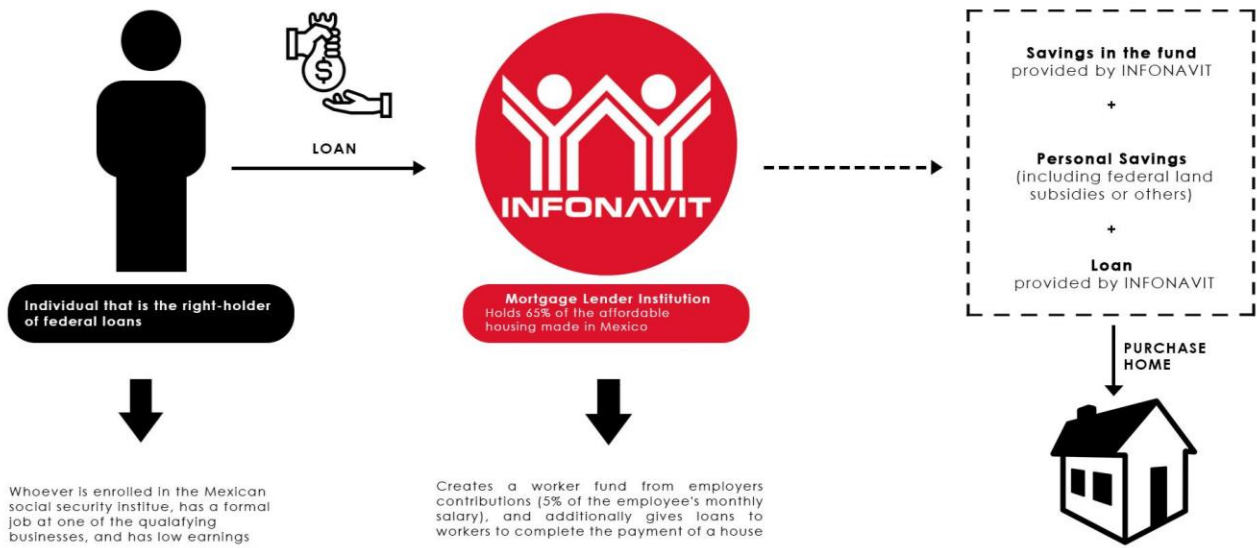
Source: Own iteration based on data from Anexo: Diseño Metodología by INFONAVIT (2017).

Despite the great improvement of these initiatives, housing was still needed for many, perhaps due to the growth in population, the rural to urban move, or the fact that most agencies facilitated with more ease credit to workers earning at least five times more than the minimum wage and oversaw those who earned less (Pansza, et al, 2010). Only 7% of the credits were allocated for workers earning less than 4 times the minimum (CONAFOVI). INFONAVIT was one of the institutions in charge of giving credits. The credits were given by institutions such as INFONAVIT. This research will choose to focus on INFONAVIT and their impact on the housing market but acknowledges the impact of others on the housing realm.

## 2.2 INFONAVIT

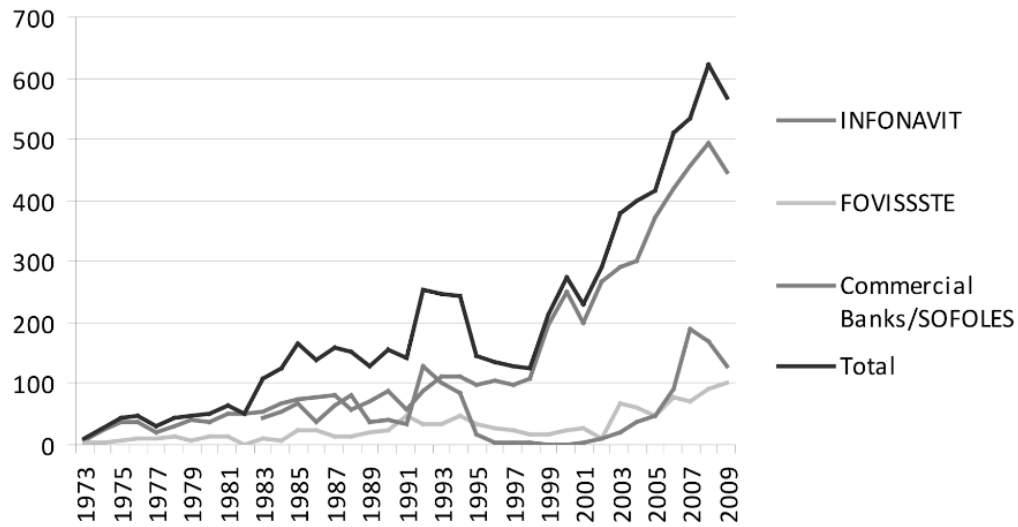
As mentioned previously, the PND had the goal of providing housing for everyone in Mexico. INFONAVIT became the tool the Mexican government used to address the housing problem. Following the creation of INFONAVIT and FOVISSSTE (1972) the housing production was strengthened. The Housing production grew from 5.4% in 1951-1960 to 9.3% from 1960-1970, to a spiked increase of 77.3% of all housing finished from 1971-1976 (Maya, 2008). Therefore, it is important to briefly understand more about INFONAVIT.

In 1972 Mexico's biggest mortgage lender institution was funded. INFONAVIT, The Instituto del Fondo Nacional de la Vivienda para los Trabajadores or the National Institute of Housing Funds for workers in English, had a clear goal: to gather a national fund of employer contributions (5% of their monthly salary) which the workers could eventually withdraw or use the credit as a loan to obtain affordable housing. Figure 2.2 shows a diagram of how an individual can get a loan from INFONAVIT to purchase a house. INFONAVIT aims to increase the supply of housing for the middle- and low-income sectors (<https://portalmx.infonavit.org.mx>). With time INFONAVIT became one of two Mexico's primary housing financiers (the other being FOVISSSTE) (for more information see full INFONAVIT history go to [portalmx.infonavit.org.mx/HistoriaDelInfonavit](https://portalmx.infonavit.org.mx/HistoriaDelInfonavit)). For a more detailed historical account of the policies and changes in INFONAVIT go to Chapter three of "El Proceso de Modernización en el INFONAVIT 2001-2006, Estrategia, Redes y Liderazgo" by Manuel Alejandro González Arreola.

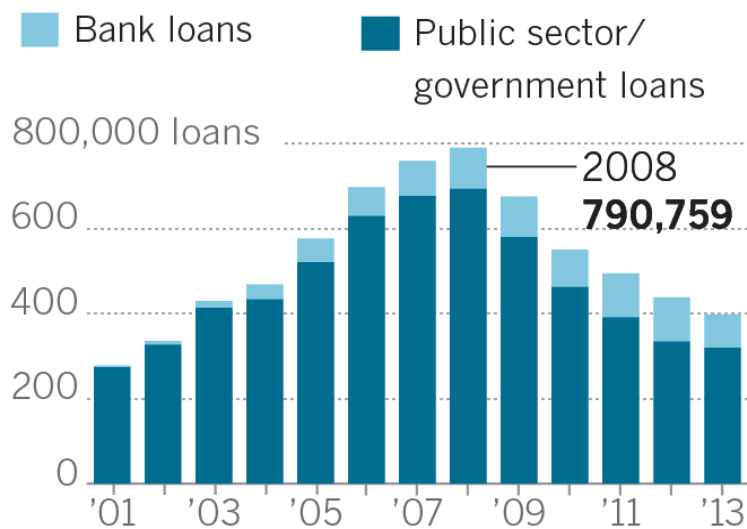


**Figure 2.2** Diagram explaining the process of IFONAVIT.  
 Source: Own elaboration based on a similar image by Ricardo Campos (2017).

In its first five years INFONAVIT, along with FOVISSSTE and the Fondo de Vivienda (FOVI-BANCA) built 77.3% of all built houses in Mexico. Figure 2.3 and Figure 2.4, show how INFONAVIT leads the home-credit allocation and their increase in lending throughout the years. Making INFONAVIT an important character in this research, and an important factor in home development in all of Mexico. Since INFONAVIT is the leader in credit lender, their policies influence the Mexican housing market.



**Figure 2.3** Evolution of Loan Origination by Main Participants.  
 Source: Reprinted from “Housing Finance in Mexico: Current State and Future Sustainability” by Lopez-Silva, Marco & Abreu-Lastra, Raúl & Saracho-Martinez, Alberto & Paulin-Hutmacher, Agustin (2011).



**Figure 2.4** Total mortgage loans granted to Mexicans to acquire a new home from 2001-2013.  
 Source: Reprinted from the LA Times’ article “Mexico’s Housing Debacle” by Richard Marosi (2017).

In 1992 (Washington Consensus of 1992) the role of INFONAVIT and other housing institutions began to drastically change (Pugh, 2001). Slowly they became more of a housing facilitator agent versus a housing promoter; changing from a joint housing fund for the workers to a source of economic resource for real estate business (García Peralta, 2010). Consequently, this change brought forth the now known “INFONAVIT House” typology as they had to adjust and follow the reforms in housing policies. The INFONAVIT House, is known as a small house with one or two rooms. The typical “INFONAVIT House” is compact, single or double level, and homogenous in design. This term later was appropriated for small houses of similar typologies even if they had not been constructed by INFONAVIT. This expresses the visual and spatial effect these houses had on the population's perception of the new urban developments.

As Mexican workers strived to obtain their homes, they became attracted to the new marketable trend of the “INFONAVIT Home”. Companies began to focus on maximizing the area, building as many houses as possible (homogenous and low quality), building them in the outskirts of the cities (as land was cheaper and in Mexico owning the home means owning the land) and sell them at an affordable price and gain a profit (Villavicencio & Durán, 2003). The ramification would eventually be seen in the urban, economic, and social fabric. The positive effects were seen in the creation of new jobs due to an increase in construction, and a national economic boost through real estate (Harvey, 2005).

INFONAVIT's credit quota increases every year, especially since the PND was set in motion (Campos, 2018). As a result, INFONAVIT chose to build more despite many abandoned houses already existed. Referring to Figure 2.3, it shows the increase in the amount of credits given in the last few years. In 2006 alone INFONAVIT granted 421, 475 thousand credits to families (Centro de Estudios de Económicos del Sector Privado, CEESP, 2006). Former



president Vicente Fox pushed INFONAVIT to lend more credit with the PND, increasing the loans from 205,000 (2001) to 494,073 (2008) (Marosi, 2017). INFONAVIT allocated 1.8 million of credits in a span of 6 years during the PND (Campos, 2017). Approximately 5-7 million houses were built from 2001-2012. CIDOC the “Fundación Centro de Investigación y Documentación de la Casa, A.C.” or “Foundation Research and Documentation Center of For Housing in English” estimated an average of 300,000 houses built in 2004 most of them being built through INFONAVIT (CIDOC 2004). The 2009 recession stopped the housing boom and thousands of INFONAVIT homes were abandoned as the public did not like the lack of basic services and the far distance from work centers (Aguilera, 2017). More than 120,000 homes were abandoned those following years. For a detailed history and understanding of Mexico's economy and how it affects the housing market go to “Finance in Mexico: Current State and Future Sustainability” by Lopez-Silva, Marco & Abreu-Lastra, Raúl & Saracho-Martinez, Alberto & Paulin-Hutmacher, Agustin, Housing (2011).

### ***2.2.1 INFONAVIT Houses***

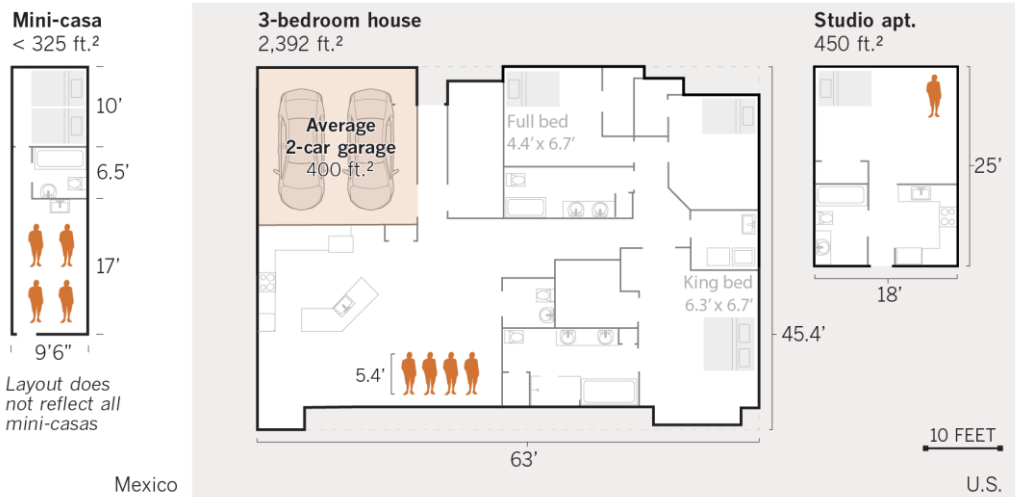
INFONAVIT has the goal of creating “dignified and decent” housing. This led to the creation of the “INFONAVIT House” or also called “mini-casa (mini house)”. **Error! Reference source not found.**5 shows a typical INFONAVIT House or “mini” casa on the left and compared to an average US house. Many architects and urban planners warned against this design as it allegedly valued profit over people. This house would have negative consequences such as being over-crowded, lack of personality, and inadequate for their context (Marosi, 2017). INFONAVIT reacted to the great demand of housing along with the government incentives and provided affordable housing ranging from \$15,000 to \$25,000 (Marosi, 2017). Figure 2.66 shows

the “INFONAVIT House” median house price per year in dollars (as dollars would make it easier to understand for this study). The graph shows us how the new homes built are less expensive, which result in these homes typically only having one bedroom, until the policy changed in 2013 pushing for two bedrooms. The average home is nine feet wide, includes five electrical outlets, a thin wall separating the next house (thus it becomes very noisy) (Aguilera, 2017). People choose to sit outside or in the car. Families await to purchase water from mobile water providers, as they lack water and lack a proper water sewage. Some families have reported roof leaking, power outages, no water and poor housing conditions (Aguilera, 2017).

Many individual’s economic limitations push them to purchase an “INFONAVIT Home” located at a distance from the city, lacking infrastructure and access to services. It is often that families are not informed of this lacking, only to discover this as they move in, leading to the decision to abandon (Marosi, 2017). The current housing model in Mexico is categorized by isolating the house, duplicating the model until a homogenous community is created and placing the new community in the outskirts of the city (Schwanse, 2014). This has affected living conditions for many Mexicans and has affected the built and natural environment (Schwanse, 2014). For a full series of abandoned housing see the full report “Mexico’s Housing Debacle” Los Angeles Times, Los Angeles (2017). Below are some photographs (Figure 2.87-Figure 2.13) from some INFONAVIT communities and their current conditions.

## Mini-casas are smaller than a 2-car garage in the U.S.

Is less than 325 sq. ft. enough to house the average four-person Mexican family?

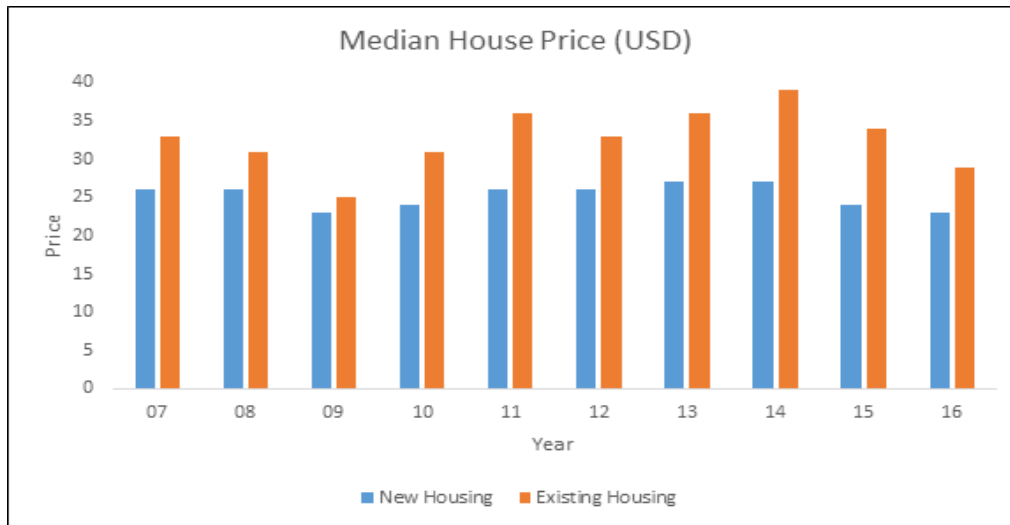


Sources: Los Angeles Times reporting, Honda.com, census.gov

@latimesgraphics

**Figure 2.5** Typical INFONAVIT House or “mini” casa on the left and compared to an average US house.

Source: Reprinted from the LA Times’ article “Mexico’s Housing Debacle” by Richard Marosi, 2017.



**Figure 2.6** “INFONAVIT House” Median House Price (USD).

Source: Reprinted from the LA Times’ article “Mexico’s Housing Debacle” by Richard Marosi, 2017.



**Figure 2.7** Abandoned INFONAVIT houses in a suburb of Mexico.  
Source: Reprinted from the LA Times’ article “Mexico’s Housing Debacle” by Richard Marosi, 2017.  
Photography by Brian van der Brug / Los Angeles Times, Marosi, 2017.



**Figure 2.8** Affordable housing development in Mexico.  
Source: Reprinted from the LA Times article “Mexico’s Housing Debacle” by Richard Marosi, 2017. Photography by Brian van der Brug / Los Angeles Times, Marosi, 2017.



**Figure 2.9** Raw sewage near her home in Colinas de Santa Fe in Veracruz, Mexico.  
Source: Reprinted from the LA Times article “Mexico’s Housing Debacle” by Richard Marosi, 2017. Photography by Brian van der Brug / Los Angeles Times, Marosi, 2017.



**Figure 2.10** Not working water treatment plant at Colinas de Santa Fe in Veracruz, Mexico.  
Untreated sewage flows into a creek.  
Source: Reprinted from the LA Times article “Mexico’s Housing Debacle” by Richard Marosi, 2017. Photography by: Brian van der Brug Los Angeles Times, Marosi, 2017.



**Figure 2.11** Squatters can be seen over taken a home.  
Source: Reprinted from the LA Times article “Mexico’s Housing Debacle” by Richard Marosi, 2017. Photograph by Travis Greske / For the Times, Marosi, 2017.



**Figure 2.12** This is how most families living in the periphery get water.  
Source: Reprinted from the LA Times article “Mexico’s Housing Debacle” by Richard Marosi, 2017. Photograph by Brian van der Brug / Los Angeles Times, Marosi, 2017.



**Figure 2.13** INFONAVIT community.

Source: Reprinted from the LA Times article “Mexico’s Housing Debacle” by Richard Marosi, 2017. Photograph by Brian van der Brug / Los Angeles Times, Marosi, 2017.

### **2.3 Reynosa, Mexico: The Context**

Reynosa is a city known for building great quantities of INFONAVIT houses is Reynosa, Mexico. Many INFONAVIT communities can be seen throughout the city. This study will focus on the city of Reynosa, Mexico. The city of Reynosa is found in the state of Tamaulipas.

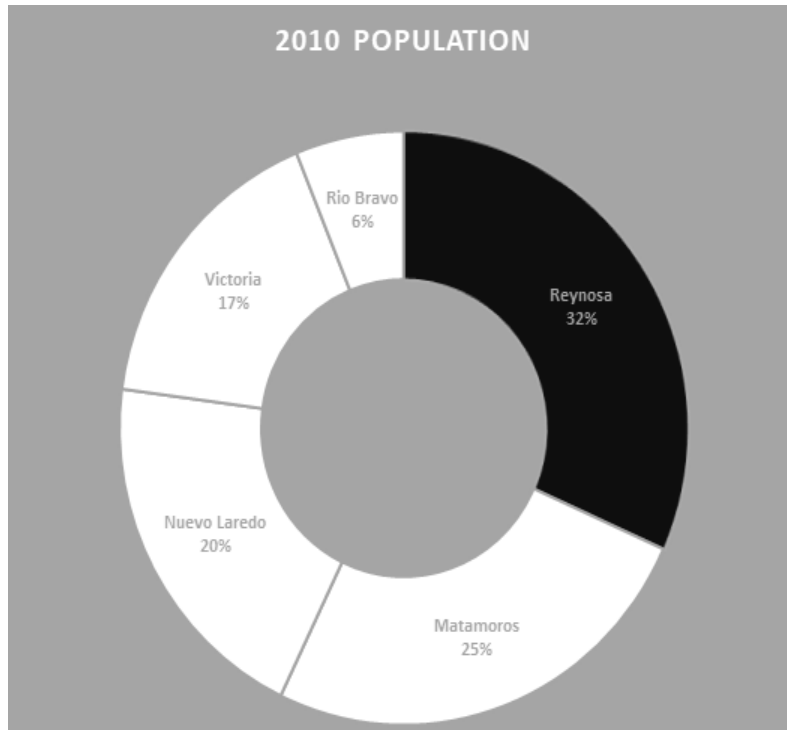
Reynosa, since being founded on March 14, 1749, it has grown from a small settlement into a thriving city with more than six hundred thousand residents (see Table 2.2 for recent census

data). Reynosa quickly became the largest city in the state of Tamaulipas, Mexico (see Figure 2.14 Table 2.2 for a comparison of the *Top 5 Tamaulipas Municipalities' Population*) (INEGI, 2015). Just across Reynosa, the U.S can be found. In Figure 2.15, the closeness of Mexico and the USA is shown. Reynosa is one of 38 municipalities in Mexico that exists in the 2,000-mile border with the United States. Figure 2.16 Figure 2.15 shows the closeness even more and shows the different municipalities of Tamaulipas.

<i>Period</i>	<i>Population</i>
<i>2019 (projected)</i>	<i>733,974</i>
<i>2015</i>	<i>649,800</i>
<i>2010</i>	<i>608,891</i>
<i>2005</i>	<i>526,888</i>
<i>2000</i>	<i>420,463</i>
<i>1995</i>	<i>337,053</i>

**Table 2.2** Total Reynosa, Mexico Population.  
Source: Own iteration based on data from INEGI, 1995-2015.

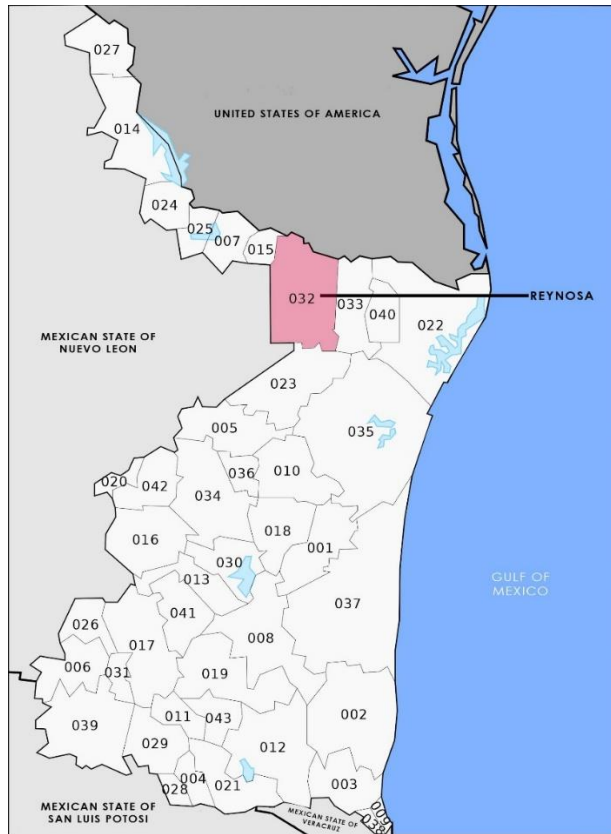




**Figure 2.14** Top 5 Tamaulipas Municipalities' Population in 2010.  
 Source: Own iteration based on data from INEGI 2010.



**Figure 2.15** Mexico- US Map: Highlighting Reynosa, Mexico.  
 Source: Own iteration with maps found on Wikimedia Commons.



**Figure 2.16** Tamaulipas and its municipalities, highlighting Reynosa Mexico.  
 Source: Own iteration with maps from Wikimedia Commons (Municipios de Tamaulipas.svg).

*A border is a dividing line, a narrow strip along a steep edge. A borderland is a vague and undetermined place created by the emotional residue of an unnatural boundary.*

*It is in a constant state of transition. (Anzaldúa 1987, p. 3).*

Reynosa has an interesting culture. Like other border towns, a merged culture (Mexico-USA) exists. The relationship is intrinsic since the border was once one land. The U.S.-Mexico war of 1846 led to territories of Mexico to be of American ownership, pushing the Texas border

down 100 miles; South Texas was no longer part of Tamaulipas (Anzaldúa 1987). For a full history of Mexico and its territories see “*Borderlands: The new mestiza = La Frontera*” (Anzaldúa 1987). This culture pours into its economic, social, educational, recreational and more importantly for this study, its mobility aspects:

**Economic:** agriculture and distribution point (Kearney and Knopp, 1995), Strategies and policies have been implemented to help the economic growth of both cities. The growth has been greatly influenced by export-processing plants or *maquiladoras* in Reynosa, Mexico

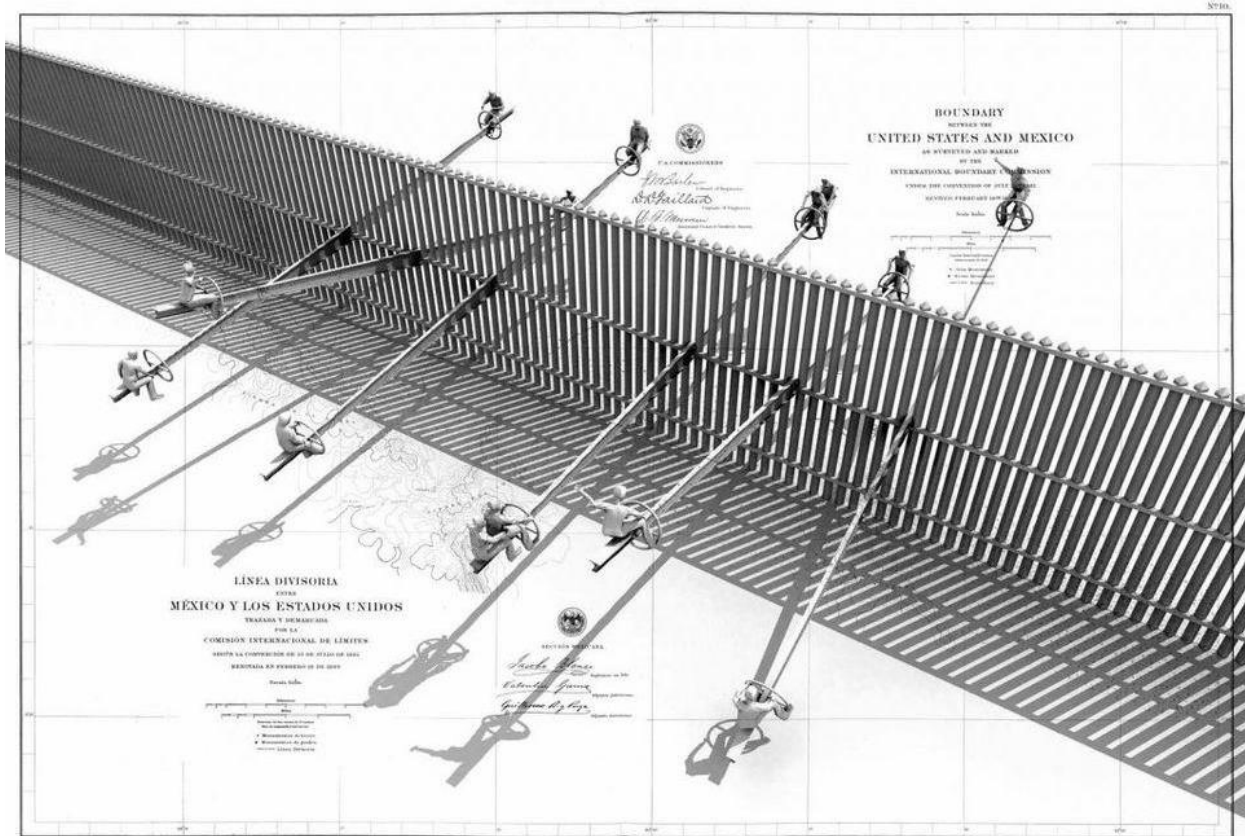
**Social:** a shared dynamic culture, language, and a special relationship exists

**Educational:** many travel to the other country for studies

**Recreational:** visiting another country for vacation or fun becomes simpler

**Mobility:** the closeness allows residents to transition and live in the adjacent country

On July 30, 2019 an architect set out to show this convergence and showcased some light of the proximity effect as a seesaw was placed on the fence. Figure 2.17 shows the seesaws placed in various points along the 2000-mile border of the United States and Mexico. This is to show the interconnected culture of the border.



**Figure 2.17** Design showcasing the interconnected relationship of the border.  
 Source: Reprinted image. Original designs for the Teetertotter Wall, which appeared on the cover of the 2017 publication *Border wall as Architecture* Courtesy of the artists and University of California Press.

This research understands how the abandoned situation in Mexico has an effect on the American, but this study will focus on the city of Reynosa, and for this research purposes will not address the effects on the American side.

### **2.3.1 Reynosa: Statistics**

In 2010 the approximate number of households were 153,086, and each household averaging 3.6 members (INEGI and CONEVAL). The educational attendance is low despite

more than 305 preschool, 300 primary and 79 secondary schools are available (SEDESOL, Coneval, Subsecretaría de Prospectiva, Planeacion y Evaluacion). Youth and teenagers are known to stop their education due to financial reasons (schools in Mexico are not free as in the U.S.A. or other countries, as they charge for admission, books, uniforms, food, and the price increases based on the prestige of the school), and parents' low involvement or busy schedules, or the need to work. Many teenagers find low paying jobs such as "Cerrillos" (or bag packers, seen in Figure 2.18) at supermarkets, with no contract and simply receive pay (average pay is 80 pesos or 4.14 USD a day) for packing the groceries and taking them to their cars. Many young kids try to balance school and work but end up leaving school to help sustain their families. In 2010, 33.7% of the total population (191,029 individuals) lived in poverty of which 3.5 % (19,763 individuals) presented extreme poverty (SEDESOL, Coneval, Subsecretaría de Prospectiva, Planeacion y Evaluacion). This study will not focus a great extent on the financial aspect of the families , but this serves to illustrate the need of many Mexican families in Reynosa and their needs to find ways to earn money to provide decent housing for their families.



**Figure 2.18** Boy working at a supermarket in Reynosa.  
Source: Own photograph taken at a Mexican supermarket in Reynosa, Mexico, 2019.

### **2.3.2 *Maquiladoras***

One-way Reynosa has facilitated jobs is through job creation of maquiladoras or factories. International and wealthy companies have settled in Mexico producing various items such as automobile parts, electronics, medical equipment, among many other production lines created items (list of maquiladoras in Reynosa at [www.midc.org](http://www.midc.org)). The maquiladoras started as a way of addressing the unemployment and poverty in Mexico (Cañas, Coronado, 2002). More

than 140 companies and thousands of jobs had been created in Mexico by 1969 through maquiladoras (Cañas, Coronado, 2002). Foreign owners created the plants to import and assemble duty-free components and export with limited taxes (only taxing the value-added to the semi-finished product, not the entire item) (Cañas, Coronado, 2002). Reynosa, alike other border Mexican cities, is the ideal location for these plans, as most maquiladoras are in Northern border states. This location allows for a low level of local integration, transportation commodity to the American parent company, and transportation savings (Tamayo-Flores 2001). Maquiladoras are important for this study as it helps understand the exponential growth of residents and the high number of residents that relocate there without a home. The population of Mexico grew partly due to the maquiladora program that began in the mid-1960s. The population in Reynosa has increased as Maquiladoras offered job opportunities.

Thousands of people from other Mexican states began migrating to Reynosa and even other Latin America countries (mostly women). Industrial Parks (a cluster of maquiladoras in a specific zone) took over the agricultural lands. More importantly for this study, a rise of informal housing construction, and social housing began to appear in the areas near the industrial parks (Hirschberg, 2009). The innate dilemma was that the expansion created by the maquiladoras led to an economic boost and city expansion but a shortage in housing for the flourishing population. The booming worker wave lead to the need to create affordable housing. The city infrastructure began to adapt (new roads, highways, housing). The rapid growth pushed Reynosa to try to respond to the change rather than a deliberate urban city plan (Hirschberg, 2009). This study will focus on abandoned housing in different zones, one of them being near maquiladoras. This study refers to maquiladoras and its impact on the city but acknowledges that

Reynosa's economy and development have also been greatly affected by other companies and factors such as the oil refinery company PEMEX (Petróleos Mexicanos, a state-owned firm that held a monopoly over the Mexican oil industry) but for a full economic history of Mexico and Reynosa go to <https://eh.net/encyclopedia/the-economic-history-of-mexico/>.

## **2.4 Drug Cartel, Violence, Fear**

In order to continue understanding Reynosa, we must address the drug war. In 2006 Felipe Calderon as the newly elected president of Mexico wanted peace for the country. One of the first things he did was to declare war on the drug cartels in Mexico. More than fifty thousand troops were deployed to various cities, including Reynosa. Reynosa radically began to change as a drug war began, and crime and homicide arose. The U.S. government acted by warning American tourist to be aware of this city. The warning is stated as this:

*Travel Advisory*

**Tamaulipas state – Level 4: Do Not Travel**

*Do not travel due to crime and kidnapping.*

*Violent crime, such as murder, armed robbery, carjacking, kidnapping, extortion, and sexual assault, is common. Gang activity, including gun battles and blockades, is widespread. Armed criminal groups target public and private passenger buses as well as private automobiles traveling through Tamaulipas, often taking passengers hostage and demanding ransom payments. Federal and state security forces have limited capability to respond to violence in many parts of the state.*

*U.S. DEPARTMENT OF STATE —Mexico Travel Advisory  
BUREAU OF CONSULAR AFFAIRS - April, 9,2019*

Fear began to rise in the city, and many of its residents became affected because of the changes. A resident's poem is in the next page helps explain the changes, and its disillusion with the city (the original poem is in Spanish , a translated version is provided as well).



*¿Mí Reynosa, por dónde empezar?*

*Cómo decirte que no serás la que conocí sino vuelves a ser como la ciudad de mis infancias; quieta, sin balaceras, trabajadora, con canchas de fútbol a orillas del Rio Bravo y, aunque pobre y al lado del país más rico del planeta, siempre alegre y admirada por tus cantores de buena fama.*

*De pronto, el narcotráfico, con sus escenas de muerte por tus calles que, un día me emocionaron, te volvieron otra ciudad que desconozco.*

*Lovely Reynosa,  
por los aprietos de no poder hacer nada y porque el corazón que portan estas letras tuyo es, te doy mi respeto y gratitud por haberme hecho crecer en tus menos peligrosos días, mismos, que ilusionaron a éste pensar.*

*A las distancias, siento que no soy yo sino eres tú, la ciudad de mí primer amor, mi primer poema, mi primera pelea y mi libertad de caminar sin el rumor del---tatatatata---de las ametralladoras por tus Tamaulipecas calles que me enseñaron el hermoso sabor de haber nacido Mexicano, fronterizo y universal por razones de conciencia.*

- Poema por Fidel Guerra, 2017

*My Reynosa, where to start?*

*How can I tell you that you are not the one I met, the city of my childhood; quiet, without shootings, worker, with soccer fields on the banks of the Rio Grande and, although poor and next to the richest country on the planet, always happy and admired by your singers.*

*Suddenly, drug trafficking, with its death scenes through your streets moved me, made you into another city that I do not know.*

*Lovely Reynosa,  
for the trouble of not being able to do anything and because the heart that carries these letters it's yours, I give you my respect and gratitude for raising me in your less dangerous days, same, that deluded this one to think.*

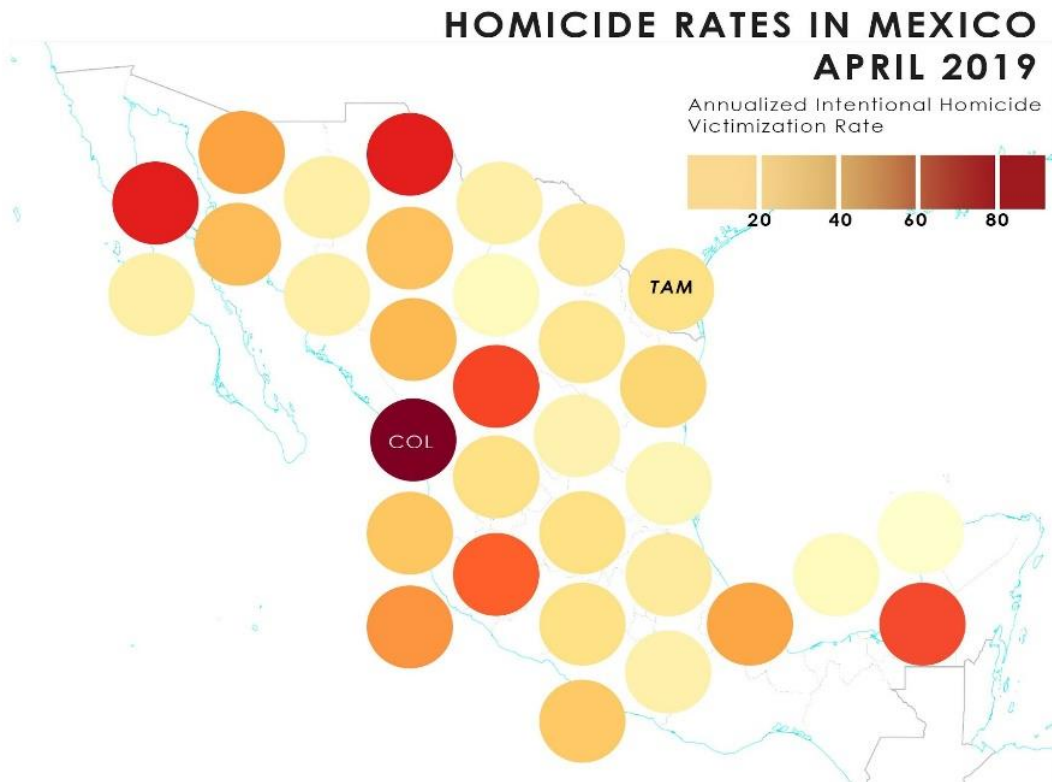
*At distances, I feel that it is not me but you, the city of my first love, my first poem, my first fight and my freedom to walk without the rumor of --- tatatatata --- of the machine guns for your Tamaulipecas streets who taught me the beautiful taste of having been born Mexican, border and universal for reasons of conscience.*

- A Poem by Fidel Guerra, 2017 (translated versión)

June S. Beittel an Analyst in Latin American Affairs in her 2019 report states that Mexico's homicide rate has become above average in comparison to other Latin America countries (2019). For full details please see Mexico: Organized Crime and Drug Trafficking Organizations Updated August 15, 2019 and International Crisis Group. Latin America Report N°69 | 11 October 2018, Building Peace in Mexico: Dilemmas Facing the López Obrador Government. For more background on Mexico, see CRS In Focus IF10578, Mexico: Evolution of the Mérida Initiative, 2007-2020, by Clare Ribando Seelke, and CRS Report R42917, Mexico: Background and U.S. Relations, by Clare Ribando Seelke and Edward Y. Gracia. Many researchers link the rise in crime to the drug war mentioned before.

Data shows that the rise in crime from 2007 until 2019 has been unprecedented. Figure 2.19 shows how the homicide rates are high in many parts of Mexico, but Reynosa has one of the highest. Other data shows that:

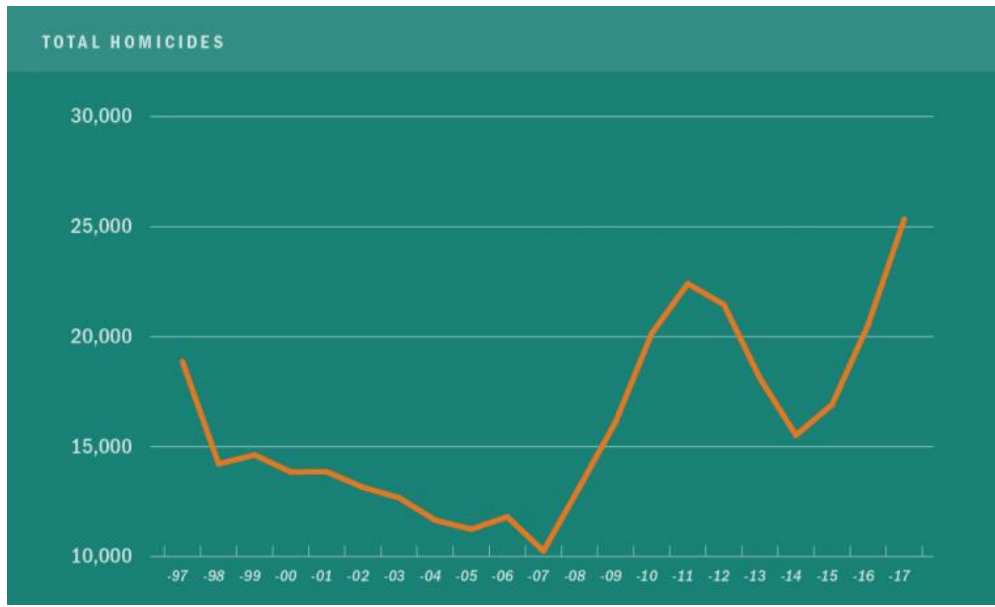
- New records reached in Mexico's intentional homicide rate in 2017 and 2018. (Beittel, 2019)
- More than 17,000 homicides between January and June 2019, setting a record (Mexico's national public security system, Beittel, 2019)
- 40,000 disappeared or missing in Mexico (2019) (Beittel, 2019).
- In 2018 homicides in Mexico rose above 33,000, a national rate of 27 per 100,000 people, increasing 33 percent from 2017 (Beittel, 2019).
- Since 2006, Mexico experienced close to 150,000 murders related to organized crime, 30 percent to 50 percent of total intentional homicides (Beittel, 2019).
- In 2017, Mexico's homicide rate hit a twenty-year high (International Crisis Group, 2018).
- Peña Nieto's administration it ranked consistently high or highest among the country's municipalities in cases of homicide, extortion, kidnapping for ransom, armed robbery, burglary, car theft and cargo theft. (International Crisis Group, 2018).
- Gun battles became more frequent, the murder rate nearly tripled, and people felt less and less safe (Beittel, 2019).
- No one is held to account for at least 95 percent of murders (International Crisis Group, 2018).



**Figure 2.19** 2019 Homicide Rates in Mexico.  
Source: Own graph with reference to data obtained from Diego Valle Jones, 2019.

Organized crime groups have overtaken cities in different manners such as extortion, kidnapping, theft, homicide, drug sales and other illicit activities. An intrinsic quality of drug cartels is violence (Beittel, 2019). In 2019 Mexico welcomed a new president who has pledged to fight corruption, and combat crime including the drug war (Beittel, 2019).

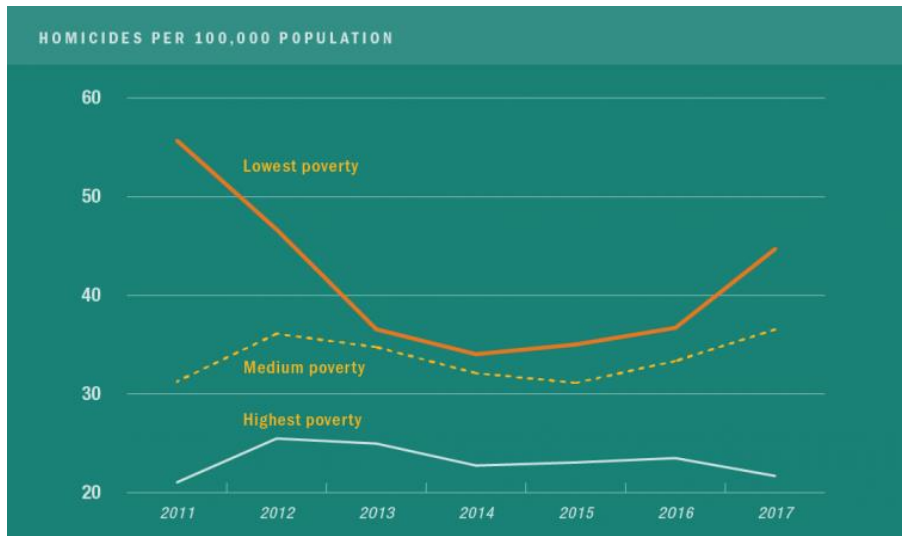
The following graphs (Figure 2.20-Figure 2.23) show the increase and spike in homicides in Mexico in the last years:



**Figure 2.20** Total Homicides in Mexico, by Year ( 1997-2017).  
 Source: Reprinted from “Building Peace in Mexico: Dilemmas Facing the López Obrador Government”, Appendix B, by International Crisis Group, 2018.

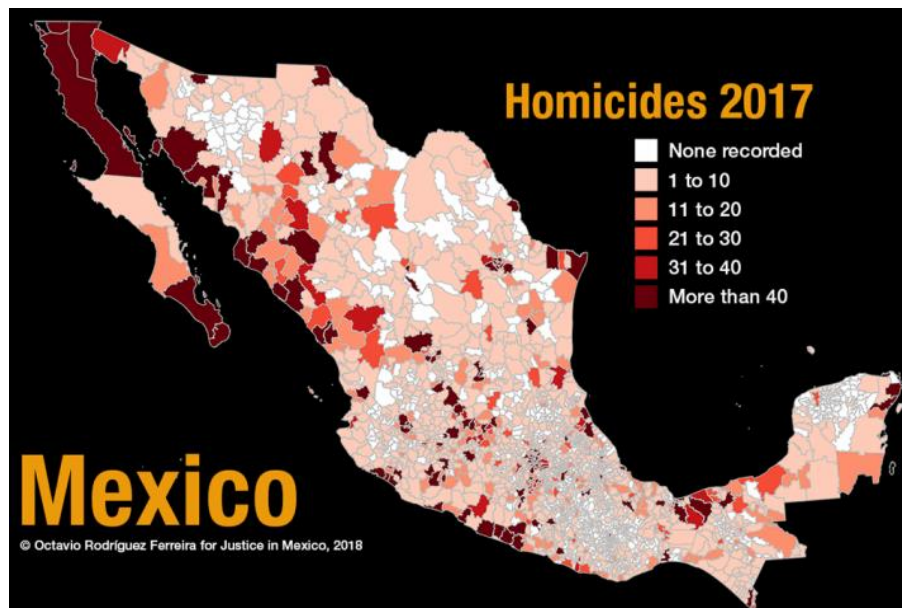


**Figure 2.21** Homicide Rates in Mexico by Year (1997-2017).  
 Source: Reprinted from “Building Peace in Mexico: Dilemmas Facing the López Obrador Government”, Appendix C, by International Crisis Group, 2018.



**Figure 2.22** Average Homicide Rates in Low, Medium and High Poverty Municipalities in Mexico from 2011-2017.

Source: Reprinted from “Building Peace in Mexico: Dilemmas Facing the López Obrador Government”, Appendix D, by International Crisis Group, 2018.



**Figure 2.23** Homicide Rate by Mexican Municipalities in 2017.

Source: Reprinted from “Building Peace in Mexico: Dilemmas Facing the López Obrador Government”, Appendix E, by International Crisis Group, 2018, map generated by Octavio Rodríguez Ferreira.

The U.S. has focused its attention to border towns in recent years. The American government has not only advised the general public to avoid Mexican border towns, such as Reynosa, but has increased their interventions. Increased border militarization and surveillance can be seen in efforts to track down drug cartels residing in Mexican Border towns (Heyman, 1999). The narco- economy in the border is not only out of control but as well violent (Campbell, 2005, 2008, 2009). The violence evolves from drug cartels fighting for market share and territories. Some scholars push for a label of “narco-state” or even a “narco-democracy” (narco is a drug dealer). “Mexico: Narco-Violence and a Failed State?”, by George W. Grayson (2010) suggests that Mexico is on the verge of being considered a failed state, due to the overpowered drug cartels in Mexico. Researchers have concluded that the drug war has an overarching consequence woven in Mexico's overall foundation as a country (Harbers, 2017). This is important for this research as it helps understand at a deeper level the implications of living in the Mexican-American Border such as the city for this study, Reynosa (Harbers, 2017). Some researchers have become more pessimistic as they study this topic, as they believe it is almost impossible to stop the drug war, particularly the drug cartels (Grayson, 2010). This research itself acknowledges this is part of an ongoing debate and new topics arise constantly while this is written and will continue as this is published.

#### ***2.4.1 Atmospheric Fear***

Due to the ongoing drug-war, fear has spread across the city of Reynosa. Newspaper covers as the one seen in Figure 2.24, were common and helped spread the fear of the drug war happening in Reynosa. When the crime began to escalate many started to hide and remain at

home. As time progressed citizens realized that they must continue life. They returned to their daily routines but an “atmospheric fear” invaded the city (Luna, 2018).



**Figure 2.24** Newspaper Covers of the “El Manana” de Reynosa 2015 “Reynosa under Fire” (left), “Now there is 30 killed” (2017) right. Showing the crime condition in Mexico with the drug cartels.

Source. Reprinted from “El Manana” Newspaper. <https://www.elmanana.com/>

An atmospheric fear occurs when a city is invaded by rumors, stories, news and constant fear inducing events, thus terrorizing the city or creating an atmosphere of fear. Citizens realized that their lives were not safe and that meddling with a cartel could be life threatening. Sarah Luna in her research interviewed a couple of Reynosa residents and they described this fear by sharing stories as this:

*Eva told us a story about two “little old women” shopping at a market in downtown Reynosa. While one woman loudly recounted a rumor about narcos, the other remained quiet and looked nervous. The loud woman was later found dead, with a severed finger in her mouth. A note was attached to the corpse: “Keep quiet if you don’t have anything to say.” Our eyes widened, we breathed deeply, and we looked at one another in silence.*

*Affective Atmospheres of Terror on the Mexico-U.S. Border: Rumors of Violence in Reynosa's Prostitution Zone, 2018, Cultural Anthropology 33: 58-84.*

In her research Sarah Luna argues that living in a constant state of fear such as the residents of Reynosa are experiencing is a “contagious performativity that conditions affective responses and inculcates both fear and intimacy” affecting the residents heart rate, a state of hyper awareness and possibly shortness of breath (Luna, 2018). This atmosphere fear creates vulnerability in the residents and visitors of Reynosa. Residents as mentioned before changed many of their habits, thus their spatial practices take a change (Luna, 2018). The atmospheric fear can be attributed to four factors: threats, spread of fear, narco/propaganda and narco stories or rumors (Luna, 2018). What is important to understand from this is that fear changes the way people experience their context, creates vulnerability, and affect spatial mobility. Residents in Reynosa began to move differently through the city, business began to close, and migrants moved away. Spatial topography of fear became evident as people avoided areas, and even took different routes home. Some even felt fearful of living far away from the city (as more crime organized in those areas), thus leading to home abandonment.



Reynosa is one of the main sites for the northbound smuggling of drugs and weapons. Although Reynosa, as any city, was not free from crime and fear, Reynosa residents did see an increase in homicide rates and crime in their city since the soldiers and federal police came into Reynosa in December 2007, following the instruction of the previously mentioned President Felipe Calderon. Like Reynosa, the crime rate increased in other parts of the country (Luna, 2018). Sara Luna's study was an ethnographic approach as this one is and she states "these findings offer further evidence for the value of an ethnographic approach to understanding the dynamics in hostile situations like drug-war zones, where freedom of the press is compromised and survey data or brief interviews would not yield the textured data and analytic richness of long-term research" (2018). Which is why the ethnographic study method was chosen for this study and will add its own value in the architecture perspective.

This research will focus on the abandonment housing in Reynosa Mexico and its factors, which is important to address one of them Crime and fear. Yet this study acknowledges this is not the only variable, but others do exist, and possibly some unknown or unaccounted factors will not be mentioned.

## **2.5 Literature Review Conclusion**

The abandoned housing situation is a worldwide dilemma. Numerous researchers, projects, studies and government interventions have addressed this and attempted to understand the problem. This research will rely on the body of literature, and policies regarding abandoned housing. This literature review begins broad (worldwide) and ends more specific (Reynosa). To understand the problem of abandoned housing, one must understand the problem of housing first. Through other researchers we can see that the current problem of abandoned housing was

attributed to many factors, but one stands out specifically in Mexico: the PND initiative. The PND's attempt to provide housing, many believe ended up failing and creating more problems than aid. This initiative also explains: (1) **The Need:** many Mexican residents without homes (2) **The Response:** provide more credits, provide credits mostly to anyone, build more homes in an urban unplanned manner (3) **Consequence:** oversupply of housing met with economic problems that resulted in mass abandoning. Currently "the need" still exists as many residents in Reynosa are homeless or working towards purchasing a home. The "response" was improperly construed and had negative effects, with its biggest reasons to "failing" being the oversupply of housing, the unfinished resources needed to live in the community, the quality of the construction and the periphery placement of the houses. The "consequence" is what this study and many others have addressed: the abandoned housing. The paradox and the questions begin to arise, such as: what could have been done differently? Why do they keep building new homes rather than readapting the existing abandoned? What will they do differently as time progresses? What will happen to all the abandoned housing? There is a lot of information and studies on abandoned housing, and perhaps some of these questions are already answered or in process of being answered. Despite all the studies this literature review addresses, no ethnographic study has been done like this thesis. Other ethnographic studies have been done, in a social sense, but not in an architectural perspective, giving value to this research and allowing this research to contribute to the growing body of literature regarding abandoned housing.

## 3. METHODOLOGY

### 3.1 Methodological Approach

The purpose of this chapter is to introduce the research methodology. This thesis uses a mixed method approach. The research strategies of a case study, an interactive and interpretive auto-ethnographic approach and photo-elicitation were undertaken with the intent to demonstrate and understand the abandoned housing condition in Reynosa, Mexico. In order to understand and examine the abandoned housing situation in Reynosa, Mexico, a case study method was chosen. This method has enabled me to understand the situation and the architecture of the city through multiple sources of evidence. The research gives feedback to architects designing future housing; making them aware of inhabitants' experiences, spatial factors and living conditions. The thesis aims to help housing policies make appropriate adjustments. Thus, this study has consequences for architectural education, professional practice, urban planners and policy makers. The research plan, including the methodology, secondary government and private entities' data, the process of choosing data, and photography field-work, are also primary components of this chapter.

**Case Study:** Investigates a phenomenon or setting which suggest what data must be collected and what criteria should be used for analyzing it. Understand the cause and effect or the “what and why” (what: abandoned housing in Mexico, why: 3 variables chosen and explained later).

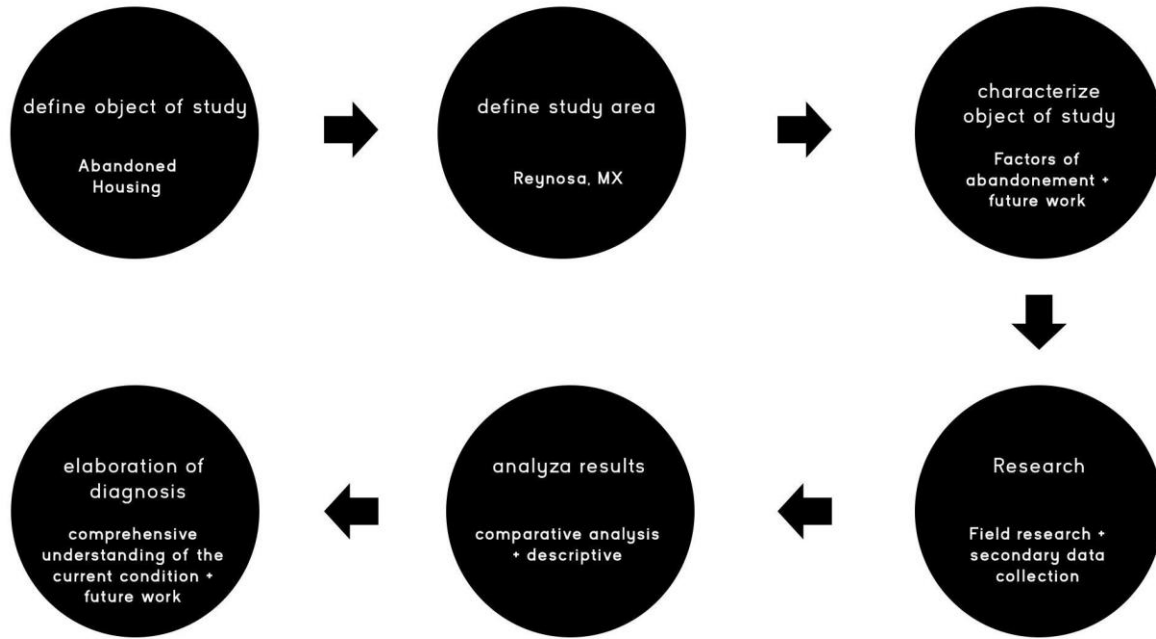
**Auto-ethnographic:** Describes the social, behavioral and material expressions of culture, including architecture in a personal interpretative and interactive manner.

**Photo-elicitation:** Uses photographs used to present to the reader and elicit inhabitants' points of view in their housing conditions.

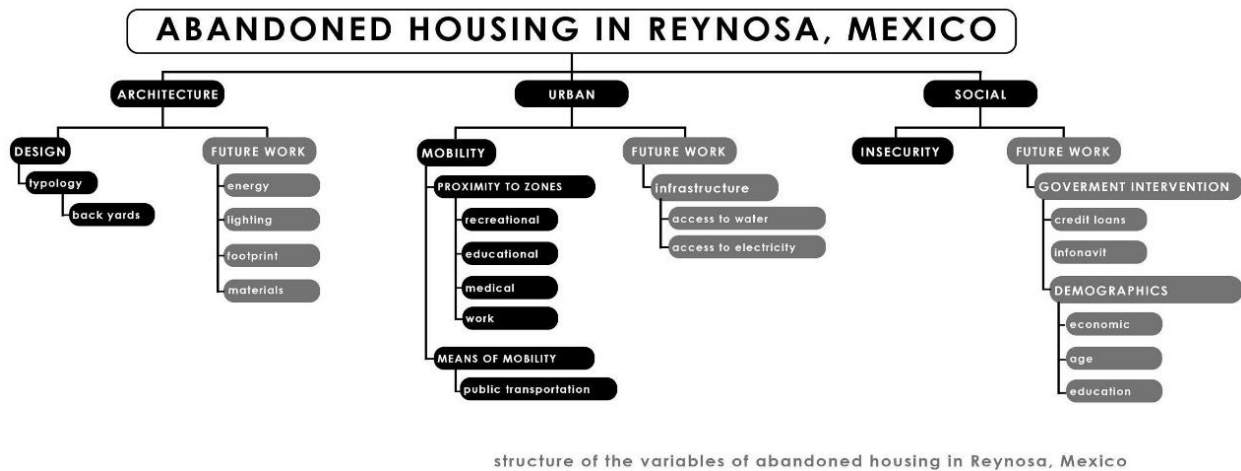
### ***3.1.1 Research Focus***

This research explores the conditions of sub-municipalities areas with the greatest amount of abandoned housing within the municipality of Reynosa. Reynosa, Mexico was the focus of this study. Figure 3.1 explains the process this study underwent in order to reach a concise and reasonable understanding of the abandonment in Reynosa. Several variables were tested as indicators that capture aspects of housing. Figure 3.2 is a graph of the variables that will be studied, further own each variable will be addressed (the figure also shows some variables to studied in the future). The aim of this research is to understand the factors leading and the present factors contributing to the grand abandonment of social housing in Reynosa, Mexico, which led to the following research focuses:

1. Describing factors regarding the abandoned social housing in Reynosa, Mexico
2. Exploratory observations of the city, its housing typology and the abandoned housing in the city that could be used to build a future research study.



**Figure 3.1** Case Study Methodology Map.  
Source: Own iteration based on Tedesco & Yahashita, 2008.



**Figure 3.2** Own structure of the variables of abandoned housing in Reynosa, Mexico, 2019.

### 3.1.2 Variables

The first variable addresses typology. Figure 3.3 shows the consolidated information of the variable, including its intended spatial coverage and time range, as well as the main sources used to retrieve this information. The purpose of this variable was to create a starting point or point of reference for the discussion, setting the location and limiting the number of houses and zones. This variable will also start introducing the specific zones, their demographics and their social urban context. It is simply setting the foundation for the variables to follow. The floor plans were limited. Reynosa's INFONAVIT office refused to give more information than their existing online resources. I contacted other INFONAVIT offices, but once again directed me to the website. A report was requested through the website but is still pending. Communication with local construction companies provided help with secondary resources. Here is where the autoethnographic interactive and interpretive method became of value, as access to housing was granted by family, friends and people associated with them. Their granted access allowed me to enter and photograph abandoned and inhabited houses in the zones chosen for the study.

1A. Built Environment: TYPOLOGY	
Defined	Various floor plans will be analyzed with a focus on layout, spatial distribution, access to private backyard and compared to others from other zones in Reynosa and eventually other cities
Source	INFONAVIT, RUV, own photographs through field work
Spatial Coverage	3 Specific zones in U1, U2, U3,
Time	Existing houses, primarily built 2001-2019

**Figure 3.3** Variable 1A. Built Environment: Typology.

The second variable focuses on mobility and Figure 3.4 shows the descriptions of the variable. The purpose of this variable was to understand one of the most common contributors in abandonment according to the literature review. The indicator will help measure the relationship between agglomeration of abandoned homes and the distance to work, schools and medical centers. According to studies of residential mobility, remoteness to work is one of the main reasons for the change of residence within a city. Reynosa, being a medium sized municipal city of less than 600 thousand inhabitants, has one major center area for jobs and recreational activities. Maquiladoras are dispersed and do provide jobs to many, but for this study I will focus on the Key Centers (schools, medical, work) as given relevance and importance by the research document “Atlas of Abandonment” by INFONAVIT (2015).

2A. Urban: MOBILITY	
Defined	It is the average distances between each zone of agglomerated abandoned homes and the metropolitan employment centers detected in a city and other centers
Source	Georeferences of the national statistical office of economic entities (DENUE), AGEB codes as reference and GOOGLE Maps
Spatial Coverage	the 4 Specific zones and their distance to school, medical, work
Time	Existing distance according to google maps 2019

**Figure 3.4** Variable 2A. Urban: Mobility.

The final variable is insecurity, seen in Figure 3.5. The purpose of this variable was to understand the confidence of the population in public safety at a certain time. Researchers believe if the population perceives insecurity in their environment or where they live, it is likely it will lead to their decision to leave their residence. The homicide rates will shed light of a city-wide problem. Homicides are usually higher where organized crimes organizations abide, which is the case of Reynosa with the drug cartels.

### 3A. Social: INSECURITY

Defined	1. Opinion and perceptions of people 18 and over who are members of Mexican households in regards to security or insecurity and short-term expectations. 2. Indicates the number of deaths due to intentional homicide at the municipal level per 100,000 inhabitants
Source	1. Secondary Data Interview, INEGI 2002-20019 2. Encuesta Nacional de Seguridad Pública Urbana (ENSU) Encuesta Continua sobre la Percepción de la Seguridad Pública (ECOSEP)
Spatial Coverage	Reynosa as a whole
Time	2012-2019

**Figure 3.5** Variable 3A. Social: Insecurity.



### *3.1.3 Case Study Methodology*

This research is based on an empirical exploratory research on a current phenomenon. Multiple sources were used as evidence. I was able to take a step back and look at the totality of the event and develop the research by obtaining and analyzing data. The case study methodology introduced me to the question “why” and “how” is abandonment a big phenomenon in Reynosa. Case study methodology allowed me to investigate the contextual realities of the current situation. I focused on a specific area or zone: the municipal area of Reynosa, making the research more specific, rather than a broad attempt of all abandoned housing in the country of Mexico. Through a case study methodology and an interactive and interpretive auto-ethnographic approach I was able to better understand the complex real-life context, activities, environment and lives of residents. This research did not use surveys as part of the research design as the intent is not generalization (quantitative methods might provide more generalization elements). A limited number of surveys could fail to provide the best basis for data generalization or a statistical approach. Despite this, secondary interviews will help to provide some insight, and my auto-ethnographic interactive and interpretive approach will provide an insider’s perspective as access was granted to places perhaps unavailable to other or outsiders. As no interviews or surveys were done, this research mainly aims at providing a deeper look at a city with a great number of abandoned housing, synthesizing existing data which will set a foundation for future research I will be conducting.

The Literature Review process discovered that there are some models that attempt to estimate or predict the effects of the abandoned housing using several variables. An example done in 2017 by Ricardo Martinez Campos (to see his findings go to his thesis “Housing

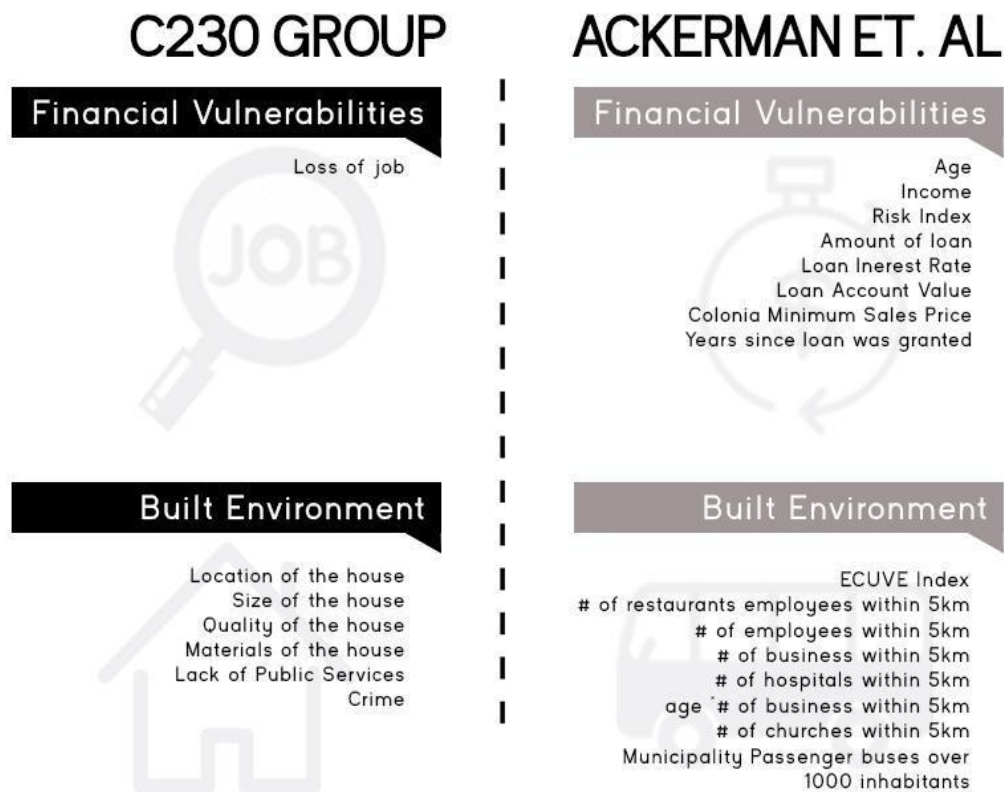
abandonment in Mexican metropolitan areas...”) presents a model with abandonment, housing built conditions, demographics, credit holders individuals characteristics and error terms variables ( $abandonment = f(Housing\ and\ Built\ Environment\ Conditions, Demographics, Credit\ holder's\ Individual\ Characteristics) + error\ term$ ).

Campos also addresses literature reviews, with the attempt to predict the probability of abandonment using social, financial and built environment conditions in Mexico (Campos, 2017). Ackerman, mentioned previously, has developed a model to predict the likelihood of home abandonment based on loan, personal and location characteristics (Ackermann, et al. 2015), which according to Campos improves the model (Campos, 2017). Regardless, all these models have limitations based on data reliability or accessibility and scalability. For future research some of these models might be implemented or a new model might be used that accommodates scalability and data limitations. To explain the effects of abandonment, I chose the various variables mentioned before in this chapter (Figure 3.3, Figure 3.4, and Figure 3.5) that estimates the effect of different household-level variables in the decision of abandoning a house.

### **3.2 Research Design**

Data was extremely important for this type of research. Multiple sources were combined which include three components: 1. Literature Review: a growing body of knowledge exists on abandoned housing and Mexican housing; 2. governmental/ private data: census data (INEGI), crime data (INEGI), housing data (RUV, INFONAVIT, SEDESOL, CONAVOL), marginalized zones (AGEB, INEGI) agglomerated zones of abandoned housing (INFONAVIT, SEDESOL,

RUV) and typologies (floor plans, images, renderings, or 3-models) ;and 3. collected data: measuring mobility, distance and length of time from the community to several zones using Google Maps and other maps for reference. Ackerman in 2015 used two documents that I will use as well to help formulate my variables of what accounts for abandonment in Mexican cities at a national level, one document being C230 Group and the second being one done by Ackerman. Figure 3.6 shows the top predictors in these two studies, focusing on the Location of the House, the Size of the House, and Crime found in the C230 group document.



**Figure 3.6** Top predictors of Abandonment in Mexican Cities.  
 Source: Own iteration based on diagram made by Ricardo Campos in ““Housing abandonment in Mexican metropolitan areas...” 2017.

### ***3.2.1 Crime Data***

A preliminary set of data from INFONAVIT (Atlas del Abandono, 2015) showed the highest rates of home abandonment and the INEGI showed highest rates of crimes in specific periods (2002-2019). A database on crime during these periods was highlighted and summarized in graphs and tables that facilitate the observations of consistencies and validation of the variable.

### ***3.2.2 Interactive and Interpretative autoethnographic approach and photo-elicitation***

Informal interviews autoethnographies with residents and experts were conducted but not recorded as this was not the focus of the study. Two pilot field visits were carried out in which the relevance, flexibility and usefulness of the information collection tools were tested such as photography ease and accessibility to the “colonias” or neighborhoods. These visits provided important lessons learned not only to better the tools, but also to execute field trips more efficiently to document and analyze the various zones.

### ***3.2.3 The Researcher***

I, as the researcher hold a bachelors in University Studies in Architecture and continued to a master’s in architecture until eventually transferring to a Master of Science in Architecture. Living in the areas chosen for the study, an advantage is gained, (accessibility in the Spanish language, which is Mexico’s primary language, and ease of entrance exists). Some might argue that this would create bias, but the information provided will be secondary data and primary data

obtained will be quantitative not allowing for bias. Rather than a bias, having the ability to speak Spanish, having family in the area, and knowing the area, allows for an autoethnographic interpretative and interactive approach. This will bring a different perspective to the study. This allowed me to take photographs that will be seen throughout the research.

### ***3.2.4 Study Zones***

The abandoned housing zones have been selected in accordance with the following criteria (note: these communities are in different PCU zones, which will be stated in the research):

i. Housing in the periphery, usually lacking basic living infrastructure as it helps to understand where a high percentage of the abandoned housing exists.

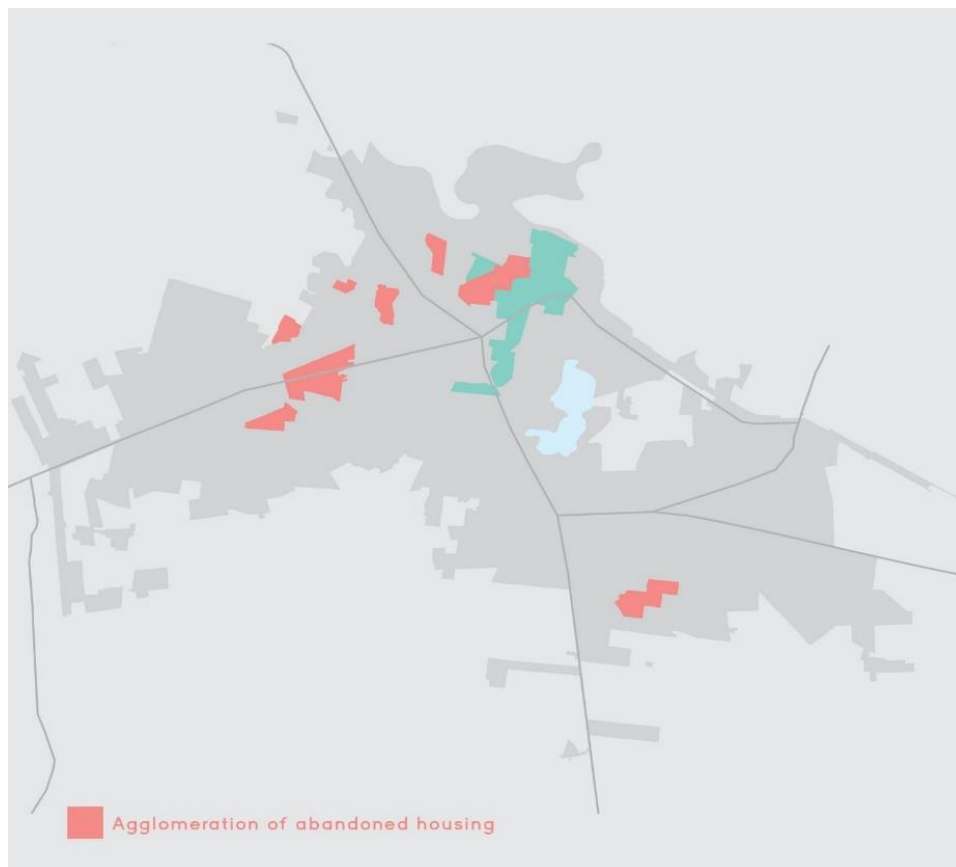
ii. Housing near the maquiladoras or factories, as it helps understand the social housing and the Maquiladora centered city of Reynosa, Mexico.

iii. INFONAVIT communities, as this study will focus on INFONAVIT houses. Several communities which vary in socio-economic and insecurity levels.

One key document was used: The Atlas del Abandono “Atlas of Abandonment” by INFONAVIT in 2015. The “Atlas del Abandono” designates the abandonment zones in Mexico. In this document INFONAVIT examines the habitability conditions of the municipalities and metropolitan areas where the greatest amount of abandoned housing is presented in Mexico. Several variables were tested by INFONAVIT and led to selection of the Agglomerations of abandoned housing seen in Figure 3.7, which will be used for this study. Each zone was given an AGEB (Area Geoestadística Básica or Basic Geostatistical Area) code. The AGEB codes are

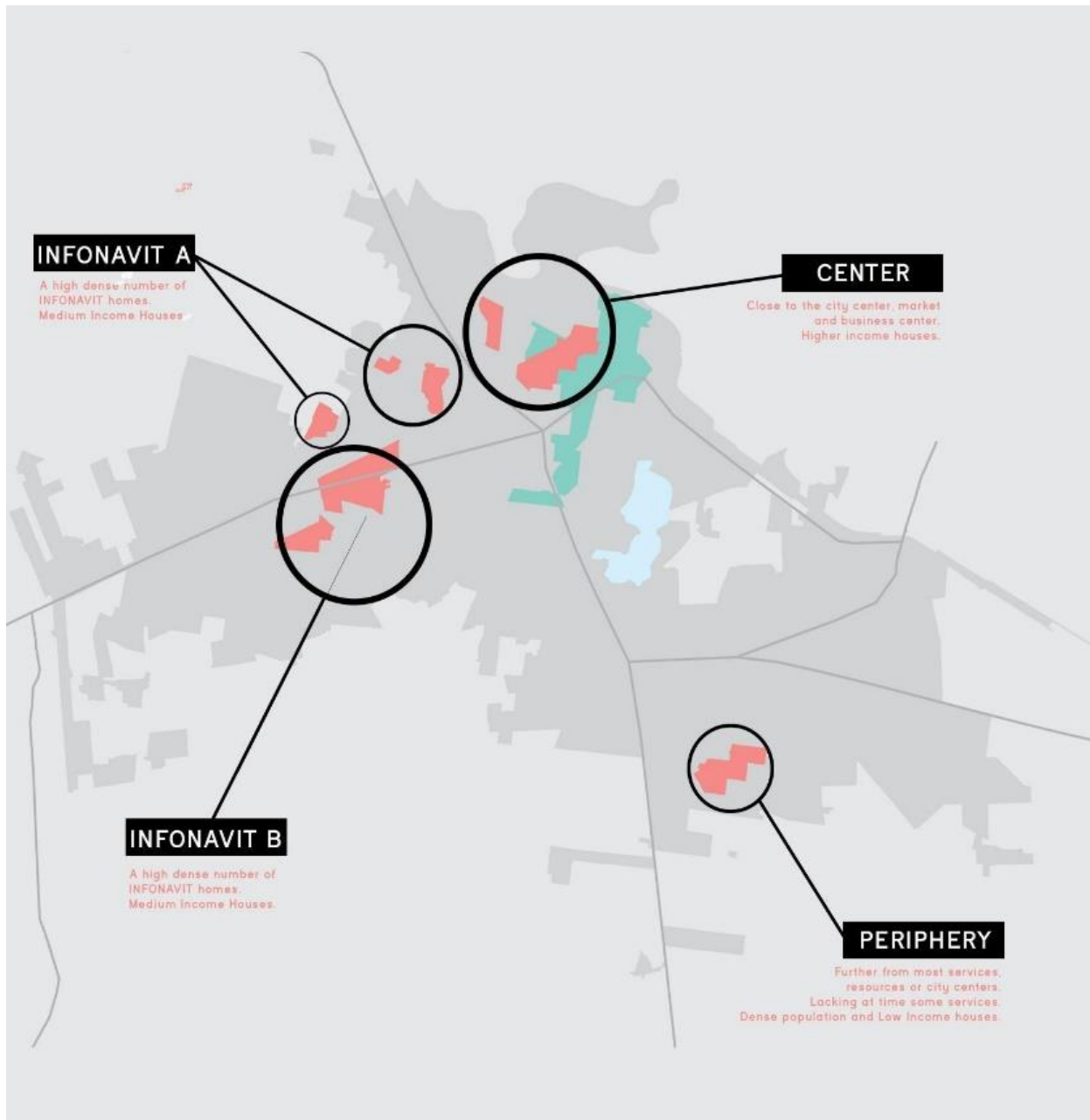
created by the Mexican Government (INEGI) and given to a corresponding part of an urban or rural zone. It is used for statistical and census geo-referencing purpose.

The first step was choosing the highlighted areas of agglomerated abandoned housing shown in Figure 3.7 given by INFONAVIT. Second, I used the criteria mentioned before to help select the four zones leading to: Center, INFONAVIT A, INFONAVIT B, and Periphery seen in Figure 3.8.



**Figure 3.7** Step 1: Locating the Agglomerated abandoned housing according to the AGEB of INFONAVIT.

Source: Reprinted from the “Atlas de Abandono” by INFONAVIT, 2015.



**Figure 3.8** Step 2: Selecting the Four Zones and naming them.  
Source: Own iteration based on the diagram found in “Atlas de Abandono” by INFONAVIT, 2015.

CENTER: Close to the city center, market and business center. Higher income houses.

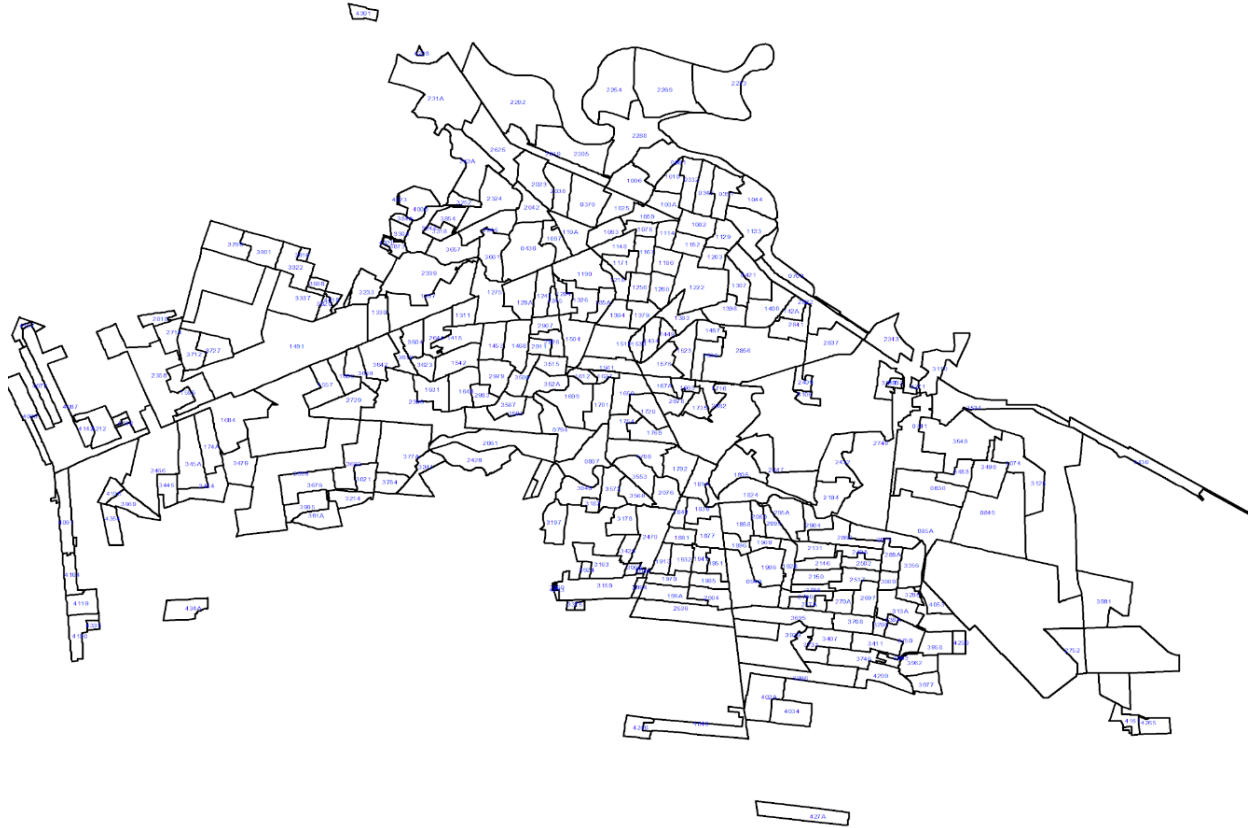
INFONAVIT A: A high dense number of INFONAVIT homes. Medium income houses.

INFONAVIT B: A high dense number of INFONAVIT homes. Medium income houses.

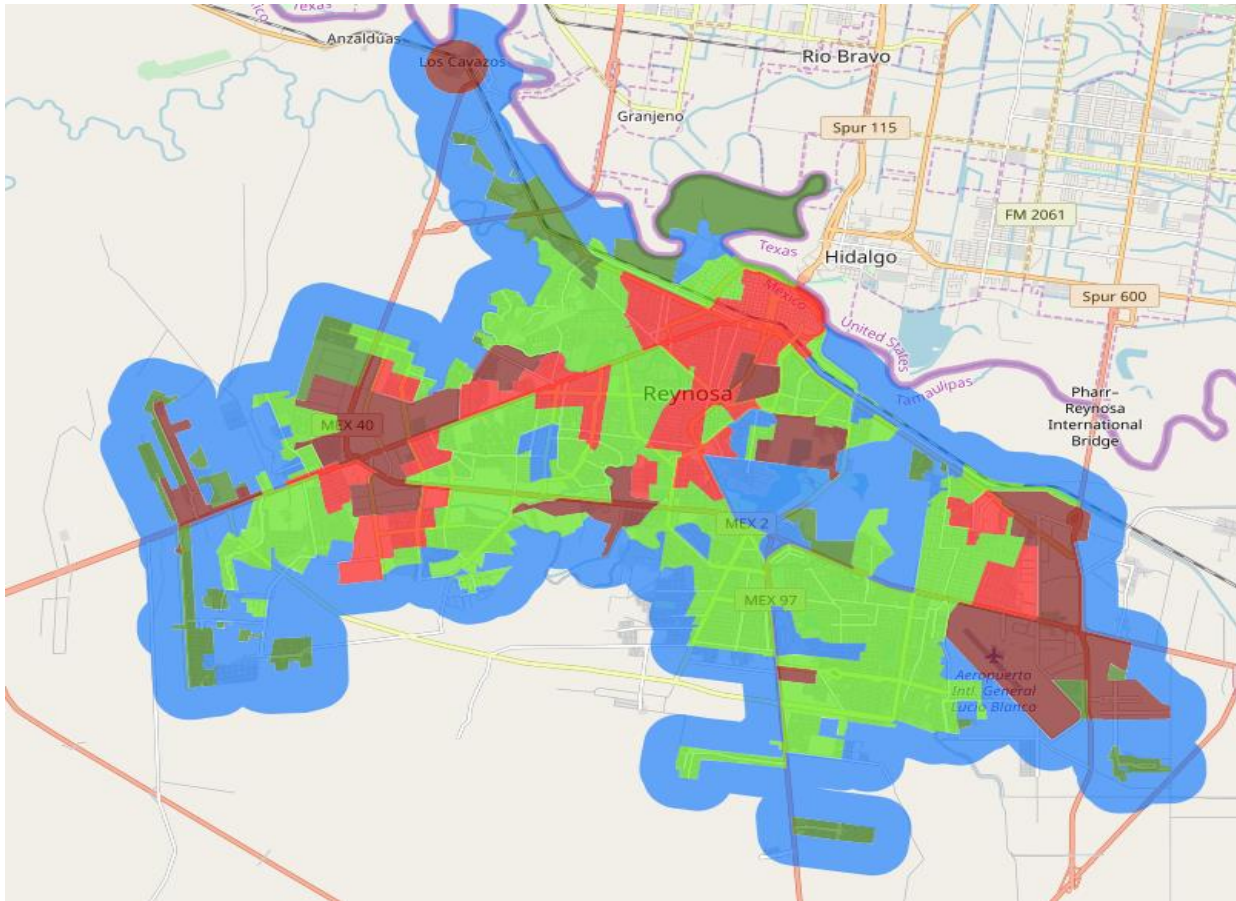
PERIPHERY: Further from most services, resources or city centers. Lacking at time some services. Dense population and Low-Income houses.

Third, the zones were placed on top of the Map of Reynosa showing the AGEB's Code to find out the specific names and AGEB codes given (Figure 3.9 and Figure 3.10). Each zone had various sub zones which were created by combining the information of the Atlas del Abandono and the Geostatistical Data of the municipalities. The AGEB is a Geostatistical Framework, designed by INEGI to reference the statistical information generated by the different census projects or surveys, with appropriate geographic locations (Rules of Operation of the Access Program Financing for Housing Solutions for the fiscal year 2018, March 7, 2018). Like census blocks which reference census projects. In these areas there are two types: Urban and Rural. This study just focused on Urban.





**Figure 3.9** Step 3: Identifying the AGEB's Code of the agglomerated zones.  
Source: Reprinted from CONEVAL estimates using the census of population and housing 2010



**Figure 3.10** Step 4: Identifying the Urban Containment Perimeters zones.  
 Source: Reprinted from RUV, estimates using the census of population and housing 2015

The chosen zones are territorial extension that corresponds to the subdivision of the geostatistical areas. These locations represent any place occupied with one or more homes, which may or may not be inhabited; this place is recognized by a name given by law or custom. Urban localities are those that have a population greater than or equal to 2,500 inhabitants or that are municipal headings regardless of the number of inhabitants according to the II Count of Population and Housing 2005. Each urban or rural locality is coded with a four-digit code that is assigned ascendingly by municipality from 0001 to cover the total locations of each of the

municipalities that make up the country, usually code 0001 corresponds to the municipal head.

Figure 3.11 shows the codes found on INEGI for each of the zones selected and their population.

These codes were used throughout the study to represent and label the zones used.

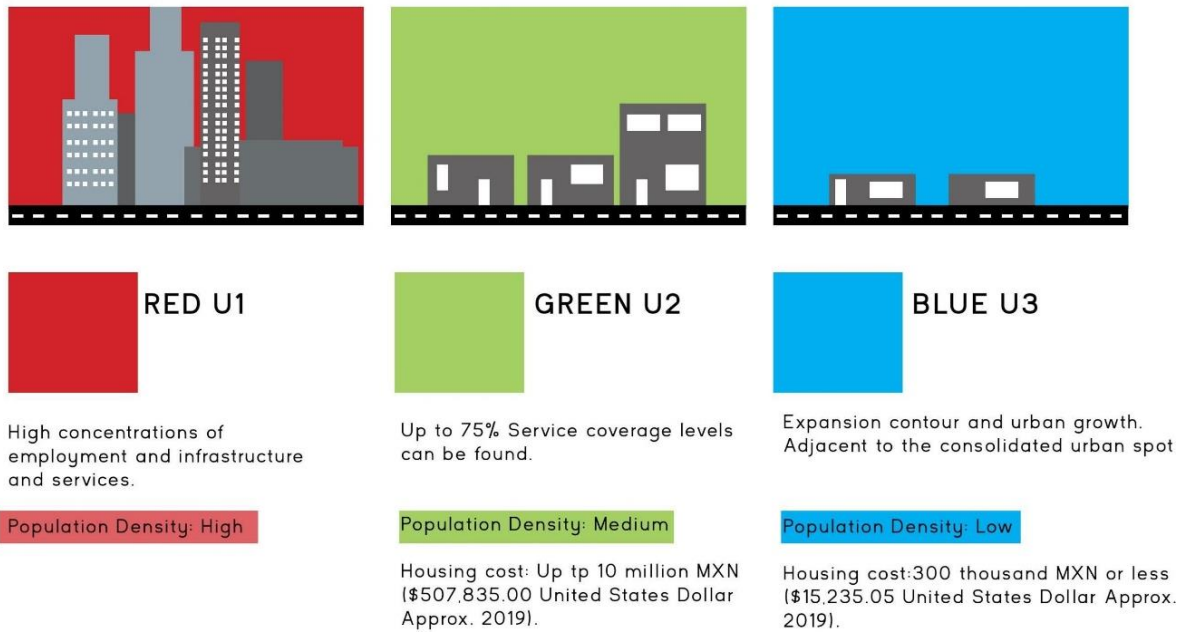
AGEB given Code	Total Population
103A	1694
1059	807
1063	923
1078	779
1148	1027
2038	1495
2644	2827
2729	4122
3233	6287
3318	1775
3407	4338
3604	2233
3619	2534
3623	2681
3642	3046
3661	3973
3708	3800
3731	3234

**Figure 3.11** AGEB's Code Found representing the zones selected for this study.

Source: Own Iteration based on data from INEGI, 2015.

Finally, the zones' data was overlaid over the PCU (Perímetros de Contención or Urban Containment Perimeters in English). The PCU were created by INFONAVIT. The PCU's are a Federal Government tool to guide the housing subsidies aiding them to better place their home,

ideally closer to employment and urban services in cities. There are three categories U1, U2, U3 (Figure 3.12). The U1 location contains the sources of employment as a basic element to consolidate cities. Figure 3.12 explains with more detail the different PCU categories.

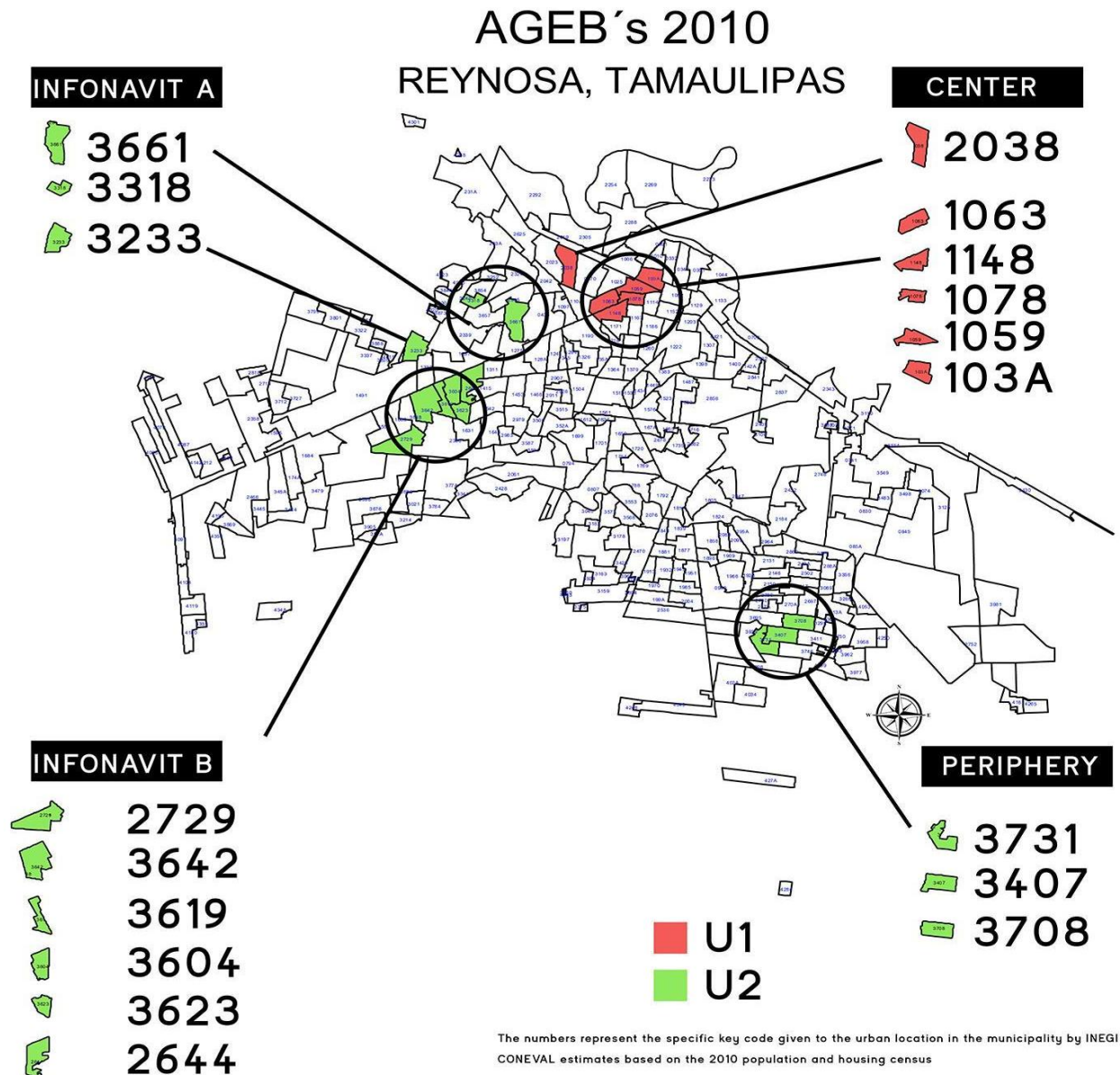


FC: housing located outside the urban containment perimeter  
 ND: homes whose location does not match the captured data

Own iteration based on figure created by hacerciudad.mx data obtained from the single housing registry, March 2017

**Figure 3.12** PCU diagram showing the different zones and their meaning.  
 Source: Own iteration based on figure created by hacerciudad.mx in the article "Establecen Límites Urbanos Para Subsidios De Viviendas".

Finally, As the zones were overlaid to the PCU map, the PCU determined in which zone each AGEB would fall. Figure 3.123 shows the PCU color association, names and association to the zones. The zones happen to land on the PCU categories of U1 and U2. For this research U3 will be omitted.



**Figure 3.13** Final Image: Shows all the iterations 1. showing the zones 2.the AGEB codes, 3. the PCU category and location in relation to Reynosa as a whole.

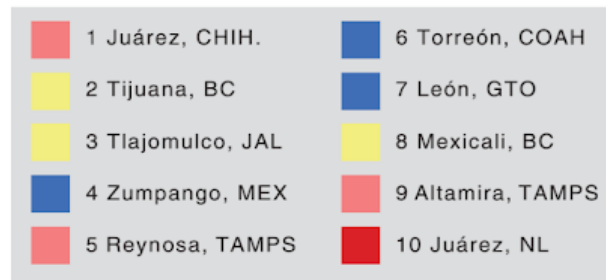
Source: Own iteration based on data from INEGI 2015, INFONAVIT 2015, RUV 2015.

## Data Collection

This study used primary data to understand the mobility and the distance from the zones selected to, educational, medical, work centers. A table was created to document his data. The data will be added in the appendix section (Appendix A).

### 3.2.5 Data Analysis

The analysis of the data consisted of using the data presented and comparing it to other Mexican cities. Two more cities were chosen. The two other cities were taken again from the Atlas del Abandono, as they present the top ten municipalities with the most abandonment see Figure 3.14.



**Figure 3.14** Top 10 cities with highest number of abandoned housing in Mexico.  
Source: Reprinted from “Atlas del Abandono” by INFONAVIT, 2015.

Given this data these cities were selected: Juarez Chihuahua being the highest and Juarez Nuevo Leon being the lowest. The three factors were compared (Built Environment, Urban, Social). I compared the housing typology style, the mobility from the abandoned agglomerated zones to specific centers and the crime index. The comparison allows the variations between the

three of the top ten cities with home abandonment to be analyzed. The comparison will highlight the differences found in Reynosa and show if it is above or below average.

### ***3.2.6 Trustworthiness***

As mentioned previously, there is a level of personal connection to the city being researched. I had the opportunity to live there, I still have family there and know the area. To assure for no bias I used comparative analysis and this analysis aims to focus on the connections between the analysis and data. The data saturation provided in the methods and in the Literature, Review also provided an unbiased study. This research primarily builds on the existing body of knowledge rather than providing new theories. New theories will be done in the doctorate level.

I ensured ethics remained a top priority throughout the study. There were limitations in the study, the major being: safety and data access limitations. Some areas according to residents were not safe to walk freely and photograph. Data on abandoned housing and crime is an estimate as an exact number was not available, but I did use the data given by governmental research and INFONAVIT.

### **3.3 Methodology Conclusion**

The focus of this chapter was to describe the research methods used to explore the research questions. A discussion of the collection of data, zones chosen and why, and the variables used. A mixed method approach was used. The research strategies of a case study, an interactive and interpretive autoethnographic approach and photo-elicitation, was undertaken with the intent to demonstrate and understand the abandoned housing condition in Reynosa, Mexico. The next chapter will provide the results and the analysis of the methodology used.

## 4. FINDINGS AND ANALYSIS

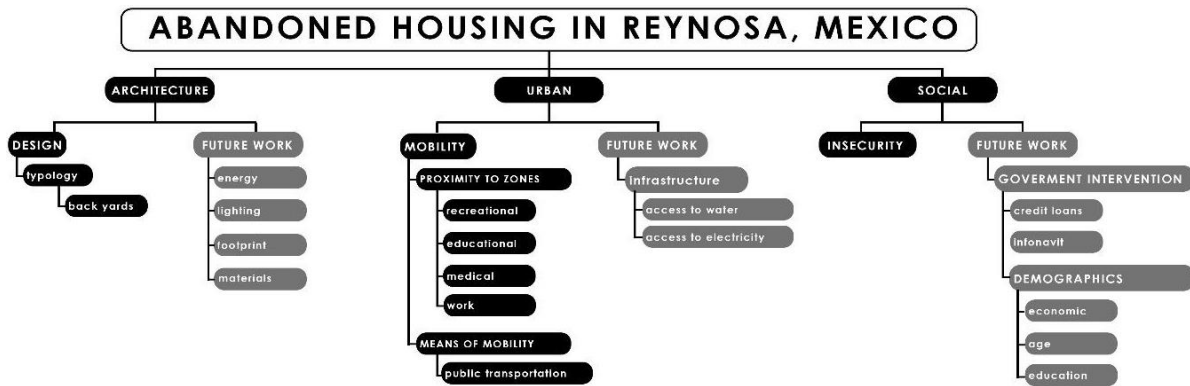
### 4.1 Introduction

This chapter contains the results of the mixed methods methodology study conducted to understand the issue of abandoned housing in the city of Reynosa, Mexico. The research as stated previously focuses on:

1. Describing factors regarding the abandoned social housing in Reynosa, Mexico
2. Exploratory observations of the city, its housing typology and the abandoned housing in the city that could be used to build a future research study.

This chapter will describe the three variables I will be using. Figure 4.1 shows the variables once again. The three variables will be (1) Architecture: Typology (2) Urban: Mobility (3) Social: Insecurity. When addressing Architecture: Typology, we will briefly address the spatial attributes. This chapter will include the analysis conducted of the findings. Additionally, this chapter includes sample zones, uses tables, own 3d models and photographs to present the findings.





structure of the variables of abandoned housing in Reynosa, Mexico

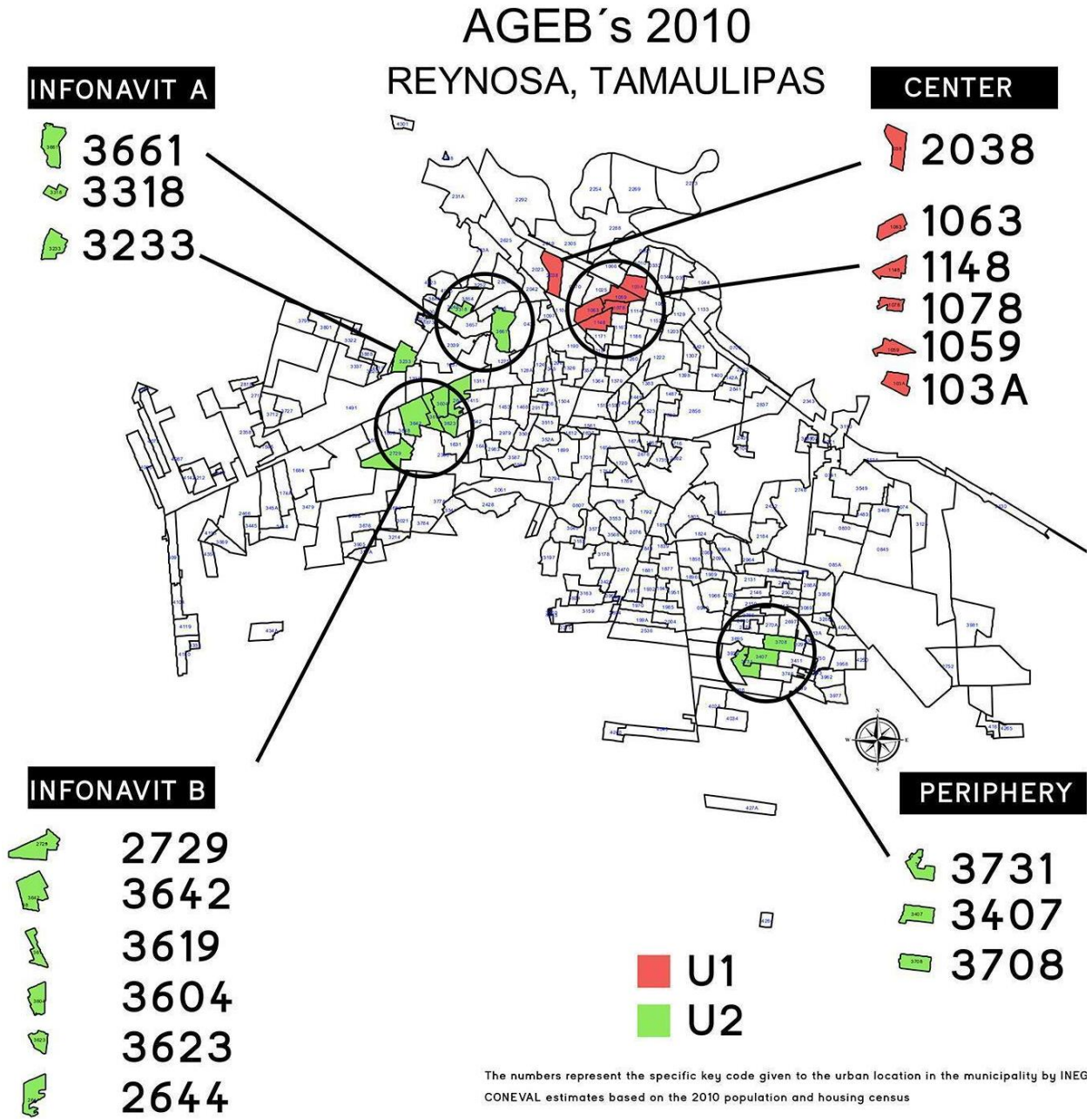
**Figure 4.1** Own structure of the variables of abandoned housing in Reynosa, Mexico, 2019.

Four zones were selected: Centro, INFONAVIT A, INFONAVIT B and Periphery. INFONAVIT A and Periphery Zones, had three communities represented within and INFONAVIT B and Center had six communities represented, thus a total of eighteen communities were chosen for this study. As mentioned before the zones in Reynosa were chosen following the study done by INFONAVIT in the report “Atlas del Abandono, 2015”. The report highlighted these zones as the zones with the highest index of agglomerated abandoned housing.

Table 4.1 details the four zones and the eighteen communities, Figure 4.2 shows similar information laid out over a map of Reynosa and Figure 4.3 again shows the 4 zones and their communities but presenting some pictures of the communities to start representing the typologies.

AGEB given Code	Communities	Total Population	Inhabited homes
<b>Infonavit A</b>			
3233	La Cima	6287	1696
3661	Las Arboledas	3973	1034
3318	Hacienda las Fuentes Sector III	1775	484
<b>Infonavit B</b>			
2644	Lomas del Real Jarachinas	2827	710
2729	Las Cumbres	4122	1011
3642	Rosalinda Guerrero	3046	750
3604	Jardines Coloniales	2233	596
3619	Valle Del Bravo	2534	621
3623	Residencial San José	2681	677
<b>Periphery</b>			
3708	Balcones de Alcalá	3800	1008
3731	Río Grande	3234	930
3407	Los Almendros	4338	1161
<b>Center</b>			
1063	Col del Valle	923	299
1059	Ayuntamiento	807	249
1148	Simón Rodríguez	1027	314
103A	Ferrocarril Zona Centro	1694	455
1078	Longoria	779	244
2038	Arboledas Ribereña	1495	387

**Table 4.1** AGEB's Code Given to the zones selected for this study.  
Source: Codes and names of cities obtained from INEGI, 2015.



**Figure 4.2** Final Image: Shows all the iterations 1. showing the zones 2.the AGEB codes, 3. the PCU category and location in relation to Reynosa as a whole.  
 Source: Own iteration based on data from INEGI 2015, INFONAVIT 2015, RUV 2015.

# INFONAVIT A PERIPHERY



# INFONAVIT B CENTER



**Figure 4.3** The Four zones with photographs of the typologies. (the same images but enlarged are found in the pages to follow).  
Source: Own elaboration, photographs obtained from Google maps (2019).

The eighteen zones were visited and photographed. Some images were taken for this study, some were obtained from google map view (2009) just as this facilitated the movement through the city and not risk any security problems for photographing some areas. Safety

precautions were in place, and various zones limited the number of photographs or ability to roam the city. After viewing the Google generated image, areas were visited to compare if the houses were still standing. The google map view and aerial view also provided a better understanding of the spatial aspects of the houses. Combining the data and images from Google maps and referencing to actual visits made the study stronger. This facilitated the understanding of the city. The mobility and crime data were obtained by secondary resources such as INEGI, INFONAVIT, SEDESOL and CONAVI.

## **4.2 Data and Analysis**

In this section the secondary data is presented and is consolidated in a table form. Each zone and AGEB Zone are described. Auxiliary data of the city is shown in Appendix A to convey a more rounded understanding. This data then is analyzed and compared to the average of other cities.

### ***4.2.1 Mobility***

In the following pages the results for the zones with the highest concentration of abandoned dwelling will be presented according to their zones. From all the variables, mobility, is referenced the more in studies. Data shows that an average of 500 homes are reported abandoned with every kilometer increase in distance from employment centers to housing centers (Vivienda INFONAVIT 2015).

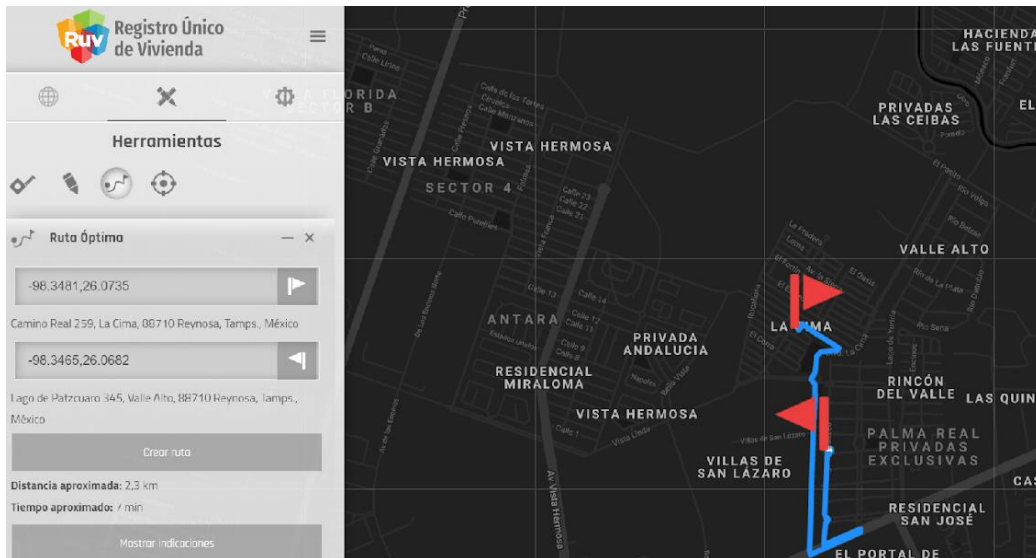
The study focuses on eighteen communities and their distances the work centers (employment), and school centers (educational). As a comparison Table 4.2 shows the average distances found in different city sizes in Mexico to major work centers. To obtain the average distance the geospatial services of RUV (Registro Unico de Vivienda) were used. RUV maps out

the schools, and work centers. Figure 4.4 shows the website being used for a measurement of data. The data collected will be presented in Appendix A.

City Type	Population	Avg. distance to work center from housing community
Big	1 and 5 million inhabitants	12.52 km (7.78 miles)
Middle	500 - 999,999 inhabitants	8.23 km (5.11 miles)
Small	100 thousand - 499,999 inhabitants	5.75 km (3.58 miles)

**Table 4.2** Relationship between abandoned housing and the distance to the workplace per metropolitan zone.

Source: Own iteration based on data from INFONAVIT Atlas del abandon, 2015.



**Figure 4.4** Screenshot of the Distance Method of Data Collection website.  
Source: Own image obtained from RUV (2017) geospatial resources website.

The average distance from the housing community to the work center for a city the size of Reynosa is 8.23 km (5.11 miles). The zones' commute distance was below average, except for the periphery zone (tables shown in appendix A) The periphery was expected to be above average. Individually eight of the eighteen communities were above the average which is close to 44%. Atlas del Abandono (2015) shows the average of these zones to work centers being 9.1 miles. This indicates that these zones are above average to the national average. It is also important to notice that in the periphery zone the highest number of abandoned housing existed compared to the other zones.

As mentioned before there is an educational lag in Reynosa. Table 4.3 shows the high number of inhabitants not going to school or finishing school. This is due as mentioned before to economic reasons, and the distance to school. All the zones shown in Appendix A did not go above an average of 3.7 KM (2.3 Mi). This shows that the zones of agglomerated abandoned housing are relatively close to educational centers. The educational level with the least number of distances was the Pre-K centers with an average of 2.0 KM (1.2 Mi). This shows that most parents have access to schools close to their homes, allowing them to transport them to school, before going to work. This also shows the possible pre planning of new communities, as perhaps new communities are being placed near school centers to attract more residents. The University was the only that was relative far, but that is expected and common in most cities. Closeness to educational centers are important, but most researchers focus on the distance to work. Other factors such as economic reasons were not studied and perhaps could be studied in future research. Also, limitations existed when gathering data, as private vs public school was not determined, nor school ratings, nor school price of admission, simply an average distance of the ten nearest schools to the zones were calculated.

Description of Population (2010)	Total
Population of 3 to 5-year old that do not assist school	18,241
Population of 6 to 11-year old that do not assist school	3,369
Population of 12 to 14-year old that do not assist school	2,821
Population of 8 to 14-year old that do not know how to read and write	1,367
Population of 15-year old and up that are illiterate	8,759
Population of 15-year old and up without schooling	13,480
Population of 15-year old and up with incomplete elementary education	30,541
Population of 15-year old and up with incomplete junior high education	19,794

**Table 4.3** Population of Reynosa according to school attendance conditions by groups of age and sex 2010.

Source: Own iteration based on data from “Plan Municipal de Desarrollo”, 2016-2018, page 33.

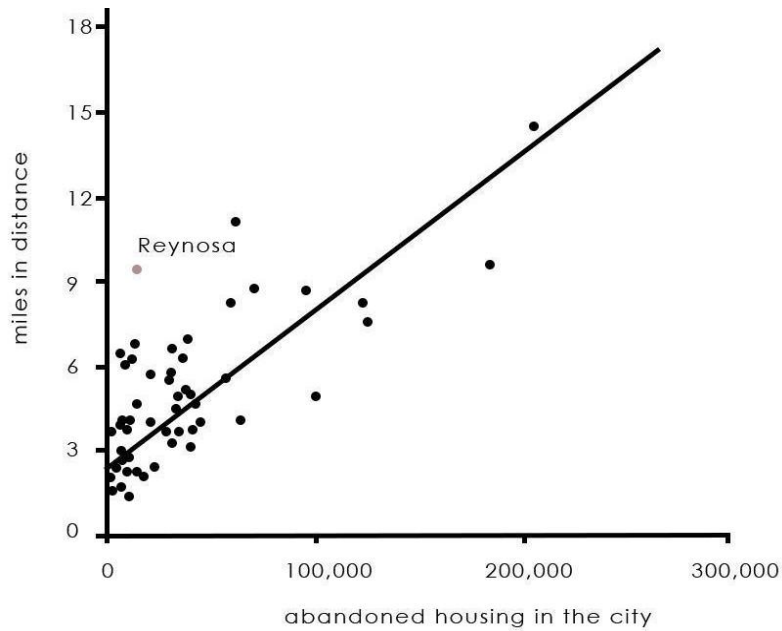
#### **4.2.2 Mobility Conclusion**

Housing communities, in a Mexican city of 500-999,999 inhabitants, are approximate 5.11 miles away from the work centers (Atlas del Abandono, 2015). Reynosa is above average, having an average of 9.05 miles (work-dwellings). **Error! Reference source not found.**5 shows how as the distance increases the number of abandoned houses increases in Mexico. This graph also shows how Reynosa with close to 10,000 abandoned homes is at a lower distance rate than it should be. With that distance the average number of housing according to the data should be of 140,000 dwellings. This allows us to see that mobility and being far from work centers is an undeniable factor but perhaps not the strongest as one as one might assume but it does show us that Reynosa is building more in the periphery than others. Figure 4.66 shows that Reynosa is city dependent on vehicle transportation, especially if living in the periphery. A report from



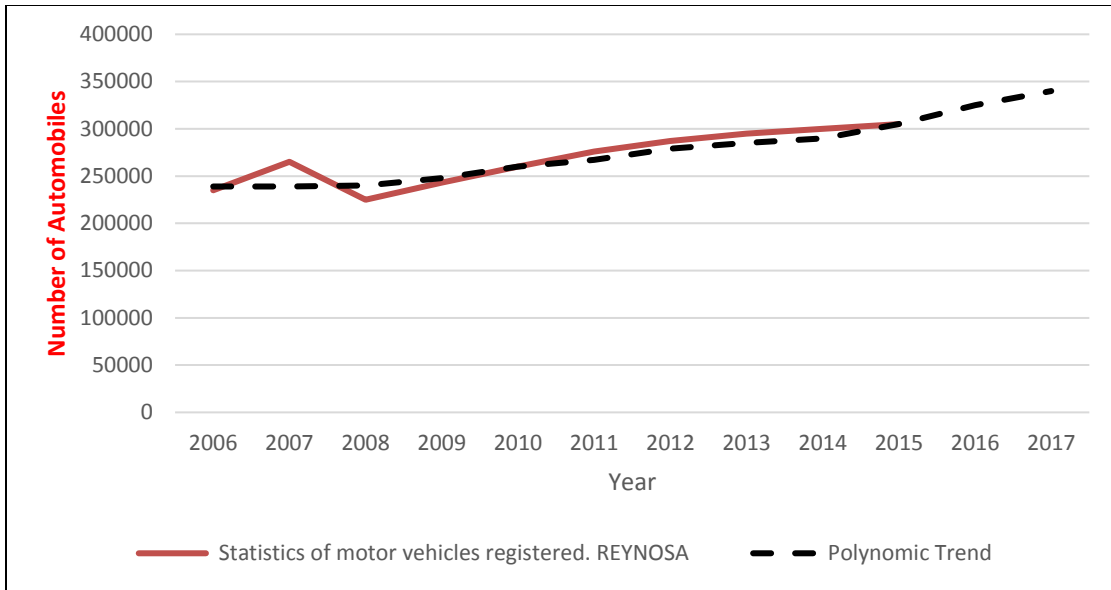
IFONAVIT found that the high number of abandoned housing can be found in the periphery but also in the city centers (as is the case in Reynosa), and stated that future housing should look more to the quality of life in its urban context (Monkkonen, 2014).

When this data is compared to the number one city (Figure 4.7) with the most abandoned housing (Juárez, CHIH, 12,391 abandoned houses, 8.4 miles average distance from work centers) and the number eight city (Mexicali, BC 5,712 abandoned houses, 5.7 miles average distance from work centers) one can tell that Reynosa has placed houses further than both cities. This can show us that Reynosa does have a city planning problems but perhaps it is not the core reason of abandonment. The next section will focus on the next variable: insecurity.



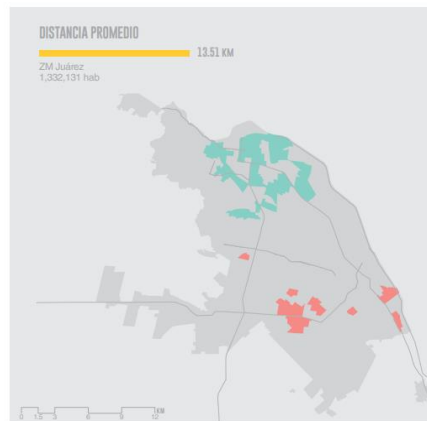
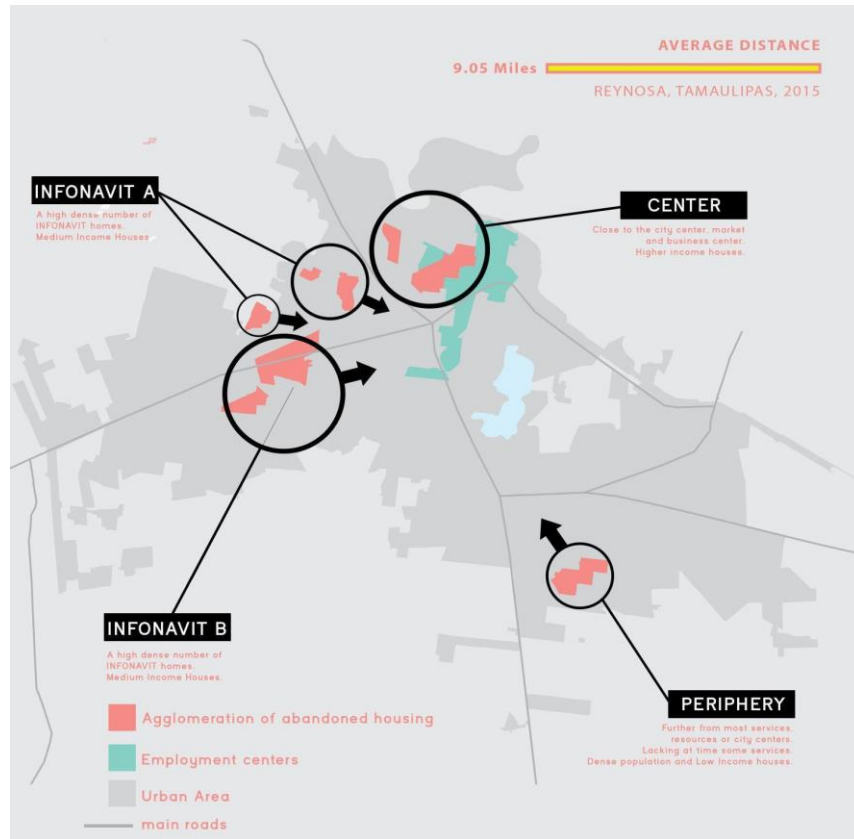
**Figure 4.5** Correlation of distance (in miles) and number of abandoned housing (hundred thousand).

Source: Own iteration based on Atlas del Abandono, 2015.

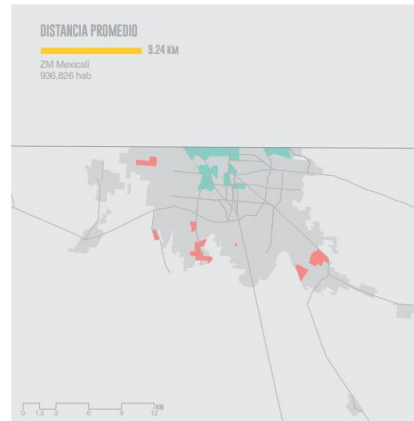


**Figure 4.6** Motor vehicles registered in Reynosa, 2006-2015.

Source: Own iteration base don Plan Municipal de Desarrollo: Ayuntamiento Constitucional De La Ciudad De Reynosa, page 36, 2016-2018.



ZM Juárez, CHI



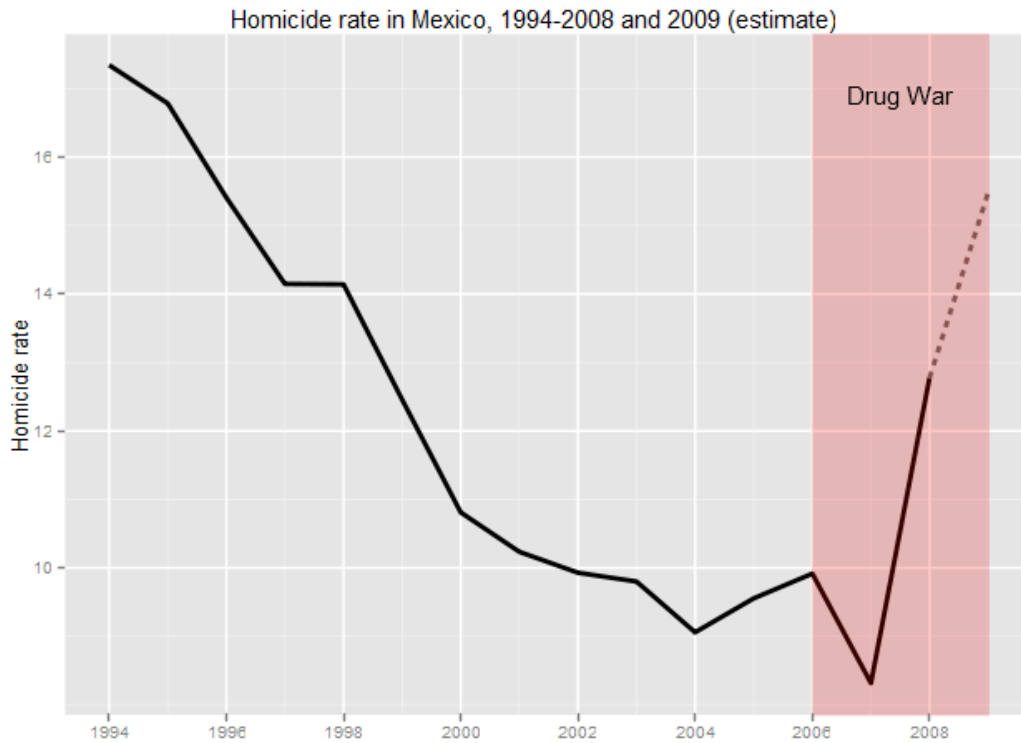
ZM Mexicali, BC

**Figure 4.7** The Four Zones in Reynosa of Agglomerated abandoned housing by Atlas del Abandono (2015) and showing the average distance to employment centers, Juarez, Chihuahua Mexico and Mexicali, Baja California, Mexico Zones of Agglomerated abandoned housing by Atlas del Abandono.

Source: INEGI 2015, INFONAVIT 2015, RUV 2015, AGEB's Code in 2010, CONEVAL estimates using the census of population and housing 2010.

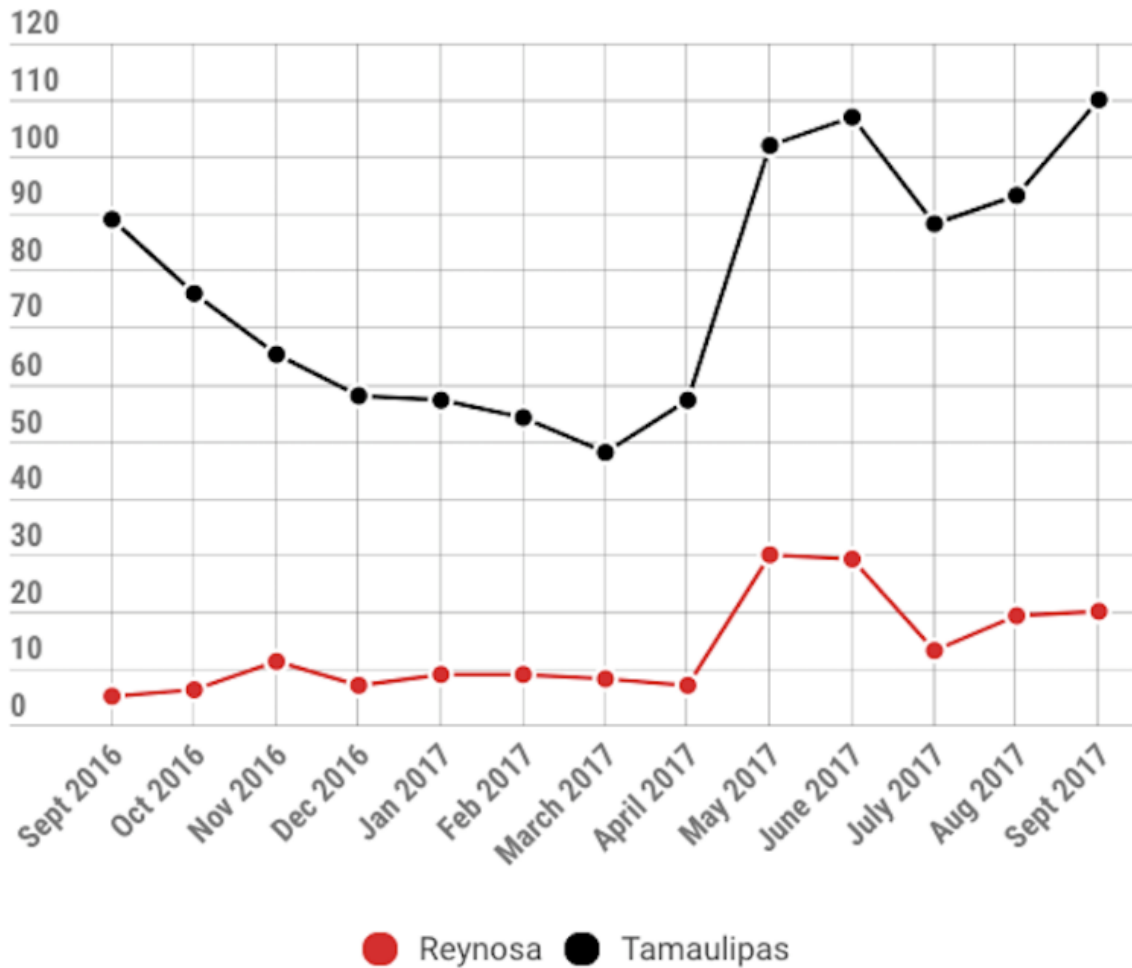
### 4.2.3 Insecurity

Reynosa, Mexico is the biggest city in its state (Tamaulipas). Its governor once said, “It is the most booming city in Tamaulipas [and] that which generates the most jobs, but at the same time it is where the quality of life has deteriorated the most” (Cabeza de Vaca, 2016). That year they had an increase of 167% homicide rate. Figure 4.8, Figure 4.9 and show the spike starting in 2006, and how the drug war increased the fear due to crimes and homicides. This research will investigate the homicide rates in the city of Reynosa and its fear perception.



**Figure 4.8** Homicide Rates in Mexico (1994-2008).  
Sources: Reprinted from “Statistical Analysis and Visualization of the Drug War in Mexico” created by Diego Valle-Jones, 2010.

# Homicides in Tamaulipas state and in Reynosa, Sept 2016 to Sept 2017



**Figure 4.9** Homicides in Tamaulipas state and in Reynosa (2016-2017).  
 Sources: Reprinted from "The Breakdown of One of Mexico's Most Powerful Cartels Is Driving Violence in A Valuable Border City" found in the Business Insider by Cristopher Woody, 2017.

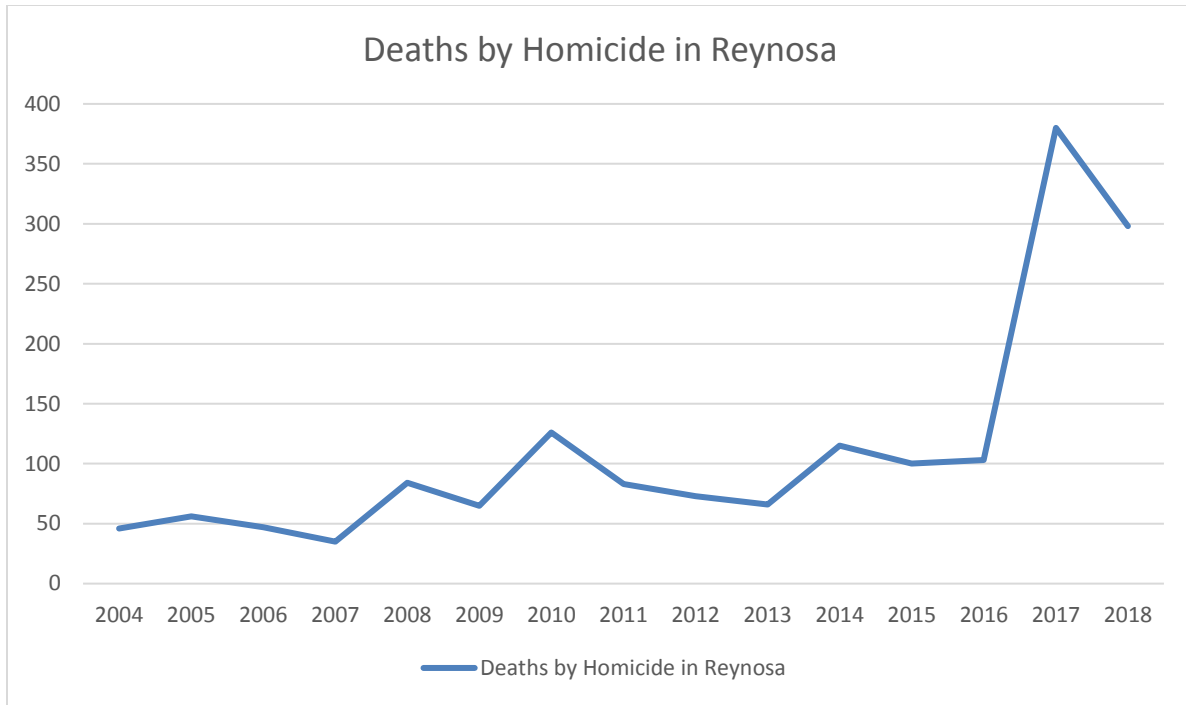
There are two ways to measure the number of homicides (this study will focus on the second):

1. **Police records.** Data collected by law enforcement agencies. Available from:
  - The National System of Public Security
  - The Statistical Yearbooks
2. **Vital Statistics** from the INEGI. Produced from death certificates, they include data at the municipality level and the month of death. In addition, they include sex, age, marital status, occupation, education, etc.

Secondary data found on Mexico's national census data (INEGI) show the rates and number of homicides increasing in Reynosa, this can be seen in Table 4.4 and its corresponding linear graph (Figure 4.10).

Year	Deaths by Homicide in Reynosa
2004	46
2005	56
2006	47
2007	35
2008	84
2009	65
2010	126
2011	83
2012	73
2013	66
2014	115
2015	100
2016	103
2017	380
2018	298

**Table 4.4** Number of deaths by Homicide in Reynosa.  
Source: Own elaboration with data from INEGI 2004-2018

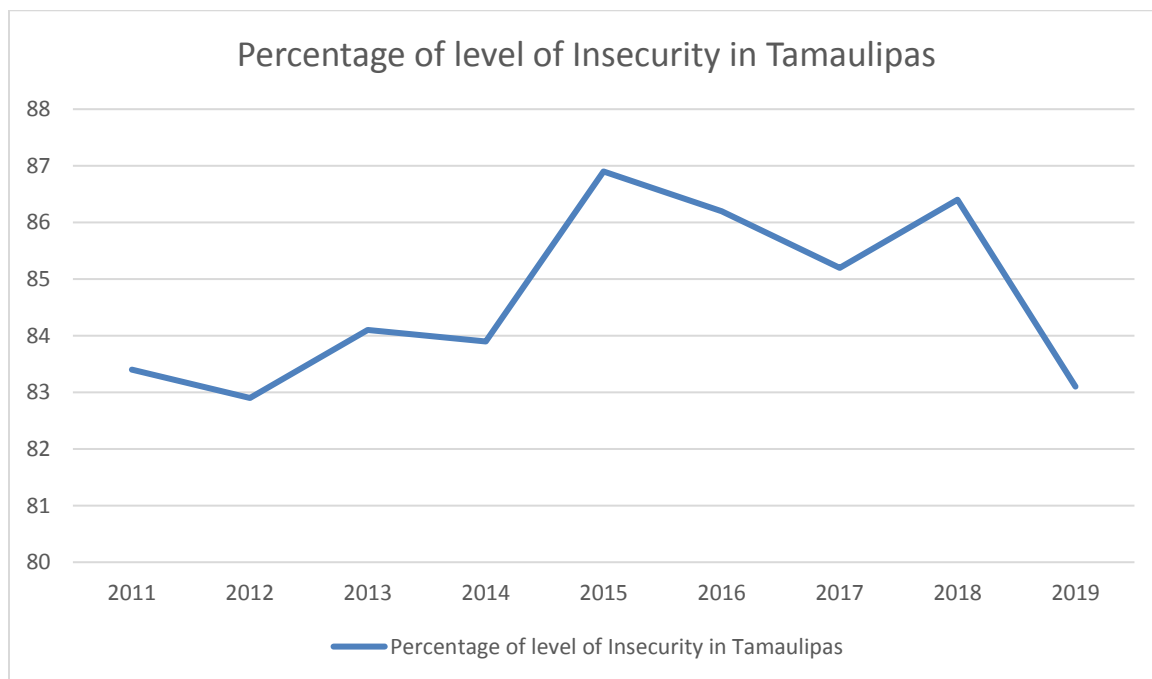


**Figure 4.10** Linear Graph of Number of deaths by Homicide in Reynosa.  
 Source: Own elaboration with data from INEGI 2004-2018.

This increase in crime and homicides led to an evident change in atmosphere. The perception of insecurity arose in Reynosa. Data found on INEGI’s website under the ENSU survey (Encuesta Nacional de Seguridad Pública Urbana) or National Urban Public Security Survey, which is commissioned by INEGI, which surveys Mexico to determine their perception of fear, records the perception of fear to be at almost 100% or all the residents of Reynosa in recent years ( Table 4.5 and Figure 4.11).

Year	Percentage of level of Insecurity in Tamaulipas
2011	83.4
2012	82.9
2013	84.1
2014	83.9
2015	86.9
2016	86.2
2017	85.2
2018	86.4
2019	83.1

**Table 4.5** Percentage of level of Insecurity in Tamaulipas.  
Source: Own elaboration with data from INEGI and ENSU 20011-2019.

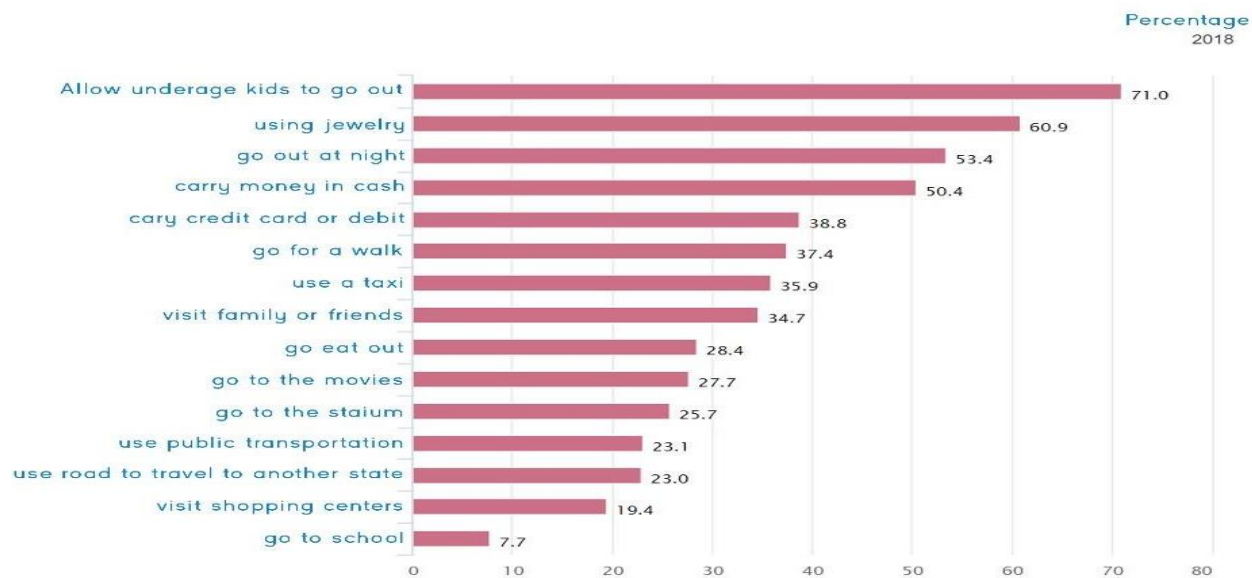


**Figure 4.11** Linear Graph of Percentage of level of Insecurity in Tamaulipas.  
Source: Own elaboration with data from INEGI and ENSU 20011-2019.



#### ***4.2.4 Insecurity Conclusion***

Ever since the drug war became a bigger issue in 2016, crimes have increased. In 2019, the latest ENSU, showed 85.9% of the population of Reynosa feared using public transportation (ENSU, 2019). In the same study, spatial changes occurred. The graphs and tables of Reynosa allows us to see how the residents live. Figure 4.12 shows how many residents have stopped participating in daily activities such as going to the movies. Table 4.6 and Table 4.7 describe how most residents have witness some sort of crime and have the belief that crime will continue, thus altering their way of moving around the city. Table 4.8 presents some of the most common places where residents perceive fear, and interestingly their homes was the one with the lowest percentage. The study did not address if abandoning their house could be a response to fear, but it could be something interesting to research in the future. Almost the whole city (99.8% seen in Table 4.6) of the city addressed the city had a problem, but interestingly focused more on the services, and infrastructure rather than the crime. It is evident that the drug war is having a negative effect on the city of Reynosa, but it is not enough data to connect it to the abandonment of housing, further research and data will be needed. Also, it is important to see this data and compare it to Mexico as a whole. When compared to the previous cities, the number one city Juarez and the number eight city Mexicali, Juarez has a much higher index of homicides almost double than Reynosa and Mexicali (Atlas del Abandono, 2015). Mexicali and Reynosa are quite similar. Figure 4.13, Figure 4.14 and Figure 4.15 compare the homicide rates to other states in Mexico. Reynosa does have a high number of crimes and homicides, but others states in Mexico exist with higher rates of crime and less abandoned housing.



source  
INEGI (encuesta nacional de victimizacion y percepcion sobre seguridad public) 2019

**Figure 4.12** Spatial activity stopped because of Fear (18 years or older).  
Source: Reprinted from INEGI 2019 ENSU Survey.

Crimes Witnessed	
	%
Drinking in Public	43.5
Robbery or assault	52.7
Vandalizing	37.1
Drug Sale or consumption	44
Gunshots	77.8
<b>Expect Crime to Increase</b>	
73.2%	
<b>Witnessed problems in the city</b>	
	%
Potholes	93.7
Crime	63.4
Government Intervention	28.2
<b>The whole city of Reynosa</b>	<b>99.8</b>

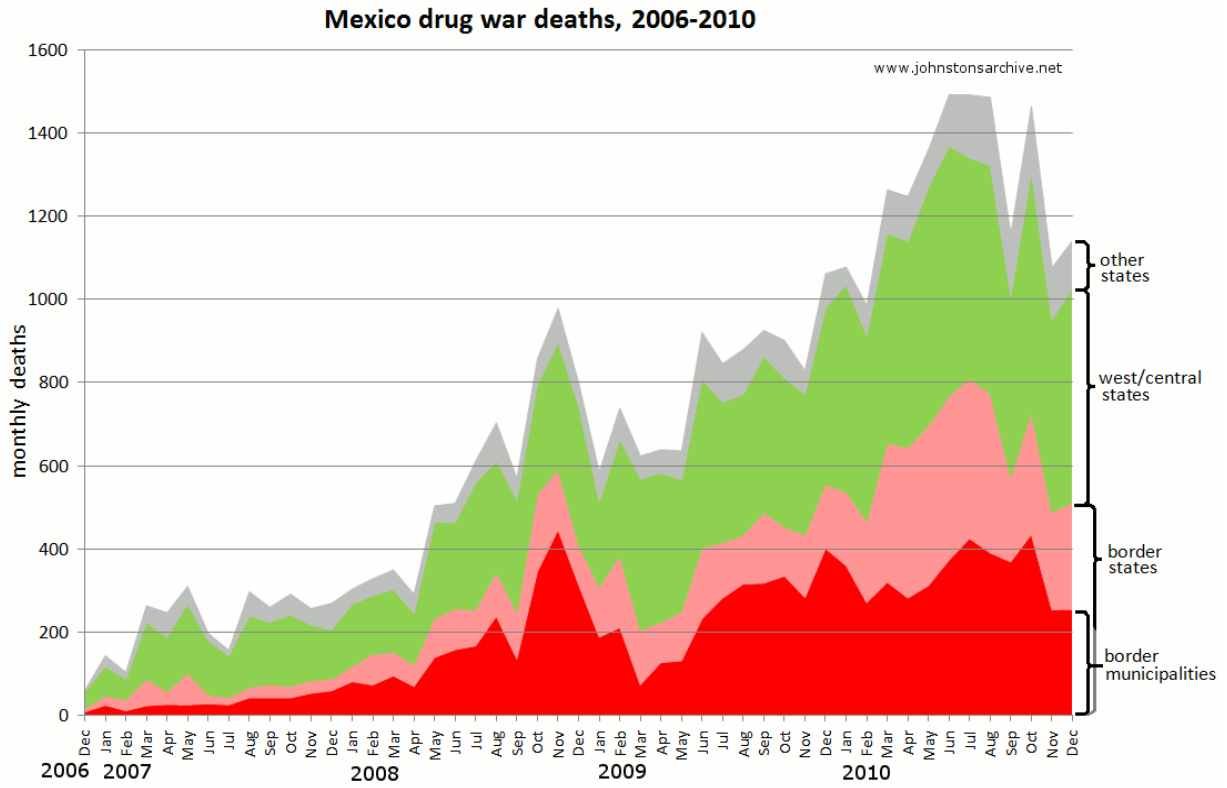
**Table 4.6** Various Fear Percentages from Reynosa Residents.  
Source: Own table with data from INEGI- ENSU July 2019.

Feared going to these places	
	%
Bank	70.1
ATM	79.3
Spatial Changes	
	%
Kids cannot go out	83.3
Walk at night	72.9
Visit family or friends	61.7

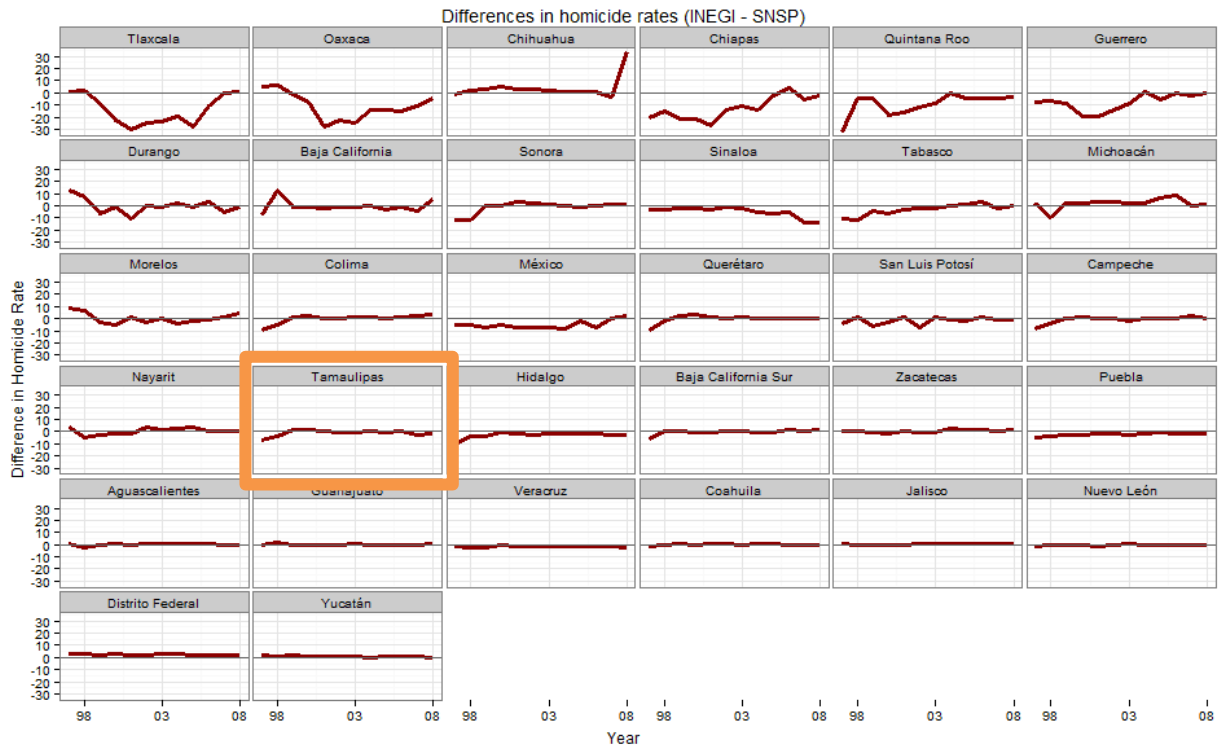
**Table 4.7** Various Fear Percentages from Reynosa Residents.  
Source: Own table with data from INEGI- ENSU July 2019.

CITY / PUBLIC SPACE	POPULATION 18 YEARS AND UP	FEELING OF INSECURITY	
		ABSOLUTE	RELATIVE
Reynosa population: 410,423			
Public ATM	335,321	265,612	79.2%
Bank	327,291	241,238	73.7%
Road	342,640	251,462	73.4%
Public Transportation	282,728	188,781	66.8%
Recreation park or center	269,532	177,034	65.7%
Streets most commonly used	408,315	258,299	63.3%
School	42,284	26,426	62.5%
Mall	399,948	215,883	54.0%
Vehicle	274,781	144,350	52.5%
Work	272,894	81,665	29.9%
House	410,423	115,232	28.1%

**Table 4.8** Feeling of insecurity in public Spaces in Reynosa.  
Source: Own iteration and translation based on Plan Municipal de Desarrollo: Ayuntamiento Constitucional De La Ciudad De Reynosa, page 40, 2016-2018.



**Figure 4.13** Average deaths caused by the Mexico Drug war.  
 Source: Reprinted from "Data on Mexican Drug War Violence" by Johnston, Robert, 2011.



**Figure 4.14** Differences in homicide rates in 26 states of Mexico.  
 Source: Reprinted and created by Diego Valle-Jones.

Homicide rates and trends in the main Mexican cities (2011)

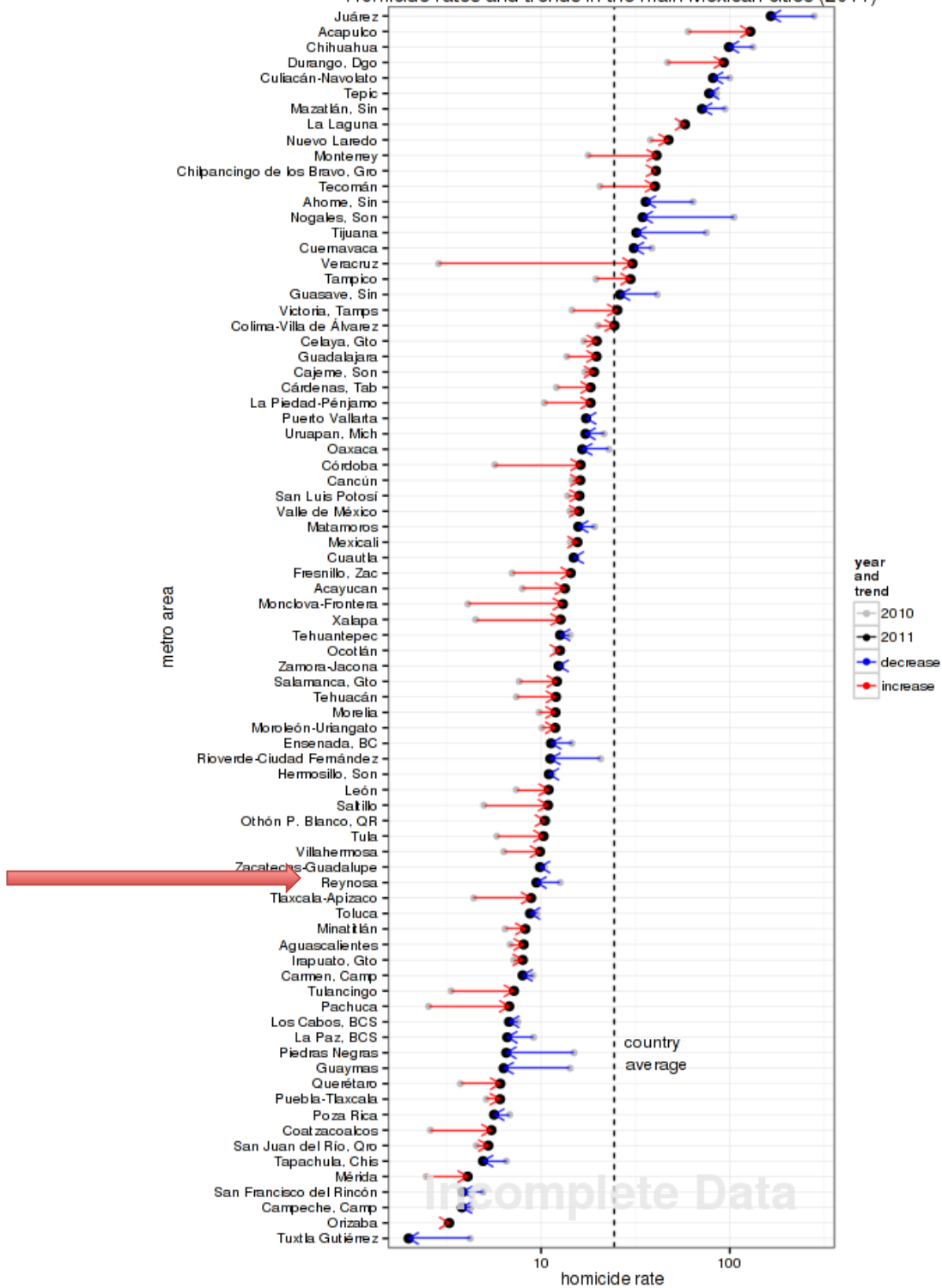


Figure 4.15 Homicide rate in main Mexican cities.

Source: Reprinted from "Mexico's Most Violent Cities In 2011" created by Diego Valle-Jones.

#### **4.2.5 Typology 3D**

Each zone has a unique housing typology. There are many overlays between the zones, but they to remain unique. As you drive around the communities something that will be recurring is that you can see that abandoned housing exists. The typology that will be addressed in this chapter, will be completely exterior, focusing on the lot to open space percentage. This is important because some researchers mentioned many residents were not content with their housing because of limited spatial attributes.

The first zone discussed is INFONAVIT A ( see Figure 4.16 and Figure 4.17). This is a typical INFONAVIT community. This means that all the houses look very similar, in color, design, materials, orientation, and their limited size (different model versions existed but the most popular was chosen) . This community has a Regular IFONAVIT housing model, which is bigger than others, has a second floor, and has an above average backyard. Most houses had no garden in the front, just dirt, perhaps because of the lack of water. The houses were not connected, which meant this was better for the residents in privacy and audio discomfort. A recurring thing in all communities will be the idea to expand. We can see this in this community. Most expansion were either for storage or businesses. Some decided to expand their dwelling and added their own store (see Figure 4.18). Some decided to give their house a sense of identity by changing color and adding a gate (see Figure 4.19). In summary this housing seems appropriate for a family 1 -5 and with one car. The opening of small dwelling shopping markets provides residents the ability to not travel far and even if they do, they are only 5 miles from the center.

# INFONAVIT A



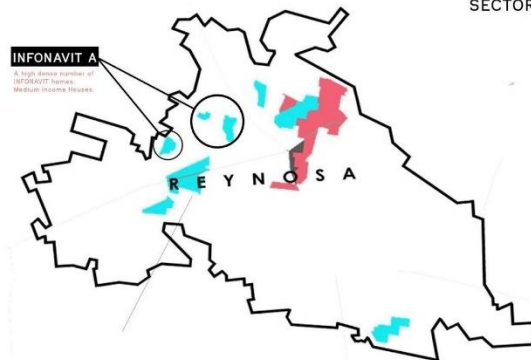
AGEB CODE: 3233  
COMMUNITY: LA CIMA



AGEB CODE: 3661  
COMMUNITY: LAS ARBOLEDAS



AGEB CODE: 3318  
COMMUNITY: HACIENDA LAS FUENTES  
SECTOR III

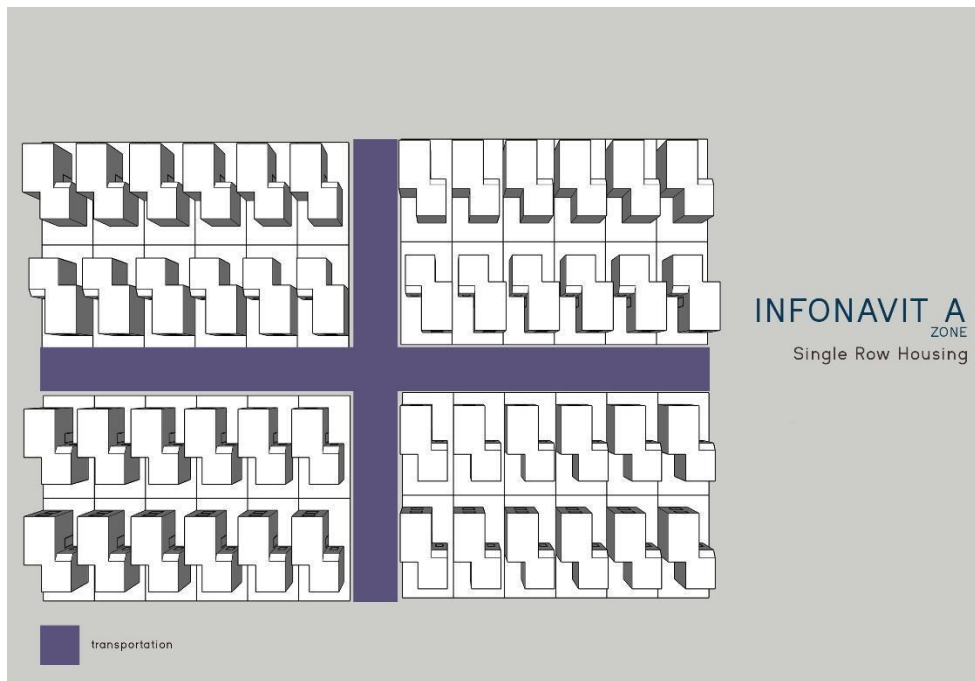
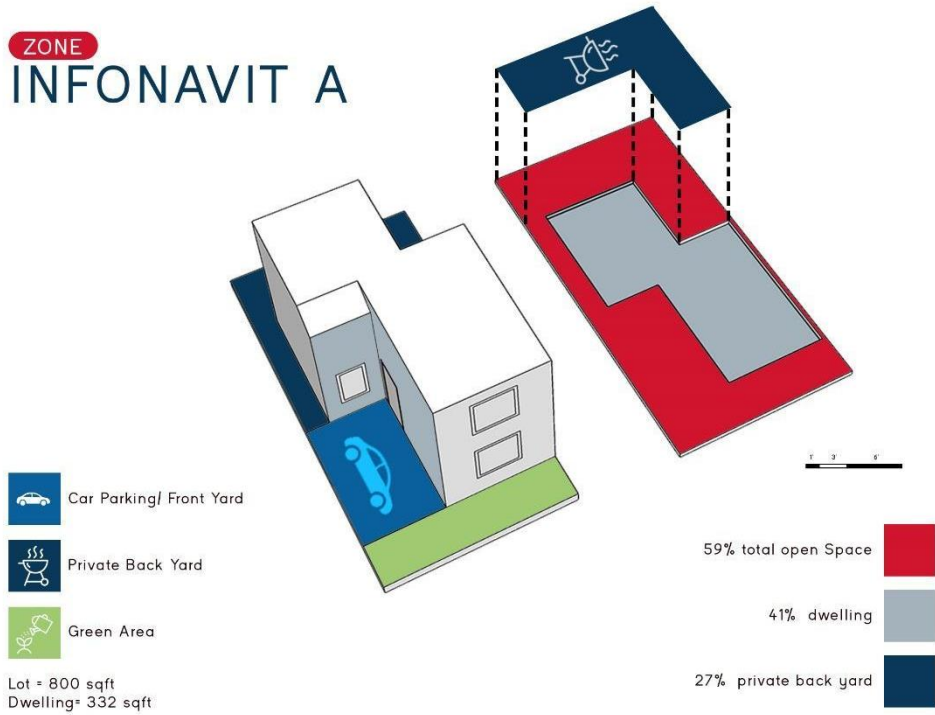


**Figure 4.16** Zone IFONAVIT A: Typology.

Source: Own elaboration using data from RUV, Google maps and own observations, 2019.



**ZONE**  
**IFONAVIT A**



**Figure 4.17** Zone IFONAVIT A: Typology.

Source: Own elaboration using data from RUV, Google maps and own observations, 2019.



**Figure 4.18** Community: Hacienda Las Fuentes Sector III.  
Source: Image obtained from google maps and modified, 2019.



**Figure 4.19** Community: Hacienda Las Fuentes Sector III.  
Source: Reprinted from google maps and modified, 2019.

The next community is INOFAVIT B ( see Figure 4.20 and Figure 4.21 for some image reference). This community is older in existence. One can feel the identity of this community. Despite every house is the same, the colors variate. Some have added to their houses as well, a business, church, or an extension to their house. There are abandoned houses here, but the ones who remain seem to have incorporated to the community.

# INFONAVIT B



AGEB CODE: 2644  
COMMUNITY: LOMAS DEL REAL JARACHINAS



AGEB CODE: 3604  
COMMUNITY: JARDINES COLONIALES



AGEB CODE: 2729  
COMMUNITY: LAS CUMBRES



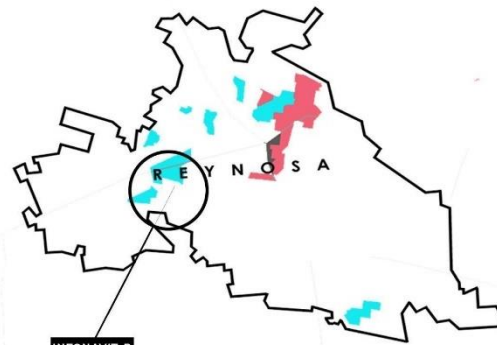
AGEB CODE: 3619  
COMMUNITY: VALLE DEL BRAVO



AGEB CODE: 3642  
COMMUNITY: ROSALINDA GUERRERO



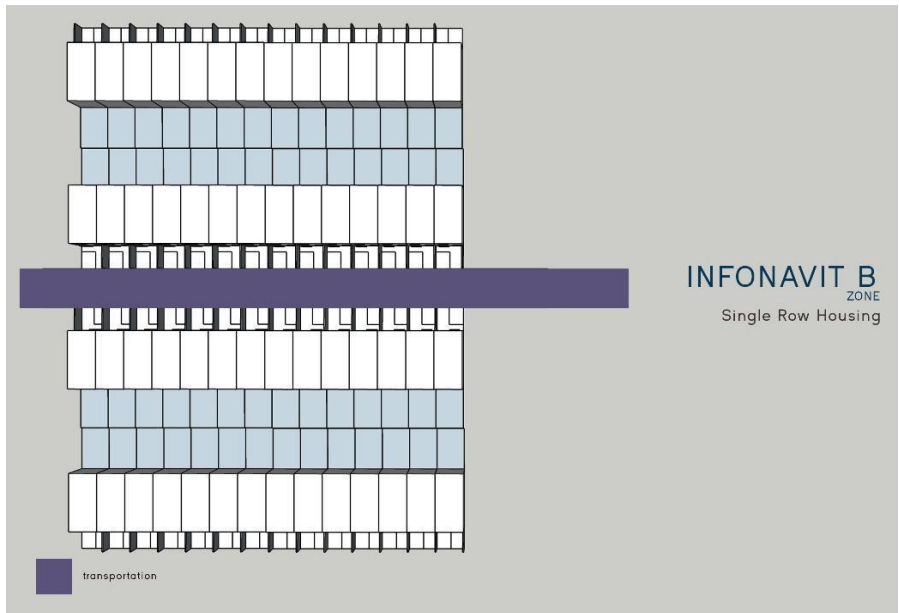
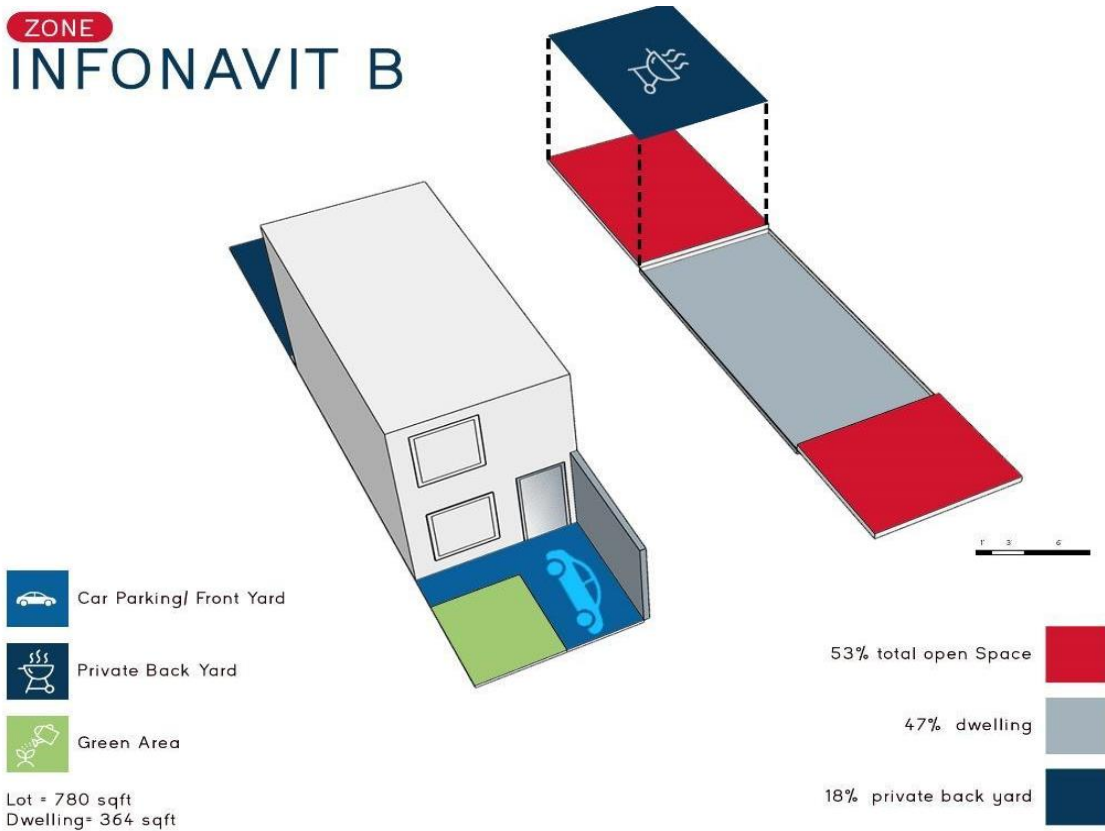
AGEB CODE: 3623  
COMMUNITY: RESIDENCIAL SAN JOSE



**Figure 4.20** Zone IFONAVIT B: Typology.

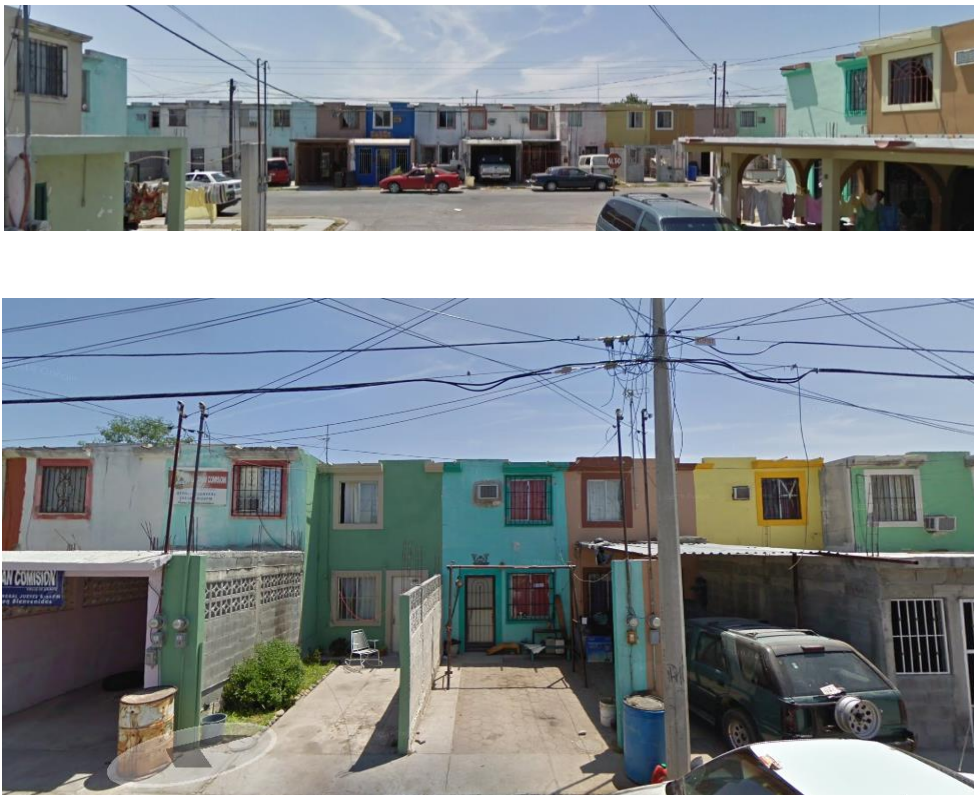
Source: Own elaboration using data from RUV, Google maps and own observations, 2019.

**ZONE**  
**INFONAVIT B**



**Figure 4.21** Zone IFONAVIT B: Typology.  
Source: Own elaboration using data from RUV, Google maps and own observations, 2019.

In the front part of the dwellings many seating furniture and barbeque equipment can be seen, as the back is too limited for such activities (see Figure 4.22). Some houses you can tell are abandoned as locks are placed in the door (see Figure 4.23). The design for the house in this zone is simpler and again you can see the lack of green area and limited backyards (see Figure 4.21).. This housing is adequate for a family one-four. In summary this community because of its age has been able to adapt. The recent crime seems to not have affected most of its residents. There is abandoned housing in the area, but the idea of fear is not persistent in this community, nor the commute to work (an average of 5 miles to the center exists).



**Figure 4.22** Community: Valle del Bravo.  
Source: Reprinted image from google maps and modified, 2019.



**Figure 4.23** Community: Valle del Bravo.  
Source: Image obtained from google maps and modified, 2019.

# PERIPHERY



AGEB CODE: 3708  
COMMUNITY: BALCONES DE ALCALÁ



AGEB CODE: 3731  
COMMUNITY: RÍO GRANDE



AGEB CODE: 3407  
COMMUNITY: LOS ALMENDROS



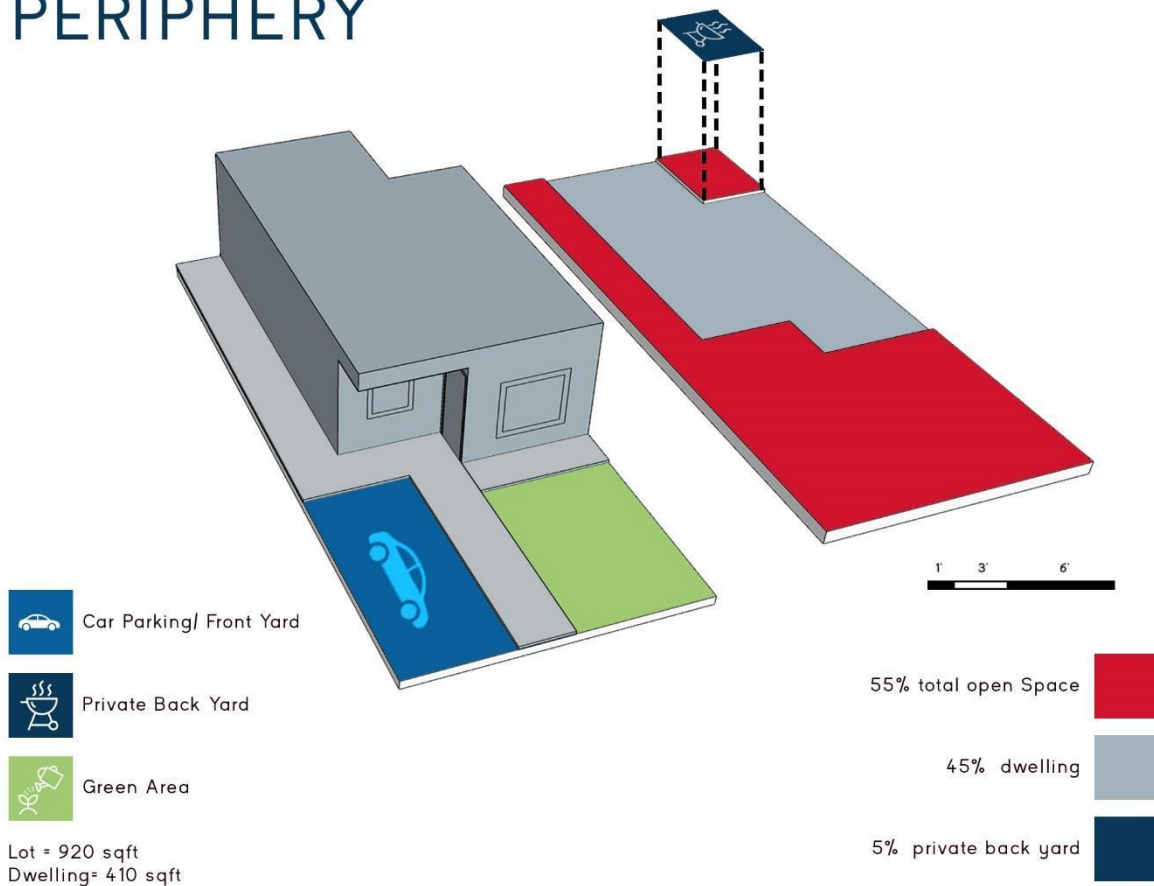
**Figure 4.24** Zone Periphery: Typology.

Source: Own elaboration using data from RUV, Google maps and own observations, 2019.

The third zone discussed is the periphery zone (see Figure 4.25 for 3-D rendering and descriptions), which is located further from the center. The further you get from the center the smaller the dwelling start to become. This community had a higher number of abandoned housing, despite being a newer community. Most houses were abandoned, or unfinished. Some had again incorporated a mini super market or store in their house (Figure 4.26). All the houses looked similar, some streets did change color, but other than that they remained similar. This was also one of the most dangerous communities, as some mentioned to not walk around taking too many pictures. This community from all four zones had the smallest backyard, almost nonexistent (see Figure 4.25). Also, not a lot of green space in the front. The designs were done in a modern style but in conclusion this community could be described as a failed community because of the vast amount of abandoned housing and the high atmosphere of fear.



**ZONE**  
**PERIPHERY**



**Figure 4.25** Zone Periphery: Typology.

Source: Own elaboration using data from RUV, Google maps and own observations, 2019.



**Figure 4.26** Community: Valle del Bravo.  
Source: Reprinted from google maps and modified, 2019.

The last zone is the center ( see Figure 4.27 and Figure 4.28 for a rendering and description of the zone). Very limited green areas can be found, and larger private areas could be found (see Figure 4.28). This is one of the oldest centers in Reynosa. The center is the most diverse from all the zones. Most houses look very different from one another. Unlike other zones, most houses here were enclosed (see Figure 4.29). Abandoned houses could be found throughout this neighborhood but given that many others in the same street had not been abandoned (Figure 4.30), it would be hard to explain from a simple observation. One can find INFONAVIT houses next to self-made houses or a very small house next to a luxurious house (see Figure 4.31). Many dwellings were self-made, but some INFOANVIT houses can be found. A series of houses were found. These were the biggest houses of all the study. It was very interesting to notice the big differences from this community to the periphery. The center was very much alive, a lot of traffic, and many stores abided. The distance from here to school, work, markets, or even USA is close. In summary, the history of Reynosa and now the influence of modern designs is present in the “center” zone. The community residents appear active and comfortable with their current situation.

# CENTER



AGEB CODE: 1063  
COMMUNITY: COL DEL VALLE



AGEB CODE: 103A  
COMMUNITY: FERROCARRIL ZONA CENTRO



AGEB CODE: 1059  
COMMUNITY: AYUNTAMIENTO



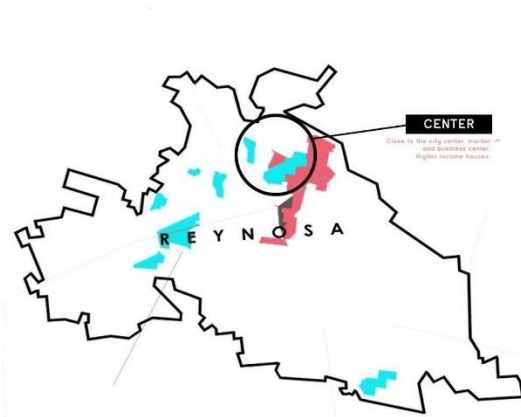
AGEB CODE: 1078  
COMMUNITY: LONGORIA



AGEB CODE: 1148  
COMMUNITY: SIMON RODRIGUEZ



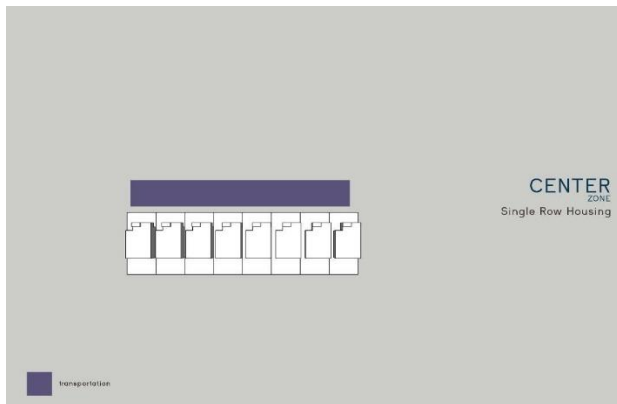
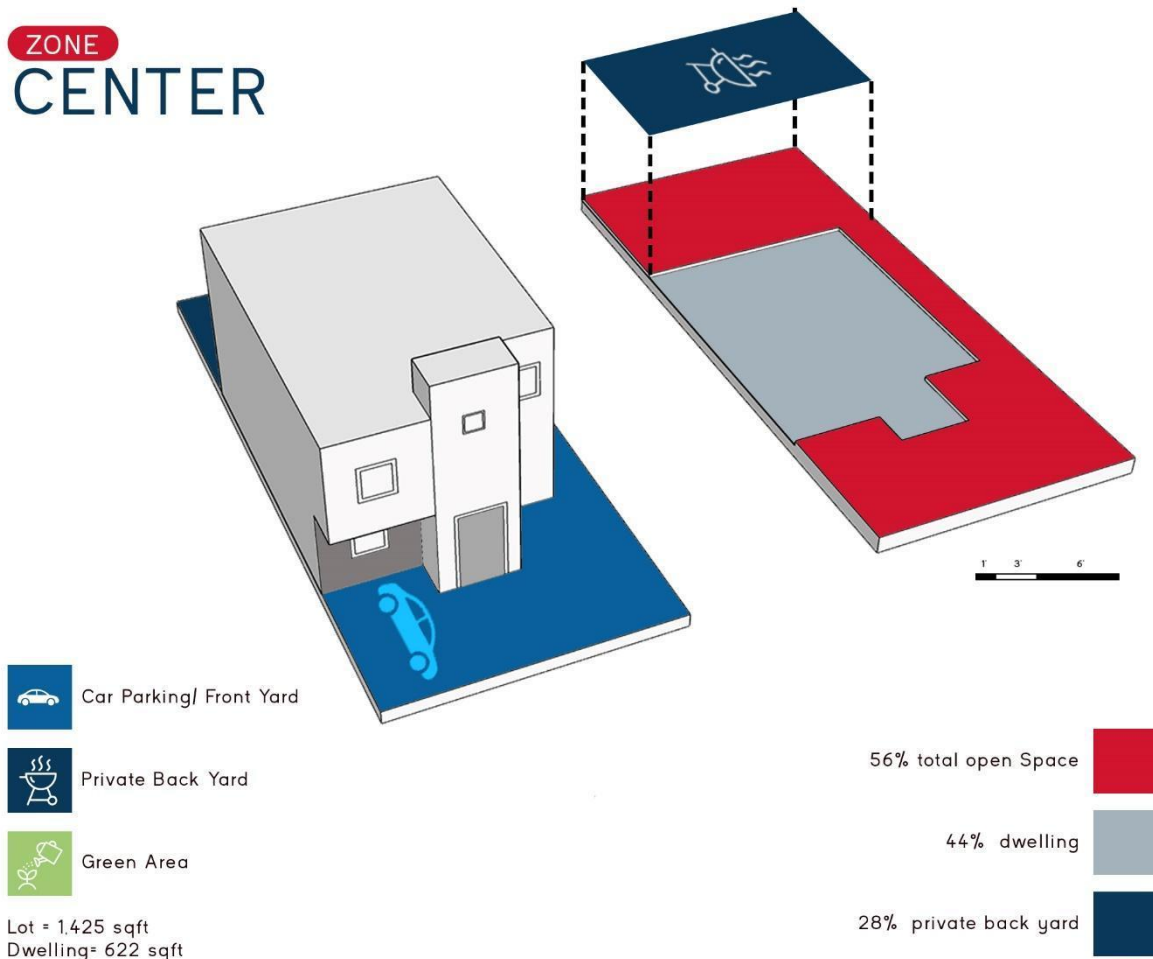
AGEB CODE: 2038  
COMMUNITY: ARBOLEDAS RIBEREÑA



**Figure 4.27** Zone Center: Typology.

Source: Own elaboration using data from RUV, Google maps and own observations, 2019.

**ZONE**  
**CENTER**

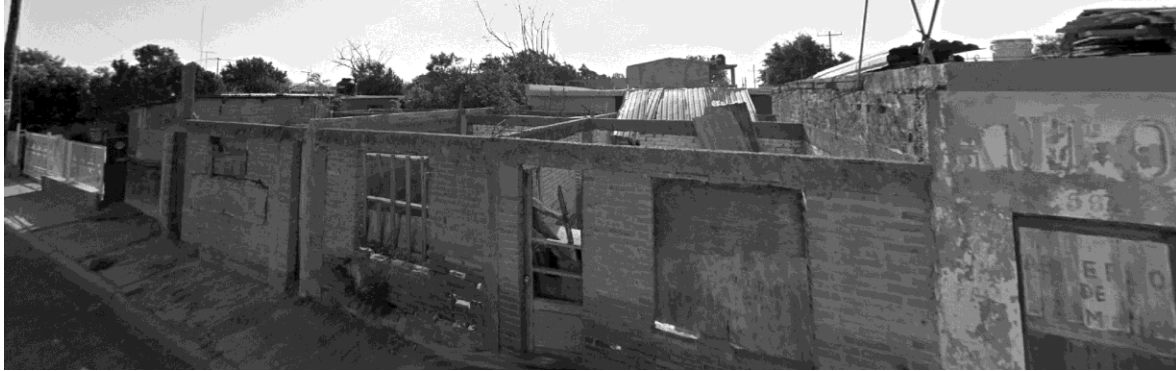


**Figure 4.28** Zone Center: Typology.

Source: Own elaboration using data from RUV, Google maps and own observations, 2019.



**Figure 4.29** Community: Longoria.  
Source: Reprinted from google maps and modified, 2019.



**Figure 4.30** Community: Zona Centro.  
Source: Reprinted from google maps and modified, 2019.



**Figure 4.31** Community: Zona Centro.  
Source: Reprinted from google maps and modified, 2019.

### **4.3 Findings Conclusion**

The three variables all showed different aspects of the character of Reynosa. A city that keeps evolving. As stated in the first chapter this research is not meant to create new knowledge but simply use the existing knowledge to create a case study of the city of Reynosa, with the goal of creating a foundation for future research. These variables provided us with this. They allowed us to see the city in a different manner, understand how the citizens co-exist with the perpetual state of fear and the spatial dimensions of their current living conditions.



## 5. CONCLUSIONS

This thesis has used the mixed methods approach to present a case study of the city of Reynosa and its housing abandonment. Housing is one of the basic satisfactory requirements of an individual or family. The closer a society gets to everyone having an adequate space of living, the closer to being successful. This along with education, social justice, public health, constitute as the foundation of human rights in most countries (McTarnaghan et al., 2016). The United Nations Committee on Economic, Social and Cultural Rights stated that individuals should have the “the right to live somewhere in security, peace and dignity.” (United Nations Committee on Economic, Social and Cultural Rights).

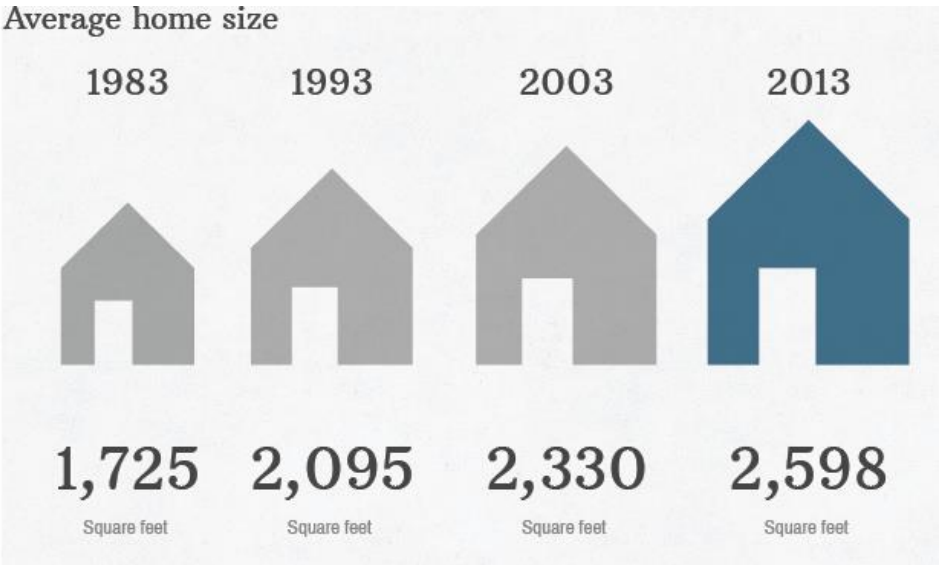
This case study also explains: (1) the need: many Mexican residents without homes (2) the response: provide more credits, provide credits mostly anyone, build more homes in an urban unplanned manner (3) consequence: oversupply of housing met with economic problems that resulted in mass abandoning. Various variables were used and showcased how layers of socio demographic processes account for the volumes of uninhabited housing and its change in the analyzed territories. Each variable allowed us to explore and learn about the city.

### **5.1 Findings**

#### ***5.1.1 Typology***

Most of the houses in the zones described were relatively small, on average were 1000 sq. ft or smaller. In comparison Figure 5.1 shows the average square feet of houses in the U.S. These INFONAVIT houses were created to accommodate a family of 2-4 but larger quantities

end up living together, ranging from 5-10 people. Table 5.1 shows how most of the communities selected showed signs of overcrowding.



**Figure 5.1** Average home size in the USA.  
Source: Reprinted from “America's Homes Are Bigger than Ever” on CNNMoney by Christie, 2014.

<b>Degree of Social Lag by urban AGEb, Reynosa 2010</b>								
AGEb Code	Community	Total Population	Inhabited homes	People living overcrowded	Homes without electricity	Homes with dirt floor	Homes without piped water from public network	Homes without drainage
<b>ZONE: INFONAVIT A</b>								
3233	La Cima	6287	1696	0.36	0.06	0.35	0.12	0.00
3661	Las Arboledas	3973	1034	2.72	0.00	0.87	0.00	0.00
3318	Hacienda las Fuentes Sector III	1775	484	0.42	0.00	0.21	0.21	0.00
<b>ZONE: INFONAVIT B</b>								
2644	Lomas del Real Jarachinas	2827	710	0.30	0.00	0.14	0.00	0.00
2729	Las Cumbres	4122	1011	1.15	0.00	0.20	0.00	0.00
3642	Rosalinda Guerrero	3046	750	3.47	0.53	2.13	0.27	0.40
3604	Jardines Coloniales	2233	596	0.00	0.17	0.50	0.00	0.00
3619	Valle Del Bravo	2534	621	0.99	0.00	0.48	0.00	0.00
3623	Residencia al San José	2681	677	1.13	0.00	0.30	0.00	0.59
<b>ZONE: PERIPHERY</b>								
3708	Balcones de Alcalá	3800	1008	6.43	0.10	2.88	0.20	0.10
3731	Río Grande	3234	930	2.82	0.00	1.29	0.00	0.00
3407	Los Almendros	4338	1161	7.86	0.00	1.21	0.00	0.00
<b>ZONE: CENTER</b>								
1063	Col del Valle	923	299	1.03	0.33	1.00	0.00	0.00
1059	Ayuntamiento	807	249	0.84	0.00	1.20	0.00	0.00
1148	Simón Rodríguez	1027	314	1.98	0.00	0.64	0.32	0.64
103A	Ferrocarril Zona Centro	1694	455	5.39	0.66	6.15	0.44	1.10
1078	Longoria	779	244	0.84	0.00	0.41	1.64	0.41
2038	Arboledas Ribereña	1495	387	5.35	0.78	3.62	0.26	2.33

**Table 5.1** Degree of Social Lag in Reynosa.  
Source: Own iteration with data from INFONAVIT, 2010.

### **5.1.2 Mobility**

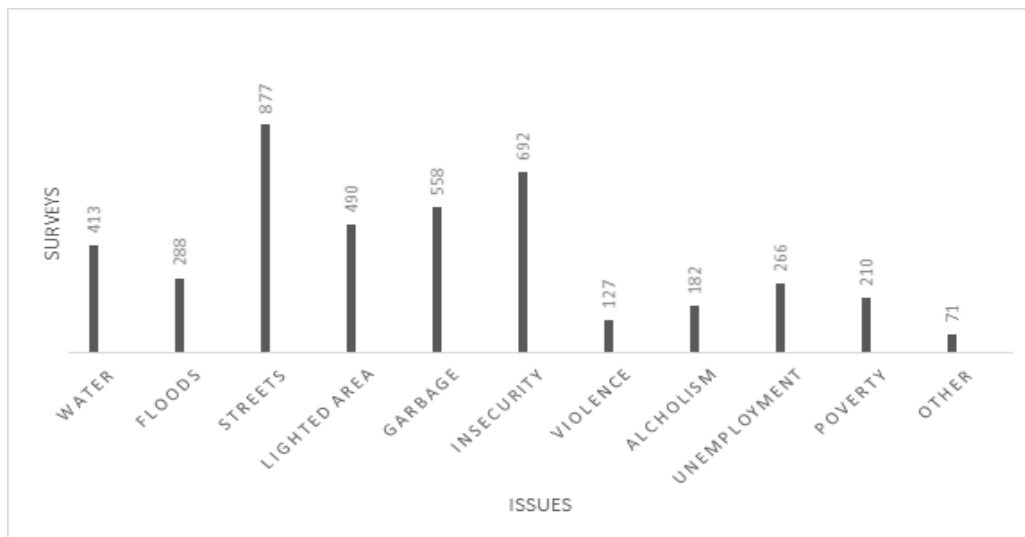
Architecture can be envisioned as the “how”. The design aspect of architecture is important but understanding the where is crucial too. Future housing in Reynosa should pay more attention to the location of where they are building. It will not matter if the dwelling is modern, elegant or a great design, if the surrounding conditions are not favorable the inhabitant will not feel well accommodated and will eventually relocate. The location affects other parts such as access to public services, mobility, and overall connectivity. Table 5.1 shows some percentages of the communities in the study lacked piped water, drainage, and electricity. In recent years, a high number of houses were built in the periphery in Reynosa, as land is cheaper in the outskirts of the city. The families that I was able to meet did mention the unhappiness of the location, primarily as they lacked many services.

### **5.1.3 Insecurity**

The perception of fear is hard to measure, as it is more qualitative. The data gathered of crime and homicides, sometimes does not convey the true experience of the residents. The debate is evident over the link between the drug war (the rise in crime) to the high number of abandonments. It is certain that some have abandoned their homes because of security reasons, as I have gotten to meet some families that have done this throughout the research, but what is debated is the percentage of contribution. Some, like author Gabriel Garcia Moreno, believe and state that crime and insecurity may have no active role in the abandoned housing determining (Garcia Moreno, *El abandono de la vivienda como consecuencia de la delincuencia e inseguridad urbanas* 2012).

## 5.2 Architecture Solutions

The main reason I believe this is important is because despite researchers cannot conclude on a definitive answer of why abandonment, they are all saying the same thing: it reveals the behavior and reflects the residents' discomfort. Some families in Mexico that I was able to talk to address this discomfort and expressed since they didn't want to keep living in that condition they left. Some of those conditions include, lack of services, feel of insecurity, economic crisis, etc. Regardless of the situation, this can reveal a greater social downfall of the city. Figure 5.2 shows a survey done to residents in Reynosa and the need that they would want to see resolved most, which shows us how most care about fixing their streets and insecurity. Therefore, it is urgent for government and private entities to think of the Mexican families and respond with housing that will push them to want to stay there for a long time.



**Figure 5.2** Primary issues to be solved in Reynosa.

Source: Reprinted from Plan Municipal de Desarrollo: Ayuntamiento Constitucional De La Ciudad De Reynosa 2016-2018.

### ***5.2.1 Changes Being Done***

This is not to say that changes are not being done. In the last ten years, INFONAVIT and other government institutions have begun to invest in research, prototypes, and have invested more in listening on the users. One example is the Land Reserve's Consolidation Program which aims to reduce the number of dwellings in the periphery. Another is INFONAVIT's programs of House Improvement and House Expansion with the goal of reducing abandonment by improving the physical characteristics of houses. INFONAVIT has begun to understand more of the problem. The data collected by INFONAVIT is being used to understand the adequate maximum distance thresholds that residents are willing to travel, the materials and typologies of new constructions, among others changes which will be implemented in the years to come.

### ***5.2.2 Successful housing developments funded through INFONAVIT***

For a full list go to “From the jaws of disaster: social housing solutions in Mexico” 21 August 2019 by Juan Carlos Cano (<https://www.architectural-review.com/10044101.article>). The housing community, “Bosco Residencial” ( see Figure 5.3 and Figure 5.4) has become an innovative reference in the future of INFONAVIT housing. First, it was not built in the periphery. The location allows for the residents to fully integrate with the context and the services in its surroundings. Also, this is in an area where more than 10,000 jobs exist. The architecture space was limited, so the architect had to know how to use the space. It ended up creating a community with extra space that it built a community center/ library and a greater number of homes than expected. Each house has a unique facade, despite all have a common architectural language. This allows for the user to feel connected to the house. Some houses even came with the option to include a business attached, as we mentioned earlier this is something

common in residences. The dwellings responded to the climate through the design changes seen in the windows and ceilings. As we mentioned also overcrowding can become a problem and these dwellings address this by providing flexible movable walls inside and very high ceilings that makes the space bigger.



**Figure 5.3** Bosco Residencial exterior and interior.  
Source: Reprinted from the architect's website, "Bosco" *Derex Desarrollo Residencial* | *Gente Confiante Construye Tu Hogar*, 2019.



**Figure 5.4** Bosco Residencial model and interior.

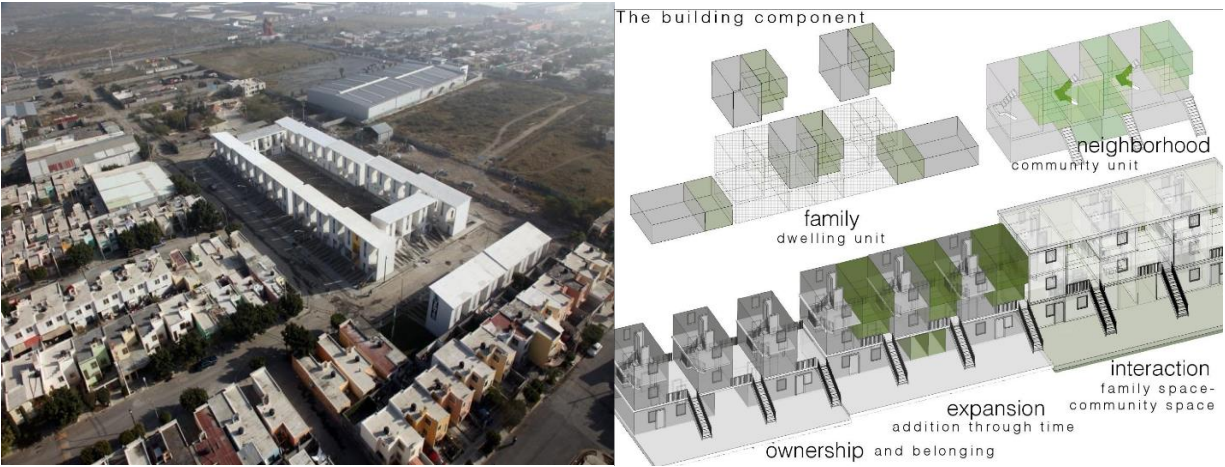
Source: Reprinted from the architect's website, "Bosco" *Derex Desarrollo Residencial* | *Gente Confiable Construye Tu Hogar*, 2019.



Another great example is the Project by Pritzker prize winner Alejandro Aravena, is the Elemental in Monterrey Mexico ( see Figure 5.6 and Figure 5.6). The points he tried to address where the sense of ownership as he allows the residents to keep building with time, a sense of community as the placement allows for higher interaction and a sense of security as children can play freely in the enclosed courtyard. The dimensions and most of the design is like what you would find in the periphery in Reynosa but done in a way that responds to some of the main issues of current abandoned housing.



**Figure 5.5** Elemental- Monterrey (facade) by Alejandro Aravena.  
Source: Reprinted from the website *ArchDaily* "Monterrey Housing / ELEMENTAL, 2010.



**Figure 5.6** Elemental- Monterrey (aerial view (left) and expansion design (right) by Aravena. Source: Reprinted from the website *ArchDaily* "Monterrey Housing / ELEMENTAL, 2010.

### 5.3 Future work

This thesis has set the foundation for future work and multiple routes can be taken. Some of the questions that can arise are:

- Further research is needed to determine the causes of/effects of/relationship between crime and abandonment
- What are the areas where they have given the most credits to in the last 5 years, and are abandoned homes existing there?
- How are the squatters' living conditions?
- How can abandoned housing be renovated or saved?
- Interviews done to people who have abandoned their housing
- Studying more built works and comparing them to existing in Reynosa
- Focus on the rest of the variables excluded for this research

### 5.4 Conclusion

It is a paradox: many Mexicans don't have a home and many abandoned homes exist in Mexico. Housing will always be basic human necessity, thus understanding a country's housing limitations and conflicts is important. Housing abandonment is connected to the fiber of society. In Mexico, The INFONAVIT organization and the Mexican government, are advancing in

change through the new-found era of research and housing promotion, yet work is still to be done. My initial expectation was to discover how INFONAVIT had failed its citizens (as this is what I had heard). Yet, I began to understand how INFONAVIT admitted to some faults and invested time and resources into providing future adequate housing that will not be abandoned. Another expectation was to identify crime as the main and only reason for housing abandonment in Reynosa. This thesis allowed me to see that crime is a critical factor, but when compared to other cities it is not enough to attribute the cause to crime, it is simply another variable. The variables presented showcase the need for government intervention, citizens intervention, and an architect's intervention. The typologies created limitation for families in Reynosa and many lacked a sense of ownership. The lack of basic services and the above average long commute to main city centers created problems for the residents. Crime and an atmosphere of insecurity can be felt, as most data shows Reynosa residents altered their mobility around the city. The spatial changes caused by fear can be inferred also resulted in the abandonment of houses. Many stated avoiding certain streets, zones, recreational centers, etc., thus it could be inferred they will also avoid certain communities, thus they become abandoned. This thesis resulted in a clearer understanding of the current housing situation in Reynosa. Reynosa is currently a city with many residents lacking housing, but also many abandoned houses. This is the paradox: a city needing houses for many homeless individuals (Mexico has a high housing deficit), while simultaneously having abandoned houses available and an ongoing construction of new homes that culminate in abandonment. This study chose to focus on the abandoned side of the paradox, and not focus on exploring the housing need. There is much research to be done in understanding this paradox.

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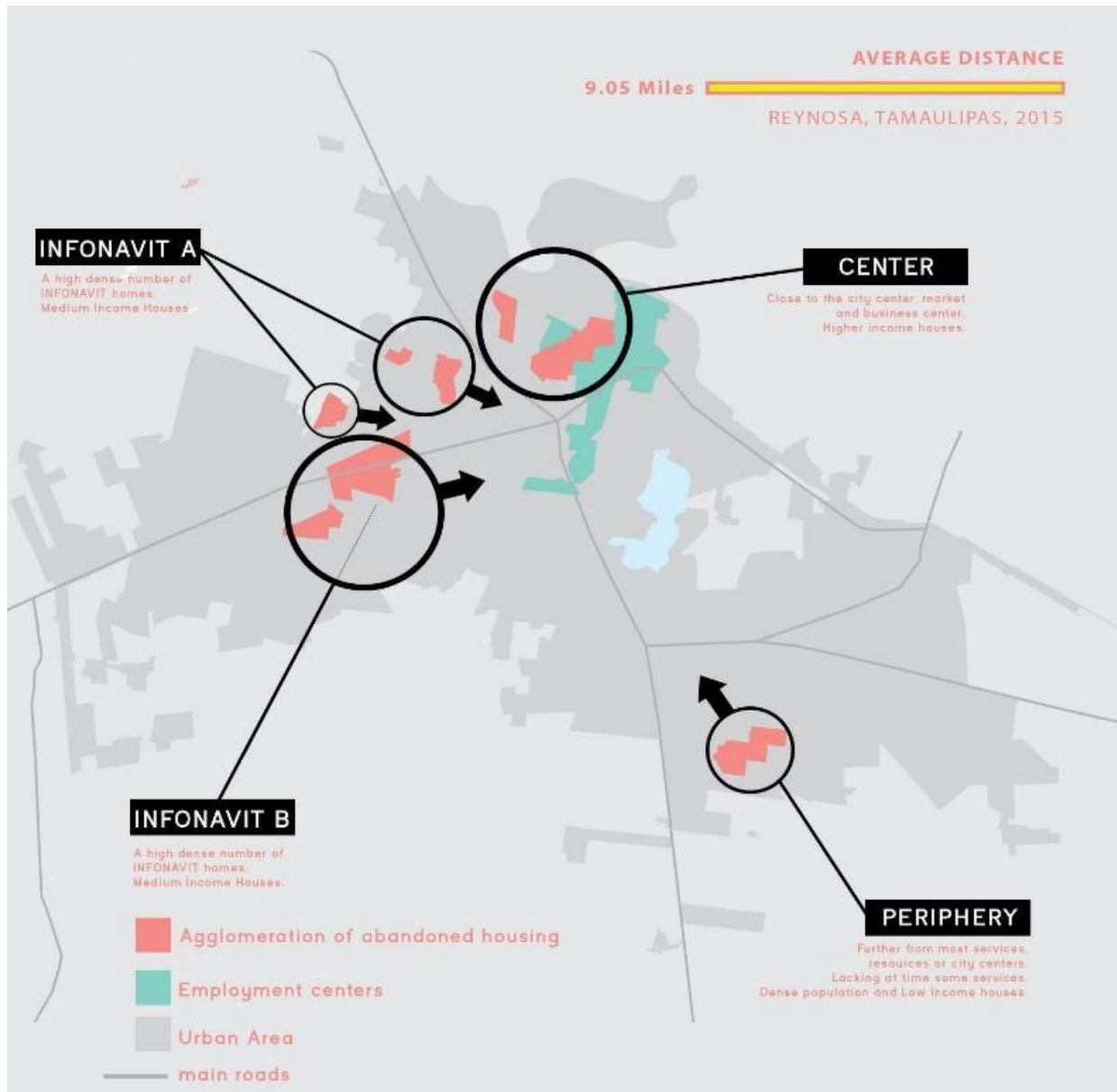
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## APPENDIX A

### MOBILITY TABLES FROM THE FOUR ZONES TO DIFFERENT CENTERS

Mobility data was collected with the end goal of gaining a basic understanding of the selected zones. The data focuses on the average distance to work and education centers. The work center chosen was obtained from the Atlas del Abandono (2015) by INFONAVIT. For the educational mobility data, the ten nearest different school centers were recorded then the average distance of the ten institutions was recorded. This data is not conclusive and will be expanded in future research. The findings are recorded in the tables to follow.

## A.1. Mobility to Work Center



**Figure A-1** The Four Zones in Reynosa of Agglomerated abandoned housing by Atlas del Abandono (2015) and the employment centers.

<b>INFONAVIT A</b>		
<b>AGEB Code Given</b>	<b>Community</b>	<b>Avg. distance to work center from housing community</b>
3233	La Cima	8.5 KM (5.30 Mi)
3661	Las Arboledas	6.7 KM (4.16 Mi)
3318	Hacienda las Fuentes Sector III	7.9 KM (4.91 Mi)
<b>Total Average Combined: 7.7 KM (4.78 Mi)</b>		
<b>INFONAVIT B</b>		
<b>AGEB Code Given</b>	<b>Community</b>	<b>Avg. distance to work center from housing community</b>
2644	Lomas del Real Jarachinas	9.6 KM (5.97 Mi)
2729	Las Cumbres	6.4 KM (3.98 Mi)
3642	Rosalinda Guerrero	8.3 KM (5.16 Mi)
3604	Jardines Coloniales	6.3 km (3.91 Mi)
3619	Valle del Bravo	8.9 km (5.53 Mi)
3623	Residencia San Jose	8.3 Km (5.16 Mi)
<b>Total Average Combined: 7.97 KM (4.95 Mi)</b>		

**Figure A-2** Zones distance to Employment centers.  
 Source: Own elaboration with data from RUV and Google Maps (2019).

<b>PERIPHERY</b>		
<b>AGEB Code Given</b>	<b>Community</b>	<b>Avg. distance to work center from housing community</b>
3708	Balcones de Alcala	14.4 KM (8.95 Mi)
3731	Rio Grande	17.1 KM (10.63 Mi)
3407	Los Almendros	16.2 KM (10.10 Mi)
<b>Total Average Combined: 15.9 KM (9.88 Mi)</b>		
<b>CENTER</b>		
<b>AGEB Code Given</b>	<b>Community</b>	<b>Avg. distance to work center from housing community</b>
1063	Colonia del Valle	1.7 KM (1.10 Mi)
1059	Ayuntamiento	1.0 KM (0.62 Mi)
1148	Simon Rodriguez	2.3 KM (1.43 Mi)
103A	Ferrocarril Zona Centro	1.0 km (0.62 Mi)
1078	Longoria	1.8 km (1.12 Mi)
2038	Arboledas Ribereña	2.5 Km (1.55 Mi)
<b>Total Average Combined: 1.72 KM (1.10 Mi)</b>		

**Figure A-3** Zones distance to Employment centers.  
Source: Own elaboration with data from RUV and Google Maps (2019).

## A.2. Mobility to Educational Zones

INFONAVIT A			Average Distance to Specific School Level			
AGEB Code Given	Community	Avg. total distance to educational centers	PreK	Elementary	High School	University
3233	La Cima	3.1 KM	2.3 KM	2.5 KM	2.9 KM	4.8 KM
3661	Las Arboledas	1.6 KM	.4 KM	0.5 KM	2.4 KM	3.1 KM
3318	Hacienda las Fuentes Sector III	4.6 KM	3.7 KM	3.6 KM	5.5 KM	5.4 KM
<b>Total Average Combined: 3.1 KM (1.9 Mi)</b>						

**Figure A-4** Zones distance to Educational centers.

Source: Own elaboration with data from RUV and Google Maps (2019).

INFONAVIT B			Average Distance to Specific School Level			
AGEB Code Given	Community	Avg. total distance to educational centers	PreK	Elementary	High School	University
2644	Lomas del Real Jarachinas	2.0 KM	0.8 KM	1.1 KM	1.1 KM	5.1 KM
2729	Las Cumbres	1.5 KM	1.3 KM	1.8 KM	2.0 KM	0.9 KM
3642	Rosalinda Guerrero	1.5 KM	0.9 KM	0.9 KM	1.1 KM	3.0 KM
3604	Jardines Coloniales	1.0 KM	1.0 KM	0.6 KM	1.0 KM	1.4 KM
3619	Valle del Bravo	1.5 KM	0.7 KM	1.4 KM	1.0 KM	2.7 KM
3623	Residencial San Jose	1.4 KM	1.0 KM	0.7 KM	1.0 KM	3.0 KM
<b>Total Average Combined: 2.0 KM (1.2 Mi)</b>						
PERIPHERY			Average Distance to Specific School Level			
AGEB Code Given	Community	Avg. total distance to educational centers	PreK	Elementary	High School	University
3708	Balcones de Alcala	5.2 KM	0.9 KM	0.9 KM	5.4 KM	13.6 KM
3731	Rio Grande	5.5 KM	1.8 KM	1.8 KM	4.4 KM	14.1 KM
3407	Los Almendros	7.0 KM	4.1 KM	4.3 KM	5.2 KM	14.2 KM
<b>Total Average Combined: 5.9 KM</b>						

**Figure A-5** Zones distance to Educational centers.

Source: Own elaboration with data from RUV and Google Maps (2019).



CENTER			Average Distance to Specific School Level			
AGEB Code Given	Community	Avg. total distance to educational centers	PreK	Elementary	High School	University
1063	Colonia del Valle	1.8 KM	0.9 KM	0.9 KM	0.9 KM	4.3 KM
1059	Ayuntamiento	1.8 KM	0.9 KM	0.8 KM	0.9 KM	4.8 KM
1148	Simon Rodriguez	1.7 KM	0.9 KM	0.8 KM	1.1 KM	4.1 KM
103A	Ferrocarril Zona Centro	2.4 km	1.4 KM	0.9 KM	1.4 KM	5.8 KM
1078	Longoria	2.0 km	0.8 KM	1.2 KM	1.5 KM	4.3 KM
2038	Arboledas Ribereña	1.9 Km	0.8 KM	1.0 KM	0.9 KM	4.9 KM
<b>Total Average Combined: 2.0 KM (1.2 Mi)</b>						

**Figure A-6** Zones distance to Educational centers.  
Source: Own elaboration with data from RUV and Google Maps (2019).

## APPENDIX B

### ABANDONED HOUSING OWN PHOTOGRAPHS

Throughout the study own photographs were taken in the different zones. This section will include some of those photographs. Some zones were not safe to travel so the photographs were taken from inside the vehicle. Most of the dwelling's photographs were considered abandoned. Most dwellings had begun to deteriorate. The photographs to follow do not portray a picture of Reynosa but just of some specific zones.



**Figure B-1** Own Photographs. Abandoned Housing: Zona Centro, Reynosa, Tamaulipas, Mexico (2019).



**Figure B-2** Own Photographs. Abandoned Housing: Zona Centro, Reynosa, Tamaulipas, Mexico (2019).



**Figure B-3** Own Photographs. Abandoned Housing: Zona Centro, Reynosa, Tamaulipas, Mexico (2019).



**Figure B-4** Own Photographs. Abandoned Housing: Colonia Cañada, Reynosa, Tamaulipas, Mexico (2019).



**Figure B-5** Own Photographs. Abandoned Housing: Modulo 2000, Reynosa, Tamaulipas, Mexico (2019).



**Figure B-6** Own Photographs. Abandoned Housing: Colonia Roma, Reynosa, Tamaulipas, Mexico (2019).



**Figure B-7** Own Photographs. Abandoned Housing: Colonia Roma, Reynosa, Tamaulipas, Mexico (2019).





**Figure B-8** Own Photographs. Abandoned Housing: Colonia Mexico, Reynosa, Tamaulipas, Mexico (2019).



**Figure B-9** Own Photographs. Abandoned Housing: Colonia Mexico, Reynosa, Tamaulipas, Mexico (2019).



**Figure B-10** Own Photographs. Abandoned Housing: Colonia Mexico, Reynosa, Tamaulipas, Mexico (2019).



**Figure B-11** Own Photographs. Abandoned Housing: Balcones de Alcala, Reynosa, Tamaulipas, Mexico (2019).



**Figure B-12** Own Photographs. Abandoned Housing: Balcones de Alcala, Reynosa, Tamaulipas, Mexico (2019).



**Figure B-13** Own Photographs. Abandoned Housing: Colonia Naranjitos, Reynosa, Tamaulipas, Mexico (2019).



**Figure B-14** Own Photographs. Abandoned Housing: Colonia Naranjitos, Reynosa, Tamaulipas, Mexico (2019).



**Figure B-15** Own Photographs. Abandoned Housing: Colonia Roma, Reynosa, Tamaulipas, Mexico (2019).





**Figure B-16** Own Photographs. Abandoned Housing: Colonia Roma, Reynosa, Tamaulipas, Mexico (2019).