

Irregular Settlements in Mexico City a complex perspective

Master Thesis

Omar Ortiz Meraz

S2132486



Prof. Dr. Gert de Roo

Dr. Marien de Bakker



TABLE OF CONTENTS

Table of Figures, Maps and tables.....	5
Chapter 1 - INTRODUCTION.....	6
1.1 BACKGROUND	7
1.2 AIMS AND OBJECTIVES.....	7
1.3 INTRODUCTION	8
1.3.1 COMPLEXITY THEORY AND NON-LINEARITY.....	8
1.4 IRREGULAR SETTLEMENTS	9
1.5 CASE STUDY	9
1.5.1 THE INVOLVED ACTORS.....	10
1.5.2 FIELD WORK.....	10
1.5.3 DATA COLLECTED.....	11
1.6 METHODOLOGY	11
1.6.1 STRUCTURE.....	12
Chapter 2 - THEORETICAL BACKGROUND	13
2.1 INTRODUCTION	14
2.2 THE EVOLUTIONARY DEBATE REGARDING PLANING THEORY	14
2.2.1 THE EVOLUTION OF THE SPATIAL PLANNING.....	15
2.3 COMPLEXITY (THEORY)	17
2.3.1 COMPLEX BEHAVIOR.....	18
2.3.2 EVOLUTION, COEVOLUTION AND SELFORGANIZATION	18
2.3.3 SYSTEMS THEORY AND NON-LINEAR DYNAMICS	20
2.4 SCENARIO DEVELOPMENT USING COMPLEXITY.....	22
2.4.1 MODELING UNCERTAINTY	24
2.5 CONCLUSIONS.....	25
Chapter 3 - IRREGULAR SETTLEMENTS AND RESEARCH PROJECT	27
3.1 INTRODUCTION	28
3.2 IRREGULAR SETTLEMENTS	28
3.3 CONSERVATION LAND	30
3.4 CHARACTERISTICS OF THE IRREGULAR IN SETTLEMENTS TLALPAN	32
3.4.1 ACCOUNTABILITY OF THE IRREGULAR SETTLEMETS.....	34
3.5 COMMUNITY ONED LANDS.....	34
3.6 THE AUTHORITY FOR THE CONSERVATION LAND	35
3.7 INVOLVED ACTORS.....	36
3.8 PROJECT DEVELOPMENT.....	38
3.8.1 THE SURVEY DESIGN	39
3.8.2 THE APLICATION.....	40
3.8.3 RESULTS OF THE SURVEY	41
3.8.4 INTERVIEWS.....	43
3.9 RESULTS OF THE PROJECT.....	44
Chapter 4 - scenarios and possible outcome.....	46
4.1 Introduction.....	47
4.2 The scenarios and outcome.....	47
4.3 Most likely Outcome	47
4.4 Development of alternatives.....	51
4.5 Clean the Conservation Land – Scenario 1	51
4.6 Stand still the conservation Land – Scenario 2	52
4.7 Smart Containment of the Irregular Settlements – Scenario 3.....	53

Chapter 1

4.8	Conclusions	55
Chapter 5 - Proposed policy measures		56
5.1	Introduction	57
5.2	Change of discourse	57
5.3	Alternative discourse and Outcome	58
5.4	Degrees of necessity	58
5.5	Policy EFFECTIVENESS in The conservation land	59
5.6	Minimal environmental services	60
5.7	Optimal environmental services	61
5.8	Agricultural activities	62
5.9	Leisure activities	63
5.10	Critical evaluation	64
Chapter 6 - Conclusions		66
References		70
Survey		75
Interview		78
	Settlement Tetecala	79
	Settlement Tlaltepancatitla	80
	Settlement tlaltepancatitla	81
	Settlement la esperancita	82
	Settlement tepacheras	83
	sentemiento valle verde	84
	Settlement magueyera	85
	Settlement magueyera	86
	Settlement dolores tlali,	87
Data mining Repot		88
AGE AND NUMBER OF FAMILIES PER SETTLEMENT		89
	AGE OF SETTLEMENTS	89
	NUMBER OF ORIGINAL FAMILIES PER SETTLEMENT	90
CURRENT NUMBER OF FAMILIES PER SETTLEMENT		91
	CORRELATIONS	92
	DIFFERENTIAL OF CURRENT NUMBER OF FAMILIES AND ORIGINAL FAMILIES	93
	NOTES AND CONCLUSIONS	94
DECISION MAKING INSIDE OF THE SETTLEMENT		95
	DECISION MAKING METHOD	95
	FREQUENCY OF THE MEETINGS	96
	ASSISTANCE TO THE DECISION MEETINGS	97
	CORRELATION BETWEEN DECISION-MAKING METHOD, FREQUENCY OF THE MEETING AND ATTENDEES	98
	6.1.1 NOTES AND CONCLUSIONS	98
WATER AND POWER SUPPLY		99
	WATER SUPPLY METHOD	99
	INDIVIDUAL WATER SUPPLY MANAGEMENT	100
WATER AND POWER SUPPLY		101
	WATER SUPPLY METHOD	101
	PROVIDER OF THE WATER SUPPLY	103
WHAT PERCENTAGE OF THE SETTLEMENT HAS POWER METERS?		104
	INDIVIDUAL WATER SUPPLY MANAGEMENT	105

Irregular Settlements in Mexico City – A complex perspective

POWER SUPPLY PROVIDER.....	106
CORRELATION BETWEEN VARIABLES.....	108
NOTES AND CONCLUSIONS.....	108
REGULARIZATION PROCESS OF THE SETTLEMENT	109
IS THE SETTLEMENT IN A REGULATION PROCESS?	109
Regularization Process authority.....	110
NOTES AND CONCLUSION	111
PROTESTS AND POLITICAL AFFILIATION	112
PUBLIC PROTEST.....	112
THE SETTLEMENT HAS ANY POLITICAL AFFILIATION.....	113
WITH WHOM IS THE POLITICAL AFFILIATION.....	114
CORRELATIONS.....	115
NOTES AND CONCLUSIONS.....	115
RELATIONSHIPS WITH THE LOCAL ACTORS	116
RELATIONSHIP WITH OTHER SETTLEMENTS.....	116
DOES THE SETTLEMENTS TAKE MEETINGS WITH EACH OTHER.....	117
RELATIONSHIP WITH THE ORIGINAL INHABITANTS	118
CORRELATIONS BETWEEN VARIABLES.....	119
NOTES AND CONCLUSION	119
Formulas for the calculation of the expansion of the Irregular Settlements	120
Calculation of the formulas and correction factors	123
Discussion of the formulas	125
Amplification of the formulas	126

TABLE OF FIGURES, MAPS AND TABLES.

FIGURE 2-1 MAP OF THEORETICAL POSITIONS IN PLANNING THEORY	16
MAP 3-1 LOCATIZATION MAP OF THE CONSERVATION LAND	31
MAP 4-1 CALCULATED GROWTH OF THE IRREGULAR SETTLEMENTS	50
TABLE 2-1 TABLE DESCRIBING THE FOUR CLASSES OF THE SYSTEMS THEORY.....	22
TABLE 3-1 SUMMARY OF THE SURVEY APPLIED BY THE UNAM	41
TABLE 4-1 CALCULATED GROWTH OF THE IRREGULAR SETTLEMENTS.....	49

Chapter 1 -INTRODUCTION

1.1 BACKGROUND

The green belt of Mexico City is threatened by the expansion of urban space in the form of irregular settlements. The settlements follow patterns of self-organization and organic growth.

The Irregular Settlements develop through the 'Sprawl Urban', also have characteristics that differ them from other forms of urbanization that came before it or the regular urbanization developed under any kind regime (Torrens, 2006). When the sprawl takes place in the periphery of an urban area, it develops its own dynamics in social, economic and organizational fields (Adrian Guillermo Aguilar, 2008). The Irregular Settlements develop outside of the legal boundaries it becomes a significant problem in the social, economical, public safety and political problems.

These situations of urban sprawl cause also other several problems and uncertainties like shortage of resources, insecurity and economic deficiencies. It varies from urban region to urban region, not to speak from country to country. It is commonly to a reflection of other socio-economic problems related to segregation and urban vulnerability (Winton, 2011).

A path to deal with the sprawl of irregular human settlements is through policy measures that may induce that the formal planning systems. These policy measures aim replacing the rigid and top-down responsibility policy system with more pluralistic governance system that adapts in with the various interests, and the relations between stakeholders (De Roo, 2007).

The exploration of possible policy measures in this work will be based on the case of Tlalpan municipality in Mexico City. Where since many decades ago there is the presence of Irregular Settlements in lands destined to forestall and agricultural use; and the current local government in coordination with the National University of Mexico (UNAM) has started a series of studies to find a win-win solution to end with the illegal sprawl.

1.2 AIMS AND OBJECTIVES

In Mexico City, a large debate has been taking place over the effectiveness of the current land use policy in practice. It is well acknowledged the presence of human settlements of different sizes, population and legal status in the peri-urban zones of Mexico City (Aguilar & Santos, 2011). The current policy has been of a reactive nature and unable to deal with the settlements that lack of a legal sprawl process.

The purpose of the present work is to propose a set of policy measures that facilitate the conservation of the green areas of the Tlalpan municipality. The tools used to outline the policy measures are the complex perspective and geographical information system. The combination of tools gives the possibility to think over in an analytical playground through the developing scenarios. In the analysis is included a set of different actors, objectives, feedbacks.

The first objective of the thesis is to explore what possibilities exist to preserve the Conservation Land from the threat posed by the expansion of the Irregular Settlements in the Conservation Land.

The second objective is to determine a set of Policy Measures can lead to a greener scenario for the zone. These objectives described are expressed in the research question and several sub questions:

How to preserve the Conservation Land against the expansion of the Irregular Settlements?

The Sub questions are:

- *How can the complexity theory and systems theory help in the design of policies for the preservation of the Conservation Land?*
- *Which are the possible scenarios for this area?*
- *How can the policy change to control the spatial behavior of the Irregular Settlements?*

The construction of an answer for the first sub question shall help to define the rest of the sub questions, and when all the answers are collected is possible to answer the main question.

1.3 INTRODUCTION

1.3.1 COMPLEXITY THEORY AND NON-LINEARITY

The word complexity in the planning practice has a long history and mixed views and definitions (De Roo, 2010a). For this situation, the most accurate would be a collection of dynamic realities and non-linear behavior. A definition of non-linearity is, a complex system contradicts the conception of 'true or false' but offering in its place an unknown number of shadows of gray. For a planning intervention in the current situation taking place at the Conservation Land in Mexico City, or any other 'complex' situation, the definition by De Roo (2010) "as a relative constitution, superimposed upon a fixed-state reality". Having then fixed states of reality to work with for the zone allow determining the degree of complexity inherent to the situation.

Based on the complexity theory three assumptions were build, from which the degree of complexity can be cataloged. The first assumption states that any open system will evolve into a chaotic situation, due to the intrinsic complexity. The second assumption notes that, from the edge of chaos and order interaction complex systems will emerge. In this assumption, the self-organization and adaptive behaviors are the most patent. The third assumption describes the result of the prior ones, from these complex systems new orderly systems will emerge (De Roo, 2010b).

From the chaos theory, complexity theory and these assumptions four classes of systems are proposed to classify the system's behavior. The first class is the closed systems, which are simple and straightforward; with stable context, perfect equilibrium and interactions are fixed. The second class is the systems with circular feedback. The context of this class is less stable more stakeholders are involved, and the causal relations are not easy to distinguish. The system is still fixed, but the feedback causes the means for change. The Class three systems or open network systems are deeply influenced by the context. The system is in movement and

Irregular Settlements in Mexico City – A complex perspective

relationships are complex, getting sometimes to the point of chaotic. These systems are also called open systems. The system again stays more or less unchanged, but the parts inside the system the system do change.

The class IV systems evolve along with its parts. This means that are systems *convicted* to continuous change. Therefore is possible to speak of co-evolution. They are very flexible systems that continuously adapt to the situation inside and outside of them. Class IV creates new needs, chances and opportunities with its change. By this definition cities, and furthermore Irregular Settlements 'can be seen as' Class IV systems, the co-evolve, adapt continuously

1.4 IRREGULAR SETTLEMENTS

A variety of terms and names has come and gone to describe the poor urban settlements, such as *asentamiento* or *barrio* (Mexico City), *favela* (Rio de Janeiro), *población* (Santiago), *slum* (New Delhi), *barrio popular* (Bogotá) are just some of the options in different parts of the world. The differences in the infrastructure and social conditions, in comparison to the higher income areas of the city, have often led to them being characterized as marginal settlements (Perlman, 1976).

In addition to the precarious conditions when adding the adjectives as 'illegal', 'irregular' or 'spontaneous' the socio-economic characteristics and methods of construction are included in the description.

They are irregular settlements because they lack planning permission and are sometimes developed in areas unsuitable for urban development. Many are located on the sides of steep hills, in swampy areas, or beyond the urban perimeter determined by the city administration as the area appropriate for urban development (Hataya, 2007)

The process the residents use to construct their houses follows an organic and humble fashion. They build their own homes with their own resources, frequently, with little or no help. Each home is built in gradual steps according to the financial capacity of the family. In the absence of official servicing, collective efforts sometimes satisfy the immediate needs of the community.

Interest in urban poverty and the housing of the poor is hardly new, and a multitude of academic studies have appeared focusing on these issues. However, the perspectives employed and the policies proposed have changed remarkably over time.

1.5 CASE STUDY

The case of study related to this work is the Tlalpan municipality, part of the Metropolitan Zone of Mexico City (MZMC). The MZMC is located in three states (regions), *Distrito Federal* (actual Mexico City), *Estado de Mexico* and *Hidalgo*; at the municipality level it contains 60 municipalities. This gives the planning practice several dimensions, legal frameworks, and political positions that prevent the application of a single policy for the whole region. Until recent years, the problem started priority in the local governments. In *Distrito Federal* (DF), after 1999 the Conservation Land established as it is, to prevent the complete urbanization of DF. There the only land uses allowed are agricultural and forestall use (Ruiz, 2011). The Conservation Land is extended in nine municipalities; the most important in

geographical and economic sense are Tlalpan, Xochimilico and Milpa Alta. The main objective of the Conservation Land is to provide with the necessary ecological services to Mexico City. The ecological services guaranty the 'health' of Mexico City.

In the Conservation Land the current law except for the "Indigenous Towns" there is no right for public services (Aguilar & Santos, 2011). The current policy does not contemplate to provide with public services to the people that build any housing in the Conservation Land. However, through different alternatives the people in the conservation land public services.

Inside the Irregular Settlements, the way of life from the urban and social perspective is characterized by the status of services. The supply water is transported to the houses by truck. There is no sewage system and power is taken illegally from the infrastructure of the Power Company. Nevertheless, there is an attraction force from the Conservation Land applied on the people searching a place to build a house. The attraction force consists on the low price of the land, and the facilities of buying produced by the self-organization process in Conservation Land (Adrian Guillermo Aguilar, 2008).

The local government looking for guidance in how to intervene change in the current policy for including the local groups asked the UNAM to participate. The role of the UNAM was to develop strategies to manage the spatial growth of the Irregular Settlements in the Conservation Land.

From one of these projects is that the fieldwork for this work was gathered.

1.5.1 THE INVOLVED ACTORS

The following paragraphs list the directly involved actors in the current situation. Each 'actor' or group of actors is explored, and linked to the case study.

The irregular settlers – People from different parts of the country that moved in the last decades to the Conservation Land. This group is in the economic sense very heterogenic, is possible to find wealthy and prosper households as well as poor and segregated.

The original inhabitants – People living inside the original towns. These towns have a historical background of existence, in some cases dating back up to 200 years ago. They hold the legal deeds to the majority of the terrains in the Conservation Land Some of them are active participants in the development of Irregular Settlements.

The Tlalpan municipality (local government) – The local government, with a growing interest on the recovery of the green areas of the Conservation Land by a more integrated and democratic approach.

UNAM/Geography Institute – Involved as third actor to perform as a mediator between the parts. The UNAM has the duty to propose a midpoint to negotiations between the parts.

1.5.2 FIELD WORK

The respective fieldwork was done as with the involved author as part of the research group that took place in 2012 during the months from May to July where the

Irregular Settlements in Mexico City – A complex perspective

Conservation Land was crossed gather the data in the form of a survey applied to the chairman, or leader, of each settlement or from a person from the settlement board.

1.5.3 DATA COLLECTED

As mentioned in the Aims Subsection, there are two major sources of direct information for the case of study zone: the cartographical data provided by the municipality and the data collected during the fieldwork. The first includes the spatial data of the zone: the contour of the municipality, the conservation land, the indigenous towns, and the irregular settlements; as well as the road network, from the tolling highways to the bike paths and dirt roads. This data will provide the spatial component to the study, helping to understand the complex situation.

For the survey data is organized in the following categories:

- **Age and population of the settlement:** *age of the settlement, number of founder families in the settlement, current number of families living in the settlement.*
- **Organization and leadership:** *how are decisions made in the settlement, how often are gatherings of settlers, what percentage of participation are in the gatherings, gender of the leader.*
- **Relationships:** *how is the relationship with other settlements, how is the relationship with the original inhabitants.*
- **Water & Electrical Power:** *is the supply regular or irregular, was the process individual or collective, who is the provider.*
- **Political pressure:** *does the settlers have taken part in any type of public manifestation, does the settlement have any political affiliation, with who is the affiliation.*
- **Studies and programs:** *there are any specific studies for the settlement; the settlement is recipient of any public program.*

1.6 METHODOLOGY

As mentioned before, the objective of this work is to propose Policy Measures to help a sustainable housing model in the Conservation Land of Mexico city in the Tlalpan municipality. To deal with the illegal urban expansion that takes place in the zone, the present work uses complexity theory to understand the processes taking place. The knowledge will aid the scenario development process that would mediate with concrete and tangible information.

Through the complexity theory, the present work attempts to comprehend the constructed reality from the different points of view and how does it evolves in time. This perspective allows resolving the degree of complexity of the situation. To find the degree the emergence, adaptation, and self-organization processes that take place in the zone will be analyzed and placed in the spectrum of planning thought. The degree of complexity indicates how to connect the issues and to determine the possible consequences of the different options proposed.

Considering the obtained information from the Irregular Settlements and the knowledge from the system theory and complex theory, a series of scenarios with the objective of preserving the Conservation Land are proposed. Each scenario is evaluated accordingly. After the evaluation is made a discussion about the

feasibility of the scenario. Later, based on the data gathered and provided about the Tlalpan Municipality, the most likely outcome is calculated.

Using the scenarios and the most likely outcome a series of policy measures are proposed with the intention of securing the function of the Conservation Land in Mexico City.

1.6.1 STRUCTURE

The Chapter 2 contains the theoretical frame for the present work. The themes in the chapter are the Planning Practice, Spatial Planning, Complexity Theory, Scenario Development and the concept of Irregular Settlements. In the Planning Practice and Spatial Planning section the evolution of planning is discussed. In the Complexity Theory section, the history of complexity is revised, and the concepts of Evolution and Coevolution and the Systems Theory and the non-linear dynamics are discussed. The Scenario Building section talks about the history of model building up to the Spatial Planning. The section of Irregular Settlements explains the concept and why they can be considered Complex Systems.

The chapter 3 discusses on detail the zone of study, the local actors, and the research project from which the present work emerges. The chapter contains a description the Conservation Land in Mexico City. Followed by a brief explanation of the Irregular Settlement for the specific case of Tlalpan Municipality. The chapter also discusses the social groups living on it and the local dynamics. Also, the description of the research project done by the UNAM. The chapter ends with the description of the survey used and the results of the survey.

Chapter 4 contains the scenarios and the most likely outcome for the Conservation Land. Each scenario consists on the application of a policy measure and the result it would have based on the discussion had on the previous chapters. The scenarios are cataloged on the degree of likeness to establish a 'control' over the expansion of the Irregular Settlements and the social repercussions such policy measures might have. The scenarios are built from the less likely to the more likely. The chapter concludes with the most likely outcome based on the survey done by the UNAM. The outcome analyses the expansion the Irregular Settlements might have if the conditions are kept as they are.

The Chapter 5 proposes a change of discourse to deal with the current situation. Instead of focus the policy measures on the Irregular Settlements, the present work proposes the application of the policy measures to the Conservation Land. The chapter proposes a series of policy measures to be applied to the zones of grater environmental value to Mexico City and discus such policy measures.

The last chapter expresses the conclusions of the present work. The conclusions explain the necessity of the change of discourse and why a complex approach is the best solutions to intervene the situation of the Irregular Settlements in the Conservation Land.

CHAPTER 2 - THEORETICAL BACKGROUND

2.1 INTRODUCTION

The objective of this chapter is to build a frame of reference for the analysis of the Irregular Settlements and the interaction with them. The chapter explains briefly the evolution of the planning theory and elaborates on the elements that will be used on the analysis further on the present work. The concepts developed are Complexity theory, Systems Theory, evolution, and scenario development.

This Chapter contains the theoretical background for the present work. The Chapter begins with an overview of the Planning Practice and the Spatial Planning. This section holds two subsections. The first briefly is described the background and the changes Spatial Planning has had. The changes in Spatial are discussed with more detail in the second subsection. In the next section, the concept of Complexity is explained as well as the Complexity Theory.

The Complex Behavior and its characteristics are the content of the first subsection. Going further the concepts of Evolution and Coevolution are discussed in the second subsection. The last part of the Complexity subsection boards the Systems Theory and the non-linear dynamics.

The Scenario Building section talks about the parallel history of model building to the development of Spatial Planning. In the only subsection is discussed how Complexity can be included in the modeling efforts.

The next section explains the concept of Irregular Settlements and why they can be considered Complex Systems. A deeper discussion on the zones is held, the periphery zones in the first subsection. The last section holds the conclusions of the Chapter.

2.2 THE EVOLUTIONARY DEBATE REGARDING PLANNING THEORY

This section is a brief summary of the evolution of the Planning Practice. The themes examined go from the early technical and blue print thinking to the Spatial Planning. The section finishes with the discussion of the communicative turn.

Urban spaces are constantly subject to change across time and space. The features and characteristics are constantly being reshaped and adapted through various mechanisms, from formal decision-making processes to self-organization movements (Crooks, Castle, & Batty, 2008). Every part of such system should be considered, from the daily activities, the land development migration etc.

Spatial Planning is the approach used in this work to propose a policy frame for managing with the situation discussed in Chapter 1. Like many concepts Spatial Planning has earned many definitions, but most of them converge in the idea of shaping the economic, social, cultural and ecological spheres that society touches. While this concept is related in its origin to the continental European planning tradition, now is more common to see Spatial Planning being used in other regions of the world. Spatial Planning has been built upon various and wide foundations. These foundations include structuration theory, relational geographies, sociological studies, institutional capacity building, discourse analysis and frameworks (Allmendinger et al, 2005; Baker et al, 2007; Shaw and Lord, 2007 in Phil Allmendinger & Haughton 2010).

2.2.1 THE EVOLUTION OF THE SPATIAL PLANNING

Philip Allmendinger (2009) reflects on a moment of history when the discussion of Planning Theory was a straightforward process. Moreover, was limited to the application of the scientific method in a rather crude way to outline the policy on the works. However, from this point in history where there was a certain air of arrogance. The Planning Theory has moved to a more introspective and uncertain standing. This shift of attitude came as the result from the perceived failure of the technocratic approaches. The technocratic approaches ignored several issues, like gender, race, democracy and culture. The new standing for the Planning Theory is now in the realm of the post-positivist thinking, acknowledging the indeterminacy, incommensurability, variance, diversity, Complexity. This shift requires a leap from causal reasoning as the main element and basis of plan making to discovering and confirming meanings.

2.2.1.1 TECHNICAL RATIONAL TO PLANNING

The belief that the world can be modeled into simple straightforward systems is not only a post-war attitude. This attitude was in tune with the need of precision and 'command and control' of those times. Nevertheless, there was also the wish from the social sciences to wear the suit of cleanness, elegance and simplicity inherent to the Newtonian models for physics. The idea behind the Newtonian models for physics was to show a world in equilibrium. Allowing simple models and formulas describing all the physical phenomena in nature (Zuidema & De Roo, 2004).

The concept was then to extrapolate this concept from the material world and apply it to 'reality'. The idea was to obtain a simple model that would explain the situation at hand. Such models would make social sciences embrace the concept certainty. The main tool to gain such certainty in the positivistic perspective is the verification. In that time, verification was considered to be the ultimate test for grasping reality (De Roo, 2010b).

One of the most influential names in Planning Theory during (and since) the decades of 1980s is Faludi, who developed his approach on the distinction between substantive and procedural theory. However, his was not the only position, Friedmann, Healey and Underwood developed each one their own ideas in opposition to Faludi. For example, Healey in 1979 presented a map of the theoretical positions in Planning Theory. In her map, the new and emerging positions in reference to the procedural Planning Theory Planning Theory; the social and advocacy planning are conceptualized as parts of the procedural planning (P. Allmendinger, 2002).

The planners appealed for the technical-rational approach while trying to contribute to the progress and fruitful development of the society. Aiming for certainty when the moment of decision making the objective was to predict and control the outcomes. Knowing precisely what the future would be. At that point, the planner was invested with the mantle of expert, steering the path for society to follow. This position was endorsed by their bureaucratic and democratic position in the institutions. That position was considered to be an absolute need to establish order and progress (De Roo, 2010b).

By that moment, there was a clear position of mechanisms, and desired targets meant for the planning departments of each government. Much in tune with the manifestations and national policies and rationalities the Planning Practice was part

of the political thinking of the moment, a blueprint future (Phil Allmendinger & Haughton, 2010).

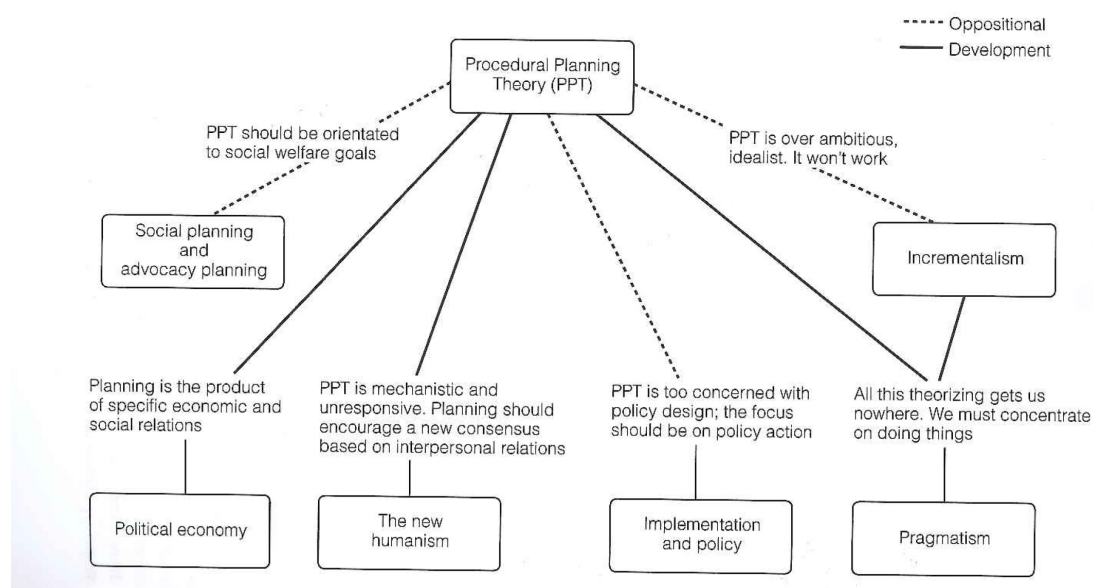


FIGURE 2-1 MAP OF THEORETICAL POSITIONS IN PLANNING THEORY (HEALEY, MCDUGALL AND THOMAS, 1970 IN P. ALLMENDINGER, 2002)

2.2.1.2 THE COMMUNICATIVE TURN

Just like politics and the society has moved from a strict, nation central, ideology to a more decentralized democratic and content sensitive attitude (Loorbach, 2010). Planning moved on from the search of a utopia, where certainty prevails, where planners have a perfect understanding of the environment surrounding us. This new position seeks a more pertinent and sensitive way of planning (De Roo, 2010b).

From this position is that the spatial planning and the communicative turn start shifting from a central thinking to a more local and regional and institutionally devolution, providing a new public management thinking.

New planning spaces and governance with a local focus were the results of this way of thinking. However, these changes occurred in companionship with complex parallel processes. The objective of those processes was to adapt the governance and planning mechanisms to the new 'local scale'. Duties like economic development and resources assignation are just some of the new tasks that came with the change (Phil Allmendinger & Haughton, 2010).

Several authors like De Roo, Healey, Martens, and Voogd & Woltjer predict that the transformation of governance and planning models will keep going Migrating from traditional systems and models like top-down, central government and technical solutions into pluralistic governances approaches that adapt congruently with the balance of interests and the relations between stakeholders. Turning policy control into an adaptive tool that merges with the situation at hand (De Roo, 2007).

The step that the Planning Practice had taken can be seen as struggle even in the northwest side of Europe. Several planning bodies have not had a smooth experience when the moment of transforming the environment to the conjunct desires. The planning bodies find themselves allowing developments taking their own

Irregular Settlements in Mexico City – A complex perspective

course. Instead of the developments being guided and motivated by planners, who give the impression of staying one step behind at the time to deal and adapt to reality.

According to De Roo, even with these imperfections is a better option to challenge and adapt the system (features inherent to the nature of the model) of governance. Instead of, listening to the more radical positions that advocate restarting from scratch. (2007).

All these issues in the Planning Practice have pushed for the development of the (concept of) Complexity as defined in Chapter 1 as *a collection of dynamic realities and non-linear behavior*. It took considerable time and effort before this and many more definitions came to exist. The non-linear behavior evolved from the negative idea of situations being “too complex to manage” and the disastrous fame of Complexity. The planning academic community has started a debate on the concept of Complexity; and how should we act at the moment of facing it (De Roo, 2010a).

De Roo (2010b) gives us the perfect phrase for the tune for this work to engage such theme:

“Between these two opposed understandings and interpretations of Complexity is a world-awaiting discovery, in which Complexity has a positive role to play in planning”.

2.3 COMPLEXITY (THEORY)

This section boards the Complexity Theory, the evolution it has had and the current status that it holds. The Complex behavior is explained, as well as, the concepts of evolution and coevolution. The section closes with a discussion on the systems theory.

In the last decades, a notion that science per se would solve and answer any question and mystery from the universe has been disappearing (Michael Batty & Torrens, 2001). A more doubtful and critical standing is needed. A standing that requires the observer (the scientist) to acknowledge (and expand) the limits to the human logic to understand non-linear systems.

PM Allen (1997) recalls the work of Prigogine, acknowledging him as the first to realize and study the non-equilibrium systems in a scientifically basis. The understanding of such systems helped to understand the emergence of Complexity and its systems, which have their own set of rules and self-organization mechanisms.

Complexity science is defined as the study of such systems whose internal structure is not reducible to a simple straightforward mechanism. In addition, how do these systems connect with each other; where no simple assumptions about their interactions can be used. (Peter Allen, 2001)

These characteristics made the planners contemplate Complexity as a quantification and (at the same time a) confrontation with reality. Planners constructed a Complex Constellation of interest, Complex Relationships and a Complex Process.

This made the planners see these complex interrelationships as an untamed unpredictable and cumbersome situation that is impossible to manage. From this perspective is that Complexity was feared as a barrier, an obstacle for achieving satisfactory resolutions to the Planning Practice (De Roo, 2010a).

From all the mentioned above some planners started linking Complexity with complicatedness and unsolvable problems. Others realize there is a fundamental difference between Complexity and complicatedness. Some argue that the environment and society are sensitive to changes. That the environment and society are becoming more and more complex and that the Planning Practice should adapt and behave accordingly. The other (and contrary) position assures that reality is, and always has being, complex. This work is more in tune with the second opinion because thinking the reality changes accordingly to the collective consciousness is just like claiming the sun spins around the earth; just because is what we can appreciate to the naked eye.

2.3.1 COMPLEX BEHAVIOR

In a Complex System, we see macro-structures emerge and dissolve constrained by the choices of actors and their positions. The actors and structures are coevolving as a consequence of the interactions, behavior, knowledge or ignorance of the actions, and decision that are taken inside the Complex System. The results of the mechanisms of a Complex System make impossible having one single strategy for interacting with the system (Peter Allen, 2001).

A strategy applied in Complex systems no matter the size or scale in one or two parameters can induce dramatically big changes into the whole system. No matter if the intervention was aimed to only one of its parts. Complex Systems are called also nonlinear systems due to the way some of the components of the system act and interact with a feedback loop web, that changes with each loop or trial (Anderson, 1999).

One way to characterize Complex Systems proposed by Batty and Torrens (2001) is by the states or conditions the system can adopt. A good example is a system with N elements where each element can be at a specific state. Each state is described by a binary state of existence or not existence as a particular condition for each element then we have 2^N different states. Taking this system to a whole class of urban models built around cellular automata gives a proper sense of Complexity. In an urban system where the state of the system might be described by N cells, and with each cell can developed or not developed (instead of existing or not existing). Therefore, if the system is limited to 100.000 cells or zones the number of possible states defies description.

Increase the number of states and rules generating states and the system starts gathering characteristics that cannot be handled by conventional theorizing, it becomes Complex.

Michael Batty & Torrens (2001) point out even if this of characteristic of Complexity has been known for a long time. The adoption in the worldview of the Complex Systems has transferred attention away from the restrictive aspects of models. Making that the new models have to deal with the boundaries of Complexity.

2.3.2 EVOLUTION, COEVOLUTION AND SELFORGANIZATION

Evolution and self-organization have been so far the most opposite phenomena to the closed systems with physical equilibrium. Basic nonlinearities in a system can reflect evolution and self-organization by leaping from symmetry. The self-

Irregular Settlements in Mexico City – A complex perspective

organization can break patterns and instabilities which the prior state or organization the system did not have (PM Allen, 1990).

The 'real world' or 'reality' can be assumed as a nonlinear and Complex System. Evolution and self-organization are constant characteristics of it. These characteristics make 'reality' a more lively system than any fixed mechanical artifact. Symmetry breaking transitions occur spontaneously. Structures grow and fall, modifying their patterns (self-organization), and changing in time (evolution).

Evolution is a term borrowed from biology; there it is related on genetic reproduction, and adapting for the better use of such genetic information. So new stages for the entities are reached, and the 'new' adapted information is affecting the behavior or life cycle of the new generation. However, in the social systems, contrary to the biological process, the transfer of modifications is not only passed to the descendants. In a social system the transfer of information, can be done in all direction, vertically and horizontally. This exchange is possible to coevolution of social entities. Coevolution is defined as the process when more than one entity changes (or adapts) to suit some purpose or due to some other incentive.

In social terms, evolution and coevolution are not just about solving problems or optimizing processes in a positive way. They also refer to the emergence of self-consistent and organized groups or set of populations, developing and taking new positions, opportunities problems and characteristics that rarely stop. Evolution and coevolution processes are dynamic and constant features.

Mentioning the characteristics and effects of an evolutionary process is not enough to fully understand it, or frame management strategies and policies to deal with them. Planners must rethink the policies and strategies they propose to fit the mechanisms of a complex and evolving social situation.

Allen (1990) helps by providing an example: he poses an evolutionary landscape of hills and valleys representing levels of functional efficiency of different possible organisms. In such landscape, there is an 'error maker' who is able to modify the topography. There is also an opposing 'rival' who gets set out of competition by the 'error maker'. The errors are made even if it would be better not to make the error

The concept of Evolution then implies a change of 'form', character, behavior or strategy that modify the inner mechanisms of an entity or system resulting in a different life cycle, and its relationship with the rest of the world (PM Allen, 1997). Contrary to the biological concept in the case of anthropological agglomerations (cities, towns, settlements) is quite more complicated to speak about a life cycle, especially about an entity dying. Because an entity that is relatively young (less than 10 years) might have similar characteristics to other entities that are several decades old (20- 80 years). In addition, the "natural selection" process is less strict, making harder to find "mutations" or different varieties in the system. This means that in general, in a certain system we can find a shorter spectrum of entities than in a biological (or any other) framework.

The Coevolution process of a social organization or structure with its context is about continuing the process of modification, altering them 'inside' and 'outside' mechanisms over time and space. This process of Coevolution may be held by to close entities or systems that blur the barriers between each other and radically redefining their boundary (P. M. Allen, Varga, & Strathern, 2009).

2.3.3 SYSTEMS THEORY AND NON-LINEAR DYNAMICS

Classifying systems that cannot be simplified by conventional reduction or aggregations because in doing so the characteristics and crucial information would be lost produce a big challenge. Such impossibility of reduction may even be counter productive for some scientifically based study. Especially when the objective is to understand the system with the aim to intervene in order to modify certain characteristics.

A second issue related to the process is how to model the characteristics in space and (even more especially) on time. The time scale is where the system's dynamics change. Those changes are reflected in space and mechanisms to the 'inside' and the 'outside' (Michael Batty & Torrens, 2001).

For example, when presented with an object that has emerged into 'reality', and once it was considered to have well known and logical limits. A clear interaction with the rest of the system might, over the course of time, change or mutate into a completely different system. Modify its size, change its mechanisms to the 'inside' and 'outside'. The new object may devour, or be consumed by, another object in the system. Enter in strange and unpredictable loops, and end up being something that has little to do with the original system. How do we make any clear and crisp representation of the system, and how do we bind it to space and time?

To answer this question, Complexity Theory has shown interest and a willing hand by demonstrating models of systems. Before such models, those systems were qualified and doomed to be inexplicable because the erratic, unpredictable, and commonly surprising behavior (Michael Batty & Torrens, 2001). Once such behaviors were not surprising and erratic, the study and explanation process could begin properly.

Rewinding then, the jump made from the failure of strict Newtonian models to a scene where the role of the planners were no longer blueprint designers and cold calculators but social engineers (Michael Batty, 1991). The planners had the need to understand how does the world changed and help society change and adapt to it. In this moment of change, the System Theory was given by several authors a classification for such systems.

De Roo (2010a) makes a list of authors (De Roo, 2000/2001; Christensen 1985; Geurtsen, 1996; Van de Graaf and Hoppe, 1996; Minzberg, 1983; Stacey, 2001; Van der Valk, 1999) that have collaborated in the classification of systems based on the intrinsic Complexity. The classification allows establishing the degree of Complexity of the system. As well as, connecting the issues related the issue and the consequences of intervention. The classification allows the Planners to chose the best approach to intervene a situation no matter the degree of Complexity. Moreover, manage a closed system with different tools that the ones needed for dealing with a network system.

The objective of the classification is to give the analysis of the system versatility and robustness at the same time. The only thing a planner should have always in mind when using the classification is: that this is not part of the standard body of Planning Theory, but part of the vanguard of new theories that might allow for better understanding of 'reality' and how to interact with it. The first foundation of the planning practice was based on the idea of closed systems with see-through elements, which interact in direct cause-effect relationships. These types of systems are considered Class I. Class I systems were conceptualized as unchanging systems

Irregular Settlements in Mexico City – A complex perspective

in time, such characteristics allowed for the premise of fully understanding these systems. The popularity of Class I systems started to see its end by the post-war period (De Roo, 2010b).

Since the world rarely can be considered static, the next step was to integrate the feedback a system may encounter. The systems that are locked into oscillation between fixed states are referred to as Class II systems. This second class did not fulfill the expectations of everyone in the planning community. To broaden the use of the Class II system the study on the actors and the interactions was integrated. Instead of the physical identity and characteristics of the issue at hand, with this addition of the 'network thinking', a leap was made from object-oriented perspective to a reflexive inter-subjective position.

Insufficient was the Class II system when dealing with a system that presented no predictable loops or patterns and has no stability. Class III was defined with such characteristics, but a shift of paradigm came with such a concept. Contemporary Planning Theory is until this point trying to assimilate and ease itself with the idea of a dynamic and malleable 'reality'; giving room for the experiences of the network approaches.

The concept pushing forward all of these approaches is called 'communicative rationale'. This side of the Planning Theory places much interest then on how to build 'realities' by common consensus. Such rationale has gathered the attention at the beginning of the 21st century of several authors like Allmendinger, Tewdwr-Jones and De Roo.

For many reasons while talking about feedback and unpredictable outcomes, the role 'time' plays normally is ignored. Class IV system was conceived to integrate time and its effects into the systems theory. Class IV differs from all the previous classes on one hand by including the transformability across time that an entity can show and on the other by showing the (not always appreciated) feature of permanent coevolution (De Roo, 2010b).

The perfect example for this Class IV is a city. Cities develop as physical entities over time; they are robust systems resisting the majority of imaginable threats, disasters and any eventuality that might happen; being capable of rebuilding even from a critical situation. At the same time, the city is a very flexible system, adapting to the changes and public needs, by official or civic channels. In addition, cities evolved from the citadels with the function to protect and provide with the most basic needs. Turning themselves into centers of commerce, debate, innovation, productivity; being attractive places to live.

Class / Characteristic	I	II	III	IV
behavior in the macrosystem (universe)	Linear	Loop	Erratic	Adaptive
behavior in time	Fix	Repetitive	Known	Emergence
Objective of the system (target)	Static	Clear	Semi Clear	Unclear
Focus	See through elements	How networks work	dynamic and malleable 'reality'	Evolution & Coevolution

TABLE 2-1 TABLE DESCRIBING THE FOUR CLASSES OF THE SYSTEMS THEORY.

2.4 SCENARIO DEVELOPMENT USING COMPLEXITY

In this section the concept of scenario development is discussed. The themes in this section are the evolution of the scenario development, the inclusion of complexity in the scenarios and the solutions to deal with the complexity. A subsection is dedicated to the concept of uncertainty and the efforts to include it in the scenarios.

To intervene the Complex Systems is necessary to aggregate spatial, taxonomical and evolutionary information from a scientific perspective. The information should be analyzed using both the 'hard' and 'soft' standings of science. To create models that could offer an insight from the technical rationale perspective was proposed to replicate the elegance and simplicity of the Newtonian model. To build a model it was necessary to understand how each piece comes together in the system, and what forces drive each part or mechanism. The result of having the knowledge would allow to constitute a model of the system that would (in the mind of the time) bring understanding and make predictions (PM Allen, 1997).

To constitute a model the mechanisms are expressed in terms of the "typical elements of the system", where the spatial and taxonomical included and digested into more tangible elements. The intention behind this strategy was to have models that corresponded to reduced and manageable descriptions of reality, assuming that only average conditions were present for the calculations.

Nevertheless, the intrinsic Complexity surrounding a 'natural' system was not properly contemplated so, just like in Systems Theory, such a simplistic approach failed to capture the real interactions and adaptability that are always present in the 'reality'. Instead of giving up on mathematical solutions, some members of the planning community jumped into the wagon of the Technological Innovation. Such innovation became quickly rooted in the Western Planning Practice because of the use of computers and telecommunications to build plans for cities (Michael Batty, 1991).

Computer models bought time for the idea of building understanding of the 'reality' by the use of a Newtonian model. Nevertheless, it remained impossible to produce a model that contemplated in a proper way the Complex behavior as well as, situations and conflicts that come with it (P. M. Allen et al., 2009). To understand a social system including: how will it behave, how it will be affected by choices, and the

Irregular Settlements in Mexico City – A complex perspective

reaction to an applied policy the planning community aided themselves by experts from other disciplines. The planner can build complex models, including the internal structures that can change over time.

Changing its internal structure and the inner hierarchy on each system, and the stability or lack of it from a system the idea of a Newtonian-like model for social sciences had to be abandoned (PM Allen, 1997). The reason behind trying to emulate the simple physical-mechanical equations is simple: is so elegant that seems to be perfect. Nevertheless, the reasons of why it did not work are by far more interesting.

Newton's model only fulfilled the need to describe the physical phenomena of the gravity. The Newtonian model was never meant to explain the true nature of gravity.

Furthermore, Newton's formulas were never created to model social phenomena, they do not reflect that people can respond, react, learn and change according to their individual experience and personality; Human systems are not mechanical (PM Allen, 1997). The option was then to jump from a mechanical approach for understanding the social phenomena to the use of probability and statistics.

Taking the behavior of the subjects as the base to building models that represented more accurately the interactions of large populations, and while this step helped with getting models that are more realistic, the individual decisions were still ignored at large.

Taking this step models attempted to trade some of the Complexity of the 'real' world with some simplicity of a reduced representation at the discussion table. Peter Allen (2001) gives two assumptions concerning a relevant system modeling: first, establish the relevant System boundary, which refers to excluding the non-essential elements Second, reduction of full heterogeneity to a typology of elements, like individual, groups, networks, and find the average behavior.

These two assumptions make the model more grounded and sensitive to the adaptive and evolutionary features of the 'real' system. The model acquires the possibility to match the possible inflection points and have an idea of spontaneously evolutions of the involved agents. Having all the information at hand allows classifying the system by how it relates to the situation or object in study. This information include the history of how did it came to be, and how is it expected to behave in the future.

(Peter Allen, 2001) explains the current objective of model making:

"The idea behind the 'modeling' approach is not that it should create true representations of 'reality'. Instead, it is seen as one method that leads to the provision of causal "conjectures" that can be compared with and tested against reality".

So it is clear that the model is not reality, nor tries to be. The model is a creation that helps the modeler, in this case the planner, to reflect on the questions that have to be answered. Such process cannot assure the certainty of the model, or if it will work. So we cannot think that the results of the calculation will represent reality but just one possibility. Therefore is possible to build an extreme, or must influential scenario to make considerations for plans and policies. Therefor much debate has grown over

the surroundings of new technology in planning matters, and how does it help to solve the tensions between technical and political thinking (Michael Batty, 1991).

Building a model then is to encode a natural, or 'real' system into a formal or 'logical' system, compressing the longer description into a shorter and easier to manage by excluding the non-essential information. When dealing with non-linear and Complex Systems the difficulty increases dramatically. The interacting elements inside of them are sometimes contradictory, and simple reductions have no place (Anderson, 1999).

2.4.1 MODELING UNCERTAINTY

Contrary to the 'traditional' scientific view, where the modeling process eliminates uncertainty the approach of the Complex Systems in society must include it. One example is a certain knowledge that a certain part of the system might hold in secret, and the reaction of such knowledge by the second, such situations cannot be easily predicted. Instead of having a pessimistic view of the situation we can use Complexity and Evolutionary theories to bring the scenarios closer to reflecting a Complex situation.

Just like in the biological concept of evolution, in social sciences it is not necessarily linked to progress or a preordained future. That is why can be rarely foreseen to its full extent, yet is possible to recognize some triggers and patterns that make it possible (PM Allen, 1990).

To properly model the changing world, and the realities attached to it, is necessary to understand the process of learning and adapting. The current perspective of planning is using Complexity and Evolution Theory to build the models. The objective of the models is helping to revealing the mechanisms of adaptation and learning that are present in 'reality'. With such knowledge is possible to imagine and explore possible avenues of reaction and response. So we could say that these models build on Complexity are concerned with exploring possible futures and the qualitative nature of those instead of containing a detailed description of existing systems (Peter Allen, 2001).

Batty and Torrens (2001) proposed that a theory induced using a particular set of information needs to be validated against another different set of information.

One simple model is, is a model in which an independent variable Y measured over certain periods or ranges. The variable Y is explained in terms of another independent variable X over the same periods or ranges. In some cases, a single independent variable $X_1 X_2 \dots X_n$ is used to explain variation in a single variable Y_n . Each independent variable X_n accounts for some independent component of the variation in Y . It might be argued that if more independent variables used in this way, the less frugal the model becomes.

A second principle for a good model building involves testing the model in a different context, independent from the original context that the model was build. This is just a heritage from the closed-door laboratories with deterministic point of view of science for setting up experiments. To validate a theory this principle demands that the model is corrected, and fine tuned with the second context by analyzing how does it transfers from one situation to the new one (Michael Batty & Torrens, 2001).

Unfortunately, this is rarely possible for Class IV system. It remains to be proven to be possible due to the different patterns that one single complex situation may take.

Irregular Settlements in Mexico City – A complex perspective

However with the special cases of rich data models containing homogeneous undifferentiated processes with linked inputs and outputs meet the requirements of independence to include some Complexity in them. There are situations where the observations are extensive and rich enough and meet a homogeneous standard. The system can be partitioned into different sets or regions without adding distorting noise to the model building process.

This can be seen as fitting a model to one segment of a city, and the validating with the full extent of the city. However, this is just theoretical, some cities are quite homogeneous in their growing patterns. Larger or more ancient cities will hardly pass this principle due to the spatial variations that might be present in different parts of the city. Nevertheless is a common practice that if the data sets are rich and the relations between inputs and outputs are predictable the model might fit on a certain extent of the urban space (Michael Batty & Torrens, 2001).

There are other methods for modeling the urban space based on Geographical Information System (GIS). In this category, some are based on the concept of a cellular automata with a time sensitive change process that take place in immediate spatial continuity are programmed on each element (M. Batty, Xie, & Sun, 1999).

From a Complexity point of view, the cellular automata model will always be limited by the recorded interactions. No matter how detailed programming is inside each cell, the dynamic changes are only limited by spatial vicinity.

Not including entities that might be subject to another type changes other than spatial. As mentioned before in this chapter, entities emerge and dissolve constrained by the choices of actors and their positions. The changes not always take place in the immediate vicinity of the elements. Is concluded then that the association between cells, grids and raster-based representation in a GIS environment limit the cellular automata models. The models are incapable to reflect social dynamics like self-organization, organic growth and other Complex characteristics.

Nevertheless, there is great value to the cellular automata in less Complex Systems it might be more effective. If used on the correct scale and a more accurate focus like proper zones with activities in urban systems that follow cycles, the extent of choice making is limited to the immediacy of the entities good results can be produced.

Batty, et. al. (1999) retake the work of Forrester in distinguishing certain Urban Dynamics, how new, mature and declining housing, industry and commercial land uses are subject to different rates of growing (or decline) and different rates attracted or detracted investments in the zone.

2.5 CONCLUSIONS

As mentioned in the previous chapter, the objective of this work is to aid in the development of measures that facilitate the conservation of the green belt areas of the Tlalpan municipality. To do so, we must understand that we are dealing with a mixture between green/urban spaces.

Several elements relating to Complexity Theory have to be applied get the wished understanding. Self-organization and coevolution are to characteristics common in the zone. The Irregular Settlements have their own management system with no

fixed set of rules or plans. Making the irregular settlement fall into a Class IV system classification. Placing the Irregular Settlements as a Class IV system can explain why there has been several and unfruitful efforts to deal with them. The technical problems start from keeping an up-to-date catalog of the Irregular Settlements to preventing the growth and apparition.

The concepts developed in this chapter in conjunction with the academic discussion of the situation in chapter 3, will be used in chapter 4 to evaluate the possible scenarios for the Conservation Land. As well as in chapter 5 where they will be used to analyze the proposed policy measures.

CHAPTER 3 - IRREGULAR SETTLEMENTS
AND RESEARCH PROJECT

3.1 INTRODUCTION

The chapter begins with the application of the concepts developed in Chapter 2 about complexity and evolution into the Irregular settlements, later is included the description of the Conservation Land in Mexico City is discussed where the problems are framed using Complexity Theory. Followed by, a brief explanation of the Irregular Settlement for the specific case of Tlalpan Municipality. Describe also the social groups living on it, the methods of occupation and commercialization of the terrains. Followed by a review of the mapping and cataloging efforts previously done for the zone. With a discussion of the success obtained. Next, it is a summary of the actors involved in the situation of occupation of the Conservation Land: the irregular settlers; the original inhabitants; the Tlalpan Municipality and lastly the UNAM. In the next section, a description of the project this work is the project description. Here, where the objectives and methodology of the project are explained. Followed up by, the description of the survey used and the results of the survey. A summary is included with the highlights of the interviews done during the project. Lastly, the results of the project are discussed.

3.2 IRREGULAR SETTLEMENTS

In this section the Irregular Settlements are discussed. The main characteristics and how it relates to the complexity are explained. A subsection is dedicated to explain the processes of growth of the Irregular Settlements.

Deconcentration and explosive growth are common symptoms in Latin America due to the industrialization and development of the economy of the larger cities in the last decades. These symptoms are driven by self-organization and coevolution. Automatically classifying the cities in Latin America as Class IV at the edge of chaos. The changes in the trace of the urban spaces come also with transformation of the political decision-making processes. One of the major processes in the transformation consists in the main metropolis of each country gaining power and primacy over other cities. In the other hand, the smaller nearby cities suffered from a slower growth, placing in a harder position the inhabitants of the smaller cities. This process induces migration from the rural or small cities to the large urban spaces (Adrián G Aguilar & Ward, 2003).

These movements of people kept fueling the economy and creating circles. Smaller cities send people to the larger cities; the smaller cities diminish their local economy. At the same time, the inhabitants emigrate searching for better quality of life in larger cities.

The transfers of people made the inner city hubs densely populated, especially by the working class. Reducing with time the space for the people that would in the future arrive in the city. The middle and upper class then started to build suburbs in the outer regions of the cities. Fully occupying the planned areas with the appropriate land use for building housing. The process kept until a point where the people immigrating to the city had no real chance to find accommodation in the inner hub. The option for them was to 'spawn' illegal, irregular, self-organized settlements on the outskirts of the city. From a Complexity perspective, the new settlements surrounding the cities can be positioned as a cluster of Class IV systems surrounding a larger Class IV System.

Irregular Settlements in Mexico City – A complex perspective

Several are the repercussions caused by this phenomenon. Aguilar and Ward (2003) mention three broad demographic effects: a transfer of the middle class population to other parts of the region; a further decline in the inner city population, compensated by a densification of the existing built up area and the development of self-build and self organized settlements; an inflow of new migrants, with a stronger preference for the periphery, into the urban areas.

Researchers have wondered how do the self-organized settlements develop and coevolve as time passes and population changes. Another question is, what is the nature behind the movement of people; what role does the labor supply, or the economic development plays; what are the wage differentials and living costs in comparison to the points or origin from the people moving to the city (Pérez Campuzano, 2006).

Other questions have focused on how do the irregular settlements behave and organize. The present work will focus on the current situation that is taking place in the periphery. In the Periphery, the governmental action is present normally with delay. The actions are not done with an accurate idea of the full situation, and the settlements have capabilities of self-organization and very complex behavior.

3.2.1.1 GROWTH IN PERIPHERY ZONES

The expansion of the urban space in the periphery of the city (regular and irregular) commonly follows two main patterns (Adrián G Aguilar & Ward, 2003). The first one is in the form of urban corridors as the name suggest are linear developments. Concentrating an eclectic collection of activities along the way, from corporate developments, industrial parks, residential areas, and the density is proportional to the distance and size for the nearest city. The other pattern is surrounding urban sub centers.

In the peripheries from the large cities, such centers were normally towns with agricultural activities. When the city became large enough they became part of the very same city. These changes can be considered of Complex Nature. They involve a lot of self-organization, different patterns of coevolution and a large number of hidden mechanisms. Making hard to fully understand the relationships that are handled inside the irregular settlements, related both to their population, how it grows, distributes, migratory patterns and the economic activities related to the main city (Pérez Campuzano, 2006).

The result is a diffuse fringe from the rural-urban and an unknown number of realities operating in the periphery of the cities. The fringe is also a vast field for research regarding the irregular settlements.

Some of the results of the research done in the zone include a general idea of the occupation process of the rural land-use. The occupation begins with a buyer who does the transaction with a seller that has not completely control (land-use) of the land in deal. This type of transactions is considered then as clandestine. A complicity is built between the seller and the buyer. The complicity consists on the both parts ignoring the agricultural or forestall land use of the zone. Even the staff of the municipality can be part of the complicity. The staff overlooks these transactions to get political support.

To explain the conditions of why such complicated and unconventional urbanization processes persist, at least in Mexico City, two main points must be discussed. The

process to give partial recognition to these settlements is rather common. It is also a tool to gather political power within the urban context. One condition for the development of the irregular settlements is the recognition process some actors give to it, as a twisted vision of 'social integration' for the immigrants coming to the city. That way the local governments manage to maintain a certain political stability by allowing the local people profit from their lands while providing new housing (Adrian Guillermo Aguilar & Santos Cerquera, 2011).

Other common condition for the apparition of Irregular Settlements is that some governmental agencies have hands tied and duplicated function. This means that two or more agencies have the same tasks and objectives. However, they do not share information or logistics. In some case doing actions that the counter part agency has banned. That makes them oversee the violation to the land-use and give any use that is requested. The situation of the governmental agencies is then providing with mechanisms for transforming into the proper habitation land-use. Using black holes and misunderstanding in the law (Azuela, 1997 in Adrian Guillermo Aguilar & Santos Cerquera 2011).

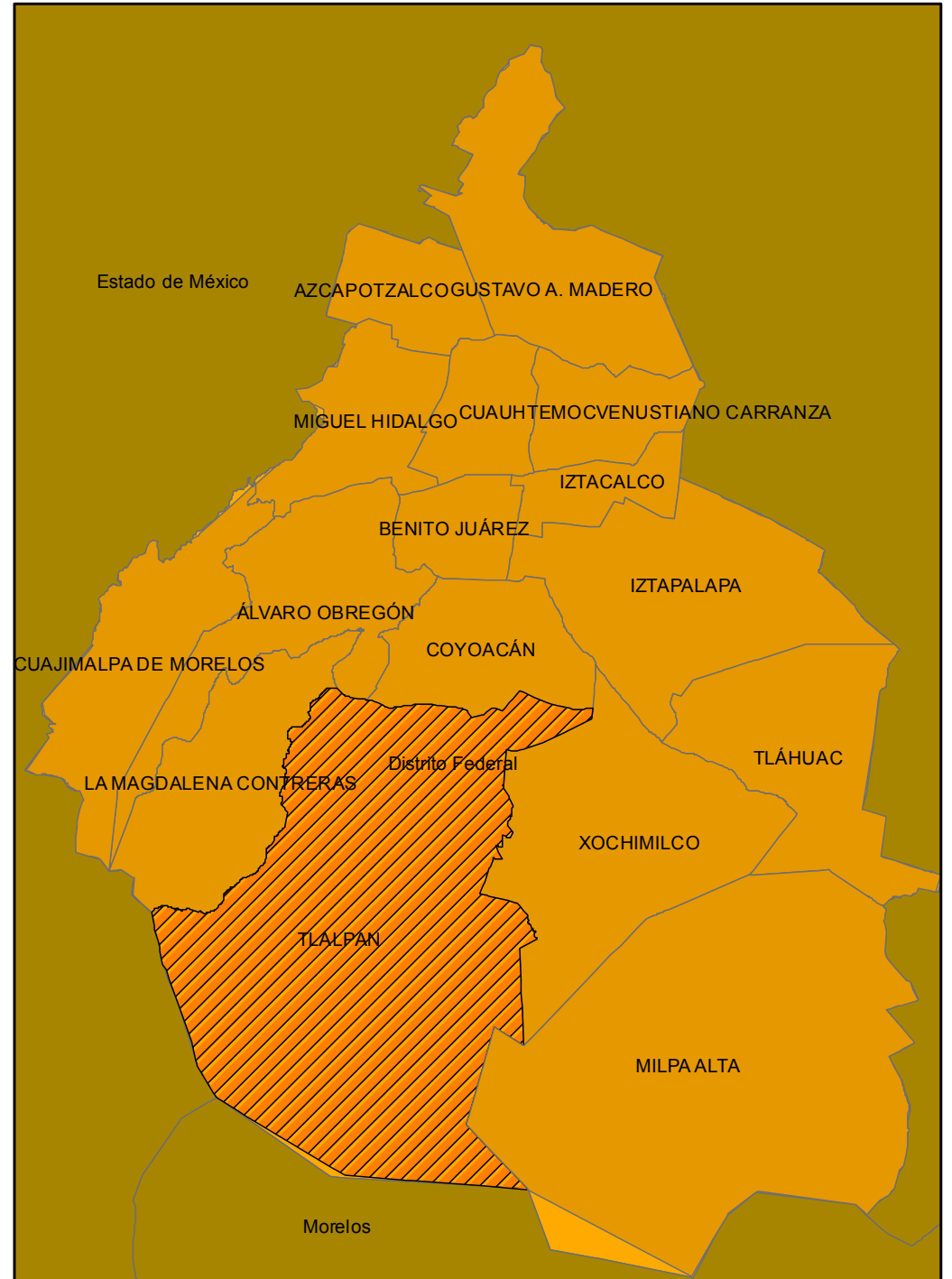
In the case of Mexico City by the decade of 1970 land regularization became a common practice in the government for dealing with the Irregular Settlements. Building windows of opportunity for sellers and buyers to self-organize and self-build new settlements in the knowledge that sooner or later the law would recognize them.

3.3 CONSERVATION LAND

Legally the Distrito Federal (DF) (Mexico City) is divided into two administrative zones, the Urban Land and the Conservation Land (CL). The CL refers to the zones that follow certain ecological characteristics and provide with environmental services needed to guarantee the quality of life of the inhabitants of the DF. The actions the Conservation Land performs are: reducing the contamination levels; acting as a regulator agent for the local microclimate; acting as a water retention and management system and as agricultural zone. In the spatial component, the Conservation Land spreads over more than 87 000 hectares. The Conservation Land mainly located in the south and southwest side of DF. In the political division, the Conservation Land is located in the following municipalities: Tlalpan, Alvaro Obregon, Magdalena Contreras, Cuajimalpa, Xochimilco, Tlahuac, Milpa Alta, Iztapalapa and Gustavo A. Madero (PAOT & GDF, 2012) (see Map 3 – 1).

The Conservation Land was created in the decade of 1980 as part of the "Plan de Desarrollo Urbano del Distrito Federal" – Urban Development Plan for Distrito Federal with two zones the Urban Land and the Conservation Land. The Conservation Land was also subdivided into a Buffering Zone and a Preservation Zone. The Buffering Zone would act as a mediator between the Urban Land and the Preservation zone. The Preservation Zone should have a strict policy of non urban occupancy and an active protection (Departamento del Distrito Federal, 1980 in PAOT, 2005). Is important to remark, that lands have a character of natural reservoir, but they also have a certain ownership (this will be explained on further detail on this chapter).

Reference Map of Mexico City and Tlalpan Municipality Map 3 - 1



Inside the Conservation Land the road network is very eclectic. The road network consists of several dirt roads interconnecting the settlements and Original Towns. As well as, some highways connecting the original towns with the rest of the City, and a speedway connecting Mexico City with the south states.

As mentioned earlier in this chapter, there is a lack of congruence when comes to actively deal with the Conservation Land. The environmental agencies try to stop the occupation while other agencies legalize the change of land-use. The situation creates conditions for the owners to constantly subdivide the lands for one reason or another, deteriorating the forests, agricultural zones and other natural areas in the Conservation Land affecting all the inhabitants of DF (Aguilar & Santos, 2011). No matter the effort placed on the strength of the environmental law and the pressure of NGO and other citizen groups.

There has been an increasing attention to the problem regarding the Irregular Settlements in DF in the last decades. Today, the Irregular Settlements represent a large problem to the preservation of the Conservation Land. The environmental and political nature of the problem has helped to keep it as a taboo theme outside of the range of an easy solution. Another of the reasons of the lack of solution is that there are no areas established for current and future developments. Leaving as only option for the urban growth the Conservation Land.

The Irregular Settlements represent a menacing threat to the natural environment because the high environmental cost that they bring with them (deforestation, change from rural/forest to urban, etc.). At the same time, the Conservation Land is not able to provide to the settlements with the standards of public services and the minimum of safety by the bad quality of the soil to hold a construction integrally (the topography is characterized by hills, cliffs, rivers, and low quality soils for the proper foundation for housing).

More specifically for the Tlalpan municipality there is a record of attempts to deal with the irregular settlements and protect the Conservation Land. The first key moment in the campaign to deal with the irregular settlements dates to 2003, when the presence of the settlements began to be more noticeable. The first action to control the irregular urban sprawl in the zone was to write an action to guide further action. As a result, several governmental operations (police raids) were held against the irregular settlements aiming to dislodge and bring them to an end the settlements. These actions were, of course, part of the political campaign of the recently elected major at the moment.

The second key moment is between 2006-2007. In that moment, the Assembly of Representatives of DF declared the intention to have an active campaign to prevent and remove irregular settlements. For that intention, a fixed budget was proposed. However, by 2008 the fixed budget was reduced by ten percent.

The third and current moment started in 2012 when the Tlalpan Municipality contacted the National Autonomous University of Mexico (UNAM) to bring a third actor. The advantage of including the UNAM is the academic background and the possibility to offer a new perspective into the problem (Roque Guzmán, 2012). In this moment is where the present work emerges.

3.4 CHARACTERISTICS OF THE IRREGULAR IN SETTLEMENTS TLALPAN

Irregular Settlements in Mexico City – A complex perspective

This section will add up to the discussion of the Irregular Settlements in the Tlalpan Municipality. It includes a brief discussion on the origin of the people living in the Conservation Land. How the people acquire the terrains in the Conservation Land, in all its modalities.

The periphery of the Tlalpan municipality just like any other city is an attractive zone for the development of housing, especially for two main social groups. Each group produces different conditions that allow the proliferation of Irregular Settlements in the Conservation Land. The first one is people with limited resources. The condition linked to this group is the better chance to buy terrains by all the facilities for payment that the sellers in the zone offer. This group ignores the character of natural reservoir of the zone. This implies a theoretical lack of basic services like water and power supply. The second social group is the population with a considerable spending power. The condition that pushes this group in the majority of the cases is a search for a better quality of life in the periphery, despite this group has already housing in the city.

However, the majority of the settlements form part of the first demographic group. People coming from the center and south states¹ (regions/departments) of the country normally integrate these settlements.² Normally the method used to build houses is the self-construction with precarious and unsafe materials. There are two main reasons for this. The first and most obvious is the amount of money required to so is considerably less than in a traditional fashion. The second is the fear of a forced displacement by the hand of the authority when discovered. With the passing time they begin to lose the fear, and they invest more money and effort in the consolidation of their housing (Adrian Guillermo Aguilar & Santos Cerquera, 2011)a.

For the acquisition of terrains in the zone, the civil servants of the municipality have pointed out three main ways. *The first is the ant invasion* or “invasión hormiga”. Where the occupation is gradual, it starts with small constructions to bigger as time passes. *The plain invasion*, where the houses are built in a fast fashion, and if necessary there is use of ‘various’ means of pressure. These methods rely on passing unnoticed for enough time, furthermore then try to pull the legal tools to get some degree recognition. The third consists on the illegal trading of terrains.

The effectiveness of the first method is getting less common due to the organization and legal ownership of the terrains. One outcome when discovered is to leave, the other outcome is to negotiate and apply the third method. The second method is common when an individual (or a group) begins guards in a certain terrain to ‘mark it’ for in the short periods begin with the cleaning and preparation for full occupation. The last method is the most ‘popular’ due to the benefit it poses to both the seller and the buyer.

Other situation in the zone is the fake sellers. These persons act like scammers by doing a selling transaction of terrain without being the owners of the land. A common practice is one fake seller sells one terrain to several people and disappears.

¹ The most poor states in the country (Inegi, 2012)

² Result of the surveys done in the field work

3.4.1 ACCOUNTABILITY OF THE IRREGULAR SETTLEMENTS

In this subsection the main characteristics of the previous efforts surrounding the Irregular Settlements. The characteristics of the Irregular Settlements, in size and number.

The presence of the irregular settlements is common in the full extend of the municipality. Some Irregular Settlements can even be found inside the reservoirs located in the regular urban zone. Other Irregular Settlements require the use of dirt roads to access them. This characteristic has been the main problem when any agency or actor involved is trying to have an up to date catalog for any. The effort made by the PAOT up to 2008 included 186 settlements. The civil servants at the municipality back up the number. Other governmental agencies like The Local Office for the Environment in the year 2008 establish their own and different series of polygons for the Irregular Settlements. The exact number of settlements is a 'game of broken phone'. The lack of accurate information favors another condition for the success of the creation of Irregular Settlements.

So any project trying to accurately manage and update the number and characteristics of the settlements, physical and social, would require a large effort both using large amounts of aerial/satellite imagery and extensive fieldwork (Velázquez Morales, 2012). This trade and all the previous mentioned regarding the self-construction and organization clearly give the situation the badge of Complex.

The academic project of the UNAM³ used the catalog offered by the civil servants of the municipality. In the spatial/technical side, it includes 186 settlements, with 1685 individual polygons, across an area of almost of 981 hectares out of the 31 200 hectares of the municipality. This area counts for the 3.15% of the total area of the municipality.

3.5 COMMUNITY OWNED LANDS

This subsection contains a brief history of the concept of community owned lands in Mexico.

This type of property was created in Mexico in 1915. This was an effort to restore or provide with lands to the groups that had none. The amount of lands given collectively to a group of people was assigned by the characteristics and size of each group. The organization in charge of the distribution of lands was the Agrarian Reform Office.

The concept behind the community owned lands is that each group has land enough to produce food and resources for their own consumption (Travecera Peralta, 2012). And the surpluses would allow the community to do trading with other communities or individuals. The lands are meant only for the use of the community. The community can perform agricultural and livestock production only. The law prohibited the commercialization of the lands by one member of the community or by the community as a whole.

³ The present work emerges from the academic project.

3.6 THE AUTHORITY FOR THE CONSERVATION LAND

This section discusses the Governmental Office in charge with handling the Conservation Land. The tools and objective the PAOT has to fulfill its duty.

The governmental agency that officially handles the defense of the natural environment has the objective to provide a better quality of life of the inhabitants of the DF is the Procuraduría Ambiental y del Ordenamiento Territorial (Office Environmental and Land Management, PAOT). It is an independent organism with the main objective of procure the welfare of the natural zones and biodiversity by acting as a watchman in environmental law (PAOT, 2013).

The main tool of the PAOT is the General Law of Ecological Balance and Environmental Protection (Ley General del Equilibrio Ecológico y Protección al Ambiente LGEEPA). This law has four main policies:

- The first is the *Protection Policy*. With this policy, the PAOT attempts to provide with maintenance the natural areas y relevant characteristics, to secure the continuity of those areas. The PAOT provides the owners of terrains with ecological value an income and allowing for reactive, ecologic, and scientific use of the terrain. The PAOT in exchange forbids any industrious activity and development of any infrastructure.
- The second is the *Conservation Policy*. This policy applies to areas or natural elements that their current use does not interfere with its ecological function, and there is no risk of degradation of the environment. The PAOT has the obligation to observe and watch for misuse of the land. At the same time offer guidance to secure the natural value of the zone. The *Restoration Policy* is the third. It focuses on the zones with natural value that are under pressure due to anthropogenic activities and have suffer from degradation. The PAOT has the duty to intervene to cease the degradation process and start a recuperation of the environment. In these cases, the PAOT will take an active part in the restoration of the zones. This may also be applied to agricultural zones that have lost the productivity of function.
- The last Policy is about *Sustainable Exploitation*. This policy promotes the current use or the change for an environmental management unit. This means a zone that is appropriate to provide with environmental services but at the same time it provides with social benefits. The benefit of the transformation should be clear and be in accordance with the required characteristics. It is important to say that the objective of the transformation should only benefit the diversification and sustainability and have no negative impact on the environment (PAOT, 2011).

The official mission of the agency is guided by three priorities, each one assigning tasks and duties (PAOT, n.d.). The first one is to adopt an urban ecological focus that brings visibility and value to an integrated administration of the territory of the DF. The prevention of the sprawl is done by monitoring for new irregular settlements. The PAOT monitors also the expansion, densification, or creation in non-affected zones by Irregular Settlements. The second priority is to have a clear territorial focus that preserves the biggest possible number of zones with ecologic value, and that are threatened by the sprawl of irregular settlements. For this, the PAOT has a series of instruments for zoning and evaluation. Instruments that allow the PAOT to declare a priority based on the typology of the case.

The third priority is in line with the past two. The priority is to enhance the mission, tools, values, and capacity of the agency to protect the 'order of the territory'. To perform this task is essential to contain and prevent the sprawl of human settlements. In the vision of the PAOT, the irregular settlements violate the Conservation Land. The Irregular settlements affect the environmental services and rights of the rest of the inhabitants of Mexico City. Making of top importance the protection of the Conservation Land as an ordered territory because of the clear importance it has for the welfare of the city.

3.7 INVOLVED ACTORS

In this section, the involved actors will be discussed. The involved actors are the Irregular settlers, the Original Inhabitants, the Tlalpan Municipality and the UNAM. The Irregular settlements are the object of study of the research project. Detailed information was collected for them; both quantitative and qualitative data are available. The demography, economic income, education level and the way they get the basic services are discussed. For the Original Towns, the historical background is explained. The evolution the Original Towns and Mexico City have experienced together and the urban integration that is taking place. For the Tlalpan Municipality, the office that supported the UNAM during the data collection process is described. As well, as the political situation in the inner management of the local government. Lastly the UNAM and how it got involved with the zone for this study is discussed.

Irregular settlements – The irregular settlers

It is estimated⁴ that the population of the Irregular settlements is composed in general numbers by 52% female and 48% male, with the majority, the 57%, adults and the 43% underage. In the same scale, the largest group is from 26 to 36 years old with the 17% of the total of the population. A condition that will boost the irregular settlements comes from the 43% underage people living in the Irregular Settlement. From this group can be expected that in the future decade a force of expansion in the Irregular Settlements.

The senior adults group is only on the 1% of the total. From the same studies, it is concluded that approximately 1400 irregular settlers are in a situation of high to very high risk due to natural and man made risks (Instituto de Geografía, 2011).

The economical side is divided by the personal income. In the most economic vulnerable groups, the income is around 2000 to 4000 Mexican Pesos (130 to 260 €) per month. This group normally takes jobs with low salaries like drivers, factory workers, domestic workers, day laborers, and farmers. Other wealthier group is constituted by people with an income around 8000 to 16000 Mexican Pesos (500 to 1 000€) per month. They perform better paying jobs, like shopkeeper, office workers, factory supervisors, farm owners, and similar occupations. There are other wealthy groups living in the Conservation Land, from politician to TV personalities, but they were not available for data gathering.

In the education side as presumed the more economically vulnerable the group is the lower educational grade they get, being the most common to have the secondary school as the most common grade, sometimes incomplete. As the economical level

⁴ Information from the - Atlas de Peligros Naturales o Riesgos de la Delegación Tlalpan

Irregular Settlements in Mexico City – A complex perspective

increases the schooling gets to high school and some cases to university. There is some recorded cases of University students in low economical income households.

The state of services for the Irregular Settlements is a theme of debate. For instance, the supply of water since 2011 has turned to a basic right in the Mexican Constitution (EL Universal, 2011). Obliging the government the government to provide with water every to every person. Nevertheless, even before that change in the law the Tlalpan Municipality has provided with water trucks the Irregular Settlements. This can be seen as a double message. The government provides with the basic service to the zone and at the same time asks to abandon the zone. A similar situation has the power supply in the zone. Contrary to the water supply how do they get it can be in illegal ways. So many of the people living in the Irregular Settlements is reluctant to talk about it.

Original Towns – The Original inhabitants

The Original Towns located in the Tlalpan Municipality just like any other Original Town in Mexico City; they have a history of trying to conserve their autonomy and 'tradition' that in some cases can date from before the independence of Mexico as a Country. Some of the ideologies, world visions, and organization forms have been set under pressure by the different governments that the Mexico City has had, as well as the change of times. Many of these towns have caved to the growth of Mexico City, but others, the farthest have not (Cruz, Moreno, Cruz, & Gutiérrez, 2011). Making some of the Original Inhabitants take defensive positions when interacting with elected officials and institutions.

The towns located in the Conservation Land are in risk of change of forestall or agricultural land-use for habitation land use. The change from Original Town happens when the majority of the area of the Original Town becomes urban. When there is enough urban area the Original Town loses the title and becomes regular area of the city. According to the classification that Gomezcézar (2011) gives we find two main types of Original Town in the Tlalpan Municipality: The rural and semirural towns and the urban towns with recent rural past. The first type has as characteristics: large areas of forests or agricultural fields in their territory; base part of their economy on the development of primary activities and less on third grade activities; having a representation organism to deal with the respective authorities. The second type has: recently lost their rural characteristics and agricultural in the last fifty years or so; It has have several changes in its land use; as only remnants of their past the celebration of traditional dates and parties, and some symbolic titles instead of representatives.

The Tlalpan Municipality – Municipal Civil Servants

As any other Municipal government the staff, aims and objectives, and some policies change in a frequently basis. The change takes place every three years in the political and legal frame of Mexico. So the degree of cooperation, commitment and flexibility is constantly changing; even when there is supremacy of a certain political party⁵. Many of the moves and postures of the civil servants are guided by politically driven agendas. The office in charge with the cooperation with the UNAM in the last administration (2009-2012) was the Land Management Office. The Office was based on the "Cimarron" group that had activities on the prior administration (2006-2009). The group itself had its origins in the Sub direction of Natural Resources (Velázquez

⁵ The dominant political party is the PRD – Partido de la Revolución Democrática

Morales, 2012). As the administration changes the people in them, creating certain instability inside of the municipality.

UNAM/ Geography Institute

The Tlalpan municipality approached the UNAM originally on 2011 for the development of a Risk Atlas for it. From that initial the involvement of the (research group of the) UNAM was to be called to act as an impartial third involved for dealing with the situation with the uncontrolled growth of the Irregular Settlements in the Conservation Land. The research group was lead by the Prof. Dr. Clemencia Santos Cerquera, Prof. Dr. Irma Escamilla Herrera, and Prof. Dr. Enrique Pérez Campuzano.

3.8 PROJECT DEVELOPMENT

In this section, the details of the research project done by the UNAM are described in detail. The methodology used in the project and the rational behind it. Lastly the stages of the project, indicating which stages were not complete due to the set on hold of the project.

The development of the project *“Periferia Urbana y configuración de peligros derivados de factores de riesgo ante la expansión de asentamientos humanos y transformaciones de la zona urbana con afectaciones en Suelo de Conservación”* (Urban Periphery and configuration of hazards arising from risk factors by the urban sprawl by human settlement expansion and transformation of the urban area affectations to the natural environment in the Conservation Land) had the three following objectives to understand the risks and vulnerabilities for the Conservation Land as well as to the people living in the Irregular Settlements. The first objective was to determine to what extend that the Irregular Settlements can be controlled. The best set of tools to do so by the use of negotiations and data analysis. Second one, to perform studies to quantify the urban affectation to the natural environment⁶, the results of these studies would be compared with the Special Regulation Commission of the municipality for validation. The third objective was to perform an evaluation of the policies for a better application when dealing with the Irregular Settlements.

The methodology used in the project was based both in fieldwork and office work simultaneously. The aim of doing so was to correct and update the information as it became available. Allowing the research team re-draw the action path for best fit the situation at hand. The expected outcome was to obtain accurate results. The desired objective was to exceed the requirements of the project.

The advantage of this methodology is to detect possible misidentified conurbations⁷, tendencies, the self-organization patterns, and inner mechanisms. Other benefit was to identify the environmental characteristics and socio-economical profiles. The gathered information was then linked to its correspondent spatial/organizational actor or Settlement (Santos Cerquera, Escamilla Herrera, Pérez Campuzano, Ortiz Meraz,

⁶ Up to this point the Project was set on hold

⁷ A region comprising a number of cities, large towns, and other urban areas that, through population growth and physical expansion, have merged to form one continuous urban and industrially developed area.

Irregular Settlements in Mexico City – A complex perspective

& Velázquez Morales, n.d.). But due to political reasons the whole project was set on **hold indefinitely**.

As for the procedure of the project it was divided on ten general stages:

1. To establish the Theoretical Background with state on the art knowledge and equipment for handling urban sprawl. And build sets of comparison including developed and developing countries.
2. Identification of the risks, both for the Conservation Land as for the inhabitants of it. For this stage the aim was to get a general image to be polished during the rest of the project.
3. Diagnostic of Population and Housing for determining which sties are more suitable for intervention.
4. Analysis of the current legislation, policies and which can be applied as is, and which were in need of tuning (**this stage was not completed**).
5. Characterization of the urban sprawl in the Conservation Land by the use of satellite imagery (2009-2012) (**this stage was not completed**).
6. Selection of the human settlements for a more punctual study for determining what are the main drivers in the urban sprawl taking place.
7. Fieldwork on the selected settlements with three aim objectives: the first to verify the previous office work (stages 3, 4 and 5); second, to apply a survey to the chairmen, or equivalent, of each settlement about the age, population and inner organization; third, to establish what is the most common path the settlements follow in their quest for regularization (**this was the last stage developed for the project**).
8. Final quantification of the risk and office work examination of the field data gathered (the project stopped at this point). The main objectives were: to determine a factor and grade of vulnerability of the settlements, the more vulnerable the easier would be to remove them by offering some sort of compensation; and to measure how the planning guidelines can be modified and applied in a constant effort.
9. Analysis and results of the land management guidelines for the irregular settlements. With all the results from the previous stages a “model” would be built where all the gathered information would interact, including the guidelines and behaviors recorded. This would be a ‘Complex Model’ for the behaviors present in the Conservation Land.
10. Elaboration of the final report.

3.8.1 THE SURVEY DESIGN

In this subsection how the survey was design is described, the considerations and the iteration process behind the final version. It also includes a table where the questions used for the present work.

The intention was to gather information of the chairman of each settlement to gather information about the nature of each settlement and then have an individual point of view for constructing a collective profile, o as many profiles as necessary to construct a model for planning the future action to be taken in the Conservation Land. The

contents of the survey covered from how long has the settlement existed to the political affiliation and means of supply for basic services (Santos Cerquera et al., n.d.).

Some considerations taken in account during the design of the survey were: the survey should be short enough so that the respondent didn't felt tired or threatened by the length of it; some questions, especially the ones related to the inner organization, couldn't be too close and there must be some sort of control questions to make sure the responses recorded were the closest to what really is going on; the results should help build a coherent model to help the decision-making in the zone.

The survey was trial tested and it went through several corrections, also it received fine tuning during its application to include more accurate options than the originally had. The resulting survey included the Table 3 – 1.

From this list the present work uses mostly information related to the inner organization, the relationships with other settlements and the Original Inhabitants, and the standard services to establish the policy measures that may help to regain and endeavor for the natural areas in the Preservation Zone of the Conservation Land.

3.8.2 THE APPLICATION

This subsection explains the application of the survey. The number of settlements where the survey was applied. Followed by, an explanation on how was the fieldwork done.

The application of the survey was done over 54 Irregular Settlements in a time period of three months, from late May 2012 until early July 2012. The number of Irregular Settlements selected for the survey was 65 settlements. The Irregular Settlements met the characteristic of being good representation of the rest of the settlements. The 65 settlements also represented the urban sprawl patterns and average consolidation. In 11 of the targeted settlements, it was not possible to contact the chairman, or anyone with the authority, to answer the survey. The total number of fieldwork days was 14, and each implied a travel between 50 and 80 kilometers to reach the settlements. During the fieldwork, some interviews were held with the chairmen of the settlement. The idea was to capture all the qualitative information that the survey was not able to register.

The fieldwork team consisted of the research team of the Geography Institute personnel as well as civil servants from the Land Management office of the Municipality. The group was divided in two main sub groups, each containing three pairs, one pair would drive the other two to some settlements, for them to conduct the survey and then the driving pair would get to the furthest settlement possible so they would conduct their survey. The aim was to perform each pair one or two interviews per day, but sometimes this was not possible due to the ability of the chairmen or the need to arrange a specific meeting for solving the survey. (Map with one of the routes for one day here)

Irregular Settlements in Mexico City – A complex perspective

Category	Questions	Used in present work
About the Settlement	the age of the settlements (in years)	x
	how many houses were when the settlement was founded	x
	how many houses are now	x
	are you expecting more families	x
About the inner organization	how is the decision making process	
	if they make assemblies, how often do they do them	
	when an assembly is performed how many house 'bosses' are gathered	
	how is your relationship with the other settlements	
	do you gather with other settlement chairmen	
	has the settlement been object of any type of study	
Relationships	from which Original Town does the settlement recognize itself	
	how is the relationship with the Original Inhabitants	
	name of the chairman and gender	
	how do they get the water supply	x
Service Supply	is it a regular and regulated supply	x
	which authority is providing the water	x
	has the settlement received any aid programs	x
	does the settlement has any water catchment systems	
	do they the paper work for the water supply individually or collectively as one settlement	
	what percentage of the settlement has power gauges	x
	do they the paper work for the power supply individually or collectively as one settlement	x
	who is the power provider	x
Status of the services	is the settlement on a regularization process	
	if not, or it is on second trail, has the settlement began with the regularization process	
	with which authority is managed the regularization process or regularization application	
political affiliation	have the people from the settlement applied any sort of political pressure	
	does the settlement has any sort of political affiliation	
	with which political entity	

TABLE 3-1 SUMMARY OF THE SURVEY APPLIED BY THE UNAM

3.8.3 RESULTS OF THE SURVEY

In the following subsection, the results of the survey will be discussed. The results will be divided into the following themes for the discussion: Ages and number of families per settlement; the decision making system inside the settlement; the relationship of the settlement with the rest of the actors in the zone; and the status of the services in the settlements; and lastly, if there is a Regularization Process taking process in the settlement. All the information that is below is extracted from the

report of the research project, but as the project was set on hold the document has not been published in regular press.

The Results of the survey will contain a series of conclusions and explanations about each topic. Further detail with tables can be found in the appendix TBA.

AGE AND NUMBER OF FAMILIES PER SETTLEMENT

The first point to clarify is that the population units are the families (or households) because of the level of disorganization inside the settlements. It is common that not even the chairman of a settlement is aware of the total number of people in their settlement. The number of families is a unit much easier. Because in the reunions or gatherings each household sends one or two representing the family, in the majority of cases the house boss.

The total amount of families living in the surveyed is 6893. The most important characteristic out of this analysis is the nonexistent correlation between the age of the settlements and the total population. The urbanization process can explain this because it is driven by economic, social and political motives rather than straightforward processes.

DECISION MAKING INSIDE OF THE SETTLEMENT

There is a big participation and involvement inside the settlements. The majority of the settlements has more than a fifty percent of assistance to the assemblies. In the fieldwork, it was noted that in some cases, existed isolated groups inside the biggest settlements. These isolated groups operated like splinter groups with individual leaderships, but they tend to work together in the proper circumstances.

RELATIONSHIPS WITH OTHER ACTORS

There is a considerable good relationship between some of the settlements and some the Original Inhabitants. Around the fifty percent has no intention or interest in developing a communication channel for discussion of the common problems and situations. The other half with no communication is due to grudges and legal situations. The last motive for not having relationships with the other actors is a lack of interest or personal situations.

WATER AND POWER SUPPLY

The major provider of services for the settlement is the municipality while measuring both services water and power, but in the electric power supply only the mayor provider is the CFE (Federal Commission of Electricity). Almost the seventy five percent of the settlements are dependent of the municipally water trucks for the water supply, but there are also private companies that sell the water trucks to a higher price. This last option is common amongst the newer settlers who have not made the paperwork with the municipality. While the majority of the settlements has no power gauge for quantify the power consumption to pay the proper bill, the electrical installation, in some cases done by the power company (CFE), but in the other cases it may just be illegal tampering. The cases with regular water and power supply are linked with the most consolidated settlements.

REGULARIZATION PROCESS OF THE SETTLEMENT

The majority of the settlements claims that are in deals with the municipality for a formal recognition of their status as urban areas in forestall land use zone. In case, the municipality rejects the request of the settlements for the recognition. The people of the settlement attend to other authority. The second authority is asked for recognition as urban area in forestall land use zone. The double authority situation creates legal loopholes and confusion between the authorities.

3.8.4 INTERVIEWS

This subsection contains some statements extracted from the surveys. These statements represent the general feeling of the people living in the Irregular settlement.

The interviews conducted reveal other key information to understand the situation in the Conservation Land. The interviews offer specific perspectives about information that could not be portrayed in the survey. The appendix will contain the original transcriptions of the interviews. Here are six statements selected from the interviews. The format for the selected statements is the following, the name of the statement, the name of the interviewee, the original transcript, and the translation to English.

Settlement Tetecala

Interview made with Elena.

The delimitation of the Polygon to begin the regularization process is done. We build the peripheral wall with our own resources to fulfill the requisites of the municipality. Also there are no taller than 2 stories houses to respect the law. But the people living “outside” in the posterior part destroyed a segment of the wall because it was obstructing their way.

Settlement Tlaltepantitla

Interview made with Claudia.

At the beginning there was a well-organized board, but the settlement suffered of many forced evictions. So the level of cooperation has declined a lot. The municipality has already told us that they wont recognize us. In one moment they offered us department and land in (the town) Topilejo, 120 square meters of terrain and departments on the highway.

Settlement tlaltepancatitla

Interview made with Gloria.

They (the municipality) has forced evicted us many times. But we come back, we build with light material, I was evicted on 2008 but on 2010 I came back. My father-in-law bought the terrain and he had crops. In fact next to my home my father has crops... Because we have illegal electric installation we have had the cable stolen several times.

Settlement tepacheras

Interview made with Jesus

We have an illegal electric installation in my house; the CFE has told us that they cannot give us service until we have the legal status of the terrain solved. The process of the environmental impact assessment has begun... On a certain point eleven families begun their relocation process, but aside of the start of the paperwork nothing happened. They are still there. We are waiting for the determination of the land-use... As the process has not been complete more people keeps coming.

Settlement Valle Verde

Interview made with Luz.

In this settlement thing do work in a positive way thanks to all the work that the previous boards did, and because all the community is always participating. For example is that 10 years ago we placed asphalt on all the streets. Also the swage, we all cooperate, even people from 'la magueyera'. There is also a big sense of belonging from the people living in the settlements.

Settlement Dolores Tlali

Interview made with Rebeca.

The colony is mostly occupied, the majority of the terrains has owners (the have been sold) but not everyone is living here. The electrical installation is here but it does not work. For the swage we have told the municipality but they tell us is to expensive.

3.9 RESULTS OF THE PROJECT

The results of the project are discussed in this section. The first point is a reflection on the stop of the project. Followed by, the reflection of what type of Class system is based on the discussed in this chapter. Lastly are included some conclusions of the information gathered. How can the information be further used will be discussed in the next chapter.

While the project had an abrupt stop at the middle of its course much information was gathered. The future of the project is unknown but still as the information was gathered by the UNAM under academic conditions much can be used to learn from it. As mentioned earlier all the information for the results of the research project done by the UNAM is part of the report of the project, and is yet unpublished.

The first conclusion is that here is being dealt with a Complex system, that is self-organized, changes over time, and has unpredictable patterns, a Class VI system to be precise. In the zone it is possible to appreciate cases of self-organization. For example the boards form the settlements. Evolution and coevolution are characteristics that the Irregular Settlements constantly showing. The Irregular settlements adapt their organization, and responses to the other actors each time is needed. All the changes are in one direction in the time scale. All the characteristics of a Complex System can be appreciated.

Some of the main conclusions done after the process of the information are:

Irregular Settlements in Mexico City – A complex perspective

- There is no simple pattern of growth for the Irregular Settlement, the main drivers for the growth are: political power, economical capability, and complicity of the involved.
- The services in the majority of the Irregular Settlements are provided in a scarce or illegal way.
- The communication, cooperation and sympathy between the settlements is very heterogeneous, so forming a single board of representatives is hard to see.
- The number of frauds is really high due to two main reasons: the fake sellers, selling someone else's terrain to an uninformed buyer, or one terrain to several buyers; and the shared property most of the terrains have, making it illegal to be subject of any type of commercialization.
- Overall it can be appreciated that no straightforward solution will come soon. Also the intrinsic Complexity discards any type of modeling by standard techniques.

There are several conditions supporting the apparition and success of the Irregular Settlements in the Tlalpan Municipality. The conditions from the governmental The first condition is the idea linked to the Irregular Settlements about offering 'housing' to the scares resources groups. This idea is part of the worldview of some civil servants. The civil servants see a (personal) political benefit in allowing people to build the Irregular Settlements.

Another condition is the lack of congruence between different the policy at different governmental levels, from local, central and federal levels. The lack of congruence in the policy extends to the agencies and offices of the government. Giving the space for duplicated tasks, and opinions that result in confusion that allows the success of the Settlements. Working almost in tune with the previous condition mentioned, the lack of information about the real status and numbers of the Irregular Settlements play an important condition to the success of the Irregular settlements.

The conditions form the local actors are the following. The principal condition consists in allowing for commercialization is the subdivision the owners of the terrains do. The objectives of the division are to inherit their offspring, or to sell parts of the terrain to obtain earnings. Form the last objective another condition is generated. The offer of terrains in cheap prices and the facility of payment many people feel attracted to the zone.

The last condition that will foment the spatial growth of the Irregular Settlements in the coming future is the underage group. It can be expected that this group will be a powerful force pushing for the expansion of the Irregular Settlement.

CHAPTER 4 - SCENARIOS AND POSSIBLE OUTCOME

4.1 INTRODUCTION

The chapter is divided in seven sections and the introduction section. The second section describes the objectives of the chapter. The following section describes the most likely outcome using data from the fieldwork done by the UNAM. Next is the introduction of the scenarios, in this section is explained how the scenarios are created. The three following sections are the scenarios and discussion for each scenario. The last section is the conclusions of the chapter.

4.2 THE SCENARIOS AND OUTCOME

The most likely outcome for the Conservation Land and the alternative scenarios are elaborated and discussed. The function of the most likely outcome is not accurate prediction of how the Conservation Land will evolve, but an illustration of the consequences of keeping the Conservation Land as is. In the other hand, the alternative scenarios are theoretical explorations of action paths based on practices already applied in the Conservation Land.

To counteract the outcome, a series of scenarios are built upon policies already applied in the Conservation Land. The scenarios for the present work are illustrations built upon an academic discussion and the experiences during the fieldwork. The academic discussion collects the results of several investigations done in the Conservation Land, as well as the discussions done regarding similar themes.

Three possible scenarios will be described. The scenarios are part of 'a mind game'. Each scenario is evaluated by complexity and systems theory to elaborate on the possibility degree of each scenario. Starting with the near to impossible and unrealistic scenario, which is also provided the largest benefits for the environmental services. The second scenario is with a higher degree of possibility. Nevertheless is an unachievable and ungrounded scenario. The last scenario is considered as a possible but temporary solution.

The possibility of each scenario is determined by the ability of the action or policy measure that defines the scenario to deal with the complexity regarding the expansion and inside mechanisms of the Irregular Settlements. The likelihood of the scenarios is determined with an academic review of the studies done in the zone as well as by the current discussion and concepts regarding the complexity theory.

The scenarios to be discussed are: The cleaning of the Conservation Land, which contemplates the removal of the entire housing infrastructure inside the Conservation Land. The Second scenario, is the stand still of the Conservation Land, the idea behind this scenario is to stop any further development of housing in the Conservation Land. The Last scenario, is the controlled growth in the Conservation Land, the scenario explains the possibility of controlling the further development of the housing infrastructure of the Conservation Land.

4.3 MOST LIKELY OUTCOME

The policy ruling the Conservation Land has not been able to prevent the apparition of and success of the Irregular Settlements. To help with the situation, the national government of Mexico has also provided economic support for the owners of lands providing environmental services (Pérez Campuzano 2012). Nevertheless, the

expansion of the Irregular Settlements in the Conservation Land is an alarming situation. From 1995 to 2005 it was calculated an expansion of 1 014 hectares (Ávila Foucat 2012).

The urbanization process in the Conservation Land by the Irregular Settlements will follow the population, economic and social growth on Mexico City (Aguilar & Santos 2011). The Irregular Settlements offer a quick way to provide with housing to the increasing population. Furthermore, with the urbanization of the Conservation Land the environmental services will be lost.

The ineffectiveness to control and manage the Irregular Settlements by the programs and policies can be tracked to different elements. However, the academic sources indicate the main reason. The majority of the programs created from the ruling policy measures lacked the proper documentation that provide the needed guidelines or evaluation of the application (Martínez Bordon & Abreu Vera 2012) (Pérez Campuzano & Perevochtchikova 2012) (in Martínez Rivera, 2012).

Without any supervision, the policies are ineffective to prevent the expansion of the Irregular Settlements and preserve the Conservation Land. Based on the experiences and the studies done (see chapter 3), is possible to foresee the urbanization of the Conservation Land. Using the field data from the project done by the UNAM is possible to estimate how the process will evolve. Using the data gathered from the survey conducted by the UNAM the spatial growth is modeled into nonlinear equations. The equations are used in spatial analysis calculations to draw the projected area that the settlements are expected to have.

Elaboration of the expansion projection

The first step was to separate the most abnormal cases of sprawl from the general trend taking place inside the Conservation Land. To do so, it was used plotting and statistical tools as well as the interviews done in fieldwork. Once with a cleaner feed of data is set the data ordered in terms of similarity, so a local compensation can be applied to diminish the generated error in the formulas. A series of formulas were built using the same databank to calibrate them. The formulas were applied on the following order. The next step is to calculate the area using the population as base.

After the population was calculated, the next step was to estimate an approximate age for each settlement using the calculated population as input. To the estimated age of each settlement was then added 6,12,24 and 48 years, then the projected population corresponding the new ages were calculated. The periods were chosen because of the political cycle in Mexico, and the data mining done in the data from the survey.

The last formula used corresponds to a new estimation of the future area based on the projected population. The average radius of the area of each settlement is calculated, then the radius of the estimated future area. The next step is to compare the radius of the estimated future area of each settlement to the radius of the current area to obtain a differential between them. The differential then is submitted to a compensation process to reflect the surveyed intention of expansion.

Once is obtained a product after the application of the described mathematical processes the result is applied in the form of a buffer operation to the vector files corresponding the irregular settlements. The calculations foresee the possible outcome if the Irregular Settlements keep expanding on the Conservation Land. In

Irregular Settlements in Mexico City – A complex perspective

the Map 4 -1 is possible to see the calculations done for the expansion of the Irregular Settlements.

Description of the map

The map 4 – 1 represents the projection done for the expansion of the Irregular Settlements inside the Tlalpan Municipality over the next 48 years. The Perimeter of the Tlalpan Municipality is marked with a red line. The Conservation Land contrast with the rest of the city because of the color satellite image covering it, meanwhile the rest of the city is in black and white. The Original Towns are shown in an orange hatch. In the north of the map is with grey hatch the regular Urban.

The map presents the Irregular Settlements surrounded by different colored zones. The green zone represents the expansion projected to the next six years. The zone in yellow represents the expansion projected to twelve years. The orange zone represents the expansion projected for twenty-four years. Lastly, the red zone represents the expansion projected for forty-eight years.

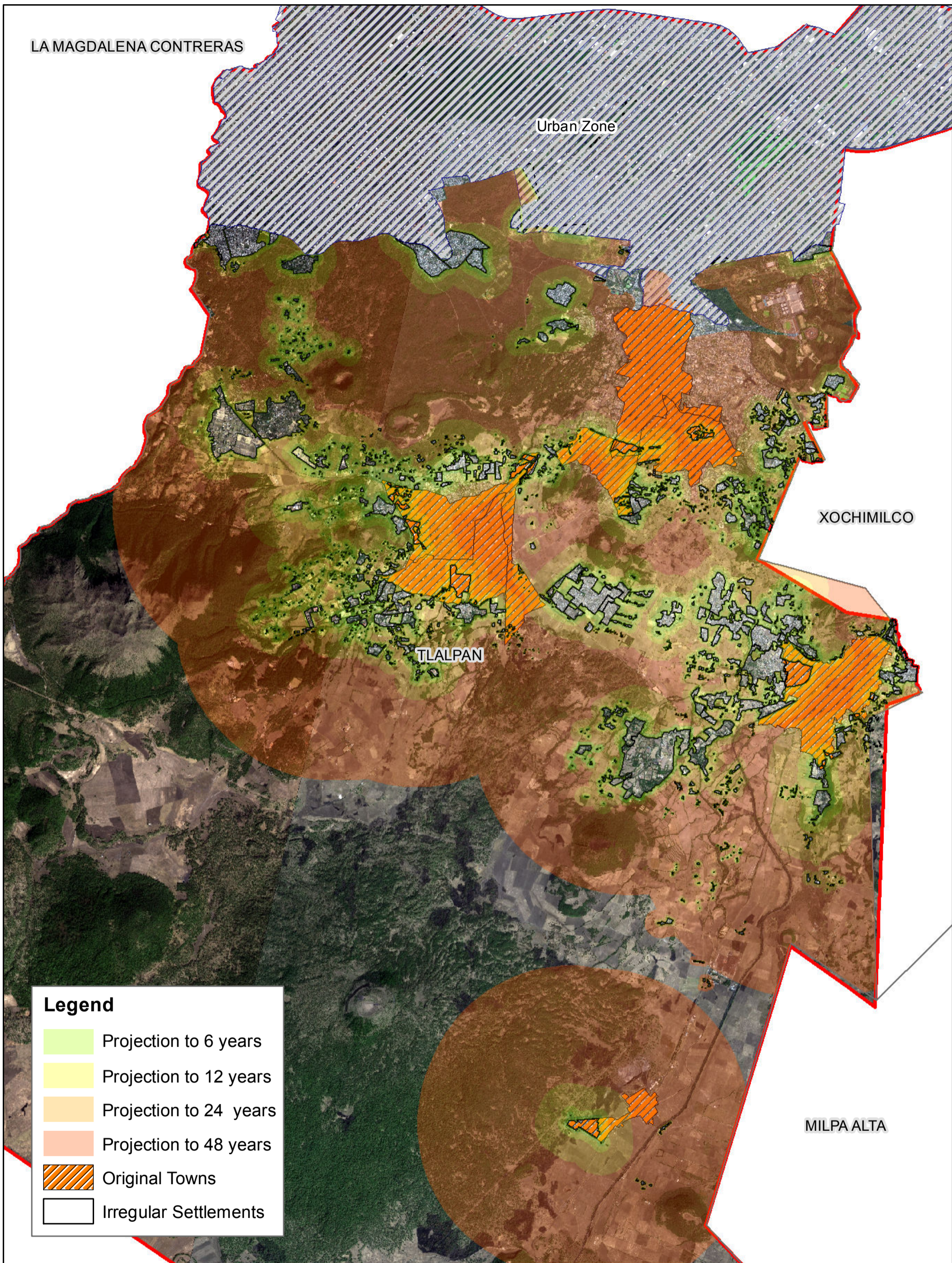
Results

The results from the calculation can be seen in the following table. The table contains the area the Irregular Settlements in the Conservation Land occupy, currently and projected into the future.

The table includes Settlements in the first column the area in hectares of the Irregular. In the second column present the growth percentage. In the third column is shown the percentage of occupation of the Irregular Settlements of the Conservation Land. The conservation Land in the Tlalpan Municipality is of 25959.5 hectares.

	Area	Growth percentage	Occupation of the Conservation Land
Original Area	1,079.79	100.00%	4.16%
6 years	2,050.42	189.89%	7.90%
12 years	3,136.03	290.43%	12.08%
24 years	5,913.28	547.63%	22.78%
48 years	14,355.71	1329.49%	55.30%

TABLE 4-1 CALCULATED GROWTH OF THE IRREGULAR SETTLEMENTS

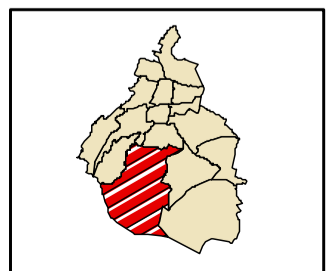


**Irregular Settlements in Mexico City,
Case of study Tlalpan Municipality**

Map 4 - 2



Reference Map



Must likely outcome | O. Ortiz Meraz

September 2013

Supervisors:
Prof. Dr. Gert De Roo - Drs. Marien de Bakker

1:60,000

4.4 DEVELOPMENT OF ALTERNATIVES

To develop alternatives to the estimated outcome the present work develops a 'mind game'. The 'mind game' consists on the elaboration of a set of scenarios. The scenarios are built upon opposite ideas, taking government action and policies that have shown certain degree of success to an 'extreme'.

Each scenario is then evaluated using Complexity Theory and Systems Theory to understand the implications of each scenario. The nature of the scenario and the logic driving it are compared with the planning practice moments described on chapter 2. How the Conservation Land results in case of each scenario is placed in relation with Systems Theory. It is described whether the Conservation Land enters in a fixed position (class I) or non-linear processes (class IV) are included into the scenario. Then is analyzed what behavior and the result could be expected, considering the characteristics of the Irregular Settlements (see chapter 3) using complexity theory, evolution theory and non-linearity (see chapter 2). Complexity theory will be used to set the scenario in a multilevel situation.

4.5 CLEAN THE CONSERVATION LAND – SCENARIO 1

The scenario consists on the cleaning of the Conservation Land. This means the removal of the entire housing infrastructure inside the Conservation Land, and the subsequent relocation of the Irregular Settlers living there. This would imply the destruction of the Irregular Settlements, and recovery of all the Conservation Land for forestall and agricultural lands.

Furthermore, to prevent the reinstallation of people inside the Conservation Land, a fencing project might be necessary to isolate and secure the Conservation Land. In addition, it would be necessary to establish a permanent surveillance program to monitor the no-development of housing inside the Conservation Land.

This scenario is based on the efforts done in 2003. The government through displacement and police raids managed to recover terrains of the Conservation Land (Winton 2011).

Discussion

The core argument of this scenario is to support biodiversity conservation, and the ethical necessity with the critical importance for future sustainable survival (Agrawal & Redford 2009). However, when discussing this theme there are several things to consider.

Analyzing this scenario through the different moments of the planning practice (see chapter 2) this scenario is linked to the technical planning. This scenario is aiming for certainty by removing the Irregular Settlements with the objective to predict and control the outcome of the Conservation Land. The scenario proposes dealing with the Conservation Land and the Irregular Settlements as a class I system. Turning the Conservation Land into a predictable and linear system (see Table 2-1) in relation with Mexico City would be a positive thing. Nevertheless, just like the technical rationality school, this scenario ignores that reality is, and always has being, complex.

An example of such complexity is the tension between human presence/use and conservation success means that the management objectives associated with particular classifications and their translation into practice are deeply contested (Agrawal & Redford 2009).

The displacement of the Irregular Settlements pretends to think of the mechanisms inside the Conservation Land as a straightforward situation. Having on one hand, the land-uses are essential for humanity because they provide critical natural resources and ecosystem services (Foley et al. 2005). In the other hand, the scenario has the concept of the local communities as the destroyers of biodiversity.

One of the ignored realities is the evidence regarding the displacement projects is inconclusive (Lele et al. 2010). Other reality ignored is the true nature of the Irregular Settlements, as class IV systems (see chapter 2). The processes of self-organization and multiple unknown mechanisms linked to the Irregular Settlements would result in a reoccupation of the Conservation Land. Therefore, the removal of the Irregular Settlements inside the Conservation Land can be considered a near to impossible and unrealistic scenario.

4.6 STAND STILL THE CONSERVATION LAND – SCENARIO 2

The scenario considers the next alternative from a technical perspective to the eviction of the Irregular Settlers. The alternative consists on the fencing of the Irregular Settlements, to prevent their expansion into forestall and agricultural zones. Fencing is the alternative proposed because other methods of 'dissuasion' as penalties, arrests, and evictions have failed previously to isolate the Conservation Land and prevent the urbanization (Aguilar & Santos, 2011). This scenario can be considered as placing the Conservation Land and the social phenomenon in a stand still position.

The idea behind the fencing is to force the no expansion upon the Irregular Settlements. The fencing would be established along with the legal support required. At the same time would acknowledge the people living there and the right they have to keep their investments.

This scenario is based on the current policy named "Bando 2". The aim of the policy was to prevent the development of the Irregular Settlements in the Conservation Land. At the same time, the policy promoted the regular urban land in Mexico City (Pérez Campuzano 2012).

Discussion

The core of this scenario is to solve the environmental challenges of land use will require assessing and managing inherent trade-offs between meeting immediate human needs and maintaining the capacity of ecosystems to provide goods and services in the future (Foley et al. 2005).

Analyzing this scenario through the different moments of the planning practice, (see chapter 2) this scenario is in the mid term between the technical rationale planning and the communicative turn. This scenario offers the possibility of the coexistence of the Irregular Settlements with the zones providing the environmental services inside the Conservation Land. The objective of the scenario is to place the future of the Conservation Land in a clear position.

Irregular Settlements in Mexico City – A complex perspective

The scenario proposes managing the Conservation Land as a class II system, and the Irregular Settlements and the natural zones as elements inside a network. To bring equilibrium between the Irregular Settlements and the Conservation Land, the scenario proposes limiting in spatial terms the Irregular Settlements and providing them with sustainable public. Allowing the Irregular Settlements to remain in the Conservation Land, but at the same time limiting the damage to the environmental service providing zones. Even if this scenario does not attempt to fix the Conservation Land into a static point, it targets to lock the Conservation Land into a known path to transit. Explaining the previous idea further, the scenario contemplates how does the Conservation Land behaves across time as a known fact.

From that perspective, several issues can be found. The first is linked to the management of sustainability. The main issue of the sustainability policy measures implemented in Mexico is heavy reliance in the technology. Nevertheless, the technology has not been able to solve the sustainability in Mexico (Martínez Rivera 2012). Secondly is that the quality of the environmental services is strained by several factors that degrade the health of the natural areas. Those factors follow characteristics that fall into the erratic and unpredictable elements like illegal logging, the wildfires, the plagues, and plant diseases up to the human intervention attempting to help the environment. (Sandoval Palacios & Gutierrez Cacique 2012).

The combination of the previous two issues in addition to the nature of the Irregular Settlements as class IV systems would not result in the clear path the Conservation Land must follow to fulfill the scenario. The Irregular Settlements would follow a non linear adaptive pattern and appeal to the practices illegal of land acquisition mentioned in chapter 3.

The conditions described would result in the breaching of the fence and the further expansion of the Irregular Settlement. The discussion shows the limits and uncertainties of fencing the Conservation Land. The discussion also suggests that the Irregular Settlers could overcome the fence. In addition, other efforts to enforce the preservation of the Conservation Land (arrest, fines, evictions) have no deterrence power (Aguilar & Santos, 2011). The result of the discussion of the scenario suggests that it may be considered as unachievable and ungrounded.

4.7 SMART CONTAINMENT OF THE IRREGULAR SETTLEMENTS – SCENARIO 3

The third scenario consists on the design and application of smart adaptive programs for the smart and controlled growth of the Irregular Settlements. This scenario considers the possibility of allowing for controlled and limited expansion of the Irregular Settlements and a simultaneous protection of the Conservation Land. The control and limitation of the spatial growth of the Irregular Settlements could be achieved by concentration processes.

This scenario is based on the success of the cases of the towns of San Nicolas Totolapan and San Bernabe in the Tlalpan Municipality. There are reports of specific cases where the support for the provision of environmental services have stopped the expansion of the Irregular Settlements surrounding the towns (Serrano Flores 2012).

The replicating the concept of compact city the growth of the Irregular Settlements would be compensated by a concentration of the housing infrastructure inside de current and recognized perimeter of the Irregular Settlements. The concept of the

compact city has been thought to be a sustainable concept. Compactness as a spatial concept is a response to outward expansions (De Roo 2000), which in this case is the unwanted result.

Discussion

This scenario is the more plausible than the previous two for several reasons. First, in the last years the central government of Mexico City has shown interest in this approach (Santos Cerquera et al. n.d.). Second, several authors coincide in the idea of working to achieve 'sustainability' in the Conservation Land. The definition used of sustainability considers continuous provisioning of environmental services no matter the urbanization level (López & Gamiño, 2009). From the academic discussion, the following parameters are suggested. Strengthen of the agricultural activities, turning them into economic fuel for the zones, and recovery and preservation of the natural zones providing the environmental services (Serrano Flores, 2012).

Analyzing this scenario through the different moments of the planning practice, (see chapter 2) this scenario is placed grounded in the communicative turn. The scenario follows the efforts of the communicative turn by, migrating from traditional systems and models like top-down, into pluralistic governance approach that adapt congruently with the balance of interests and the relations (De Roo 2007) inside the Conservation Land.

This scenario considers treating the Irregular Settlements as class IV. The scenario acknowledges the processes of self-organization and evolution in the nature of the Irregular Settlements. Instead of trying to set the Conservation Land into a fixed position, or locking it into a known path, the third scenario proposes allowing the non-linear processes take place in the Conservation Land.

The processes the scenario contemplates include evolution and coevolution. The idea is that the class IV system under the correct influence manages to solve problems and optimize the situation in a positive way (PM Allen, 1990). Allowing the emergence of self-consistent and organized groups developing in accordance of providing environmental services to Mexico City.

Nevertheless, this scenario has a similar issue as the two previous scenarios. The idea of steering a non-linear adaptive system with a high degree of complexity is similar to bring it to a locked path.

Trying to steer the direction of the Irregular Settlements by introducing an external force is contrary to the nature of the self-organizing class IV systems. The class IV systems are dynamic, often non-deterministic, open, exist far from equilibrium. The key element that should not be forgotten is that self-maintenance one of the most important function of self-organizing systems (Banzhaf 2009).

It is well known that the Conservation Land in Mexico City every day receive more urbanization pressure due to the expansion of the Irregular Settlements and increasing need of environmental services by regular urban land (Ávila Foucat 2012). The result of this scenario would be a regression from class IV system (adaptive) into a class III system (erratic) (see Table 2 –1) for the Conservation Land as a system. The erratic behavior of the Conservation Land would correspond with the full expansion of the Irregular Settlements and the extension of the environmental services.

Irregular Settlements in Mexico City – A complex perspective

Even if a comprehensive, content sensitive and adaptive policy can offer to control the expansion of the Irregular Settlements such control would be only temporal. The urban pressure and the need for housing would eventually overcome any policy no matter how adaptive it is.

All the discussion considered this scenario could be considered as a possible temporary solution. Nevertheless, in the end the policy measures presents itself as a useless effort to preserve the Conservation Land.

4.8 CONCLUSIONS

The results of the discussion about the outcome and the scenarios indicates that trying to control the Irregular Settlements would only result in a lack of success.

While the local government of the Tlalpan Municipality and the central government of Mexico City still try to address the situation with reactive policies and actions focused on the Irregular Settlements, (Aguilar & Santos Cerquera 2011) similar results can be expected.

A main issue with all the scenarios is the scope they have. The scope of the three scenarios is limited to a local perspective, ignoring the external factors pressing the Conservation Land. The expansion of the Irregular Settlements is the result of many factors. One of them is the urban pressure Mexico City and other near urban centers create (Aguilar & Ward 2003). Another factor that is not addressed in the scenario is the economic forces driving people from other regions of the country into the Irregular Settlements (Aguilar 2002). Furthermore, there might be forces driving the Irregular Settlements still unknown to the academic community.

Controlling the irregular settlements is a complex task without acknowledging such issues, forces, and factors. In addition, presents the impossibility of applying policy measures that regulate and control the Irregular Settlements.

Based on the discussion made so far, the present work proposes a change of focus in the policy to deal with the expansion of the Irregular Settlements.

CHAPTER 5 - PORPOSED POLICY MEASURES

5.1 INTRODUCTION

The chapter contains eight sections plus the introduction. In the second section, the proposed change of discourse is discussed. The following section explains how the change of discourse will affect the outcome of the Conservation Land. In the fourth section, the application of the change of discourse then is transformed into policy measure proposals. The next four sections discuss the policy measures created from the change of discourse. The structure of the sections is the following. First the general description, then the policy measure proposed and lastly the discussion of the policy measure. The discussion is done using the concepts developed in chapter 2 (complexity theory and systems theory) and 3 (the current situation in the Conservation Land). The last section is the discussion of the possible effectiveness of the proposed policy measures.

5.2 CHANGE OF DISCOURSE

Considering the situation in the Conservation Land in Mexico City, a new ideology for the management of the Conservation Land could bring more chances of preservation (Serrano Flores, 2012). Acknowledging the complexity of the Irregular Settlements as class IV systems (see chapter 3) is the first step towards the preservation of the Conservation Land. Similar to the communicative turn where the complexity of reality had to be incorporated in the planning practice, (see chapter 2) including complex perspective in the policy making regarding the Conservation Land open a new set of possibilities.

In the north of Europe, the change was made towards a bottom-up, congruent adaption, and balance approaches (De Roo, 2007). Nevertheless, transferring 'as is' the policies developed in North Europe to Latin America, hoping to modernize the planning practice would defeat the very essence of the communicative turn. The main element the planning practice in Latin America can learn from the planning practice in North Europe is to adapt the discourse and the approach to the situation at hand.

Trying to exercise any type of control or manipulation directly over the Irregular Settlements has historically had little success. In the scenarios developed chapter 4 the main issue all scenarios had was a misunderstanding the nature of a class IV system and trying to impose an external guidance into them.

The System Theory and Complexity Theory recognize the class IV as entities that develop over time, with robust inner mechanisms that allow them to resist the majority of imaginable threats (De Roo, 2010). The self-maintenance is the main objective of the self-organizing systems (Banzhaf, 2009). Any other imposed objective will be ignored at the long run.

One option to develop the change of discourse towards the management of Conservation Land is, understanding the notion of 'place', it refers to the intimate human relations between people and their homes, neighborhoods, cities, lands, and countries. The positivistic 'space', on the other hand, is an alienating, and dehumanizing concept (Portugali, 2006). The Irregular Settlements are made through the human action.

The present work proposes a change of discourse, rather than of focusing the efforts in preventing the expansion of the Irregular Settlements. The proposal consists on

shifting the focus to the zones that still provide ecological services and actively protect them, instead of actively trying to contain the Irregular Settlements.

5.3 ALTERNATIVE DISCOURSE AND OUTCOME

The new discourse proposed by the present work focuses on the zones with ecological value, opening a new possible an alternative outcome. The difference with the most likely possible outcome is that the switch in the discourse gives the chance to 'play' with different 'amounts' of green areas.

By protecting specific green areas that provide the key environmental services to Mexico City, the main function of the Conservation Land is preserved. The protection from the expansion of the Irregular Settlements is obtained by transforming the selected zones from potential places of expansion into spaces of preservation.

The zones that do not play a key role in the providing of environmental services to Mexico City can be subject to negotiation with the local actors.

The alternative outcome then would be the preservation of the function of the Conservation Land, and the partial urbanization by the Irregular Settlements of the Conservation Land.

5.4 DEGREES OF NECESSITY

The idea behind the change of discourse is actively protecting the zones providing environmental services in the Conservation Land. In order to select which zones should be protected and under what scheme, in this section is introduced the concept of 'degrees of necessity'. The degrees of necessity are a classification for the zones providing environmental according to their characteristics and capacity.

Considering that the environmental services consist of flows of materials, energy, and information from natural capital stocks that provide a state of welfare for people living in contact with such environment (Costanza et al., 1997). There has been a large debate on how to classify the different degrees and options of environmental provision (K. Wallace, 2007) (Costanza et al., 1997).

Four degrees of necessity are determined for the Conservation Land in the Tlalpan Municipality using academic research, complexity theory and the experience of the fieldwork done by the UNAM.

Form the environmental perspective the degrees will be based of the following criteria. First, Wallace (2007) proposes to use the categories of services used in his classification, which are adequate resources; benign physical and chemical environment; protection from predators, disease and parasites; and socio- cultural fulfillment – are human values. Second, another important aspect of the definition of environmental services, they are components. This means that services are environmental things or characteristics, not functions or processes (Boyd & Banzhaf, 2007). Another element to consider in the elaboration of the degrees of necessity is the impact on the local economy. The economic activities that allow the land to provide environmental services should also be supported (Martínez Rivera, 2012).

Irregular Settlements in Mexico City – A complex perspective

Considering the evolution of the planning practice (see chapter 2) each degree will be linked to the respective characteristic of a system (I to IV). The most important for the provision of environmental services will be linked to the class I system. Meanwhile, the zones providing the less support can be conceived as class IV systems.

The resulting degrees of necessity are the following. Minimal environmental services; Optimal environmental Services; Agricultural zones with environmental services; and lastly the Leisure zones with environmental services.

5.5 POLICY EFFECTIVENESS IN THE CONSERVATION LAND

The main critic done to the current policy is the lack of success in protecting the natural areas originally proposed. The original target was to provide protection to 52 000 hectares of natural areas, but the protection was provided only to 16 000 hectares (Sandoval Palacios & Gutiérrez Cacique, 2012).

The effectiveness of the proposed policy measures will be determined by the method of application and the fine-tuning done to them. Unfortunately, several things are ignored when designing and applying policy measures in Mexico. For example, an element ignored by the policy makers, is the mechanisms of the natural areas and resources. Such mechanisms do not match with the mechanisms of the economical and the social systems. This explains the lack of success in the elaboration of policy measures that contemplate sustainability as the option to follow (Martínez Rivera, 2012). In some cases, the excuse for the no application of the protection of the natural areas is the legal condition of such areas (Sandoval Palacios & Gutiérrez Cacique, 2012).

Another critic is the lack of diffusion the support for the provision of environmental services has. As well as, the critic for support for the provision of environmental services is the insufficient infrastructure and the lack of economic resources to achieve the targets (Perevochtchikova & Vázquez Beltrán, 2012). The current policy for the support of the environmental services was designed as a strategy to diversify the quality and health of the zones providing the environmental services. However, the extend or the effectiveness of the current policy have not been measured, either in a social or ecological extent (Ávila Foucat, 2012).

Furthermore, the urban spaces in the developing world are expanding faster than cities in more-developed countries in recent decades. Cities in Latin America and the Caribbean are highly urbanized region, but they are also less-organized urbanized regions (Angel, Parent, Civco, Blei, & Potere, 2011). Specifically talking about Mexico City, there are conditions turning the Conservation Land in an ideal target for the development and expansion of the Irregular Settlements. Specially in the Tlalpan municipality, the forestall zones are at large risk of urban transformation (Ávila Foucat, 2012).

The main advantage of the proposed policy measures is the extraction of the zones that secure the environmental services for Mexico City. While the policies securing the mentioned zones do fall in a more technical approach, when dealing with class IV systems (see chapter 2) trying to provide a communicative solution might, or not, provide a concrete permanent solution. Experimenting with the concepts of space and place new avenues of solution are open. Having 'place' as the arena for the

human interaction and the space not (Portugali, 2006) bring new options for the Conservation Land.

The policy measures are thought not to alter the Irregular Settlements directly, but through interaction with the environment in which they develop. The Irregular Settlements can be expected to follow the rules of a class IV system. The Irregular Settlements will evolve and adapt to the new forces opposed to them, 'hopefully' evolving in terms that represent a lesser threat to the 'health' of Mexico City.

5.6 MINIMAL ENVIRONMENTAL SERVICES

Description

The areas providing the minimal environmental services to Mexico City can be defined as the zones that maintain the minimal level of air and water quality for the rest of the city. Moreover, the zones with the largest biodiversity should be included to preserve the local species.

Policy measure proposal

The Central Government of Mexico City should acquire the zones determined to be providing the critical environmental services for the welfare of the city. The acquisition should be done using the necessary means. Such zones should be granted the title of national parks to ensure the maintenance and protection. The zones should be kept in the best possible state to provide the minimal environmental services the city needs.

Discussion

The definition for minimal environmental services proposed in the present work is the following. The adequate amount of natural resources needed to support the life of individuals. They must be in sufficient supply for survival and reproduction – under normal circumstances they have a lower, quantity threshold, but not an upper threshold (K. J. Wallace, Beecham, Bone, & Australia, 2003).

From the complexity theory and systems theory (see chapter 2), the zones providing the minimal environmental services should be considered as class I systems. Due to the permanent need of these zones, they should be static objects, and be fixed across time.

The zones providing environmental services should be turned into space out of the reach of the Irregular Settlements. Once the lands are owned by the central Government of Mexico City, the fencing and transformation into parks should be done as fast as possible to prevent further confrontation with the previous owners, or any attempts of occupation by potential Irregular Settlers.

The risk of not granting the title of national parks and allow the local actors is the following. Even with the economic support of the policy measures supporting the provision of environmental services, not all the families owning lands capable of providing environmental services decide to practice agriculture. Is common, that the economic revenue of the commercialization of the land is larger than the revenue from agriculture (Martínez Rivera, 2012).

Irregular Settlements in Mexico City – A complex perspective

The long-term maintenance of the parks should be performed by the central government of Mexico City, this to avoid the problems of the local government (see chapter 3).

5.7 OPTIMAL ENVIRONMENTAL SERVICES

Description

The areas providing the optimal environmental services to Mexico City can be defined as the zones that ensure the optimal level of air and water quality for the rest of the city. The zones that bring to a comfortable state the environmental services in Mexico City can be arranged and bargained, as the central government considers best.

Policy measure proposal

The Central Government of Mexico City should acquire the zones determined to be providing the critical environmental services for the welfare of the city. The acquisition should be done in a bargaining process with the local actors. Such zones should be granted the title of national parks to ensure the maintenance and protection. The zones should be kept in the best possible state to provide the optimal environmental services for the city.

Discussion

The definition for optimal environmental services proposed in the present work is the following. The capability of renewal of soils and the cycling of nutrients (Boyd & Banzhaf, 2007) that prevent further the health damage like the provision of air quality, drinking water quality, land uses or predator populations hostile to disease transmission. In other words, The natural capital stock that produces these services adequate for the current and continued future human welfare (Costanza et al., 1997).

From the complexity theory and systems theory (see chapter 2), the zones providing the minimal environmental services should be considered as class II systems. While the zones should have a clear and known outcome, the selection of zones for this transformation can operate as a feedback system. The feedback consists on 'playing' with the amount of area providing the optimal environmental services. This opens the chance to increase or decrease the area based on the factors and forces at each moment. In case the environmental services start to fell into the minimum necessary, more area could be added to the zones providing the optimal environmental services. In the opposite case, if there is enough provision of environmental services some area could be destined for other uses.

The zones providing the optimal environmental services should be turned into space out of the reach of the Irregular Settlements, similar to the minimal ones. The management and ownership should follow the course of the zones providing minimal environmental services, fencing and management by the government of Mexico City.

One of the reasons supporting the creation of these zones is the bad management of the policy, allowing for lax criteria (Ávila Foucat, 2012). For example, in the year 2006 the policy indicated that the requirement be recipient of economic support for the provision of environmental services was the coverage of the 80% by forest of the total amount of land. By the year 2008 the coverage was diminished only to 50% (Sandoval Palacios & Gutiérrez Cacique, 2012). The policy ruling the Conservation

Land has not been able to prevent the apparition of and success of the Irregular Settlements. (Pérez Campuzano, 2012).

The differences between the 'minimal' and 'optimal' is the sense of urgency, in the optimal the sense of urgency is lower. In compensation, the degree of flexibility is higher.

5.8 AGRICULTURAL ACTIVITIES

Description

The areas that are capable of having agricultural activities and provide the environmental services to Mexico should receive of support as well. The idea is to make attractive for the owners of the land to keep the agricultural activities that provide environmental services for Mexico City. In the case of these zones, there is no need for an acquisition by the central government of Mexico City.

Policy measure proposal

The Central Government of Mexico City and the Tlalpan Municipality should support the zones determined to be capable of having agricultural activities. At the same time, provide environmental services for the welfare of the city. The support should be proportional to the amount of agricultural production and the environmental services provided.

Discussion

The definition for the agricultural zones providing environmental services proposed in the present work is the following. The zones capable of agricultural activities that support the provision of environmental services while attending the local food production (Serrano Flores, 2012).

From the complexity theory and systems theory (see chapter 2), the zones with agricultural activities providing environmental services should be considered as class VI systems. Contrary to the two previous zones need to be handled by the local actors. Therefore, the zones are subject to the process of self-organization and non-linearity in the Conservation Land. As a result, the agricultural zones providing environmental services can be considered part of a class IV system. In the following paragraphs, an academic discussion will reflect about the possible future of these zones.

The concept of agricultural zones providing environmental services the zones is not new in the Conservation Land (Pérez Campuzano & Perevochtchikova, 2012). The zones cataloged with a high degree of importance in the provision of environmental services have had several programs and policy measures applied. The expected result was the proliferation of agriculture and ecotourism while supporting the local communities (Cruz García, 2012).

Nevertheless, these zones being subject of the self-organization process in the Conservation Land, it is impossible to estimate how long the zones will keep its status. The agricultural activities in the Tlalpan municipality are limited to corn and wheat production. The problem with that is the production of wheat and corn cannot match with revenue of the commercialization of the lands (Mollá Ruíz, 2006).

5.9 LEISURE ACTIVITIES

Description

The areas that are capable being used with leisure purpose and provide the environmental services to Mexico should be subject of support, to keep the environmental services and still provide leisure services to the tourists in the zone.

Policy measure proposal

The Tlalpan Municipality should support the zones determined to be capable of providing environmental services for the welfare of the city, and at the same time provide leisure services to the tourist and local people.

Discussion

The definition for the leisure zones providing environmental services proposed in the present work is the following. The zones capable ecotourism or cultural benefits that at the same time provide environmental services (Cruz García, 2012).

From the complexity theory and systems theory (see chapter 2), the zones having leisure and ecotourism activities that provide environmental services should also be considered as class VI systems. Similar to the agricultural zones, the leisure areas need to be handled by the local actors, but are also subject to the visitors from the city (Perevochtchikova & Vázquez Beltrán, 2012). Therefore, the zones are subject to the market and the process of self-organization and non-linearity in the Conservation Land. In the following paragraphs, an academic discussion will reflect about the possible future of these zones.

Historically, the zones cataloged with a high capacity for the provision of environmental services with the objective of offering leisure and ecotourism activities have had support by the local government. The expected result was the proliferation of ecotourism alternatives that back up the preservation while supporting the local communities (Cruz García, 2012) helping the families avoiding the search for new economic opportunities (Martínez Rivera, 2012). The reasoning of the policy was to obtain a positive result focused on sustainability and the economic support for the provision of environmental services is a better cohesion of the local community and social cohesion (Perevochtchikova & Vázquez Beltrán, 2012).

Nevertheless, the benefits were minor, like the generation of small and temporal jobs; the earnings are divided equally in the community. However, that does not guarantee the reinvestment at the long run of the environmental services (Perevochtchikova & Vázquez Beltrán, 2012). In addition, the process of development of these activities has not followed the established pattern by the current policy. The process has responded to the urbanization of the surrounding areas of the Conservation Land (Cruz García, 2012).

Even with the economic support of the policy measures supporting the provision of environmental services. Is common, that the economic revenue of the commercialization of the land is larger than the revenue from ecotourism (Martínez Rivera, 2012).

This policy measure is the last mentioned due to the limited scope it has now in the zone. However it should not be ignored, as part of the very complex list of processes

and mechanisms inside the zone the leisure zones might be able to work as a buffer for the 'minimal' and 'optimal' service zone for a considerable amount of time.

5.10 CRITICAL EVALUATION

Critical Assessment

The proposed change of discourse differs from the current policy because it does not try to control or manage the Irregular Settlements. As discussed in chapter 4, the Irregular Settlements possess self-organization and adaptation capabilities. Those capabilities have made unfruitful the efforts to control them.

The control instead is placed in the areas providing the environmental services. The zones determined to provide the minimal and optimal zones are transformed from places vulnerable to become Irregular Settlements into spaces of preservation.

With the change of discourse, the confrontation with the Irregular Settlements is avoided. Moreover, the Irregular Settlements can keep their self-organization processes without endangering the environmental services for Mexico City.

Even when the situation in the Conservation Land has a multilevel degree of complexity, the project from which this work is developed had a local character. The weight of dealing with the provision of environmental services for Mexico City is a local (municipal) task. Therefore, the change of discourse proposed in the present work provides a grounded alternative for the management of the Conservation Land.

Critical Discussion

There are two main critics to the proposed policy measures. The first critic refers to the zones providing the minimal and optimal environmental services. The second critic refers to the agricultural and leisure zones providing environmental services.

For the policy measures, that proposes the transformation into national parks of the zones providing the minimal and optimal environmental services. The main critic is the disconnected to the local actors. Such transformation would include the expropriation of lands and in some cases evictions. For the policy measures supporting the agricultural and leisure, the main critic is different. The critic is basing on policies that have already proven to be ineffective and allow misuse of them to support the irregular settlements.

Other critic is the limited multilevel inclusion of the policy measures. Even if the policy measures do not try to interfere with the expansion of the Irregular Settlements, they are only focusing on the micro level. The macro and meso levels are not contemplated into the policy measures. Limiting the possible interaction with other elements in the Conservation Land system.

From the government perspective, the application of the policy measures may be troublesome. The policies regarding the minimal and optimal environmental services require a harsh approach. Meanwhile, the policy for supporting the agricultural and leisure must be cooperative and communicative with the local actors.

The last critic to the proposed policy measure is the pressure from the urban zones. It is less likely that the natural park created to provide the minimal and optimal environmental services break before the urban pressure. Although, in the other hand

Irregular Settlements in Mexico City – A complex perspective

the agricultural and leisure zones are quite vulnerable to the urban pressure and be transformed in a short time.

CHAPTER 6 - CONCLUSIONS

Irregular Settlements in Mexico City – A complex perspective

The situation in the Conservation Land regarding the expansion of the Irregular Settlements can be cataloged as a highly complex system. The policy measures based on a technical perspective applied to the Conservation Land have been characterized by a technical rational. Nevertheless, the design of policy measures and postures based on the technical rational have proven not only ineffective but also inconsistent with the situation.

The ineffectiveness of the policy measures applied to the Irregular Settlements can be related to the narrow sight of the technical rational. The technical rational does not see the full spectrum of forces driving the mechanisms inside the Conservation Land. The complexity theory shows such mechanisms and helps to ground the decision-making process.

The following section discusses the research question and sub questions. An elaboration on what answers each question received in the present work. Next is a general conclusion on the situation on the Conservation Land and the lessons learned from the elaboration of the present work.

Research questions

The first sub question is: How can the complexity theory and systems theory help in the design of policies for the preservation of the Conservation Land? The answer is expressed in chapter two, four, and five. The complexity theory along systems theory was used to analyze the situation, the scenarios and proposals. The result of the analysis was the following. The best option to preserve the function of the Conservation Land was to focus the efforts in the land providing the environmental services. Contrary to the current policy, which tries to control the Irregular Settlements.

The main contribution of the complexity theory to the proposal making process is the change of focus for the design and application of policy measures. The contribution is done by showing that any type of control over the Irregular Settlements is an illusion. The Irregular Settlements follow only the inner self-organization process and self-preservation interests.

The next question is: Which are the possible scenarios for this area? The scenarios and the most likely outcome are explored in the chapter 4. In chapter 4, the scenarios are evaluated using complexity theory and academic discussion on the current situation. The first scenario consisted on the eviction of the Irregular Settlers and destruction of the Irregular Settlements. The second scenario consisted on fencing and stopping of the expansion of the Irregular Settlements. The third scenario consisted on the smart containment of the Irregular Settlements and support for environmentally friendly activities. Nevertheless, all scenarios were blind to the nature of the Irregular Settlements. The Irregular Settlements are driven by self-preservation and the mechanisms of self-organization cannot be manipulated to fit any policy.

The last sub question is the following. What changes can be made to the policy to control the spatial behavior of the Irregular Settlements? The answer to this question comes by the analysis of systems theory, complexity theory, and the academic discussion on the zone. The Irregular Settlements can be seen as class IV systems with a high degree of complexity. Therefore, trying to place under control the Irregular Settlements is a task that will not deliver lasting results.

The research question is: How to preserve the Conservation Land against the expansion of the Irregular Settlements? The answer developed in chapter five and was the following. It is unwise to try to stop the Irregular Settlements from expanding. The Irregular Settlements will continue to expand as long as the self-organization processes demands. Any policy measure applied directly to the Irregular Settlement will be overcome. Instead of trying to preserve the full Conservation Land, the present work proposes to preserve its function. The preservation method suggested is to apply the policy measures directly to the lands providing the environmental services to Mexico City.

General Conclusions

The processes taking place in the Conservation Land have a high degree of complexity.

The introduction of a non-linear thinking and the class IV systems grounds the possible solutions and discussions about the expansion of the Irregular Settlements.

Analyzing the possible scenarios of intervention for the current situation through the lens of the complexity perspective allows estimating the result of the developed scenarios.

Complexity breaks the illusions of a straightforward or simple solution by the application of a certain policy to the Irregular Settlements.

The result of the application of the complexity theory along the analysis of the current situation shows that the biggest illusion is to obtain a green outcome by the controlling the Irregular Settlements. The very same nature of the Irregular Settlements protects them from intervention by external forces. The class IV characteristics of the Irregular Settlements allow for the evolution and adaptation to overcome the threats and limitations imposed directly to them.

In addition, the situation in the Conservation Land is subject to the effect of multilevel forces. The first example of such forces is the urban pressure generated by Mexico. Trying to find a local solution for a complex problem with multilevel intervention will result in failed efforts.

However, doing nothing to prevent the depredation of the Conservation Land in Mexico City is not a feasible option. To find an alternative we must consider the conditions of the current situation in the Conservation Land, as well as the nature of the Irregular Settlements. The present work proposes a change of discourse. Instead of focusing on controlling the Irregular Settlements, the proposal consists on the intervention directly on the Conservation Land. Modifying the 'arena' instead of the 'players' opens a new set of opportunities for the preservation of the Conservation Land.

The change of discourse, focusing on the Conservation Land instead of the Irregular Settlements creates opposition forces with different characteristics that stand a better opportunity to alter the mechanisms working in the Conservation Land.

The result of the discourse change results in forces that do not oppose the expansion of the Irregular Settlements. Instead, creates conditions that the Irregular Settlements will not overcome in their evolution process. Acknowledging the complexity intrinsic

Irregular Settlements in Mexico City – A complex perspective

to the Irregular Settlements allows creating policy measures that do not ignore the capacity of the Irregular Settlements to expand and maintain its status, contrary to the traditional technical approach.

REFERENCES

Irregular Settlements in Mexico City – A complex perspective

1. Agrawal, A., & Redford, K. (2009). Conservation and displacement: An overview. *Conservation and Society*, 7(1), 1. doi:10.4103/0972-4923.54790
2. Aguilar, Adrián G., & Ward, P. M. (2003). Globalization, regional development, and mega-city expansion in Latin America: Analyzing Mexico City's peri-urban hinterland. *Cities*, 20(1), 3–21. doi:10.1016/S0264-2751(02)00092-6
3. Aguilar, Adrian Guillermo. (2008). Peri-urbanization, illegal settlements and environmental impact in Mexico City. *Cities*, 25(3), 133–145. doi:10.1016/j.cities.2008.02.003
4. Aguilar, Adrián Guillermo, & Santos, C. (2011). Asentamientos informales y preservación del medio ambiente en la Ciudad de México. Un dilema para la política de uso del suelo. In E. Pérez, M. Perevochtchikova, & S. Ávila (Eds.), *Suelo de Conservación del Distrito Federal* (pp. 93–124). Mexico City: Porrúa.
5. Aguilar, Adrian Guillermo, & Santos Cerquera, C. (2011). Informal settlements' needs and environmental conservation in Mexico City: An unsolved challenge for land-use policy. *Land Use Policy*, 28(4), 649–662. doi:10.1016/j.landusepol.2010.11.002
6. Aguilar, & Santos, C. (2011). El manejo de asentamientos humanos irregulares en el Suelo de Conservación del Distrito Federal. Una política urbana ineficaz. In Adrián Guillermo Aguilar & I. Escamilla (Eds.), *Periurbanización y sustentabilidad en grandes ciudades* (First Edit., pp. 277–315). Mexico City: Porrúa.
7. Allen, P. M., Varga, L., & Strathern, M. (2009). Complexity, Innovation and Organizational Evolution. *Projectics / Proyética / Projectique*, 1(1), 31. doi:10.3917/proj.001.0031
8. Allen, Peter. (2001). What is complexity science? Knowledge of the limits to knowledge. *Emergence, A Journal of Complexity Issues in Organizations and Management*, 3(1), 24–42.
9. Allen, PM. (1990). Why the future is not what it was: New models of evolution. *Futures*, 22(6), 555–570. Retrieved from <http://www.sciencedirect.com/science/article/pii/0016328790901274>
10. Allen, PM. (1997). Modelling the Coevolution of Communications and Socio-Economic Structure. *Prometheus*, 15(1), 83–100. Retrieved from <http://www.tandfonline.com/doi/full/10.1080/08109029708632053>
11. Allmendinger, P. (2002). Towards a Post-Positivist Typology of Planning Theory. *Planning Theory*, 1(1), 77–99. doi:10.1177/147309520200100105
12. Allmendinger, Phil, & Haughton, G. (2010). Spatial planning, devolution, and new planning spaces. *Environment and Planning C: Government and Policy*, 28(5), 803–818. doi:10.1068/c09163
13. Allmendinger, Philip. (2009). *Planning Theory* (Second Edi.). Palgrave Macmillan.
14. Anderson, P. (1999). Perspective: Complexity theory and organization science. *Organization Science*, 10(3), 216–232. Retrieved from <http://orgsci.journal.informs.org/content/10/3/216.short>
15. Angel, S., Parent, J., Civco, D. L., Blei, A., & Potere, D. (2011). The dimensions of global urban expansion: Estimates and projections for all countries, 2000–2050. *Progress in Planning*, 75(2), 53–107. doi:10.1016/j.progress.2011.04.001
16. Ávila Foucat, S. (2012). Las UMA como una estrategia de diversificación productiva rural en el suelo de conservación del Distrito Federal. In E. Pérez Campuzano, M. Perevochtchikova, & S. Ávila Foucat (Eds.), *Hacia un manejo sustentable del suelo de conservación del Distrito Federal* (First., pp. 165–188). Mexico City: Miguel Ángel Porrúa.
17. Banzhaf, W. (2009). Self-organizing Systems. In *Encyclopedia of Physical Science & Technology*.
18. Batty, M., Xie, Y., & Sun, Z. (1999). Modeling urban dynamics through GIS-based cellular automata. *Computers, Environment and Urban Systems*, 23(3), 205–233. doi:10.1016/S0198-9715(99)00015-0
19. Batty, Michael. (1991). New technology and planning: Reflections on rapid change and the culture of planning in the post-industrial age. *Town Planning Review*, 62(3), 269–294. Retrieved from <http://liverpool.metapress.com/index/H60TJ04147615726.pdf>
20. Batty, Michael, & Torrens, P. (2001). Modeling Complexity the limits to prediction. *Cybergeo: European Journal of ...* Retrieved from <http://cybergeo.revues.org/1035?file=1>
21. Boyd, J., & Banzhaf, S. (2007). What are ecosystem services? The need for standardized environmental accounting units. *Ecological Economics*, 63, 616–626. doi:10.1016/j.ecolecon.2007.01.002

22. Costanza, R., Arge, R., Groot, R. De, Farber, S., Grasso, M., Hannon, B., ... Sutton, P. (1997). The value of the world's ecosystem services and natural capital. *nature*, 387(May), 253–260. Retrieved from http://www.esd.ornl.gov/benefits_conference/nature_paper.pdf
23. Crooks, A., Castle, C., & Batty, M. (2008). Key challenges in agent-based modelling for geo-spatial simulation. *Computers, Environment and Urban Systems*, 32(6), 417–430. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0198971508000628>
24. Cruz García, F. A. (2012). Asentamientos irregulares y fomento al turismo ecológico en los pueblos rurales tradicionales. El caso de Tlalpan. In E. Pérez Campuzano, M. Perevochtchikova, & S. Ávila Foucat (Eds.), *Hacia un manejo sustentable del suelo de conservación del Distrito Federal* (First., pp. 231–251). Mexico City: Miguel Ángel Porrúa.
25. Cruz, M. S., Moreno, A., Cruz, L., & Gutiérrez, M. (2011). Los Pueblos del Distrito Federal, Una Reconstrucción Territorial. In L. Álvarez (Ed.), *Pueblos Urbanos* (First Edit., pp. 27–35). Mexico City: Porrúa.
26. De Roo, G. (2000). Environmental conflicts in compact cities. *Environment and Planning B*, 27(1), 151–162.
27. De Roo, G. (2007). Shifts in planning practice and theory : From a functional towards a communicative rationale. In G. De Roo & G. Porter (Eds.), *Fuzzy planning: the role of actors in a fuzzy governance environment*. (pp. 97–108). Ashgate Pub Co. Retrieved from <http://books.google.com/books?hl=en&lr=&id=i8JsKQoeOQC&oi=fnd&pg=PA103&dq=Shifts+in+planning+practice+and+theory:+From+a+functional+towards+a+communicative+rationale&ots=IUjRkYKHR9&sig=i5OAJhSsKQg0L4X6rjGUKE-EeNM>
28. De Roo, G. (2010a). Planning and complexity: An introduction. In G. De Roo & E. A. Silva (Eds.), *A Planner's Encounter with Complexity* (First., pp. 1–18). Farnham: Ashgate Publishing, Ltd.
29. De Roo, G. (2010b). Confronting Complexity with Contemporary Planning Theory: Being or Becoming ? That is the Question ! In G. De Roo & E. A. Silva (Eds.), *A Planner's Encounter With Complexity* (First., pp. 19–40). Farnham: Ashgate Publishing, Ltd.
30. EL Universal. (2011, September 29). Senado aprueba derecho al agua. *EL Universal*. Mexico City. Retrieved from <http://www.eluniversal.com.mx/notas/797377.html>
31. Foley, J. a, Defries, R., Asner, G. P., Barford, C., Bonan, G., Carpenter, S. R., ... Snyder, P. K. (2005). Global consequences of land use. *Science (New York, N.Y.)*, 309(5734), 570–4. doi:10.1126/science.1111772
32. Gomezcesar, I. (2011). Introducción. Los pueblos y la ciudad de México. In L. Álvarez (Ed.), *Pueblos urbanos. Identidad, ciudadanía y territorio en la ciudad de México* (pp. V–XVI). Mexico City: UNAM-Centro de investigaciones interdisciplinarias en ciencias y humanidades (CEIICH), Miguel Ángel Porrúa.
33. Hataya, N. (2007). *The illusion of community participation : experience in the irregular settlements of Bogotá*. University College London.
34. Inegi, I. N. de E. y G. (2012). *ESTADÍSTICAS A PROPÓSITO DEL DÍA MUNDIAL DE LA JUSTICIA SOCIAL* (pp. 1–13). México, D.F.
35. Instituto de Geografía, U. (2011). *Atlas de Peligros Naturales o Riesgos de la Delegación Tlalpan* (pp. 1–52). Mexico City. Retrieved from http://www.inapam.gob.mx/work/models/SEDESOL/Resource/2612/Atlas_Estados/09012_TLALPAN/Atlas_Peligros_Riesgos_Tlalpan_2011.pdf
36. Lele, S., Wilshusen, P., Brockington, D., Seidler, R., & Bawa, K. (2010). Beyond exclusion: alternative approaches to biodiversity conservation in the developing tropics. *Current Opinion in Environmental Sustainability*, 2(1-2), 94–100. doi:10.1016/j.cosust.2010.03.006
37. Loorbach, D. (2010). Transition Management for Sustainable Development: A Prescriptive, Complexity-Based Governance Framework. *Governance*, 23(1), 161–183. doi:10.1111/j.1468-0491.2009.01471.x
38. Martínez Bordon, A., & Abreu Vera, J. (2012). La evaluación de las políticas públicas: evolución, principales herramientas y Métodos. In E. Pérez Campuzano, M. Perevochtchikova, & S. Ávila Foucat (Eds.), *Hacia un manejo sustentable del suelo de conservación del Distrito Federal* (First., pp. 15–30). Mexico City: Miguel Ángel Porrúa.

39. Martínez Rivera, S. (2012). El pago por servicios ambientales como instrumento económico de conservación: aproximaciones de evaluación en México. In E. Pérez Campuzano, M. Perevochtchikova, & S. Ávila Foucat (Eds.), *Hacia un manejo sustentable del suelo de conservación del Distrito Federal* (First., pp. 31–44). Mexico City: Miguel Ángel Porrua.
40. Mollá Ruíz, M. (2006). El crecimiento de asentamientos irregulares en áreas protegidas. La delegación Tlalpan. *Investigaciones Geográficas*, 60, 83–109.
41. PAOT. (n.d.). *Una propuesta de tipología de criterios rectores para el tratamiento diferenciado de los asentamientos irregulares ; bajo un enfoque preventivo de Orientación y alcances de la propuesta de tipología de criterios*. Retrieved from www.paot.org.mx
42. PAOT. (2011). *Distribución espacial de los Asentamientos Humanos Irregulares ubicados en el Suelo de Conservación en relación con el proyecto del Programa General de Ordenamiento Ecológico y Zonas de Valor Ambiental del Distrito Federal*. México, D.F. Retrieved from www.paot.org.mx
43. PAOT. (2013). Procuraduría Ambiental y del Ordenamiento Territorial del Distrito Federal. Retrieved May 03, 2013, from <http://www.paot.org.mx/index.php?module=paginas&func=display&pageid=461>
44. PAOT, P. A. y del O. T. del D. F. (2005). *Elementos para una gestión adecuada del Suelo de Conservación del Distrito Federal* (pp. 1–37). Mexico City.
45. PAOT, P. A. y del O. T. del D. F., & GDF, G. del D. F. (2012). *ATLAS GEOGRÁFICO DEL SUELO DE CONSERVACIÓN DEL DISTRITO FEDERAL*. Mexico City: Ekilibra.
46. Perevochtchikova, M., & Vázquez Beltrán, A. (2012). El programa de pago por servicios ambientales hidrológicos en el suelo de conservación del Distrito federal, México. In E. Pérez Campuzano, M. Perevochtchikova, & S. Ávila Foucat (Eds.), *Hacia un manejo sustentable del suelo de conservación del Distrito Federal* (First., pp. 85–107). Mexico City: Miguel Ángel Porrua.
47. Pérez Campuzano, E. (2006). Reestructuración urbano regional y nuevos derroteros de la migración en la Región Centro de México. El caso de la ZMCM. *Estudios Demográficos y Urbanos*, 2(62), 331–367. Retrieved from <http://www.jstor.org/stable/10.2307/40315222>
48. Pérez Campuzano, E. (2012). Periferia urbana e incentivos económicos para la conservación ambiental: el caso de los FOCOMDES. In E. Pérez Campuzano, M. Perevochtchikova, & S. Ávila Foucat (Eds.), *Hacia un manejo sustentable del suelo de conservación del Distrito Federal* (First., pp. 207–230). Mexico City: Miguel Ángel Porrua.
49. Pérez Campuzano, E., & Perevochtchikova, M. (2012). Introducción. In E. Pérez Campuzano, M. Perevochtchikova, & S. Ávila Foucat (Eds.), *Hacia un manejo sustentable del suelo de conservación del Distrito Federal* (First Edit., pp. 5–14). Mexico City: Miguel Ángel Porrua.
50. Perlman, J. (1976). *The myth of marginality: urban poverty and politics in Rio de Janeiro*. Berkeley: University of California Press.
51. Portugali, J. (2006). Complexity theory as a link between space and place. *Environment and Planning A*, 38(4), 647–664. doi:10.1068/a37260
52. Roque Guzmán, S. (2012). El Universal DF - PAOT y UNAM combaten asentamientos irregulares. *El Universal*. Mexico City. Retrieved from <http://www.eluniversaldf.mx/milpaalta/nota47894.html>
53. Ruiz, E. (2011). Doce años en el Suelo de Conservación. Una mirada desde el enfoque de la política pública. In E. Pérez, M. Perevochtchikova, & S. Ávila (Eds.), *Suelo de Conservación del Distrito Federal* (First Edit., pp. 53–63). Porrua.
54. Sandoval Palacios, E., & Gutiérrez Cacique, J. (2012). Servicios ambientales, experiencia en el Distrito Federal. In E. Pérez Campuzano, M. Perevochtchikova, & S. Ávila Foucat (Eds.), *Hacia un manejo sustentable del suelo de conservación del Distrito Federal* (First., pp. 69–84). Mexico City: Miguel Ángel Porrua.
55. Santos Cerquera, C., Escamilla Herrera, I., Pérez Campuzano, E., Ortiz Meraz, O., & Velázquez Morales, P. (n.d.). *Periferia Urbana y configuración de peligros derivados de factores de riesgo ante la expansión de asentamientos humanos y transformaciones de la zona urbana con afectaciones en Suelo de Conservación*. México, D.F.
56. Serrano Flores, M. E. (2012). Agricultura en periferias urbanas. Determinantes y posibilidades en el suelo de conservación del Distrito Federal. In E. Pérez Campuzano, M. Perevochtchikova, & S. Ávila

- Foucat (Eds.), *Hacia un manejo sustentable del suelo de conservación del Distrito Federal* (First., pp. 189–206). Mexico City: Miguel Ángel Porrúa.
57. Torrens, P. M. (2006). Simulating Sprawl. *Annals of the Association of American Geographers*, 96(2), 248–275.
58. Travecera Peralta, J. C. (2012). *PERDIDA DE LA CONCEPCIÓN SOCIAL DE LA PROPIEDAD EJIDAL EN MÉXICO Y SU TRANSICIÓN A PROPIEDAD PRIVADA*. Universidad nacional autonoma de méxico.
59. Velázquez Morales, P. (2012). *VULNERABILIDAD EN LOS ASENTAMIENTOS HUMANOS IRREGULARES UBICADOS EN SUELO DE CONSERVACIÓN DE LA DELEGACIÓN TLALPAN*. Universidad Nacional Autónoma de México.
60. Wallace, K. (2007). Classification of ecosystem services: problems and solutions. *Biological conservation*, 9. doi:10.1016/j.biocon.2007.07.015
61. Wallace, K. J., Beecham, B. C., Bone, B. H., & Australia, W. (2003). *Managing Natural Biodiversity in the Western Australian Wheatbelt: a conceptual framework*. Department of Conservation and Land Management.
62. Winton, A. (2011). Comunidad. Estado y periurbanización- procesos e impactos sociales de la reubicación de asentamientos irregulares en la delegación Tlalpan. In Adrián Guillermo Aguilar & I. Escamilla (Eds.), *Periurbanización y sustentabilidad en grandes ciudades* (First Edit., pp. 413–438). Mexico City: Porrúa.
63. Zuidema, C., & De Roo, G. (2004). Integrating complexity theory into planning: truth or dare? *AESOP Conference. Grenoble, 11*. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.101.8997&rep=rep1&type=pdf>

SURVEY

Asentamiento

ID:
Nacimiento del Asentamiento

- 1.-¿Cuándo se instalaron por primera vez en este lugar? _____
- 2.-¿Cuántas viviendas llegaron al lugar? _____
- 3.-¿Cuántas hay actualmente? _____
- 4.- ¿Vendrán nuevas familias? Sí No

Organización del Asentamiento

- 5.-¿Cómo se toman las decisiones en el asentamiento?
 a) Las decisiones se toman en Asamblea b) El Líder toma las decisiones
- 6.-Si es en asamblea, ¿cada cuanto son las reuniones?
 a) Semanalmente b) Quincenalmente c) Mensualmente d) Cada que sea necesario e)
Otro _____
- 7.- ¿Cómo se dota de agua el asentamiento?
 a) Agua Entubada b) Pipas c) De las dos formas d) Otro _____
8. - ¿Usted directamente ha gestionado el suministro de agua regular? Sí No
- 8.1.- ¿Cón qué dependencia de gobierno?
 a) Delegación b) SACM c) Jefe de Gobierno d) Más de uno de los Anteriores e)
Otro _____
- 9.- En el caso de la electricidad, ¿en el asentamiento tienen medidores de electricidad?
 a) Sí b) No c) Menos del 50% d) Más del 50%
- 9_1 ¿Usted directamente ha gestionado el suministro regular de la electricidad? Sí No
- 9_2.- ¿Cón quién?
 a) Delegación b) CFE c) Jefe de Gobierno d) Más de uno de los anteriores e)
Otro _____
- 10.- ¿El asentamiento está en proceso de regulación? Sí No
- 10_1.- Si no, ¿ha iniciado algún tipo de gestión para hacerlo? Sí No
- 10_2 ¿Con qué autoridad?
 a) Delegación b) Gobierno del Distrito Federal c) CORETT d) Otro _____
- 10_3.- ¿Han implementado algún tipo de presión?
 a) Marchas b) Plantones c) Cerrado Oficinas d) Otro _____
- 11.-El asentamiento tiene alguna filiación política? S N
- 12.- ¿Con cuál? a) PRD b) PRI c) PAN d) Nueva Alianza e) Movimiento Ciudadano
f) Partido Verde g) Partido del Trabajo g) Otro _____

Irregular Settlements in Mexico City – A complex perspective

13.- De que poblado se reconoce el asentamiento _____

14.- De cuales programas se han beneficiado _____

14.1.- Les han ofrecido el programa de captación de agua de lluvia Sí No

14.2.- Que porcentaje de viviendas tiene este sistema _____

15.- Cuando convocan a asamblea que porcentaje de personas del asentamiento asisten _____

16.- Como es su relación con los representantes de los otros asentamientos

a) Buena b) Regular c) Mala d) Indiferente

16.1.- Realizan reuniones con los otros representantes? Sí No

17.- Cuentan el asentamiento con estudios específicos (ambientales, PEMEX Riesgo ..) No

18.- De donde vienen la mayoría de personas del asentamiento

19.- Como es la relación de los ejidatarios con los habitantes del asentamiento

a) Buena b) Regular c) Mala d) Indiferente

20.- Nombre del representante o quien contesta _____

20-1 Genero a) Femenino b) Masculino

INTERVIEW

Irregular Settlements in Mexico City – A complex perspective

Here are the original transcripts of the interviews done during the fieldwork of the project.

SETTLEMENT TETECALA

Entrevistada la Sra elena reyes, es parte de la mesa directiva.

Su hermana crescenciana reyes es la representante de la mesa directiva de la comunidad. Telefono de su local en el mercado 5003 8663, celular 55 1402 1784. La hermana fue de las primeras en asentarse en el 2000, actualmente hay 39 lotes, pero hay personas que solamente van a la comunidad los fines de semana para vigilar su terreno y que no se los ocupen.

Existe ya la firma para la delimitación del polígono, construyeron con sus medios la barda para que pudieran entrar en la poligonal con las restricciones para construir máximo dos niveles, sin embargo los dueños de los terrenos de la parte posterior les tiraron un pedazo, porque les impedían el paso.

Anteriormente había sembradíos pero actualmente ya no. La Sra. Compró su terreno en 1998, 200 m², el metro les costó más o menos 180 ó 200 pesos

Las reuniones se llevan a cabo cada vez sea necesario pero las personas que han llegado a habitar las últimas casas ya no cooperan, antes realizaban faenas para la instalación de servicios como la puesta de los cables para la luz.

En algún momento la delegación los amenazó con el desalojo y por tanto requirieron apoyarse con los Settlements cercanos para evitar que lo hicieran.

En cuanto a los programas les ofrecieron baños ecológicos, pero solo 3 ó 4 familias los aceptaron pero comentan que no les funcionaron y los dejaron. También les ofrecieron el de captación de agua, pero nunca les traen nada y ellos tampoco siguieron presionando. Los vecinos por su cuenta captan el agua de acuerdo a sus medios que se utiliza para aseo y lavado de ropa.

Cuentan con la tarjeta para la dotación de agua casi todos los del Settlement, pagan en la delegación, a ella le surten una y media, cada familia gasta según sus necesidades. En época de lluvia después de realizar su pago les tarda en llegar unos tres días, en tiempo de secas hasta un mes, por lo que cuando reciben la dotación están pagando ya la del siguiente mes.

El delegado saliente higinio Chávez fue directo a la colonia y les prometió la regularización, pero siguen esperando la resolución.

El suministro de luz llega con bajo voltaje y les descompone aparatos. en cuanto a seguridad hay patrullas que realizan sus recorridos, pero cuando no hay milpa en los terrenos de alrededor se han llegado a meter a las casas.

Ellas vinieron a vivir aquí porque anduvieron buscando terrenos o deptos. Con apoyo de infonavit, pero no tuvieron éxito y se enteraron que vendían en ese lugar, ya que la hermana en el puesto del mercado conocía gente y fueron a ver los terrenos y compraron.

SETTLEMENT TLALTEPANCATITLA

La entrevistada es la Sra. Claudia duarte.

Ella llegó cuando se casó en el 2006 , su esposo tiene ya 15 años en el Settlement. En un principio había comité vecinal, pero debido a que han sido varias veces desalojados ya no están organizados, pero sí hay una señora catalina que los reúne de vez en cuando.

Cuenta con tarjeta para que le surtan el agua, costo \$90 cada mes. Comenta que la delegación ya les ha informado que no se regulariza. En su momento les ofrecieron departamentos y tierra por tierra de 120 m2 en topilejo, en la orilla sobre la autopista, y los deptos. Por six flags. Por lo que los vecinos destruyeron sus casas, era la condición para que les dotaran de los deptos. O terrenos y con ello confirmar que no se regresarían a sus terrenos.

Han visto a algunos de los antiguos vecinos y se lamentan haberse ido ya que la delegación los presionó mucho y si no aceptaban irse se quedarían sin nada.

En el caso de su marido no aceptó lo que la delegación ofrecía y continúa con su casa y terreno grande pues cuentan con 360 m2 y la delegación sólo les dio a los que si se fueron el equivalente a 120 m2.

SETTLEMENT TLALTEPANCATITLA

La entrevistada es la Sra. Gloria maría.

Prácticamente han sido desalojados varias veces, pero regresan y levantan su casa, con materiales ligeros, se fue dos años en el 2008 y regresó en 2010.

De hecho su marido y ella pasan las noches en casa de su hija que vive en san andrés, y por la mañana se van a su casita ya que tiene conejitos, ahí se pasa el día para que vean que sí vive.

El terreno lo compró su suegro y tenía siembra, de hecho al lado de su casa el terreno es un cultivo de papa. Por lo que el dueño les deja “titichar” juntar la papa chiquita

Debido a que están “colgados” para la luz, han sido objeto de que les roben el cable varias veces, ya que sí son muchos metros para que puedan contar con el servicio en su casa., en el km 30 es donde “están colgados”.

Como se siguen vendiendo terrenos supone que pueden venir de nuevo gente a ocupar, comenta que ahora cuesta \$1000 m2.

SETTLEMENT LA ESPERANCITA

La entrevistada maría fernanda

El terreno pertenece a un tío, que le vendió a su padre hace un año y ella apenas tiene medio año, de hecho en el terreno hay tres casitas.

Aunque entramos por el lado de la ciclopista, que sería la parte posterior del terreno, la calle principal daría a la del “rancho mágico”.

Su padre llegó de pedregal de san nicolás y ella de iztapalapa.

Comenta que cfe ha llegado al km 30 pero no ha llegado con ellos todavía. Los que sí han pasado son los que denominó del “proyecto del agua” hace 3 o 4 meses.

SETTLEMENT TEPACHERAS

El entrevistado es el sr. Jesus martinez

Se tuvo oportunidad de hablar con el representante, quien vive ahí desde 1989. En un principio tuvieron muchas asambleas para tener más fuerza, de las que obtuvieron las credenciales para el agua, costo de la pipa \$ 87 surten para dos meses , 8000 litros.

En cuanto al suministro de energía están “colgados” ya les ha dicho cfe que no pueden dar el servicio hasta que se regularicen, comenta que ya está en proceso el estudio de impacto ambiental.

En algún momento once familias se les quiso reubicar, recibieron su procedimiento administrativo pero no encontraron fundamento y ahí continúan las familias.

Están en espera que les den la determinación del uso del suelo. Como no se finaliza el estudio considera que sí pueden seguir llegando personas a asentarse. La mayoría de las casas tienen procedimiento administrativo.

el sr. Mtz compró a \$250 m2 al núcleo agrario pero ahora están vendiendo a \$1000 m2 aquí cerca del Settlement.

SENTEMIENTO VALLE VERDE

Logramos platicar tanto con la representante de la mesa directiva- comité vecinal Sra. Luz maría como con otras dos integrantes la Sra. Blanca estela y Sra. Magdalena que en ese momento se dirigian a la delegación a resolver asuntos relacionados con el Settlement.

Se inició la entrevista con la Sra. Blanca estela, quien comenta obtuvo su casa por un traspaso, zona ejidal. Cada familia ha hecho sus trámites ante la delegación para la dotacion de agua por pipa, cuentan con tarjeta costo \$68.50 por surtirla cada mes.

la mayoría de los vecinos han sido muy participativos, se reúnen los domingos a fin de mes en el centro comunitario.

Refiere que directamente han tratado con el sr. Víctor hugo martínez para el proceso de regularización.

Tienen viviendo 17 años Sra. Luz ma., 20 años Sra. Blanca y 15 años Sra. Magda, procedentes de la deleg. Venustiano carranza, de santa úrsula coapa y de valle de chalco, respectivamente, para contar con una vivienda propia. Tambien hay vecinos que proceden de oaxca y guerrero.

Refieren que es un Settlement donde las cosas funcionan favorablemente, gracias a las gestiones de los directivos anteriores y porque participa toda la comunidad como cuando fue el caso de la introducción del pavimento hace más o menos 10 años, red primaria y secundaria, todos cooperaron se contrataron faenas de gente de la magueyera.

Desearían que estuviera más urbanizado, y ya contarán con drenaje.

Hubo un proyecto del centro pegaso, centro de alto rendimiento para que se introdujera drenaje, y éste fuera canalizado para aprovecharlo en riego, pero no hubo avances al respecto.

Su relación con los demás Settlements es buena.

Cuentan con el servicio de transporte publico la ruta 82 de la rtp por lo que la movilidad es muy buena.

SETTLEMENT MAGUEYERA

Entrevista anónima.

Aquí se entrevistaron dos personas que tienen puntos de vista opuestos de acuerdo a la relación que tienen con el sr. Rubén quien es el representante vive en calle yoali 83, quien no se localizó, así que se habló con una de las integrantes del comité vecinal la Sra. Yesenia, hija de la Sra. Isabel, entre las dos respondieron la encuesta.

Comentaron que hace poco pasó un grupo de jóvenes encuestando cada casa, tomando medidas, por lo que no quería responder en un principio.

Inicialmente se reunían cada ocho días ahora solo cuando sea necesario.

Compró su terreno el esposo que es militar.

Capta el agua porque construyó su cisterna que aprovecha en baños y aseo de casa.

SETTLEMENT MAGUEYERA

Entrevista con la Sra. Rosalba hernández,

Vecina de la anterior encuestada Sra. Isabel, de hecho salió y preguntó si estábamos entrevistando a todo el Settlement, para que la entrevistáramos a ella y comenta que ya han estado un grupo de jóvenes anteriormente tomando datos e información de las viviendas.

La relación con el sr. Rubén no es nada favorable. Dice que nadie lo eligió, él llegó y se nombró, ha corrido gente de su casa cuando llegan a preguntar sobre datos de la colonia. Ella es una de las primeras en asentarse en el lugar hace 27 años.

El sr. Jorge fue su anterior representante y ya fallecido, quien hablaba de “mi gente” al referirse a sus vecinos, sí vió por los intereses de toda la comunidad, se preocupaba por conseguir cosas para todos. Como todos participaron para poner el adoquin, los postes de luz.

Cuentan con su tarjeta para surtir el agua cada mes con la pipa, aunque han padecido en ocasiones y ha tenido que acordar con unas de las vecinas pues el costo es de \$1000 y la mitad es para cada una

Refeire que el sr. Rubén era dueño de muchos terrenos, ella le compró a él y una forma de ir abonando a sus pagos era que los citaba a faenas de diversos trabajos para ir pagando el terreno.

El sr. Rubén apenas se cambió hace unos 6 años, ya que la colonia está más urbanizada, así que no te tocó padecer, comenta la entrevistada, sin embargo al ser dueño de varios terrenos se cree con derecho a decir qué se hace y qué no.

Llama a las patrullas para que vigilen en su casa, cambió la posición del poste de luz para que de frente a su casa. si ha llegado a conseguir cosas de la delegación u otra instancia y se queda con ellas como despensas.

Inssstía en decir que debía preguntar a todos los de la calle para que nos dieran las malas referencias del sr. Rubén.

Aclaró que se entrevistaron con el actual delegado higinio quien ofreció darles material (no aclaró de qué tipo)

A todas luces es manifiesta su animadversión por el sr. Rubén, muy descontenta por la manera de actuar del sr., ya que él ha podido levantar su gran barda y construir más pisos, pero eso sí cuando ellos apenas levantan un muro, llama para que les vayan a clausurar, ya ha hecho eso con varios vecinos.

SETTLEMENT DOLORES TLALI,

Entrevista con Sra. Rebeca.

Ella es parte de la mesa directiva, la tesorera. Quien está a cargo de la mesa es la Sra. Lupita castro de sandoval.

La colonia tiene ya ocupado la mayor parte, la mayoría de los terrenos tienen dueños aunque no todos se han ido a vivir ahí.

Se les compró a particulares.

Los que llegaron a poblar primero son los señores david y paty, anteriores representantes.

La red de luz está puesta pero no funciona.

En la dotación de agua en tiempo de estiaje recibe dos pipas por mes.

La colonia pertenecía a la delegación xochimilco, sin embargo cuando fueron a la delegación tlalpan hace un año para que les dotaran de pavimento sí recibieron el apoyo.

Les ha ido mejor al ser parte integrante de tlalpan, cuenta con servicio de patrullas. Para vigilancia.

En cuanto a lo del drenaje les ha dicho la delegación que es costoso, ya había un proyecto en el centro de alto rendimiento para que con la instalación del servicio, ellos pudieran contar con aguas para regar en sus instalaciones, pero no ha prosperado el asunto.

Ha mejorado su condición de vida al estar asentados ahí.

A pregunta de la relación con otras colonias y sobre el sr. Rubén efectivamente confirma que el trato con él es difícil, abusa de su cargo y ha ocasionado que llame a las autoridades para tirar casas.

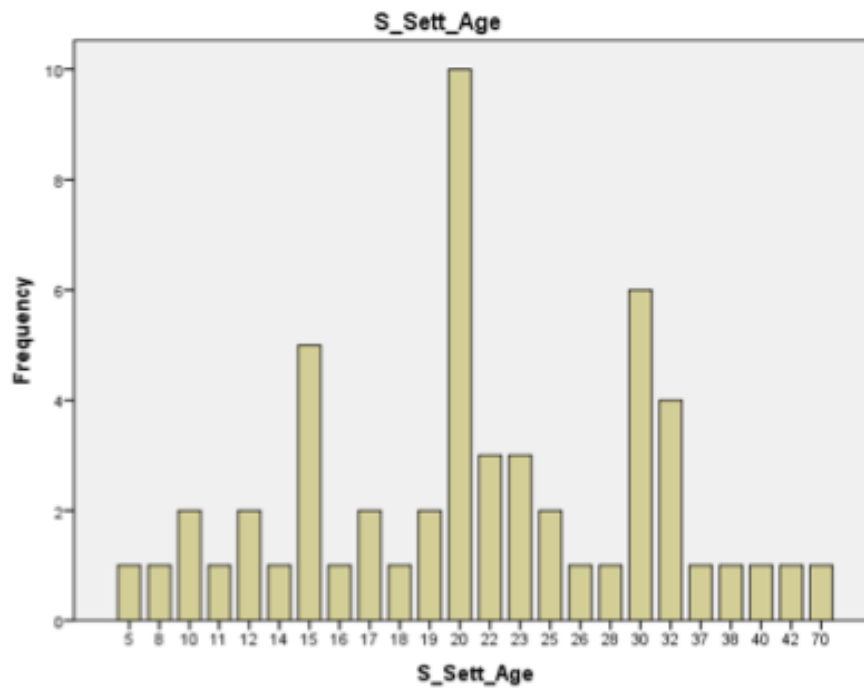
DATA MINING REPOT

AGE AND NUMBER OF FAMILIES PER SETTLEMENT

AGE OF SETTLEMENTS

Statistics

S_Sett_Age		
N	Valid	54
	Missing	1
Mean		22.91
Median		20.00
Mode		20
Std. Deviation		10.537
Variance		111.029
Range		65

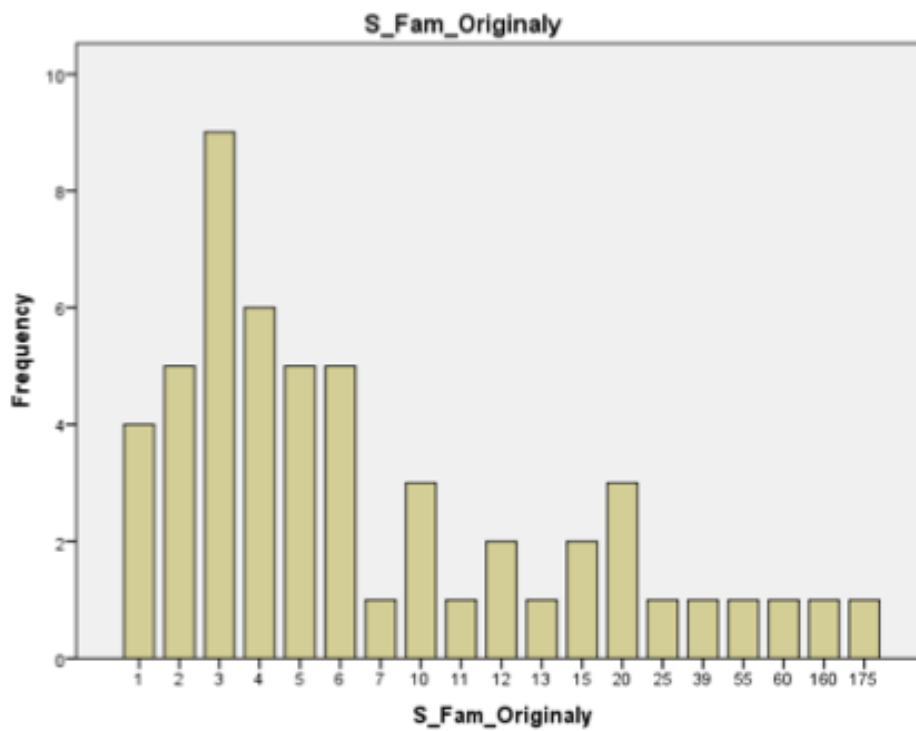


NUMBER OF ORIGINAL FAMILIES PER SETTLEMENT

Statistics

S_Fam_Originaly

N	Valid	53
	Missing	2
Mean		15.26
Median		5.00
Mode		3
Std. Deviation		32.737
Variance		1071.737
Range		174

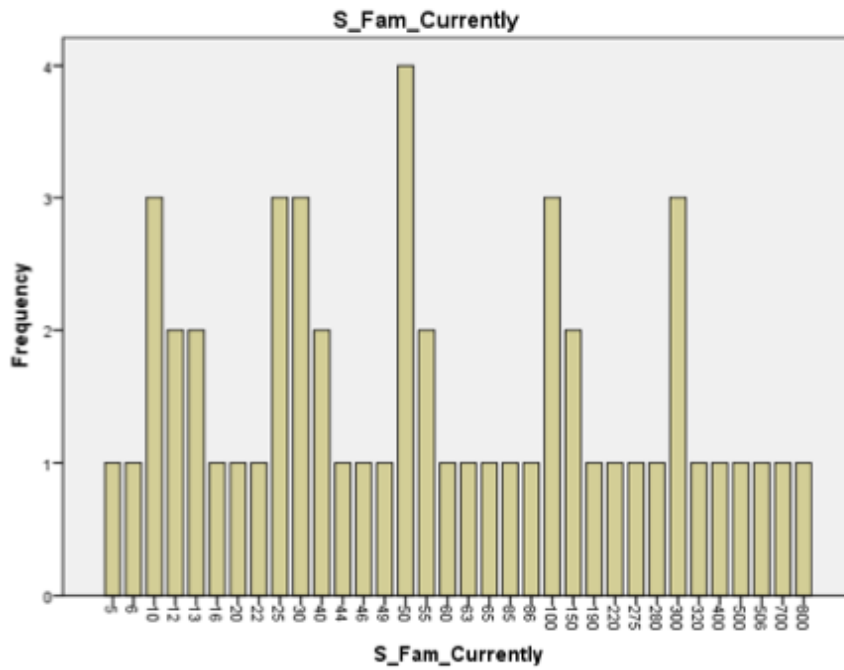


CURRENT NUMBER OF FAMILIES PER SETTLEMENT

Statistics

S_Fam_Currently

N	Valid	52
	Missing	3
Mean		132.56
Median		50.00
Mode		50
Std. Deviation		178.615
Variance		31903.153
Range		795



CORRELATIONS

Descriptive Statistics

	Mean	Std. Deviation	N
S_Setl_Age	22.91	10.537	54
S_Fam_Originaly	15.26	32.737	53
S_Fam_Currently	132.56	178.615	52

Correlations

		S_Setl_Age	S_Fam_Originaly	S_Fam_Currently
S_Setl_Age	Pearson Correlation	1	-.177	.093
	Sig. (2-tailed)		.209	.517
	N	54	52	51
S_Fam_Originaly	Pearson Correlation	-.177	1	.449**
	Sig. (2-tailed)	.209		.001
	N	52	53	51
S_Fam_Currently	Pearson Correlation	.093	.449**	1
	Sig. (2-tailed)	.517	.001	
	N	51	51	52

** . Correlation is significant at the 0.01 level (2-tailed).

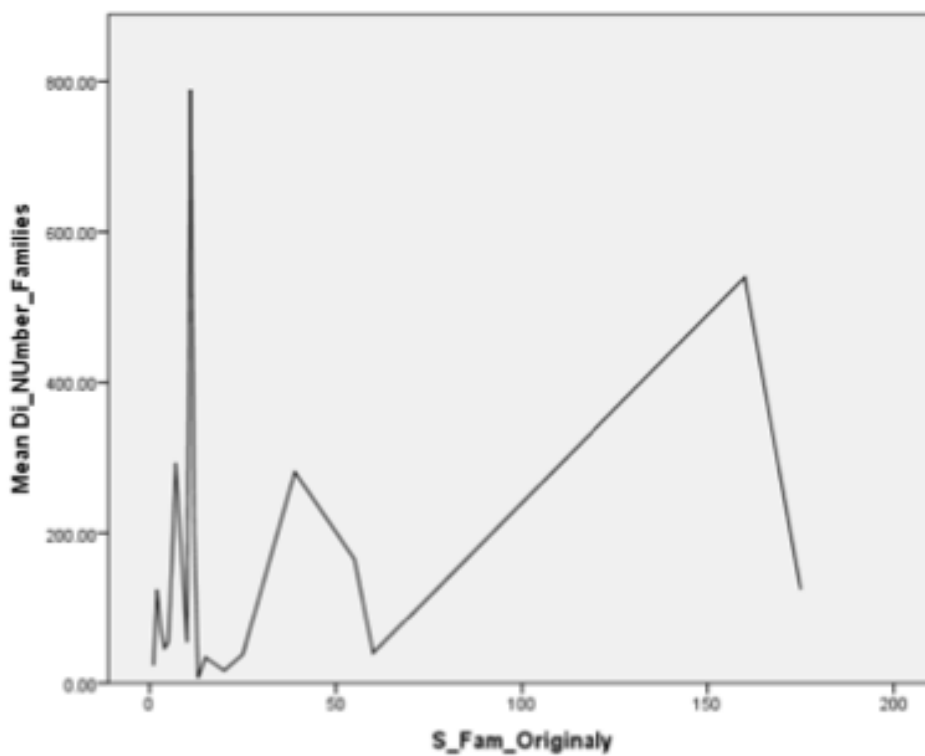
DIFFERENTIAL OF CURRENT NUMBER OF FAMILIES AND ORIGINAL FAMILIES

Statistics

Di_Number_Families

N	Valid	51
	Missing	4
Mean		110.3529
Median		44.0000
Mode		20.00 ^a
Std. Deviation		159.68129
Variance		25498.113
Range		789.00

a. Multiple modes exist. The smallest value is shown



NOTES AND CONCLUSIONS

- The first point to clarify is, the population units are the families (or households). The reason of using family units comes from of the local level of disorganization, and lack of communication inside the settlements. The disorganization reaches the point where not even the leaders of the settlements are aware of the exact number of people in their settlement. However, the number of families is an easier unit. The number is calculated in the reunions or gatherings. For these gatherings, each household sends one the family head.
- The most important characteristic out of this preliminary analysis is the practically nonexistent correlation between the age of the settlements and the total population. This because of the urbanization process is more affected by economical, social and political motives rather than time.
- There are cases that are abnormal, they reflect specific social/political decisions.
- The growth of families (differential) cannot be modeled with a linear regression.

DECISION MAKING INSIDE OF THE SETTLEMENT

DECISION MAKING METHOD

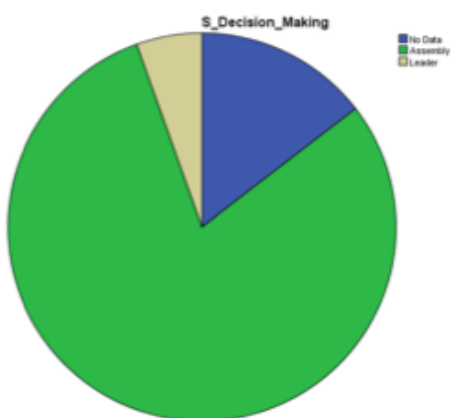
Statistics

S Decision Making

N	Valid	55
	Missing	0
Mean		.91
Median		1.00
Mode		1
Std. Deviation		.442
Variance		.195
Range		2

S Decision Making

	Frequency	Percent	Valid Percent	Cumulative Percent
No Data	8	14.5	14.5	14.5
Valid Assembly	44	80.0	80.0	94.5
Valid Leader	3	5.5	5.5	100.0
Total	55	100.0	100.0	



FREQUENCY OF THE MEETINGS

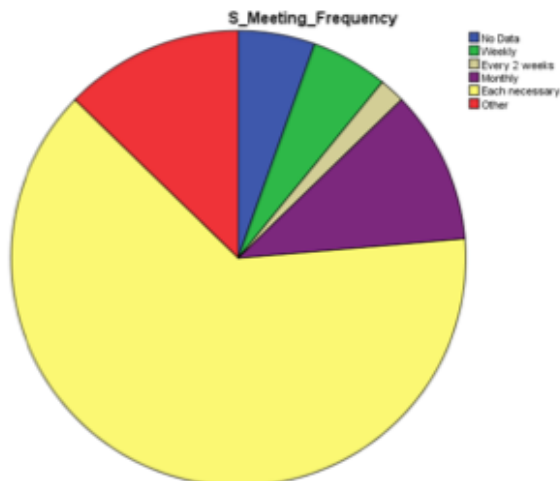
Statistics

S_Meeting_Frequency

N	Valid	55
	Missing	0
Mean		3.60
Median		4.00
Mode		4
Std. Deviation		1.241
Variance		1.541
Range		5

S_Meeting_Frequency

	Frequency	Percent	Valid Percent	Cumulative Percent
No Data	3	5.5	5.5	5.5
Weekly	3	5.5	5.5	10.9
Every 2 weeks	1	1.8	1.8	12.7
Valid Monthly	6	10.9	10.9	23.6
Each necessary	35	63.6	63.6	87.3
Other	7	12.7	12.7	100.0
Total	55	100.0	100.0	

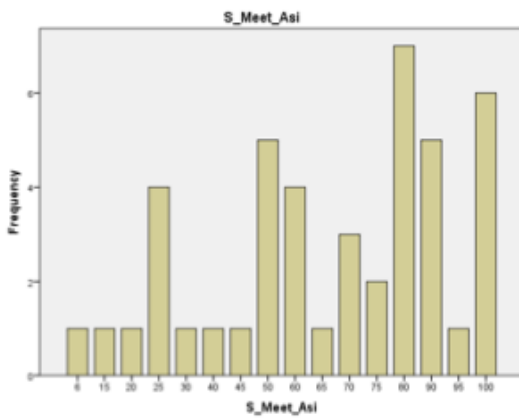


ASSISTANCE TO THE DECISION MEETINGS

Statistics

S_Meet_Asi

N	Valid	44
	Missing	11
Mean		65.36
Median		70.00
Mode		80
Std. Deviation		26.893
Variance		723.260
Range		94
Percentiles	25	50.00
	50	70.00
	75	90.00



CORRELATION BETWEEN DECISION-MAKING METHOD, FREQUENCY OF THE MEETING AND ATTENDEES

Descriptive Statistics

	Mean	Std. Deviation	N
S_Decision_Making	.91	.442	55
S_Meeting_Frequency	3.60	1.241	55
S_Meet_Asi	65.36	26.893	44

Correlations

		S_Decision_Ma king	S_Meeting_Fre quency	S_Meet_Asi
S_Decision_Making	Pearson Correlation	1	.338*	-.043
	Sig. (2-tailed)		.012	.784
	N	55	55	44
S_Meeting_Frequency	Pearson Correlation	.338*	1	-.101
	Sig. (2-tailed)	.012		.513
	N	55	55	44
S_Meet_Asi	Pearson Correlation	-.043	-.101	1
	Sig. (2-tailed)	.784	.513	
	N	44	44	44

*. Correlation is significant at the 0.05 level (2-tailed).

6.1.1 NOTES AND CONCLUSIONS

- There is no direct correlation between the variables, but there is a significant trend for decision-making in meetings and doing the meetings in an irregular schedule.
- The participation and involvement inside the settlements is a considerable, the bigger percent of the settlements have more than a fifty percent of assistance.
- In the field work, it was noted that in some cases, there were isolated groups inside the biggest settlements, like splinter groups with individual leaderships; however they tend to work together in the proper circumstances.

WATER AND POWER SUPPLY

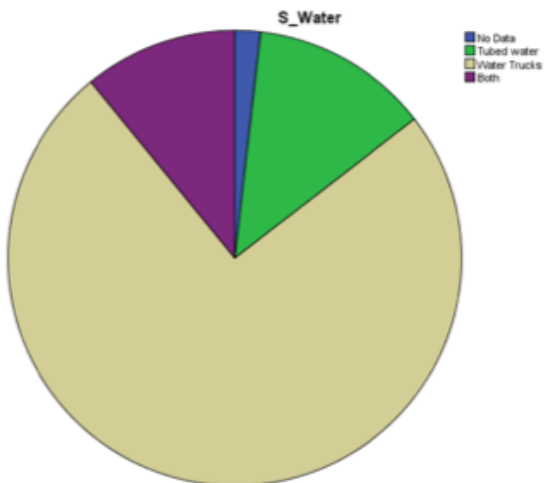
WATER SUPPLY METHOD

Statistics

S_Water		
N	Valid	55
	Missing	0
Mean		1.95
Median		2.00
Mode		2
Std. Deviation		.558
Variance		.312
Range		3

S_Water

	Frequency	Percent	Valid Percent	Cumulative Percent
No Data	1	1.8	1.8	1.8
Tubed water	7	12.7	12.7	14.5
Valid Water Trucks	41	74.5	74.5	89.1
Both	6	10.9	10.9	100.0
Total	55	100.0	100.0	



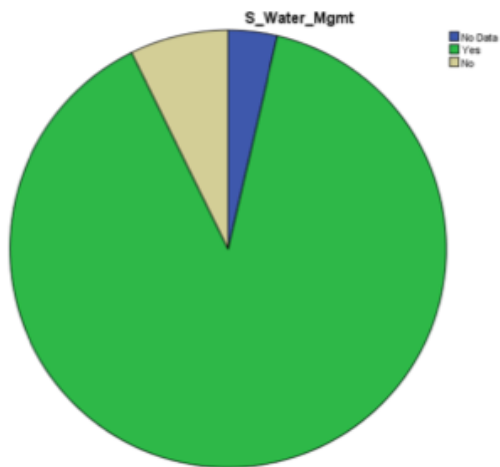
INDIVIDUAL WATER SUPPLY MANAGEMENT

Statistics

S_Water_Mgmt		
N	Valid	55
	Missing	0
Mean		1.04
Median		1.00
Mode		1
Std. Deviation		.331
Variance		.110
Range		2

S_Water_Mgmt

	Frequency	Percent	Valid Percent	Cumulative Percent
No Data	2	3.6	3.6	3.6
Valid	Yes	49	89.1	92.7
	No	4	7.3	100.0
Total	55	100.0	100.0	



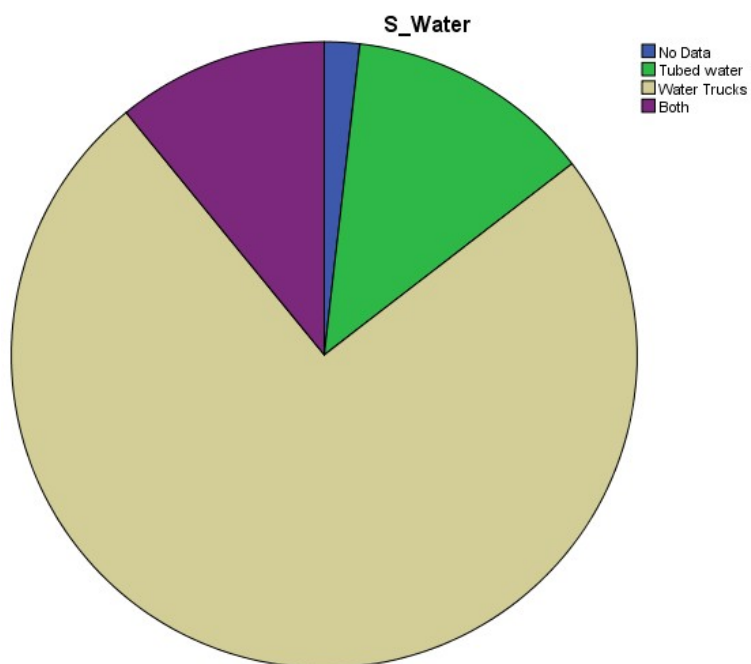
WATER AND POWER SUPPLY

WATER SUPPLY METHOD

N	Valid	55
	Missing	0
Mean		1.95
Median		2.00
Mode		2
Std. Deviation		.558
Variance		.312
Range		3

S_Water

	Frequency	Percent	Valid Percent	Cumulative Percent
No Data	1	1.8	1.8	1.8
Tubed water	7	12.7	12.7	14.5
Valid Water Trucks	41	74.5	74.5	89.1
Both	6	10.9	10.9	100.0
Total	55	100.0	100.0	



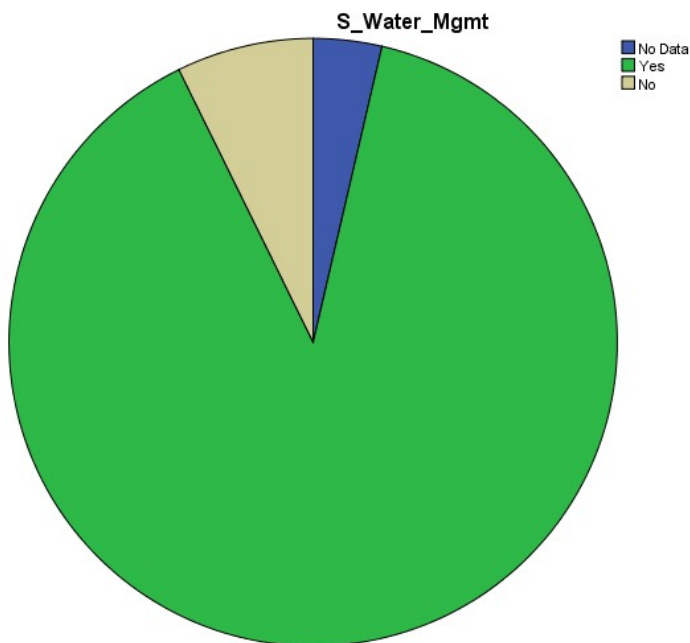
Statistics

S_Water_Mgmt

N	Valid	55
	Missing	0
Mean		1.04
Median		1.00
Mode		1
Std. Deviation		.331
Variance		.110
Range		2

S_Water_Mgmt

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No Data	2	3.6	3.6	3.6
	Yes	49	89.1	89.1	92.7
	No	4	7.3	7.3	100.0
	Total	55	100.0	100.0	



PROVIDER OF THE WATER SUPPLY

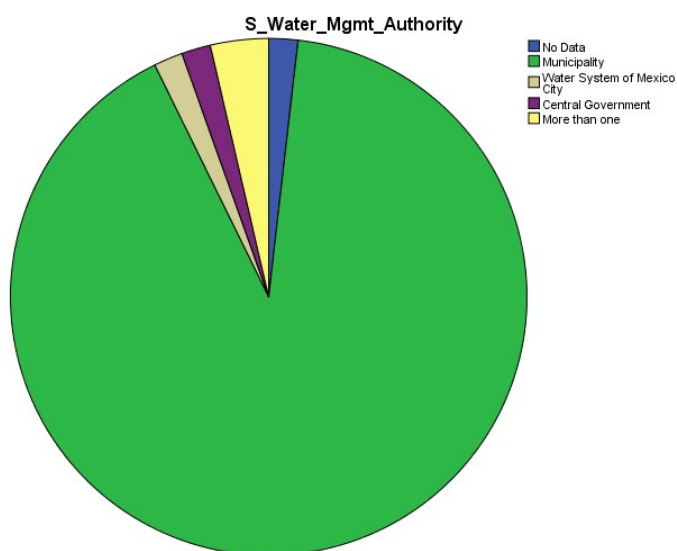
Statistics

S_Water_Mgmt_Authority

N	Valid	55
	Missing	0
Mean		1.15
Median		1.00
Mode		1
Std. Deviation		.650
Variance		.423
Range		4

S_Water_Mgmt_Authority

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid No Data	1	1.8	1.8	1.8
Municipality	50	90.9	90.9	92.7
Water System of Mexico City	1	1.8	1.8	94.5
Central Government	1	1.8	1.8	96.4
More than one	2	3.6	3.6	100.0
Total	55	100.0	100.0	



WHAT PERCENTAGE OF THE SETTLEMENT HAS POWER METERS?

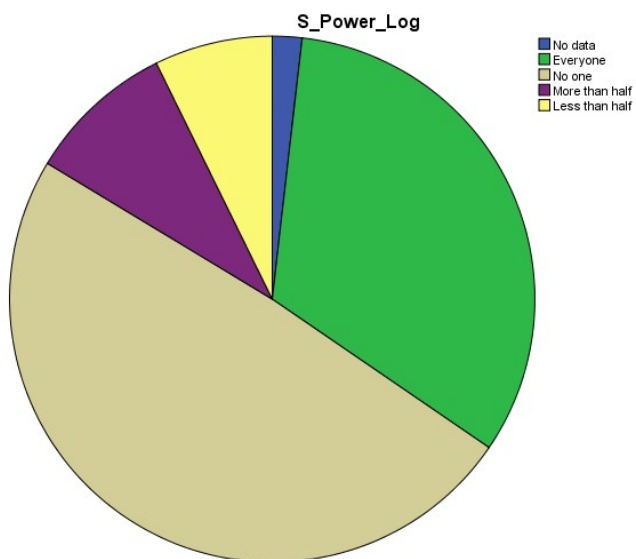
Statistics

S_Power_Log

N	Valid	55
	Missing	0
Mean		1.87
Median		2.00
Mode		2
Std. Deviation		.883
Variance		.780
Range		4

S_Power_Log

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No data	1	1.8	1.8	1.8
	Everyone	18	32.7	32.7	34.5
	No one	27	49.1	49.1	83.6
	More than half	5	9.1	9.1	92.7
	Less than half	4	7.3	7.3	100.0
	Total	55	100.0	100.0	



INDIVIDUAL WATER SUPPLY MANAGEMENT

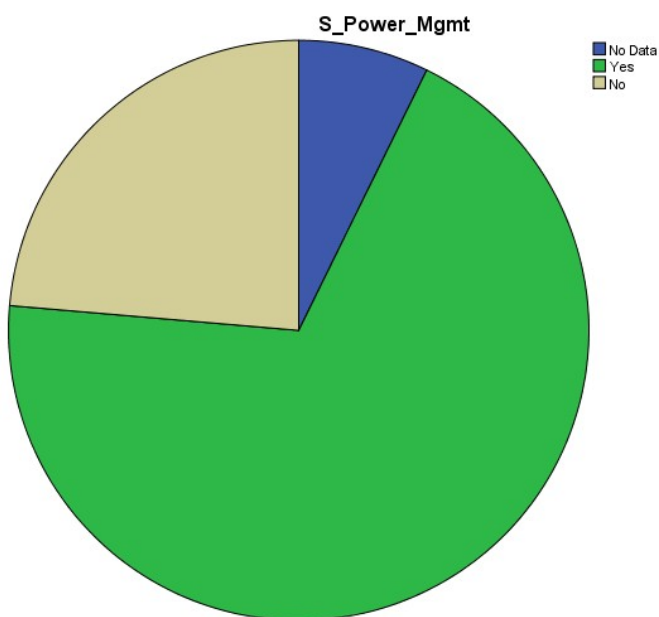
Statistics

S_Power_Mgmt

N	Valid	55
	Missing	0
Mean		1.16
Median		1.00
Mode		1
Std. Deviation		.536
Variance		.288
Range		2

S_Power_Mgmt

	Frequency	Percent	Valid Percent	Cumulative Percent
No Data	4	7.3	7.3	7.3
Valid	Yes	38	69.1	76.4
	No	13	23.6	100.0
Total	55	100.0	100.0	



POWER SUPPLY PROVIDER

Statistics

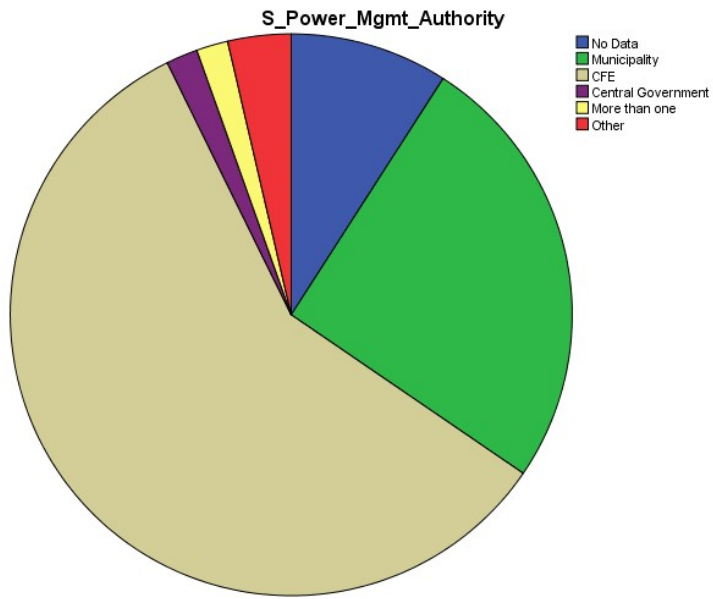
S_Power_Mgmt_Authority

N	Valid	55
	Missing	0
Mean		1.73
Median		2.00
Mode		2
Std. Deviation		.990
Variance		.980
Range		5

S_Power_Mgmt_Authority

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	5	9.1	9.1	9.1
	Data	14	25.5	25.5	34.5
	Municipal	32	58.2	58.2	92.7
	Other	1	1.8	1.8	94.5
	More than one	1	1.8	1.8	96.4
	Other	2	3.6	3.6	100.0
Total		55	100.0	100.0	

Irregular Settlements in Mexico City – A complex perspective



CORRELATION BETWEEN VARIABLES

Correlations

		S_Water	S_Water_Mgmt	S_Water_Mgmt_Authority	S_Power_Log	S_Power_Mgmt	S_Power_Mgmt_Authority
S_Water	Pearson Correlation	1	.211	.124	.136	.154	.174
	Sig. (2-tailed)		.122	.366	.323	.261	.205
	N	55	55	55	55	55	55
S_Water_Mgmt	Pearson Correlation	.211	1	.061	.016	.279*	.031
	Sig. (2-tailed)	.122		.658	.907	.039	.823
	N	55	55	55	55	55	55
S_Water_Mgmt_Authority	Pearson Correlation	.124	.061	1	.162	-.123	-.110
	Sig. (2-tailed)	.366	.658		.238	.372	.425
	N	55	55	55	55	55	55
S_Power_Log	Pearson Correlation	.136	.016	.162	1	.319*	.108
	Sig. (2-tailed)	.323	.907	.238		.018	.433
	N	55	55	55	55	55	55
S_Power_Mgmt	Pearson Correlation	.154	.279*	-.123	.319*	1	.330*
	Sig. (2-tailed)	.261	.039	.372	.018		.014
	N	55	55	55	55	55	55
S_Power_Mgmt_Authority	Pearson Correlation	.174	.031	-.110	.108	.330*	1
	Sig. (2-tailed)	.205	.823	.425	.433	.014	
	N	55	55	55	55	55	55

*. Correlation is significant at the 0.05 level (2-tailed).

NOTES AND CONCLUSIONS

The major provider of services for the settlement is the municipality while measuring both services, but in the electric power supply only the mayor provider is the CFE (Federal Commission of Electricity).

Almost the seventy five percent of the settlements are dependent of the municipally water trucks for the water supply, but there are also private companies that sell the water trucks to a higher price. This last option is common amongst the newer neighbors who have not made the paperwork with the municipality.

While the majority of the settlements has no power meter for quantify the power consumption to pay the proper bill, the electrical installation maybe in some cases done by the power company (CFE). However, in the other cases it may just be illegal tampering.

The cases where the power and water supplies are regular are linked to the more consolidated settlements (which in some cases are authentic luxury villages).

REGULARIZATION PROCESS OF THE SETTLEMENT

IS THE SETTLEMENT IN A REGULATION PROCESS?

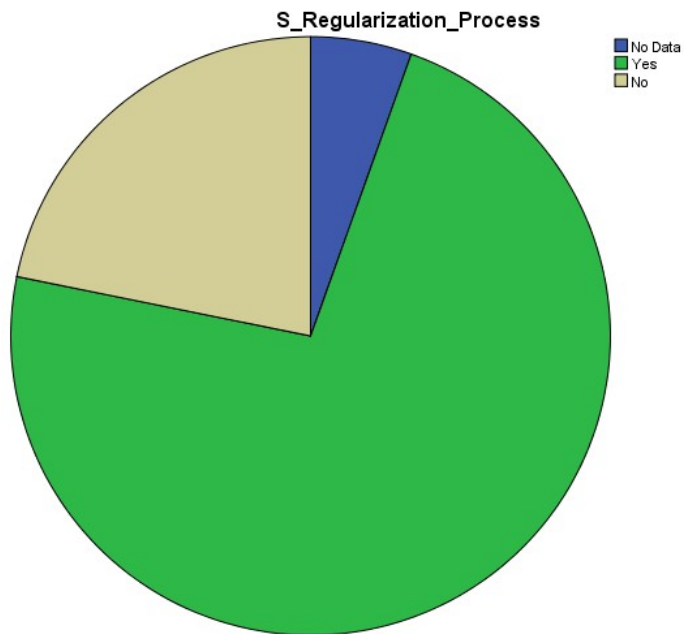
Statistics

S_Regularization_Process

N	Valid	55
	Missing	0
Mean		1.16
Median		1.00
Mode		1
Std. Deviation		.501
Variance		.251
Range		2

S_Regularization_Process

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No Data	3	5.5	5.5	5.5
	Yes	40	72.7	72.7	78.2
	No	12	21.8	21.8	100.0
	Total	55	100.0	100.0	



REGULARIZATION PROCESS AUTHORITY

Statistics

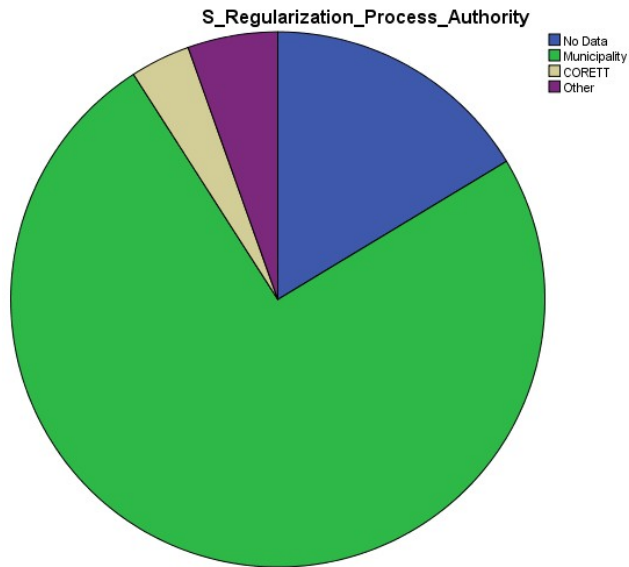
S_Regularization_Process_Authority

N	Valid	55
	Missing	0
Mean		1.07
Median		1.00
Mode		1
Std. Deviation		.900
Variance		.809
Range		4

S_Regularization_Process_Authority

	Frequency	Percent	Valid Percent	Cumulative Percent
No Data	9	16.4	16.4	16.4
Municipality	41	74.5	74.5	90.9
Valid CORETT	2	3.6	3.6	94.5
Other	3	5.5	5.5	100.0
Total	55	100.0	100.0	

Irregular Settlements in Mexico City – A complex perspective



NOTES AND CONCLUSION

The majority of the settlements are in deals with the municipality for a formal recognition of their status as urban areas in forestall land zone.

When the municipality rejects the request of the settlements, they ask other authority to regularize the paperwork. Creating legal loopholes and confusion between the authorities

Because of the nature of the data there is no need to run a correlation test. It is known beforehand that there is no direct correlation between the variables.

PROTESTS AND POLITICAL AFFILIATION

PUBLIC PROTEST

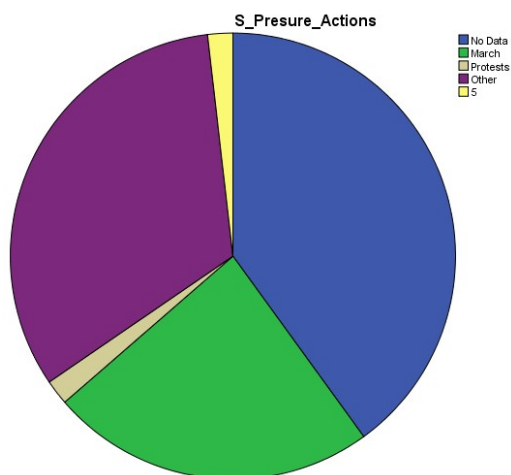
Statistics

S_Presure_Actions

N	Valid	55
	Missing	0
Mean		1.67
Median		1.00
Mode		0
Std. Deviation		1.806
Variance		3.261
Range		5

S_Presure_Actions

	Frequency	Percent	Valid Percent	Cumulative Percent
No Data	22	40.0	40.0	40.0
March	13	23.6	23.6	63.6
Protests	1	1.8	1.8	65.5
Other	18	32.7	32.7	98.2
5	1	1.8	1.8	100.0
Total	55	100.0	100.0	



References

THE SETTLEMENT HAS ANY POLITICAL AFFILIATION

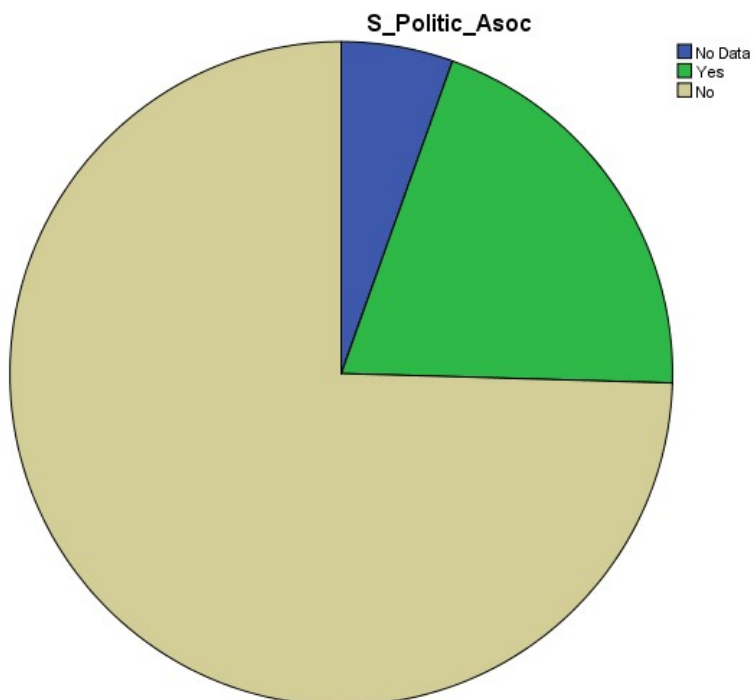
Statistics

S_Politic_Asoc

N	Valid	55
	Missing	0
Mean		1.69
Median		2.00
Mode		2
Std. Deviation		.573
Variance		.329
Range		2

S_Politic_Asoc

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No Data	3	5.5	5.5
	Yes	11	20.0	25.5
	No	41	74.5	100.0
	Total	55	100.0	100.0



WITH WHOM IS THE POLITICAL AFFILIATION

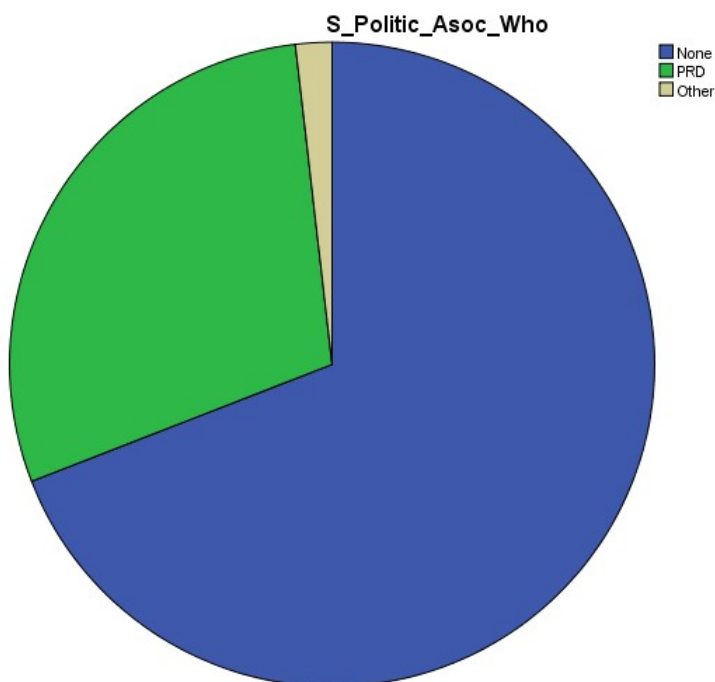
Statistics

S_Politic_Asoc_Who

N	Valid	55
	Missing	0
Mean		.44
Median		.00
Mode		0
Std. Deviation		1.135
Variance		1.288
Range		8

S_Politic_Asoc_Who

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid None	38	69.1	69.1	69.1
PRD	16	29.1	29.1	98.2
Other	1	1.8	1.8	100.0
Total	55	100.0	100.0	



References

CORRELATIONS

Correlations

		S_Presure_Acti ons	S_Politic_Asoc	S_Politic_Asoc_ Who
S_Presure_Actions	Pearson Correlation	1	.240	-.164
	Sig. (2-tailed)		.077	.232
	N	55	55	55
S_Politic_Asoc	Pearson Correlation	.240	1	-.358**
	Sig. (2-tailed)	.077		.007
	N	55	55	55
S_Politic_Asoc_Who	Pearson Correlation	-.164	-.358**	1
	Sig. (2-tailed)	.232	.007	
	N	55	55	55

** . Correlation is significant at the 0.01 level (2-tailed).

NOTES AND CONCLUSIONS

There is no real correlation between the variables, but there are clear trends. In case that there is political affiliation is openly shared; it will most likely be with the PRD (The mayor left popular party).

In the case of the protest, the 'No Data' is in the majority of cases a "No practice of protest". It was not considered the lack of protest as an option.

During the field work, it was noted that the ones with political affiliation are more promptly to take action and do apply different methods of political pressure

RELATIONSHIPS WITH THE LOCAL ACTORS

RELATIONSHIP WITH OTHER SETTLEMENTS

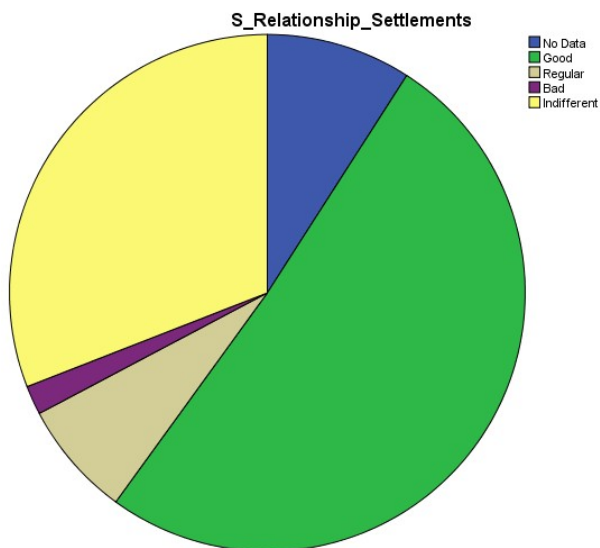
Statistics

S_Relationship_Settlements

N	Valid	55
	Missing	0
Mean		1.95
Median		1.00
Mode		1
Std. Deviation		1.471
Variance		2.164
Range		4

S_Relationship_Settlements

	Frequency	Percent	Valid Percent	Cumulative Percent
No Data	5	9.1	9.1	9.1
Good	28	50.9	50.9	60.0
Regular	4	7.3	7.3	67.3
Bad	1	1.8	1.8	69.1
Indifferent	17	30.9	30.9	100.0
Total	55	100.0	100.0	



References

DOES THE SETTLEMENTS TAKE MEETINGS WITH EACH OTHER

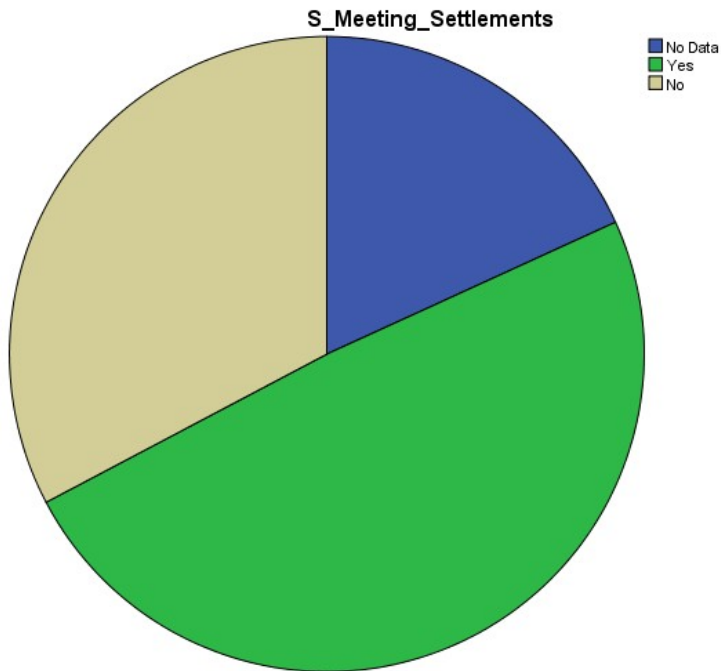
Statistics

S_Meeting_Settlements

N	Valid	55
	Missing	0
Mean		1.15
Median		1.00
Mode		1
Std. Deviation		.705
Variance		.497
Range		2

S_Meeting_Settlements

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No Data	10	18.2	18.2
	Yes	27	49.1	67.3
	No	18	32.7	100.0
	Total	55	100.0	100.0



RELATIONSHIP WITH THE ORIGINAL INHABITANTS

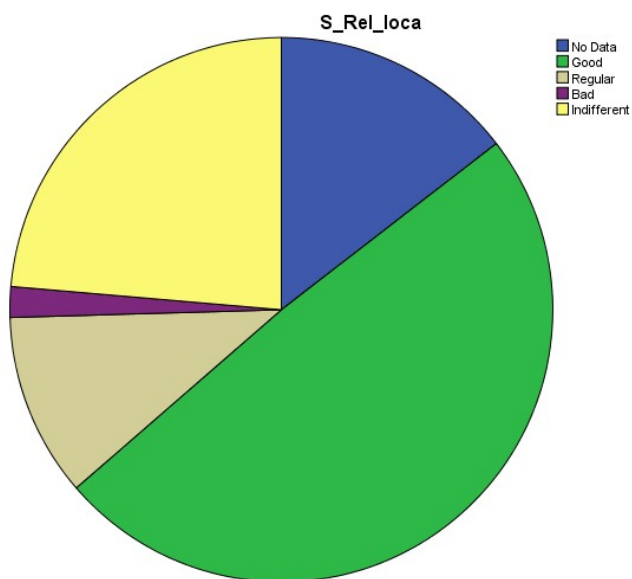
Statistics

S_Rel_loca

N	Valid	55
	Missing	0
Mean		1.71
Median		1.00
Mode		1
Std. Deviation		1.410
Variance		1.988
Range		4

S_Rel_loca

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No Data	8	14.5	14.5	14.5
	Good	27	49.1	49.1	63.6
	Regular	6	10.9	10.9	74.5
	Bad	1	1.8	1.8	76.4
	Indifferent	13	23.6	23.6	100.0
Total		55	100.0	100.0	



References

CORRELATIONS BETWEEN VARIABLES

Correlations

		S_Relationship_ Settlements	S_Meeting_Settl ements	S_Rel_loca
S_Relationship_Settlements	Pearson Correlation	1	.204	.305*
	Sig. (2-tailed)		.135	.024
	N	55	55	55
S_Meeting_Settlements	Pearson Correlation	.204	1	.155
	Sig. (2-tailed)	.135		.258
	N	55	55	55
S_Rel_loca	Pearson Correlation	.305*	.155	1
	Sig. (2-tailed)	.024	.258	
	N	55	55	55

*. Correlation is significant at the 0.05 level (2-tailed).

NOTES AND CONCLUSION

There is a considerable good relationship between the settlements and the original inhabitants, around the fifty percent. The other half of the settlements has no intention or interest in developing a communication channel for discussion of the common problems and situations.

The other half with no communication is due to grudges and legal situations; lack of interest or personal situations, here is the first area of improvement

FORMULAS FOR THE CALCULATION OF
THE EXPANSION OF THE IRREGULAR
SETTLEMENTS

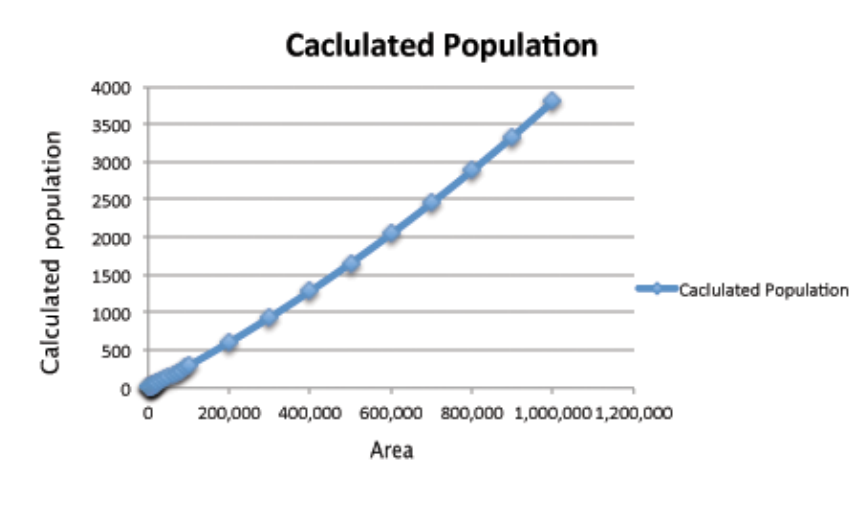
References

The following pages explain the formulas used to calculate the expansion of the Irregular Settlements.

Formula for Calculated population = CP

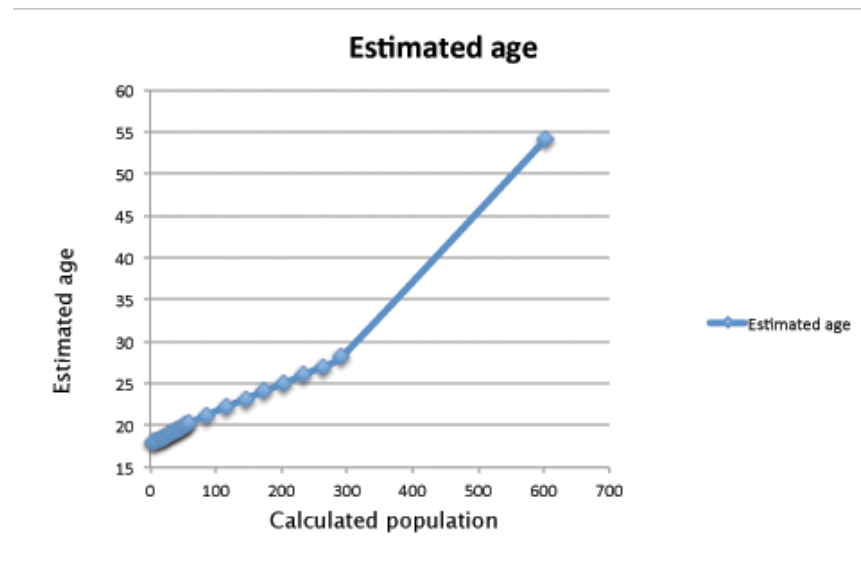
Area = A

$$CP = (0.000000001 * A^2) + (0.028 * A) + 2.1784$$



Formula for Estimated age = EA

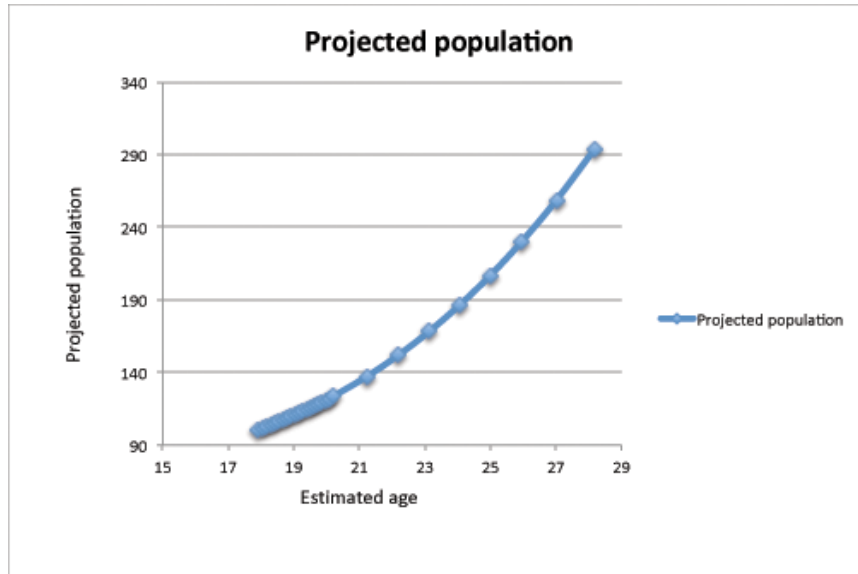
$$EA = (0.0000002 * CP^3) - (0.0001CP^2) - (0.0481 * CP) + 17.667$$



Formula for Projected population = PP

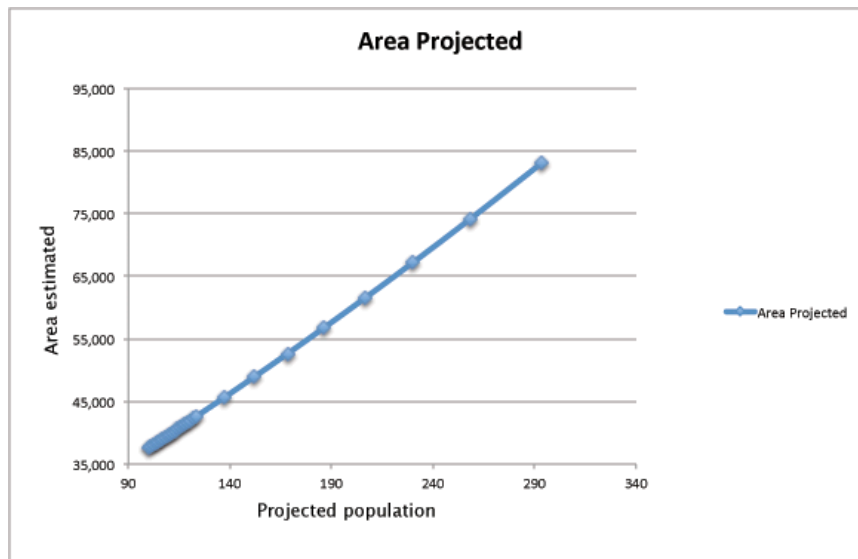
**Added age = AA

$$PP = (0.0227 * (EA + AA)^3) - (0.8254(EA + AA)^2) + (8.7654 * (EA + AA)) + 46.129$$



Formula for Area estimated for projected population after the added population = AE

$$AE = (0.1189 * PP^2) + (188.67 * PP) + 17480$$

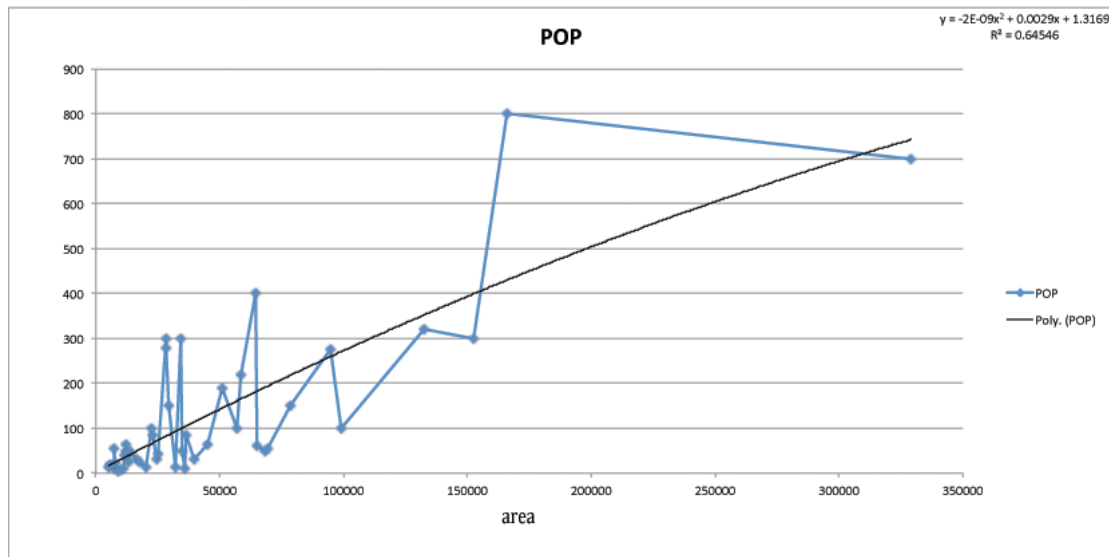


References

CALCULATION OF THE FORMULAS AND CORRECTION FACTORS

In order to calculate the formulas for the expansion of the Irregular Settlements the data from the fieldwork was used. From the fieldwork, it was obtained around the 25% of the settlements surveyed. The process for the formulas was developed by linking the (qualitative) data to the cartography provided of the zone.

The first step was to plot and study the relationship between the area and population. As mentioned in the chapter 3, the Irregular Settlements are class IV systems. As such, the Irregular Settlements do not follow any recognizable pattern of growth, statistical or spatial. The following graph shows the data and the second grade formula that best suits the relationship area-population.



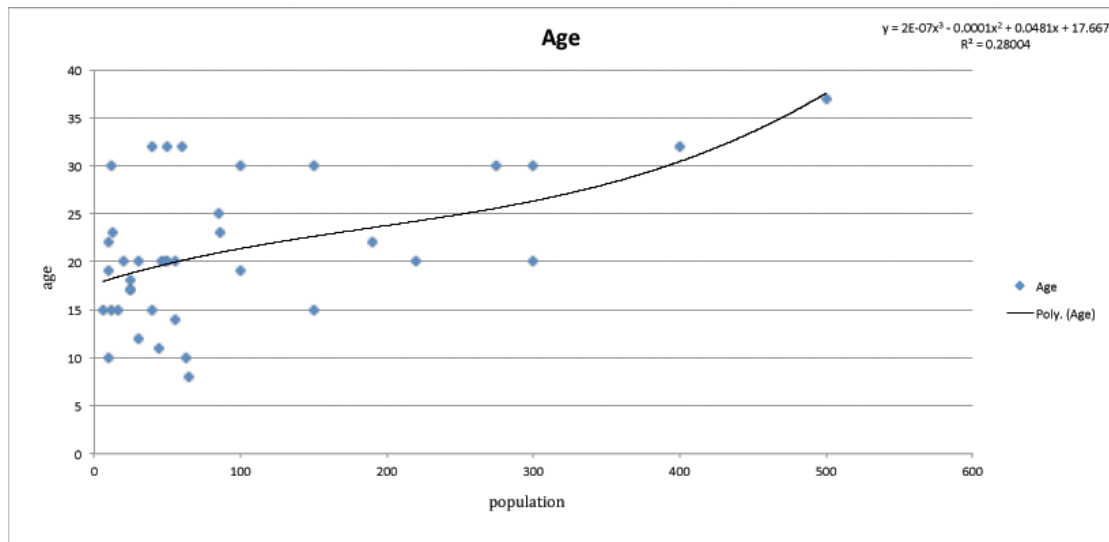
The obtained formula is:

$$CP = (0.000000001 * A^2) + (0.028 * A) + 2.1784$$

Where the A is the area and the CP is the calculated population.

Once the formula was calculated the values obtained from it and the original data is compared. The data is group by similarities in the area size. With the groups, the differences between calculated values and the surveyed values are set on least square minimum to obtain the corrected values. The correction factor is the result of the least square.

A similar process is done with the age and the population. The age is compared with the population of the settlements. Just like with the age and size the relationship is far from linear, and there is no linking of the data by statistical or spatial analysis.



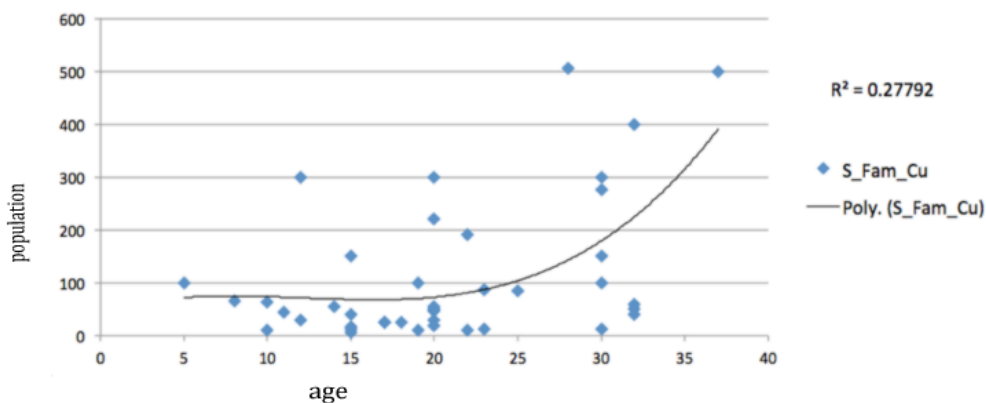
The resulting formula is

$$EA = (0.0000002 * CP^3) - (0.0001CP^2) - (0.0481 * CP) + 17.667$$

Where the EA is the estimated age and the CP is the calculated population from the prior formula.

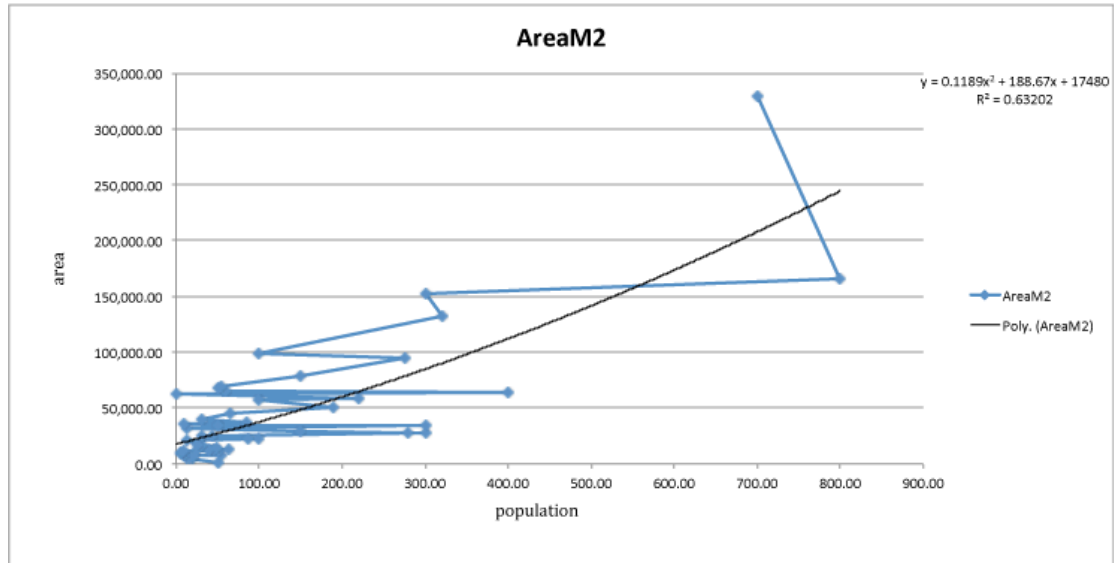
Just like in the calculated population the correction factor is obtained by least square minimum comparison of the calculated values and the surveyed values.

The next step was, to calculate the population from the age of the settlements. The comparison of data survey with the calculated values is as if the other elements (age, population calculations) follow the non-linear and complex patterns.



Lastly, the estimated area is based on the population. With the formulas developed previously is possible to estimate the area on the projected population.

References



DISCUSSION OF THE FORMULAS

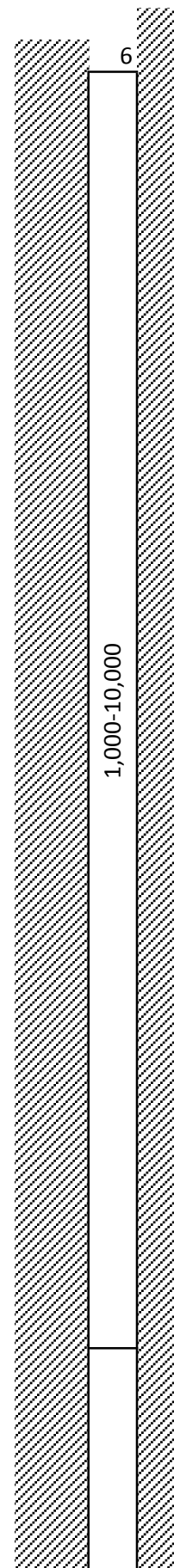
The exposed formulas attempt to model a phenomenon with the sole aim of illustrating the most likely outcome if the conditions as kept as they currently are. The problem inherent to modeling class IV systems, is the limitation of the mathematical input for finding a solution. The real possibility that comes from modeling is to estimate the outcome. It is impossible to foresee the outcome due to conditions that are impossible to consider. For example, a natural disaster or cultural conditions.

The formulas stated in the present work have the aim of illustrating only. In addition, they would only work on the data that was gathered during the specific moment of collection. If more data would operate in a similar fashion, it would be needed either a tuning of the formulas or new formulas, because the conditions would have changed. This does not mean that is useless to use mathematics when dealing with complex systems. It means that the mathematics should be used with a high degree of meditation and not expecting a straightforward solution.

The use of mathematics in complex systems may follow the footsteps of the chaos theory. Where no matter how exact a formula is, with small differences in the input data different results might be obtained.

AMPLICATION OF THE FORMULAS

ID	Name	AreaM2
23	Cerrada Porfirio Diaz/UH	671
110	Rancho la Esperanza	1,738
119	Tepetzintla	1,864
108	Poligono 127 / Sin Nombre	1,870
24	Cerrada Sierra San Juan	1,895
22	Cerrada Porfirio Diaz	2,434
188	Cuchilla de Tepeximilpa/ Ampliacion Tepeximilpa	2,698
127	Unixco	2,827
191	Tepetongo	2,927
77	Las Bombas	3,423
130	Xilonimoco	3,693
125	Tlaltepancatitla	4,164
150	Colinas del Angel	4,240
120	Tepezintla	4,250
184	Xitle II	4,362
9001	Parque Ecologico CD Mexico	4,656
21	Cerrada la Mora	4,723
49	El Conejo /El Charco	5,211
115	Siete Ocotes / Subestacion electrica	5,507
92	Huinizco	5,515
54	La Herradura	5,565
71	Los Arcos	5,689
107	La Pedrera	5,821
148	Prolongacion 5 de mayo	5,921
7	Ampliacion La Nueva Magdalena Petlcalco	6,300
15	Alta Tension	6,594
2	Las Cebadas	6,788
118	Tepacheras	6,800
66	Acopiaco/Tezontle	7,299
78	Bosques de San Jose/ Ixpangologuia	7,531
30	Mirador el Colibri	7,545
14	El Guardita	7,664
183	Tlapanco	8,156
132	Bellavista	8,275
34	Retesco / Privada Eucalipto	8,461
94	Kilometro 33 / Teteocotla	9,064
9003	Fuentes Brotantes	9,221
147	Paraje Tetenco	9,455
85	El Crucero	9,549
166	Cocuyatla	9,614
95	Kilometro 34.5 / Lomas de San Jose	10,169
36	Santiago Tepalcatitla II	10,251
153	Tepozanes	10,755
164	Cercantitla	11,059
26	Diamante	11,068
117	Tehitic	11,243
69	Ampliacion Tezontitla	11,482



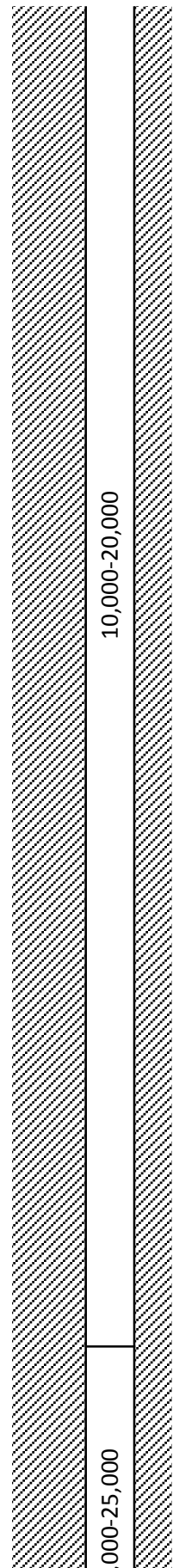
Calculated Population			Estimated Age			Projected
Formula	Average	Corrected V	Formula	Average	Corrected V	Formula
4.057650241		4	17.8522787		16	79.65014366
7.047820644		7	17.98692565		16	80.25377877
7.401074496		7	18.00272829		16	80.32583516
7.4178969		7	18.00348028		16	80.32927046
7.487991025		7	18.0066131		16	80.34358817
8.999524356		9	18.07396129		16	80.65382208
9.740079204		9	18.10681253		16	80.80684377
10.10199193		10	18.12283257		16	80.88186998
10.38256733		10	18.13523667		16	80.94014428
11.77451693		11	18.19657401		16	81.23065437
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13.8549389		13	18.28763345		16	81.66917531
14.0683776		13	18.29693417		16	81.71445464
14.0964625		13	18.29815741		16	81.72041661
14.41102704		14	18.31184928		16	81.78725689
15.23687834		15	18.34771661		16	81.96328872
15.42510673		15	18.35587553		16	82.00352117
16.79635452		16	18.41513542		16	82.29785233
17.62832705		17	18.45093812		16	82.4774838
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18.13996472		17	18.47289907		16	82.58834343
18.51108404		18	18.48880168		16	82.66894186
18.79225824		18	18.50083509		16	82.73010996
19.85809		19	18.5463324		16	82.96278384
20.68508084		20	18.58150721		16	83.14419278
21.23087694		20	18.60466131		16	83.26433447
21.26464		20	18.60609205		16	83.27177727
22.6688754		22	18.66543603		16	83.58243943
23.32191596		22	18.69292679		16	83.72764677
23.36132703		22	18.69458369		16	83.73642486
23.6963369		23	18.70865809		16	83.81111006
25.08172034		24	18.76667253		17	84.12124313
25.41687563		24	18.78066221		17	84.19658
25.94078852		25	18.80249562		17	84.31458561
27.6397561		26	18.87300437		17	84.69925394
28.08222684		27	18.89129412		17	84.79993175
28.74179703		28	18.91850196		17	84.95038543
29.0067834		28	18.92941413		17	85.01095806
29.190029		28	18.93695394		17	85.05288817
30.75500856		28	18.93185676		20	111.4863801
30.986283		28	18.94084763		20	111.592223
32.40807003		29	18.99596055		20	112.2445675
33.26590148		30	19.02908079		20	112.6395314
33.29130062		30	19.03005992		20	112.6512414
33.78520505		31	19.04908274		20	112.8791282
34.45983632		31	19.07501365		20	113.1909482

population to Average	6 Corrected V	Area Projected to Formula	Average	6.00 Corrected V	Radius Present	Projected
	25	22320.10557		6,934.82	14.61	46.98
	25	22357.36565		6,946.40	23.52	47.02
	25	22361.81399		6,947.78	24.36	47.03
	25	22362.02607		6,947.85	24.40	47.03
	25	22362.90998		6,948.12	24.56	47.03
	26	22382.06359		6,954.07	27.83	47.05
	26	22391.51188		6,957.01	29.31	47.06
	26	22396.14456		6,958.45	30.00	47.06
	26	22399.74294		6,959.57	30.52	47.07
	26	22417.68289		6,965.14	33.01	47.09
	26	22427.51253		6,968.20	34.29	47.10
	26	22444.7668		6,973.56	36.41	47.11
	26	22447.56361		6,974.43	36.74	47.12
	26	22447.93187		6,974.54	36.78	47.12
	26	22452.06054		6,975.82	37.26	47.12
	26	22462.9344		6,979.20	38.50	47.13
	26	22465.41975		6,979.97	38.77	47.14
	26	22483.60315		6,985.62	40.73	47.15
	26	22494.70157		6,989.07	41.87	47.17
0.317035984	26	22495.00225	0.310698556	6,989.16	41.90	47.17
	26	22496.88235		6,989.75	42.09	47.17
	26	22501.55135		6,991.20	42.55	47.17
	26	22506.53154		6,992.75	43.05	47.18
	26	22510.31123		6,993.92	43.41	47.18
	26	22524.68939		6,998.39	44.78	47.20
	26	22535.90052		7,001.87	45.81	47.21
	26	22543.32575		7,004.18	46.48	47.22
	26	22543.78575		7,004.32	46.52	47.22
	26	22562.98754		7,010.29	48.20	47.24
	27	22571.96349		7,013.08	48.96	47.25
	27	22572.50612		7,013.25	49.01	47.25
	27	22577.12297		7,014.68	49.39	47.25
	27	22596.29605		7,020.64	50.95	47.27
	27	22600.95388		7,022.08	51.32	47.28
	27	22608.25006		7,024.35	51.90	47.29
	27	22632.03604		7,031.74	53.71	47.31
	27	22638.26204		7,033.68	54.18	47.32
	27	22647.56667		7,036.57	54.86	47.33
	27	22651.31287		7,037.73	55.13	47.33
	27	22653.90614		7,038.54	55.32	47.33
	77	32777.29672		18,148.24	56.89	76.01
	77	32792.49503		18,156.66	57.12	76.02
	78	32886.19544		18,208.54	58.51	76.13
	78	32942.95029		18,239.96	59.33	76.20
	78	32944.63324		18,240.89	59.36	76.20
	78	32977.38814		18,259.03	59.82	76.24
	78	33022.21666		18,283.85	60.46	76.29

Projected

Diferential	Expansion	Buffer	A H I	
32.37		2	16.18	23
23.50		1	23.50	110
22.67		2	11.33	119
22.63		2	11.31	108
22.47		2	11.23	24
19.21		2	9.61	22
17.75		1	17.75	188
17.07		1	17.07	127
16.54		2	8.27	191
14.08		1	14.08	77
12.81		1	12.81	130
10.71		2	5.35	125
10.38		2	5.19	150
10.34		1	10.34	120
9.86		2	4.93	184
8.64		1	8.64	9001
8.36		1	8.36	21
6.43		1	6.43	49
5.30		2	2.65	115
5.27		1	5.27	92
5.08		1	5.08	54
4.62		2	2.31	71
4.13		2	2.07	107
3.77		1	3.77	148
2.42		2	1.21	7
1.40		2	0.70	15
0.73		1	0.73	2
0.69		1	0.69	118
0.96		1	0.96	66
1.71		2	0.86	78
1.76		2	0.88	30
2.14		1	2.14	14
3.68		1	3.68	183
4.04		1	4.04	132
4.61		2	2.31	34
6.40		1	6.40	94
6.86		1	6.86	9003
7.53		1	7.53	147
7.80		2	3.90	85
7.99		1	7.99	166
19.11		2	9.56	95
18.90		1	18.90	36
17.62		1	17.62	153
16.87		2	8.43	164
16.84		1	16.84	26
16.41		1	16.41	117
15.83		2	7.92	69

72 Arenal de Guadalupe	11,585
136 Chancoyote	11,649
180 San Juan Nuevo /Ocotlaltongo	11,673
182 Tecpan	11,817
141 Kilometro 2	11,858
104 Paraje Iluca	12,004
25 Colibri	12,167
86 Cuailascantitla	12,254
53 La Herradura II	12,298
20 La Caseta	12,627
68 Amilco	12,676
19 Camino a la Marina	13,042
152 Tepetlica el Alto	13,077
89 Estrella Mora	13,171
134 Camino Viejo a Tepepan	13,585
122 Tetequilo	13,588
16 Ampliacion Lomas de Texcalatlaco	13,925
116 El Sifon	14,015
82 Chinita Norte	14,135
175 Miluyac	14,146
76 Ayopa	14,279
37 Tecorraltitla	14,466
1 Belvedere de Teresa	14,733
178 Poligono 81/ Sin Nombre	15,213
60 La Quinta	15,648
158 Arcoiris	15,840
171 La Magueyera	15,941
121 Tetecala	16,017
35 Santiago Tepalcatitla I	16,564
73 El Arenal / Tlahuacapan	16,642
96 La Joyita / Prolongacion Nogal	16,689
65 Achichipisco	17,429
144 Tatamaxtitla	17,593
146 Carrasco	17,614
11 El Silbato	17,805
129 Xaxalipac	17,889
151 Tepetlica /12 de Diciembre	17,890
138 Corrasolco	17,901
4 Prolongacion Jazmin	17,966
169 Guardita	18,135
52 La Estacion	18,773
157 Apapaxtles	19,711
32 Paraje Texcalatlaco	20,438
159 Camino al Cuatzontle	20,868
3 Lomas de Cuilotepec II	21,205
59 Pedregal de Cuatzontle	21,836
140 Huetlatilpa	21,895
97 Lomas del Capulin	22,656
70 Los Angeles	22,812

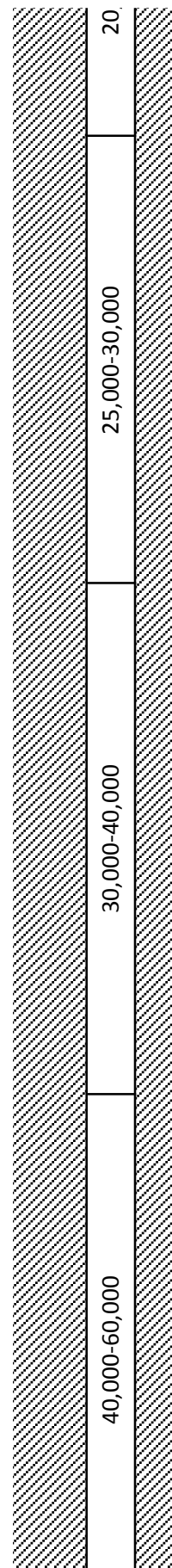


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38.96500793		35	19.24664098		20	115.2891865
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41.95619823		38	19.3591409		20	116.697256
41.98730932		38	19.36030502		20	116.7119626
42.36348984		38	19.37437133		20	116.8898877
42.89246516		39	19.39412087		20	117.1403907
43.64786129		39	19.42226308		20	117.4987425
45.00623537		41	19.47269019		20	118.1449759
46.2376599		42	19.51820732		20	118.7328357
46.7813056		42	19.53824286		20	118.9929693
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47.28254429		43	19.55668356		20	119.2331389
48.8319661		44	19.61349447		20	119.9775228
49.05295616		44	19.62157367		20	120.0839344
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51.28337004		46	19.70278901		20	121.1612769
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51.807853		47	19.72180118		21	121.4154939
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62.00205203		53	19.96630278		25	204.9083432
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63.96379103		55	20.03185145		25	206.8575611
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79	33053.60504		18,301.23	60.89	76.32	
79	33058.1203		18,303.73	60.96	76.33	
79	33085.2349		18,318.74	61.33	76.36	
79	33092.96223		18,323.02	61.44	76.37	
79	33120.50495		18,338.27	61.81	76.40	
79	33151.30234		18,355.32	62.23	76.44	
79	33167.76076		18,364.44	62.45	76.46	
79	33176.08999		18,369.05	62.57	76.47	
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81	33486.62445		18,540.99	66.58	76.82	
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	81	33527.0633		18,563.38	67.08	76.87
	81	33529.18376		18,564.55	67.10	76.87
	81	33554.83962		18,578.76	67.42	76.90
	81	33590.96698		18,598.76	67.86	76.94
	81	33642.66069		18,627.38	68.48	77.00
	82	33735.91959		18,679.02	69.59	77.11
	82	33820.79601		18,726.01	70.58	77.21
	83	33858.36726		18,746.81	71.01	77.25
	83	33878.1579		18,757.77	71.23	77.27
	83	33893.06195		18,766.02	71.40	77.29
	83	34000.63695		18,825.59	72.61	77.41
	83	34016.02023		18,834.10	72.78	77.43
	83	34025.29488		18,839.24	72.89	77.44
	84	34171.83822		18,920.38	74.48	77.61
	84	34204.44655		18,938.43	74.83	77.64
	84	34208.62544		18,940.75	74.88	77.65
	84	34246.66903		18,961.81	75.28	77.69
	84	34263.42056		18,971.09	75.46	77.71
	84	34263.62006		18,971.20	75.46	77.71
	84	34265.81465		18,972.41	75.49	77.71
	85	34278.78703		18,979.59	75.62	77.73
	85	34312.54992		18,998.29	75.98	77.76
	85	34440.46047		19,069.11	77.30	77.91
	86	34629.80393		19,173.95	79.21	78.12
	144	47213.41769		39,977.62	80.66	112.81
	145	47405.5558		40,140.31	81.50	113.04
	146	47556.58287		40,268.19	82.16	113.22
	147	47840.4149		40,508.52	83.37	113.55
	147	47867.02367		40,531.05	83.48	113.58
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13.14	1	13.14	20
13.03	1	13.03	68
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12.12	1	12.12	152
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10.99	1	10.99	134
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10.25	2	5.12	16
10.05	2	5.03	116
9.79	1	9.79	82
9.77	2	4.88	175
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7.52	1	7.52	178
6.63	2	3.31	60
6.24	1	6.24	158
6.04	1	6.04	171
5.88	1	5.88	121
4.80	1	4.80	35
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3.12	1	3.12	65
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31.53	1	31.53	159
31.06	1	31.06	3
30.18	1	30.18	59
30.10	2	15.05	140
29.07	1	29.07	97
28.86	1	28.86	70

142 La Magueyera Tatamaxtitla	24,126
145 Tlatilpa	24,387
167 Cruz Eslava	24,723
93 Kilometro 30	24,730
56 La Magueyera	25,075
58 El Oyamel	25,269
124 Titicocotla/Temaxtetitla	25,459
38 Tetamazolco	25,592
161 Camino al Xitle	26,485
168 Los Gallos	27,616
27 Dolores Tlalli	28,103
100 Nextel / Las Rosas	28,264
137 Cocomozotla	28,814
131 Atlauhtenco	29,010
63 La Via / La Herradura	29,433
8 El Arenal II	29,550
61 Valentin Reyes	29,918
18 Atocpa Sur	29,949
128 Xaxalco II	30,650
81 El Caracol	32,019
185 Zona Entre Asentamientos San Juan Bautista y la Cañ±	32,177
154 Tres de Mayo	32,478
173 Maninal Sur	33,663
43 Viveros de Coactetlan 2a Seccion	34,447
139 Emiliano Zapata	34,743
42 Vista Hermosa	34,823
50 Ejidos - Heroes de 1910	35,783
176 Ocomozotla	35,837
83 Chinita Sur / Toxtepec	35,901
29 La Magueyera	36,646
47 Bosques del Cuatzontle	37,716
111 Las Rejas / Chalquitongo	38,095
112 Las Rosas/ Piedra Larga	38,895
75 Ayometitla	39,650
109 La Presa	41,140
162 La Cañ±ada /San Juan Bautista	44,282
189 Diamante	44,600
90 La Faja / Ololique	45,243
51 Estacion - La Venta	47,275
155 Ahuayoto	50,047
10 Diligencias	50,628
67 Ahuacatitla	50,991
143 Memecala	51,587
17 Atocpa	54,963
87 Cuanejaque	57,129
46 Ampliacion La Venta	58,156
9 El Arenal	58,380
40 Valle Verde	58,678
187 Bosques de Tepeximilpa	59,304

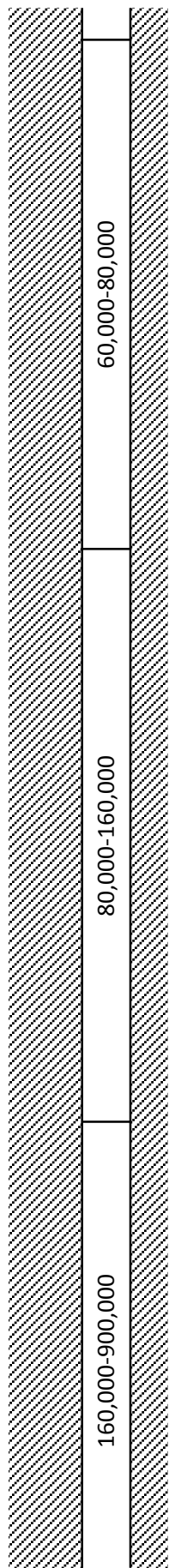


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92.85681636		36	19.27236551		19	103.7313383
93.30935933		36	19.27965023		19	103.8030536
94.17162048		36	19.29351705		19	103.9398159
97.56799757		38	19.34796914		19	104.4800125
99.81659581		39	19.38387292		19	104.8389619
100.665876		39	19.39740334		19	104.9748038
100.8954413		39	19.40105785		19	105.0115479
103.6512231	0.386152584	40	19.44483416	0.984081549	19	105.4534722
103.8062906		40	19.44729232		19	105.4783849
103.9900818		40	19.4502051		19	105.5079186
106.1301293		41	19.48406515		19	105.8523061
109.2056967		42	19.53254689		19	106.3488475
110.295629		43	19.54967738		19	106.5252653
112.597221		43	19.585765		19	106.8985747
114.7705225		44	19.61973389		19	107.2520313
119.0628996		110	22.00227559		19	104.0784733
128.1288955		118	22.27872324		19	106.5299545
129.04756		119	22.30649706		19	106.7818453
130.905729		121	22.36254992		19	107.2933473
136.7833256		126	22.53881303		19	108.9293126
144.8147022		133	22.77738974		20	111.2107891
146.4999944		135	22.82715855		20	111.6965562
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159.0957314		147	23.19652653		20	115.4093494
165.4033226		152	23.38015555		20	117.3266047
168.3973203		155	23.46710022		20	118.2511624
169.0506244		156	23.48605702		20	118.4541865
169.9199077		156	23.51127349		20	118.7250517
171.7465644		158	23.56423698		20	119.2969485

	152	48881.93481		41,390.42	87.63	114.78
	152	49001.77813		41,491.90	88.11	114.92
	153	49156.40155		41,622.82	88.71	115.10
	153	49159.62697		41,625.55	88.72	115.11
	167	52317.52328		37,542.68	89.34	109.32
	167	52375.66498		37,584.40	89.68	109.38
	168	52432.89134		37,625.46	90.02	109.44
	168	52473.11788		37,654.33	90.26	109.48
	169	52746.85706		37,850.76	91.82	109.76
	170	53102.95708		38,106.30	93.76	110.13
2.064858074	171	53259.65465	0.717592777	38,218.74	94.58	110.30
	171	53311.91621		38,256.25	94.85	110.35
	172	53492.20037		38,385.62	95.77	110.54
	172	53557.11171		38,432.20	96.09	110.60
	173	53698.41484		38,533.59	96.79	110.75
	173	53737.7953		38,561.85	96.98	110.79
	174	53862.5098		38,651.35	97.59	110.92
	174	53873.07516		38,658.93	97.64	110.93
	77	32730.92146		39,068.68	98.77	111.52
	78	32826.78174		39,183.11	100.96	111.68
	78	32837.88655		39,196.36	101.20	111.70
	78	32859.06553		39,221.64	101.68	111.73
	78	32942.74456		39,321.52	103.51	111.88
	78	32998.36897		39,387.92	104.71	111.97
	78	33019.42411		39,413.05	105.16	112.01
0.747621032	79	33025.11977	1.193632243	39,419.85	105.28	112.02
	79	33093.63601		39,501.63	106.72	112.13
	79	33097.49927		39,506.24	106.80	112.14
	79	33102.07921		39,511.71	106.90	112.15
	79	33155.49378		39,575.47	108.00	112.24
	80	33232.53517		39,667.43	109.57	112.37
	80	33259.91534		39,700.11	110.12	112.41
	80	33317.8669		39,769.28	111.27	112.51
	80	33372.75361		39,834.79	112.34	112.60
	177	54485.22849		84,272.17	114.43	163.78
	181	55446.15953		85,758.44	118.72	165.22
	181	55545.1285		85,911.52	119.15	165.37
	182	55746.2333		86,222.56	120.01	165.67
	185	56390.63939		87,219.27	122.67	166.62
	189	57292.36829		88,613.97	126.22	167.95
	189	57484.82218		88,911.64	126.95	168.23
1.695876239	190	57605.69091	1.546697577	89,098.58	127.40	168.41
	191	57805.20061		89,407.16	128.14	168.70
	196	58961.10739		91,195.00	132.27	170.38
	199	59727.13988		92,379.82	134.85	171.48
	201	60097.44204		92,952.57	136.06	172.01
	201	60178.83516		93,078.46	136.32	172.13
	201	60287.46996		93,246.48	136.67	172.28
	202	60517.00303		93,601.50	137.39	172.61

27.15	1	27.15	142
26.82	1	26.82	145
26.39	2	13.20	167
26.38	2	13.19	93
19.98	1	19.98	56
19.69	1	19.69	58
19.42	2	9.71	124
19.22	1	19.22	38
17.95	1	17.95	161
16.38	1	16.38	168
15.72	2	7.86	27
15.50	2	7.75	100
14.77	1	14.77	137
14.51	2	7.25	131
13.96	1	13.96	63
13.81	1	13.81	8
13.33	1	13.33	61
13.29	1	13.29	18
12.74	2	6.37	128
10.72	1	10.72	81
10.49	2	5.25	185
10.06	1	10.06	154
8.36	1	8.36	173
7.26	1	7.26	43
6.85	2	3.42	139
6.73	1	6.73	42
5.41	2	2.70	50
5.33	1	5.33	176
5.25	2	2.62	83
4.23	2	2.12	29
2.80	2	1.40	47
2.30	2	1.15	111
1.24	1	1.24	112
0.26	1	0.26	75
49.35	2	24.67	109
46.50	1	46.50	162
46.22	2	23.11	189
45.66	1	45.66	90
43.95	1	43.95	51
41.73	2	20.87	155
41.28	1	41.28	10
41.01	2	20.50	67
40.56	1	40.56	143
38.11	1	38.11	17
36.63	2	18.31	87
35.95	1	35.95	46
35.81	1	35.81	9
35.62	2	17.81	40
35.22	2	17.61	187

57 Manzana 36 / La Venta	59,616
28 Flor de Borrego	61,058
126 Las Torres	62,671
64 El Xipie II	62,882
79 El Calvario	64,544
88 Los Encinos	65,321
62 La Venta /La Joya	66,955
12 Tlaltenango	68,410
44 Xicalco Oriente	69,105
179 El Sabinoco	69,969
105 Los Pastores	70,739
80 Camino Antiguo al Cantil	72,135
190 El Mirador 3ra. Seccion	73,561
133 Camino Antiguo a Diligencias	76,662
41 Verano	77,648
106 Pedregal de Aminco	78,511
102 Ocotla Chico	79,344
149 Tecoantitla / Xolalpa	84,793
48 El Conejo	94,645
99 La Morucha	96,597
13 Ampliacion Parres	98,848
123 Tezontitla	100,901
156 Los Ajuscos	102,374
177 Piramide/ Providencia	106,982
165 El Charco	112,854
181 Tecoentitla/Canoas	113,688
163 El Cedral	113,787
9000 Zona de Ranchos	118,023
186 Zona Entre Calles Fernando Montes de Oca y Leona Vi	119,563
39 Tlalmille	122,785
45 Zorros-Solidaridad	132,792
135 Cantera Tehuehue	135,279
172 Maninal Norte	141,627
114 San Miguel Toxiac	144,097
74 Ayocatitla	152,302
6 El Zacaton	165,949
174 Maye	170,442
113 San Miguel Tehuisco	170,671
101 Ocotla	180,781
91 Las Granjas / Barranquillas	204,456
31 Paraje 38	205,527
84 Cortijo de Mendoza	228,269
9002 Area urbana	231,330
33 Primavera	248,124
5 San Nicolas II	270,955
98 Las Margaritas	291,243
55 El Llano / Jardines de San Juan	329,174
160 Camino al Xictontle / Lomas de Tepemecac	531,626
170 Lomas de Tepemecac	557,678



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182.2021459		133	22.75322194		27	263.7017467
187.0675279		136	22.86674389		28	267.7713888
189.344033		138	22.9196997		28	269.6884075
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205.2516061		149	23.28739037		28	283.3286901
209.3598582		152	23.38182272		28	286.9257922
213.5604207		155	23.47821859		28	290.6376887
222.7090622		162	23.6877749		29	298.8474669
225.6220119		164	23.75443009		29	301.4994129
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294.8822118		208	25.14956233		22	148.9628655
299.3060359		211	25.25118137		22	150.4878773
313.1731483		221	25.57327002		23	155.4423115
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333.4297613		235	26.05531248		23	163.205924
333.7294814	0.705823944	236	26.06256268	0.889861554	23	163.3259309
346.5722285		245	26.3768522		23	168.6216468
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361.0525562		255	26.74048133		24	174.9795738
391.6297153		276	27.54620417		25	189.9720243
399.2600078		282	27.75635997		25	194.0921942
418.7922071		296	28.31302541		25	205.4358214
426.4139454		301	28.53804653		25	210.2012515
451.8198992		319	29.3228575		26	227.6525791
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508.4664754		584	51.46129598		46	1439.90673
509.1857902		585	51.57365589		51	2067.9133
541.04697		621	56.90347695		51	2067.9133
616.4574559		708	72.53348792		51	2067.9133
619.8953477		712	73.35616637		51	2067.9133
693.4383364		796	93.51589776		52	2206.919
703.4159689	1.148177576	808	96.64990415	0.889872198	52	2206.919
758.4911194		871	115.8145989		52	2206.919
834.269012		958	147.7687822		52	2206.919
902.481285		1036	182.6571838		52	2206.919
1032.221122		1185	267.1575176		60	3555.3622
1773.357404		2036	1389.308508		60	3555.3622
1874.681552		2152	1652.415089		60	3555.3622

	203	60632.0826		93,779.50	137.75	172.77
	242	70034.83455		150,688.11	139.41	219.01
	245	70932.76244		152,620.11	141.24	220.41
	246	71051.09775		152,874.72	141.48	220.59
	250	71990.46717		154,895.88	143.34	222.05
	251	72434.14639		155,850.51	144.20	222.73
	255	73376.87434		157,878.90	145.99	224.17
	259	74227.72538		159,709.60	147.57	225.47
0.932303236	260	74638.05086	2.151616572	160,592.47	148.31	226.09
	262	75151.76077		161,697.77	149.24	226.87
	264	75613.01554		162,690.22	150.06	227.57
	268	76457.7285		164,507.72	151.53	228.83
	271	77332.2026		166,389.25	153.02	230.14
	279	79276.43361		170,572.49	156.21	233.01
	281	79907.44153		171,930.18	157.21	233.94
	283	80465.02976		173,129.89	158.08	234.75
	285	81008.03518		174,298.23	158.92	235.54
	265	75739.01972		159,888.05	164.29	225.60
	282	80220.90704		169,349.49	173.57	232.18
	286	81175.60179		171,364.89	175.35	233.55
	290	82307.37937		173,754.12	177.38	235.18
	295	83370.02789		175,997.41	179.21	236.69
	298	84151.27212		177,646.65	180.52	237.80
	307	86704.29025		183,036.17	184.54	241.38
	321	90224.10013		190,466.63	189.53	246.23
1.977378678	323	90750.78044	2.111039382	191,578.47	190.23	246.94
	323	90813.76938		191,711.44	190.31	247.03
	333	93606.70437		197,607.44	193.82	250.80
	337	94672.01743		199,856.36	195.08	252.22
	346	96994.29042		204,758.77	197.70	255.30
	376	105131.2752		221,936.26	205.59	265.79
	384	107404.0611		226,734.20	207.51	268.65
	406	113743.0328		240,116.02	212.32	276.46
	416	116441.7082		245,813.03	214.17	279.72
	450	126504.6885		267,056.38	220.18	291.56
	336	94279.63408		155,731.58	229.83	222.65
	387	108437.877		179,118.23	232.92	238.78
	556	159290.372		263,116.64	233.08	289.40
	556	159290.372		263,116.64	239.88	289.40
	556	159290.372		263,116.64	255.11	289.40
	556	159290.372		263,116.64	255.78	289.40
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	594	171464.2972		283,225.59	271.36	300.26
	594	171464.2972		283,225.59	281.03	300.26
	594	171464.2972		283,225.59	293.68	300.26
	594	171464.2972		283,225.59	304.48	300.26
	957	306828.9279		506,821.57	323.70	401.65
	957	306828.9279		506,821.57	411.37	401.65
	957	306828.9279		506,821.57	421.32	401.65


35.02	1	35.02	57
79.60	2	39.80	28
79.17	2	39.58	126
79.12	2	39.56	64
78.71	1	78.71	79
78.53	2	39.27	88
78.19	1	78.19	62
77.91	2	38.95	12
77.78	1	77.78	44
77.63	1	77.63	179
77.51	2	38.75	105
77.30	1	77.30	80
77.12	1	77.12	190
76.80	1	76.80	133
76.72	1	76.72	41
76.67	2	38.33	106
76.62	1	76.62	102
61.31	2	30.65	149
58.61	1	58.61	48
58.20	1	58.20	99
57.79	1	57.79	13
57.47	1	57.47	123
57.28	1	57.28	156
56.84	1	56.84	177
56.69	1	56.69	165
56.71	1	56.71	181
56.72	2	28.36	163
56.98	2	28.49	9000
57.14	2	28.57	186
57.60	2	28.80	39
60.20	2	30.10	45
61.14	1	61.14	135
64.14	1	64.14	172
65.56	1	65.56	114
71.38	1	71.38	74
7.19	2	3.59	6
5.85	1	5.85	174
56.32	2	28.16	113
49.52	1	49.52	101
34.29	2	17.15	91
33.62	1	33.62	31
30.70	2	15.35	84
28.90	1	28.90	9002
19.22	2	9.61	33
6.58	1	6.58	5
4.22	1	4.22	98
77.96	1	77.96	55
9.71	2	4.86	160
19.67	1	19.67	170


103 Oyameyo


844,417




3079.58607


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518.45

401.65 

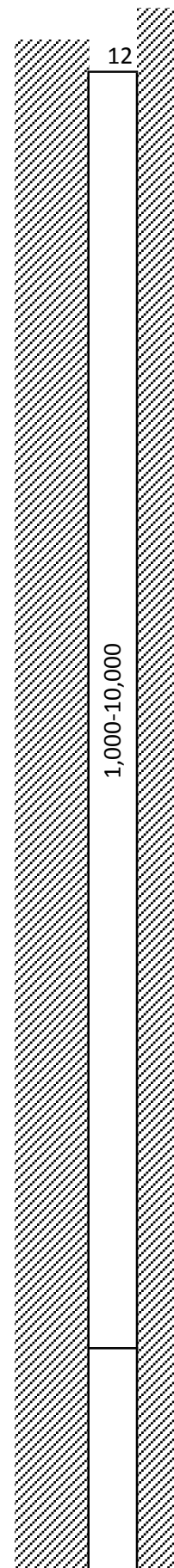
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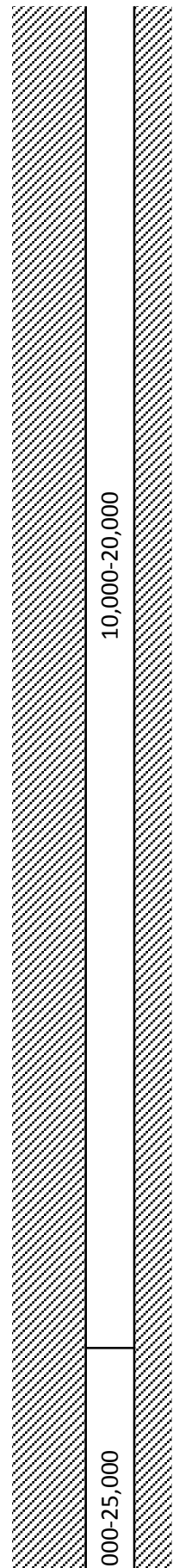
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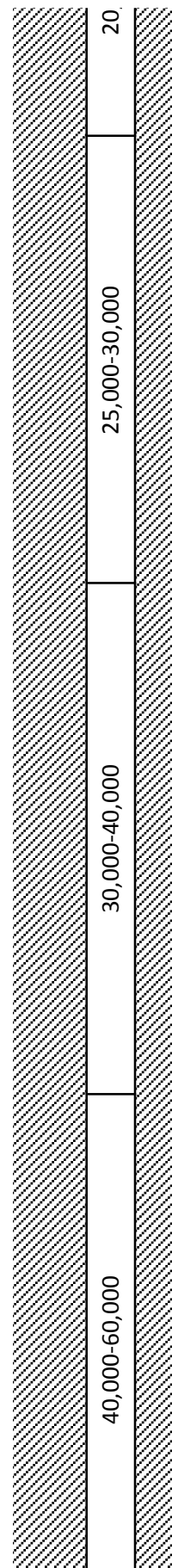
ID	Name	AreaM2
23	Cerrada Porfirio Diaz/UH	671
110	Rancho la Esperanza	1,738
119	Tepetzintla	1,864
108	Poligono 127 / Sin Nombre	1,870
24	Cerrada Sierra San Juan	1,895
22	Cerrada Porfirio Diaz	2,434
188	Cuchilla de Tepeximilpa/ Ampliacion Tepeximilpa	2,698
127	Unixco	2,827
191	Tepetongo	2,927
77	Las Bombas	3,423
130	Xilonimoco	3,693
125	Tlaltepantitla	4,164
150	Colinas del Angel	4,240
120	Tepezintla	4,250
184	Xitle II	4,362
9001	Parque Ecologico CD Mexico	4,656
21	Cerrada la Mora	4,723
49	El Conejo /El Charco	5,211
115	Siete Ocotes / Subestacion electrica	5,507
92	Huinizco	5,515
54	La Herradura	5,565
71	Los Arcos	5,689
107	La Pedrera	5,821
148	Prolongacion 5 de mayo	5,921
7	Ampliacion La Nueva Magdalena Petlcalco	6,300
15	Alta Tension	6,594
2	Las Cebadas	6,788
118	Tepacheras	6,800
66	Acopiaco/Tezontle	7,299
78	Bosques de San Jose/ Ixpangologuia	7,531
30	Mirador el Colibri	7,545
14	El Guardita	7,664
183	Tlapanco	8,156
132	Bellavista	8,275
34	Retesco / Privada Eucalipto	8,461
94	Kilometro 33 / Teteocotla	9,064
9003	Fuentes Brotantes	9,221
147	Paraje Tetenco	9,455
85	El Crucero	9,549
166	Cocuyatla	9,614
95	Kilometro 34.5 / Lomas de San Jose	10,169
36	Santiago Tepalcatitla II	10,251
153	Tepozanes	10,755
164	Cercantitla	11,059
26	Diamante	11,068
117	Tehitic	11,243
69	Ampliacion Tezontitla	11,482



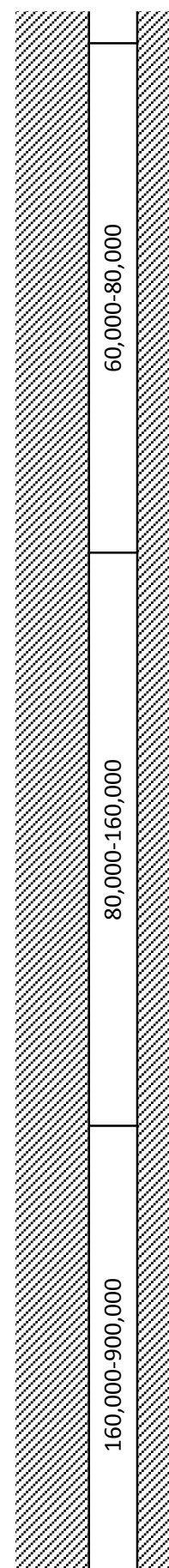
72 Arenal de Guadalupe	11,585
136 Chancoyote	11,649
180 San Juan Nuevo /Ocotlaltongo	11,673
182 Tecpan	11,817
141 Kilometro 2	11,858
104 Paraje Iluca	12,004
25 Colibri	12,167
86 Cuailascantitla	12,254
53 La Herradura II	12,298
20 La Caseta	12,627
68 Amilco	12,676
19 Camino a la Marina	13,042
152 Tepetlica el Alto	13,077
89 Estrella Mora	13,171
134 Camino Viejo a Tepepan	13,585
122 Tetequilo	13,588
16 Ampliacion Lomas de Texcalatlaco	13,925
116 El Sifon	14,015
82 Chinita Norte	14,135
175 Miluyac	14,146
76 Ayopa	14,279
37 Tecorraltitla	14,466
1 Belvedere de Teresa	14,733
178 Poligono 81/ Sin Nombre	15,213
60 La Quinta	15,648
158 Arcoiris	15,840
171 La Magueyera	15,941
121 Tetecala	16,017
35 Santiago Tepalcatitla I	16,564
73 El Arenal / Tlahuacapan	16,642
96 La Joyita / Prolongacion Nogal	16,689
65 Achichipisco	17,429
144 Tatamaxtitla	17,593
146 Carrasco	17,614
11 El Silbato	17,805
129 Xaxalipac	17,889
151 Tepetlica /12 de Diciembre	17,890
138 Corrasolco	17,901
4 Prolongacion Jazmin	17,966
169 Guardita	18,135
52 La Estacion	18,773
157 Apapaxtles	19,711
32 Paraje Texcalatlaco	20,438
159 Camino al Cuatzontle	20,868
3 Lomas de Cuilotepec II	21,205
59 Pedregal de Cuatzontle	21,836
140 Huetlatilpa	21,895
97 Lomas del Capulin	22,656
70 Los Angeles	22,812



142 La Magueyera Tatamaxtitla	24,126
145 Tlatilpa	24,387
167 Cruz Eslava	24,723
93 Kilometro 30	24,730
56 La Magueyera	25,075
58 El Oyamel	25,269
124 Titicocotla/Temaxtetitla	25,459
38 Tetamazolco	25,592
161 Camino al Xitle	26,485
168 Los Gallos	27,616
27 Dolores Tlalli	28,103
100 Nextel / Las Rosas	28,264
137 Cocomozotla	28,814
131 Atlauhtenco	29,010
63 La Via / La Herradura	29,433
8 El Arenal II	29,550
61 Valentin Reyes	29,918
18 Atocpa Sur	29,949
128 Xaxalco II	30,650
81 El Caracol	32,019
185 Zona Entre Asentamientos San Juan Bautista y la Cañ±	32,177
154 Tres de Mayo	32,478
173 Maninal Sur	33,663
43 Viveros de Coactetlan 2a Seccion	34,447
139 Emiliano Zapata	34,743
42 Vista Hermosa	34,823
50 Ejidos - Heroes de 1910	35,783
176 Ocomozotla	35,837
83 Chinita Sur / Toxtepec	35,901
29 La Magueyera	36,646
47 Bosques del Cuatzontle	37,716
111 Las Rejas / Chalquitongo	38,095
112 Las Rosas/ Piedra Larga	38,895
75 Ayometitla	39,650
109 La Presa	41,140
162 La Cañ±ada /San Juan Bautista	44,282
189 Diamante	44,600
90 La Faja / Ololique	45,243
51 Estacion - La Venta	47,275
155 Ahuayoto	50,047
10 Diligencias	50,628
67 Ahuacatitla	50,991
143 Memecala	51,587
17 Atocpa	54,963
87 Cuanejaque	57,129
46 Ampliacion La Venta	58,156
9 El Arenal	58,380
40 Valle Verde	58,678
187 Bosques de Tepeximilpa	59,304



57 Manzana 36 / La Venta	59,616
28 Flor de Borrego	61,058
126 Las Torres	62,671
64 El Xipie II	62,882
79 El Calvario	64,544
88 Los Encinos	65,321
62 La Venta /La Joya	66,955
12 Tlaltenango	68,410
44 Xicalco Oriente	69,105
179 El Sabinoco	69,969
105 Los Pastores	70,739
80 Camino Antiguo al Cantil	72,135
190 El Mirador 3ra. Seccion	73,561
133 Camino Antiguo a Diligencias	76,662
41 Verano	77,648
106 Pedregal de Aminco	78,511
102 Ocotla Chico	79,344
149 Tecoantitla / Xolalpa	84,793
48 El Conejo	94,645
99 La Morucha	96,597
13 Ampliacion Parres	98,848
123 Tezontitla	100,901
156 Los Ajuscos	102,374
177 Piramide/ Providencia	106,982
165 El Charco	112,854
181 Tecoentitla/Canoas	113,688
163 El Cedral	113,787
9000 Zona de Ranchos	118,023
186 Zona Entre Calles Fernando Montes de Oca y Leona Vi	119,563
39 Tlalmille	122,785
45 Zorros-Solidaridad	132,792
135 Cantera Tehuehue	135,279
172 Maninal Norte	141,627
114 San Miguel Toxiac	144,097
74 Ayocatitla	152,302
6 El Zacaton	165,949
174 Maye	170,442
113 San Miguel Tehuisco	170,671
101 Ocotla	180,781
91 Las Granjas / Barranquillas	204,456
31 Paraje 38	205,527
84 Cortijo de Mendoza	228,269
9002 Area urbana	231,330
33 Primavera	248,124
5 San Nicolas II	270,955
98 Las Margaritas	291,243
55 El Llano / Jardines de San Juan	329,174
160 Camino al Xictontle / Lomas de Tepemecac	531,626
170 Lomas de Tepemecac	557,678



103 Oyameyo

844,417




Calculated Population			Estimated Age			Projected
Formula	Average	Corrected V	Formula	Average	Corrected V	Formula
4.057650241		4	17.8522787		16	138.1617465
7.047820644		7	17.98692565		16	139.9894178
7.401074496		7	18.00272829		16	140.2058833
7.4178969		7	18.00348028		16	140.2161945
7.487991025		7	18.0066131		16	140.259161
8.999524356		9	18.07396129		16	141.1867786
9.740079204		9	18.10681253		16	141.64199
10.10199193		10	18.12283257		16	141.8646278
10.38256733		10	18.13523667		16	142.0373073
11.77451693		11	18.19657401		16	142.8949728
12.53243825		12	18.22983309		16	143.3626599
13.8549389		13	18.28763345		16	144.179863
14.0683776		13	18.29693417		16	144.3118848
14.0964625		13	18.29815741		16	144.3292594
14.41102704		14	18.31184928		16	144.5239061
15.23687834		15	18.34771661		16	145.0353027
15.42510673		15	18.35587553		16	145.1519359
16.79635452		16	18.41513542		16	146.0024443
17.62832705		17	18.45093812		16	146.5191745
17.65081523	0.956970572	17	18.45190428	0.879761995	16	146.5331489
17.79136923		17	18.45794103		16	146.6204999
18.13996472		17	18.47289907		16	146.8372076
18.51108404		18	18.48880168		16	147.0680172
18.79225824		18	18.50083509		16	147.2429556
19.85809		19	18.5463324		16	147.9066131
20.68508084		20	18.58150721		16	148.4221206
21.23087694		20	18.60466131		16	148.7626127
21.26464		20	18.60609205		16	148.7836825
22.6688754		22	18.66543603		16	149.6607046
23.32191596		22	18.69292679		16	150.0690298
23.36132703		22	18.69458369		16	150.0936816
23.6963369		23	18.70865809		16	150.3032746
25.08172034		24	18.76667253		17	151.1708181
25.41687563		24	18.78066221		17	151.3808882
25.94078852		25	18.80249562		17	151.7094166
27.6397561		26	18.87300437		17	152.7760058
28.08222684		27	18.89129412		17	153.0540853
28.74179703		28	18.91850196		17	153.4688334
29.0067834		28	18.92941413		17	153.6355374
29.190029		28	18.93695394		17	153.7508433
30.75500856		28	18.93185676		20	217.5148769
30.986283		28	18.94084763		20	217.747429
32.40807003		29	18.99596055		20	219.1780479
33.26590148		30	19.02908079		20	220.0420098
33.29130062		30	19.03005992		20	220.0675995
33.78520505		31	19.04908274		20	220.5653133
34.45983632		31	19.07501365		20	221.2454627


34.75061223		31	19.08617157		20	221.5387283
34.9312992		32	19.09309939		20	221.7209959
34.99905893		32	19.09569629		20	221.7893549
35.40564149		32	19.11126585		20	222.1996094
35.52141216		32	19.11569514		20	222.3164491
35.93369602		32	19.13145442		20	222.7326249
36.39403589		33	19.14902415		20	223.1974656
36.63976052		33	19.1583913		20	223.4456593
36.7640408		33	19.16312592		20	223.571206
37.69344113		34	19.19846858		20	224.5104488
37.83188098		34	19.20372345		20	224.6504106
38.86609376		35	19.2429012		20	225.6964462
38.96500793		35	19.24664098		20	225.7965327
39.23067524		35	19.2566792		20	226.0653846
40.40095223		37	19.30079003		20	227.2503049
40.40943374		37	19.30110909		20	227.2588962
41.36230563		37	19.33689505		20	228.224429
41.61682023	0.904419703	38	19.34643405	1.040255628	20	228.4824353
41.95619823		38	19.3591409		20	228.8265409
41.98730932		38	19.36030502		20	228.8580894
42.36348984		38	19.37437133		20	229.2396137
42.89246516		39	19.39412087		20	229.7762714
43.64786129		39	19.42226308		20	230.5429769
45.00623537		41	19.47269019		20	231.9226777
46.2376599		42	19.51820732		20	233.1745198
46.7813056		42	19.53824286		20	233.7275032
47.06731548		43	19.54876898		20	234.0185045
47.28254429		43	19.55668356		20	234.2375252
48.8319661		44	19.61349447		20	235.8151433
49.05295616		44	19.62157367		20	236.0402825
49.18612272		44	19.62643929		20	236.1759646
51.28337004		46	19.70278901		20	238.3143307
51.74831365		47	19.71964454		21	238.7887689
51.807853		47	19.72180118		21	238.849534
52.34941803		47	19.74139861		21	239.4023501
52.58761632		48	19.75000733		21	239.6455551
52.5904521		48	19.75010977		21	239.6484507
52.6216458		48	19.75123664		21	239.6803028
52.80597716		48	19.75789327		21	239.8685369
53.28527823		48	19.77518338		21	240.3580851
55.09522553		50	19.84023458		21	242.2080085
57.75772352		52	19.93524592		21	244.9329444
59.82251184		51	19.89302616		25	393.5772677
61.04427342		52	19.93416087		25	395.7177342
62.00205203		53	19.96630278		25	397.3966303
63.7960109		55	20.02626019		25	400.5434195
63.96379103		55	20.03185145		25	400.8378657
66.12849434	0.855274463	57	20.10374318	1.260735927	25	404.6389891
66.57238734		57	20.11842905		25	405.4189421

70.31326388		60	20.24144573		26	411.9986122
71.05672577		61	20.26573694		26	413.3076732
72.01402673		62	20.29693931		26	414.9939453
72.0339729		62	20.29758854		26	415.0290885
73.01715563		136	22.87547002		16	141.9365533
73.57012236		137	22.90849211		16	142.3013805
74.11176068		138	22.94080141		16	142.6594401
74.49095046		139	22.96339978		16	142.9105328
77.03785523		144	23.11477823		16	144.6063908
80.26584346		150	23.30576662		16	146.7806286
81.65657861		153	23.38781127		16	147.7265758
82.1164537	1.868303666	153	23.41491483	0.697180286	16	148.0406545
83.6878466		156	23.50744376		16	149.1188312
84.2479801		157	23.54039895		16	149.5050606
85.45710149		160	23.61149734		16	150.3423137
85.7916025		160	23.6311584		16	150.5748065
86.84388672		162	23.69299067		17	151.3087047
86.9325426		162	23.69819903		17	151.370713
88.9378225		34	19.20907915		19	198.6872546
92.85681636		36	19.27236551		19	200.1113518
93.30935933		36	19.27965023		19	200.2759139
94.17162048		36	19.29351705		19	200.5895309
97.56799757		38	19.34796914		19	201.8256707
99.81659581		39	19.38387292		19	202.644784
100.665876		39	19.39740334		19	202.9543043
100.8954413		39	19.40105785		19	203.0379832
103.6512231	0.386152584	40	19.44483416	0.984081549	19	204.0429459
103.8062906		40	19.44729232		19	204.0995197
103.9900818		40	19.4502051		19	204.1665764
106.1301293		41	19.48406515		19	204.9476464
109.2056967		42	19.53254689		19	206.0710212
110.295629		43	19.54967738		19	206.4693684
112.597221		43	19.585765		19	207.3109613
114.7705225		44	19.61973389		19	208.1061497
119.0628996		110	22.00227559		19	200.9072193
128.1288955		118	22.27872324		19	206.479951
129.04756		119	22.30649706		19	207.0479985
130.905729		121	22.36254992		19	208.1989967
136.7833256		126	22.53881303		19	211.8583911
144.8147022		133	22.77738974		20	216.9087883
146.4999944		135	22.82715855		20	217.9765449
147.5532821		136	22.85821658		20	218.6453711
149.2832186	0.920880345	137	22.90915186	0.863555959	20	219.7464108
159.0957314		147	23.19652653		20	226.0558479
165.4033226		152	23.38015555		20	230.1748285
168.3973203		155	23.46710022		20	232.1490271
169.0506244		156	23.48605702		20	232.5815192
169.9199077		156	23.51127349		20	233.1579638
171.7465644		158	23.56423698		20	234.3729469

172.6572675		159	23.59063145		20	234.9805874
176.8688794		129	22.62819226		27	490.8312328
181.5848542		132	22.73878339		27	497.3689283
182.2021459		133	22.75322194		27	498.2273255
187.0675279		136	22.86674389		28	505.0155713
189.344033		138	22.9196997		28	508.2059874
194.135372		141	23.0308512		28	514.9520134
198.4063281		144	23.12961694		28	521.0028058
200.447901		146	23.17673483		28	523.9082377
202.987261	0.727787559	148	23.23526487	1.203922531	28	527.5343371
205.2516061		149	23.28739037		28	530.7795137
209.3598582		152	23.38182272		28	536.6967457
213.5604207		155	23.47821859		28	542.7879082
222.7090622		162	23.6877749		29	556.2079769
225.6220119		164	23.75443009		29	560.5281037
228.1731771		166	23.8127955		29	564.3314533
230.6370703		168	23.86916184		29	568.0227579
246.7886528		174	24.06836267		21	264.4241455
276.142076		195	24.72402905		22	282.2211997
281.9809804		199	24.85584726		22	285.920813
288.7237271		204	25.00889652		22	290.2680308
294.8822118		208	25.14956233		22	294.3128141
299.3060359		211	25.25118137		22	297.2643624
313.1731483		221	25.57327002		23	306.7844593
330.9056253		234	25.99439902		23	319.6144819
333.4297613		235	26.05531248		23	321.5065243
333.7294814	0.705823944	236	26.06256268	0.889861554	23	321.7323383
346.5722285		245	26.3768522		23	331.6473865
351.250111		248	26.49319267		24	335.3805655
361.0525562		255	26.74048133		24	343.4295836
391.6297153		276	27.54620417		25	370.7458748
399.2600078		282	27.75635997		25	378.1495346
418.7922071		296	28.31302541		25	398.3286557
426.4139454		301	28.53804653		25	406.7225727
451.8198992		319	29.3228575		26	437.0854756
494.3746706		568	49.32812043		44	1921.508935
508.4664754		584	51.46129598		46	2177.773965
509.1857902		585	51.57365589		51	2998.4035
541.04697		621	56.90347695		51	2998.4035
616.4574559		708	72.53348792		51	2998.4035
619.8953477		712	73.35616637		51	2998.4035
693.4383364		796	93.51589776		52	3176.945
703.4159689	1.148177576	808	96.64990415	0.889872198	52	3176.945
758.4911194		871	115.8145989		52	3176.945
834.269012		958	147.7687822		52	3176.945
902.481285		1036	182.6571838		52	3176.945
1032.221122		1185	267.1575176		60	4871.0938
1773.357404		2036	1389.308508		60	4871.0938
1874.681552		2152	1652.415089		60	4871.0938

3079.58607

3536  7779.145504


60  4871.0938


population to Average	12 Corrected V	Area Projected to Formula	Average	12.00 Corrected V	Radius Present	Projected
	44	25972.29551		8,069.55	14.61	50.68
	44	26087.69344		8,105.41	23.52	50.79
	44	26101.36621		8,109.66	24.36	50.81
	44	26102.01753		8,109.86	24.40	50.81
	44	26104.7316		8,110.70	24.56	50.81
	45	26163.33727		8,128.91	27.83	50.87
	45	26192.10446		8,137.85	29.31	50.90
	45	26206.17591		8,142.22	30.00	50.91
	45	26217.09064		8,145.61	30.52	50.92
	45	26271.31257		8,162.46	33.01	50.97
	45	26300.88733		8,171.65	34.29	51.00
	46	26352.5767		8,187.71	36.41	51.05
	46	26360.92878		8,190.30	36.74	51.06
	46	26362.02797		8,190.64	36.78	51.06
	46	26374.34273		8,194.47	37.26	51.07
	46	26406.70169		8,204.52	38.50	51.10
	46	26414.0826		8,206.82	38.77	51.11
	46	26467.9153		8,223.54	40.73	51.16
	46	26500.63004		8,233.71	41.87	51.19
0.317035984	46	26501.51486	0.310698556	8,233.98	41.90	51.20
	46	26507.0458		8,235.70	42.09	51.20
	47	26520.76822		8,239.96	42.55	51.21
	47	26535.38484		8,244.51	43.05	51.23
	47	26546.46412		8,247.95	43.41	51.24
	47	26588.50182		8,261.01	44.78	51.28
	47	26621.16261		8,271.16	45.81	51.31
	47	26642.73849		8,277.86	46.48	51.33
	47	26644.07371		8,278.28	46.52	51.33
	47	26699.66099		8,295.55	48.20	51.39
	48	26725.54767		8,303.59	48.96	51.41
	48	26727.11065		8,304.07	49.01	51.41
	48	26740.39993		8,308.20	49.39	51.43
	48	26795.41785		8,325.30	50.95	51.48
	48	26808.74279		8,329.44	51.32	51.49
	48	26829.58377		8,335.91	51.90	51.51
	48	26897.26316		8,356.94	53.71	51.58
	49	26914.9129		8,362.42	54.18	51.59
	49	26941.24044		8,370.60	54.86	51.62
	49	26951.8237		8,373.89	55.13	51.63
	49	26959.14433		8,376.17	55.32	51.64
	151	48644.42396		26,933.61	56.89	92.59
	151	48680.63829		26,953.66	57.12	92.63
	152	48903.55833		27,077.09	58.51	92.84
	153	49038.29483		27,151.69	59.33	92.97
	153	49042.2869		27,153.90	59.36	92.97
	153	49119.94653		27,196.90	59.82	93.04
	153	49226.11788		27,255.68	60.46	93.14

	154	49271.91297		27,281.04	60.73	93.19
	154	49300.38004		27,296.80	60.89	93.21
	154	49311.05754		27,302.71	60.96	93.22
	154	49375.14937		27,338.20	61.33	93.28
	154	49393.40614		27,348.31	61.44	93.30
	154	49458.44826		27,384.32	61.81	93.36
	155	49531.11939		27,424.56	62.23	93.43
	155	49569.93102		27,446.05	62.45	93.47
	155	49589.56624		27,456.92	62.57	93.49
	156	49736.51887		27,538.28	63.40	93.63
	156	49758.42573		27,550.41	63.52	93.65
	157	49922.22249		27,641.10	64.43	93.80
	157	49937.90142		27,649.78	64.52	93.81
	157	49980.02372		27,673.11	64.75	93.85
	158	50165.76933		27,775.95	65.76	94.03
	158	50167.11666		27,776.70	65.77	94.03
	158	50318.59122		27,860.57	66.58	94.17
0.693472766	158	50359.08578	0.553683352	27,882.99	66.79	94.21
	159	50413.10562		27,912.90	67.08	94.26
	159	50418.05898		27,915.64	67.10	94.26
	159	50477.97023		27,948.81	67.42	94.32
	159	50562.27049		27,995.49	67.86	94.40
	160	50682.76465		28,062.20	68.48	94.51
	161	50899.76549		28,182.35	69.59	94.71
	162	51096.84494		28,291.47	70.58	94.90
	162	51183.95903		28,339.71	71.01	94.98
	162	51229.8159		28,365.10	71.23	95.02
	162	51264.33623		28,384.21	71.40	95.05
	164	51513.15011		28,521.97	72.61	95.28
	164	51548.68113		28,541.65	72.78	95.32
	164	51570.097		28,553.50	72.89	95.34
	165	51907.8918		28,740.54	74.48	95.65
	166	51982.90904		28,782.07	74.83	95.72
	166	51992.51895		28,787.39	74.88	95.73
	166	52079.96546		28,835.81	75.28	95.81
	166	52118.44762		28,857.12	75.46	95.84
	166	52118.90583		28,857.37	75.46	95.84
	166	52123.94627		28,860.16	75.49	95.85
	166	52153.7358		28,876.66	75.62	95.87
	167	52231.22963		28,919.56	75.98	95.94
	168	52524.31377		29,081.84	77.30	96.21
	170	52956.7393		29,321.26	79.21	96.61
	280	79730.7902		67,511.46	80.66	146.59
	282	80120.45733		67,841.41	81.50	146.95
	283	80426.48361		68,100.54	82.16	147.23
	285	81000.99129		68,587.00	83.37	147.76
	286	81054.80932		68,632.57	83.48	147.81
0.712432651	288	81750.50737	0.846742687	69,221.64	84.92	148.44
	289	81893.47336		69,342.70	85.21	148.57


	294	83102.45442		70,366.40	87.63	149.66
	294	83343.61094		70,570.59	88.11	149.88
	296	83654.56252		70,833.89	88.71	150.16
	296	83661.04663		70,839.38	88.72	150.16
	293	82988.12432		59,551.68	89.34	137.68
	294	83182.82171		59,691.39	89.68	137.84
	295	83374.03872		59,828.61	90.02	138.00
	295	83508.20896		59,924.89	90.26	138.11
	299	84416.05687		60,576.35	91.82	138.86
	303	85584.26281		61,414.65	93.76	139.82
2.064858074	305	86094.01126	0.717592777	61,780.44	94.58	140.23
	306	86263.46139		61,902.04	94.85	140.37
	308	86845.91485		62,320.00	95.77	140.84
	309	87054.85075		62,469.93	96.09	141.01
	310	87508.29314		62,795.32	96.79	141.38
	311	87634.33342		62,885.76	96.98	141.48
	312	88032.55804		63,171.53	97.59	141.80
	313	88066.22974		63,195.69	97.64	141.83
	149	48129.08758		57,448.43	98.77	135.23
	150	48367.70486		57,733.25	100.96	135.56
	150	48395.29574		57,766.19	101.20	135.60
	150	48447.8875		57,828.96	101.68	135.67
	151	48655.30833		58,076.54	103.51	135.96
	152	48792.86515		58,240.74	104.71	136.16
0.747621032	152	48844.86729	1.193632243	58,302.81	105.16	136.23
	152	48858.92826		58,319.59	105.28	136.25
	153	49027.86983		58,521.25	106.72	136.48
	153	49037.38429		58,532.60	106.80	136.50
	153	49048.66228		58,546.06	106.90	136.51
	153	49180.0714		58,702.92	108.00	136.70
	154	49369.21287		58,928.68	109.57	136.96
	154	49436.32247		59,008.79	110.12	137.05
	155	49578.17507		59,178.11	111.27	137.25
	156	49712.29259		59,338.20	112.34	137.43
	341	95565.07981		147,810.28	114.43	216.91
	350	98124.46517		151,768.87	118.72	219.79
	351	98386.54486		152,174.23	119.15	220.09
	353	98918.25673		152,996.63	120.01	220.68
	359	100614.7596		155,620.60	122.67	222.57
	368	102971.1762		159,265.27	126.22	225.16
	370	103471.6045		160,039.28	126.95	225.70
1.695876239	371	103785.4622	1.546697577	160,524.72	127.40	226.05
	373	104302.8095		161,324.90	128.14	226.61
	383	107283.4236		165,935.01	132.27	229.82
	390	109243.9421		168,967.34	134.85	231.91
	394	110187.7183		170,427.08	136.06	232.91
	394	110394.8294		170,747.42	136.32	233.13
	395	110671.0751		171,174.68	136.67	233.42
	397	111254.0677		172,076.40	137.39	234.04

	398	111546.0142		172,527.95	137.75	234.34
	458	128713.8408		276,942.83	139.41	296.91
	464	130531.4822		280,853.70	141.24	299.00
	464	130770.794		281,368.61	141.48	299.27
	471	132668.6477		285,452.06	143.34	301.43
	474	133563.9125		287,378.33	144.20	302.45
	480	135463.8468		291,466.26	145.99	304.59
	486	137175.9795		295,150.11	147.57	306.51
0.932303236	488	138000.79	2.151616572	296,924.79	148.31	307.43
	492	139032.6353		299,144.92	149.24	308.58
	495	139958.3894		301,136.79	150.06	309.60
	500	141652.006		304,780.80	151.53	311.47
	506	143402.9638		308,548.19	153.02	313.39
	519	147287.7402		316,906.74	156.21	317.61
	523	148546.2301		319,614.53	157.21	318.96
	526	149657.3713		322,005.28	158.08	320.15
	530	150738.6379		324,331.75	158.92	321.31
	523	148635.2718		313,774.91	164.29	316.03
	558	159797.7378		337,339.32	173.57	327.69
	565	162155.1406		342,315.89	175.35	330.09
	574	164941.4614		348,197.92	177.38	332.92
	582	167549.7194		353,704.06	179.21	335.54
	588	169462.6105		357,742.24	180.52	337.45
	607	175687.7603		370,883.78	184.54	343.59
	632	184210.5678		388,875.76	189.53	351.83
1.977378678	636	185480.3753	2.111039382	391,556.38	190.23	353.04
	636	185632.1483		391,876.78	190.31	353.18
	656	192342.9471		406,043.54	193.82	359.51
	663	194893.3608		411,427.56	195.08	361.89
	679	200436.3358		423,129.00	197.70	367.00
	733	219696.8817		463,788.77	205.59	384.22
	748	225036.6611		475,061.25	207.51	388.87
	788	239849.3146		506,331.35	212.32	401.46
	804	246122.4421		519,574.17	214.17	406.68
	864	269360.9996		568,631.68	220.18	425.44
	517	146828.2623		242,531.66	229.83	277.85
	586	168884.2468		278,963.85	232.92	297.99
	807	247122.5584		408,198.29	233.08	360.46
	807	247122.5584		408,198.29	239.88	360.46
	807	247122.5584		408,198.29	255.11	360.46
	807	247122.5584		408,198.29	255.78	360.46
0.269101481	855	265680.6009	1.651805044	438,852.56	269.56	373.75
	855	265680.6009		438,852.56	271.36	373.75
	855	265680.6009		438,852.56	281.03	373.75
	855	265680.6009		438,852.56	293.68	373.75
	855	265680.6009		438,852.56	304.48	373.75
	1311	469091.5011		774,847.71	323.70	496.63
	1311	469091.5011		774,847.71	411.37	496.63
	1311	469091.5011		774,847.71	421.32	496.63

1311  469091.5011

774,847.71 

518.45

496.63 

Projected

Diferential	Expansion	Buffer	A H I
36.07	2	18.03	23
27.27	1	27.27	110
26.45	2	13.22	119
26.41	2	13.21	108
26.25	2	13.13	24
23.03	2	11.52	22
21.59	1	21.59	188
20.91	1	20.91	127
20.40	2	10.20	191
17.96	1	17.96	77
16.72	1	16.72	130
14.64	2	7.32	125
14.32	2	7.16	150
14.28	1	14.28	120
13.81	2	6.91	184
12.61	1	12.61	9001
12.34	1	12.34	21
10.44	1	10.44	49
9.33	2	4.66	115
9.30	1	9.30	92
9.11	1	9.11	54
8.66	2	4.33	71
8.18	2	4.09	107
7.83	1	7.83	148
6.50	2	3.25	7
5.50	2	2.75	15
4.85	1	4.85	2
4.81	1	4.81	118
3.19	1	3.19	66
2.45	2	1.23	78
2.41	2	1.20	30
2.03	1	2.03	14
0.53	1	0.53	183
0.17	1	0.17	132
0.39	2	0.19	34
2.14	1	2.14	94
2.58	1	2.58	9003
3.24	1	3.24	147
3.50	2	1.75	85
3.68	1	3.68	166
35.70	2	17.85	95
35.50	1	35.50	36
34.33	1	34.33	153
33.63	2	16.82	164
33.61	1	33.61	26
33.22	1	33.22	117
32.69	2	16.34	69

32.46	2	16.23	72
32.32	2	16.16	136
32.27	1	32.27	180
31.95	1	31.95	182
31.86	2	15.93	141
31.55	1	31.55	104
31.20	1	31.20	25
31.01	2	15.51	86
30.92	1	30.92	53
30.23	1	30.23	20
30.13	1	30.13	68
29.37	2	14.68	19
29.30	1	29.30	152
29.11	2	14.55	89
28.27	1	28.27	134
28.26	2	14.13	122
27.59	2	13.80	16
27.42	2	13.71	116
27.18	1	27.18	82
27.16	2	13.58	175
26.90	1	26.90	76
26.54	1	26.54	37
26.03	1	26.03	1
25.13	1	25.13	178
24.32	2	12.16	60
23.97	1	23.97	158
23.79	1	23.79	171
23.65	1	23.65	121
22.67	1	22.67	35
22.53	2	11.27	73
22.45	1	22.45	96
21.16	1	21.16	65
20.88	2	10.44	144
20.85	1	20.85	146
20.52	1	20.52	11
20.38	2	10.19	129
20.38	1	20.38	151
20.36	2	10.18	138
20.25	1	20.25	4
19.97	2	9.98	169
18.91	1	18.91	52
17.40	2	8.70	157
65.94	1	65.94	32
65.45	1	65.45	159
65.07	1	65.07	3
64.39	1	64.39	59
64.32	2	32.16	140
63.52	1	63.52	97
63.35	1	63.35	70

62.03	1	62.03	142
61.77	1	61.77	145
61.45	2	30.72	167
61.44	2	30.72	93
48.34	1	48.34	56
48.16	1	48.16	58
47.98	2	23.99	124
47.85	1	47.85	38
47.04	1	47.04	161
46.06	1	46.06	168
45.65	2	22.83	27
45.52	2	22.76	100
45.07	1	45.07	137
44.92	2	22.46	131
44.59	1	44.59	63
44.50	1	44.50	8
44.22	1	44.22	61
44.19	1	44.19	18
36.45	2	18.23	128
34.61	1	34.61	81
34.40	2	17.20	185
34.00	1	34.00	154
32.45	1	32.45	173
31.44	1	31.44	43
31.07	2	15.53	139
30.97	1	30.97	42
29.76	2	14.88	50
29.69	1	29.69	176
29.61	2	14.81	83
28.69	2	14.35	29
27.39	2	13.69	47
26.93	2	13.47	111
25.98	1	25.98	112
25.09	1	25.09	75
102.47	2	51.24	109
101.07	1	101.07	162
100.94	2	50.47	189
100.68	1	100.68	90
99.90	1	99.90	51
98.94	2	49.47	155
98.76	1	98.76	10
98.64	2	49.32	67
98.47	1	98.47	143
97.55	1	97.55	17
97.06	2	48.53	87
96.86	1	96.86	46
96.81	1	96.81	9
96.76	2	48.38	40
96.64	2	48.32	187

96.59	1	96.59	57
157.50	2	78.75	28
157.76	2	78.88	126
157.79	2	78.90	64
158.10	1	158.10	79
158.25	2	79.13	88
158.60	1	158.60	62
158.95	2	79.47	12
159.12	1	159.12	44
159.34	1	159.34	179
159.55	2	79.77	105
159.94	1	159.94	80
160.37	1	160.37	190
161.40	1	161.40	133
161.75	1	161.75	41
162.07	2	81.03	106
162.39	1	162.39	102
151.75	2	75.87	149
154.12	1	154.12	48
154.74	1	154.74	99
155.54	1	155.54	13
156.33	1	156.33	123
156.93	1	156.93	156
159.06	1	159.06	177
162.30	1	162.30	165
162.81	1	162.81	181
162.87	2	81.43	163
165.69	2	82.84	9000
166.80	2	83.40	186
169.30	2	84.65	39
178.63	2	89.32	45
181.36	1	181.36	135
189.14	1	189.14	172
192.51	1	192.51	114
205.26	1	205.26	74
48.02	2	24.01	6
65.06	1	65.06	174
127.38	2	63.69	113
120.58	1	120.58	101
105.35	2	52.68	91
104.69	1	104.69	31
104.20	2	52.10	84
102.40	1	102.40	9002
92.72	2	46.36	33
80.07	1	80.07	5
69.28	1	69.28	98
172.93	1	172.93	55
85.26	2	42.63	160
75.31	1	75.31	170

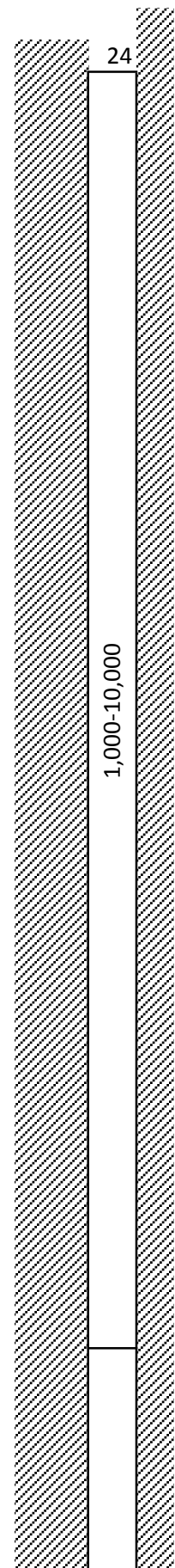
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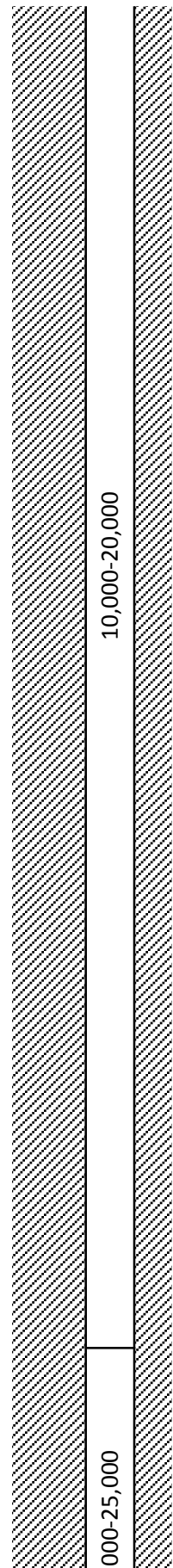
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103

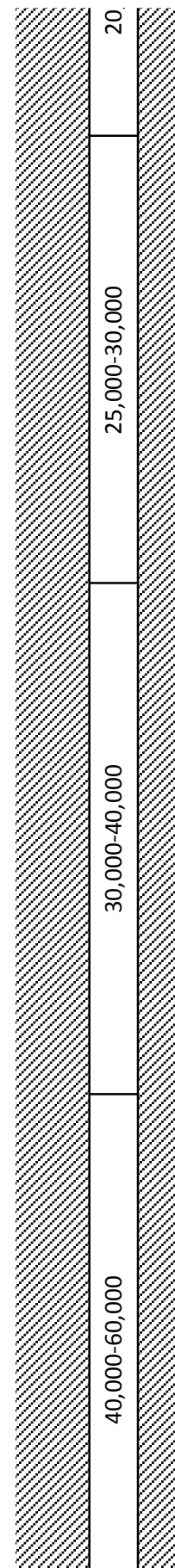
ID	Name	AreaM2
23	Cerrada Porfirio Diaz/UH	671
110	Rancho la Esperanza	1,738
119	Tepetzintla	1,864
108	Poligono 127 / Sin Nombre	1,870
24	Cerrada Sierra San Juan	1,895
22	Cerrada Porfirio Diaz	2,434
188	Cuchilla de Tepeximilpa/ Ampliacion Tepeximilpa	2,698
127	Unixco	2,827
191	Tepetongo	2,927
77	Las Bombas	3,423
130	Xilonimoco	3,693
125	Tlaltepantcatitla	4,164
150	Colinas del Angel	4,240
120	Tepezintla	4,250
184	Xitle II	4,362
9001	Parque Ecologico CD Mexico	4,656
21	Cerrada la Mora	4,723
49	El Conejo /El Charco	5,211
115	Siete Ocotes / Subestacion electrica	5,507
92	Huinizco	5,515
54	La Herradura	5,565
71	Los Arcos	5,689
107	La Pedrera	5,821
148	Prolongacion 5 de mayo	5,921
7	Ampliacion La Nueva Magdalena Petlcalco	6,300
15	Alta Tension	6,594
2	Las Cebadas	6,788
118	Tepacheras	6,800
66	Acopiaco/Tezontle	7,299
78	Bosques de San Jose/ Ixpangologuia	7,531
30	Mirador el Colibri	7,545
14	El Guardita	7,664
183	Tlapanco	8,156
132	Bellavista	8,275
34	Retesco / Privada Eucalipto	8,461
94	Kilometro 33 / Teteocotla	9,064
9003	Fuentes Brotantes	9,221
147	Paraje Tetenco	9,455
85	El Crucero	9,549
166	Cocuyatla	9,614
95	Kilometro 34.5 / Lomas de San Jose	10,169
36	Santiago Tepalcatitla II	10,251
153	Tepozanes	10,755
164	Cercantitla	11,059
26	Diamante	11,068
117	Tehitic	11,243
69	Ampliacion Tezontitla	11,482



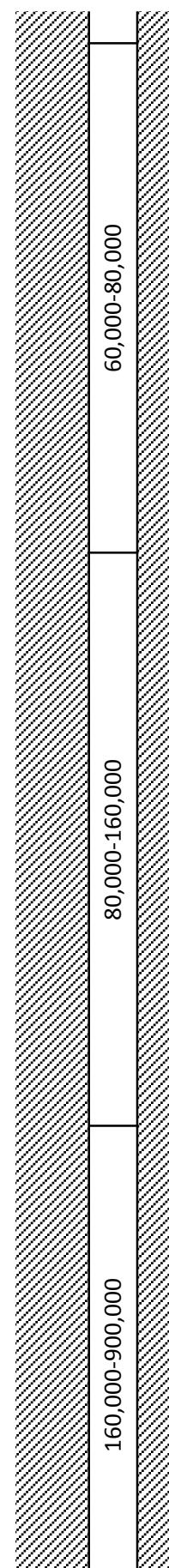
72 Arenal de Guadalupe	11,585
136 Chancoyote	11,649
180 San Juan Nuevo /Ocotlaltongo	11,673
182 Tecpan	11,817
141 Kilometro 2	11,858
104 Paraje Iluca	12,004
25 Colibri	12,167
86 Cuailascantitla	12,254
53 La Herradura II	12,298
20 La Caseta	12,627
68 Amilco	12,676
19 Camino a la Marina	13,042
152 Tepetlica el Alto	13,077
89 Estrella Mora	13,171
134 Camino Viejo a Tepepan	13,585
122 Tetequilo	13,588
16 Ampliacion Lomas de Texcalatlaco	13,925
116 El Sifon	14,015
82 Chinita Norte	14,135
175 Miluyac	14,146
76 Ayopa	14,279
37 Tecorraltitla	14,466
1 Belvedere de Teresa	14,733
178 Poligono 81/ Sin Nombre	15,213
60 La Quinta	15,648
158 Arcoiris	15,840
171 La Magueyera	15,941
121 Tetecala	16,017
35 Santiago Tepalcatitla I	16,564
73 El Arenal / Tlahuacapan	16,642
96 La Joyita / Prolongacion Nogal	16,689
65 Achichipisco	17,429
144 Tatamaxtitla	17,593
146 Carrasco	17,614
11 El Silbato	17,805
129 Xaxalipac	17,889
151 Tepetlica /12 de Diciembre	17,890
138 Corrasolco	17,901
4 Prolongacion Jazmin	17,966
169 Guardita	18,135
52 La Estacion	18,773
157 Apapaxtles	19,711
32 Paraje Texcalatlaco	20,438
159 Camino al Cuatzontle	20,868
3 Lomas de Cuilotepec II	21,205
59 Pedregal de Cuatzontle	21,836
140 Huetlatilpa	21,895
97 Lomas del Capulin	22,656
70 Los Angeles	22,812



142 La Magueyera Tatamaxtitla	24,126
145 Tlatilpa	24,387
167 Cruz Eslava	24,723
93 Kilometro 30	24,730
56 La Magueyera	25,075
58 El Oyamel	25,269
124 Titicocotla/Temaxtetitla	25,459
38 Tetamazolco	25,592
161 Camino al Xitle	26,485
168 Los Gallos	27,616
27 Dolores Tlalli	28,103
100 Nextel / Las Rosas	28,264
137 Cocomozotla	28,814
131 Atlauhtenco	29,010
63 La Via / La Herradura	29,433
8 El Arenal II	29,550
61 Valentin Reyes	29,918
18 Atocpa Sur	29,949
128 Xaxalco II	30,650
81 El Caracol	32,019
185 Zona Entre Asentamientos San Juan Bautista y la Cañ±	32,177
154 Tres de Mayo	32,478
173 Maninal Sur	33,663
43 Viveros de Coactetlan 2a Seccion	34,447
139 Emiliano Zapata	34,743
42 Vista Hermosa	34,823
50 Ejidos - Heroes de 1910	35,783
176 Ocomozotla	35,837
83 Chinita Sur / Toxtepec	35,901
29 La Magueyera	36,646
47 Bosques del Cuatzontle	37,716
111 Las Rejas / Chalquitongo	38,095
112 Las Rosas/ Piedra Larga	38,895
75 Ayometitla	39,650
109 La Presa	41,140
162 La Cañ±ada /San Juan Bautista	44,282
189 Diamante	44,600
90 La Faja / Ololique	45,243
51 Estacion - La Venta	47,275
155 Ahuayoto	50,047
10 Diligencias	50,628
67 Ahuacatitla	50,991
143 Memecala	51,587
17 Atocpa	54,963
87 Cuanejaque	57,129
46 Ampliacion La Venta	58,156
9 El Arenal	58,380
40 Valle Verde	58,678
187 Bosques de Tepeximilpa	59,304



57 Manzana 36 / La Venta	59,616
28 Flor de Borrego	61,058
126 Las Torres	62,671
64 El Xipie II	62,882
79 El Calvario	64,544
88 Los Encinos	65,321
62 La Venta /La Joya	66,955
12 Tlaltenango	68,410
44 Xicalco Oriente	69,105
179 El Sabinoco	69,969
105 Los Pastores	70,739
80 Camino Antiguo al Cantil	72,135
190 El Mirador 3ra. Seccion	73,561
133 Camino Antiguo a Diligencias	76,662
41 Verano	77,648
106 Pedregal de Aminco	78,511
102 Ocotla Chico	79,344
149 Tecoantitla / Xolalpa	84,793
48 El Conejo	94,645
99 La Morucha	96,597
13 Ampliacion Parres	98,848
123 Tezontitla	100,901
156 Los Ajuscos	102,374
177 Piramide/ Providencia	106,982
165 El Charco	112,854
181 Tecoentitla/Canoas	113,688
163 El Cedral	113,787
9000 Zona de Ranchos	118,023
186 Zona Entre Calles Fernando Montes de Oca y Leona Vi	119,563
39 Tlalmille	122,785
45 Zorros-Solidaridad	132,792
135 Cantera Tehuehue	135,279
172 Maninal Norte	141,627
114 San Miguel Toxiac	144,097
74 Ayocatitla	152,302
6 El Zacaton	165,949
174 Maye	170,442
113 San Miguel Tehuisco	170,671
101 Ocotla	180,781
91 Las Granjas / Barranquillas	204,456
31 Paraje 38	205,527
84 Cortijo de Mendoza	228,269
9002 Area urbana	231,330
33 Primavera	248,124
5 San Nicolas II	270,955
98 Las Margaritas	291,243
55 El Llano / Jardines de San Juan	329,174
160 Camino al Xictontle / Lomas de Tepemecac	531,626
170 Lomas de Tepemecac	557,678



103 Oyameyo

844,417




Calculated Population			Estimated Age			Projected
Formula	Average	Corrected V	Formula	Average	Corrected V	Formula
4.057650241		4	17.8522787		16	513.8583454
7.047820644		7	17.98692565		16	519.8765482
7.401074496		7	18.00272829		16	520.586333
7.4178969		7	18.00348028		16	520.6201275
7.487991025		7	18.0066131		16	520.7609333
8.999524356		9	18.07396129		16	523.7948676
9.740079204		9	18.10681253		16	525.2795847
10.10199193		10	18.12283257		16	526.0047602
10.38256733		10	18.13523667		16	526.5667706
11.77451693		11	18.19657401		16	529.3525103
12.53243825		12	18.22983309		16	530.8676511
13.8549389		13	18.28763345		16	533.5085345
14.0683776		13	18.29693417		16	533.9344014
14.0964625		13	18.29815741		16	533.990431
14.41102704		14	18.31184928		16	534.6178763
15.23687834		15	18.34771661		16	536.2641597
15.42510673		15	18.35587553		16	536.6391785
16.79635452		16	18.41513542		16	539.3689205
17.62832705		17	18.45093812		16	541.023169
17.65081523	0.956970572	17	18.45190428	0.879761995	16	541.0678627
17.79136923		17	18.45794103		16	541.3471793
18.13996472		17	18.47289907		16	542.0397444
18.51108404		18	18.48880168		16	542.7767715
18.79225824		18	18.50083509		16	543.3349742
19.85809		19	18.5463324		16	545.4493771
20.68508084		20	18.58150721		16	547.0882772
21.23087694		20	18.60466131		16	548.1691059
21.26464		20	18.60609205		16	548.235945
22.6688754		22	18.66543603		16	551.0136542
23.32191596		22	18.69292679		16	552.3039717
23.36132703		22	18.69458369		16	552.3818129
23.6963369		23	18.70865809		16	553.0433574
25.08172034		24	18.76667253		17	555.7764834
25.41687563		24	18.78066221		17	556.4370598
25.94078852		25	18.80249562		17	557.4691787
27.6397561		26	18.87300437		17	560.8120597
28.08222684		27	18.89129412		17	561.6816291
28.74179703		28	18.91850196		17	562.9770615
29.0067834		28	18.92941413		17	563.497242
29.190029		28	18.93695394		17	563.8568718
30.75500856		28	18.93185676		20	746.9102997
30.986283		28	18.94084763		20	747.5338463
32.40807003		29	18.99596055		20	751.3643375
33.26590148		30	19.02908079		20	753.6730929
33.29130062		30	19.03005992		20	753.7414246
33.78520505		31	19.04908274		20	755.0698748
34.45983632		31	19.07501365		20	756.8834711


34.75061223		31	19.08617157		20	757.664818
34.9312992		32	19.09309939		20	758.1502408
34.99905893		32	19.09569629		20	758.3322597
35.40564149		32	19.11126585		20	759.4242046
35.52141216		32	19.11569514		20	759.7350528
35.93369602		32	19.13145442		20	760.8417856
36.39403589		33	19.14902415		20	762.0770339
36.63976052		33	19.1583913		20	762.7361867
36.7640408		33	19.16312592		20	763.0695112
37.69344113		34	19.19846858		20	765.5610142
37.83188098		34	19.20372345		20	765.93196
38.86609376		35	19.2429012		20	768.7016397
38.96500793		35	19.24664098		20	768.9664019
39.23067524		35	19.2566792		20	769.6773932
40.40095223		37	19.30079003		20	772.807315
40.40943374		37	19.30110909		20	772.8299868
41.36230563		37	19.33689505		20	775.375997
41.61682023	0.904419703	38	19.34643405	1.040255628	20	776.055673
41.95619823		38	19.3591409		20	776.9617324
41.98730932		38	19.36030502		20	777.0447779
42.36348984		38	19.37437133		20	778.0487395
42.89246516		39	19.39412087		20	779.4599091
43.64786129		39	19.42226308		20	781.4739467
45.00623537		41	19.47269019		20	785.0922052
46.2376599		42	19.51820732		20	788.3685035
46.7813056		42	19.53824286		20	789.8137649
47.06731548		43	19.54876898		20	790.5738294
47.28254429		43	19.55668356		20	791.1456668
48.8319661		44	19.61349447		20	795.2590592
49.05295616		44	19.62157367		20	795.8452797
49.18612272		44	19.62643929		20	796.1984752
51.28337004		46	19.70278901		20	801.7554756
51.74831365		47	19.71964454		21	802.9860262
51.807853		47	19.72180118		21	803.1435706
52.34941803		47	19.74139861		21	804.576203
52.58761632		48	19.75000733		21	805.2061065
52.5904521		48	19.75010977		21	805.2136048
52.6216458		48	19.75123664		21	805.296085
52.80597716		48	19.75789327		21	805.7834352
53.28527823		48	19.77518338		21	807.050282
55.09522553		50	19.84023458		21	811.8294002
57.75772352		52	19.93524592		21	818.846057
59.82251184		51	19.89302616		25	1171.793816
61.04427342		52	19.93416087		25	1176.560603
62.00205203		53	19.96630278		25	1180.294716
63.7960109		55	20.02626019		25	1187.282474
63.96379103		55	20.03185145		25	1187.935581
66.12849434	0.855274463	57	20.10374318	1.260735927	25	1196.355561
66.57238734		57	20.11842905		25	1198.080695

70.31326388		60	20.24144573		26	1212.599704
71.05672577		61	20.26573694		26	1215.481136
72.01402673		62	20.29693931		26	1219.189389
72.0339729		62	20.29758854		26	1219.26663
73.01715563		136	22.87547002		16	526.2388989
73.57012236		137	22.90849211		16	527.4254941
74.11176068		138	22.94080141		16	528.5884221
74.49095046		139	22.96339978		16	529.4029636
77.03785523		144	23.11477823		16	534.8836263
80.26584346		150	23.30576662		16	541.85898
81.65657861		153	23.38781127		16	544.8762845
82.1164537	1.868303666	153	23.41491483	0.697180286	16	545.8758141
83.6878466		156	23.50744376		16	549.2984502
84.2479801		157	23.54039895		16	550.5213273
85.45710149		160	23.61149734		16	553.1665242
85.7916025		160	23.6311584		16	553.8996821
86.84388672		162	23.69299067		17	556.2101288
86.9325426		162	23.69819903		17	556.4050743
88.9378225		34	19.20907915		19	695.5455793
92.85681636		36	19.27236551		19	699.4954641
93.30935933		36	19.27965023		19	699.9511694
94.17162048		36	19.29351705		19	700.8192242
97.56799757		38	19.34796914		19	704.2354686
99.81659581		39	19.38387292		19	706.4946331
100.665876		39	19.39740334		19	707.347369
100.8954413		39	19.40105785		19	707.577818
103.6512231	0.386152584	40	19.44483416	0.984081549	19	710.3425392
103.8062906		40	19.44729232		19	710.4980182
103.9900818		40	19.4502051		19	710.6822846
106.1301293		41	19.48406515		19	712.8268589
109.2056967		42	19.53254689		19	715.9056954
110.295629		43	19.54967738		19	716.9958728
112.597221		43	19.585765		19	719.2964169
114.7705225		44	19.61973389		19	721.4667841
119.0628996		110	22.00227559		19	701.6979971
128.1288955		118	22.27872324		19	717.0248236
129.04756		119	22.30649706		19	718.577983
130.905729		121	22.36254992		19	721.7199889
136.7833256		126	22.53881303		19	731.6652344
144.8147022		133	22.77738974		20	745.2840086
146.4999944		135	22.82715855		20	748.1479356
147.5532821		136	22.85821658		20	749.9391845
149.2832186	0.920880345	137	22.90915186	0.863555959	20	752.8835467
159.0957314		147	23.19652653		20	769.6521782
165.4033226		152	23.38015555		20	780.5071686
168.3973203		155	23.46710022		20	785.6850692
169.0506244		156	23.48605702		20	786.8172972
169.9199077		156	23.51127349		20	788.3252144
171.7465644		158	23.56423698		20	791.4991421

172.6572675		159	23.59063145		20	793.0843036
176.8688794		129	22.62819226		27	1382.30495
181.5848542		132	22.73878339		27	1396.064823
182.2021459		133	22.75322194		27	1397.86827
187.0675279		136	22.86674389		28	1412.104109
189.344033		138	22.9196997		28	1418.779126
194.135372		141	23.0308512		28	1432.860755
198.4063281		144	23.12961694		28	1445.454291
200.447901		146	23.17673483		28	1451.489193
202.987261	0.727787559	148	23.23526487	1.203922531	28	1459.010057
205.2516061		149	23.28739037		28	1465.730654
209.3598582		152	23.38182272		28	1477.960469
213.5604207		155	23.47821859		28	1490.517259
222.7090622		162	23.6877749		29	1518.068987
225.6220119		164	23.75443009		29	1526.905887
228.1731771		166	23.8127955		29	1534.67291
230.6370703		168	23.86916184		29	1542.199788
246.7886528		174	24.06836267		21	868.2866714
276.142076		195	24.72402905		22	912.3922765
281.9809804		199	24.85584726		22	921.4482553
288.7237271		204	25.00889652		22	932.0427641
294.8822118		208	25.14956233		22	941.8560962
299.3060359		211	25.25118137		22	948.9908606
313.1731483		221	25.57327002		23	971.8582649
330.9056253		234	25.99439902		23	1002.342349
333.4297613		235	26.05531248		23	1006.806933
333.7294814	0.705823944	236	26.06256268	0.889861554	23	1007.339263
346.5722285		245	26.3768522		23	1030.606871
351.250111		248	26.49319267		24	1039.315183
361.0525562		255	26.74048133		24	1057.997334
391.6297153		276	27.54620417		25	1120.507822
399.2600078		282	27.75635997		25	1137.229298
418.7922071		296	28.31302541		25	1182.365883
426.4139454		301	28.53804653		25	1200.96219
451.8198992		319	29.3228575		26	1267.421032
494.3746706		568	49.32812043		44	3941.129623
508.4664754		584	51.46129598		46	4354.767514
509.1857902		585	51.57365589		51	5637.2215
541.04697		621	56.90347695		51	5637.2215
616.4574559		708	72.53348792		51	5637.2215
619.8953477		712	73.35616637		51	5637.2215
693.4383364		796	93.51589776		52	5909.5442
703.4159689	1.148177576	808	96.64990415	0.889872198	52	5909.5442
758.4911194		871	115.8145989		52	5909.5442
834.269012		958	147.7687822		52	5909.5442
902.481285		1036	182.6571838		52	5909.5442
1032.221122		1185	267.1575176		60	8412.781
1773.357404		2036	1389.308508		60	8412.781
1874.681552		2152	1652.415089		60	8412.781

3079.58607

3536  7779.145504


60  8412.781


population to Average	24 Corrected V	Area Projected to Formula	Average	24.00 Corrected V	Radius Present	Projected
	163	51372.15692		15,961.25	14.61	71.28
	165	51806.48577		16,096.20	23.52	71.58
	165	51857.76744		16,112.13	24.36	71.61
	165	51860.20938		16,112.89	24.40	71.62
	165	51870.38408		16,116.05	24.56	71.62
	166	52089.73302		16,184.20	27.83	71.77
	167	52197.15604		16,217.58	29.31	71.85
	167	52249.64347		16,233.89	30.00	71.88
	167	52290.32982		16,246.53	30.52	71.91
	168	52492.11297		16,309.22	33.01	72.05
	168	52601.93904		16,343.35	34.29	72.13
	169	52793.49653		16,402.86	36.41	72.26
	169	52824.40256		16,412.47	36.74	72.28
	169	52828.46907		16,413.73	36.78	72.28
	169	52874.01279		16,427.88	37.26	72.31
	170	52993.55458		16,465.02	38.50	72.39
	170	53020.79494		16,473.48	38.77	72.41
	171	53219.17729		16,535.12	40.73	72.55
	172	53339.48546		16,572.50	41.87	72.63
0.317035984	172	53342.7368	0.310698556	16,573.51	41.90	72.63
	172	53363.05735		16,579.82	42.09	72.65
	172	53413.45018		16,595.48	42.55	72.68
	172	53467.09076		16,612.15	43.05	72.72
	172	53507.72521		16,624.77	43.41	72.74
	173	53661.711		16,672.62	44.78	72.85
	173	53781.14082		16,709.72	45.81	72.93
	174	53859.93804		16,734.20	46.48	72.98
	174	53864.81182		16,735.72	46.52	72.99
	175	54067.45168		16,798.68	48.20	73.12
	175	54161.64585		16,827.95	48.96	73.19
	175	54167.32959		16,829.71	49.01	73.19
	175	54215.63951		16,844.72	49.39	73.22
	176	54415.33953		16,906.77	50.95	73.36
	176	54463.63234		16,921.77	51.32	73.39
	177	54539.10842		16,945.22	51.90	73.44
	178	54783.7391		17,021.23	53.71	73.61
	178	54847.41762		17,041.01	54.18	73.65
	178	54942.31557		17,070.50	54.86	73.71
	179	54980.4331		17,082.34	55.13	73.74
	179	55006.78966		17,090.53	55.32	73.76
	518	147102.9184		81,448.44	56.89	161.02
	518	147237.7847		81,523.11	57.12	161.09
	521	148067.2539		81,982.37	58.51	161.54
	523	148568.0111		82,259.63	59.33	161.81
	523	148582.8412		82,267.85	59.36	161.82
	524	148871.2619		82,427.54	59.82	161.98
	525	149265.3388		82,645.73	60.46	162.19

	525	149435.2338		82,739.80	60.73	162.29
	526	149540.8187		82,798.26	60.89	162.34
	526	149580.4168		82,820.19	60.96	162.37
	527	149818.0481		82,951.76	61.33	162.49
	527	149885.7205		82,989.23	61.44	162.53
	528	150126.7485		83,122.68	61.81	162.66
	528	150395.9305		83,271.72	62.23	162.81
	529	150539.6427		83,351.29	62.45	162.89
	529	150612.3349		83,391.54	62.57	162.92
	531	151156.0903		83,692.61	63.40	163.22
	531	151237.1076		83,737.47	63.52	163.26
	533	151842.524		84,072.68	64.43	163.59
	533	151900.4436		84,104.75	64.52	163.62
	534	152056.0202		84,190.89	64.75	163.70
	536	152741.586		84,570.47	65.76	164.07
	536	152746.556		84,573.23	65.77	164.07
	538	153305.057		84,882.46	66.58	164.37
0.693472766	538	153454.2783	0.553683352	84,965.08	66.79	164.45
	539	153653.2836		85,075.27	67.08	164.56
	539	153671.5283		85,085.37	67.10	164.57
	540	153892.1559		85,207.52	67.42	164.69
	541	154202.4653		85,379.34	67.86	164.85
	542	154645.7368		85,624.77	68.48	165.09
	544	155443.2482		86,066.34	69.59	165.52
	547	156166.6786		86,466.89	70.58	165.90
	548	156486.1931		86,643.80	71.01	166.07
	548	156654.3219		86,736.89	71.23	166.16
	549	156780.8578		86,806.95	71.40	166.23
	551	157692.1692		87,311.53	72.61	166.71
	552	157822.2023		87,383.53	72.78	166.78
	552	157900.5658		87,426.91	72.89	166.82
	556	159135.3745		88,110.61	74.48	167.47
	557	159409.29		88,262.27	74.83	167.61
	557	159444.3713		88,281.69	74.88	167.63
	558	159763.5133		88,458.40	75.28	167.80
	558	159903.9088		88,536.13	75.46	167.87
	558	159905.5803		88,537.06	75.46	167.88
	558	159923.9673		88,547.24	75.49	167.89
	559	160032.626		88,607.40	75.62	167.94
	560	160315.2071		88,763.86	75.98	168.09
	563	161382.8827		89,355.02	77.30	168.65
	568	162955.1666		90,225.56	79.21	169.47
	835	257851.4209		218,333.81	80.66	263.62
	838	259167.6989		219,448.35	81.50	264.30
	841	260200.7351		220,323.07	82.16	264.82
	846	262138.4082		221,963.78	83.37	265.81
	846	262319.813		222,117.38	83.48	265.90
0.712432651	852	264663.1276	0.846742687	224,101.57	84.92	267.08
	854	265144.2955		224,508.99	85.21	267.33


	864	269208.1171		227,950.00	87.63	269.37
	866	270017.6461		228,635.47	88.11	269.77
	869	271060.9421		229,518.87	88.71	270.29
	869	271082.6911		229,537.29	88.72	270.30
	1087	362877.8621		260,398.53	89.34	287.90
	1089	363973.9538		261,185.08	89.68	288.34
	1091	365049.5685		261,956.93	90.02	288.76
	1093	365803.7704		262,498.14	90.26	289.06
	1104	370895.9271		266,152.24	91.82	291.07
	1119	377420.8671		270,834.49	93.76	293.61
2.064858074	1125	380258.6227	0.717592777	272,870.84	94.58	294.72
	1127	381200.7092		273,546.88	94.85	295.08
	1134	384434.319		275,867.29	95.77	296.33
	1137	385592.5386		276,698.42	96.09	296.78
	1142	388103.0623		278,499.95	96.79	297.74
	1144	388800.149		279,000.18	96.98	298.01
	1148	391000.4873		280,579.13	97.59	298.85
	1149	391186.3899		280,712.53	97.64	298.92
	520	147740.3667		176,347.67	98.77	236.92
	523	148663.7106		177,449.80	100.96	237.66
	523	148770.3719		177,577.11	101.20	237.75
	524	148973.6231		177,819.72	101.68	237.91
	527	149774.4942		178,775.67	103.51	238.55
	528	150304.9628		179,408.85	104.71	238.97
	529	150505.3679		179,648.06	105.16	239.13
0.747621032	529	150559.5433	1.193632243	179,712.73	105.28	239.17
	531	151210.0415		180,489.18	106.72	239.69
	531	151246.6536		180,532.88	106.80	239.72
	531	151290.0487		180,584.68	106.90	239.75
	533	151795.4321		181,187.92	108.00	240.15
	535	152522.0493		182,055.24	109.57	240.73
	536	152779.6374		182,362.70	110.12	240.93
	538	153323.7305		183,012.15	111.27	241.36
	539	153837.6807		183,625.62	112.34	241.76
	1190	410368.2696		634,715.61	114.43	449.48
	1216	422707.9233		653,801.32	118.72	456.19
	1219	423967.3397		655,749.26	119.15	456.87
	1224	426520.1549		659,697.69	120.01	458.24
	1241	434644.97		672,264.32	122.67	462.59
	1264	445880.6296		689,642.49	126.22	468.53
	1269	448259.5474		693,321.96	126.95	469.78
1.695876239	1272	449750.2978	1.546697577	695,627.70	127.40	470.56
	1277	452205.4841		699,425.13	128.14	471.84
	1305	466301.2145		721,226.96	132.27	479.14
	1324	475528.4685		735,498.73	134.85	483.86
	1332	479958.3164		742,350.36	136.06	486.10
	1334	480929.4142		743,852.36	136.32	486.60
	1337	482224.0973		745,854.84	136.67	487.25
	1342	484954.2823		750,077.61	137.39	488.63

	1345	486320.4042		752,190.59	137.75	489.32
	1289	458095.4853		985,645.84	139.41	560.13
	1302	464466.7568		999,354.37	141.24	564.01
	1303	465304.7127		1,001,157.33	141.48	564.52
	1317	471942.8667		1,015,440.09	143.34	568.53
	1323	475069.8441		1,022,168.15	144.20	570.41
	1336	481696.7288		1,036,426.66	145.99	574.37
	1348	487658.0272		1,049,253.09	147.57	577.92
0.932303236	1353	490526.3374	2.151616572	1,055,424.60	148.31	579.61
	1360	494111.4423		1,063,138.37	149.24	581.73
	1367	497324.9605		1,070,052.63	150.06	583.62
	1378	503196.7166		1,082,686.39	151.53	587.05
	1390	509257.6251		1,095,727.15	153.02	590.58
	1415	522670.4909		1,124,586.49	156.21	598.30
	1424	527005.7456		1,133,914.30	157.21	600.78
	1431	530829.4622		1,142,141.47	158.08	602.96
	1438	534546.8523		1,150,139.87	158.92	605.06
	1717	691913.3103		1,460,656.25	164.29	681.87
	1804	744880.3267		1,572,471.70	173.57	707.48
	1822	755979.5918		1,595,902.69	175.35	712.74
	1843	769061.3097		1,623,518.71	177.38	718.88
	1862	781271.5643		1,649,295.04	179.21	724.56
	1877	790205.2227		1,668,154.35	180.52	728.69
	1922	819157.1611		1,729,273.03	184.54	741.92
	1982	858508.5211		1,812,345.30	189.53	759.53
1.977378678	1991	864344.3118	2.111039382	1,824,664.88	190.23	762.11
	1992	865041.3726		1,826,136.40	190.31	762.42
	2038	895766.6576		1,890,998.69	193.82	775.84
	2055	907395.5916		1,915,547.83	195.08	780.86
	2092	932581.3192		1,968,715.89	197.70	791.62
	2216	1019212.339		2,151,597.39	205.59	827.57
	2249	1043001.963		2,201,818.22	207.51	837.17
	2338	1108515.767		2,340,120.44	212.32	863.07
	2375	1136058.503		2,398,264.24	214.17	873.72
	2506	1237117.725		2,611,604.24	220.18	911.76
	1061	351314.7738		580,303.52	229.83	429.79
	1172	401861.6714		663,797.14	232.92	459.67
	1517	577307.2206		953,598.98	233.08	550.94
	1517	577307.2206		953,598.98	239.88	550.94
	1517	577307.2206		953,598.98	255.11	550.94
	1517	577307.2206		953,598.98	255.78	550.94
	1590	618207.7807		1,021,158.73	269.56	570.13
0.269101481	1590	618207.7807	1.651805044	1,021,158.73	271.36	570.13
	1590	618207.7807		1,021,158.73	281.03	570.13
	1590	618207.7807		1,021,158.73	293.68	570.13
	1590	618207.7807		1,021,158.73	304.48	570.13
	2264	1053995.487		1,740,995.06	323.70	744.43
	2264	1053995.487		1,740,995.06	411.37	744.43
	2264	1053995.487		1,740,995.06	421.32	744.43

2264  1053995.487

1,740,995.06 

518.45

744.43 

Projected

Diferential	Expansion	Buffer	A H I
56.66	2	28.33	23
48.06	1	48.06	110
47.26	2	23.63	119
47.22	2	23.61	108
47.06	2	23.53	24
43.94	2	21.97	22
42.54	1	42.54	188
41.89	1	41.89	127
41.39	2	20.69	191
39.04	1	39.04	77
37.84	1	37.84	130
35.85	2	17.93	125
35.54	2	17.77	150
35.50	1	35.50	120
35.05	2	17.53	184
33.90	1	33.90	9001
33.64	1	33.64	21
31.82	1	31.82	49
30.76	2	15.38	115
30.73	1	30.73	92
30.56	1	30.56	54
30.13	2	15.06	71
29.67	2	14.84	107
29.33	1	29.33	148
28.07	2	14.03	7
27.12	2	13.56	15
26.50	1	26.50	2
26.46	1	26.46	118
24.92	1	24.92	66
24.23	2	12.11	78
24.19	2	12.09	30
23.83	1	23.83	14
22.41	1	22.41	183
22.07	1	22.07	132
21.55	2	10.77	34
19.89	1	19.89	94
19.47	1	19.47	9003
18.85	1	18.85	147
18.61	2	9.30	85
18.44	1	18.44	166
104.12	2	52.06	95
103.97	1	103.97	36
103.03	1	103.03	153
102.48	2	51.24	164
102.47	1	102.47	26
102.16	1	102.16	117
101.74	2	50.87	69

101.56	2	50.78	72
101.45	2	50.73	136
101.41	1	101.41	180
101.16	1	101.16	182
101.09	2	50.55	141
100.85	1	100.85	104
100.57	1	100.57	25
100.43	2	50.22	86
100.36	1	100.36	53
99.82	1	99.82	20
99.74	1	99.74	68
99.16	2	49.58	19
99.10	1	99.10	152
98.95	2	49.48	89
98.31	1	98.31	134
98.31	2	49.15	122
97.80	2	48.90	16
97.66	2	48.83	116
97.48	1	97.48	82
97.47	2	48.73	175
97.27	1	97.27	76
97.00	1	97.00	37
96.61	1	96.61	1
95.93	1	95.93	178
95.33	2	47.66	60
95.06	1	95.06	158
94.93	1	94.93	171
94.82	1	94.82	121
94.10	1	94.10	35
94.00	2	47.00	73
93.93	1	93.93	96
92.99	1	92.99	65
92.78	2	46.39	144
92.76	1	92.76	146
92.52	1	92.52	11
92.41	2	46.21	129
92.41	1	92.41	151
92.40	2	46.20	138
92.32	1	92.32	4
92.11	2	46.06	169
91.35	1	91.35	52
90.26	2	45.13	157
182.97	1	182.97	32
182.79	1	182.79	159
182.67	1	182.67	3
182.44	1	182.44	59
182.42	2	91.21	140
182.16	1	182.16	97
182.11	1	182.11	70

181.73	1	181.73	142
181.67	1	181.67	145
181.58	2	90.79	167
181.58	2	90.79	93
198.56	1	198.56	56
198.65	1	198.65	58
198.74	2	99.37	124
198.80	1	198.80	38
199.25	1	199.25	161
199.86	1	199.86	168
200.14	2	100.07	27
200.23	2	100.11	100
200.56	1	200.56	137
200.68	2	100.34	131
200.95	1	200.95	63
201.02	1	201.02	8
201.26	1	201.26	61
201.28	1	201.28	18
138.15	2	69.08	128
136.71	1	136.71	81
136.54	2	68.27	185
136.23	1	136.23	154
135.04	1	135.04	173
134.26	1	134.26	43
133.97	2	66.98	139
133.89	1	133.89	42
132.97	2	66.48	50
132.91	1	132.91	176
132.85	2	66.43	83
132.15	2	66.08	29
131.16	2	65.58	47
130.81	2	65.41	111
130.09	1	130.09	112
129.42	1	129.42	75
335.05	2	167.52	109
337.47	1	337.47	162
337.72	2	168.86	189
338.24	1	338.24	90
339.92	1	339.92	51
342.31	2	171.16	155
342.83	1	342.83	10
343.16	2	171.58	67
343.70	1	343.70	143
346.87	1	346.87	17
349.01	2	174.50	87
350.05	1	350.05	46
350.28	1	350.28	9
350.58	2	175.29	40
351.23	2	175.62	187

351.56	1	351.56	57
420.71	2	210.36	28
422.77	2	211.38	126
423.04	2	211.52	64
425.19	1	425.19	79
426.21	2	213.11	88
428.39	1	428.39	62
430.35	2	215.18	12
431.30	1	431.30	44
432.49	1	432.49	179
433.56	2	216.78	105
435.52	1	435.52	80
437.56	1	437.56	190
442.09	1	442.09	133
443.57	1	443.57	41
444.87	2	222.44	106
446.14	1	446.14	102
517.58	2	258.79	149
533.91	1	533.91	48
537.38	1	537.38	99
541.49	1	541.49	13
545.35	1	545.35	123
548.17	1	548.17	156
557.38	1	557.38	177
570.00	1	570.00	165
571.88	1	571.88	181
572.10	2	286.05	163
582.01	2	291.01	9000
585.77	2	292.89	186
593.92	2	296.96	39
621.98	2	310.99	45
629.66	1	629.66	135
650.74	1	650.74	172
659.56	1	659.56	114
691.58	1	691.58	74
199.95	2	99.98	6
226.74	1	226.74	174
317.86	2	158.93	113
311.06	1	311.06	101
295.84	2	147.92	91
295.17	1	295.17	31
300.57	2	150.29	84
298.77	1	298.77	9002
289.09	2	144.55	33
276.45	1	276.45	5
265.65	1	265.65	98
420.73	1	420.73	55
333.06	2	166.53	160
323.11	1	323.11	170

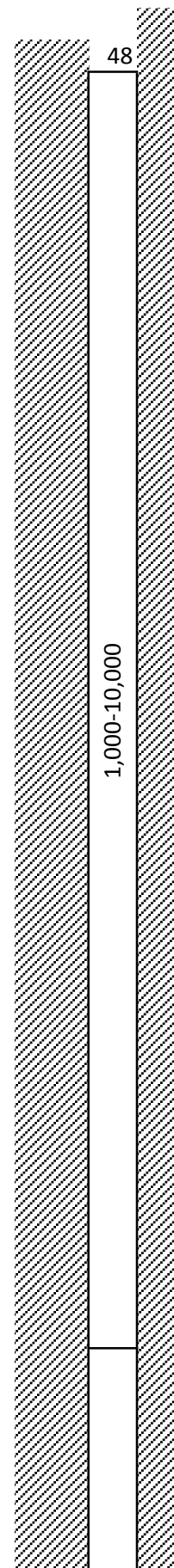
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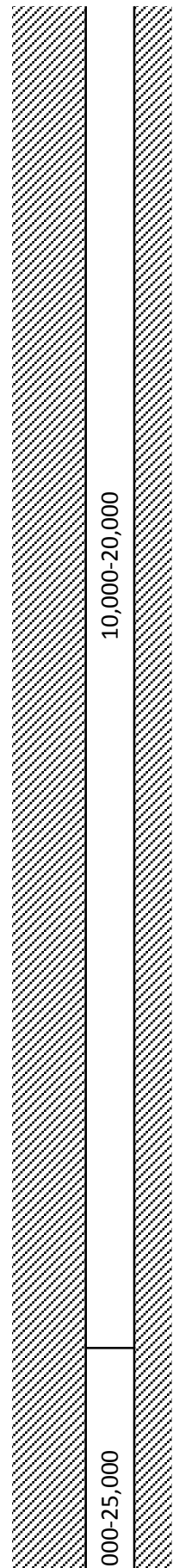
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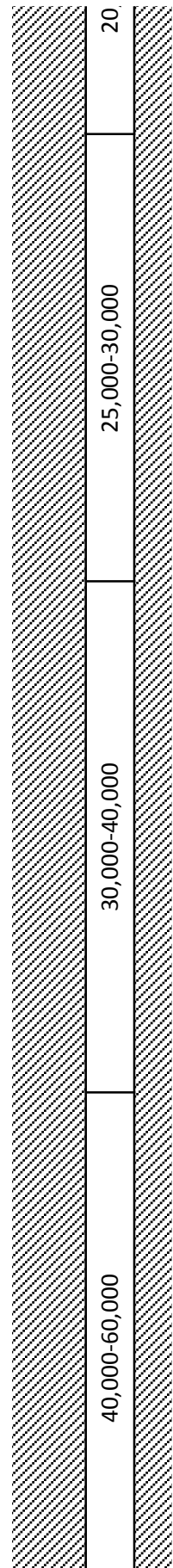
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23	Cerrada Porfirio Diaz/UH	671
110	Rancho la Esperanza	1,738
119	Tepetzintla	1,864
108	Poligono 127 / Sin Nombre	1,870
24	Cerrada Sierra San Juan	1,895
22	Cerrada Porfirio Diaz	2,434
188	Cuchilla de Tepeximilpa/ Ampliacion Tepeximilpa	2,698
127	Unixco	2,827
191	Tepetongo	2,927
77	Las Bombas	3,423
130	Xilonimoco	3,693
125	Tlaltepantcatitla	4,164
150	Colinas del Angel	4,240
120	Tepezintla	4,250
184	Xitle II	4,362
9001	Parque Ecologico CD Mexico	4,656
21	Cerrada la Mora	4,723
49	El Conejo /El Charco	5,211
115	Siete Ocotes / Subestacion electrica	5,507
92	Huinizco	5,515
54	La Herradura	5,565
71	Los Arcos	5,689
107	La Pedrera	5,821
148	Prolongacion 5 de mayo	5,921
7	Ampliacion La Nueva Magdalena Petlcalco	6,300
15	Alta Tension	6,594
2	Las Cebadas	6,788
118	Tepacheras	6,800
66	Acopiaco/Tezontle	7,299
78	Bosques de San Jose/ Ixpangologuia	7,531
30	Mirador el Colibri	7,545
14	El Guardita	7,664
183	Tlapanco	8,156
132	Bellavista	8,275
34	Retesco / Privada Eucalipto	8,461
94	Kilometro 33 / Teteocotla	9,064
9003	Fuentes Brotantes	9,221
147	Paraje Tetenco	9,455
85	El Crucero	9,549
166	Cocuyatla	9,614
95	Kilometro 34.5 / Lomas de San Jose	10,169
36	Santiago Tepalcatitla II	10,251
153	Tepozanes	10,755
164	Cercantitla	11,059
26	Diamante	11,068
117	Tehitic	11,243
69	Ampliacion Tezontitla	11,482



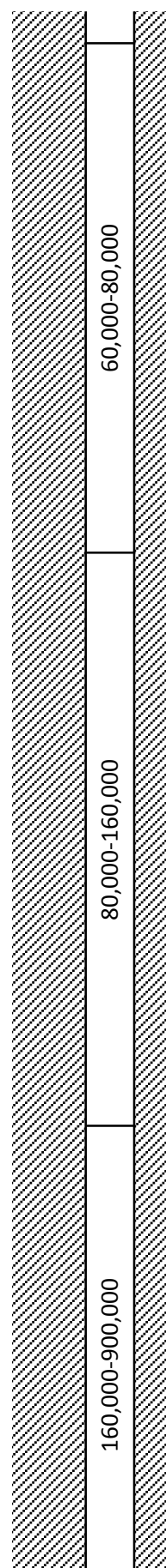
72 Arenal de Guadalupe	11,585
136 Chancoyote	11,649
180 San Juan Nuevo /Ocotlaltongo	11,673
182 Tecpan	11,817
141 Kilometro 2	11,858
104 Paraje Iluca	12,004
25 Colibri	12,167
86 Cuailascantitla	12,254
53 La Herradura II	12,298
20 La Caseta	12,627
68 Amilco	12,676
19 Camino a la Marina	13,042
152 Tepetlica el Alto	13,077
89 Estrella Mora	13,171
134 Camino Viejo a Tepepan	13,585
122 Tetequilo	13,588
16 Ampliacion Lomas de Texcalatlaco	13,925
116 El Sifon	14,015
82 Chinita Norte	14,135
175 Miluyac	14,146
76 Ayopa	14,279
37 Tecorraltitla	14,466
1 Belvedere de Teresa	14,733
178 Poligono 81/ Sin Nombre	15,213
60 La Quinta	15,648
158 Arcoiris	15,840
171 La Magueyera	15,941
121 Tetecala	16,017
35 Santiago Tepalcatitla I	16,564
73 El Arenal / Tlahuacapan	16,642
96 La Joyita / Prolongacion Nogal	16,689
65 Achichipisco	17,429
144 Tatamaxtitla	17,593
146 Carrasco	17,614
11 El Silbato	17,805
129 Xaxalipac	17,889
151 Tepetlica /12 de Diciembre	17,890
138 Corrasolco	17,901
4 Prolongacion Jazmin	17,966
169 Guardita	18,135
52 La Estacion	18,773
157 Apapaxtles	19,711
32 Paraje Texcalatlaco	20,438
159 Camino al Cuatzontle	20,868
3 Lomas de Cuilotepec II	21,205
59 Pedregal de Cuatzontle	21,836
140 Huetlatilpa	21,895
97 Lomas del Capulin	22,656
70 Los Angeles	22,812



142 La Magueyera Tatamaxtitla	24,126
145 Tlatilpa	24,387
167 Cruz Eslava	24,723
93 Kilometro 30	24,730
56 La Magueyera	25,075
58 El Oyamel	25,269
124 Titicocotla/Temaxtetitla	25,459
38 Tetamazolco	25,592
161 Camino al Xitle	26,485
168 Los Gallos	27,616
27 Dolores Tlalli	28,103
100 Nextel / Las Rosas	28,264
137 Cocomozotla	28,814
131 Atlauhtenco	29,010
63 La Via / La Herradura	29,433
8 El Arenal II	29,550
61 Valentin Reyes	29,918
18 Atocpa Sur	29,949
128 Xaxalco II	30,650
81 El Caracol	32,019
185 Zona Entre Asentamientos San Juan Bautista y la Cañ±	32,177
154 Tres de Mayo	32,478
173 Maninal Sur	33,663
43 Viveros de Coactetlan 2a Seccion	34,447
139 Emiliano Zapata	34,743
42 Vista Hermosa	34,823
50 Ejidos - Heroes de 1910	35,783
176 Ocomozotla	35,837
83 Chinita Sur / Toxtepec	35,901
29 La Magueyera	36,646
47 Bosques del Cuatzontle	37,716
111 Las Rejas / Chalquitongo	38,095
112 Las Rosas/ Piedra Larga	38,895
75 Ayometitla	39,650
109 La Presa	41,140
162 La Cañ±ada /San Juan Bautista	44,282
189 Diamante	44,600
90 La Faja / Ololique	45,243
51 Estacion - La Venta	47,275
155 Ahuayoto	50,047
10 Diligencias	50,628
67 Ahuacatitla	50,991
143 Memecala	51,587
17 Atocpa	54,963
87 Cuanejaque	57,129
46 Ampliacion La Venta	58,156
9 El Arenal	58,380
40 Valle Verde	58,678
187 Bosques de Tepeximilpa	59,304



57 Manzana 36 / La Venta	59,616
28 Flor de Borrego	61,058
126 Las Torres	62,671
64 El Xipie II	62,882
79 El Calvario	64,544
88 Los Encinos	65,321
62 La Venta /La Joya	66,955
12 Tlaltenango	68,410
44 Xicalco Oriente	69,105
179 El Sabinoco	69,969
105 Los Pastores	70,739
80 Camino Antiguo al Cantil	72,135
190 El Mirador 3ra. Seccion	73,561
133 Camino Antiguo a Diligencias	76,662
41 Verano	77,648
106 Pedregal de Aminco	78,511
102 Ocotla Chico	79,344
149 Tecoantitla / Xolalpa	84,793
48 El Conejo	94,645
99 La Morucha	96,597
13 Ampliacion Parres	98,848
123 Tezontitla	100,901
156 Los Ajuscos	102,374
177 Piramide/ Providencia	106,982
165 El Charco	112,854
181 Tecoentitla/Canoas	113,688
163 El Cedral	113,787
9000 Zona de Ranchos	118,023
186 Zona Entre Calles Fernando Montes de Oca y Leona Vi	119,563
39 Tlalmille	122,785
45 Zorros-Solidaridad	132,792
135 Cantera Tehuehue	135,279
172 Maninal Norte	141,627
114 San Miguel Toxiac	144,097
74 Ayocatitla	152,302
6 El Zacaton	165,949
174 Maye	170,442
113 San Miguel Tehuisco	170,671
101 Ocotla	180,781
91 Las Granjas / Barranquillas	204,456
31 Paraje 38	205,527
84 Cortijo de Mendoza	228,269
9002 Area urbana	231,330
33 Primavera	248,124
5 San Nicolas II	270,955
98 Las Margaritas	291,243
55 El Llano / Jardines de San Juan	329,174
160 Camino al Xictontle / Lomas de Tepemecac	531,626
170 Lomas de Tepemecac	557,678



103 Oyameyo

844,417



Calculated Population			Estimated Age			Projected
Formula	Average	Corrected V	Formula	Average	Corrected V	Formula
4.057650241		4	17.8522787		16	3123.682716
7.047820644		7	17.98692565		16	3145.051818
7.401074496		7	18.00272829		16	3147.566246
7.4178969		7	18.00348028		16	3147.685933
7.487991025		7	18.0066131		16	3148.184584
8.999524356		9	18.07396129		16	3158.917349
9.740079204		9	18.10681253		16	3164.161583
10.10199193		10	18.12283257		16	3166.721092
10.38256733		10	18.13523667		16	3168.703847
11.77451693		11	18.19657401		16	3178.520788
12.53243825		12	18.22983309		16	3183.852452
13.8549389		13	18.28763345		16	3193.132662
14.0683776		13	18.29693417		16	3194.627659
14.0964625		13	18.29815741		16	3194.824319
14.41102704		14	18.31184928		16	3197.026104
15.23687834		15	18.34771661		16	3202.79879
15.42510673		15	18.35587553		16	3204.112917
16.79635452		16	18.41513542		16	3213.668642
17.62832705		17	18.45093812		16	3219.451211
17.65081523	0.956970572	17	18.45190428	0.879761995	16	3219.607355
17.79136923		17	18.45794103		16	3220.583088
18.13996472		17	18.47289907		16	3223.001653
18.51108404		18	18.48880168		16	3225.574294
18.79225824		18	18.50083509		16	3227.52192
19.85809		19	18.5463324		16	3234.892927
20.68508084		20	18.58150721		16	3240.599394
21.23087694		20	18.60466131		16	3244.35944
21.26464		20	18.60609205		16	3244.591878
22.6688754		22	18.66543603		16	3254.242831
23.32191596		22	18.69292679		16	3258.720159
23.36132703		22	18.69458369		16	3258.990146
23.6963369		23	18.70865809		16	3261.284138
25.08172034		24	18.76667253		17	3270.751476
25.41687563		24	18.78066221		17	3273.037224
25.94078852		25	18.80249562		17	3276.606704
27.6397561		26	18.87300437		17	3288.151969
28.08222684		27	18.89129412		17	3291.151264
28.74179703		28	18.91850196		17	3295.616446
29.0067834		28	18.92941413		17	3297.408435
29.190029		28	18.93695394		17	3298.647001
30.75500856		28	18.93185676		20	3898.792462
30.986283		28	18.94084763		20	3900.748301
32.40807003		29	18.99596055		20	3912.751832
33.26590148		30	19.02908079		20	3919.977364
33.29130062		30	19.03005992		20	3920.19111
33.78520505		31	19.04908274		20	3924.345362
34.45983632		31	19.07501365		20	3930.013005

Calculation for 48 Years


6/ App5 - 48Y 20


34.75061223		31	19.08617157		20	3932.453457
34.9312992		32	19.09309939		20	3933.969221
34.99905893		32	19.09569629		20	3934.537508
35.40564149		32	19.11126585		20	3937.9458
35.52141216		32	19.11569514		20	3938.915768
35.93369602		32	19.13145442		20	3942.368193
36.39403589		33	19.14902415		20	3946.219647
36.63976052		33	19.1583913		20	3948.274053
36.7640408		33	19.16312592		20	3949.312724
37.69344113		34	19.19846858		20	3957.071965
37.83188098		34	19.20372345		20	3958.226514
38.86609376		35	19.2429012		20	3966.841433
38.96500793		35	19.24664098		20	3967.664448
39.23067524		35	19.2566792		20	3969.874126
40.40095223		37	19.30079003		20	3979.593942
40.40943374		37	19.30110909		20	3979.664303
41.36230563		37	19.33689505		20	3987.561619
41.61682023	0.904419703	38	19.34643405	1.040255628	20	3989.668487
41.95619823		38	19.3591409		20	3992.476202
41.98730932		38	19.36030502		20	3992.733494
42.36348984		38	19.37437133		20	3995.843287
42.89246516		39	19.39412087		20	4000.21229
43.64786129		39	19.42226308		20	4006.443491
45.00623537		41	19.47269019		20	4017.625356
46.2376599		42	19.51820732		20	4027.736532
46.7813056		42	19.53824286		20	4032.192665
47.06731548		43	19.54876898		20	4034.535128
47.28254429		43	19.55668356		20	4036.297026
48.8319661		44	19.61349447		20	4048.959191
49.05295616		44	19.62157367		20	4050.762078
49.18612272		44	19.62643929		20	4051.848109
51.28337004		46	19.70278901		20	4068.915514
51.74831365		47	19.71964454		21	4072.689966
51.807853		47	19.72180118		21	4073.17307
52.34941803		47	19.74139861		21	4077.564834
52.58761632		48	19.75000733		21	4079.495048
52.5904521		48	19.75010977		21	4079.518023
52.6216458		48	19.75123664		21	4079.770731
52.80597716		48	19.75789327		21	4081.263746
53.28527823		48	19.77518338		21	4085.143465
55.09522553		50	19.84023458		21	4099.76256
57.75772352		52	19.93524592		21	4121.178015
59.82251184		51	19.89302616		25	5138.214924
61.04427342		52	19.93416087		25	5151.28571
62.00205203		53	19.96630278		25	5161.514533
63.7960109		55	20.02626019		25	5180.631851
63.96379103		55	20.03185145		25	5182.417038
66.12849434	0.855274463	57	20.10374318	1.260735927	25	5205.407637
66.57238734		57	20.11842905		25	5210.112525

70.31326388		60	20.24144573		26	5249.635552
71.05672577		61	20.26573694		26	5257.463641
72.01402673		62	20.29693931		26	5267.530435
72.0339729		62	20.29758854		26	5267.740032
73.01715563		136	22.87547002		16	3167.547217
73.57012236		137	22.90849211		16	3171.731947
74.11176068		138	22.94080141		16	3175.82997
74.49095046		139	22.96339978		16	3178.698416
77.03785523		144	23.11477823		16	3197.95838
80.26584346		150	23.30576662		16	3222.370495
81.65657861		153	23.38781127		16	3232.896065
82.1164537	1.868303666	153	23.41491483	0.697180286	16	3236.378311
83.6878466		156	23.50744376		16	3248.285493
84.2479801		157	23.54039895		16	3252.533519
85.45710149		160	23.61149734		16	3261.711129
85.7916025		160	23.6311584		16	3264.252133
86.84388672		162	23.69299067		17	3272.252096
86.9325426		162	23.69819903		17	3272.926568
88.9378225		34	19.20907915		19	3735.831776
92.85681636		36	19.27236551		19	3748.49763
93.30935933		36	19.27965023		19	3749.957419
94.17162048		36	19.29351705		19	3752.737263
97.56799757		38	19.34796914		19	3763.66659
99.81659581		39	19.38387292		19	3770.88475
100.665876		39	19.39740334		19	3773.607352
100.8954413		39	19.40105785		19	3774.342945
103.6512231	0.386152584	40	19.44483416	0.984081549	19	3783.161909
103.8062906		40	19.44729232		19	3783.65753
103.9900818		40	19.4502051		19	3784.244872
106.1301293		41	19.48406515		19	3791.077012
109.2056967		42	19.53254689		19	3800.873951
110.295629		43	19.54967738		19	3804.339674
112.597221		43	19.585765		19	3811.647658
114.7705225		44	19.61973389		19	3818.535243
119.0628996		110	22.00227559		19	3755.550296
128.1288955		118	22.27872324		19	3804.431687
129.04756		119	22.30649706		19	3809.366265
130.905729		121	22.36254992		19	3819.338346
136.7833256		126	22.53881303		19	3850.811267
144.8147022		133	22.77738974		20	3893.688937
146.4999944		135	22.82715855		20	3902.673971
147.5532821		136	22.85821658		20	3908.288131
149.2832186	0.920880345	137	22.90915186	0.863555959	20	3917.507173
159.0957314		147	23.19652653		20	3969.795772
165.4033226		152	23.38015555		20	4003.453019
168.3973203		155	23.46710022		20	4019.456004
169.0506244		156	23.48605702		20	4022.950903
169.9199077		156	23.51127349		20	4027.603021
171.7465644		158	23.56423698		20	4037.385926

172.6572675		159	23.59063145		20	4042.267239
176.8688794		129	22.62819226		27	5702.492423
181.5848542		132	22.73878339		27	5738.530579
182.2021459		133	22.75322194		27	5743.246908
187.0675279		136	22.86674389		28	5780.419472
189.344033		138	22.9196997		28	5797.814914
194.135372		141	23.0308512		28	5834.441376
198.4063281		144	23.12961694		28	5867.116656
200.447901		146	23.17673483		28	5882.748183
202.987261	0.727787559	148	23.23526487	1.203922531	28	5902.204662
205.2516061		149	23.28739037		28	5919.568505
209.3598582		152	23.38182272		28	5951.112778
213.5604207		155	23.47821859		28	5983.429206
222.7090622		162	23.6877749		29	6054.088568
225.6220119		164	23.75443009		29	6076.680659
228.1731771		166	23.8127955		29	6096.509451
230.6370703		168	23.86916184		29	6115.700294
246.7886528		174	24.06836267		21	4270.513379
276.142076		195	24.72402905		22	4401.565486
281.9809804		199	24.85584726		22	4428.235937
288.7237271		204	25.00889652		22	4459.338386
294.8822118		208	25.14956233		22	4488.0538
299.3060359		211	25.25118137		22	4508.87557
313.1731483		221	25.57327002		23	4575.301516
330.9056253		234	25.99439902		23	4663.143209
333.4297613		235	26.05531248		23	4675.942184
333.7294814	0.705823944	236	26.06256268	0.889861554	23	4677.467152
346.5722285		245	26.3768522		23	4743.89546
351.250111		248	26.49319267		24	4768.645396
361.0525562		255	26.74048133		24	4821.54136
391.6297153		276	27.54620417		25	4996.626303
399.2600078		282	27.75635997		25	5042.986753
418.7922071		296	28.31302541		25	5167.184172
426.4139454		301	28.53804653		25	5217.966921
451.8198992		319	29.3228575		26	5397.708799
494.3746706		568	49.32812043		44	11497.4547
508.4664754		584	51.46129598		46	12337.52852
509.1857902		585	51.57365589		51	14849.9455
541.04697		621	56.90347695		51	14849.9455
616.4574559		708	72.53348792		51	14849.9455
619.8953477		712	73.35616637		51	14849.9455
693.4383364		796	93.51589776		52	15368.669
703.4159689	1.148177576	808	96.64990415	0.889872198	52	15368.669
758.4911194		871	115.8145989		52	15368.669
834.269012		958	147.7687822		52	15368.669
902.481285		1036	182.6571838		52	15368.669
1032.221122		1185	267.1575176		60	19960.789
1773.357404		2036	1389.308508		60	19960.789
1874.681552		2152	1652.415089		60	19960.789

3079.58607

3536  7779.145504

60  19960.789

population to Average	48 Corrected V	Area Projected to Formula	48.00 Average	Corrected V	Radius Present	Projected
	990	320932.8365		99,713.37	14.61	178.16
	997	323811.9365		100,607.90	23.52	178.95
	998	324151.4279		100,713.38	24.36	179.05
	998	324167.5915		100,718.40	24.40	179.05
	998	324234.9374		100,739.33	24.56	179.07
	1001	325685.9046		101,190.14	27.83	179.47
	1003	326395.8762		101,410.73	29.31	179.67
	1004	326742.6247		101,518.46	30.00	179.76
	1005	327011.3454		101,601.95	30.52	179.84
	1008	328343.2092		102,015.76	33.01	180.20
	1009	329067.521		102,240.80	34.29	180.40
	1012	330329.8671		102,633.01	36.41	180.75
	1013	330533.4176		102,696.26	36.74	180.80
	1013	330560.1976		102,704.58	36.78	180.81
	1014	330860.088		102,797.75	37.26	180.89
	1015	331646.8967		103,042.21	38.50	181.11
	1016	331826.1216		103,097.90	38.77	181.15
	1019	333130.6038		103,503.20	40.73	181.51
	1021	333921.0605		103,748.79	41.87	181.73
0.317035984	1021	333942.4159	0.310698556	103,755.43	41.90	181.73
	1021	334075.8776		103,796.89	42.09	181.77
	1022	334406.7893		103,899.71	42.55	181.86
	1023	334758.9354		104,009.12	43.05	181.95
	1023	335025.6341		104,091.98	43.41	182.03
	1026	336035.8052		104,405.84	44.78	182.30
	1027	336818.7486		104,649.10	45.81	182.51
	1029	337335.0631		104,809.52	46.48	182.65
	1029	337366.9916		104,819.44	46.52	182.66
	1032	338693.8221		105,231.68	48.20	183.02
	1033	339310.1292		105,423.17	48.96	183.19
	1033	339347.3084		105,434.72	49.01	183.20
	1034	339663.2783		105,532.89	49.39	183.28
	1037	340968.6215		105,938.46	50.95	183.63
	1038	341284.0983		106,036.48	51.32	183.72
	1039	341777.0043		106,189.62	51.90	183.85
	1042	343373.3641		106,685.61	53.71	184.28
	1043	343788.597		106,814.62	54.18	184.39
	1045	344407.1707		107,006.81	54.86	184.56
	1045	344655.5537		107,083.98	55.13	184.62
	1046	344827.2731		107,137.34	55.32	184.67
	2704	1396750.646		773,357.58	56.89	496.15
	2705	1397878.797		773,982.22	57.12	496.35
	2713	1404812.155		777,821.10	58.51	497.58
	2718	1408993.638		780,136.32	59.33	498.32
	2719	1409117.425		780,204.86	59.36	498.34
	2721	1411524.335		781,537.53	59.82	498.77
	2725	1414811.262		783,357.44	60.46	499.35

	2727	1416227.724		784,141.71	60.73	499.60
	2728	1417107.832		784,629.01	60.89	499.76
	2728	1417437.867		784,811.75	60.96	499.81
	2731	1419418.025		785,908.13	61.33	500.16
	2732	1419981.802		786,220.28	61.44	500.26
	2734	1421989.338		787,331.82	61.81	500.62
	2737	1424230.512		788,572.72	62.23	501.01
	2738	1425426.671		789,235.02	62.45	501.22
	2739	1426031.612		789,569.96	62.57	501.33
	2744	1430554.636		792,074.29	63.40	502.12
	2745	1431228.236		792,447.25	63.52	502.24
	2751	1436259.256		795,232.84	64.43	503.12
	2751	1436740.332		795,499.20	64.52	503.20
	2753	1438032.336		796,214.56	64.75	503.43
	2760	1443722.165		799,364.93	65.76	504.43
	2760	1443763.393		799,387.75	65.77	504.43
	2765	1448394.377		801,951.85	66.58	505.24
0.693472766	2767	1449631.05	0.553683352	802,636.58	66.79	505.46
	2769	1451279.889		803,549.51	67.08	505.74
	2769	1451431.029		803,633.20	67.10	505.77
	2771	1453258.408		804,644.99	67.42	506.09
	2774	1455827.592		806,067.50	67.86	506.54
	2778	1459495.616		808,098.43	68.48	507.17
	2786	1466089.004		811,749.07	69.59	508.32
	2793	1472063.371		815,056.98	70.58	509.35
	2796	1474700.067		816,516.88	71.01	509.81
	2798	1476087.014		817,284.81	71.23	510.05
	2799	1477130.629		817,862.64	71.40	510.23
	2808	1484641.177		822,021.10	72.61	511.52
	2809	1485712.047		822,614.03	72.78	511.71
	2810	1486357.304		822,971.29	72.89	511.82
	2822	1496515.465		828,595.70	74.48	513.57
	2824	1498766.438		829,842.03	74.83	513.95
	2825	1499054.665		830,001.61	74.88	514.00
	2828	1501676.078		831,453.04	75.28	514.45
	2829	1502828.907		832,091.35	75.46	514.65
	2829	1502842.631		832,098.95	75.46	514.65
	2829	1502993.595		832,182.53	75.49	514.68
	2830	1503885.644		832,676.44	75.62	514.83
	2833	1506204.897		833,960.58	75.98	515.23
	2843	1514959.493		838,807.85	77.30	516.72
	2858	1527828.193		845,933.04	79.21	518.91
	3661	2301418.47		1,948,709.26	80.66	787.59
	3670	2311291.813		1,957,069.44	81.50	789.27
	3677	2319032.793		1,963,624.06	82.16	790.60
	3691	2333534.272		1,975,903.08	83.37	793.06
	3692	2334890.682		1,977,051.61	83.48	793.29
0.712432651	3709	2352393.623	0.846742687	1,991,872.10	84.92	796.26
	3712	2355983.359		1,994,911.68	85.21	796.87

	3740	2386244.13		2,020,534.77	87.63	801.97
	3746	2392260.07		2,025,628.72	88.11	802.98
	3753	2400007.341		2,032,188.67	88.71	804.28
	3753	2400168.774		2,032,325.36	88.72	804.31
	6541	6337858.83		4,548,001.72	89.34	1,203.19
	6549	6352937.471		4,558,822.04	89.68	1,204.62
	6558	6367720.893		4,569,430.52	90.02	1,206.02
	6564	6378078.807		4,576,863.29	90.26	1,207.00
	6603	6447842.278		4,626,925.05	91.82	1,213.59
	6654	6536808.351		4,690,766.46	93.76	1,221.93
2.064858074	6675	6575353.543		4,718,426.21	94.58	1,225.53
	6683	6588130.439	0.717592777	4,727,594.82	94.85	1,226.72
	6707	6631912.615		4,759,012.59	95.77	1,230.79
	6716	6647567.21		4,770,246.22	96.09	1,232.24
	6735	6681450.498		4,794,560.62	96.79	1,235.38
	6740	6690846.857		4,801,303.38	96.98	1,236.25
	6757	6720472.608		4,822,562.60	97.59	1,238.98
	6758	6722973.302		4,824,357.08	97.64	1,239.21
	2793	1471944.664		1,756,960.61	98.77	747.84
	2802	1480031.109		1,766,612.85	100.96	749.89
	2804	1480964.474		1,767,726.95	101.20	750.12
	2806	1482742.642		1,769,849.43	101.68	750.57
	2814	1489743.708		1,778,206.12	103.51	752.34
	2819	1494376.194		1,783,735.61	104.71	753.51
	2821	1496125.31		1,785,823.41	105.16	753.95
0.747621032	2822	1496598.055		1,786,387.69	105.28	754.07
	2828	1502271.361	1.193632243	1,793,159.53	106.72	755.50
	2829	1502590.505		1,793,540.47	106.80	755.58
	2829	1502968.752		1,793,991.96	106.90	755.68
	2834	1507372.009		1,799,247.83	108.00	756.78
	2842	1513696.881		1,806,797.40	109.57	758.37
	2844	1515937.396		1,809,471.75	110.12	758.93
	2850	1520667.08		1,815,117.26	111.27	760.11
	2855	1525131.182		1,820,445.75	112.34	761.23
	6369	6042110.276		9,345,317.32	114.43	1,724.73
	6452	6184117.647		9,564,959.78	118.72	1,744.88
	6460	6198544.104		9,587,273.15	119.15	1,746.92
	6477	6227748.759		9,632,443.92	120.01	1,751.03
	6530	6320367.72		9,775,697.44	122.67	1,764.00
	6603	6447638.888		9,972,547.44	126.22	1,781.67
	6618	6474467.962		#####	126.95	1,785.38
1.695876239	6628	6491259.724		#####	127.40	1,787.69
	6644	6518880.326	1.546697577	#####	128.14	1,791.49
	6732	6676638.75		#####	132.27	1,813.04
	6789	6779174.235		#####	134.85	1,826.91
	6816	6828198.458		#####	136.06	1,833.50
	6822	6838928.183		#####	136.32	1,834.94
	6830	6853223.655		#####	136.67	1,836.86
	6847	6883333.793		#####	137.39	1,840.89

	6855	6898382.133	#####	137.75	1,842.90	
	5316	4381203.499	9,426,670.05	139.41	1,732.22	
	5350	4430153.716	9,531,992.15	141.24	1,741.87	
	5354	4436579.716	9,545,818.44	141.48	1,743.14	
	5389	4487388.274	9,655,138.97	143.34	1,753.09	
	5405	4511262.978	9,706,508.18	144.20	1,757.75	
	5439	4561736.143	9,815,107.08	145.99	1,767.55	
	5470	4606998.4	9,912,494.10	147.57	1,776.30	
0.932303236	5485	4628729.448	9,959,250.99	148.31	1,780.49	
	5503	4655848.522	2.151616572	#####	149.24	1,785.69
	5519	4680116.886	#####	150.06	1,790.34	
	5548	4724363.796	#####	151.53	1,798.78	
	5578	4769907.083	#####	153.02	1,807.43	
	5644	4870238.736	#####	156.21	1,826.34	
	5665	4902535.745	#####	157.21	1,832.39	
	5684	4930969.353	#####	158.08	1,837.70	
	5702	4958565.558	#####	158.92	1,842.83	
	8444	10089241.78	#####	164.29	2,603.77	
	8704	10666492.25	#####	173.57	2,677.22	
	8756	10785924.28	#####	175.35	2,692.17	
	8818	10926038.46	#####	177.38	2,709.60	
	8875	11056197.79	#####	179.21	2,725.69	
	8916	11151056.86	#####	180.52	2,737.36	
	9047	11456372.12	#####	184.54	2,774.58	
	9221	11866421.08	#####	189.53	2,823.79	
1.977378678	9246	11926766.11	2.111039382	#####	190.23	2,830.97
	9249	11933966.23	#####	190.31	2,831.82	
	9380	12249705.54	#####	193.82	2,869.04	
	9429	12368393.18	#####	195.08	2,882.90	
	9534	12623963.76	#####	197.70	2,912.53	
	9880	13488456.03	#####	205.59	3,010.61	
	9972	13722136.33	#####	207.51	3,036.58	
	10217	14358002.57	#####	212.32	3,106.13	
	10318	14622131.32	#####	214.17	3,134.57	
	10673	15576259.16	#####	220.18	3,235.23	
	3094	1739418.621	2,873,180.45	229.83	956.33	
	3320	1954473.925	3,228,409.89	232.92	1,013.72	
	3996	2670164.521	4,410,591.22	233.08	1,184.88	
	3996	2670164.521	4,410,591.22	239.88	1,184.88	
	3996	2670164.521	4,410,591.22	255.11	1,184.88	
	3996	2670164.521	4,410,591.22	255.78	1,184.88	
	4136	2831466.866	4,677,031.25	269.56	1,220.14	
0.269101481	4136	2831466.866	1.651805044	4,677,031.25	271.36	1,220.14
	4136	2831466.866	4,677,031.25	281.03	1,220.14	
	4136	2831466.866	4,677,031.25	293.68	1,220.14	
	4136	2831466.866	4,677,031.25	304.48	1,220.14	
	5371	4461511.632	7,369,547.42	323.70	1,531.60	
	5371	4461511.632	7,369,547.42	411.37	1,531.60	
	5371	4461511.632	7,369,547.42	421.32	1,531.60	

5371 4461511.632

7,369,547.42

518.45

1,531.60

Projected

Diferential	Expansion	Buffer	A H I
163.54	2	81.77	23
155.43	1	155.43	110
154.69	2	77.34	119
154.65	2	77.33	108
154.51	2	77.26	24
151.64	2	75.82	22
150.36	1	150.36	188
149.76	1	149.76	127
149.31	2	74.66	191
147.19	1	147.19	77
146.11	1	146.11	130
144.34	2	72.17	125
144.06	2	72.03	150
144.03	1	144.03	120
143.63	2	71.81	184
142.61	1	142.61	9001
142.38	1	142.38	21
140.78	1	140.78	49
139.86	2	69.93	115
139.83	1	139.83	92
139.68	1	139.68	54
139.30	2	69.65	71
138.91	2	69.45	107
138.61	1	138.61	148
137.52	2	68.76	7
136.70	2	68.35	15
136.17	1	136.17	2
136.14	1	136.14	118
134.82	1	134.82	66
134.23	2	67.11	78
134.19	2	67.09	30
133.89	1	133.89	14
132.68	1	132.68	183
132.40	1	132.40	132
131.95	2	65.98	34
130.57	1	130.57	94
130.21	1	130.21	9003
129.70	1	129.70	147
129.49	2	64.75	85
129.35	1	129.35	166
439.26	2	219.63	95
439.23	1	439.23	36
439.07	1	439.07	153
438.99	2	219.50	164
438.99	1	438.99	26
438.95	1	438.95	117
438.89	2	219.45	69

438.87	2	219.44	72
438.86	2	219.43	136
438.86	1	438.86	180
438.83	1	438.83	182
438.82	2	219.41	141
438.80	1	438.80	104
438.78	1	438.78	25
438.77	2	219.38	86
438.76	1	438.76	53
438.72	1	438.72	20
438.72	1	438.72	68
438.69	2	219.34	19
438.69	1	438.69	152
438.68	2	219.34	89
438.67	1	438.67	134
438.67	2	219.33	122
438.66	2	219.33	16
438.67	2	219.33	116
438.67	1	438.67	82
438.67	2	219.33	175
438.67	1	438.67	76
438.68	1	438.68	37
438.69	1	438.69	1
438.73	1	438.73	178
438.78	2	219.39	60
438.80	1	438.80	158
438.82	1	438.82	171
438.83	1	438.83	121
438.91	1	438.91	35
438.93	2	219.46	73
438.93	1	438.93	96
439.08	1	439.08	65
439.12	2	219.56	144
439.12	1	439.12	146
439.17	1	439.17	11
439.19	2	219.59	129
439.19	1	439.19	151
439.19	2	219.60	138
439.21	1	439.21	4
439.25	2	219.62	169
439.42	1	439.42	52
439.70	2	219.85	157
706.93	1	706.93	32
707.77	1	707.77	159
708.44	1	708.44	3
709.69	1	709.69	59
709.81	2	354.91	140
711.34	1	711.34	97
711.66	1	711.66	70

714.34	1	714.34	142
714.87	1	714.87	145
715.57	2	357.78	167
715.58	2	357.79	93
1,113.85	1	1113.85	56
1,114.94	1	1114.94	58
1,116.00	2	558.00	124
1,116.75	1	1116.75	38
1,121.77	1	1121.77	161
1,128.17	1	1128.17	168
1,130.95	2	565.47	27
1,131.87	2	565.93	100
1,135.02	1	1135.02	137
1,136.15	2	568.07	131
1,138.58	1	1138.58	63
1,139.26	1	1139.26	8
1,141.39	1	1141.39	61
1,141.57	1	1141.57	18
649.06	2	324.53	128
648.93	1	648.93	81
648.92	2	324.46	185
648.90	1	648.90	154
648.83	1	648.83	173
648.80	1	648.80	43
648.79	2	324.40	139
648.79	1	648.79	42
648.78	2	324.39	50
648.78	1	648.78	176
648.78	2	324.39	83
648.78	2	324.39	29
648.80	2	324.40	47
648.81	2	324.41	111
648.84	1	648.84	112
648.88	1	648.88	75
1,610.30	2	805.15	109
1,626.16	1	1626.16	162
1,627.77	2	813.88	189
1,631.02	1	1631.02	90
1,641.33	1	1641.33	51
1,655.46	2	827.73	155
1,658.43	1	1658.43	10
1,660.29	2	830.14	67
1,663.35	1	1663.35	143
1,680.77	1	1680.77	17
1,692.06	2	846.03	87
1,697.44	1	1697.44	46
1,698.62	1	1698.62	9
1,700.19	2	850.09	40
1,703.49	2	851.75	187

1,705.14	1	1705.14	57
1,592.81	2	796.41	28
1,600.63	2	800.32	126
1,601.66	2	800.83	64
1,609.76	1	1609.76	79
1,613.55	2	806.78	88
1,621.57	1	1621.57	62
1,628.74	2	814.37	12
1,632.17	1	1632.17	44
1,636.46	1	1636.46	179
1,640.28	2	820.14	105
1,647.25	1	1647.25	80
1,654.41	1	1654.41	190
1,670.13	1	1670.13	133
1,675.18	1	1675.18	41
1,679.61	2	839.81	106
1,683.91	1	1683.91	102
2,439.48	2	1219.74	149
2,503.65	1	2503.65	48
2,516.82	1	2516.82	99
2,532.21	1	2532.21	13
2,546.47	1	2546.47	123
2,556.84	1	2556.84	156
2,590.04	1	2590.04	177
2,634.26	1	2634.26	165
2,640.73	1	2640.73	181
2,641.51	2	1320.75	163
2,675.21	2	1337.61	9000
2,687.82	2	1343.91	186
2,714.84	2	1357.42	39
2,805.01	2	1402.51	45
2,829.07	1	2829.07	135
2,893.81	1	2893.81	172
2,920.41	1	2920.41	114
3,015.05	1	3015.05	74
726.49	2	363.25	6
780.80	1	780.80	174
951.80	2	475.90	113
944.99	1	944.99	101
929.77	2	464.88	91
929.10	1	929.10	31
950.59	2	475.29	84
948.78	1	948.78	9002
939.11	2	469.55	33
926.46	1	926.46	5
915.67	1	915.67	98
1,207.90	1	1207.90	55
1,120.23	2	560.12	160
1,110.28	1	1110.28	170

1,013.15

2

506.58

103