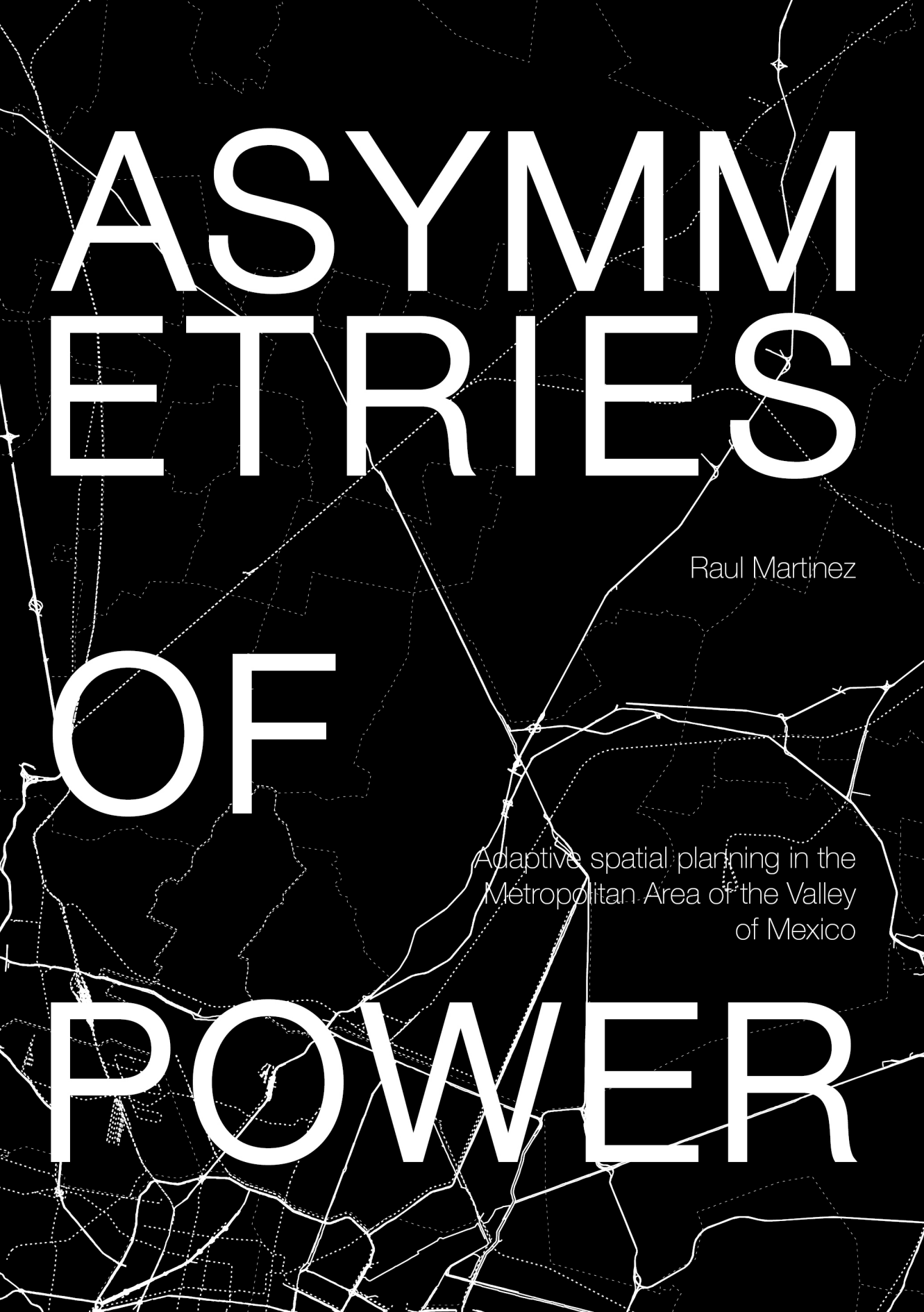

ASYMMETRIES OF POWER
Raul Martinez
Adaptive spatial planning in the Metropolitan Area of the Valley of Mexico

Special thanks to

Mar Sal

CONACYT

EFL STICHTING

PHILIP-SPANGENBERG-TRAVEL-GRANT

RAMM

© 2020 Raul Martinez

Author:
Raul Alejandro Martinez Medina
4859197

Delft, The Netherlands
02 - July - 2020

P5 Thesis Report

First Mentor:
Dr. Diego Sepulveda Carmona. Chair of Spatial Planning and Strategy
Second Mentor:
Dip. Ing. Birgit Hausleitner. Chair of Urban Design

Delft University of Technology
Faculty of Architecture and Built Environment
MSc Architecture, Urbanism and Building Sciences
MSc track Urbanism
Complex Cities Studio

For further information please contact the author
email: ramartinezmedina@gmail.com

Complex Cities

TU Delft BK Bouwkunde

Urbanism

Asymmetries of Power:
Adaptive spatial planning in the Metropolitan Area of the Valley of Mexico

Key words:

Spatial cohesion/justice
Adaptive planning
Governance
Urban morphology
Socio-ecological system
Local development

Acknowledgements

Asymmetries of Power could not have been possible without the collaboration, support, guidance and critical discussions held during the entire thesis process. Therefore several actors involved have to be acknowledge as their participation became key for the completion of this report.

®MARSAL and Conacyt, I would like to extend my appreciation for your support during this thesis, without your financial support I will not be part of TU Delft's graduate alumni.
EFL Foundation and Philip Spangenberg Grant I would like to thank you both for your generosity during the research trip phase of this project.
To my mentors Diego Sepulveda and Birgit Hausleitner for their critical insights, professionalism and outstanding vocation. Diego thank you for sharing your ideas, without your expertise I wouldn't have been able to understand the complexity of metropolitan processes. Birgit thank you for the refreshed new perspectives shared during the process without them I would have been lost in complexity.
To the interviewees whom experience and advise help sharpening the proposed framework.
To my parents, my sister and my live partner, for your encouragement and infinite support. Thank you for always believing in me.
To my colleagues and team back in Mexico, thanks to you my Architecture-self has not weaken.
To my international friends at TU Delft, thanks for sharing and expanding my understanding of the world, I had a great time listening and learning from your experiences.

To all the actors involved during the process you have my entire gratitude and admiration.

Abstract

Unbalanced decision making processes, lack of planning scope and a market-driven development lead by high power interests have shaped the emergent Metropolitan Area of the Valley of Mexico (MAVM) with an increasing spatial fragmentation and social segregation. To counteract the problematisation an adaptive planning framework is proposed linking urban morphology, governance capacities and socio-ecological systems as a way to approach vulnerable areas in the metropolis from a local perspective aiming for a collaborative and evolutionary process. Several areas with the potential to become sub-centers are defined in the territory in order to become strategic locations where endogenous development creates opportunities capable of overcoming segregation and fragmentation by means of enhanced economic and community activities. The research recognizes five main principles (systemic goals) which through spatial actions that act in a muldimensional level (scale, time and actors) stress capacities for adaptation embedded in the selected locations. Seemingly, potentials for connectedness and activation from a bottom-up perspective are revealed through exploration by design implementing a scenario construction departing from two levels of participation between stakeholders (high and low) and a further evaluation phase through pathways that inform possibilities and limitations of the strategies taken in the during the evolutionary process. This research allows to conclude that interests and their alignment with different actors, local capacities and operability of the actions taken are directly proportional to the transformation capacities and the effectiveness of the goals proposed by the adaptive framework.

Contents

1 INTRODUCTION *8*
— CONTEXT
— Global Urban Agglomerations
— Latin America and the Caribbean
— PROBLEM FIELD
— Globalization and Neoliberalism in Latin America
— The Emergent Metropolisation Process in Mexico
— The Metropolis: Metropolitan Area of the Valley of Mexico (MAVM)
— The megapolis
— PROBLEM FOCUS
— Spatial Fragmentation and Social Segregation

2 PROBLEM ANALYSIS *46*
— The Formation of the MAVM: Urban Growth of Mexico City
— Urban Planning Regim in Mexico
— 1910-1940
— 1940-1970
— 1970-1990
— 1990-2019

3 METHODOLOGY CHAPTER *64*
— Problem Statement
— Research Aim
— Research Questions
— Methodological Flowchart
— Research Approach
— Complementary Approaches
— Methods
— Towards and Adaptive Strategic Planning
— Conceptual Framework
— Analytical Framework
— Theoretical Framework
— Outcomes
— Timeline

4 THE MAVM *106*
— Substratum
— The Loss of a Lacustrine Heritage
— Natural structure
— Distribution of Population and vulnerabilities
— Land Regulation and Impact in Urban Morphology
— Transport and Mobility
— Work Places
— Housing
— Governance
— Large Strategic Urban Projects
— Assessment Conclusion

5 SITE AND SYSTEMIC GOALS *164*
— Determination of the site
— The Site
— V1 Beautification of the periphery by 2050
— V2 Park Goes Outside by 2050
— V3 Transport Oriented Development by 2050
— V4 Water Takes Over by 2050
— V5 Productive landscapes by 2050
— Conclusion

6 SITE ANALYSIS *194*
— Municipalities Involved
— Transport Structure
— Angular Integration 2000m
— Natural Structure
— Vulnerable Population
— Agricultural Land
— Conclusion Analysis

7 THE GATES *216*
— The Concept Behind the Gates
— Defining the Gates
— Urban Equipment and Infrastructure Concentration
— 2km Influence Buffer from the Periphery
— Points and Buffer of r=1km
— Economic Influence Areas for Development
— 34 Gates
— Conclusion

8 GOVERNANCE CHALLENGE *240*
— Introduction
— Governance Context
— Land Ownership
— Land Development
— Informal Process of Land-Housing (construction phases)
— Interviews and Site Visit
— Governance Challenge

9 ADAPTIVE PLANNING *266*
— Adaptive Strategic Planning in the MAVM
— Building the Adaptive Framework
— XL Potentials and Actions
— Land Development
— Informal Process of Land-Housing (construction phases)
— Instructions
— Governance Challenge
— Potentials and Actions SG1 - Water Landscape Integration and Management
— Potentials and Actions SG2 - Green Infrastructure System and Quality of Public and Open Space
— Potentials and Actions SG3 - Densification of the Built System
— Potentials and Actions SG4 - Productive Landscapes and Means of Production
— Potentials and Actions SG5 - Transport and Mobility System
— Conclusions

10 TESTING GROUNDS *336*
— Selection of the 3 Gates
— NEZA GATE [GN6]
— ECATEPEC GATE [GE7]
— CHIMALHUACAN GATE [GC3]

11 DESIGNING THE LOCAL LEVEL *388*
— Selection of the 3 Gates
— Selection of the Areas for Design Exploration
— Local Area in [GN6]
— Scenarios Gate [GN6]
— Phase 1
— Phase 2-3
— Phase 4-5
— Comparison Between Low and High
— Integration at Local Level
— Local Area in [GE7]
— Scenarios Gate [GE7]
— Phase 1
— Phase 2-3
— Phase 4-5
— Comparison Between Low and High
— Integration at Local Level
— Local Area in [GC3]
— Scenarios Gate [GC3]
— Phase 1
— Phase 2-3
— Phase 4-5
— Comparison Between Low and High
— Integration at Local Level

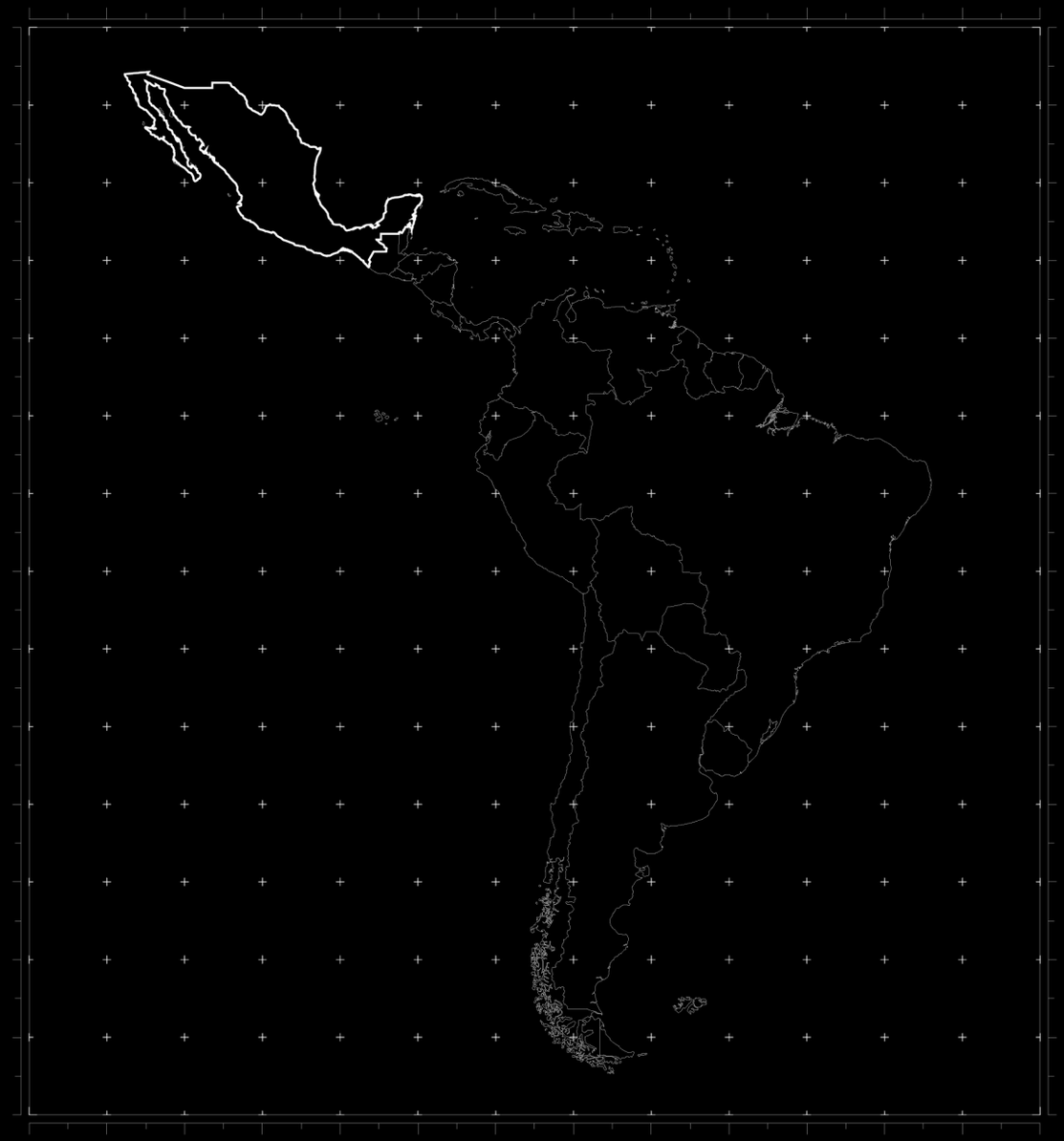
12 EVALUATION BY ADAPTIVE PATHWAYS *484*
— Evaluation Through Adaptive Pathways 486
— Adaptive Pathways AP's 488
— AP 1 490
— AP 2 492
— AP 3 494
— AP 4 496
— Conclusions 498

CONCLUSIONS AND REFLECTION *512*
— Conclusions
— Research Questions
— Reflection

APPENDIX *522*

ASYMMETRIES OF POWER

1 INTRODUCTION



Overview

The general context of inequality and poverty that has worsen since globalization processes affecting the developing countries will be introduced in this chapter. Moreover the chapter focused in the region of Latin America and the Caribbean where Mexico will be selected as a case study for the further development of this report.

Context

Global Urban Agglomerations

Cities are changing rapidly, economic, social and environmental challenges result of massive urbanization processes have test the capacity that the human kind has as a responsibility to counteract the damage caused by their own making.

By 2018 there were 548 cities with a population over 1 million inhabitants, a number than in less than two years increased 1.5 times and by 2030 according to projected estimations will increase to 706 cities *(UN- Habitat, 2017)*. Moreover over the past years the population in some cities exceeded the gap of 1 million inhabitants, 48 cities had populations between 5 and 10 million while 33 cities have more than 10 million inhabitants (FIG. 1.2). Cities with more that 10 million inhabitants coined the term of megacities, and projections estimate that by 2030 the number of megacities will increase to 43, and cities from 5 to 10 million will be more 60. What this numbers portrait is an increase of urban live, a pattern that since industrialization has been growing nonstop. 23 percent of the world´s population lived in cities with at least 1 million inhabitants and almost 7 percent in cities with at least 10 million by 2018, around 2.2 billion people in total, a number that will increase by 2030, while the population in rural areas will only decrease.
From the megacities mentioned above, 5 have more than 134 million people within their limits , Tokyo, Delhi, Shanghai, Sao Paolo and Mexico city are by 2018 the most populated cities in the world (IMG. 1.1), and by 2030 their numbers will just increase although their ranking will change since the population numbers have reached their limits and other cities are manifesting higher growth speeds, for instance, South African cities are developing and urbanizing rapidly and their population is expected to growth drastically.
It is important to mention that “global south” which excludes Europe, Oceania, United states and Canada has 27 of the 33 megacities, a clear reflection of their economic and social conditions as developing countries.

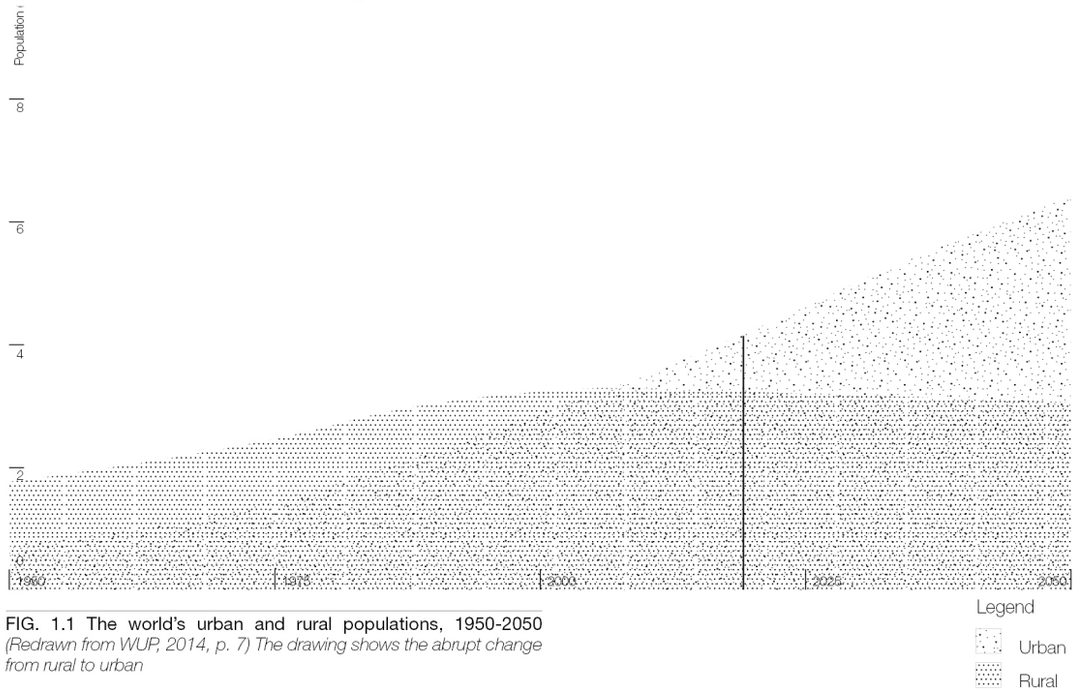


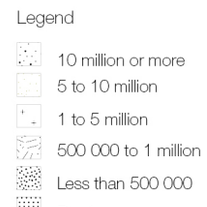
FIG. 1.1 The world’s urban and rural populations, 1950-2050 *(Redrawn from WUP, 2014, p. 7) The drawing shows the abrupt change from rural to urban*

“By 2050, the world’s urban population is expected to nearly double, making urbanization one of the twenty-first century’s most transformative trends (FIG. 1.1). Populations, economic activities, social and cultural interactions, as well as environmental and humanitarian impacts, are increasingly concentrated in cities, and this poses massive sustainability challenges in terms of housing, infrastructure, basic services, food security, health, education, decent jobs, safety and natural resources, among others…the persistence of multiple forms of poverty, growing inequalities and environmental degradation remain among the major obstacles to sustainable development worldwide, with social and economic exclusion and spatial segregation often an irrefutable reality in cities and human settlements” (UN-Habitat & New Urban Agenda, 2017, article 2).



IMG. 1.1 World’s most populated cities *(Source: google images, 2019) From left to right Tokyo, Delhi, Shanghai, Sao Paulo and Mexico city*

City	*Population 2018 (thousands)*	*Population 2030 (thousands)*
Tokyo, Japan	*37468*	*36574*
Delhi, India	*28514*	*38939*
Shanghai, China	*25582*	*32869*
São Paulo, Brazil	*21650*	*23824*
Ciudad de México (Mexico City), Mexico	*21581*	*24111*



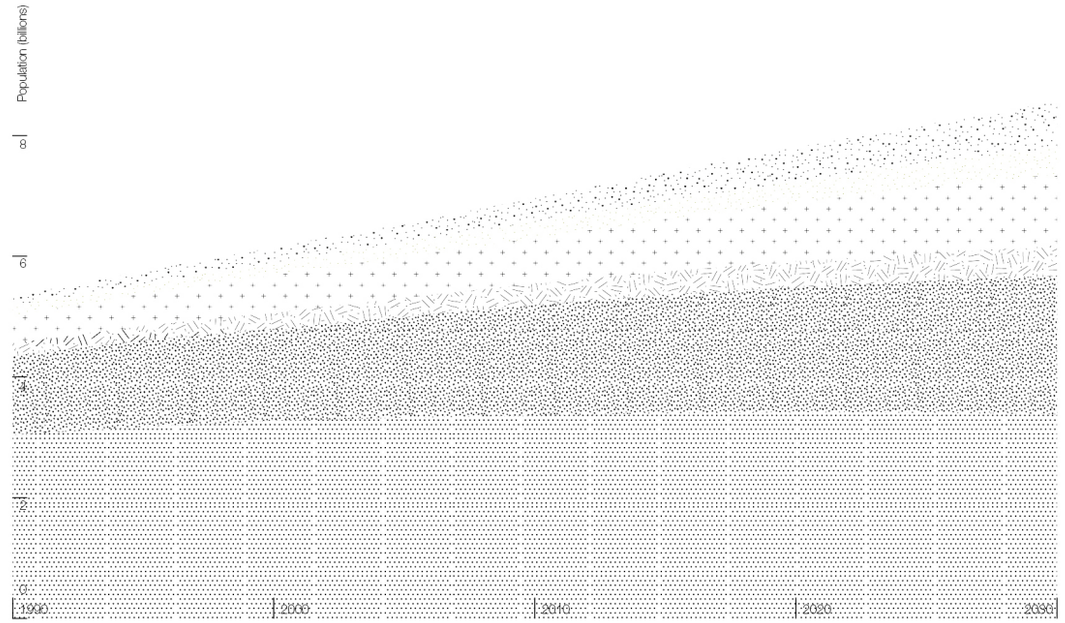
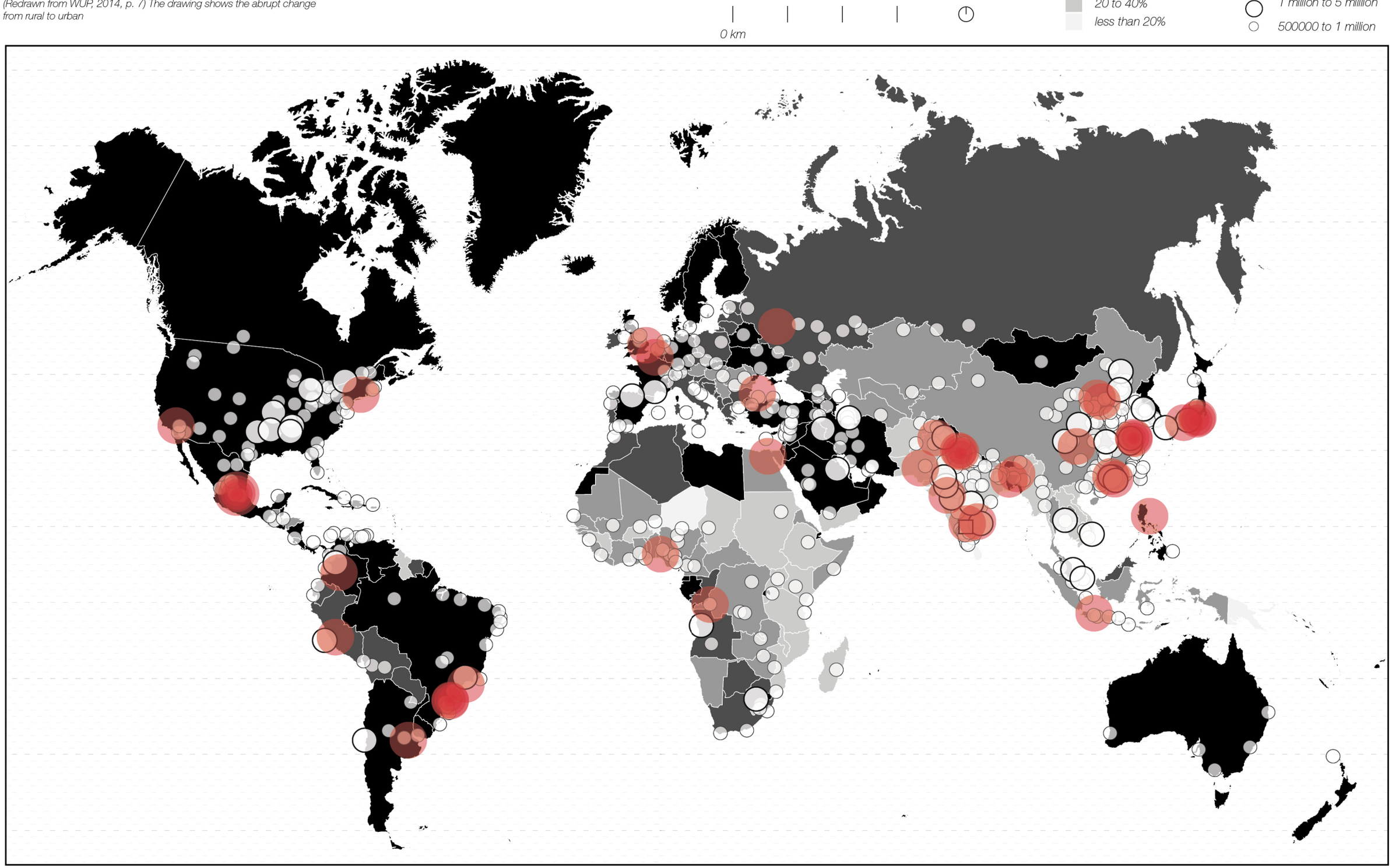


FIG. 1.2 World’s population by size class of settlement, 1990-2030 *(Redrawn from UN-Habitat, 2017)*

ASYMMETRIES OF POWER

FIG. 1.3 The world's urban and rural populations, 1950-2050
(Redrawn from WUP, 2014, p. 7) The drawing shows the abrupt change from rural to urban



Latin America and the Caribbean

Latin America and the Caribbean is a region that experienced a rapid transition derived of urbanization processes. It changed from rural to urban between 1950 and 1990 and consolidated its urban status. With 79.5 percent of its population inhabiting cities, Latin America and the Caribbean has become one of the most urbanized regions, a number that by 2050 could reach almost 90 percent of its population (FIG. 1.6). The problematisation and challenges have also changed over the years, the debate and efforts to tackle the externalities caused by the abrupt mutation of the territory from rural to urban are within the governments, municipalities and global agendas. The challenges faced by the growing urban agglomerations are similar across countries, among some of them are social and economic inequalities growing as fast as their population, danger in prosperity, quality of life and sustainability levels (UN-Habitat, 2016).

Cities in Latin America and the Caribbean remain among the most unequal in the world. *"Given the high urbanization rate in Latin America and the Caribbean, the main social and demographic trends that characterize the region inevitably leave important marks on cities. The context of persistent inequality, informal employment and job insecurity, low social protection coverage and inequitable access to quality services implies that, without adequate investment in public goods and services, social and demographic changes may give rise to urban precariousness" (UN-Habitat, 2016, p. 30).*

To illustrate the inequalities faced by the region the GINI coefficient of 0.5 by 2010 (WRC, 2016) reveals the wide gap that exists between the high income population and the low income inhabitants of Latin American cities one of the major causes of the problematisations faced by cities (FIG 1.4).
Furthermore the inequality and poverty levels are spread over the region, where the concentration of poverty worsens the closer to the center of the region and inequalities are mostly shown in the largest cities. It seems that development and urbanisation have been translated to a mere synonym of low quality standards in Latin America and the Caribbean region (FIG 1.5).



FIG. 1.4 Gini and poverty indicators *(Redrawn from CEDLAS, 2019) The following files contain poverty headcount ratios published by LAC governments, and several individual poverty indicators computed using CEDLAS methodology and international poverty lines: 1.9, 2.5 and 4 dollars a day at 2005 PPP.*



FIG. 1.5 Gini and poverty most vulnerable countries by 2013 *(Own elaboration based in data from CEDLAS)*

"The Latin America and the Caribbean region underwent a rapid transition from rural to urban in less than 40 years (1950–1990) and has reached a phase of urban consolidation, in which the main challenge is no longer to manage the rapid ruraltourban transition, but rather to ensure quality of life and sustainability in cities"(Habitat III Latin America and the Caribbean regional report, 2016, p.9).

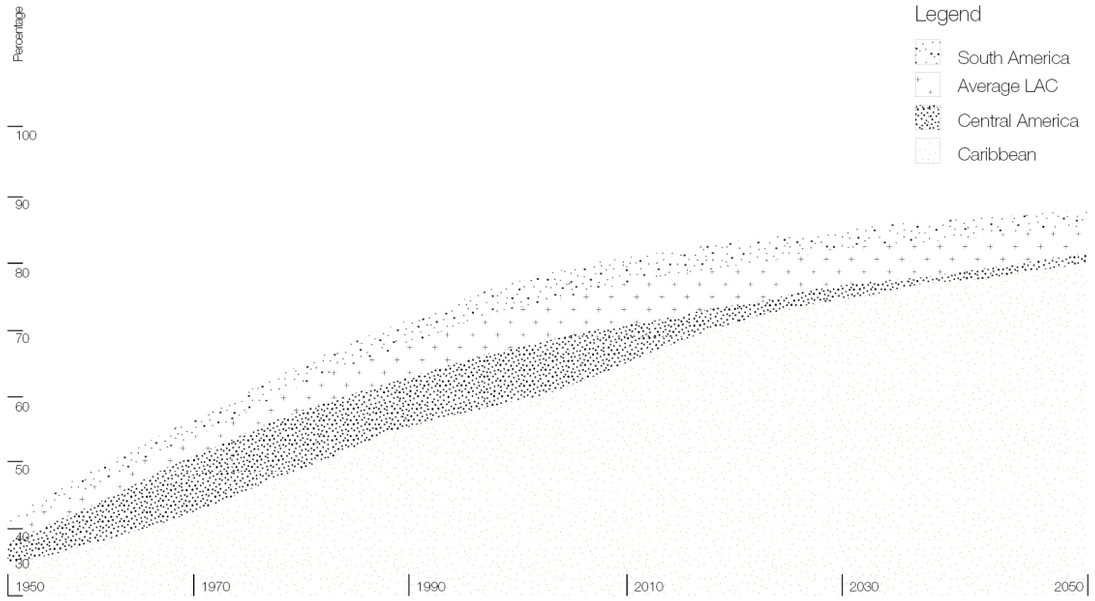


FIG. 1.6 Latin America and the Caribbean: urban population 1950-2050 *(Redrawn from Habitat III Latin America and the Caribbean regional report, 2016, p.9)*

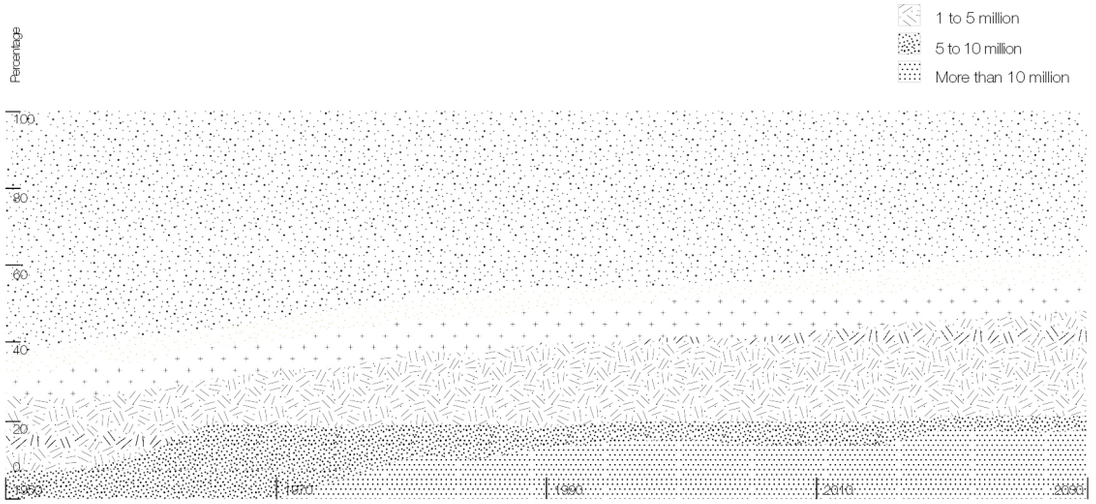


FIG. 1.7 Latin America and the Caribbean: population distribution by city type *(Redrawn from Habitat III Latin America and the Caribbean regional report, 2016, p.10)*

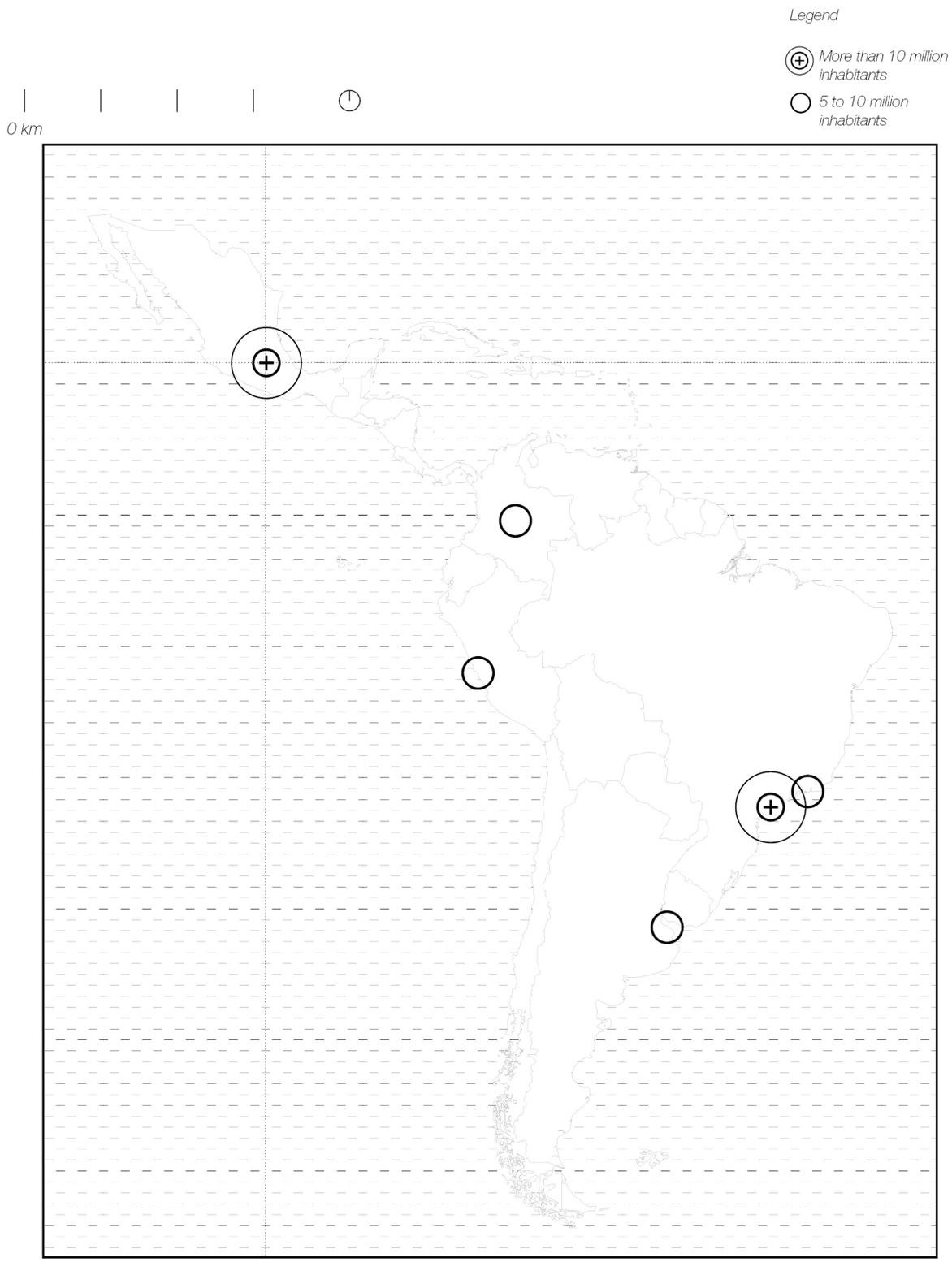


FIG. 1.8 Gini and poverty most vulnerable countries by 2013 *(Own elaboration based in data from CEDLAS)*

Problem Field

Globalization and Neoliberalism in Latin America

In an era of fast globalization and capitalism, cities have been caught up under significant changes in urbanization processes, positioning them as powerful engines of growth (Cohen, 2001). Although for Latin American countries still under “development status” growth has not been only economic, but assimilated and translated into increase levels of poverty, social inequalities, fragmentation, segregation, decentralization and unemployment, all of which were effects of globalization practices and continuous municipal competition and investment attraction. Furthermore, unable to cope with global trends and subjugated by economic growth and strong competition, Latin American countries still under debt crisis (intensified by globalization trends) followed structural reforms in form of readjustment policies as a recommended strategy by global institutions such as the World Bank and the IMF in order to get further loans (Carmona, Burgess, and Badenhorst, 2009, and de Mattos, 2002). This reforms initiated an economic trend characterised by the liberation of the market through subsidies, privatization and international participation, currently what we know as Neoliberalism (de Mattos, 2002). Soon, Neoliberalism started to modify urbanization processes, organization, structure and functionality within Latin American countries. Moreover planning overall changed drastically to cope with neoliberal ideals, fundamentally planning policies were adapted to improve the conditions and productivity of cities enabling the development of markets, privatization, investment, and the decentralization of political administrations (Carmona, Burgess, and Badenhorst, 2009).

The structural transformation of the global economy accelerated the globalization process affecting developing countries. Fast urbanization and expansion, speculation with land value and tenure, unequal development, segregated societies, informal human settlements due to unaffordability of land, and asymmetries between government institutions are some of the radical changes result of this new economic liberation in the developing world. Although changes may seem similar across countries (in Latin America) it is important to mention that there is an undeniable contextualization of the neoliberal movement that revealed endogenous and unique responses on urban developments in each one of them. Hence, beyond globalization, identity and idiosyncrasy within inhabitants of cities triggered different manifestations of urban morphology (IMG 1.2), urban landscapes, and architecture trends (de Mattos, 2002). Until today a holistic strategy capable of dealing with urban asymmetries due to neoliberal and globalization processes has not been reached and probably will never be accomplished. The complexity behind each context makes it impossible to be handled the same way across boundaries, flexibility and adaptability must be critical goals for future urban planning strategies.

ASYMMETRIES OF POWER



IMG. 1.2 Sections of inequality across countries *(Own elaboration with images from wikipedia.com) From left to right: Mexico, Brazi, Argentina, Chile, Peru, Venezuela, Colombia.*

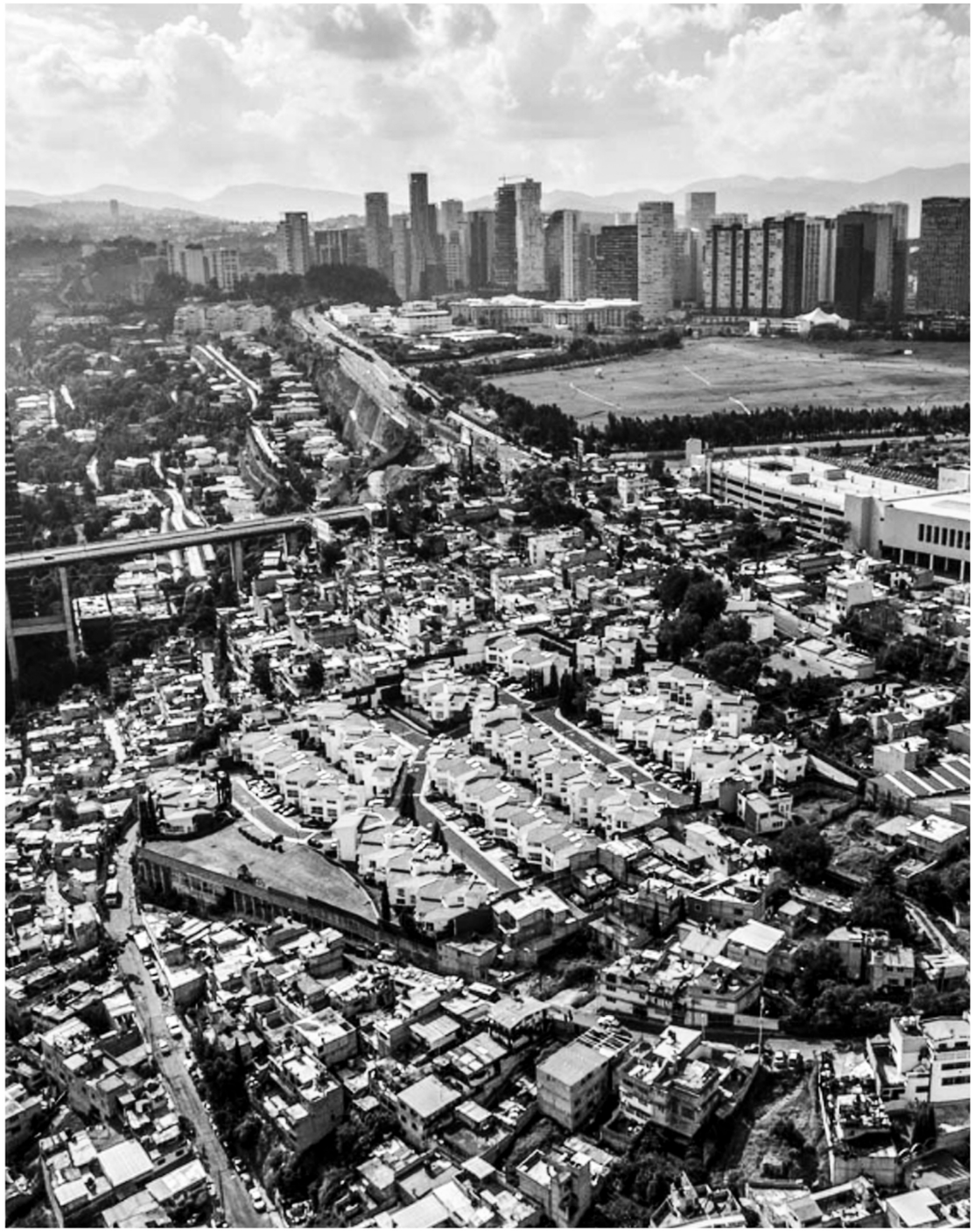
The Emergent Metropolisation Process in Mexico

As many countries in Latin America, Mexico has been heavily affected by globalization, manifesting new economic, social and political configurations that have been transforming the territory at different dimensions and scales. The complexity of the territory was then challenged and increased by the introduction of neoliberalism, ´the central guiding principle of economic thought and management´ (Harvey, 2005) which had an important impact in the urbanization process in the 80´s, leaving behind industrialization as the main economic driver of development towards a new post-industrial era dominated by a market driven economy focused on services, and characterised by international investment and municipal competition, privatization of space, stronger migration and decentralization, and inadequate land management. During the 1980s and 1990s the country undertook deep structural reforms as a way to continue with development and growth, which at the time was stopped due to several factors negative effects in the economy; during this period of time Mexico faced what can be described as one of the worst decades that involved the economy and its society as a whole due to several successive external economic shocks such as the 1982 debt crisis, the 1985 earthquake in Mexico City, and the financial crisis of 1994. Moreover subsequent years also faced economic challenges stressing the capability of the country to continue with its urbanisation; the entry of China into the World Trade Organization in 2001, the bursting of the U.S. stock market bubble in 2001, the global crisis in 2008, and the collapse in oil prices in 2014.

Ubranisation has been a key factor for productivity and economic growth in the country, it allows investment and the development of the economy following the capital model of production and consumption. As such the private sector has played an important role regarding investment and development of strategic projects that have influenced and orchestrated in some regard the growth of the country receiving a great support from municipalities and governmental institutions that from their lack of control and capacity to comply with the demands of its population, their hands were tied. Most of the investments provided by the private sector are focused on the development of infrastructure; specifically water, transport and roads, energy and telecommunications which have been the sectors that account for the majority of the investments in recent years (World Bank SCD, 2018).

In contrast to what can be perceived as a positive and fruitful economy constantly growing due to the investment of public and private partnerships the reality regarding the life of the citizens inside and outside urbanised areas is far from prosper and productive, reflecting the constant inequalities and deficiencies of a system that is focused on the benefit of the high income population with no regard of the most vulnerable people which accounts for a great number of its population (IMG 1.3). The region is under a persistent context of inequality, informality, inaccessibility to job security, inequitable access to quality services and what has been manifested spatially as a segregated and fragmented condition regarding its growth. In short these processes soon started changing the urban development of the country, shaping Mexican cities (and many others) to what we know today, a strong social-segregated and spatial fragmented nation.

ASYMMETRIES OF POWER



IMG. 1.3 Santa Fe Buisness Dristrict *(Source: UNEQUAL SCENES, 2019) The image shows the spatial asymetric relatinship between Santa Fe and informal housing developments.*

Narrowing the Scale of Analysis

The analysis of the problematization will be focused in the Metropolitan Area of the Valley of Mexico (MAVM) which is the primary metropolitan area in the country. But to get an understanding of the scale of the metropolis this section will describe it through the different scales of the territory.

The first scale as explained earlier is Latin America and the Caribbean which belongs to the global south. The country that this thesis project is focusing is Mexico which is one of the countries with higher levels of poverty and inequalities. However the scope of this research will narrow down the analysis to the Metropolitan Area of the Valley of Mexico which is formed by the agglomeration of 3 states; 16 municipalities from Mexico City, 59 Mexico state and 1 from Hidalgo state.
Moreover it will be mentioned in a brief way the new delimited area known as Megalopolis, an agglomeration of several metropolitan areas with the MAVM in the centre, not only location wise but rather in a functional way which has been proven to be monofuntional towards the MAVM area.

To summarize the scales from larger to smaller are: Latin American and the Caribbean, Mexico, the Megalopolis of the centre of Mexico and finally the Metropolitan Area of the Valley of Mexico or as will be named in the rest of this report; MAVM (FIG. 1.9).

Metropolitan Area of the Valley of Mexico (MAVM) is the macro region result of the rapid urbanization in the country's capital; Mexico City. As further will be explained the nature of its expansion and formation it is relevant for the reader to understand that the region is confirmed by 3 estates: Mexico City, Estado de Mexico and Hidalgo. The diagram (SEE DIAGRAMMAMS BLA BLA BLA) illustrates the position and scale of the metropolis compared to the country and the global scale.

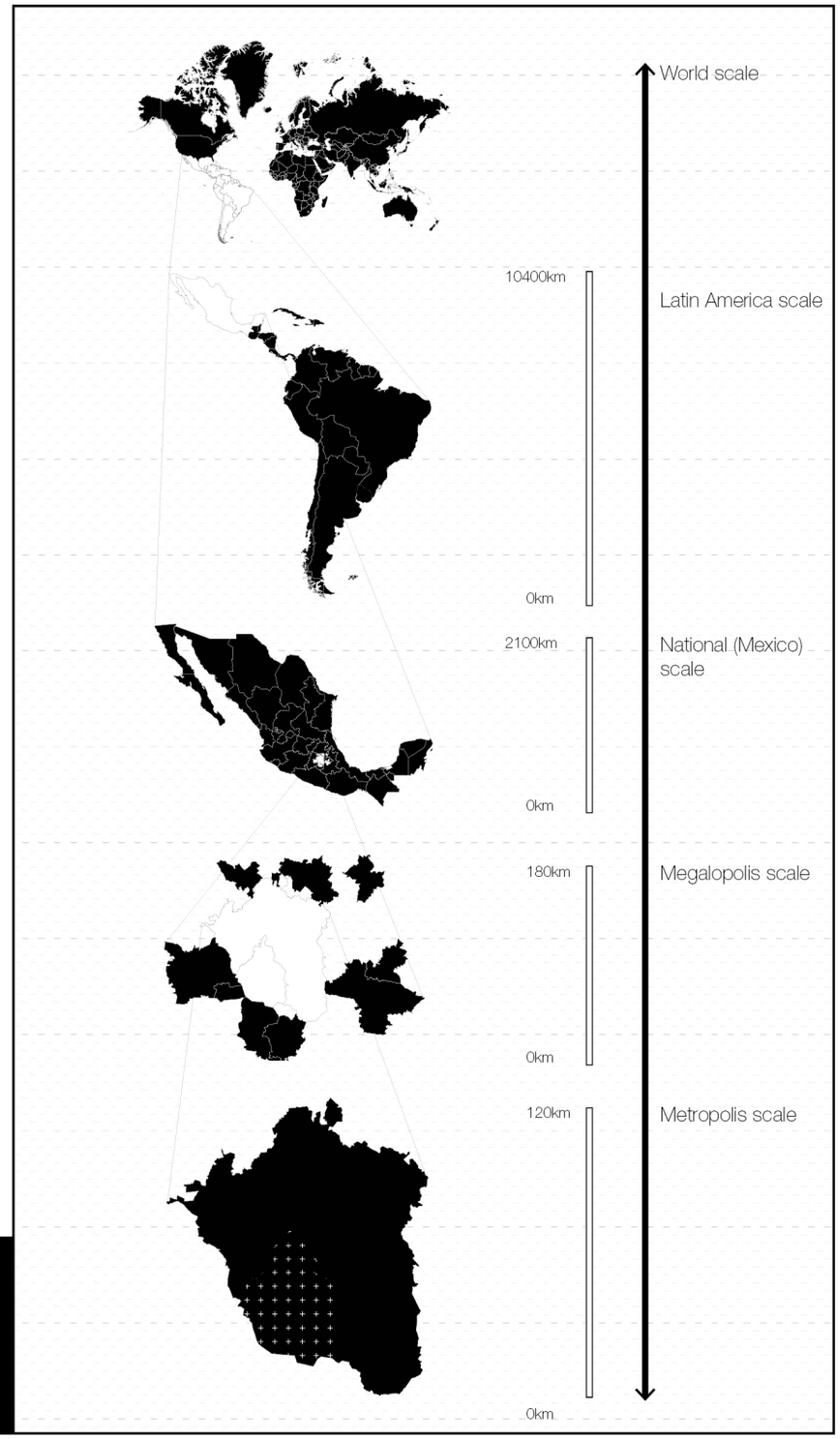


FIG. 1.9 The metropolis through scales *(Own elaboration)*

ASYMMETRIES OF POWER

74 METROPOLITAN AREAS

75.1 MILLION INHABITANTS

62.8% OF TOTAL POPULATION



FIG. 1.10 The 74 Metropolitan areas *(Source: Sedesol, Conapo and INEGI, 2015).*

The Metropolis: Metropolitan Area of the Valley of Mexico (MAVM)

The process of metropolisation in Mexico dates from the 1940´s (Sobrino, 2007) when the introduction of industrialization started transforming the country socially, economically and techno-logically. But it was not until the 70´s that the first attempts for regulating the phenomenon started to appear (Zentella 2005). Nevertheless fast urbanization and growth of cities put high pressure for the municipalities involved, which later were obligated to find solutions, solve conflicts and reach agreements before arranging an appropriate urban governance agenda, a custom practice proof of the lack of robust urban planning, governmental willingness for strategic inter-municipal collaboration and future long-term visions capable of dealing with the metropolisation phenomenon, as a result the search for investment to cope with urban challenges was found with the private sector, which in the long run is more interested in making profit than in making a cohesion within cities, an issue argued by many scholars to be a predominant characteristic of Mexican planning.

Metropolisation as in many countries is mostly characterized by an increasing population, extensive urbanisation and conurbation processes of different urban areas. However, functional or performative variables are often not taken into consideration when studying the emergent agglomerations, making it difficult to settle agreement upon one definition (Connolly, 1999). A more recent study of the urban agglomerations in Mexico was made in 2015 by an effort of different institutions such as INEGI, Sedesol and Conapo (national institutions in charge of statistical analysis, development of methodologies for urban plans and management of the territory) defining a total of 74 metropolitan areas with 417 municipalities involved (Sedesol, Conapo, INEGI, 2015). This metropolitan areas were delimited and defined as the conurbation between two or more political and administrative units resulting 3 different classifications of metropolitan areas: first the centrales (centrals) characterized by locating the main urban city that originates the metropolitan area within the same municipality; secondly two types of exteriores (external), one defined by statistics and functionality towards the central municipality; and the other type defined by federal and local government criteria. (Sedesol, Conapo, INEGI, 2015). In this regard, the Metropolitan area of the Valley of Mexico (FIG. 1.11) conformed by Mexico City (capital of the country) and its 16 municipalities plus an agglomeration of 60 municipalities between 2 states (Estado de Mexico and Hidalgo) was settled as the biggest metropolis with a population of more than 20 million inhabitants (INEGI, 2015), and it is an area characterized by strong economic, social and environmental asymmetries that have grown over the years. Regardless of its major positive impact in the economy of the country the MAVM is also a major challenge functionally and morphologically speaking due to its fast urbanization and the lack of planning instruments to cope with it.

3
STATES
76 MUNICIPALITIES

21267873 MILLION INHABITANTS

235987.29 Ha

MAVM

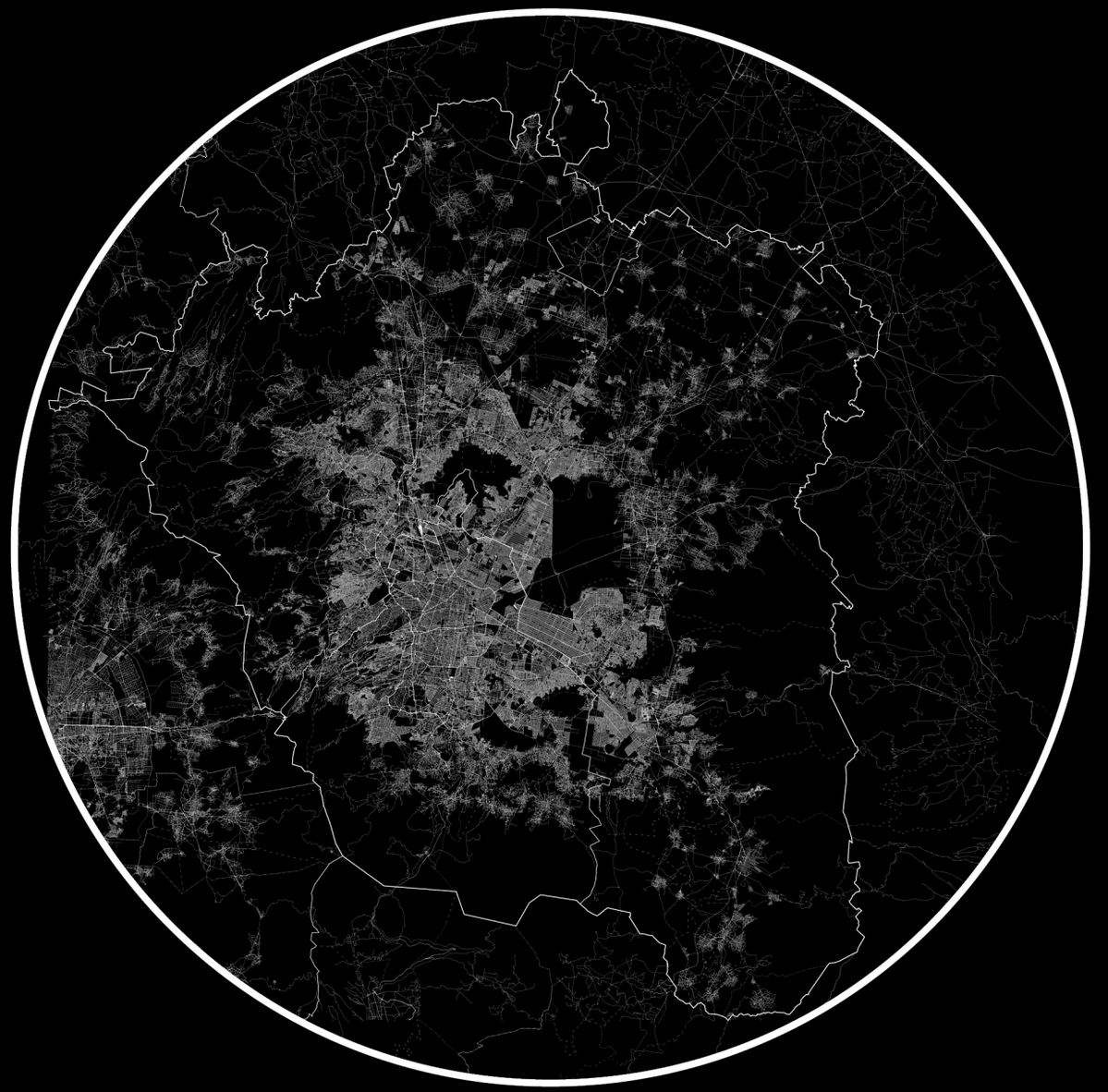


FIG. 1.11 MAVM *(Own elaboration based on data from INEGI, 2015)*

The Megapolis

Since 1996 a new region has been identified and defined as Megalopolis (Ramirez, 2010), a hierarchical system of cities closely structured, and dynamic. The system is formed by a group of metropolitan nodes with different hierarchy and a continuous network flow influencing their urban centers (Sanchez, 2002).
Due to its complexity, it has been difficult for scholars to accurately define it and settle an agreement on the limits of its regional influence. A variety of definitions frequently used are metapolis (Gottman, 1961; Ascher, 1995), megaciudad (Ward, 2004), metarregion (Serrano, 2002), and region centro de Mexico (Graizbord, 1991; Sánchez Almanza, 2002; Serrano,1996). Regardless the particular differences between definitions all of them settle in a central area of hierarchical, functional, cultural, and morphological influence; Mexico City. A magnet of attraction that only in half a decade accomplished to quadruple its size to almost 236,000Ha by 2017 (ONU HABITAT, 2017). This Megalopolis is an structured, functional agglomeration of 9 metropolis areas called Corona Regional del Centro de Mexico (FIG. 1.12) involving 5 different states; Tlaxcala, Hidalgo, Morelos, Puebla, EDOMEX and CDMX. Together the region has a population of nearly 33 million inhabitants (INEGI, 2010), the most populated region of Latin America (IMG. 1.4).



IMG. 1.4 Population density areas *(Source: Two Sides of the Border, 2018)*

3
STATES
225 MUNICIPALITIES

33 MILLION INHABITANTS

11 MILLION CARS

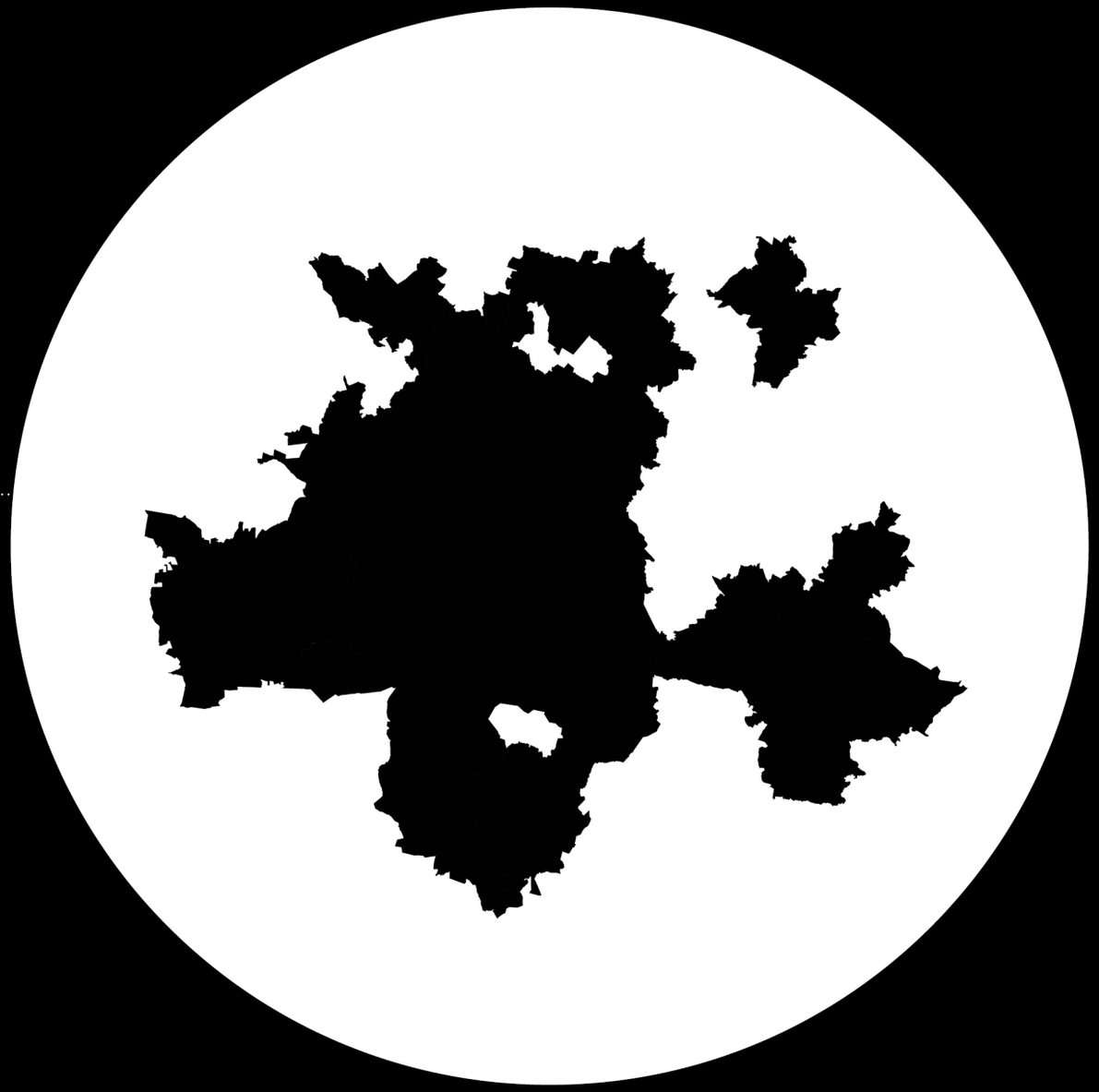


FIG. 1.12 Megalopolis *(Own elaboration based on data from INEGI,*

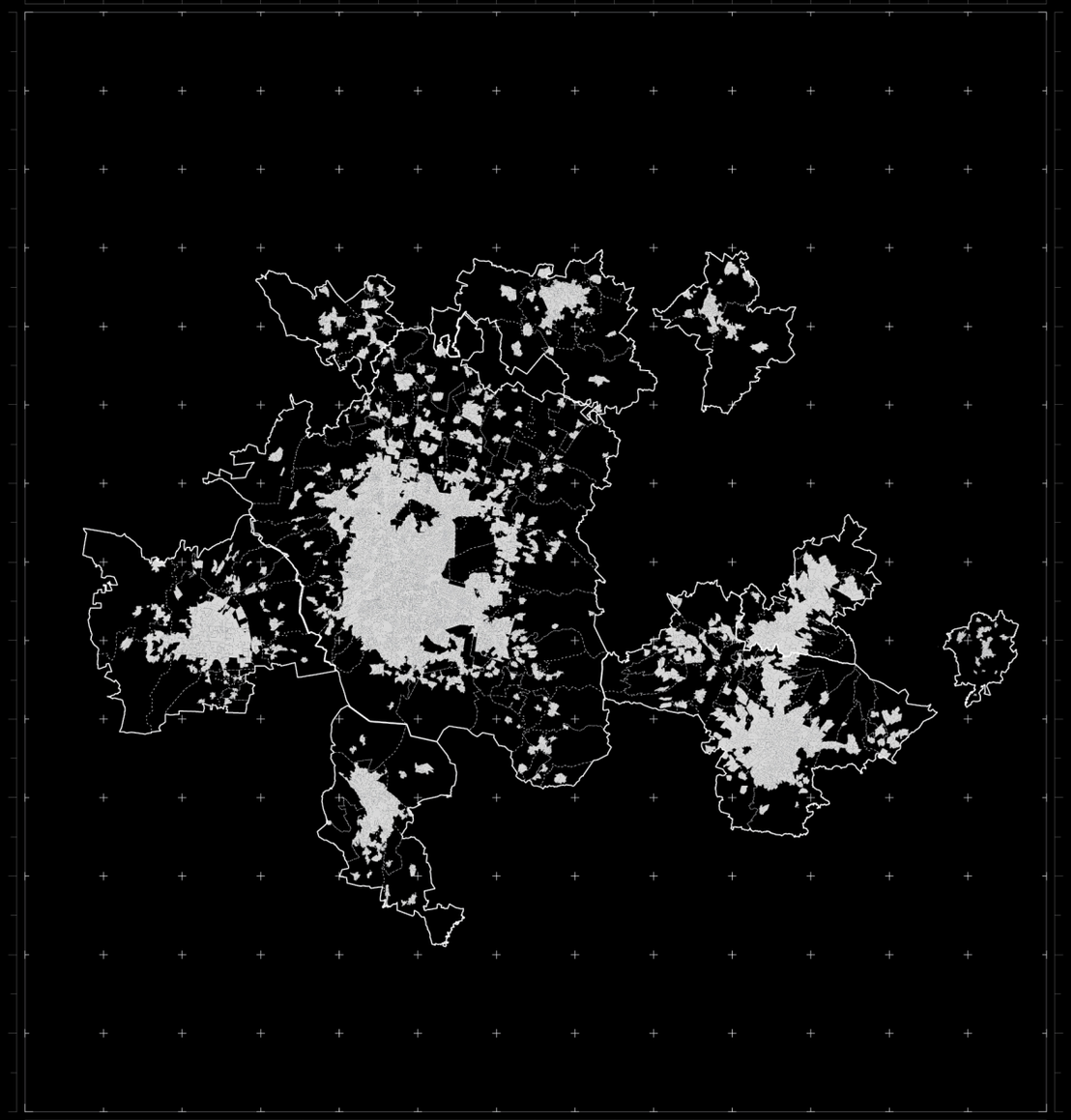


FIG. 1.13 Megalopolis *(Source: INEGI, 2019)*

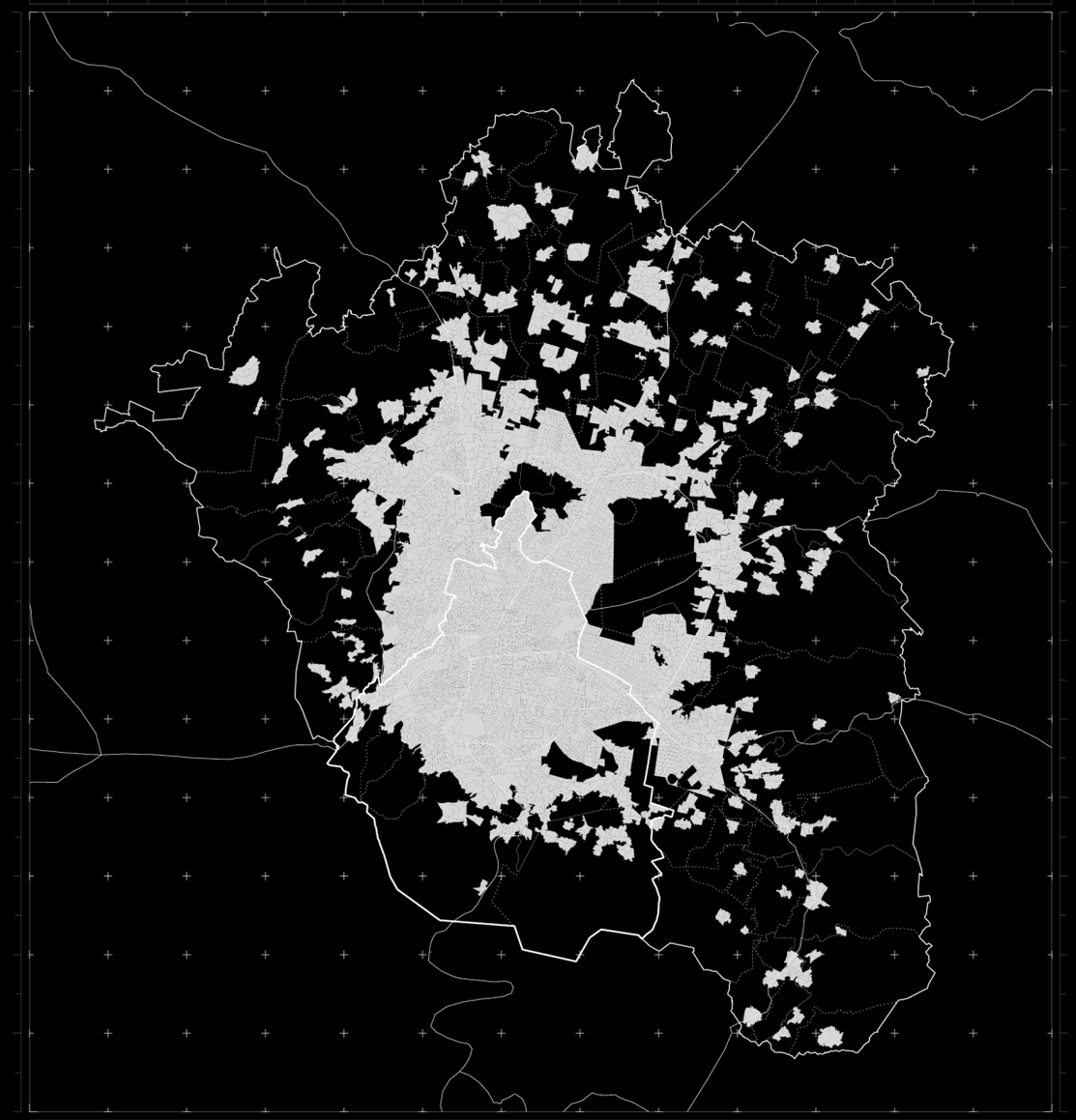
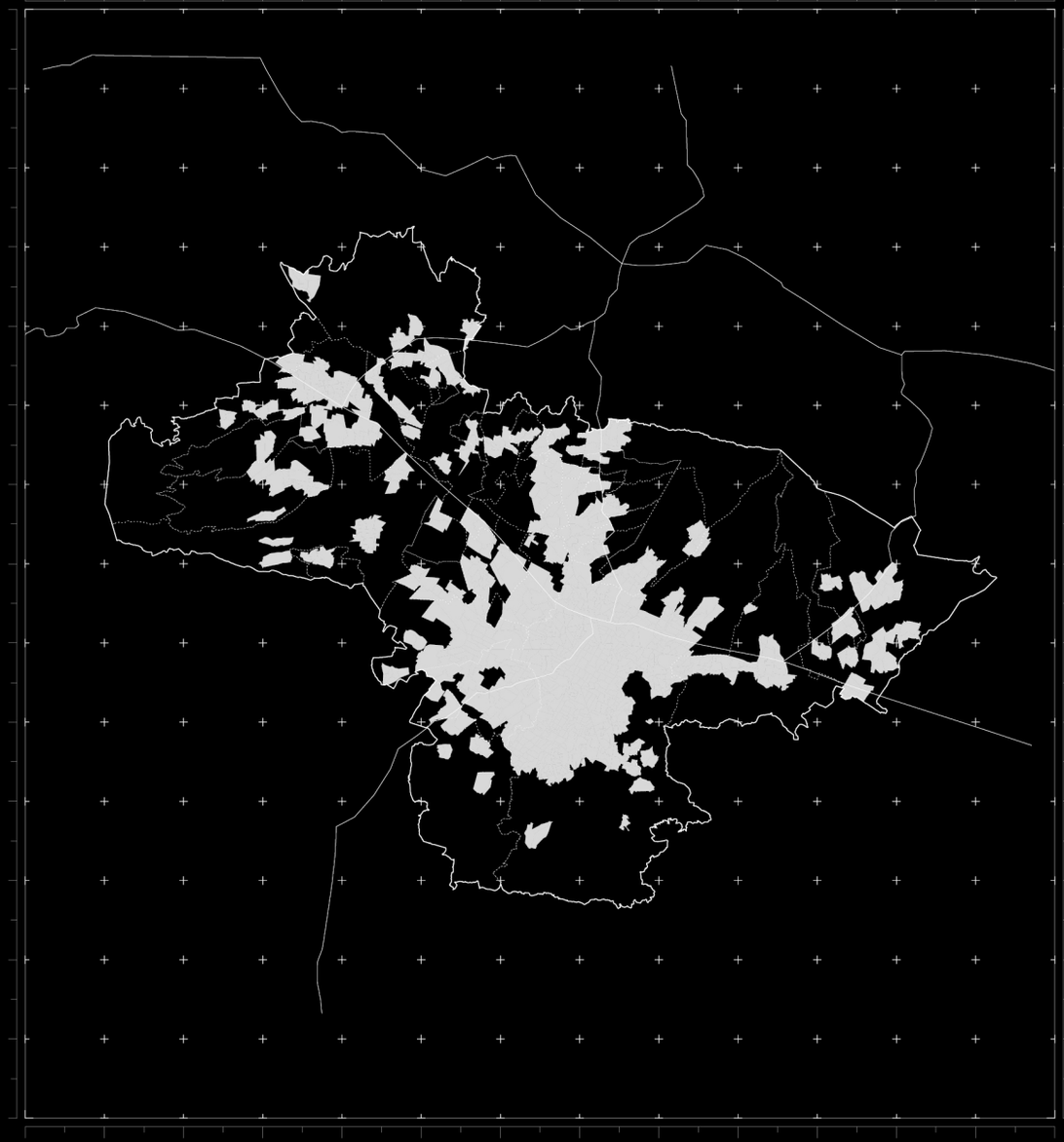


FIG. 1.14 MAVM *(Source: INEGI, 2019)*



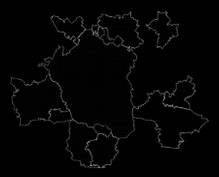
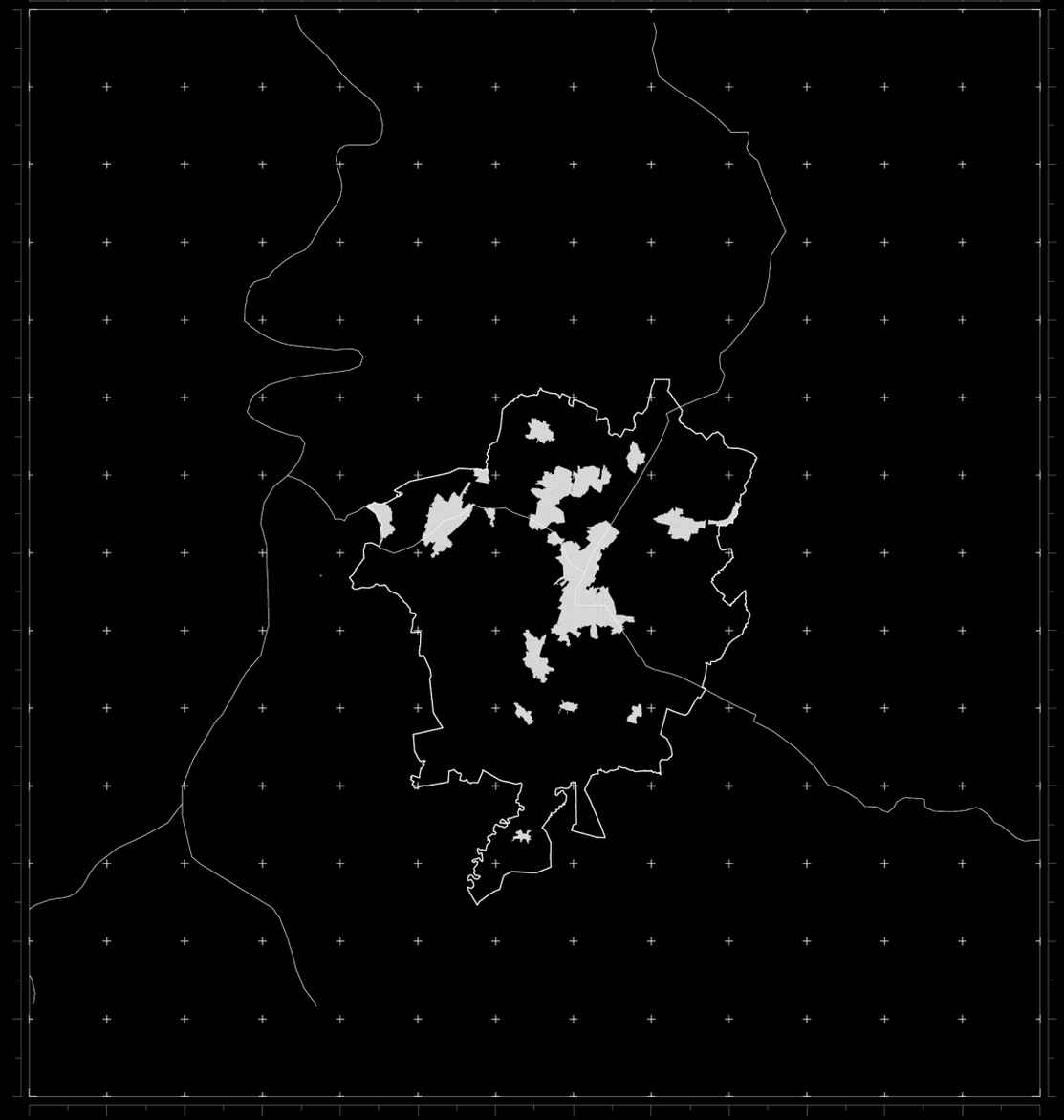


FIG. 1.15 Puebla *(Source: INEGI, 2019)*



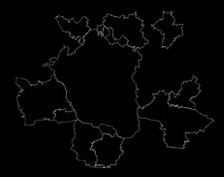
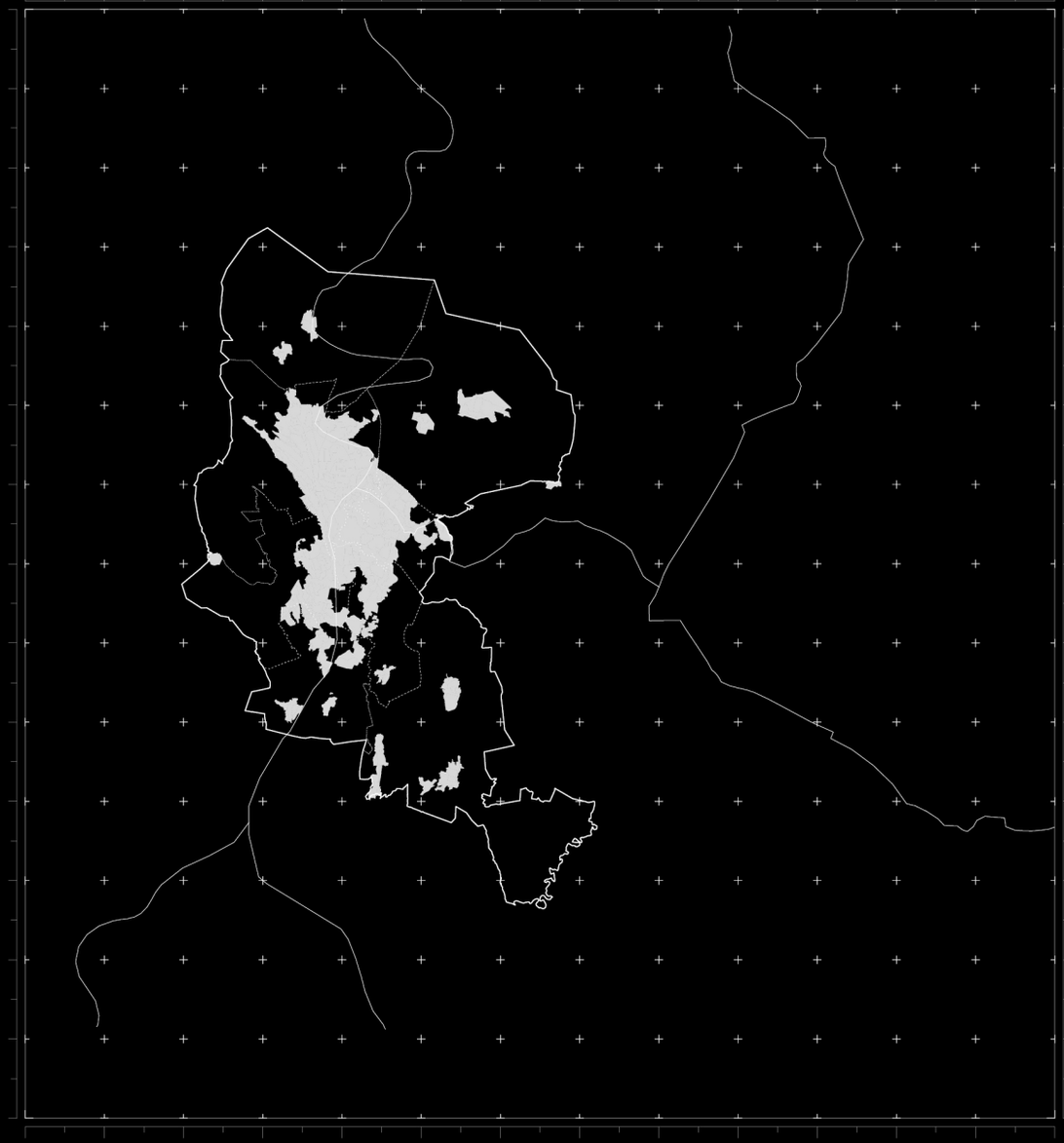


FIG. 1.16 Cuautla *(Source: INEGI, 2019)*



0 km 20 km 40 km

Legend

Main Transport Network Infrastructure

- Metropolitan area boundary
- Municipality boundary
- High way Network
- Urban footprint

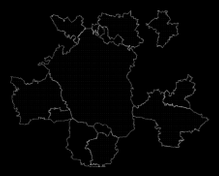
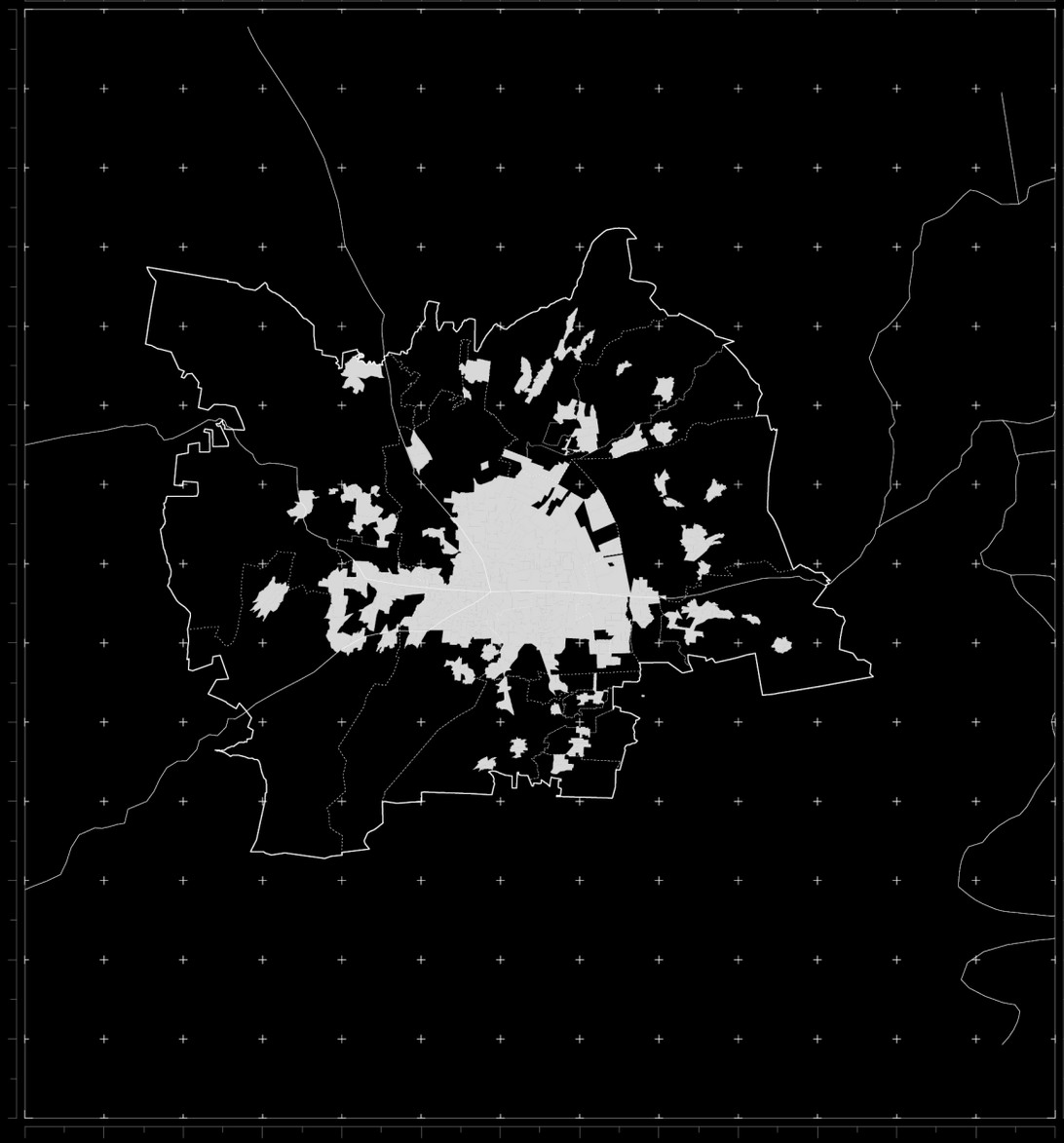


FIG. 1.17 Cuernavaca *(Source: INEGI, 2019)*



0 km 20 km 40 km

Legend

Main Transport Network Infrastructure

- Metropolitan area boundary
- Municipality boundary
- High way Network
- Urban footprint

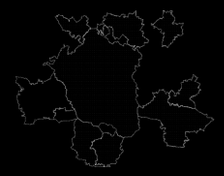


FIG. 1.18 Toluca *(Source: INEGI, 2019)*

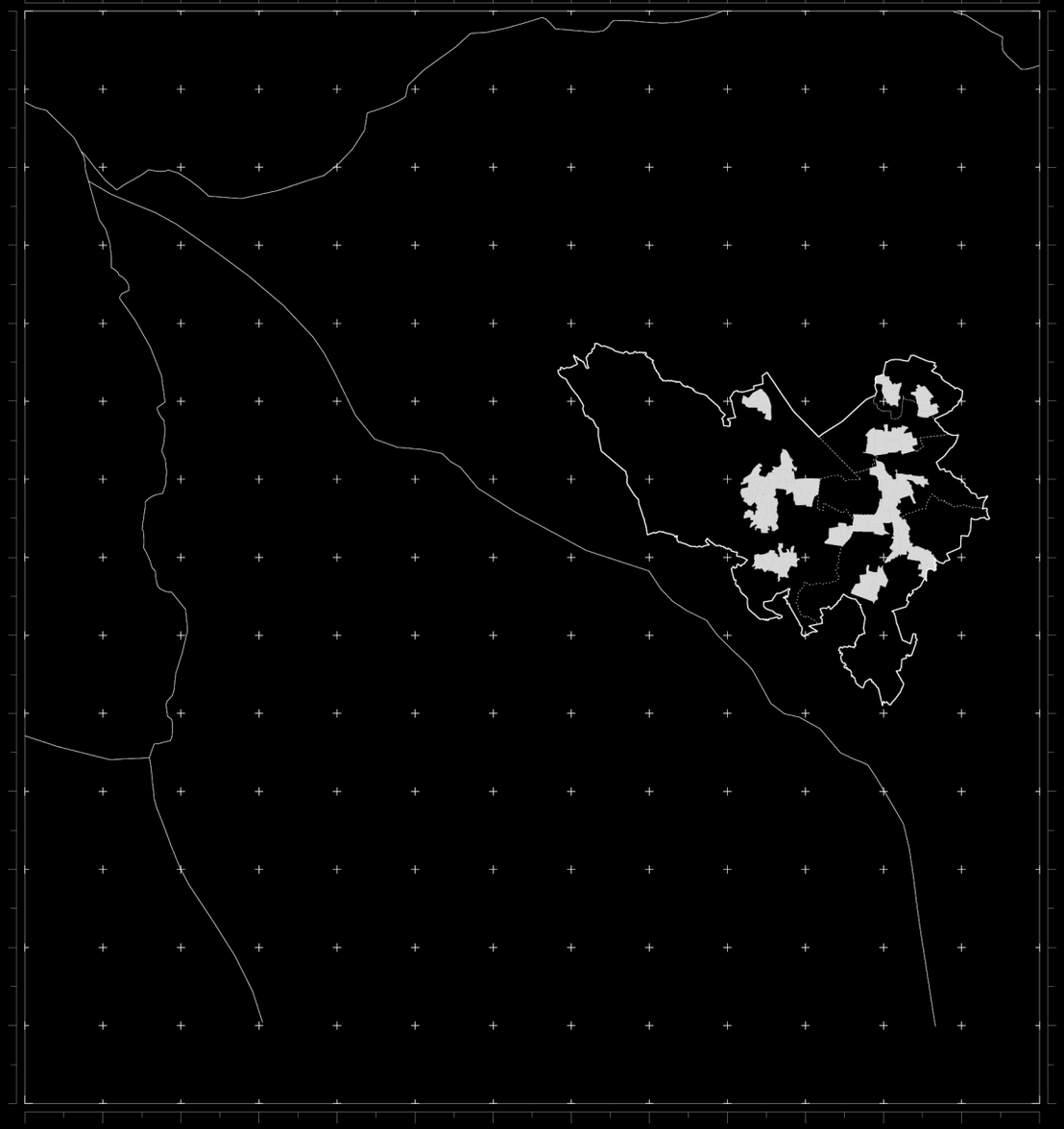


FIG. 1.19 Tula *(Source: INEGI, 2019)*

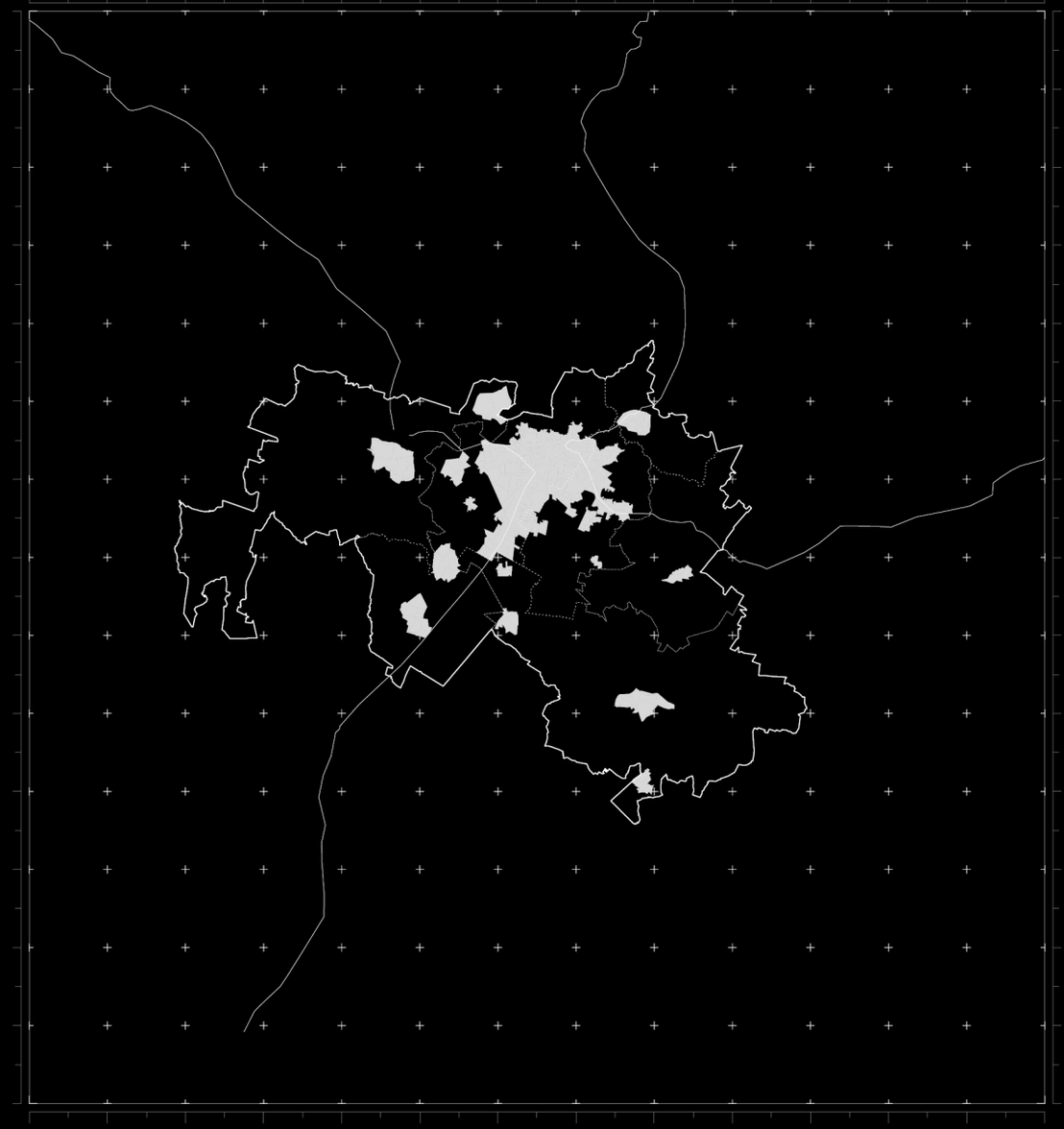


FIG. 1.20 Pachuca *(Source: INEGI, 2019)*

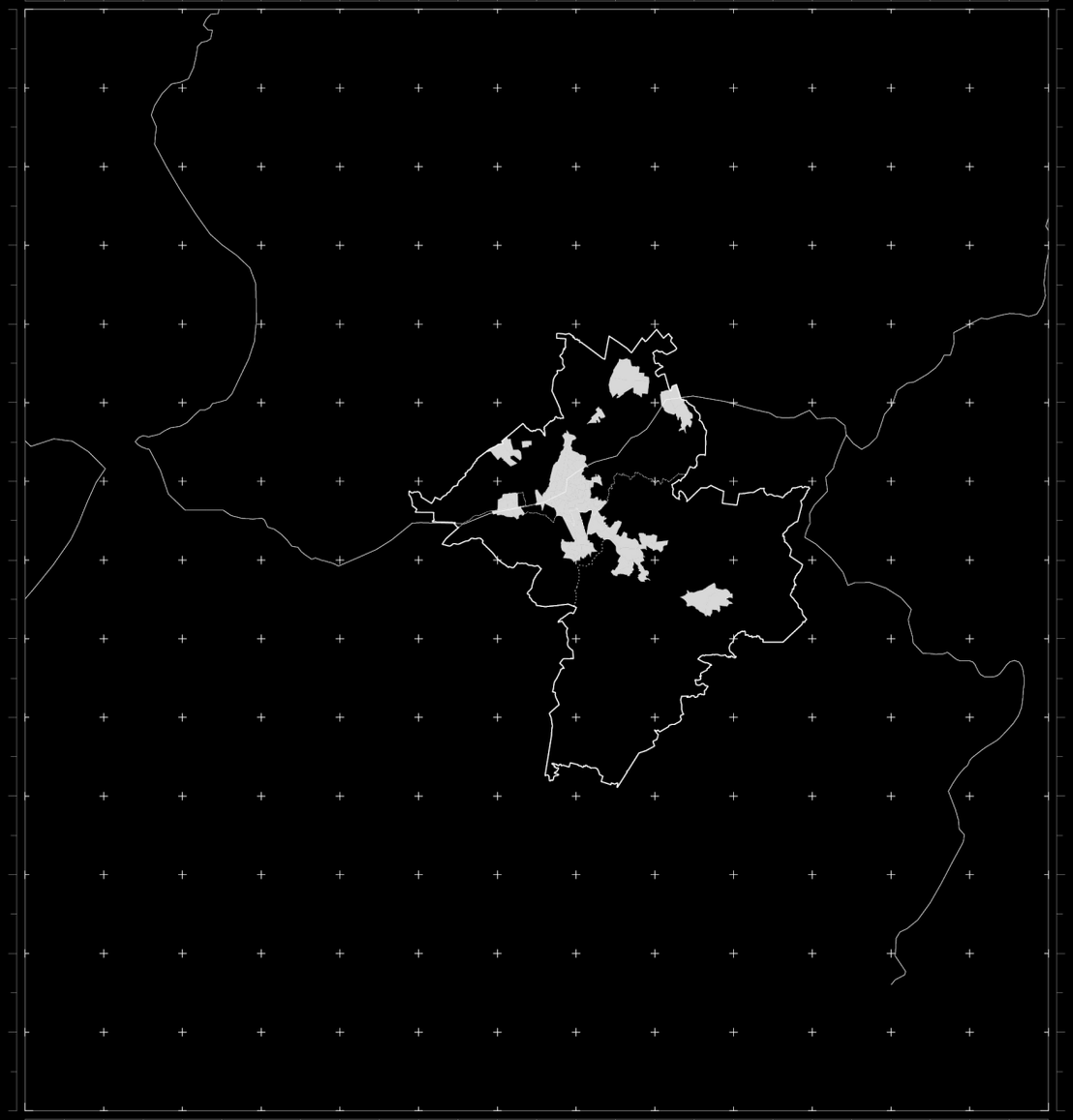


FIG. 1.21 Tulancingo *(Source: INEGI, 2019)*

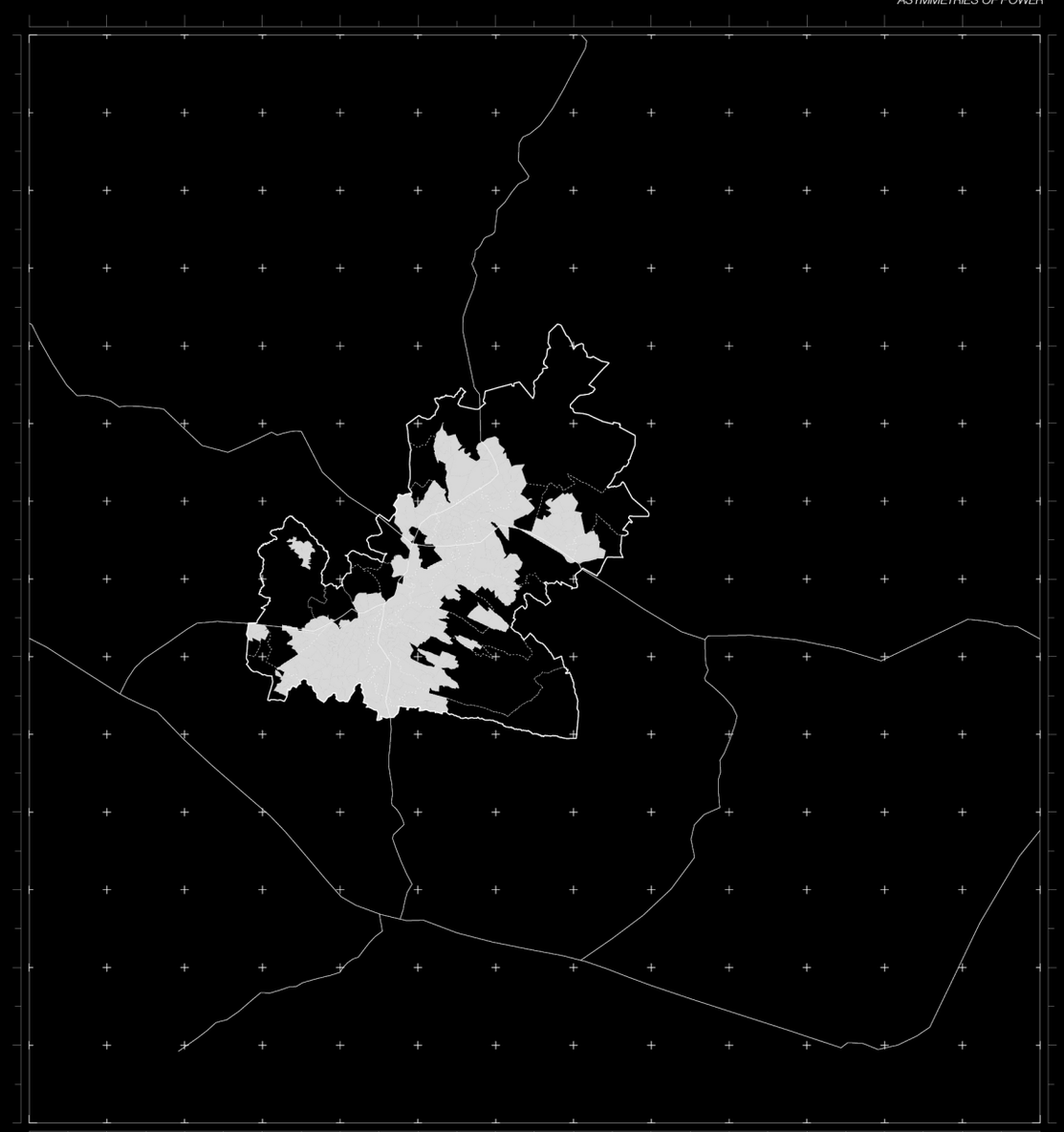


FIG. 1.22 Tlaxcala *(Source: INEGI, 2019)*

Problem Focus

"Urban planning in recent decades has brought about a rise in closed and monofunctional spaces. A trend has been observed whereby many urban centers are becoming depopulated as a result of growing migratory processes from the center to the outskirts of cities. Social housing policies and relatively low land costs have led to the development of residential neighborhoods in the urban periphery in this regard, and have contributed to the socio-spatial segregated condition of its cities. Altogether urban sprawl in Latin America and the Caribbean has grown substantially with varying degrees of intensity across borders, owing among other factors to demographic and income growth; transformation and territorialization of the productive structure; a drop in average household size; public space privatization; higher housing costs; speculation; the desire to live in closed housing estates to protect oneself from real or perceived violence; and poor urban and spatial planning." (UN-Habitat, 2016, p. 14).

Spatial Fragmentation and Social Segregation

A major deployment of the metropolisation process in Mexico and other Latin American cities is socio spatial segregation, which has been the consequence of several factors, such as land market dynamics as a way of speculation of real estate investment, where the private sector dictates prices with the anticipation of best probable use; incentives such as credit and subsidies to locate social housing in peripheral areas outside basic services due to cheaper land prices, and informal land occupancy in places where would be difficult for the government to act upon them, taking advantage of the lack of monitoring and control regarding planning instruments (Sabatini, 2003).
Furthermore, insecurity and privatization of services such as public space has turned the dynamic of mexican cities towards a context which urban landscape is full of closed housing estates, like patches inserted in both high income and low income economic levels, thus reinforcing the segregated condition of the later and strengthening the spatial fragmentation at a local and regional level.

"Segregation can result in disparities in local incomes and, without mechanisms for transferring resources between municipalities, there is a risk of polarizing urban infrastructure, equipment and services standards (ECLAC, 2014). Such polarization is deepened given the lack of policies that regulate the location, coverage, access and continuity of infrastructure, equipment and services according to deficit and demand, users' payment capacity, and a lack of incentives for more substantial private investments (CAF, 2011; ECLAC, 2014)" (UN-Habitat, 2016, p. 38).

Moreover the neighborhoods with the higher levels of basic urban services are often close to neighborhoods with the lowest and most vulnerable urban settlements which do not have the coverage of such services *(IMG. 1.5, 1.6 and 1.7)*. Social cohesion is then threaten by the huge gap between inequalities regarding income, both classes exist in the same spatial location but do not coexist.



IMG. 1.5 Spatial Fragmentation *(Source: UNEQUAL SCENES, 2019)*
Left, low income infromality; right, high income development.

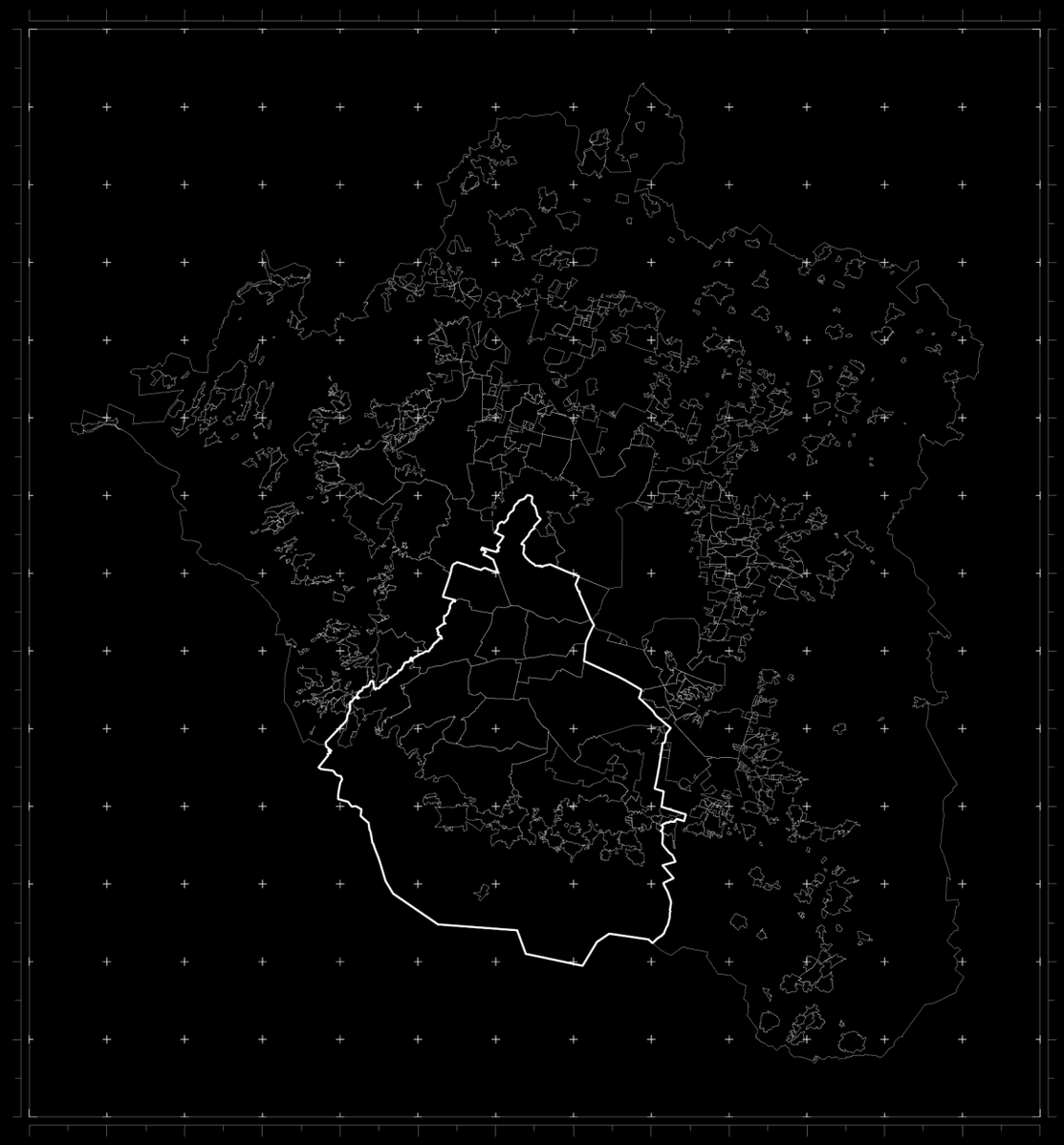
ASYMMETRIES OF POWER

IMG. 1.5 Spatial fragmentation 2 (Source: *UNEQUAL SCENES*, 2019). Left, low income informality; right, high income development.

IMG. 1.7 Spatial fragmentation 3 *(Source: UNEQUAL SCENES, 2019) Left, low income informality; right, high income development.*

2 PROBLEM ANALYSIS

ASYMMETRIES OF POWER



Overview

After the selection of the MAVM as a focus area for analysis of the problematisation this chapter will address the story line perspective of the growth of the metropolis. Several periods of time in history illustrate and depict how the problem grew and worsen during the emergent metropolisation process in Mexico.

The Formation of the MAVM: Urban Growth of Mexico City

In order to describe the growth and different phases of expansion regarding the Metropolitan Area of the Valley of Mexico first the acknowledgment and influence of Mexico City as a start point and trigger of the urban explosion has to be introduced. Mexico City is the capital of the country and has been a world capital since the 1950s, a city that since the 1940 with 1.6 million people has only manifested impressive growth in all of its positive and negative expressions; from economic prosperity, and demographics to social inequalities, high levels of corruption and violence, extreme levels of poverty, overuse of natural resources, pollution health risks and so on.

The capital that by 2019 hosted a population of over 8 million people (more than 20million in the metropolitan area) reflects the different asymmetries of its economy, its population and its natural condition in its urban footprint, the living and still growing vestige of its dynamic and controversial history.
Most of its urban expansion happened in the periphery since industrialization took over the economy, a process that dates since the beginning of the 1940´s (FIG. 2.1) where conditions favored the main cities; Mexico City, Monterrey and Guadalajara to develop as industrialized urban systems. (Eibenschutz, Carrillo, 2011). During the 1950 and 1960 population grew at a fast rate as the effect of massive migration from rural countryside to urban and industrialized cities where job opportunities were on the rise. It is in the 1960 when a phenomenon de-concentration started in the capital city passing the population growth “torch” to its nearest neighbor Estado de Mexico originating the first conurbation between them, hence initiating the process of metropilisation in Mexico City (Unikel et al. 1978)

Together with the population growth the concentration of services in the center and the rise of land affordability obligated the poorest population, generally the working class to settle in the periphery; a growth pattern soon to be recognized as a ´ring growth model´ of development (Unikel et al. 1978). A typical relation center-periphery was then enhanced by lack of land management from government institutions impotent to control the massive overpopulation and growth towards the periphery, an expansion mostly made without regulating tools or appropriate adaptive models, meaning that people settled in land illegally (IMG 2.1). In short, a new informal urbanization contrasted from the regulated formality in the center. Therefore two processes of settlement on urban soil where then recognized in Mexico: the ´formal´ although arguably characterized for compiling with regulations stablished by the government, and the ´informal´ which did not followed the regulatory framework of planning regulations. (Eibenschutz, Carrillo, 2011).



IMG. 2.1 Informal settlements in the periphery *(Source: UNEQUAL SCENES, 2019).*



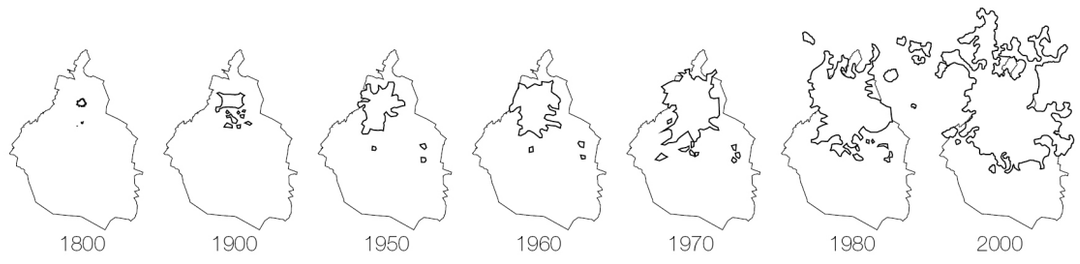
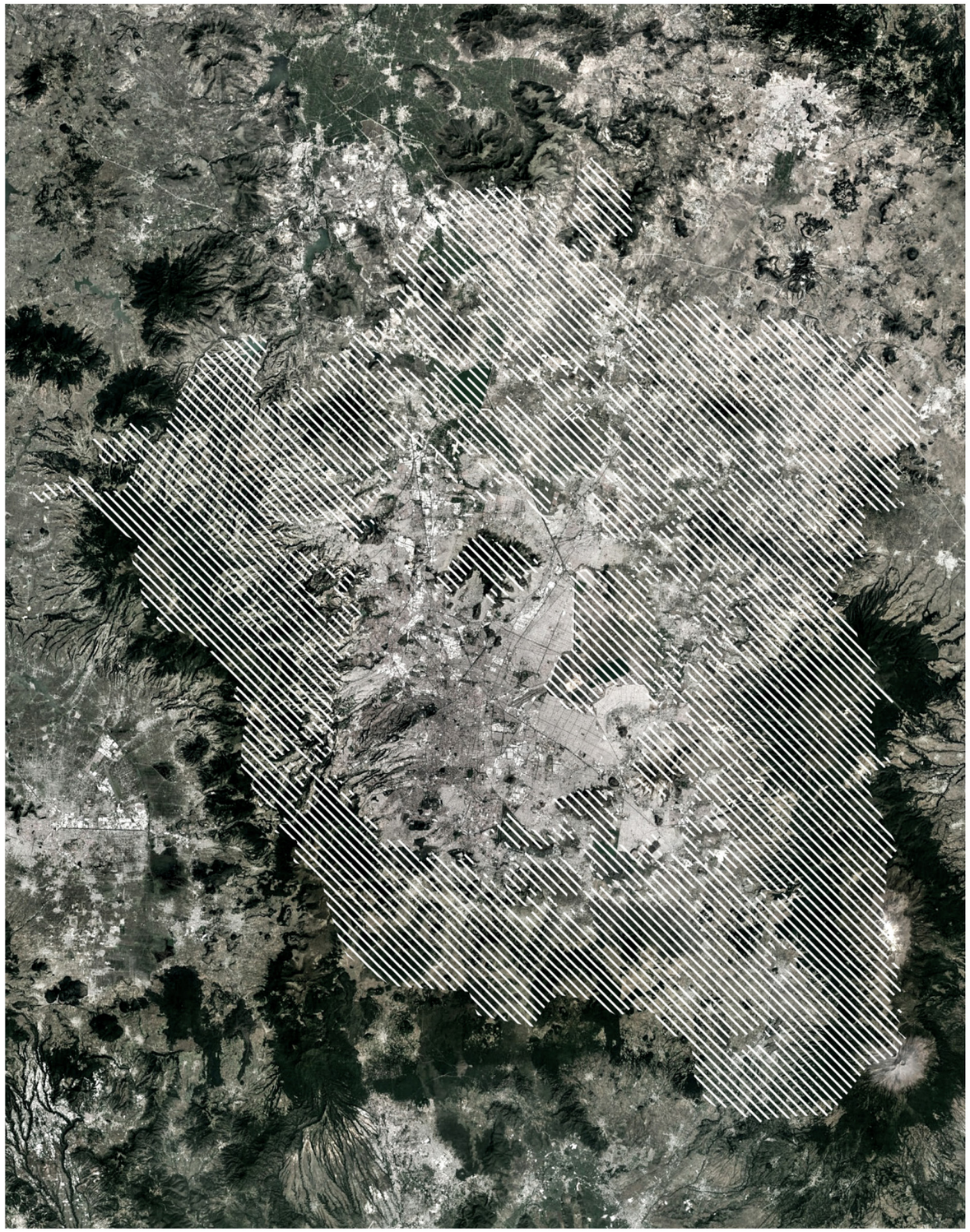


FIG. 2.1 Mexico city’s growth *(Own elaboration) The image shows the Urban growth of Mexico City since 1800 illustrating its expansion which transgressed the municipal boundary*



IMG. 2.2 MAVM satellite view *(Own elaboration with images from google earth) The image shows with a hatch the not urbanized area in the MAVM.*

Urban Planning Regime in Mexico

Urban planning in Mexico has been a process of constant evolution since the beginning of prehispanic civilization. However, under the influence of the Spanish conquest similar patterns of urbanization with other Latin American cities are recognized by the XVI century. According to several studies a historic uniformity is identified in the urban centers in Latin America during the colony after the Spanish conquest (Chaparro, 2009). During this time the European influence in the design of the emergent settlements is clear, most of the patterns recognized are known from its response to Felipe II ´ordenanzas´, an ordering system similar to zoning from characterized by having all the streets joint to a center plaza (with the most important buildings such as churches or royalty and other civil buildings) in a grid system of order (Chaparro, 2009). In this regard ´ordenanzas´ shaped the centers of the Spanish cities in America which were growing and slowly urbanizing following a specific architectural and urbanistic style incorporated in Europe during the first half of XIX century and the beginning of XX century (Chaparro, 2009). During this period urbanism in Latin America followed specific French tendencies initiated by Houssmann as the brain behind the urbanization process in Paris, better known for its long and wide avenues that created perspectives with an icon building at the end.

However, modern urbanism starts in Mexico since the introduction of “Plano Regulador de México” (Regulation plan of Mexico) at the end of the XVIII century with Ignacio Castera (IMG. 2.3 and IMG. 2.4) as the author influenced by neoclassic urbanism characterised by symmetry and order (McMichael, 2002).



IMG. 2.3 Blueprint of bobilissima Ciudad de Mexico. SMGE
(Source: Castera, Ignacio,1776).

ASYMMETRIES OF POWER

IMG. 2.4 Vue panoramique de la ville de Mexico prise depuis un montgolphière *(Source: Casimiro Castro, 1852) The image shows the rational urban morphology of Mexico City during the Spanish conquest.*

1910-1940

During the last two decades of the XIX century and under the dictatorship of Porfirio Diaz, Mexico experienced the first steps towards globalization (Suarez, 2009). Mexico was open for investment and with the railway system underway, industrialization was slowly settling as the main economic activity, influencing not only the economy but the growth of its cities as well. It is in this period of time and the first decade of the XX century when modernity was on the rise. Large-scale public buildings, public transport infrastructure, basic urban services and social equipment were built. The city was growing at a fast rate. Nevertheless, this tendency of new buildings and constant urbanization stopped suddenly after 1910 and between 1920 due to the Mexican Revolution, which put an end to the presidency of Porfirio Días. But it was the post-revolutionary period the one triggering a substantial change for urban planning in Mexico shifting the focus from favoring the elite to acknowledging the middle and lower classes. One of the substantial changes and goals of the revolution was reflected in the 1917 Constitution, where the ownership of the land, more specifically the agricultural land, large estates (haciendas) and ranches, was divided and given to peasants and landless groups in a collective ownership system called ejido (Eibenschutz, Carrillo, 2011).

Moreover, urbanism influenced by the ideas of the last century had led to the formulation of a large number of urban plans based on zoning regulations and the control of the urban expansion and building density (Chaparro, 2009). The first regulatory plan used as tool and graphic instrument that illustrated social and economic activities and its spatial manifestation was introduced by architect Carlos Contreras in the 1920´s (Chaparro, 2009, Sanchez, 2002 and Gortary and Hernandez, 1988). This regulatory plan used ´zoning´ as the control measure and guide for the ordered development and growth of the city based in their specific activities (Sanchez, 2002). But it was until 1933, that Contreras intended to define the future of the city in the “Development Plan for Mexico City 1935-1985”. Within the plan a new perspective oriented in investment and a healthy green city, with parks and electric trains was implemented thus setting the basic infrastructure needed for the upcoming decades (Kozlowski, 2015).

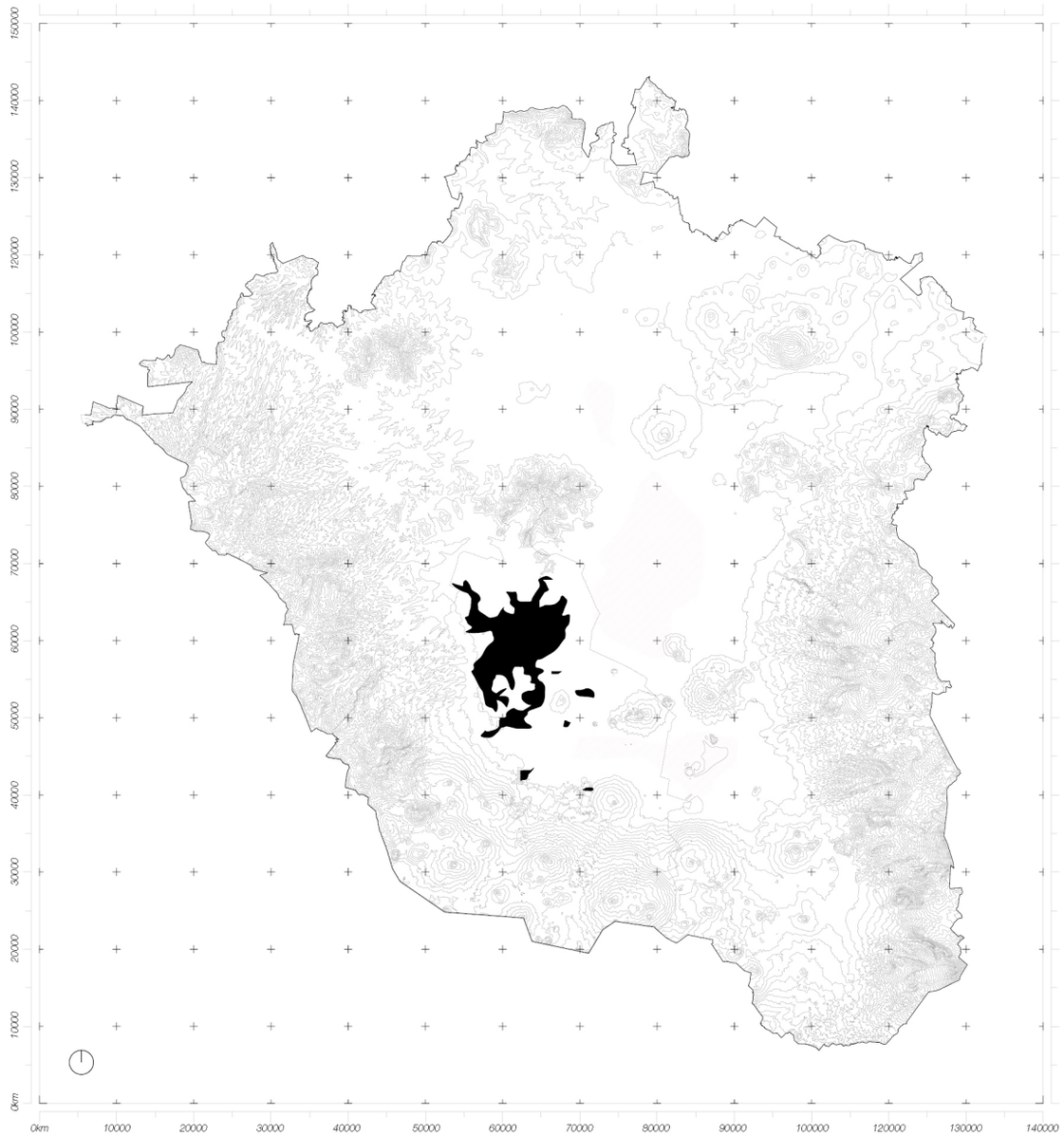


FIG. 2.2 Urban growth until 1940 *(Own elaboration) The image shows the Urban growth of Mexico City until 1940 along with the reduction of water bodies in the area*

1940-1970

The ground for the Mexican Miracle was settled with the Mexican oil expropriation, import-substitution industrialization, the empowering of the labor sector and the massive urban migration (Sohn and Duran, 2011).

"International trade market replaced the dependency on foreign imports while fueling national production, the country gained political strength and capital surplus to massively implement its industrialization" (Kozlowski, 2015 p.37). Industrialisation was the key to urban growth in city, a process that dates since the beginning of the 1940´s where conditions favored the main cities; Mexico City, Monterrey and Guadalajara to develop as industrialised urban systems. At that time the city achieved 40% of the national gross internal product while Monterrey and Guadalajara accounted for 5% and 6% respectively (Eibenschutz, Carrillo, 2011). Government action during these periods was focused on two priorities; first to complete the distribution of land and regulate production in the Mexican countryside, pending from the Mexican revolution, and the second was industrial development (Eibenschutz, Carrillo, 2011).
During the 1950 and 1960 population in Mexico City grew at a fast rate as the effect of massive migration from rural countryside to urban and industrialised cities where job opportunities were on the rise. Industries started concentrating themselves in the north of the city, attracted by the provision of infrastructure, also allowing a relatively compact urban development, due to the fact that the migration settled close to them. It is in the 1960 when a deconcentration phenomenon started in the capital city passing the population growth "torch" to its nearest neighbor Estado de Mexico, originating the first conurbation between them, hence initiating the process of metropolisation in Mexico City (Unikel et al. 1978). This central urbanization dynamic led to the beginning of the MAVM´s formation **(See figure 2).** However, growth coped with a high concentration of services in the center and the rise of land affordability, obligated the poorest population generally the working class to settle illegally in the periphery (FIG. 2.3). This informal character of land occupation recognized as colonias populares introduced a typical center-periphery relation that was then enhanced by lack of land management from government institutions impotent to control the massive overpopulation. Due to the fact that these settlements happened outside regulations, the provision of basic services and infrastructure was a major challenge for governmental institutions. The settlements were usually formed in former ejidos by means of invasion or subdivision and cessions. The later was the only mean through which ejidatarios could sold or subdivided the property. Since the land was given to them to labor it only, no proper land ownership or legal property document was established. Nevertheless the agrarian reform allowed them to establish an urban zone while it wasn't residential in order to improve production processes. Between the cession market and subdivision, the beginning of the speculative market that was soon to be enhanced by neoliberalism policies, started to manifest, thus defining the prevailing model of spatial expansion in the city.
At the time the private sector was taking advantage of the subdivision speculation. By 1946 in an attempt to control the subdivision of ejidal land, the government recognized in a legal character the subdivision with the conditions/constraint that the process was going to be monitored by a specialized board. Nevertheless the board was soon bribed by real estate companies failing their task leaving the government with no other choice but to develop a new law in 1958 enforcing the subdividers to supply the basic services to the land. However this law was the last measure the government could have implemented due to its lack of control over the issue, thus trespassing the responsibility over the developers in order to achieve the minimum standards of living (Kozlowski, 2015). However the response was not the expected and the demands were not complied.

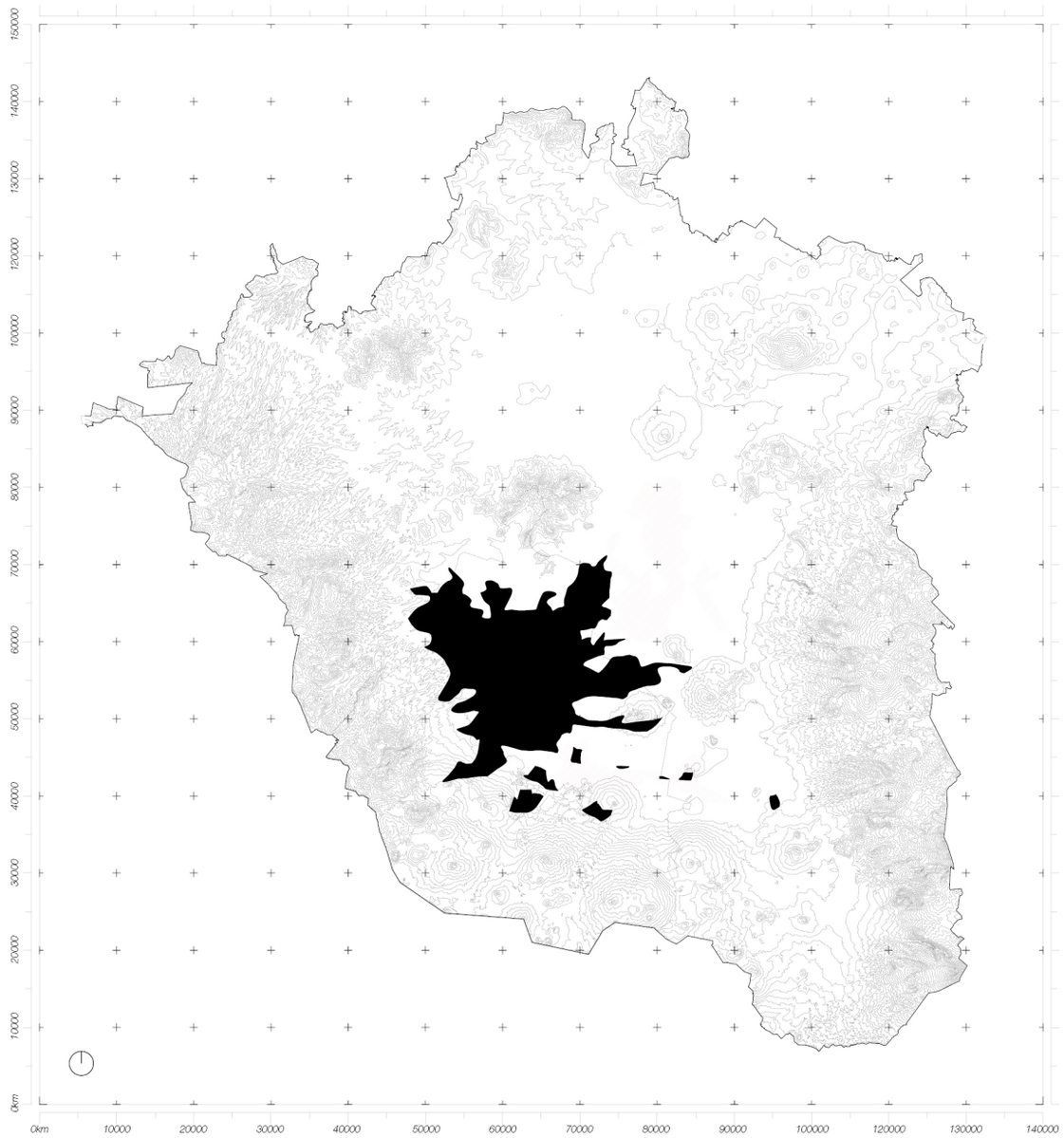


FIG. 2.3 Urban growth until 1970 *(Own elaboration) The image shows the Urban growth of Mexico City until 1970 along with the reduction of water bodies in the area*

1970-1990

Social Housing was then controlled and managed by public institutions which funds were taken from solidary savings made by obligated workers contributions. Of this institutions the largest financing agency was Infonavit; the national funding institute for workers´ housing created in 1972 by the Federal Government, which intentionally would've taken contributions from the high income workers to facilitate credit to the lower income workers. Nevertheless it failed due to internal mechanisms of corruption, enabling the private sector who was in control of the distribution of housing loans to develop their own construction companies, thus taking the commissions of housing development projects. Furthermore in addition to the conditions relating housing construction, the free land market economic model that took place in the 80´s led to the intensification in the speculation of the housing value. The open market allowed investors to buy land at lower prices at the outskirts of the city, fostering periphery developments segregated from basic services and commodities located at the center. Planning mechanisms at the time were unable to control and regulate such expansion due to the new economic model, transforming the aim of Social Housing; from being a political concern towards a mare business strategy able to profit the big winners; the housing developers.

The city was then under high pressure and massive expansion, the reality could not be clearer, a fragmented structure was dominating housing developments, which were walled estates of thousands of houses one after the other as an homogeneous organism with its own order completely different from the general city structure (IMG. 2.4); openness and livability were contested by insecurity, and insecurity was aggravated by the segregation of such developments, that segregated the population spatially and socially. From 1980´s to early 2000´s the footprint expanded almost 30km from the city center consolidating the conurbation with Estado de Mexico thus the formation of the MAVM.



IMG. 2.4 Social Housing *(Source: Jorge Tabaoda) The image shows the housing estates that were dominating the urban expansion.*

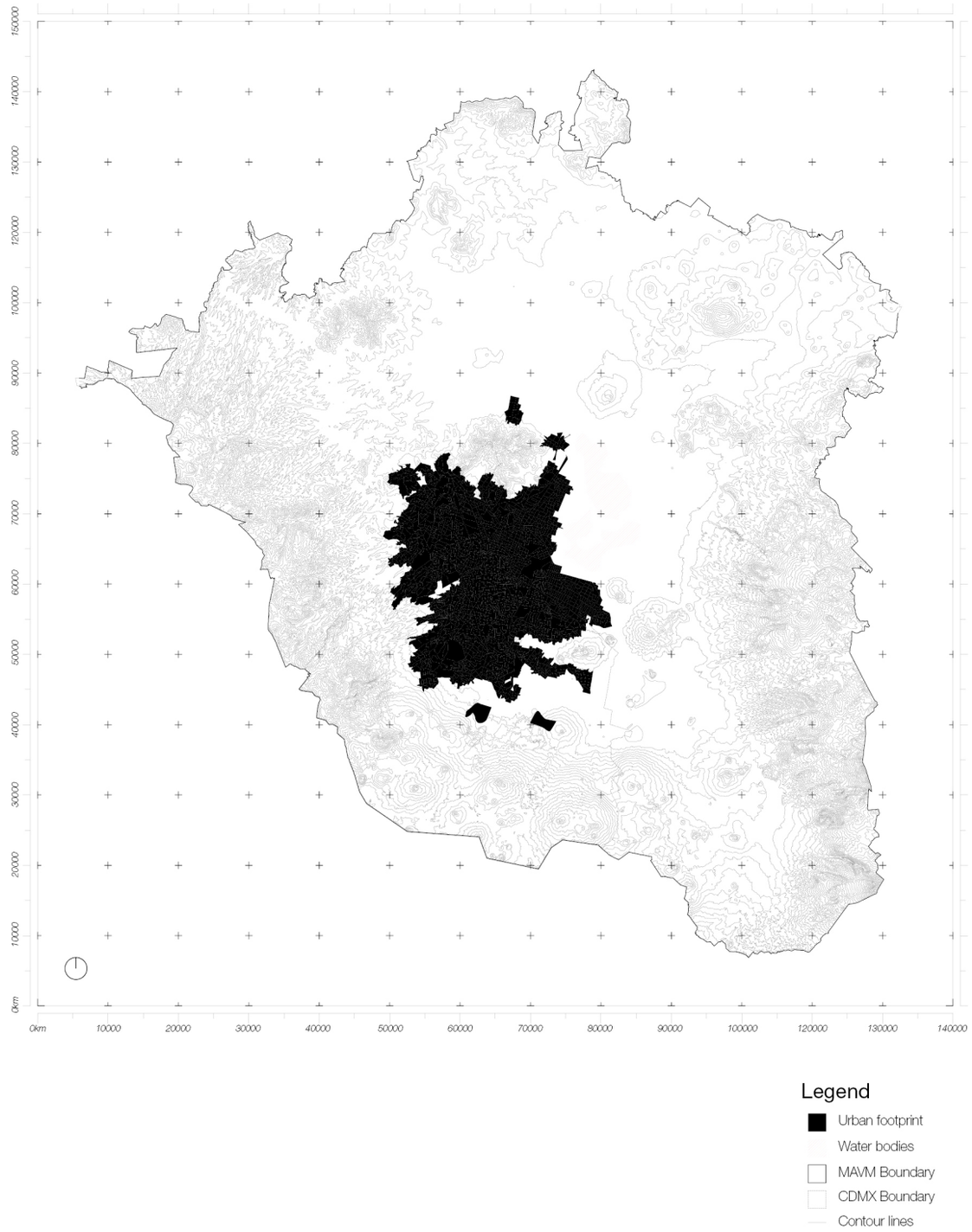


FIG. 2.41 Urban growth until 1990 *(Own elaboration) The image shows the Urban growth of Mexico City until 1990 along with the reduction of water bodies in the area*

1990-2019

The complexity of the territory was then challenged and increased by the introduction of neoliberalism, ´the central guiding principle of economic thought and management´ (Harvey, 2005) which had an important impact in the urbanization process in the 80´s, leaving behind import based industrialization as the main economic driver of development towards a new post-industrial era dominated by a market driven economy focused on services, and characterized by international investment, privatization of space, stronger migration and government decentralization which resulted in inadequate land management, giving more autonomy to private capital. These processes soon started changing the urban development of the country, shaping Mexican cities (and many others) to what we know today (2019). Moreover the dependency in neoliberal agreements worsen after several externalities affected the economic development of the country; the oil crisis in 1982, the earthquake of 1985 (with 20000 deaths and countless physical damages to structures and buildings), the US stock market crash of 1987, pushing it to take structural reforms on trade liberation, taxes, public programs and privatization schemes.

It is important to notice that Neoliberalism is idealized around the notion of the free and democratized subject, (Greenberg et al., 2012) where ownership and private property became the foundation of the system. Both function as symbols of an individual who act as an investor, with mortgages and subsidies allowing the possibility of an imaginary independency from the state (Santoyo O. I., 2014).

Following the idea of owning their own plot and their own house, Mexican citizens developed a new dream, an ideal that allowed them to become part of the economy in an independent way, land tenure and private ownership meant protection from crisis, an investment that in the following years will be consider by citizens as a way to secure themselves, the ideal became the heritage of Mexican people, “a house and an automobile is what every average Mexican dreams of having”.
Under this thinking the consumer potential grew rapidly and private investors and real estate developers benefited from it. Besides the withdrawn of governmental intervention on city planning and the market, cope with the asymmetries of land ownership allowed them to speculate and control the growth of the capital with countless housing estate developments characterized by thousands of single family houses, low density schemes with low quality materials in the periphery where the land could be acquired at the lowest price.

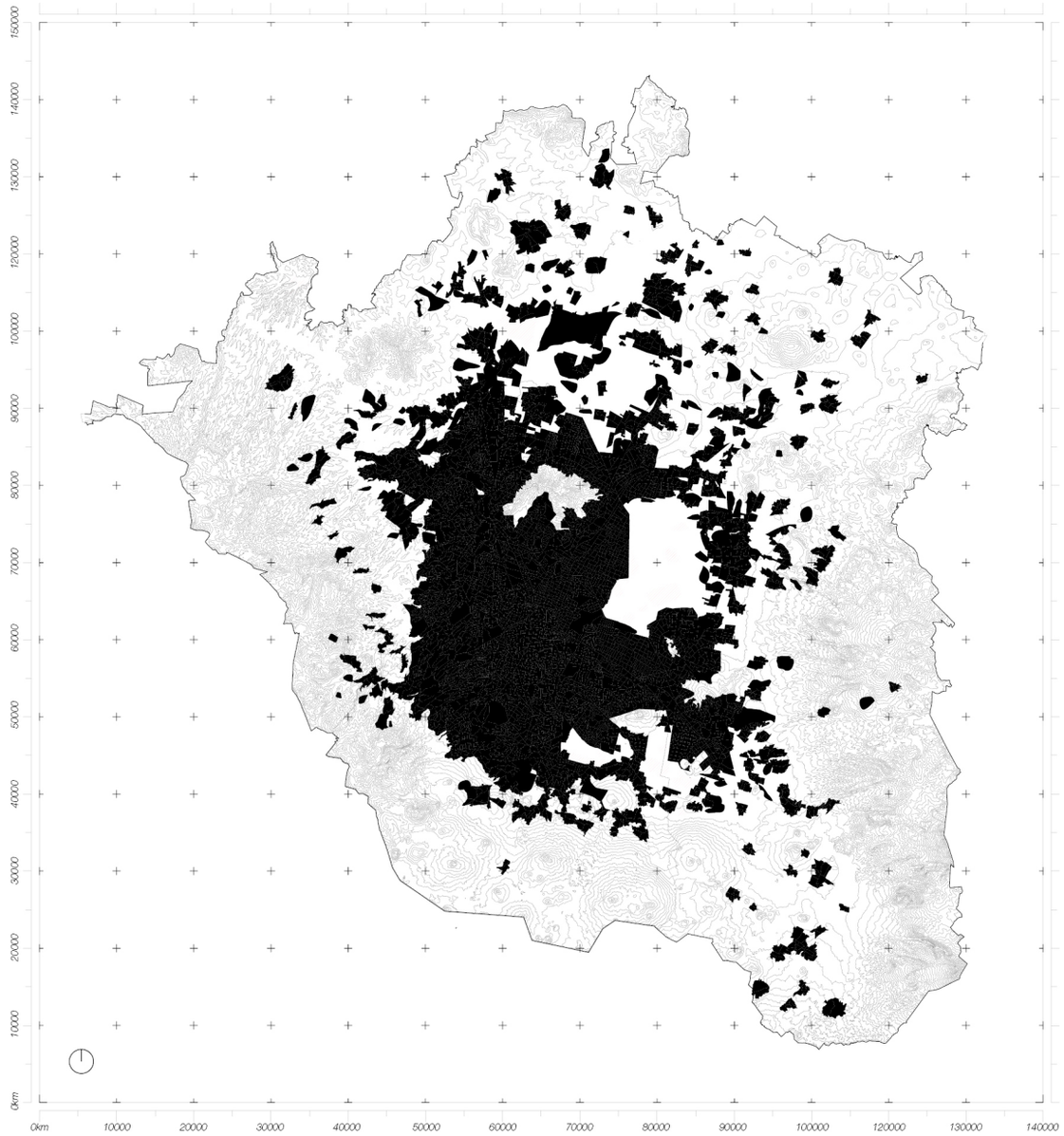


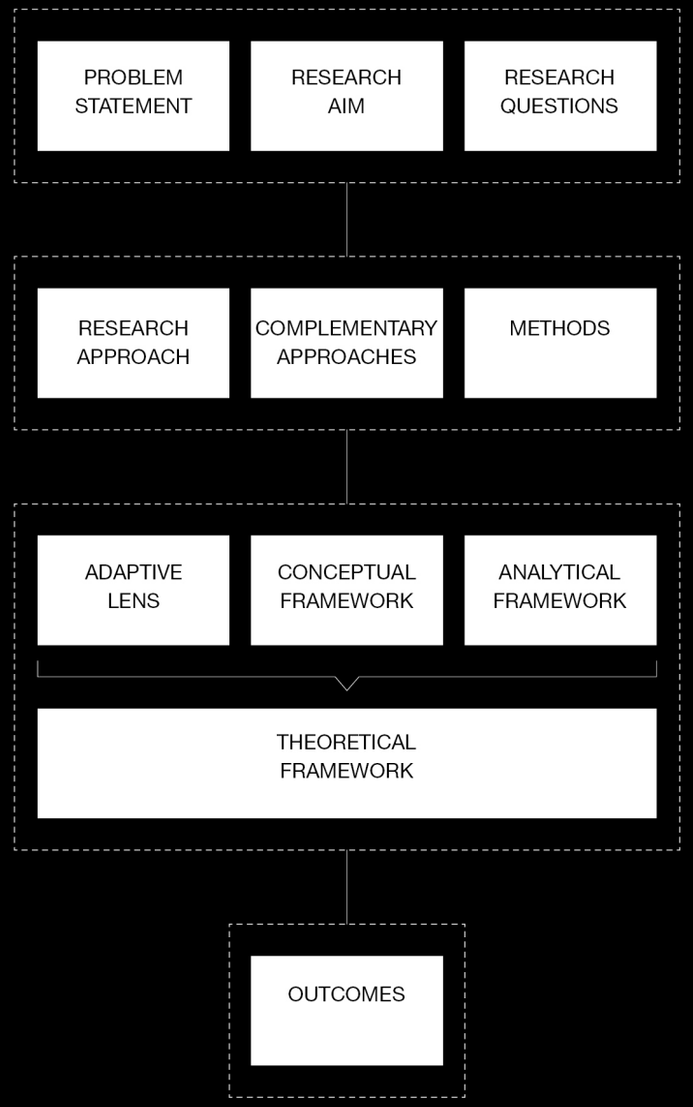
FIG. 2.5 Urban growth until 2019 *(Own elaboration) The image shows the Urban growth of Mexico City until 1990 along with the reduction of water bodies in the area*

ASYMMETRIES OF POWER



IMG. 2.6 Archive: Mexico City at Night *(Source: NASA, International Space Station, 2011) The image shows a birdeye perspective of the MAVM.*

3
METHODOLOGY CHAPTER



Overview

In the following chapter the methodology and foundations of the thesis report will be introduced and explained in detail. The chapter firstly introduces the problematisation and the context where the research is going to be conducted; spatial fragmentation and social segregation in the emergent metropolis system: The MAMV (Metropolitan Area of the Valley of Mexico). Secondly the chapter explains the focus of the problematisation and research questions to further introduce the approach taken by the author to address the project. During the third section the methodology chapter will dive into the overall approach and complementary approaches used to tackle the current condition in the metropolis, furthermore the methods will be explained so the reader understands the process that will be carried during the research.

Problem Statement

Social Segregation and Spatial Fragmentation in the MAVM

The Metropolitan Area of the Valley of Mexico is a clear example of an uncontrolled and unregulated metropolisation process. With more than 21 million inhabitants (INEGI, 2010) and an increasingly peripheral growth, the MAVM has been subject of the diverse governmental, morphological and functional asymmetries.
MAVM has continued growing throughout the peripehery due to lack of affordable land in the center city (Mexico City) where most of the jobs are located, a pattern of its monofunctional concentration. Moreover neoliberal policies have left a speculative territory used as boardgame where housing developers and community land owners ´play´; the game is simple, as long as the future outcome fills their pockets, the city can continue growing non-stop. As such, the peripheral development has been characterized for low density developments regardless of the huge amount of land used for their implementation. The periphery is recognized for irregular-informal settlements and formal settlements specially made for the low income population under a closed-alienated-configuration housign typologies (estates), which portraits themselves as affordable and comfortable but has shown the total opposite. An unsustainable sprawl urbanization that has dominated urban planning in the MAVM, a model of long commutes to job centralities, high costs of infrastructure and living expenses due to long distances and loss of protected land against informality. These are only part of the problem in an assymetric urban metropolis recognized by a small high income west with a huge mass poverty east uncapable of affording a different livestyle under a neoliberal high competitive regime that takes advantage of the fact that under poverty conditions the need for a place to settle most of the times outweigh the comfort of living close to quality infrastructure, job opportunities or public space.
The emergent metropolisation process through which the MAVM has being developed is that of a segregated society in a fragmented space.

The emergent metropolisation process through which the MAVM has being developed is that of a segregated society in a fragmented space.



Figure 1.1:
Spatial fragmentation; left, low income infromality; right, high income development. Source: UNEQUAL SCENES, 2019.

Research Aim

Adaptive Strategic Spatial Planning

The research aim is to twofold, first, understand the drivers behind the emergent metropolisation processes in the metropolitan area of the valley of Mexico (MAVM) by evaluating the different variables involved as cause-effect of the current social segregation and spatial fragmentation. Secondly to explore alternatives for a collaborative inter-municipal planning model that facilitates potential mechanisms and spatial strategies that enable endogenous development capable of reducing social segregation and spatial fragmentation, leading the MAVM towards a spatial just cohesion.

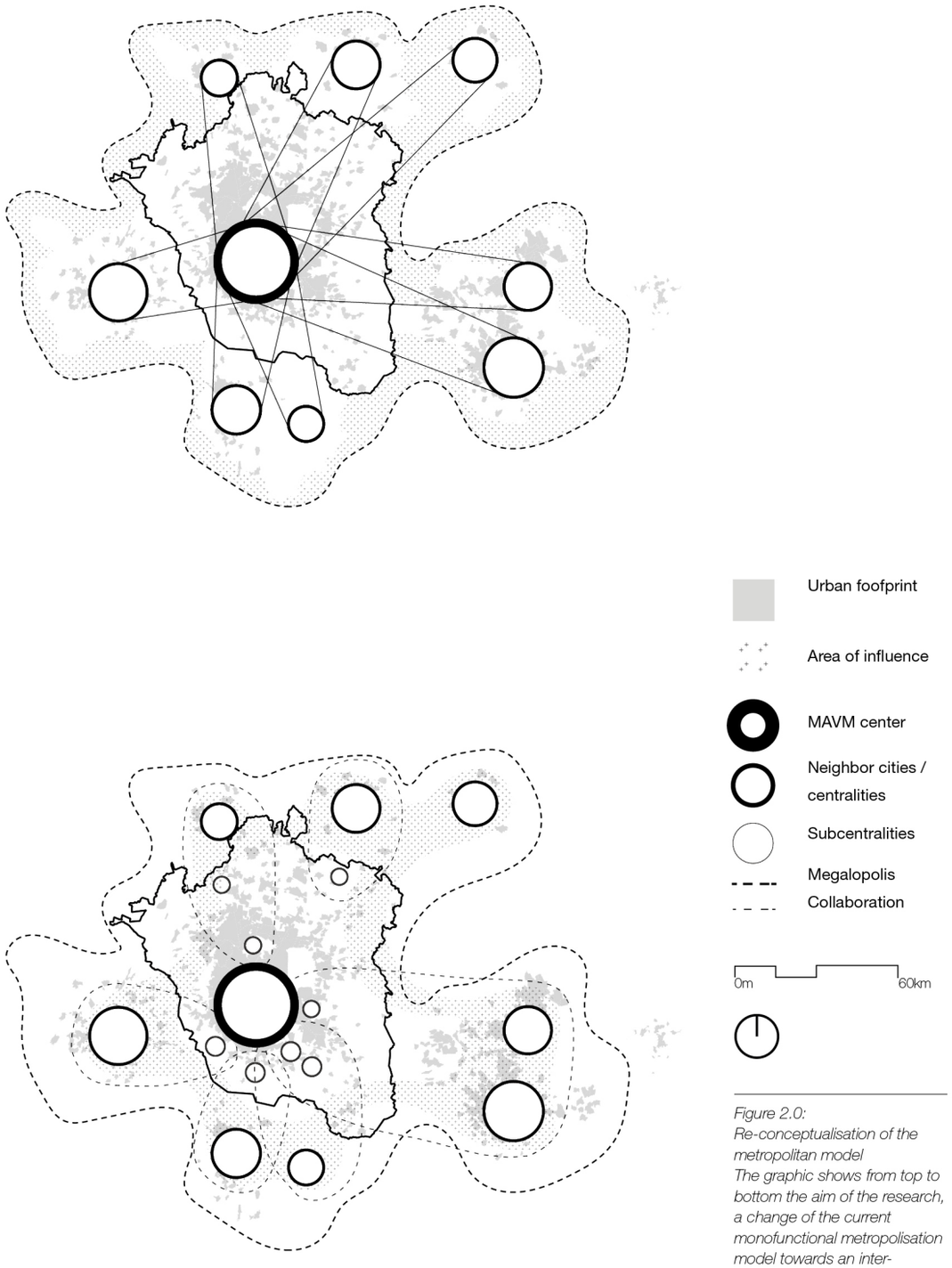


Figure 2.0:
Re-conceptualisation of the metropolitan model
The graphic shows from top to bottom the aim of the research, a change of the current monofunctional metropolisation model towards an inter-municipal collaboration model

Research Questions

Main question:

How can adaptive spatial planning facilitate endogenous urban development capable of reducing social segregation and spatial fragmentation towards a cohesive-just Metropolitan Area of the Valley of Mexico?

RQ

Subresearch question 1:

What are the social and spatial conditions in the MAVM, result of the emergent metropolisation process?

SRQ-1

Subresearch question 2:

How does urban planning and its instruments/tools affect the emergent metropolisation phenomenon in terms of policies, and project implementation?

SRQ-2

Subresearch question 3:

How and where can adaptive spatial planning be implemented in order to reduce social segregation and spatial fragmentation?

SRQ-3

Subresearch question 4:

What are the governance limitations and possibilities for endogenous development in vulnerable areas under a collaborative spatial planning framework?

SRQ-4

Subresearch question 5:

What are the spatial strategies, design principles and tools required for endogenous development capable of reducing social segregation and spatial fragmentation?

SRQ-5

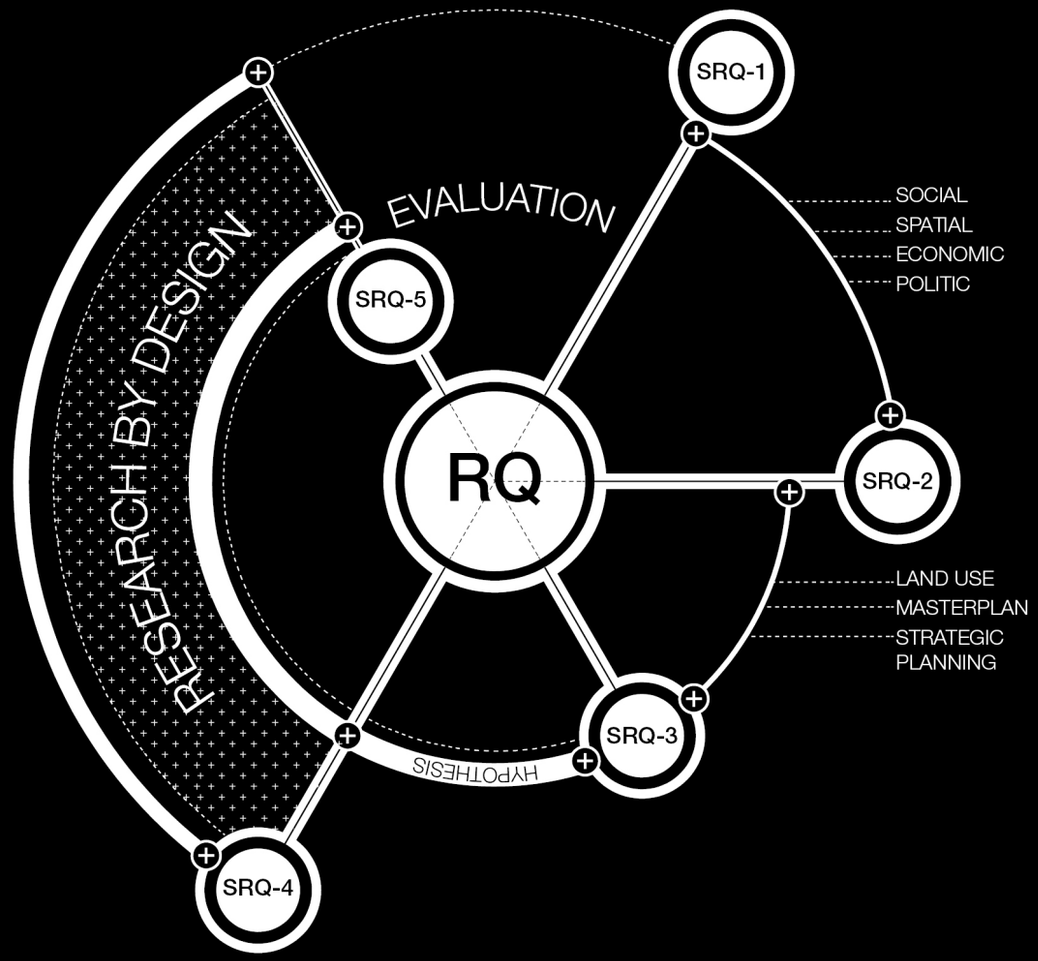


Figure 2.1:
The graphic shows the dynamic behind the main research question and the process through which the sub questions will be answered.

ASYMMETRIES OF POWER

Methodological Flowchart

The Methodological flowchart shows the in a graphic way the process taken by the author from the motivation of the research and the porblematisation to the research approach, methods and outcomes pursued in this thesis report.

Problem Field

Globalisation and Neoliberalism in Mexico

Global Theories

Edward W. Soja

Carlos De Mattos

David Harvey

Jonathan Friedman,

Daniel Kozak

Stephen Graham

Matias Garreton

Emergent Metropolisation

Social Segregation

Spatial Fragmen-tation

Problem Statement

SOCIAL

SPATIAL

Eugenia Negrete, Montejo Jorge A., Blanca Ramirez, Pricila Collony, Perla Fernandez and Sergio Vega , Javier Delgado, Manuel Perlo Cohen Juan Carlos Zantella, Alfonso Iracheta , Felipe de Alba, Carlos M.

Contextualized Theories

Sub-Research Questions

SRQ1 What are the social and spatial conditions in the MAVM, result of the emergent metropolisation process?

SRQ2 How does urban planning and its instruments/tools affect the emergent metropolisation phenomenon in terms of policies, and project implementation?

SRQ3 How and where can inter-municipal collaborative spatial planning be implemented in order to reduce social segregation and spatial fragmentation?

SRQ4 What are the governance, urban functional and urban morpho-logical conditions, limitations and possibilities for endogenous develop-ment in vulnerable areas under a collaborative spatial planning framework?

SRQ5 What are the spatial strategies and design principles and tools required for endogenous development capable of reducing social segregation and spatial fragmentation?

Research Aim

Re-conceptualis-ation of the emergent metropolitan

Adaptive inter-municipal collaborative model

Potential site for adaptation with several multi-scalar interventions

Research Approach

DEDUCTIVE - INDUCTIVE

Scenario making | Layer approach | Strategic large urban projects

Main Research Question

How can inter-munici-pal collaborative spatial planning facilitate endogenous urban development capable of reducing social segregation and spatial fragmentation towards a cohesive-just Metropolitan Area of the Valley of Mexico?

Analytical Framework

Accountability
Operations
Tools
Outcomes

Morphological assesment
Socio-spatial alignment
Density distribution
Urban typologies
Connectivity

Distribution of infrastructure
Concentration of population
Connectivity

Theoretical Framework

Multi-level governance
Cross border planning
Borrowed size cities
Policentricity
Land value capture
Transferable development rights

Morphological transformation and spatial capital
Space density and urban form
Endogenous Development and Co- production

Transit-oriented development
Splintering Urbanism

Methods

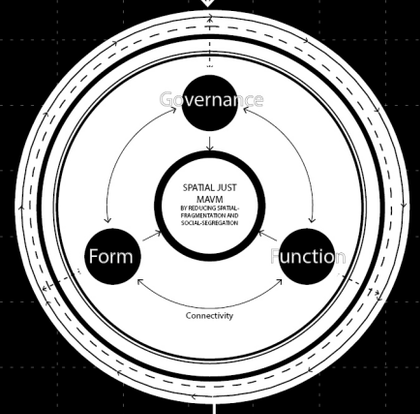
Literature Review	Trascalar Mapping	Test by design
Documentary Analysis	Stakeholder Analysis	
Fieldwork / Interview	Case studies	

Outcomes

Metropolis	Neighborhood	Block	Building
Adaptive spatial strategies for inter-municipal collaboration	Pilot projects in vulnerable areas (centre and periphery) as testing ground for social cohesion		Endogenous typologies for housing and co-production

Governance system and Policies applied across scales

Conceptual Framework



Multi-scalar Analysis

Metropolis Assessment

Systemic goals

Forecasting of systemic goals

V1 - Periphery development
V2 - Park to exterior
V3 - Transport oriented
V4 - Water takes over
V5 - Productive landscapes

Test by Design

Determine scale of intervention

Assessment of selected area

Redefining goals and alignment with first findings

Adaptive framework for change

Research Approach

Inductive - Deductive

This research combines inductive and deductive approaches in order to tackle the complexity of the problematisation of segregation and fragmentation in the emergent metropolis. Due to the size of the MAVM first the deductive approach is applied in order to understand the general conditions and patterns that lead to its vulnerable condition (from general to particular)
Several sites are to be identified by the deductive approach as possibilities to implement the adaptive framework. The case studies will be studied by literature review and field (in-situ) analysis through interviews, and observation of patterns, understanding how the areas function and their possibilities for adaptation. Test by design is the last stage of the deductive approach revealing the capacities embedded in the site.
After the design phase an evaluation phase will be carried out thus the change from deductive to inductive approaches. The results are to be evaluated by adaptive pathways observing and summarizing the local response to the spatial strategies implemented and its capacity to influence the general metropolitan system (from particular to general).
In short, the approach will use both approaches departing from a deductive to an inductive (deductive-inductive) in a first stage to further develop an inductive-deductive so to validate its broader impact.

Deductive approach stages

- Identification of theory (ies)
- Hypothesis
- Test by design
- Evaluation phase

Inductive approach stages

- Observation
- Identification of patterns
- Develop theory

ASYMMETRIES OF POWER

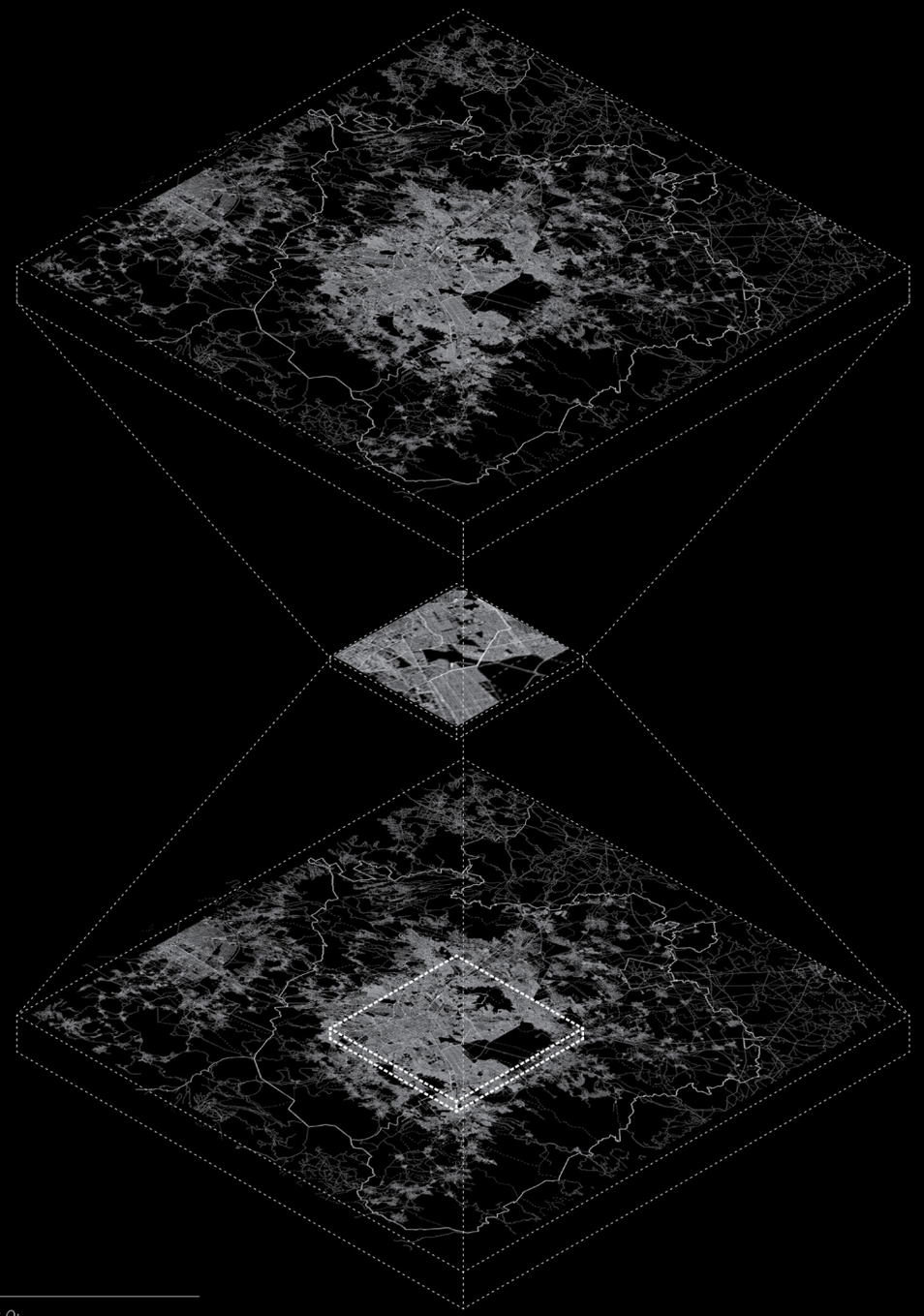


Figure 3.0:
The image shows the approach taken in this research; from deductive to inductive and to inductive to deductive.

Complementary Approaches

a. Scenario Making
b. Layer approach
c. Strategic large urban projects

a. Scenario construction will be use as a complementary design approach where variables previously studied, evaluated and summarized will help the construction of different scenarios capable of dealing with the problematisation of the project. As such, spatial fragmentation and social segregation will be addressed in different ways according to the specific location for the future intervention. Scenarios will respond to some characteristics: Coherency, pertinence, probability, transparency and importance (Durance and Godet, 2010).
Two types of scenarios can be recognized: normative-anticipatory and exploratory-descriptive (Zagare, 2018; Alcamo, 2001; Godet & Durance, 2011; MIDEPLAN, 2005). The first type answers to the question “How do we get there?” this implies that a future goal has to be addressed while the second one answers to a “What if?” question, implying that the scenario must start in the present before arriving to a future.

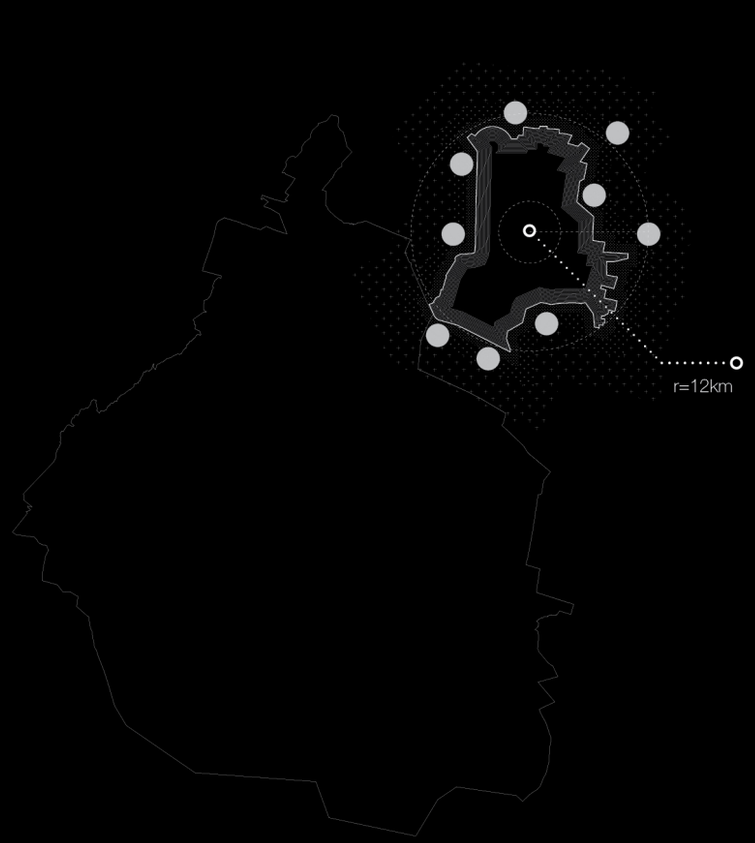


Figure 3.1:
The image shows different sites around a possible future area of intervention in order to answer the question: What if those areas enable local development in order to reduce social segregation and spatial fragmentation.

In short normative departs from a desirable future and descriptive from present conditions to develop future possibilities (Zagare, 2018).
For this research exploratory-descriptive scenarios are the appropriate choice since no future robust plans have been made in the MAVM. This scenarios will allow to test and reveal possibilities for interventions in the short term and long term, thus achieving the desirable outcomes of the research, reducing spatial fragmentation and social segregation in vulnerable areas.

b. The layer approach is an integrated perspective and tool that enables urban planning to analyze territories in constant change by considering and linking the different spatial layers that conform it (Zagare, 2018). 2009). “The approach distinguishes three layers in the spatial organization of territory: the substratum layer (also called the environment or base layer), the network layer, and the occupation layer (De Hoog et al., 1998, p.78; Pols et al., 2015b, p. 51)” (Zagare, 2018 p.62).

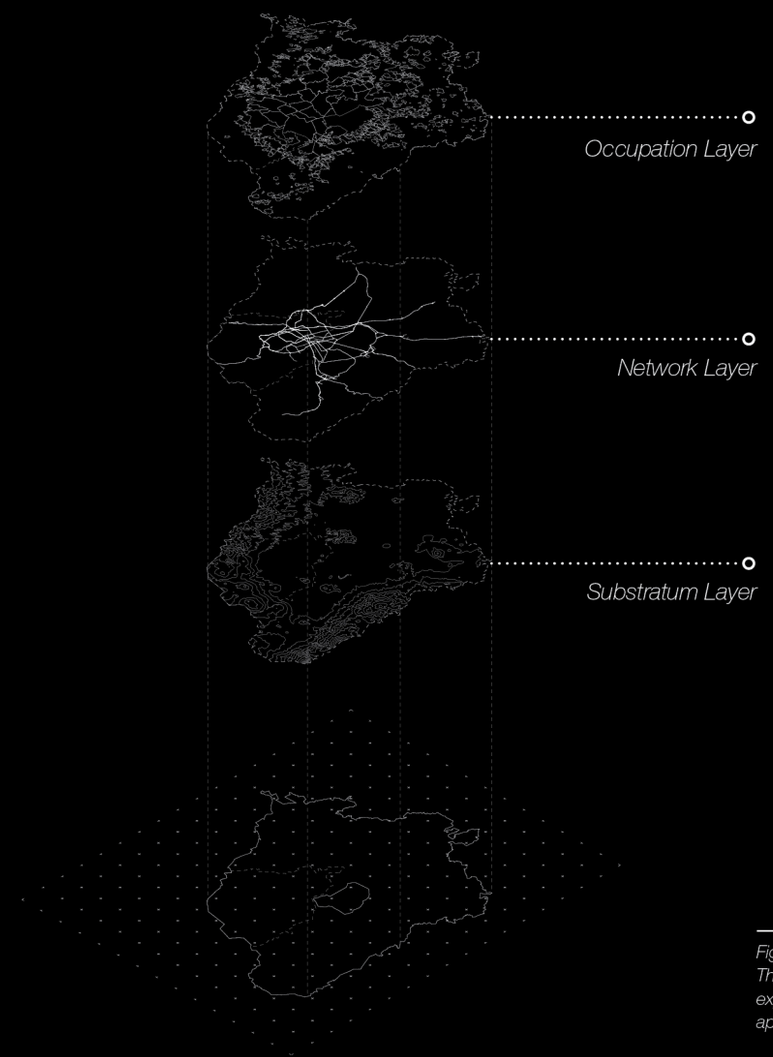


Figure 3.2:
The image shows an axonometric exploded view of the three layer approach applied in the MAVM.

Moreover governance has been recognized as a new layer that affects the system in an important way. Through governance a new decision-making processes that include different stakeholders can be reached capable of affecting the territory at unprecedented levels.
The aim of using the layer approach is to consider these four layers (built environment, structure, nature and governance) as a cohesive system that needs to work together. It has to be recognized that each layer responds to different transformation temporalities and in order to achieve the outcomes proposed by the research and to develop an adaptive approach capable of dealing with the complexity of emergent metropolises they need to be addressed in an interrelated way.

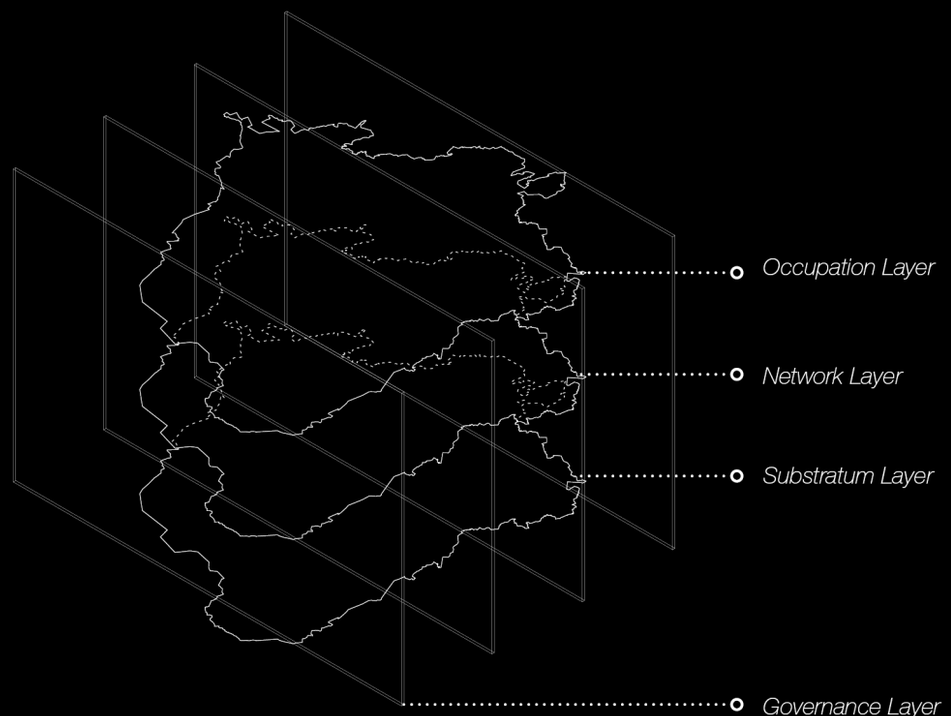


Figure 3.3:
Layer approach with governance as fourth layer (based in Zagare, 2018)

c. Current strategic large urban projects that originated in a top-down approach and are difficult to change at this stage of development are some of the challenges faced the Metropolis, but that can be opportunities to startup the adaptive change due to its large scale of impact and multidimensional levels of interest and actors.

These projects are strategic and respond to specific metropolitan needs, nevertheless, the power of decision-making process is still unbalanced. Current municipal urban plans (PDU´s) are not coordinated reflecting the lack of interests in this regard with the planned projects. It is important to mention that each municipality has its own interests and stress the fact that such interests are competing with each other weakening the possibility to reach agreements with the current planning framework. For this reason municipalities must engage a different approach, one that recognises their own interests and common ones, economically and functionally enabling the development of shared visions for a better inclusive and cohesive metropolis, thus reducing the asymmetries that characterise it until now.

Moreover, if local areas are taken into consideration (primarily vulnerable low-power communities), new developments can be planned regarding the interests of local people combined with those of developers and the own municipalities from a cohesive and inclusive approach. In order to make this possible a multilevel-governance most be implemented, approaching the main actors that want to get benefited from the project, those that will take most of the responsibilities and the negatively affected ones that are always diverted by the process, lifting most of the burdens (in current planning strategies). The possibilities could benefit all levels of power, from local and municipal to state level. Moreover, endogenous developments which people relate with, are important to start with the reduction of social segregation and the spatial fragmentation, characteristics and challenges of the MAVM.

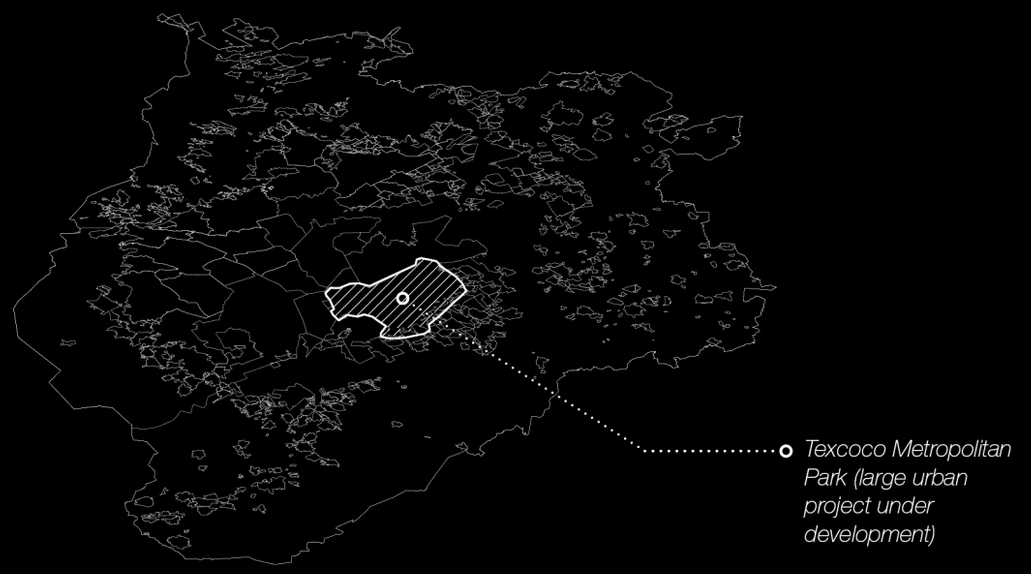


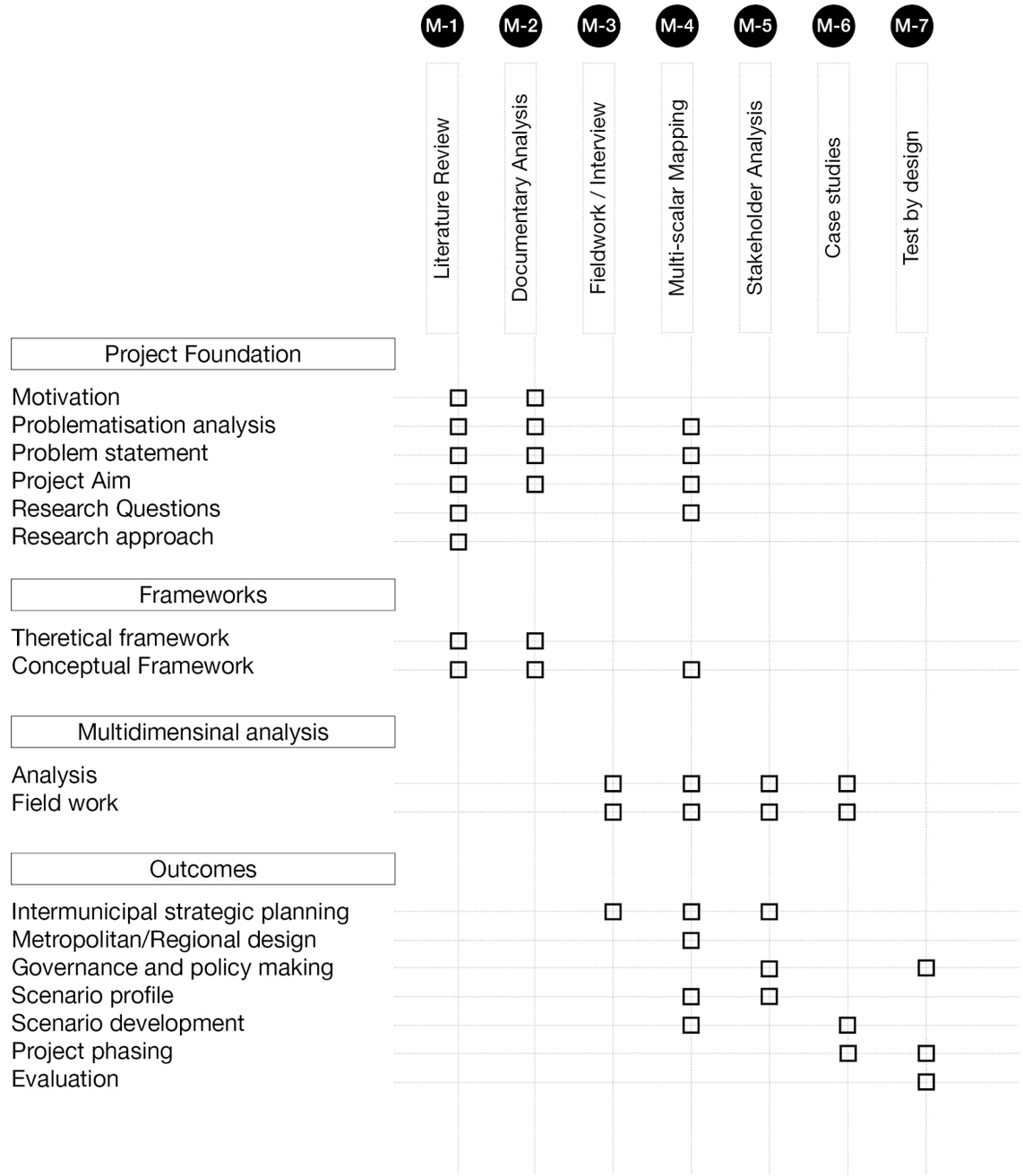
Figure 3.4:
Axonometric view of the MAVM showing the site for the future Texcoco Metropolitan Park

Methods

Steps for the Research

The methods used in this research are mainly qualitative. The different methods involved during the research will help to develop a complete understanding of the emergent metropolitan model currently developed in the MAVM, from its drivers, and spatial causalities to the social conditions through which the people has grown over the years. The methods will be used interchangeably depending in the challenge of the phase involved. From literature review, interviews, case studies, scenarios making and design testing, the research will aim to reveal the possibilities of an adaptive strategic planning which takes into account all levels of power involved in decision making processes to foster local developments (endogenous) capable of changing the current condition of the metropolis towards a cohesive and inclusive system.

Methods and Research phasing



M1: Literature review

Definition:

The method consists in the collection of relevant literature thorough the analysis of the problem field until the definition of theoretical framework and adaptive approach.

Subresearch Question addressed:

1, 2, 3, 4,

Main sources consulted:

- Comision Económica para Latinoamerica y el Caribe / Latin American and Caribbean Economic comission (CEPAL).
- Comisión en Planificación Estratégica Urbana y Ciudades Periféricas (CGLU).
- Asamblea Internacional de Capitales y Grandes Ciudades (IAC).
- Programa de Estudios sobre la Ciudad (Universidad Autónoma de México)
- Diario Oficial de la Federación (DOF).

Procedure:

- Research on relevant papers, articles and publications related with the Metropolitan Area of the Valley of Mexico (MAVM), its evolution and current situation.
- Research on relevant papers, articles and publications related to the problem field: social segregation and spatial fragmentation in developing countries.
- Research on relevant papers, articles and publications related to the problem statement: social segregation and spatial fragmentation in the context of Mexico.
- Select relevant findings according to different subjects such as growth, urban projects, urban functions, urban morphology, statistics, housing and land uses.
- The information selected will be summarized and conclusions will be made in order to define the strategic approach.

Outcome:

The objective of this method is to collect, analyze and synthesize the main literature regarding the problematization and the definition of the metropolitan area, to collect contextualized theories in order to define a research and design approach. For the purpose of this report I have focused on the following:

Problematization: from general to particular: in this section I focused mainly on the relevant theories and literature regarding globalization and neoliberalism in Latin Amerca and Mexico as a specific case. The main objective is to understand the drivers behind social segregation and spatial fragmentation in the Metropolitan Area of the Valley of Mexico (MAVM).

Adaptive strategic planning approaches: Several theories have been studied regarding new strategic approaches for urban planning. This section will be useful to develop a theoretical approach to and adaptive strategic planning suitable for

Urban projects: current urban projects in the MAVM are important for future development, as such, this section seeks to understand their approach, future impact and possibilities for adaptation as a strategy of the future design proposals. The specific projects will reveal if the areas are suitable for implementation of the adaptive strategy.

Case studies: In this section, literature regardin policies and new practices will be evaluated. The objective is to find the most suitable approaches that have already been tested in order to be implemented in the MAVM context.
Theories for endogenous development: theories regarding endogenous development will reveal design strategies for specific local areas previously defined.

M2: Document and policy analysis

Definition:

The method consists in the collection of relevant documents of urban planning, policies and municipal regional plans

Subresearch Question addressed:
2, 3

Main sources consulted:

- Comisión en Planificación Estratégica Urbana y Ciudades Periféricas (CGLU).
- Diario Oficial de la Federación (DOF)
- Instituto del Fondo Nacional de la Vivienda para los Trabajadores (INFONAVIT).
- Plan Nacional de Desarrollo (PROMARNAT).
- Plan General de Desarrollo Urbano (PGDU)
- Planes Parciales de desarrollo (PP).
- Secretaria de Medio Ambiente y Recursos Naturales (SEMARNAT).
- Secretaria de Desarrollo Agrario, Territorial y Urbano (SEDATU).
- Agencia Mexicana de Cooperacion Internacional para el Desarrollo (AMEXCID) and its Plan de Desarrollo Integral (PDI).

Procedure:

- Research on policy documents, urban planning documents and publications related with the future planning of the Metropolitan Area of the Valley of Mexico (MAVM).
- Research on relevant papers regarding alternative urban planning plans developed for the MAVM.
- Summary of process, hierarchy of planning institutions at municipal level.
- Conclusion of the planning instruments implemented in the MAVM to further identify potentials for an adaptive strategic planning which allows inter-municipal collaboration and coordination to reduce in a collective effort social segregation and spatial fragmentation of the Metropolis.

Outcome:

The objective of this method is to collect, analyze and synthesize the relevant documents that enable urban planning in Mexico and the MAVM. By analyzing the process for urban planning opportunities for adaptation can be identified, thus understanding the constellation of actors involved in the current top-down approach can help building a new multigovernance structure for collective efforts in urban planning.

Urban projects: current urban projects in the MAVM are important for future development, as such, this section seeks to understand their approach, future impact and possibilities for adaptation as a strategy of the future design proposals. The specific projects will reveal if the areas are suitable for implementation of the adaptive strategy.

Case studies: In this section, literature regardin policies and new practices will

be evaluated. The objective is to find the most suitable approaches that have already been tested in order to be implemented in the MAVM context.
Theories for endogenous development: theories regarding endogenous development will reveal design strategies for specific local areas previously defined.

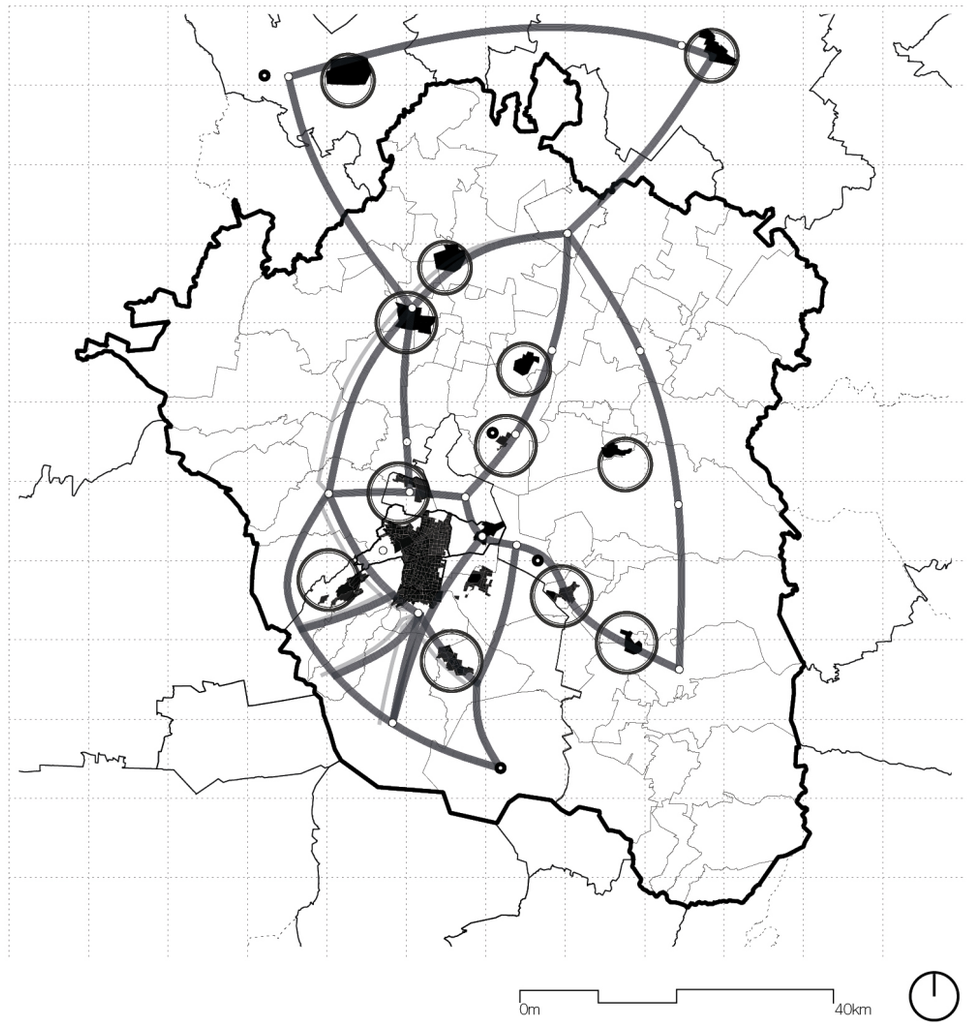


Figure 3.5:
General strategy of the metropolitan region
Source: Developed by author, based in POZMVM, 2012.

M3: Fieldwork and interviews

Definition:

The method consists a thorough research based in observation and analysis of the previously defined sites for case study and pertinent interviews with relevant actors.

Subresearch Question addressed:

3, 4

Main sources consulted:

- Interviews with relevant actors such as researchers and local residents. (yet to be confirmed).
- Marcelo Sanchez (Architect, Queretaro, Mexico)
- Diana Garcia (Researcher and Architect, ITESM, Queretaro, Mexico)
- Pablo Landa (Anthropologist and Researcher, Mexico City, Mexico)
- Alejandro Pareyon (Researcher, UNAM, Mexico City, Mexico)
- David Mora (Architect and Researcher, UAM, Mexico City, Mexico)
- Roberto Rodriguez (Architect, Mendrisio, Switzerland)

Procedure:

- Contact the relevant actors in order to know the audience to which the questions will be directed
- Programmed the fieldtrip after confirmation of interviews (the suggested timeline stablish February for this task)
- Develop surveys with adequate questions for the interviews during the fieldwork.
- Develop surveys with adequate questions for interviews with other relevant actors that cannot be reached during the fieldwork, the interviews will be done via email.
- During fieldwork, analysis and conclusions will be done after the observation and interviews carried out.
- After analysis, the outcomes of the fieldwork will be defined and then contested with the design approach.

Outcome:

The objective of this method is to study the cases selected for future design implementation and to address relevant actors involved in different dimensions of power regarding urban planning, from municipality authorities to local actors. Moreover with the interviews carried out the different interests will be revealed.

M4: Multi-scalar mapping

Definition:

The method consists a thorough research based in observation and analysis of the previously defined sites for case study and pertinent interviews with relevant actors.

Subresearch Question addressed:

1, 3, 4

Main sources consulted:

- Instituto Nacional de Estadística y Geografía (INEGI).
- Consejo Nacional de Población (CONAPO).
- Secretaría de Comunicaciones y Transportes (SCT).
- METRO organizaiton.
- Directorio Estadístico Nacional de Unidades Económicas (DENUE).
- Secretaria de Movilidad (SEMOVI).
- Secretaria de Desarrollo Urbano y Vivienda (SEDUVI).
- (SEDEMA).
- Secretaría de Desarrollo Agrario, Territorial y Urbano (SEDATU).
- Registro Agrario Nacional (RAN).
- Comisión Nacional para el Conocimiento y Uso de la Biodiversidad (CONABIO).
- Existent maps and reports.
- Empirical and experimental mapping.

Procedure:

- Download the pertinent geodata information from the different data sources.
- Verify the validity and accuracy of the data.
- Map the main aspects from problematization to the specific analysis.
- Through observation and assessments (made by the software) make conclusions of the data collected and mapped.
- The outcome of the maps will reveal the potentials and current conditions of the metropolitan area in 2D.

Outcome:

The objective of this method is to use mapping as a tool to understand the current condition of the metropolis focusing on its evolution and development regarding urban planning, the metropolitan functions, environmental and morphological conditions, socio-economic structure, in order to depict conflicts and potentials that answer to the problem statement and research questions previously defined.

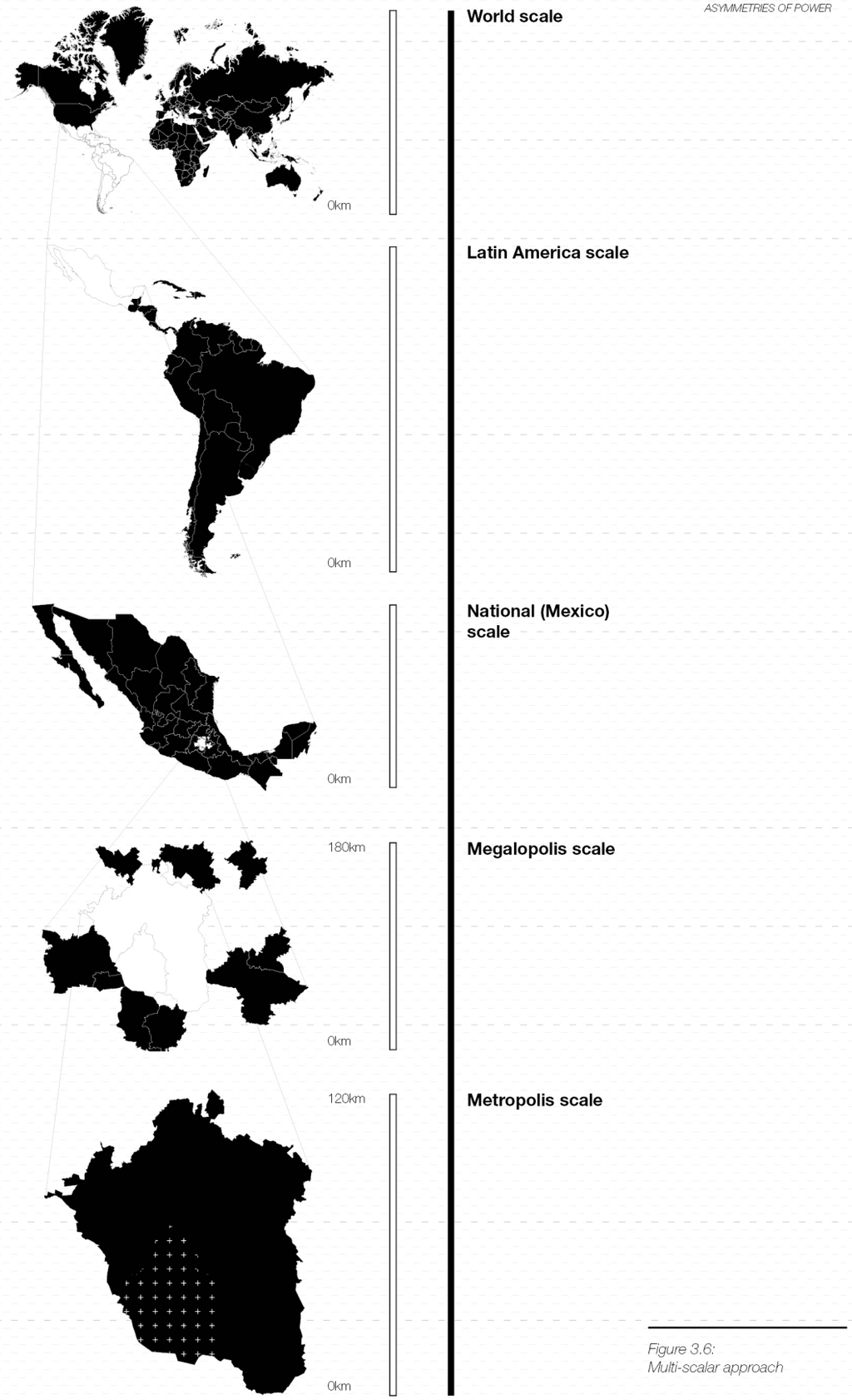


Figure 3.6:
Multi-scalar approach

M5: Stakeholder analysis

Definition:

The method consists in identifying the stakeholders involved for a multi-governance approach regarding the case studies for design interventions.

Subresearch Question addressed:

3, 4

Main sources consulted:

- NGO´s.
- Municipality of CDMX and EDOMEX.
- Secretaria de Movilidad (SEMOVI).
- Secretaria de Desarrollo Urbano y Vivienda (SEDUVI).
- (SEDEMA).
- Secretaría de Desarrollo Agrario, Territorial y Urbano (SEDATU).
- Secretaría de Comunicaciones y Transportes (SCT).
- Secretaría de Medio Ambiente y Recursos Naturales (SEMARNAT).

Procedure:

- Identify the main institutions, organizations and relevant actors related with the Metropolitan Area of the Valley of Mexico.
- Categorize the different stakeholders by identifying their role in decision making processes, hierarchy and influence.
- Summarize their main objectives and procedures.
- Develop the stakeholder assessment to further elaborate different organization schemes for a more equal power distribution in the adaptive approach.
- Identification of collaboration and coordination opportunities among the different actors.

Outcome:

The objective of this method is identify the different actors across dimensions of power, from civil society, public and private interests. The aim is to understand their hierarchies and role during decision-making process in order to make conclusions for an adaptive approach which allow collaboration and coordination among them. New potentialities and limitations will be identify before restructuring them to successfully accomplish the desire multi-governance structure.

M6: Case studies

Definition:

The method consists in identifying different case studies which relate to the conditions of the MAVM regarding planning instruments and implemented strategies which had been proven successful.

Subresearch Question addressed:

3, 4

Main sources consulted:

- General Law of Human settlements (LGAH) and article 27 Chapter 5.
- Law of urban development (Ley de desarrolo urbano).
- Land Value Capture (Morales-schechinger,2019).
- Land Value Capture, Colombian case.
- Transferable Development Rights, Tokyo, Hong Kong and Toronto cases.

Procedure:

- Select the cases for further study
- Understand similar cases of studie by evaluating their results in a qualitative way in order to contextualize them for future implementation
- Identify the areas where alternative planning strategies and instruments can be implemented
- Summarize and conclude the possibilities of implementation or their adaptation to the MAVM case from a local perspective

Outcome:

The objective of this method is to identify different case studies, their planning instruments and implementation strategies such as transferable development rights, land value capture, land pooling and readjustment, zoning incentives among others, used as planning control measures for metropolitan areas with similarities with the MAVM. This instruments and tools will be studied for future possibilities of implementation in the MAVM, after a contextualized analysis which will adapt them to the metropolitan area.

M7: Test by design

Definition:

The method consists in the test of the research by design in specific vulnerable locations within the MAVM

Subresearch Question addressed:

5

Main sources consulted:

- General Law of Human settlements (LGAH), article 27 Chapter 5.
- Law of urban development (Ley de desarrolo urbano).
- Land Value Capture (Morales-schechinger,2019).
- Land Value Capture, Colombian case.
- Transferable Development Rights, Tokyo, Hong Kong and Toronto cases

Procedure:

- Previously select the places/locations of interest where the design interventions will be implemented.
- Frame the approach for design interventions, from procedural to implementation.
- Develop the design interventions with the appropriate instruments/tools for an adaptive strategic planning.
- The outcomes of design interventions will be evaluated depicting the potentialities and limitations of their implementation.
- Conclusions have to be made after the final design result, reflecting on the impact, feasibility in order to elaborate the next steps of exploration and implementation.

Outcome:

The objective of this method is to apply and evaluate the adaptive strategic planning through design interventions in specific locations within the MAVM, previously defined and selected because of their vulnerable status and possibilities for change regarding endogenous development and their effect in the metropolitan system. The final aim of this research by design is to explore such possibilities and make conclusions for future implementation and transferability capacities.

Conceptual Framework

A mixed conceptual model

In order to tackle spatial fragmentation and social segregation and achive a spatial just metropolis by an adaptive strategic planning approach it is needed to frame the concepts involved in the process.
It has been explained that a complementary approach taken by the author is the “layer approach” which includes the fourth layer; governance. Nevertheless for the purpose and scope of this research project there will be specific focus regarding the different layers. It needs to be stress that the 4 layers have different timeframes which means that are modified in a different timespan; the occupation layer needs to be address first due to the building´s life and so on. The project seeks to address the first two layers (occupation and network) and their relationship with the fourth layer in a more intensive way, however the third layer (substratum) will also be taken into consideration because it influence how the metropolis is shaped and adaptation cannot be achieved without it. In short the main concepts for the conceptual framework are, Governance, Urban Form (artificial and natural conditions) and Urban Function (networks), pillars of analysis, evaluation and implementation for a socio-spatial cohesion. In this regard the conceptual framework of this thesis project ties together three main concepts that complement, relate and have the ability to work with each other in order to counteract the spatial fragmentation and social segregation in the Metropolitan Area of the Valley of Mexico trough an inter-municipal collaborative strategy.

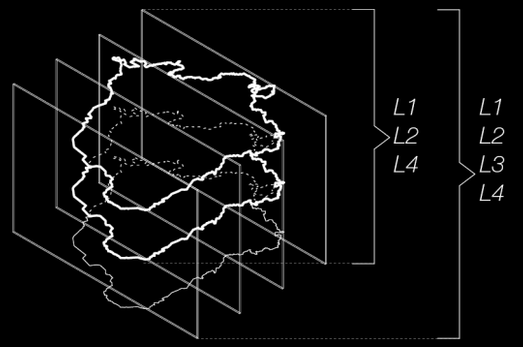


Figure 4.0:
The diagram shows the layers in order of relevance for the research

Reading the conceptual model.

The model is a combination of a Sequential Diagram which interrelates the 3 main concepts; Governance, Urban Form and Urban Function. This concepts are used to understand the current metropolis system and will be fundamental keys for the successful development of the spatial design processes and projects; and an Ecological Model which acknowledge the multi dimensions of power involved and the multi-scalar nature of interventions, the farthest level is that of the municipalities (the ones that conform the MAVM) which according to the diagram have to collaborate in an inter-municipal level in order to develop the adaptive spatial strategy that guarantees the inter and intra-relations of the concepts involved in order to achieve the scope of the research.
This diagrammatic model technique is used to place in the center of the diagram the contested problematisation of the main thesis, spatial fragmentation and social segregation and its counteraction which is spatial justice/cohesion to understand that the core of the project is in fact the desirable outcome of the research.

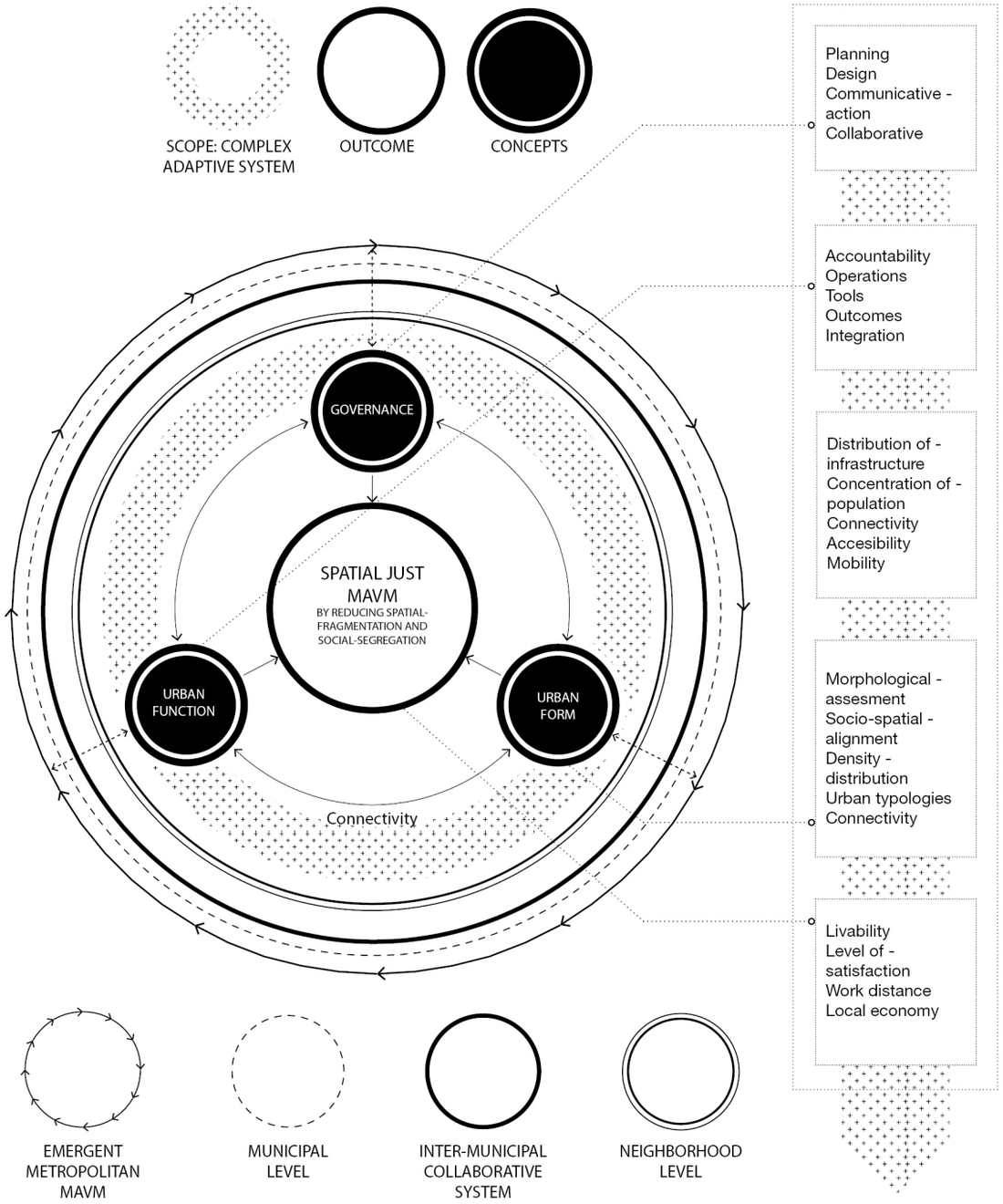
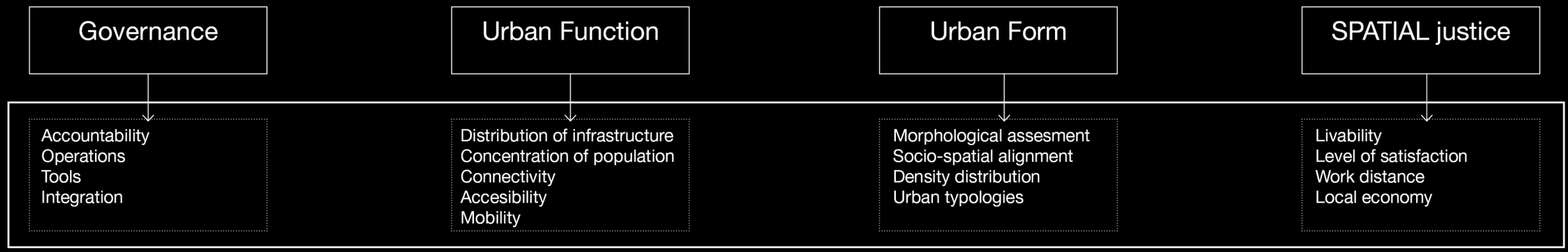
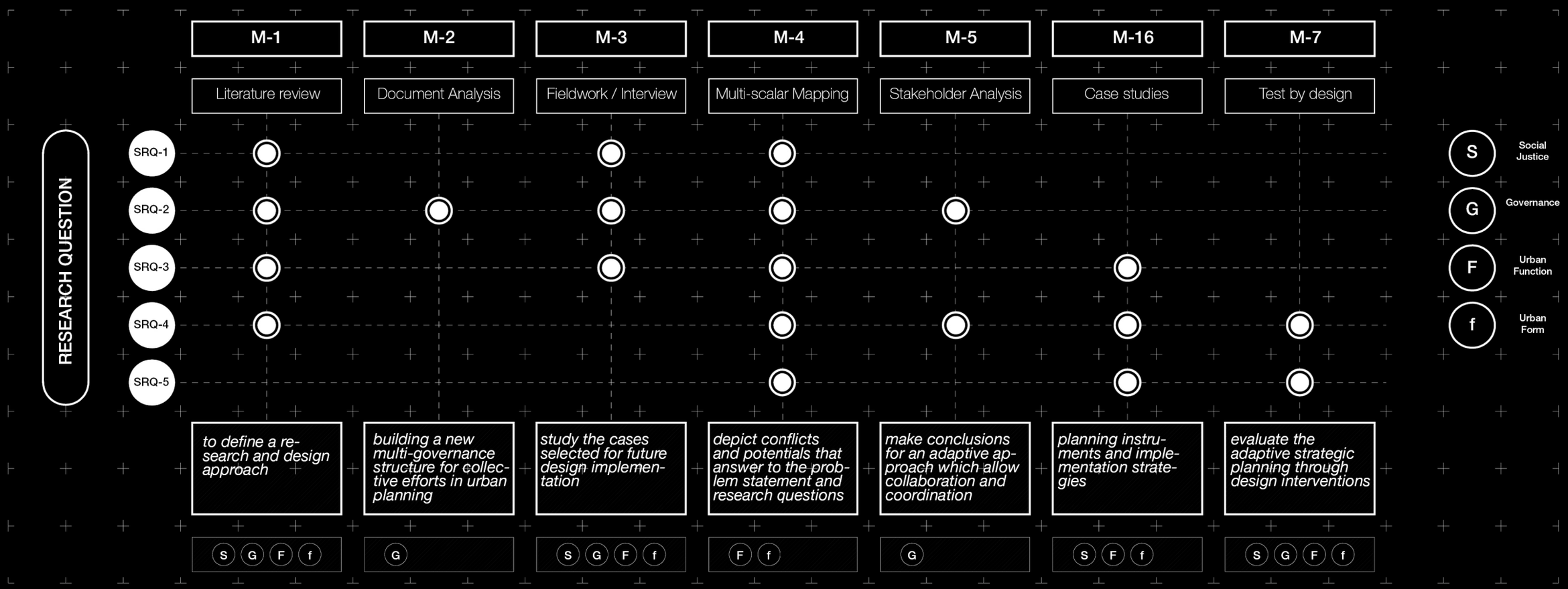


Figure 4.1:
Conceptual Framework
The graphic shows the 3 main concepts and their respective multiscalar relations

Analytical Framework

The Analytical Framework shows the variables at stake for each concept of the conceptual framework, these will lead to the study of specific theories involved, so the theoretical framework can be developed. Moreover, the framework shows the different methods used to answer the research questions with is corresponding outcome and their relationship with the concepts mention earlier.





Theoretical Framework

The theoretical framework shows the theories that help develop the basis for the research in relation with the variables from the analytical framework and the concepts from the conceptual framework. With them the design and strategic approach will be developed in order to continue with the proposal.

Governance

Accountability
Operations
Tools
Integration

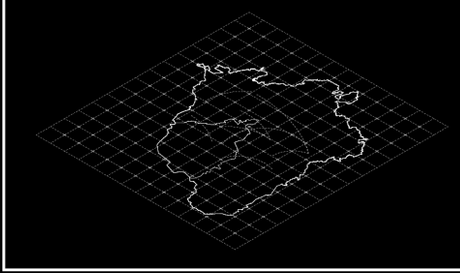
Regional governance
Albrechts et. AL. 2003; Friedmann, 2001; Ünlü, 2018

Multi-level governance
Katherine A. Daniell and Adrian Kay, 2017 ; Hooghe and Marks 2003; Bache and Flinders 2004; Enderlein et al. 2010

Cross border planning
Markus Leibenath, Ewa Korcelli-Olejniczak, Robert Knippschild, 2008
Lawrence A. Herzog, 2000

Borrowed size cities
Evert Meijers and Martjin Burger 2017
Alonso, 1973

Land value capture
Carlos Morales-Schechinger, 2003
Abigail Friendly, 2017

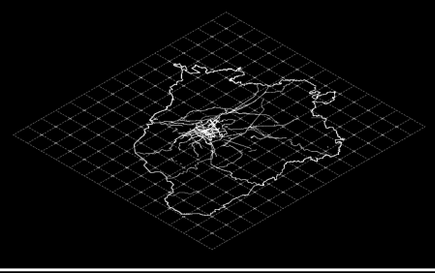


Urban Function

Distribution of infrastructure
Concentration of population
Connectivity
Accesibility
Mobility

Transit-oriented development
R. Cervero, 2018

Splintering Urbanism
Stephen Graham and Simon Marvin, 2001



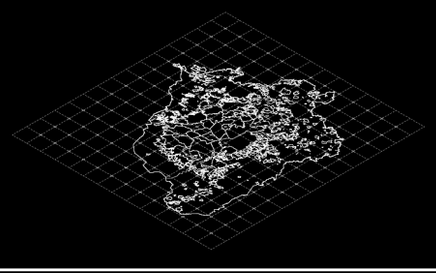
Urban Form

Morphological assesment
Socio-spatial alignment
Density distribution
Urban typologies

Morphological transformation and spatial capital
Lars Marcus and Johan Colding, 2014
Pedro Buraglia, 2009

Space density and urban form
Meta Berghauser Pont and Per Haupt, 2009

Endogenous Development
Shucksmith, M. 2000. Millar D. 2005



SPATIAL justice

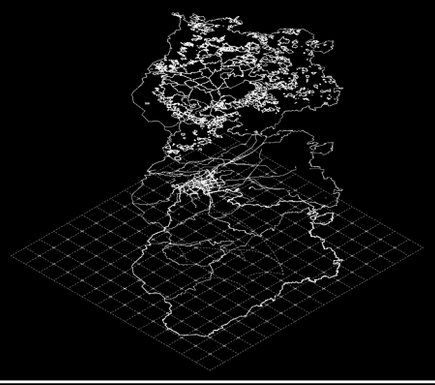
Livability
Level of satisfaction
Work distance
Local economy

Transport Justice
K. Martens, 2016

Towards a Spatial Morphology of Urban Social-Ecological Systems
L. Marcus, 2011

The Just City
S. Frainstein, 2010

Social Justice
P. Pirez, 2005



Governance

Regional governance

Ünlü, 2018, Albrechts et Al., (2003), Friedmann,(2001).

Regional governance is defined as"a process of governing on a specific region by institutions which have authority to govern that are given by states voluntarily" (Ünlü, 2018).

Multi-level governance

Katherine A. Daniell and Adrian Kay, 2017 ; Hooghe and Marks 2003; Bache and Flinders 2004; Enderlein et al. 2010

Multi-level governance is defined as the vertical (multiple levels) and horizontal (multiple actors) dispersion of central government authority (Bache and Flinders 2004) and refers to both, political structures and decision making processes. While governance refers to the "growing interdependence between governments and non-governmental actors at various territorial levels" (Bache andFlinders 2004) the concept of multi-level governance adds the dimension of scale.

Cross border planning

Markus Leibenath, Ewa Korcelli-Olejniczak, Robert Knippschild, 2008 Sohn, Reitel and Walther, 2009

It has to be recognized that this theory has been practiced mainly in European countries, as such the paper is developed by explicitly depicting the lessons learned from European case studies.
Cross border planning recognizes the complexity within areas that share their geographical location, it is an approach that enables cooperation among governmental institutions with common goals and challenges (Moya, 2019) in order to achieve a better and coordinated planning. In such areas "the presence of a state border represents a specific geographic configuration where the function of the metropolitan node connected into world networks is combined with the double function of interface and barrier specific to the border." (Shohn et. Al, 2009, p-2).
In their work Sohn, Reitel and Walther (2009) explore and evaluate the integration of functional and institutional perspectives regarding cooperation in cross border metropolitan areas, and acknowledged that the emergence of any cooperation project departs from political construction (Shohn et. Al, 2009).

Borrowed size cities

Evert Meijers and Martjin Burger 2017, Alonso, 1973

"In its original conceptualization by Alonso, the concept describes and explains the situation that especially smaller cities that are located in a larger 'megapolitan complex' do perform better because they have access to agglomeration benefits of larger neighbouring cities."

Urban Form

Morphological transformation and spatial capital

Lars Marcus and Johan Colding, 2014

The authors develop a conceptual discussion based on Resilence Theory and Urban Morphology stressing the ´how´ of future urban designs addressing ecological systems instead of only dealing with economical and technological ones such as transport, energy, and waste, as has been done years before. Both have different implications in urban morphology and urban design and can be used in a layout of social-ecological systems. Thus Acknowledging human and natural factors in urban planning could open "for the possibility to develop knowledge on how to specifically design resilient urban systems." (Marcus, 2011)

Endogenous Development

Millar D. 2005; Shucksmith, M. 2000

"Endogenous development is a contrast of exogenous development. While the former is internally driven and controlled, the latter is externally driven and controlled. Endogenous development includes processes that enable local people, especially those at the grassroots and/or in rural communities, to initiate and negotiate their own development. It taps on local and indigenous knowledges, skills and expertise to initiate change that is relevant and meaningful to the needs and aspirations of the local people" (*Millar D. 2005, p-107).*

"In this review paper are identified three aspects to this approach: a territorial basis; the use of local resources; and local contextualization through active public participation. The approach holds out the prospect of local areas assuming greater control of development by reorienting development around local resources and by setting up structures to sustain the local development momentum after the initial 'official' intervention". (Shucksmith, 2000, p.166)

Although this approach is contextualized in Europe (UK case study) and it was an innovative solution to rural poblems , it can be stressed as a suitable model for further research an implementation in other contexts such as vulnerable areas in developing countries where decision-making processes are made predominantly in a top-down fashion.

Urban Funtion

Transit-oriented development

R. Cervero, 2004, Xu, W., Guthrie, A., Fan, Y., & Li, Y. 2017

“Transit-oriented development (TOD) is the creation of mixed-use, compact, walkable neighborhoods that encourage people to live near and use public transit. At their hearts, TOD neighborhoods typically feature a transit station and public spaces as well as a walkable street network connecting moderate- or high-density residential and commercial buildings to that station within a half-mile (800 m) radius (Feudo, 2014).” (*Xu et Al., 2017,p-743)*

Splintering Urbanism

Stephen Graham and Simon Marvin, 2001

This theory develops a transdisciplinary approach to understanding the changing relations between contemporary cities, infrastructure networks, and technological mobilities. (Graham and Marvin, 2001, p.52)

Splintering Urbanism deals with the juxtaposition of different realities affected by infrastructural networks (including information and communication technologies) that might allow or block their access to certain parts of the population. Moreover it is recognised that networks are more about flows than places, fragmenting certain parts of the cities causing a relationship of winners whom are the ones with access to the infrastructure and losers alienated from the privilege.

Spatial Justice

Transport Justice

K. Martens, 2016

Transport Justice is a framework that focuses on principles of justice and how the concept can be extended, assessed, and quantified in order to improve regional transport planning not only focusing on efficiency but rather in equity factors.

The Just City

S. Fainstein, 2010

Fainstein argues “that democracy, diversity, and equity are the three governing principles for urban justice but also recognize the tension among them. Although structural transformation cannot be achieved at the municipal level, a change in the rhetoric around urban policy from a focus on competitiveness to a discourse about justice can improve the quality of life for urban residents.” (Fainstein, 2010, p.3)

Social Justice

Harvey D. 2010, Stilwell Frank, 2017

“Harvey’s argument is that if we really want to understand cities and spatial form, we need to scrutinize the systemic forces shaping production, distribution and exchange. Looking through this lens brings capital, class and state into sharp focus, contrasting with the neoclassical economic view of how an idealized ‘market economy’ delivers equilibrium outcomes and with liberal views of ‘social justice’ coming through ameliorative reforms.” (Frank Stilwell, 2017, p.2)

Outcomes

Due to the complexity of the problematisation and the context involved the outcomes will correspond to various scales of analysis. As stated before a multi-scalar approach is needed in order to analyze, evaluate, assess, synthetize, and design. Therefore multiple outcomes will be necessary in order to conclude the project.

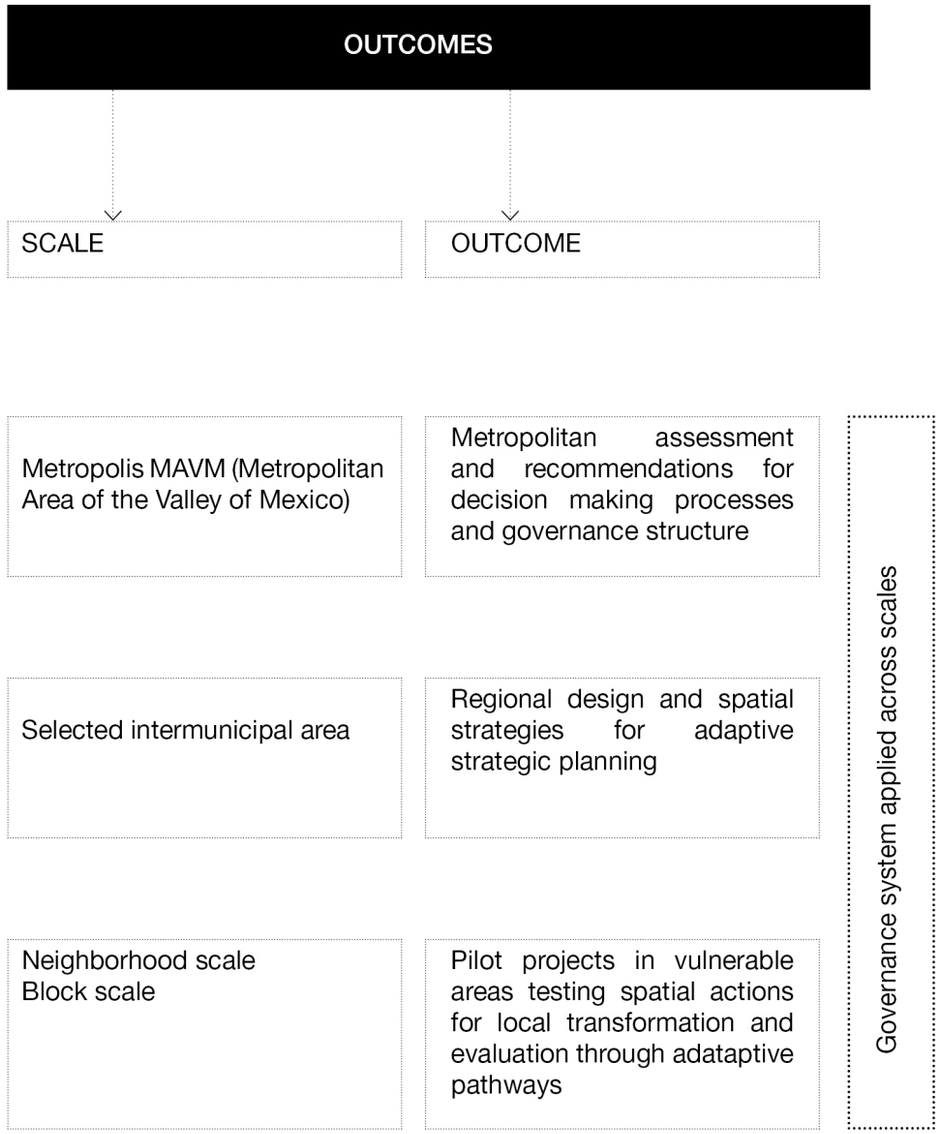


Figure 4.2:
Outcomes
different theories taken Multi-scalar outcomes

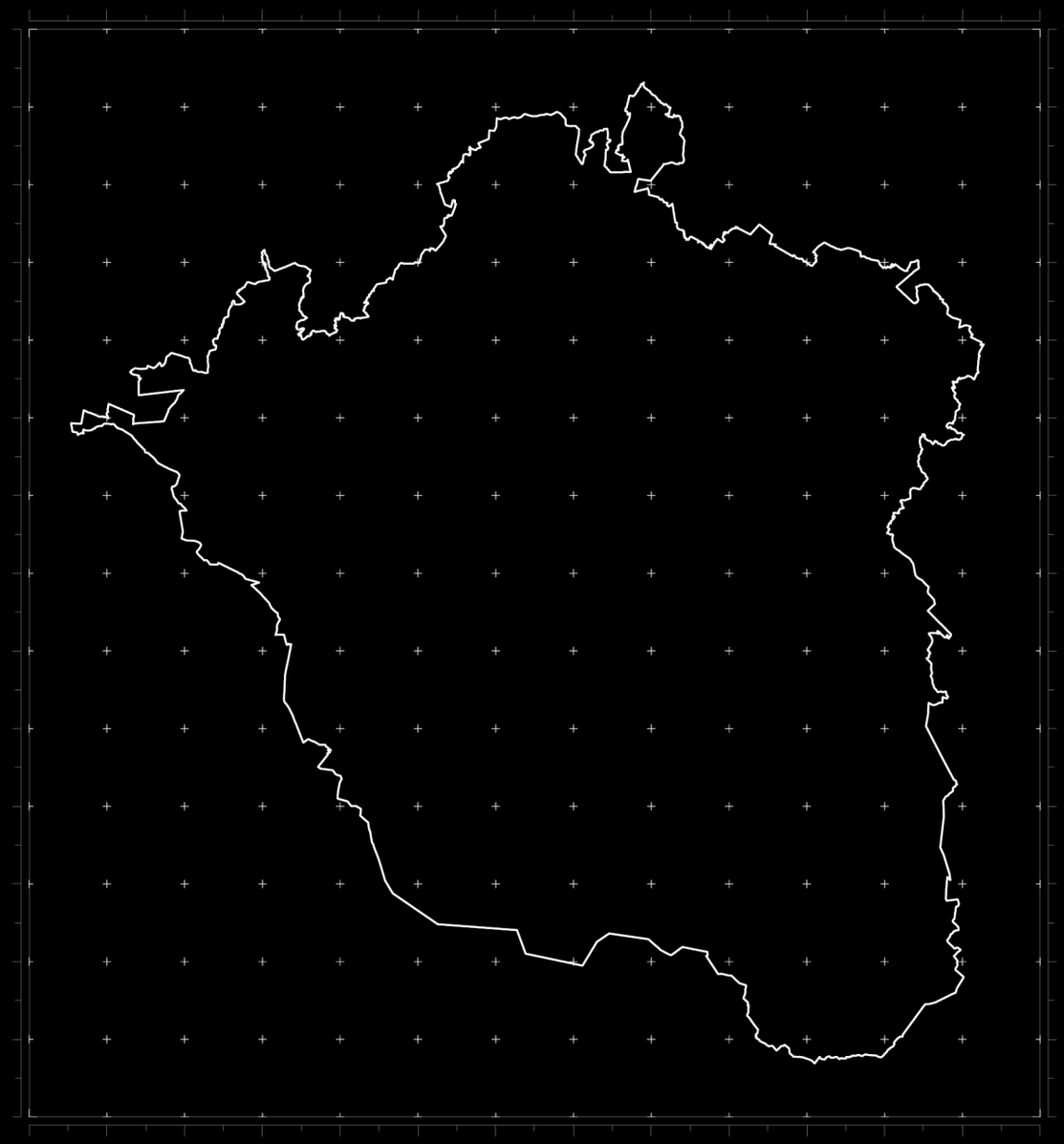
ASYMMETRIES OF POWER

Timeline

	General objectives	Particular objectives	2019 SEP	OCT	NOV	DEC	2020 JAN	FEB	MAR	APR	MAY	JUN	JUL
1.0	Problem definition and Methodological framework	1.1 Definition problem field											
		1.2 Problem statement and Research questions											
		1.3 Problem analysis											
		1.4 Research Methodology											
		1.5 Preliminar case studies											
2.0	Research / methods / analysis	2.1 Literature review											
		2.2 Document and report analysis											
		2.3 Statistical analysis											
		2.4 Mapping											
		2.5 Stakeholder analysis											
		2.6 Fieldwork and interviews											
3.0	DESIGN	3.1 Study cases analysis											
		3.2 Design approach											
		3.3 Design strategies											
		3.4 Design typologies											
		3.5 Impact assessment											
		3.6 Conclusions											
4.0	Reports	4.1 Report preparation											
			SUB-RESEARCH Q1 & Q2					SUB-RESEARCH Q3, Q4 & Q5						
5.0	Deliverables	5.1 Graduation lab			RP1 P1	RP2	P2		RP3 P3		RP4 P4	RP5	P3
		5.2 Theory of Urban Design and Planning		PRE	RP1 P1	FIN RP2	P2		RP3 P3		RP4 P4	RP5	P3
		5.3 Analytical methods of Urban Planning and Design		PRE	RP1 P1	FIN RP2	P2		RP3 P3		RP4 P4	RP5	P3

4 THE MAVM

ASYMMETRIES OF POWER



Overview

During this chapter the Metropolitan Area of the Valley of Mexico will be assessed according to several variables introduced in the methodology chapter. Each variable influences the metropolis in different ways and the main outcome of the chapter reflects how the segregated and fragmented condition of the metropolis is shown at several levels and dimensions of its structure.

Substratum

The Loss of a Lacustrine Heritage

As will be explained later in this report, the natural and environmental conditions will not be tackled in a robust way since it is not the scope of the research. Nevertheless the acknowledgement of its natural condition, its topography and water tradition has to be analyzed since it has affected the development of the city, but in a greater way the city has affected the natural resources provided by its strategic location.

"The Mexico City Basin is endorheic: It is a closed drainage basin that retains water and allows no outflow to other external bodies of water, such as rivers. It stores the water from rain and streams that run down from the surrounding mountains, and then very slowly infiltrate into the ground, due to a thick layer of impervious sediment called the aquitard" (DE URBANISTEN, 2016, p.41).

This natural condition of the basin will in the long term affect its future.The region where the metropolis is today was at the beginning of its development linked with water. It was a strategic location chosen by the former civilizations because of its natural potential. It hosted the Mexicas as the first civilization to inhabit the area. It is know that their civilization started to develop in an island in the middle of the basin which because of natural causes was later flooded, forcing them to adapt to the waterscape that was changing at the time (DE URBANISTEN, 2016). As a result two notable hydrolocial engineering works were put in motion; the first one were dams in order to control the water levels of the adyacent lakes and at the same time divide the fresh water from the barakish waters in the east, the second one was an agricultural mechanism for cultivation called chinampas a system based in soil filling that allowed them to cultivate in arable land in the lake surface (DE URBANISTEN, 2016).

Soon after the XV century and the Spanish conquest the city of Tenochtitlan with around 200000 inhabitants was submitted to a new urban western ideal. However the new model of urbanization was challenged by the combination of the environment and the natural condition of the location which flooded it more than once. In this regard the first artificial canals system was executed, thus intonating the drainage of the basin. Soon enough the drainage indrastructure continued until the end of the XIX century where the most important engineering drainage canal was constructed thus eradicating most of the basin. (DE URBANISTEN, 2016).

As explained before Mexico city grew and expanded drastically allocating more than 20 million inhabitants within its metropolitan borders, the drainage of the basin continues until today which has generated an irony in the country, what was once a water basin is now a dry land where people strive for water (FIG. 4.1).

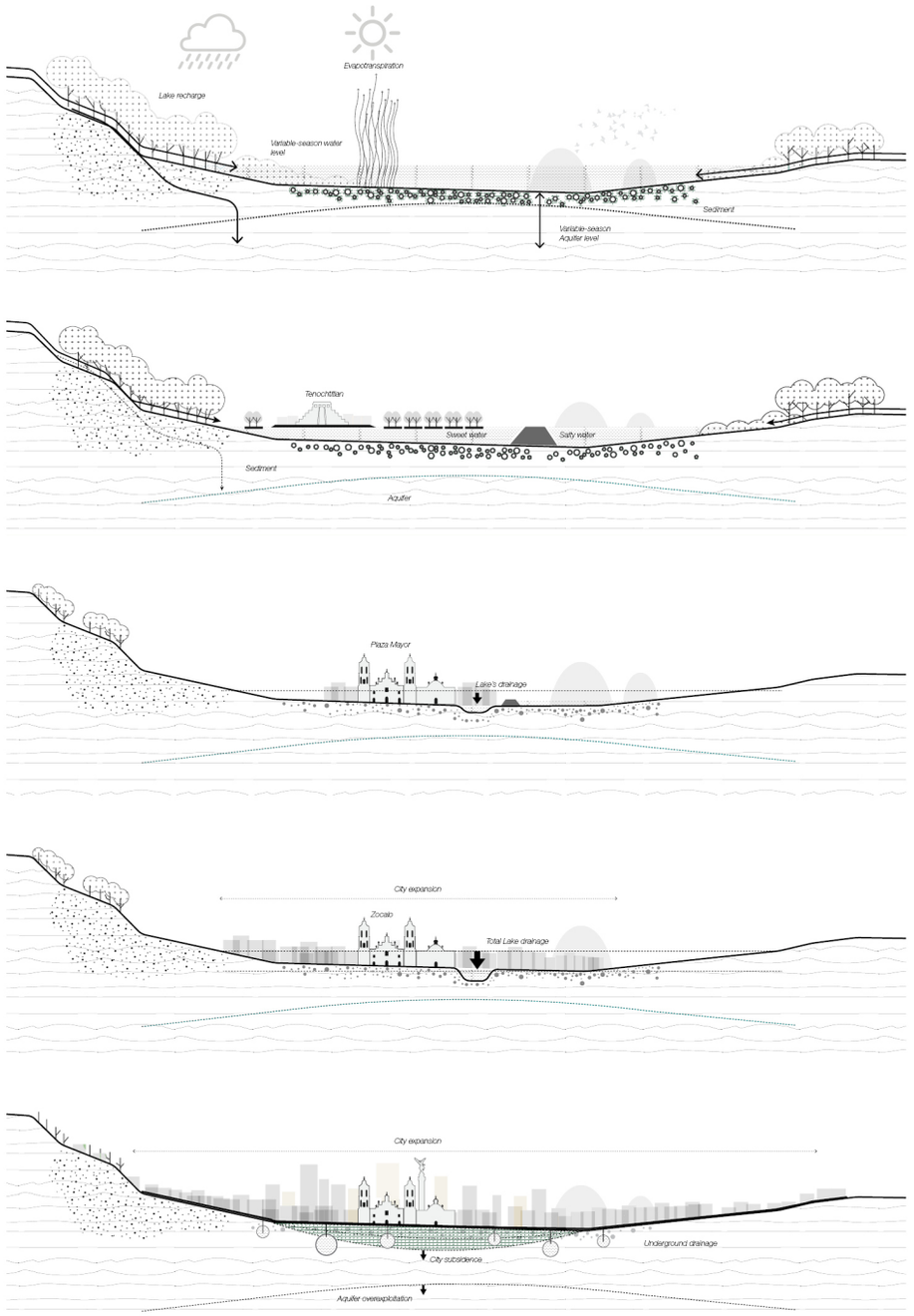
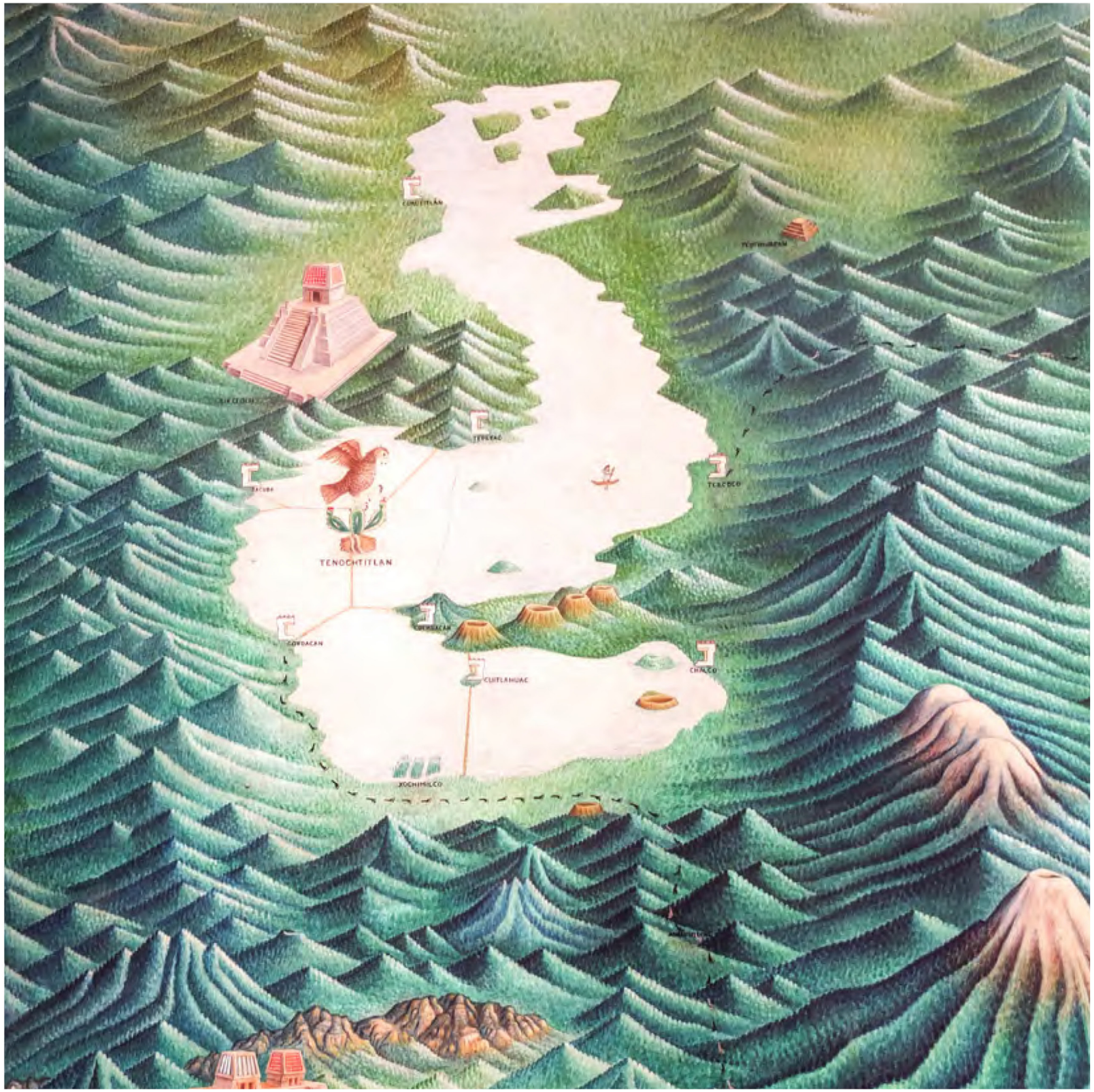
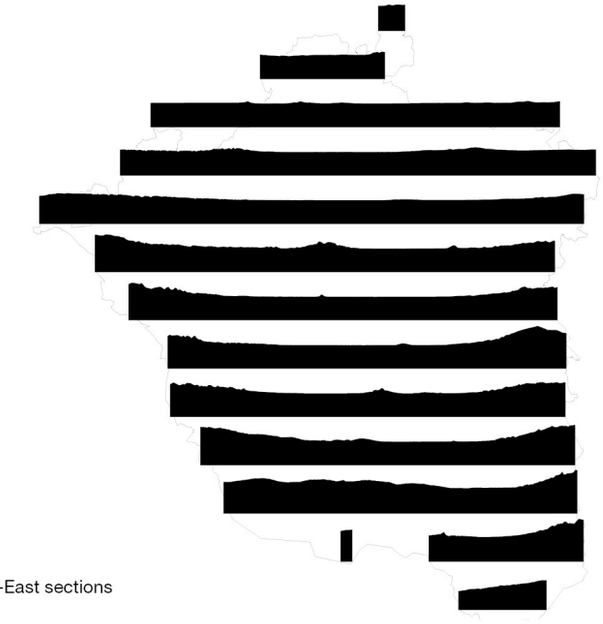


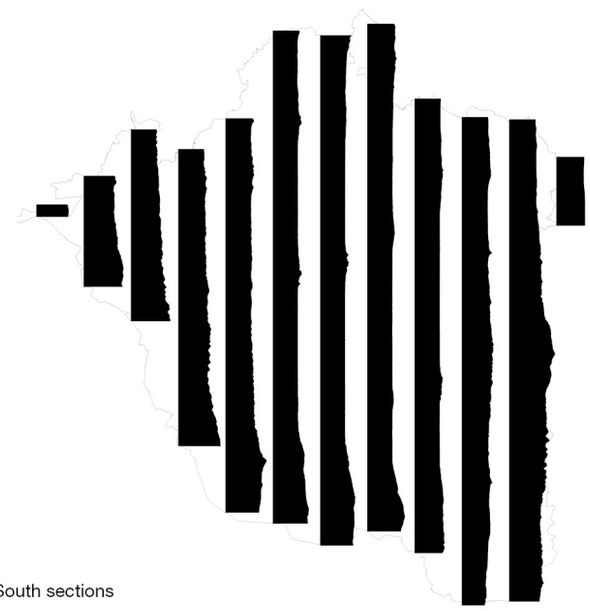
FIG. 4.1 Drainage of water basin *(Redrawn from DE URBANISTEN, 2016) The sections show hwo water was drained from the basin within time.*



The natural structure of the area is that of a basin where the urban agglomeration has grown surrounded by hills, a place that changed drastically from mainly water to urban tissue. The figure below shows sections every 10000m to illustrate the basin condition, which is around 2000 and 4000m above see level.



West-East sections



North-South sections

IMG. 4.1 Texcoco Lake Mural *(Source: National Museum of Anthropology) The image shows a painting that portraits the lake its civilization and the natural structure around it.*

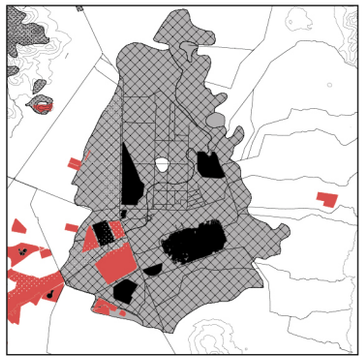
Natural Structure

The natural conditions of the area can explain the current until some extent the current morphological condition of the MAVM since is an urban area delimited by high hills which act as a natural boundary. Moreover where the city stands there used to be a lake that was drained over the years until most of it disappeared. The urban fabric is continuously growing and there are cases where the natural boundaries are not enough, several informal settlements take place around the edges of hills and irregular soil not suitable for urbanization.

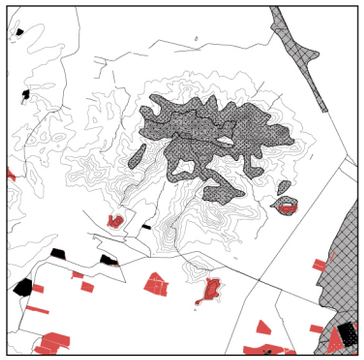
One of the most important assets to the natural environment thus the heritage of the area is the natural void that has formed due to the expansion (FIG. 4.2). What was once the former lake of Texcoco is now a natural void in the massive urban footprint, which has been intervened in order to rescue the lacustrine heritage with a several artificial lakes (IMG. 4.2) from which the biggest in size is Lake Nabor Carrillo. This land is mostly contaminated or dried soil that has been used as dumpster for the main capital; the void nevertheless maintains natural conditions that must be preserved such as flora and fauna (mostly birds).



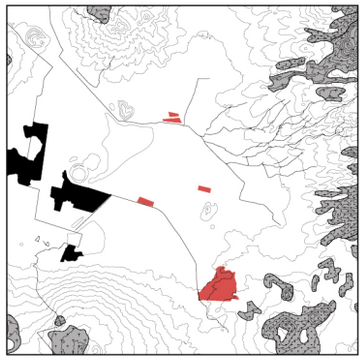
IMG. 4.2 Water treatment in Texcoco's former lake *(Source: Google images, 2019) The figure shows the natural elements within the MAVM boundary*



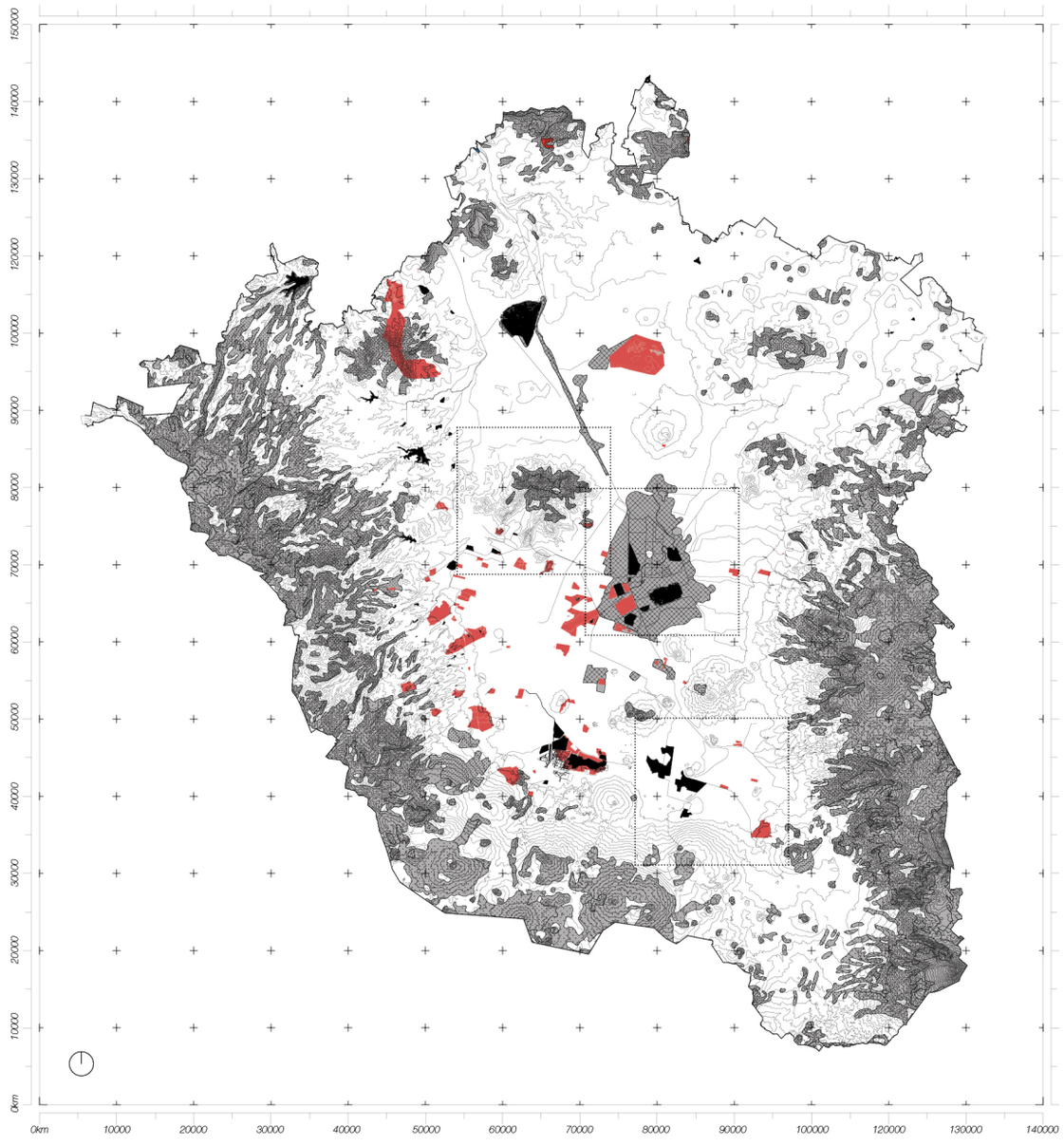
Section 1



Section 2



Section 3



Legend

Natural structure
- Water bodies
- Green Bodies
- Hydrophilic halophilic vegetation
- Forest areas
- Metropolitan natural areas and restricted areas
- Contour lines
- Waterways

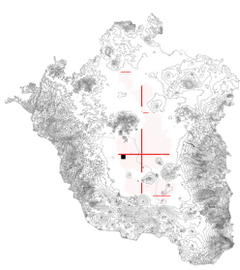
Administrative structure
- Urban structure
- MAVM Boundary
- CDMX Boundary
- Municipality Boundaries

FIG. 4.2 MAVM Natural system *(Own elaboration based on data from INEGI, 2010) The figure shows the natural elements within the MAVM boundary*

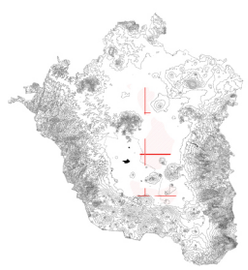
ASYMMETRIES OF POWER

IMG. 4.3 Lake Nabor Carrillo *(Source: Google maps, 2019) The image shows the Lake Nabor Carrillo from a north-south perspective*

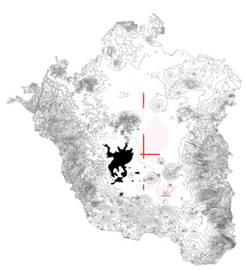
ASYMMETRIES OF POWER



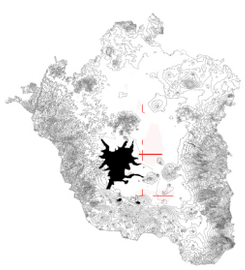
1519



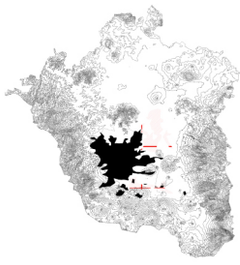
1824



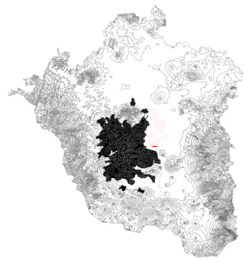
1941



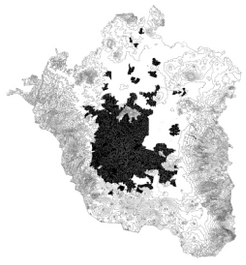
1959



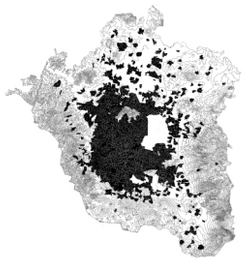
1970



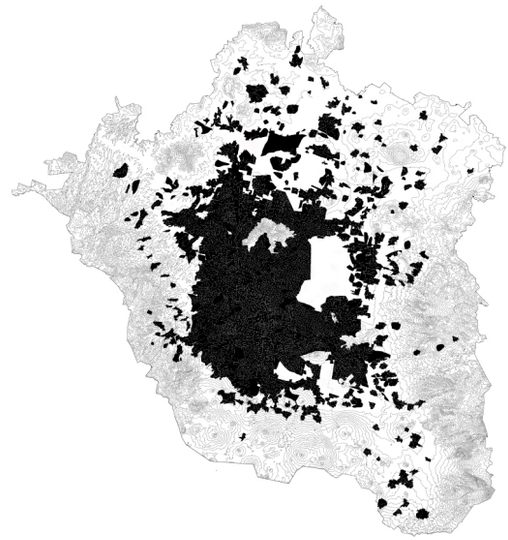
1980



2000



2010



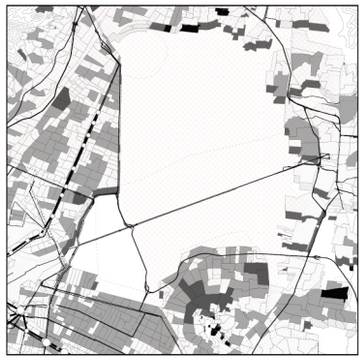
2020

FIG. 4.3 Urban expansion and Water reduction *(Redrawn from Kozlowski, G. 2015) The figure shows a the evolution of the urban fabric against the reduction of water bodies in the MAVM.*

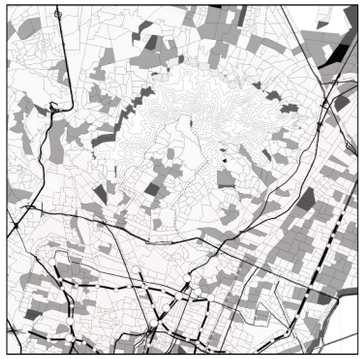
Several vulnerabilities due to its natural condition affect the urban area such as floods and earthquakes which have affected primarily the most vulnerable areas regarding social segregation and spatial fragmentation. Regarding earthquake vulnerability the east area is the most affected, it is also an area that suffers from constant floods (IMG. 4.4 and FIG. 4.4) but the most vulnerable sector in this regard is the west of the metropolis where a lot of informal settlements next to irregular topography are located.



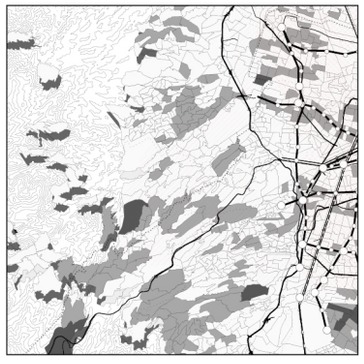
IMG. 4.4 Flooding in the metropolis *(Photography by Pedro Anza. Cuartoscuro ®)*



Section 1



Section 2



Section 3

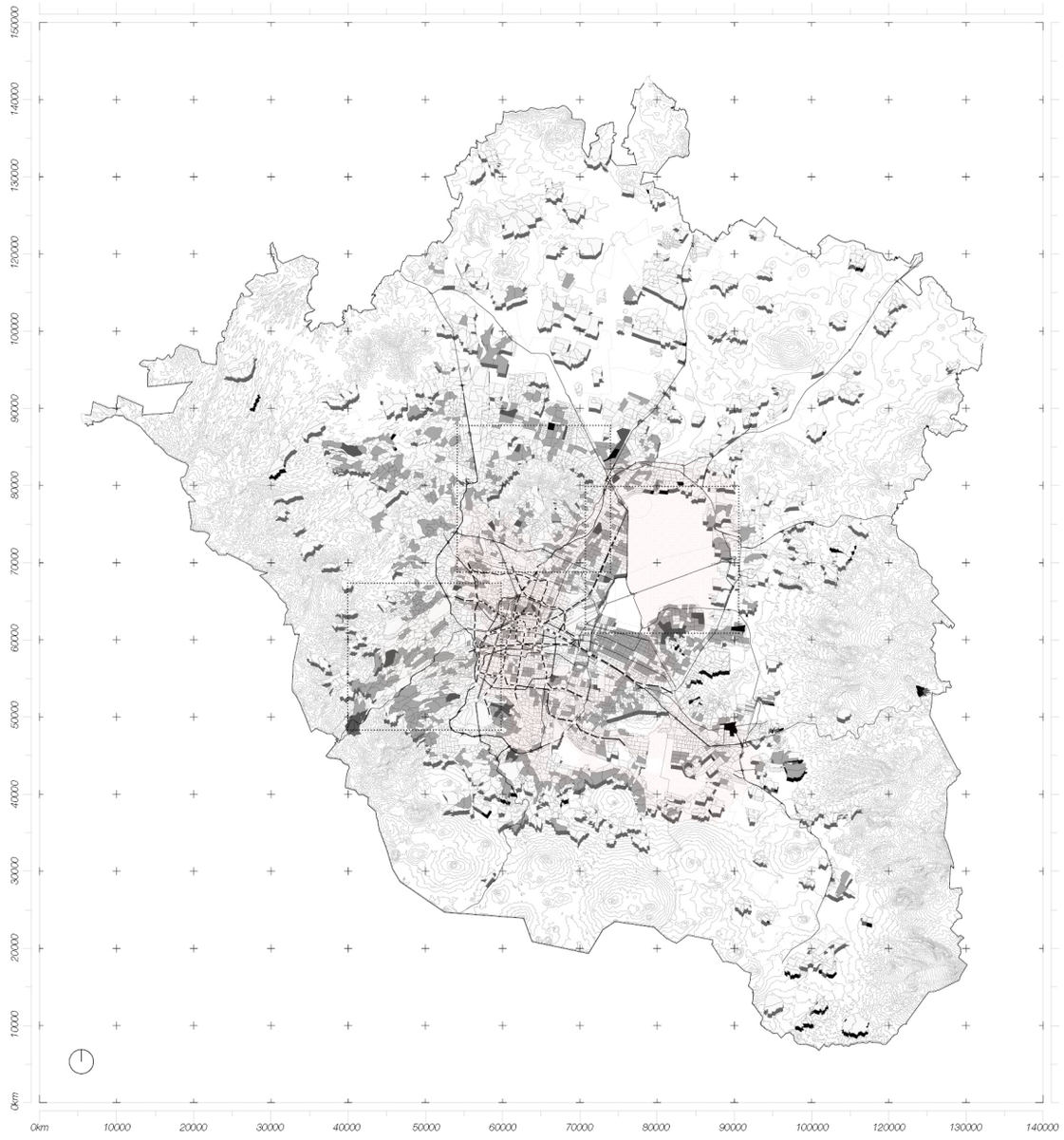
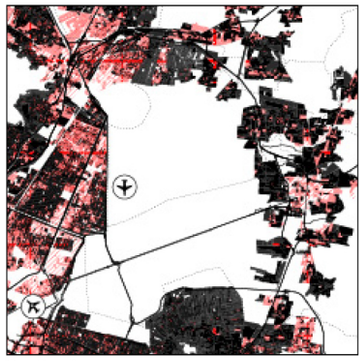


FIG. 4.4 MAVM Natural system *(Own elaboration based on data from INEGI, 2010) The figure shows the natural elements within the MAVM boundary*

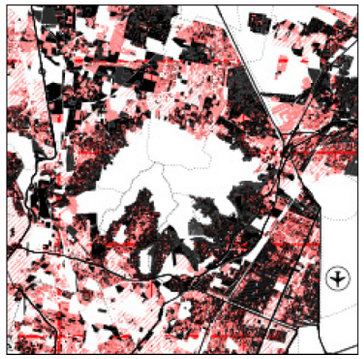
Distribution of Population and vulnerabilities

The distribution of the population in the metropolitan territory has been influenced by the economic dynamics and strategic projects to which it has been subject of.
During its consolidation as urban system, (1800-1910) the city was growing towards an industrialized character with Porfirio Diaz as the main leading agent, and coped with the revolution period (1910-1940) the working population surrounded industrial areas to stay close to their source of job; the most intensive areas were located in the north while the high income population maintained distant from this areas, concentrating in the south and the west. Soon after this period the country faces the Mexican Miracle period, during this period strong concertation of low income population remained in the north-east while the middle income population occupied the surroundings of the center; while is interesting to notice is that a great amount of informal settlements was growing in the south, west and north in remote locations invading private property. 1980s were defined by the oil boom in the economy and the earthquake that modified the demographic dynamics, inhabitants were migrating to other cities as a way to secure their families from hazardous events, the first deconcentration of middle class population took place during this period, while informality was prevailing and growing in the north-east area (characterized for its ejidal condition). The introduction of neoliberal policies and the introduction of the Metro system worsen the condition of the metropolis allowing developers to buy land where informality was prevailing to further developed it and sell it without care of basic services, and as a contrast, Santa Fe, the city within the city, the city of the future where businesses thrive was developed in a former informal settlement location, the approach involved the clearance of the informal settlements hence landing the megaproject which until now is surrounded by other informal developments.

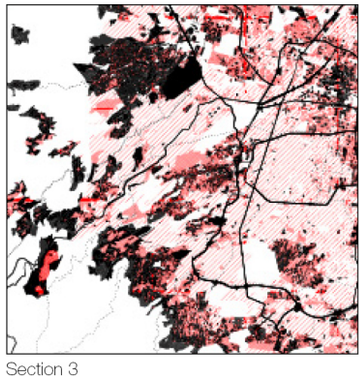
To conclude, the east (including north-east and south east) and section of the west hosts the majority of the low income population (IMG. 4.5), the west the high income, and the farther from the center the more informal the settlements get. This sectorial condition strengthens the segregated condition of the metropolis while the closeness regarding the existence of informal and formal settlements illustrate its fragmented condition.



Section 1



Section 2



Section 3

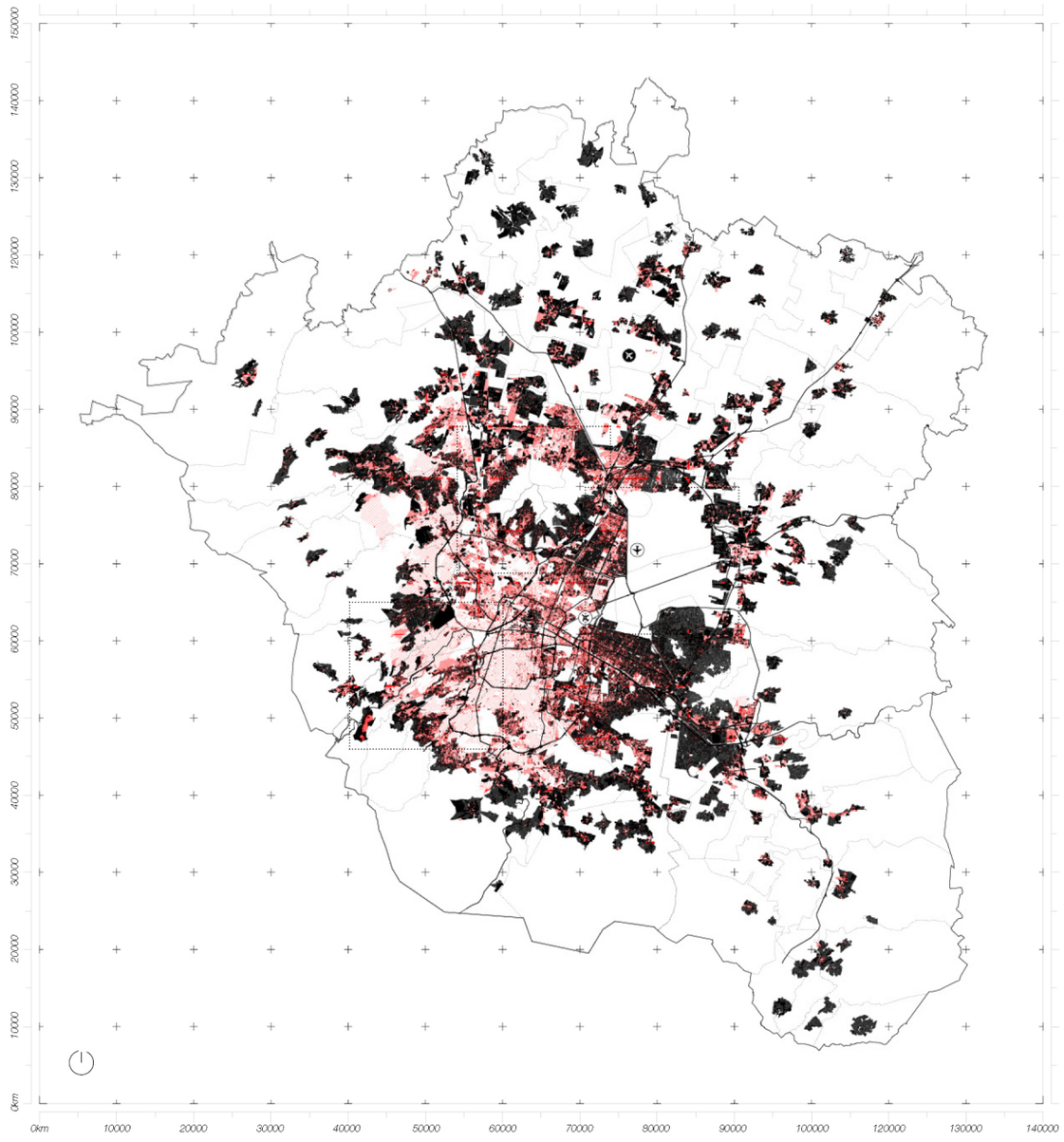


FIG. 4.5 MAVM Poverty levels *(Redrawn from F. Vallete based on data from INEGI, 2012) The figure shows the poverty distribution among plots in the MAVM*

ASYMMETRIES OF POWER

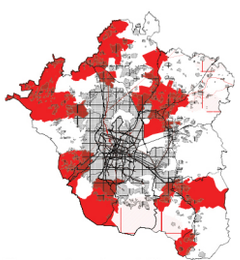
IMG. 4.5 Spatial poverty *(Source: UNEQUAL SCENES, 2019). The image shows informal settlements at the periphery of the MAVM.*

The metropolis has several vulnerabilities affecting the daily life of its citizens. The most relevant ones are economic, social and environmental vulnerabilities (FIG. 4.6.1). As shown in the figures the vulnerabilities mostly affect the peripheral areas which are the ones with the larger amount of informal settlements. It has to be pointed out that some of the municipalities affected by these vulnerabilities are close within the continuous urban fabric that has been growing over the years specifically the east area close to the natural heritage of the metropolis.

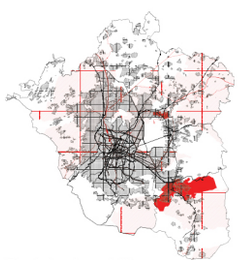


IMG. 4.6 MAVM Vulnerabilities *(Source: Google maps, 2019) The figure shows vulnerable areas close to Texcoco former lake.*

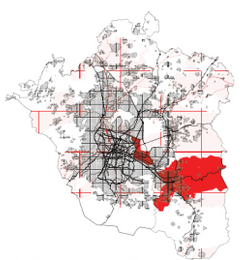
When looking at the marginalization levels of the metropolis it is clear that the later vulnerable municipalities show the areas with higher levels of marginalization. The three sections in FIG. 4.6 illustrate the most vulnerable areas closer to the urban center, which are located in the north-east side of the metropolis (if cross sectioned from south to north). The areas have similarities with each other, such as the surrounding of natural areas where the urban expansion control is weaker. Another important aspect shown in the figure (FIG. 4.6) is that there is a close relationship between the most marginalized areas and the amount of massive transport facilities they have, depicting their precarious condition due to lack of connectivity and accessibility to metropolitan functions.



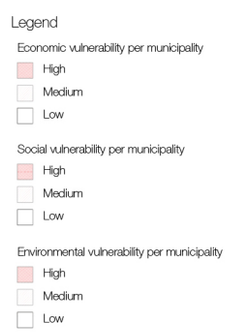
Economic vulnerability per municipality



Social vulnerability per municipality



Environmental vulnerability per municipality

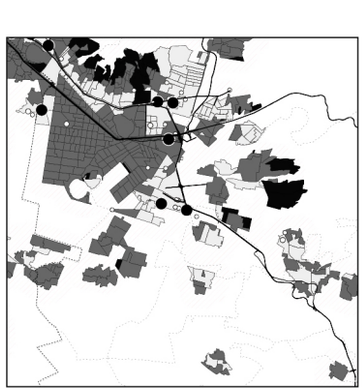




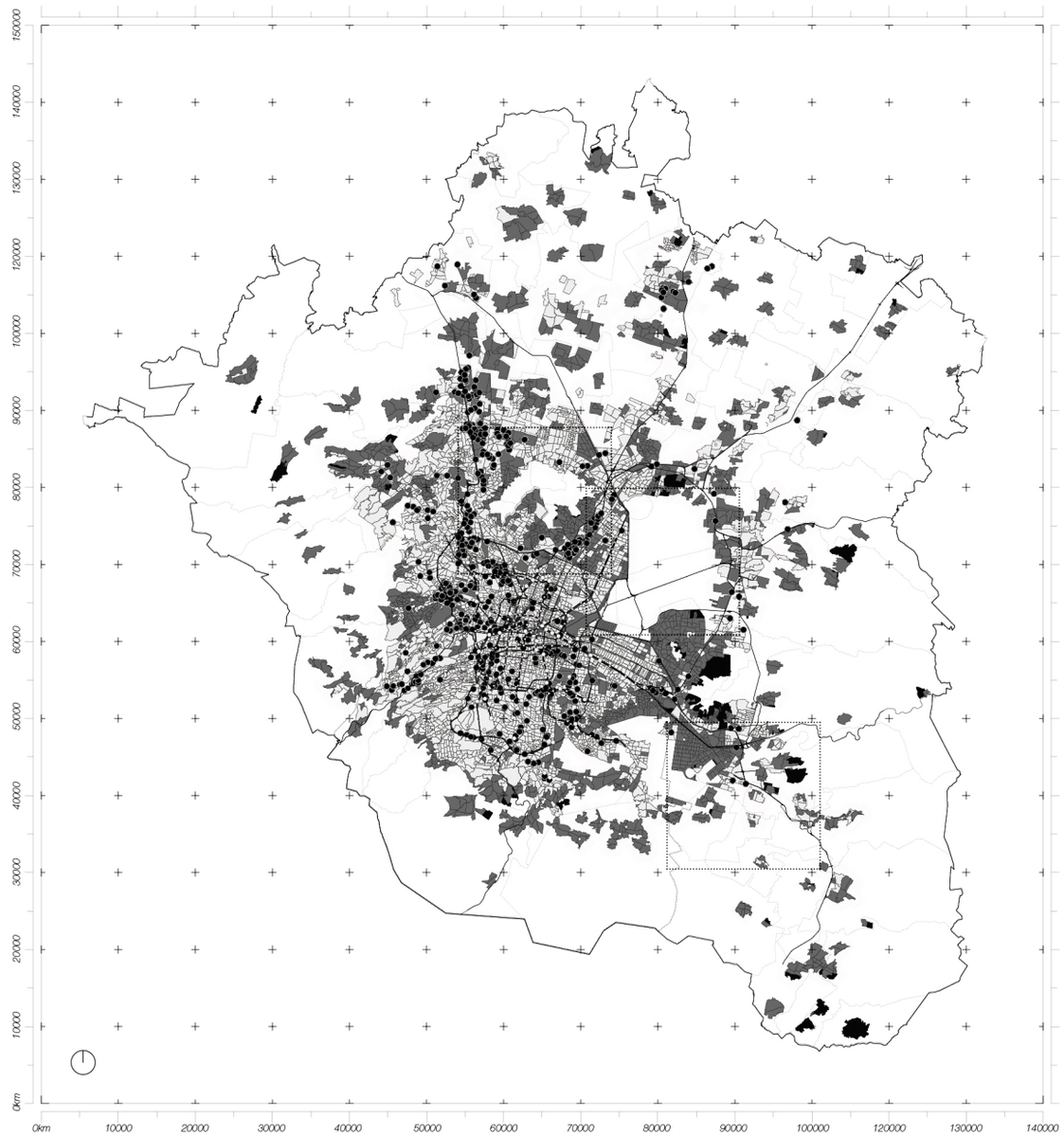
Section 1



Section 2



Section 3



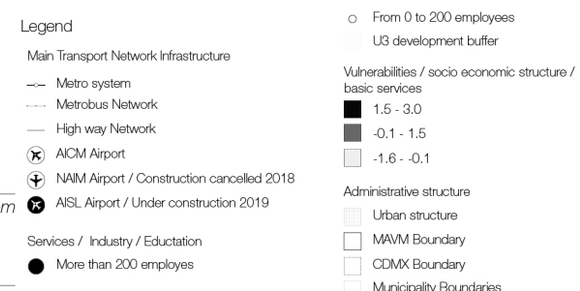


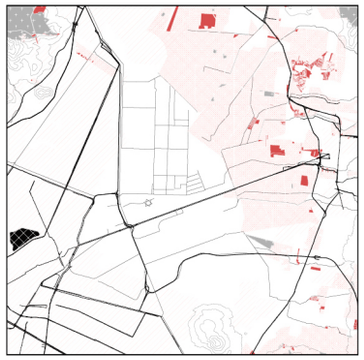
FIG. 4.6.1 MAVM Vulnerabilities *(Own elaboration based on data from INEGI, 2015).*

FIG. 4.6 MAVM Vulnerabilities *(Own elaboration based on data from INEGI, 2015) The figure shows the most vulnerable areas regarding economic, and basic services such as water.*

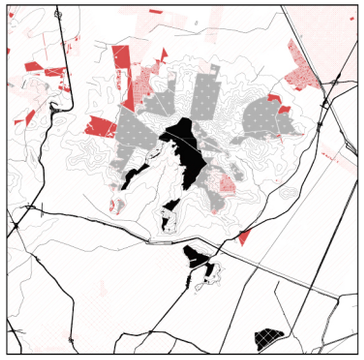
Land Regulation and Impact in Urban Morphology

The asymmetries between Informal and formal urbanization kept growing due to the lack of successful land management, policy making, tenure regulations, appropriate development and above all corruption. Irregularity became a commodity, widely accepted not only by Mexican people but by government institutions which did not implemented robust regulatory policies when needed.

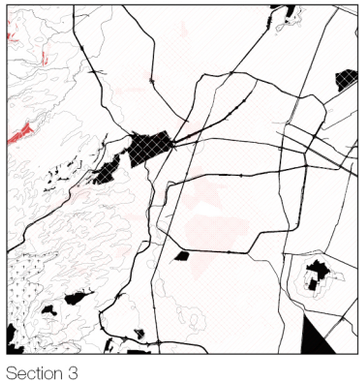
Land has been one of the most important topics related with unsuccessful urban development in the country, mostly due to its privatization, possible through current land policies and regulations. The history of land regulation asymmetries dates since the beginning of the Twentieth century, when the revolutionary movement of 1910 accomplished a division of large land estates called haciendas or ranches as a solution to give agricultural land to the most vulnerable population at the time; peasants. This division resulted not in a private individual ownership of the land but rather a communal agreement between collective groups empowered with the right to work and inhabit the land. This communal agrarian land was called ´ejido´, and its distribution continued until the 1950's when urbanization arouse due to industrialization. It is in the ejidal land where the urban expansion took place (authorized and unauthorized), primarily because it was less expensive than land located closer to the center of the cities and secondly because the price is negotiated between developers and locals, without government participation, resulting in their own speculative market. The later started to be a common practice due to the 80´s introduction to neoliberalism, which had an unprecedented influence, changing the article 27 of the constitution and stablishing the new agrarian law, allowing collective owners of agrarian land the permission to incorporate it into the property market which was not possible before in order to avoid ejido members to lose it just to become once again the property of a few owners (Eibenschutz, Carrillo, 2011). The outcome of integrating ejido land freely in the property market resulted in speculation towards its value whose effect was that ejido owners from the land closest to the urban city sell it to the highest bidder. It is relevant to mention that regardless of this selling procedure the land price outside the urban city was much lower than the one inside as mentioned before. Such discrepancies and with an open free market at their disposal, construction companies and developers did not hesitate to take advantage of the situation (IMG. 4.7), buying land at low prices to develop it. The market was their playground and they were winning all the matches. Authorities lost the control of land processes, speculation and maximization of profit were the commodity leaving the poorest population with no option but to settle informally in places without services and close to harzardous areas (IMG. 4.8 and IMG. 4.9).



Section 1



Section 2



Section 3

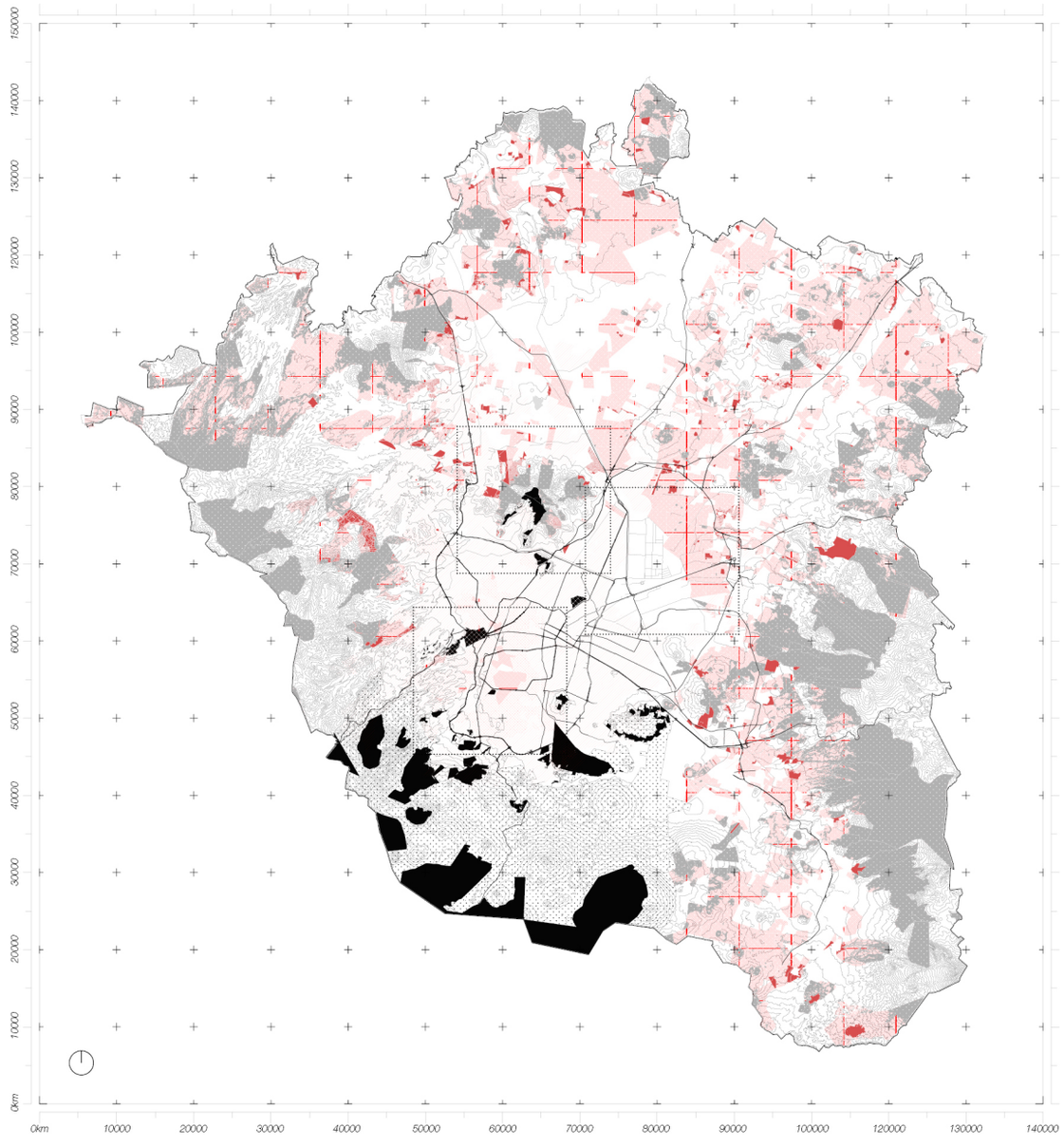


FIG. 4.7 MAVM Land use and land value *(Own elaboration based on data from INEGI, 2015) The figure shows the distribution of communal land, restricted areas and land value.*

ASYMMETRIES OF POWER



IMG. 4.7 Unequal land exploitation *(Source: UNEQUAL SCENES, 2019) The image shows informal settlements at the right close to what will be used to built housing estates or medium class developments worsening the fragmentation in the MAVM.*

ASYMMETRIES OF POWER



IMG. 4.8 Xicotencatl Park *(Image from VIVIENDA INFONAVIT VOL. 2 NÚM. 1, 2017, p.35) The image show settlements close to natural areas in the MAVM.*

ASYMMETRIES OF POWER



IMG. 4.9 Cerro del Peñon *(Image from VIVIENDA INFONAVIT VOL. 2 NÚM. 1, 2017, p.33) The image show settlements within Cerro del Peñon.*

Transport and Mobility

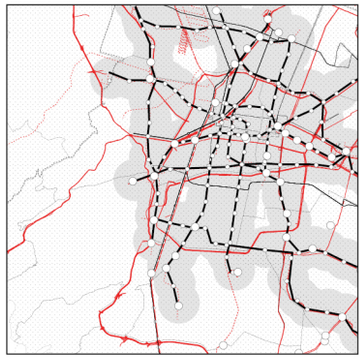
Until this point it has been stressed the effect that housing and land speculation due to withdrawal of the government regarding the control of the city growth had in the metropolis that we know today.
But in order to get a better understanding of the urban growth we need to understand the metropolitan functions of the metropolis, how they came to exist and the effects they had in the city. This metropolitan functions have been defined by strategic projects that had an important impact in the growth of Mexico City, not only were those projects capable of guiding the development but due to the natural asymmetries of power that characterized the country the projects worsen the condition that was already taking place in the pheriphery of the city.
During 1970s the expansion of the housing sector in the city was enhanced by one of the most important and expensive projects of infrastructure in the country, the subway system or as was commonly know back in the day, STC (Sistema de transporte colectivo). The STC was created in response to the fast growing population and its urgent demand for public transport, however, it had another important effect on the housing market more specifically the low-income market, pushing it to the periphery (Kozlowski, 2015).

The subway system is one clear example of the power struggle that such large scale strategic projects carry with them. The subway proposal took strength in the early 1960s as a proposal from ICA (Ingenieros Civiles Asociados) the largest engineering and construction company in Mexico at the moment and one of the biggest real estate developers in the city.(Diane E Davis, Urban leviathan: mexico city in the twentieth century Philadelphia: temple university press, 1994 p150). The project was portrayed as a modernizing icon for the city and branded as an opportunity to get support while waiting to host the Olympic games of 1968.
One of the supporters was the political party and its representatives at the time (PRI) whom were expecting similar growth patterns to those of the industrialization boom in the 1940s expecting an increase of migration from rural areas to the city, thus allowing more real estate opportunities (Kozlowski, 2015). Moreover, the project had another specific interest behind it, and it was the revitalizing of the city center, changing the current deviations result of inefficient land use replacing the low-income residential uses by commercial ones allowing the incorporation of new businesses (Kozlowski, 2015). With this new interest in play the real estate supported the operation since the strategic project meant a great capacity to capitalize from it due to the future development, increase land value and gentrification in the center and the development for the low-income outside the core.

In 1969 the STC was implemented and its impact in the city was as expected by its promotors. The center increase in size to the fringe of the subway lines that by 1980 increased the radius of the center, thus generating a new periphery that was already being built to host the new incoming labor population and the already displaced one. The spatial implications of the strategic project changed the city´s organization.


Section 1


Section 2


Section 3

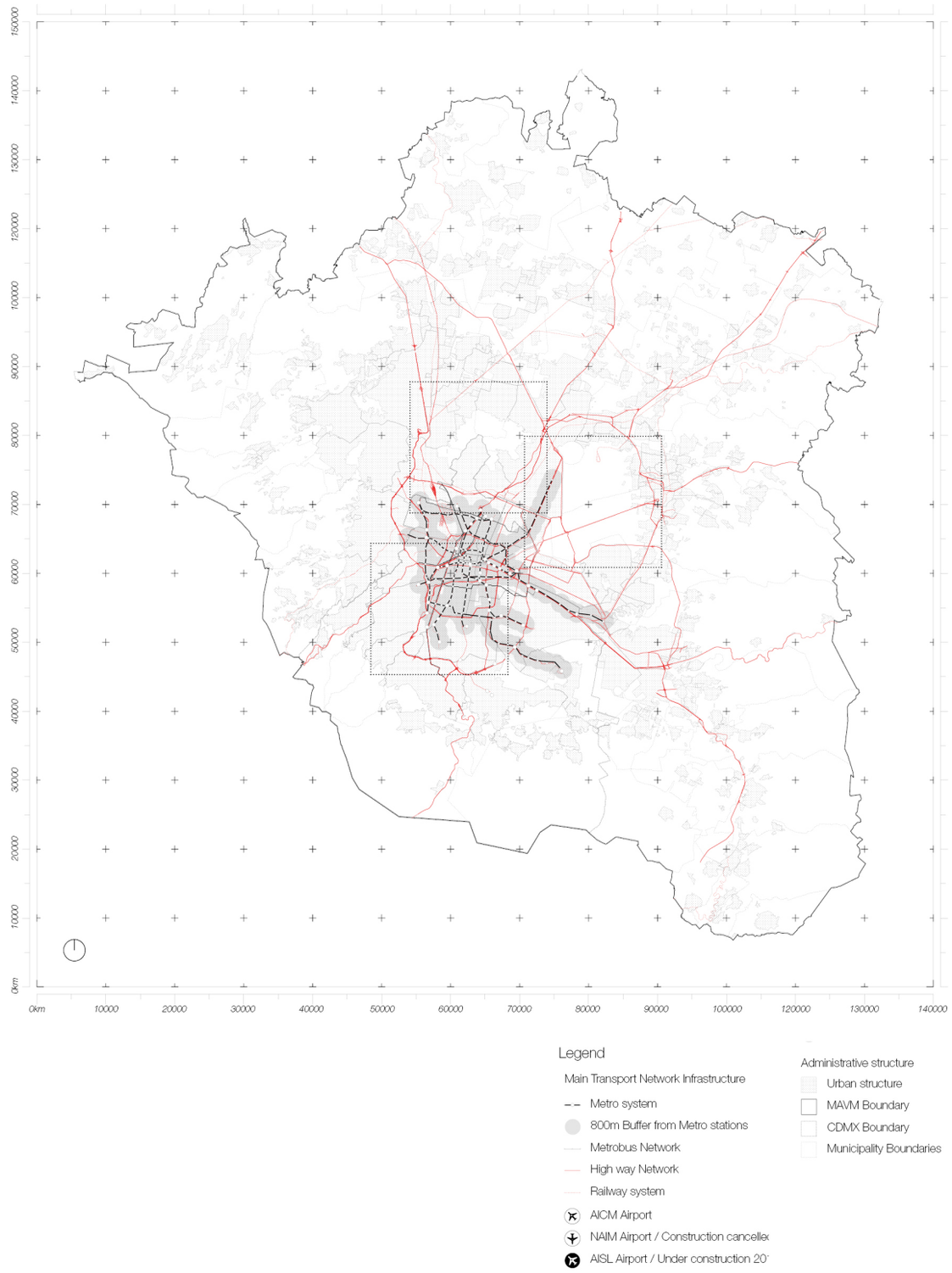


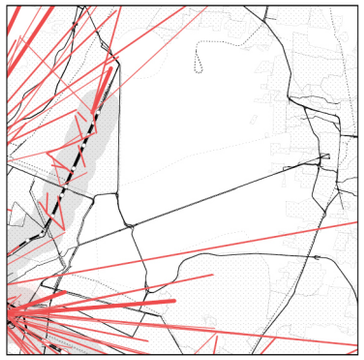
FIG. 4.8 MAVM Mobility structure *(Own elaboration based on data from INEGI, 2015) The figure shows the distribution of the different mass mobility - transport systems.*

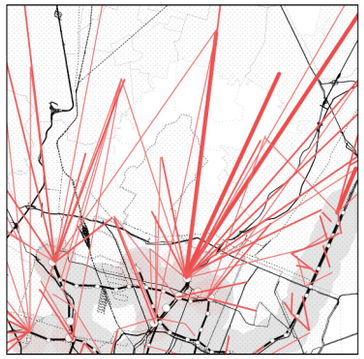
By 2016 the Metro system mobilized 4.3 million people per day within its 12 lines that function nowadays, nevertheless this number for impressive that it can be, has not changed drastically in almost 30 years since in 1989 according to EOD the total was 4.1million. Moreover it is the third most used transport method besides taxis and the private automobile in second and first respectively (EOD,2007).
Some of the reasons behind this results have to do with several factors that affect the decision making to take the metro or other way of transport; one of the reasons is the distance between the stations and the departure place, secondly the amount of stations in the neighborhoods and thirdly the facility to change from one transport mode to the other and the amount of time this takes (Murata, et. Al. 2017).

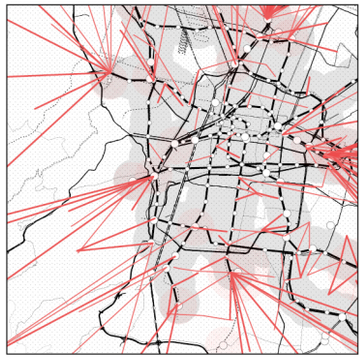
Notwithstanding the impact that the subway system had in the city the model of urbanisation, it has proved to be nothing but inefficient to cope with the demand. Public transport has not been taken into consideration in urban plans, the city expansion and growth is completely disassociated from mobility and public transport strategies as proven by the diverse interests behind the Metro system, a clear example of the asymmetries of power taking over the decision-making processes that if treated differently could have substantially changed positively the lives of its citizens.

The current model of urbanization has been highly inefficient increasing not only the footprint of the city to its conurbated estates but it has developed a scenario where public transport does not fit the demand of a continuously growing urban tissue.

The demand for public transport has increased drastically since industrialization changed the dynamics of the city and public transport has failed to comply with such demands. Long distances from job centralities have caused a dependency in the motorized vehicles to transport as a way to comply the existing demand of the mononocentric and monofuntional metropolis. It is worth mentioning that the private car is one more imaginary of the Mexican average consumer, along with private property in a neoliberal market. However the private car is not the only preferable nor affordable choice for the majority of the population, leaving a gap to fed by informal low quality ways of transport, in this regard the existence of public transport of low quality such as peceros, microbuses and combis, in order to cope with the demand. This transport vehicles are of low quality and increase the motorized mobility in the city which has already increase in 5.2% in the metropolitan region (INEGI,2010).


Section 1


Section 2


Section 3

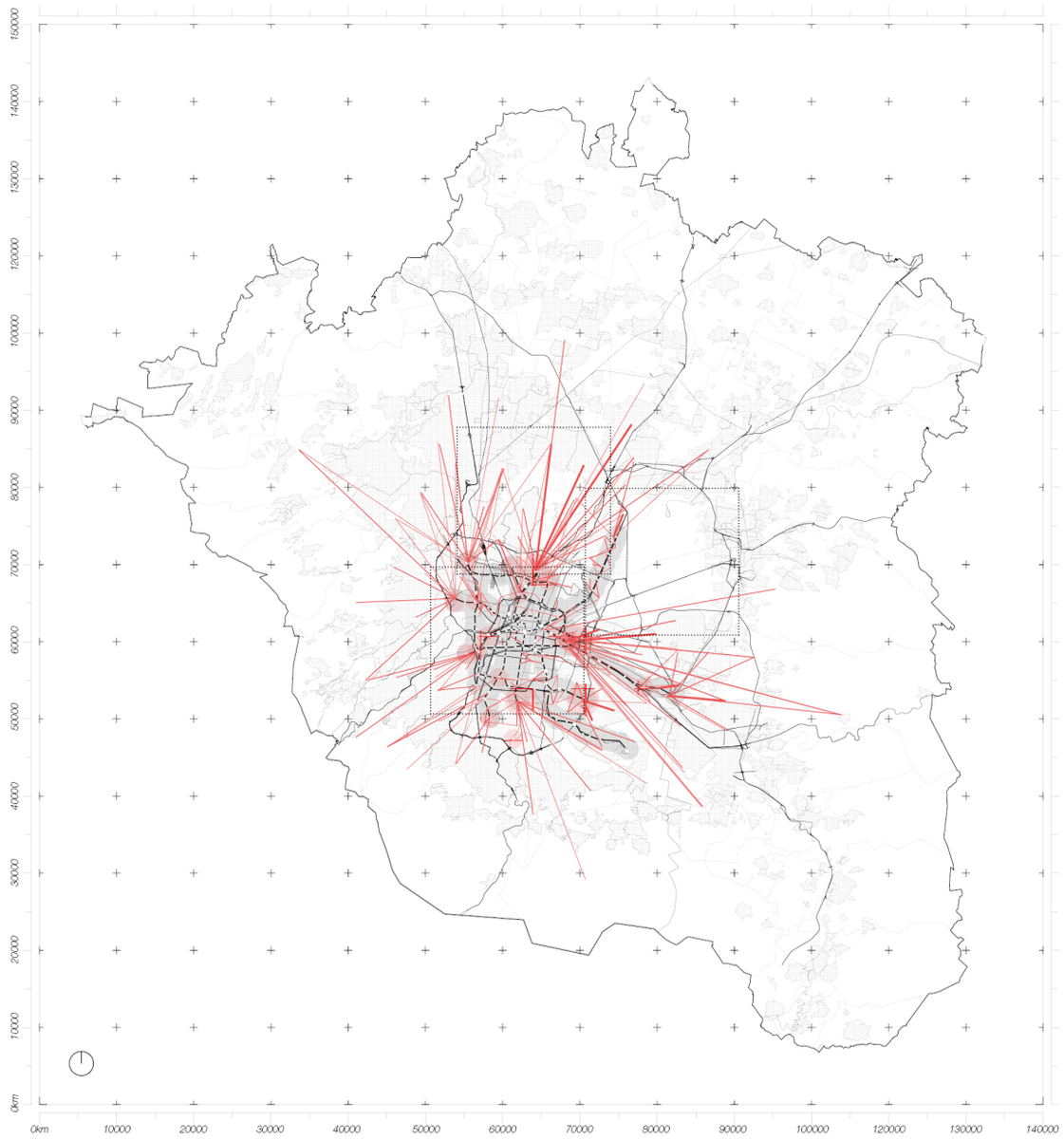


FIG. 4.9 MAVM Influence of CETRAMs *(Own elaboration based on data from INEGI, 2015) The figure shows the distribution of CETRAMS (Multimodal transport stations) and the amount of travels per day they have, depicting a clear hierarchy among them.*

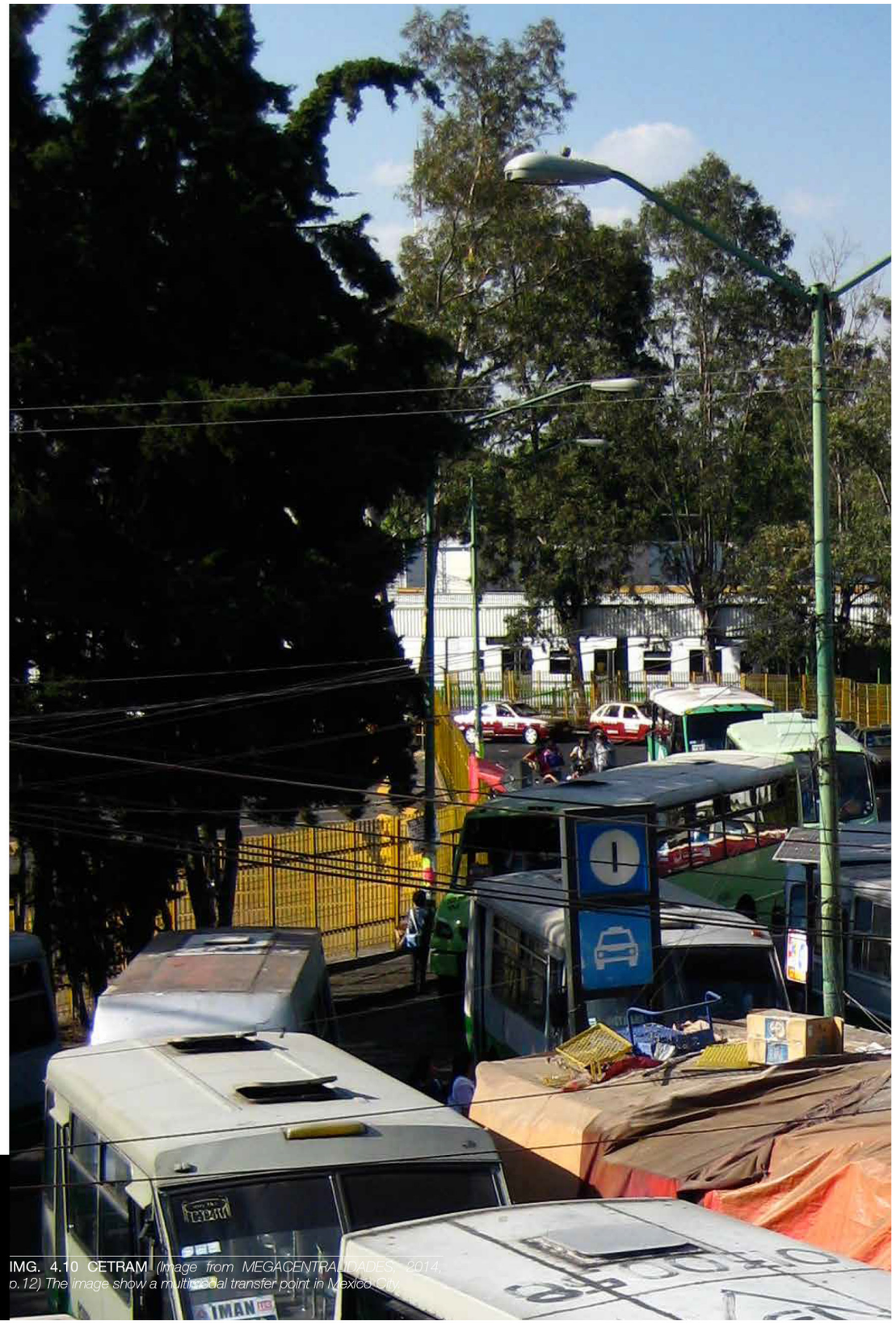
To summarize, two ways of alternative transport; private cars and motorized public transport, which have turned out to be the most used until now have created huge externalities in the urban life. Between 1990 and 2010 the number of vehicles has raised to 5.72% (INEGI, 2010) and according to the survey origin-destination (EOD, 2007) 20% of the travels are made by private cars while 53.4% is made by microbus.

Nevertheless the current infrastructure does not have the capability to absorb and mobilize the 5.5 million vehicles circulating the metropolis (ITDP,2015).This condition creates a complicated condition of high levels of traffic, long travel times, pollution, and lose of productive labor-hours, not to mention stress and other health issues. Such externalities account to almost 5% of the Metropolis GDP (hacia una estrategia de DOT)

Travel distances

Travel distances can be as long as 2.5 hours from the point of departure to the destination, usually job locations or places for high education (FIG. 4.9). This accounts for almost 4 hours every day of the week to comply with the needs to transport from one place to the other. In personal experience this has proved to be a true fact since in 2012 the total amount of travel time spent from La Joya (south neightborhood) to Universidad Autonoma Metropolitana de Azcapotzalco (University located in the north-east fringe of the second ring) was of almost 3 hours for a round trip and almost 2 hours (round-trip) from Buenavista (north of the city center) to the WTC building (9km to the south). The later could vary depending on the hour of departure, since the majority of time is taken while waiting for the public transport.

CETRAM or Centro de Transferencia Modal (multimodal transfer centers) are strategic places where 2 or more different types of public transport coexist. The majority of CETRAMS are close to a metro-stop while colectivos, buses, taxis, metrobus and other ways of transport function together to transport people to their final destinations.



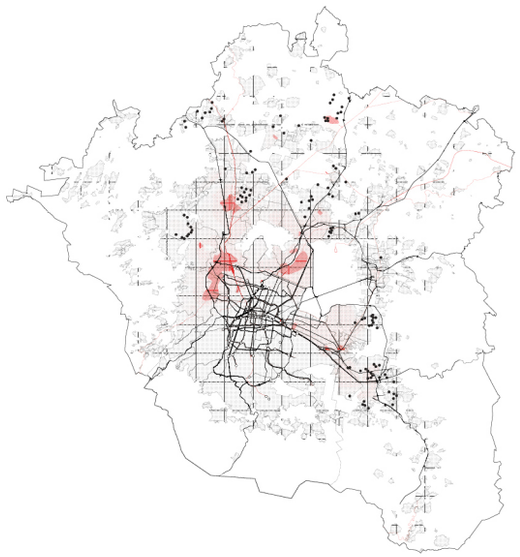
IMG. 4.10 CETRAM *(Image from MEGACENTRALIDADES, 2014, p.12) The image show a multimodal transfer point in Mexico City*

Work Places

The MAVM reflects its segregated condition in the distribution and accessibility to job locations per sector,
Retail Commercial activities and manufacture which represent 33% and 9.8% respectively regarding labor force in the MAVM are located mostly in the periphery of the metropolis while the tertiary service sector is concentrated in the centre. This shows a clear difference in the distribution of labor within the metropolis, but at the same time could be a reflection of the changed urban structure and functions regarding land uses. As another possible outcome only by looking at the location of the peripheral job sources, one could imagine that social housing in the fringe of the metropolis will have an easier access to them and at some point the position of such places might be strategic to attract low cost workers. Nevertheless in a study conducted by Montejano, Caudillo and Cervantes (2018) whom studied the patterns of segregation and accessibility from 121 new social housing developments in the MAVM. The results pointed out lack of accessibility to the labor locations both in the periphery and in the center, however the jobs located in the fringe which are related with manufacture and retail commerce are the most accessible to the social developments located in the periphery, which exacerbates the segregated condition of those developments, with a continuous homogeneity and concentration of negative effects, to what Sabatini (2006) recognized in previous residential segregation studies.



Accessibility to retail service employment



Accessibility to industry employment

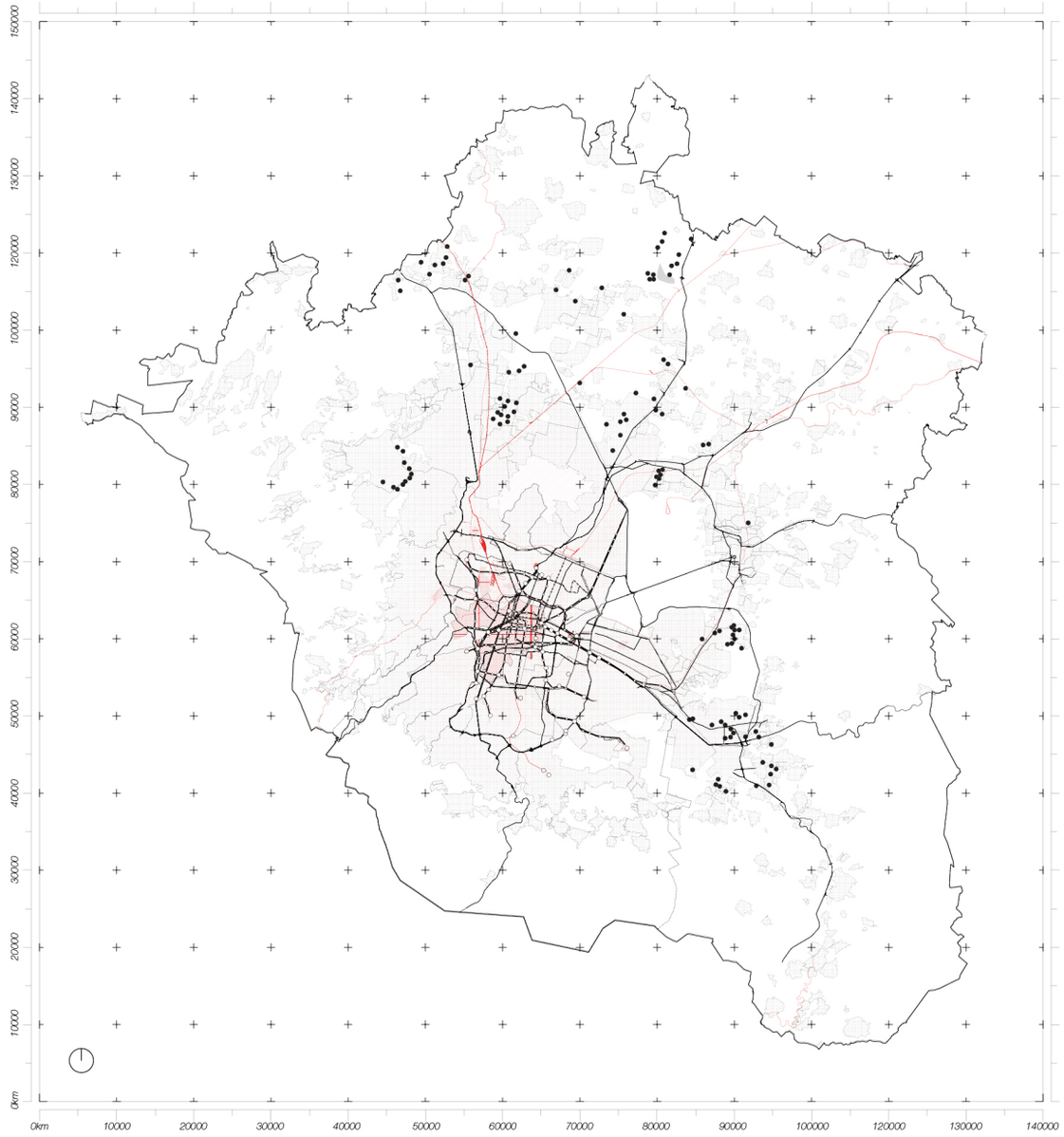
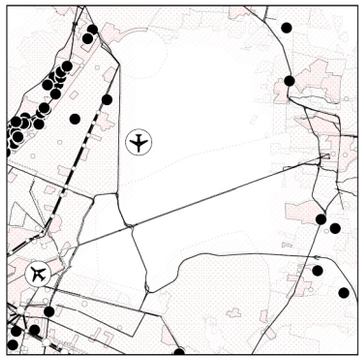


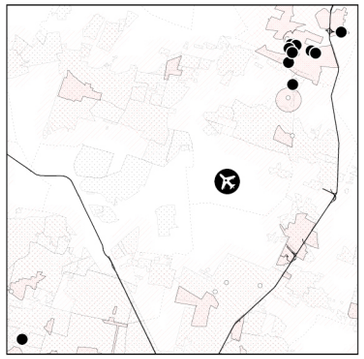
FIG. 4.10 MAVM Total Employment accessibility *(Own elaboration based on data from INEGI, 2015 and Montejano, Caudillo and Cervantes, 2018) The figure shows the total accessibility to job sources from the 121 new housing developments at the periphery of the MAVM.*

The metropolitan functions are concentrated in the centre of the Metropolis. Nevertheless the industrial areas are located in the north of the urban edge as a clear strategy to locate themselves near the main rail and highway networks allowing them to function correctly rather than locating themselves in the center where congestions and traffic might hinder their activities.

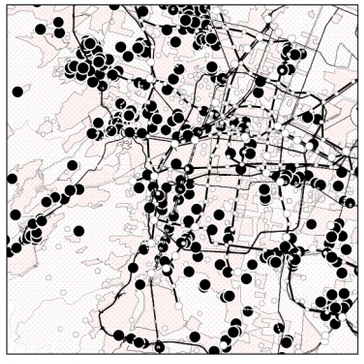
It is also shown in FIG. 4.11 that several areas of economic interest regarding jobs and with more than 250 employees are concentrated in the center but have shown to expand in some regard to the periphery areas. The areas U1 and U3 are defined by DENUE (2016); U1 are areas where there is a concentration of economic businesses with more than 1000 employees within a distance lower than 4km while the U3 is a 400 meter buffer from the later. As shown by the figure there are areas of interest which are not continuous to the urban fabric in the center, almost like patches disperse in the periphery following the main highway structure.



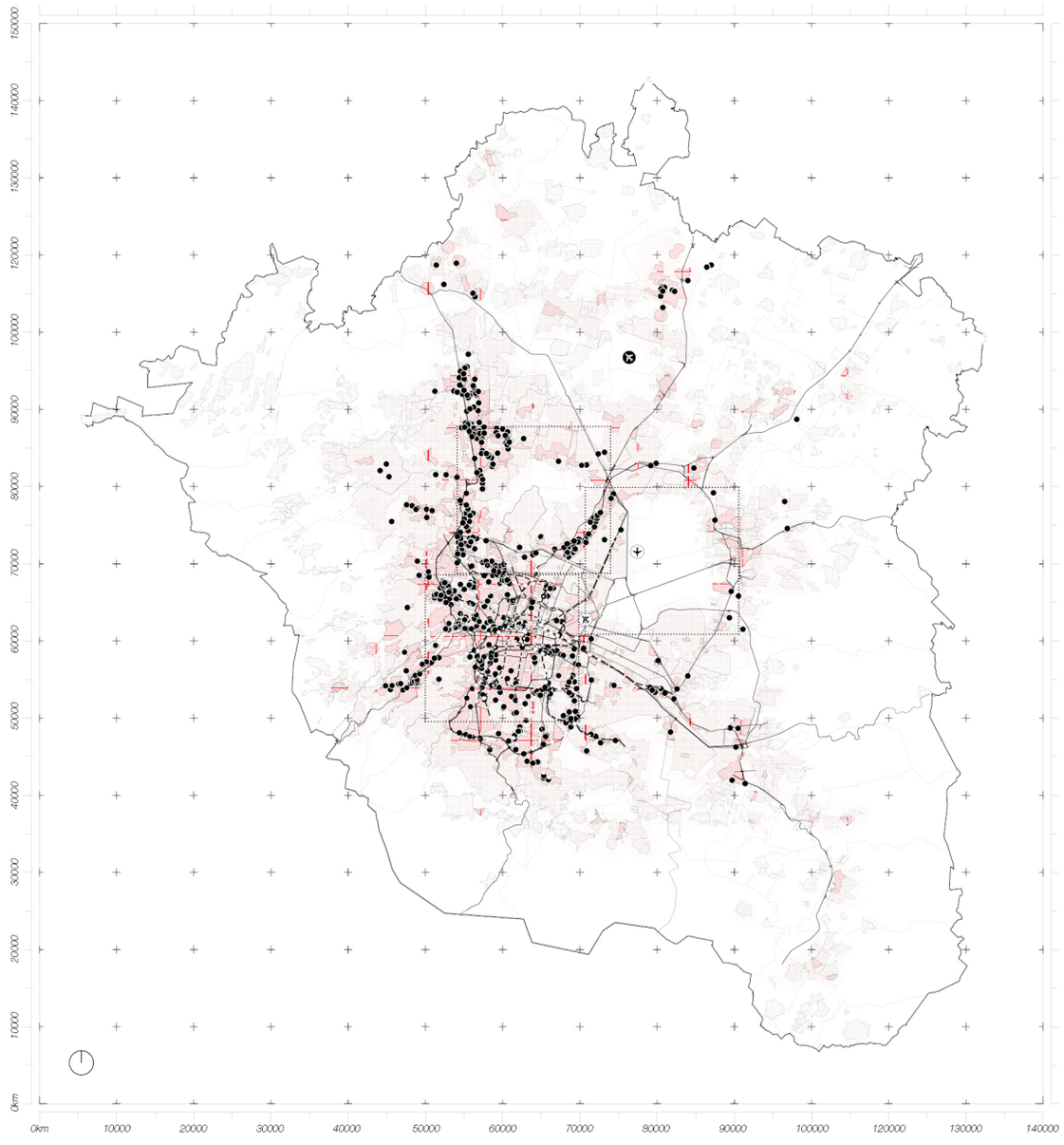
Section 1



Section 2



Section 3



Legend

Main Transport Network Infrastructure
- Metro system
- Metrobus Network
- High way Network
- AICM Airport
- NAIM Airport / Construction cancelled 2018
- AISL Airport / Under construction 2019

Services / Industry / Eductation
- More than 200 employes
- From 0 to 200 employees

- U1a and U1b employment sources
- U2a and U2b services sources / water + drainage
- U3 development buffer
- From 0 to 200 employees

Administrative structure
- Urban structure
- MAVM Boundary
- CDMX Boundary
- Municipality Boundaries

FIG. 4.11 MAVM Metropolitan functions *(Own elaboration based on data from INEGI, 2015 and DENUE and SEDATU, 2016) The figure shows the distribution of the main economic employment sources in the Metropolis and the areas of influence according to values from DENUE and SEDATU.*

Housing

Housing in the MAVM and specifically social housing has been one of the decisive modifiers of the urban form and functions of the metropolis. As explained in the urban growth of the city there is correlation between social housing and the private investment. The municipalities were not able to cope with the fast growing population and the increase in housing demands turning to private developers in order for the governmental institutions to foster only the subsidies with no involvement in the actual construction of the developments. In this regard the developers were free to speculate with the market and the result is the fragmented condition faced by the metropolis. As explained before, the housing demand has been surpassed and a great number of houses that born under the neoliberal speculative market are not being inhabited due to the lack of services, long distances from jobs and high costs of maintenance because of the low quality materials involved in their construction.

In order to understand the evolution of how housing was managed, the following timetable will elaborate in the actors involved and some of the developments made along with the major actors regarding the construction of the houses (FIG. 4.12).

The image clearly shows that the estate and municipalities withdrawn their power regarding the construction of social housing to transform into a facilitator in charge of subsidies and loans for the working class. Meanwhile the private sector took control over the construction of the housing developments which validates the transformation through which the MAVM has been dealing in the past fifty years.

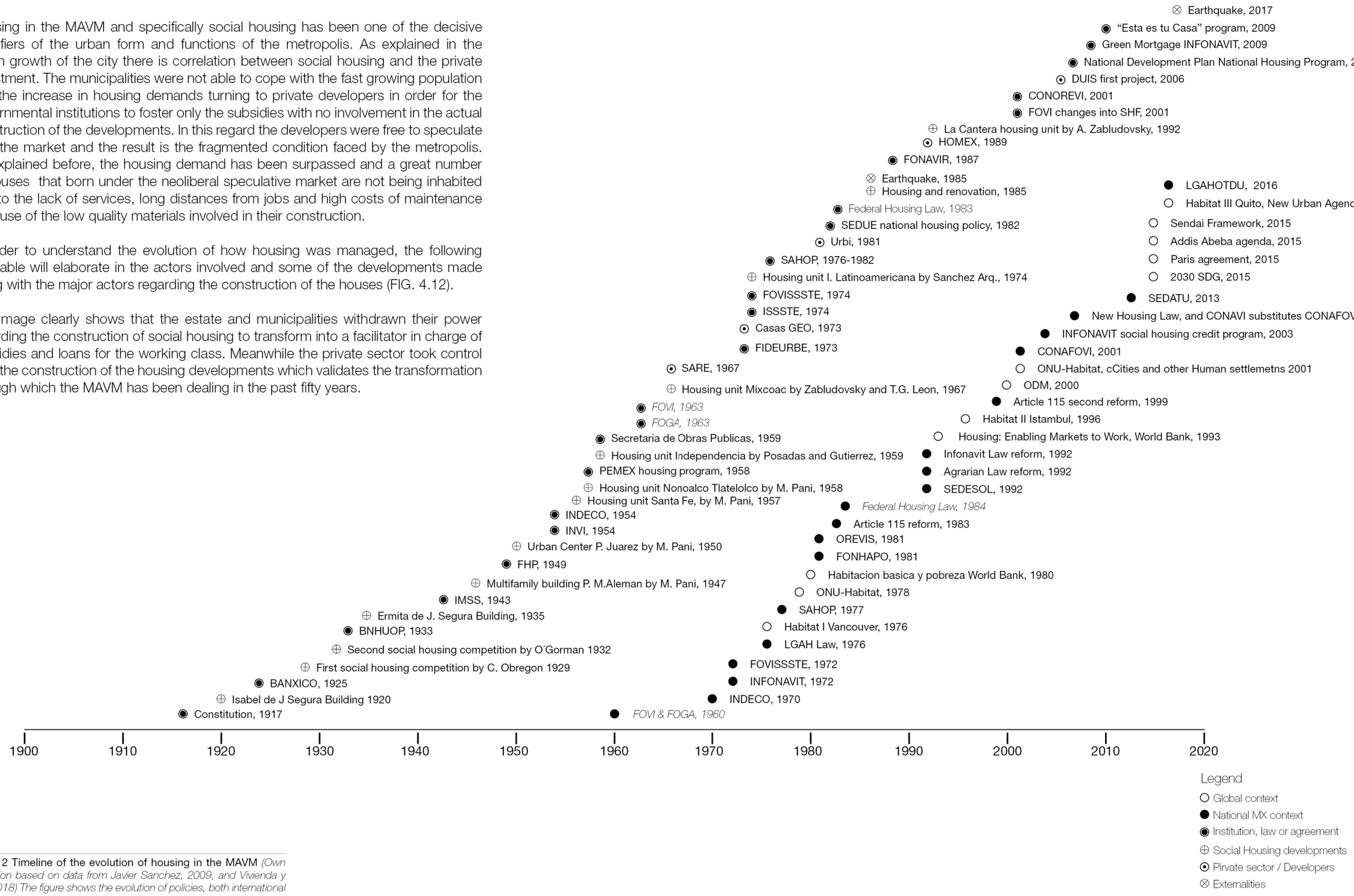
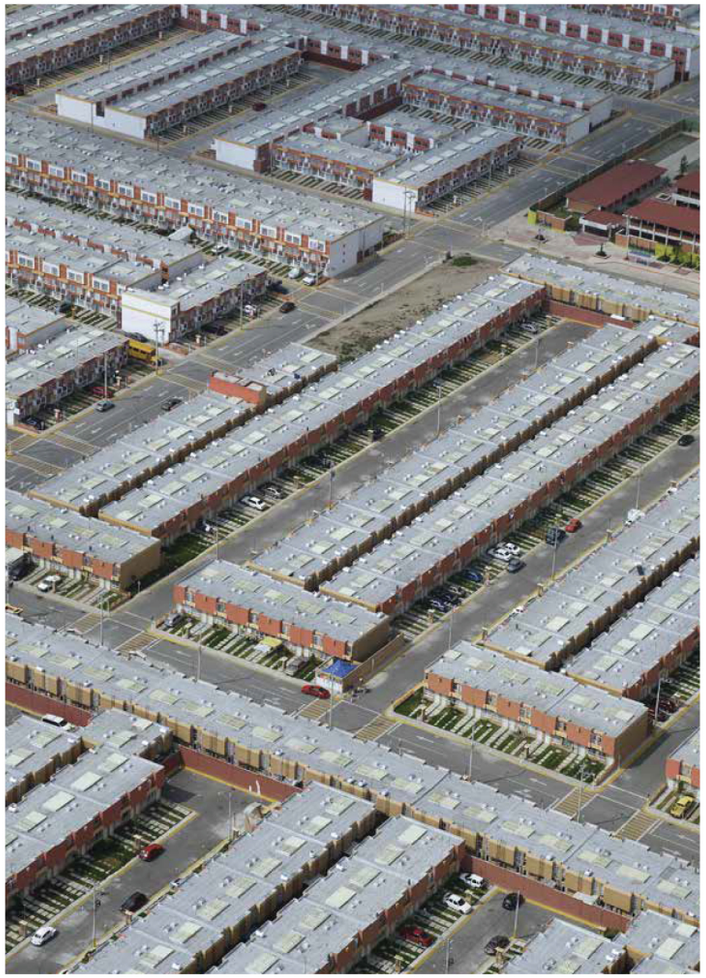
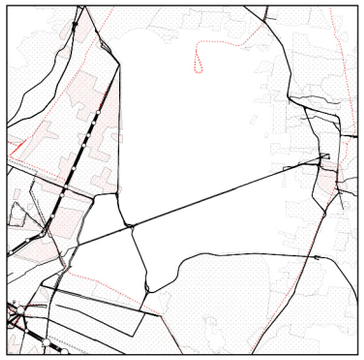


FIG. 4.12 Timeline of the evolution of housing in the MAVM *(Own elaboration based on data from Javier Sanchez, 2009, and Vivienda y ODS, 2018) The figure shows the evolution of policies, both international and national.*

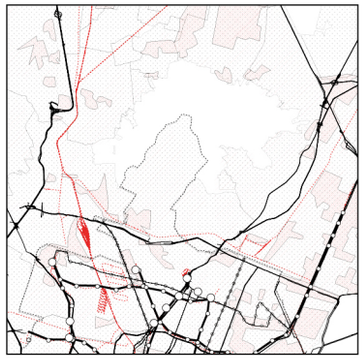
Regardless of economic prosperity cities were not prepared for the massive population growth, increasing the demand for urban land, basic urban services, infrastructure and housing. (Garcia, 2010). Moreover housing in informal human settlements took place in places far from the aforementioned services, increasing the risk to vulnerabilities such as hazards and healthy issues.
As a response to the increase in housing demand, complementary programmes for finance were put in motion, such as the housing finance programme (PFV) and the Housing Fond (Fovi) in 1963, and with them ´the emergence of a new agent for housing production: the real estate promotion sector´ (Garcia, 2010), thus the beginning of the social housing market (IMG. 4.11).



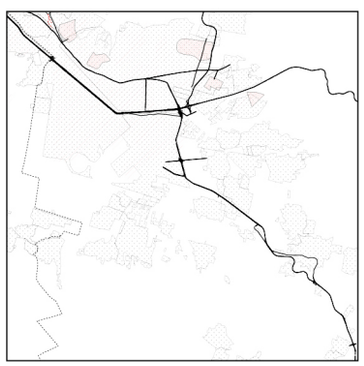
IMG. 4.11 Ecatepec housing estate development *(Image from VIVIENDA INFONAVIT VOL. 3 NÚM. 1, 2018, p.90 Jorge Tabaoda, Alta Densidad) The image show a housing estate development in Ecatepec municipality, a pettern that has been increasing since the introduction of neoliberalism*



Section 1



Section 2



Section 3

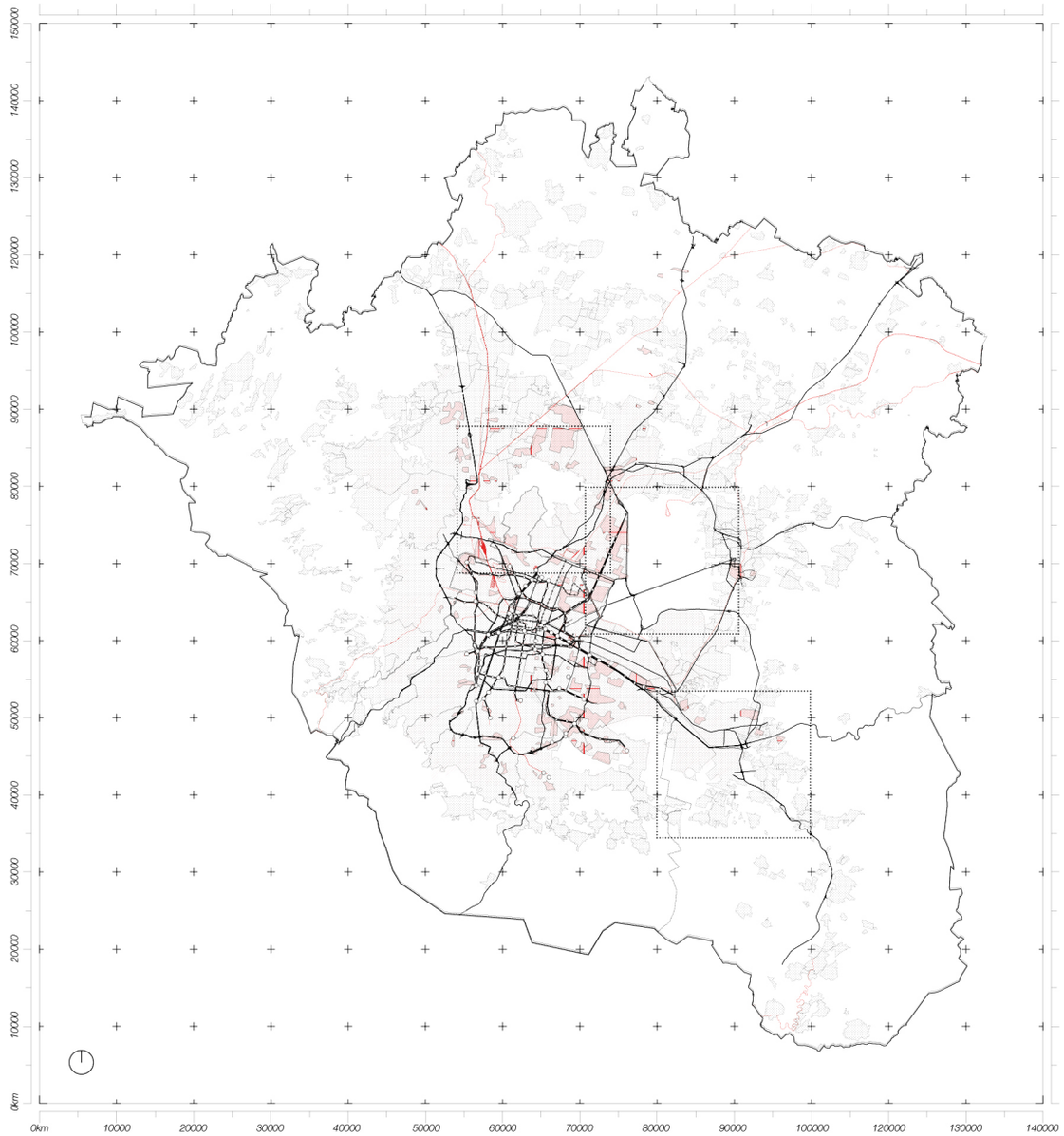


FIG. 4.13 MAVM Distribution of housing typologies *(Own elaboration based on data from INEGI, 2010) The figure shows the location of social housing and informal settlements in the MAVM.*

Governance

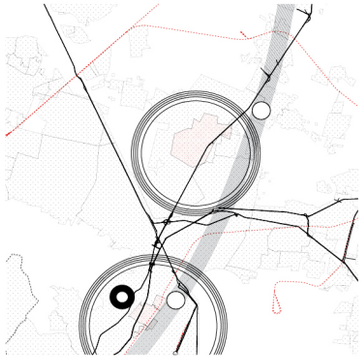
Planning in Mexico has been contextualized as a technical instrument without flexibility; an administrative tool dedicated to “control” urban expansion, mobility and land use, inadequate to answer to contemporary conflicts such as socio-spatial fragmentation, leaving vulnerable communities behind, increasing their precarious living standards.
Moreover planning has a Top-Down approach in the country since it came to be implemented during the first decades of the XX century, municipal and federal authorities have shown a serious inefficiency when approaching towards a more just planning process excluding the communities in decision making process, influenced by historical traditions and competitiveness in a neoliberal, globalized reality. The national system is full of asymmetries regarding decision making processes where political interests and corruption are part of the day to day life. In this regard governance in Mexico seems to be hard to accomplish, at least under the current economic and political conditions, it is worth to mention that some scholars, practicing architects and planners have recognized the idea of a “new” metropolitan organization or institution capable of dealing with the current multi-level problems and challenges faced in the territory under a collaborative scheme, allowing a multilevel governance and coordination regarding urban projects.

Fig. 4.14 shows the last attempt of a metropolitan master plan, made in 2012, it reflects the influence of the top-down approach where most of the interventions are not in the vulnerable areas of the metropolis but in places where investment is higher. Moreover the centre continues to have a leading position regarding the metropolitan projects.

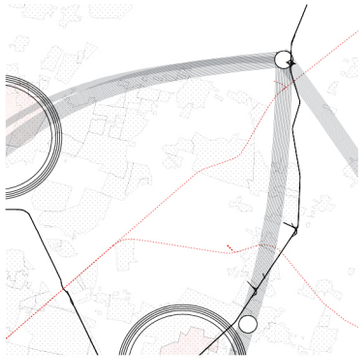
Reforma Urbana (urban reform) is one of the names coined in 2013 by group of professionals, scholars with experience at different levels and disciplines regarding city making as a way to express the concern and urgency of a substantial change at National level. The fundamental ideas behind it spin around a change in how Mexican cities have been governed and managed until today. From what is recognized as a scattered, disconnected and distant model of urbanization the change proposed by the organization is that of a compact, connected and close model. Nevertheless, connected cities imply a most needed involvement between them, a coordinated relationship between municipalities and states that can only be achieved according to CITÉS by strengthening the National level regarding planning decision making as an entity capable of coordinating the lower levels. However the efforts seem to be not working, since 6 years have passed and no substantial change has been made. As such, governance in Mexico seems to be out of the question in current urban plans. Mexico continuous with an uncoordinated approach, an unjust extreme top-down perspective that reflects the lack of willingness in implementing



Section 1



Section 2



Section 3

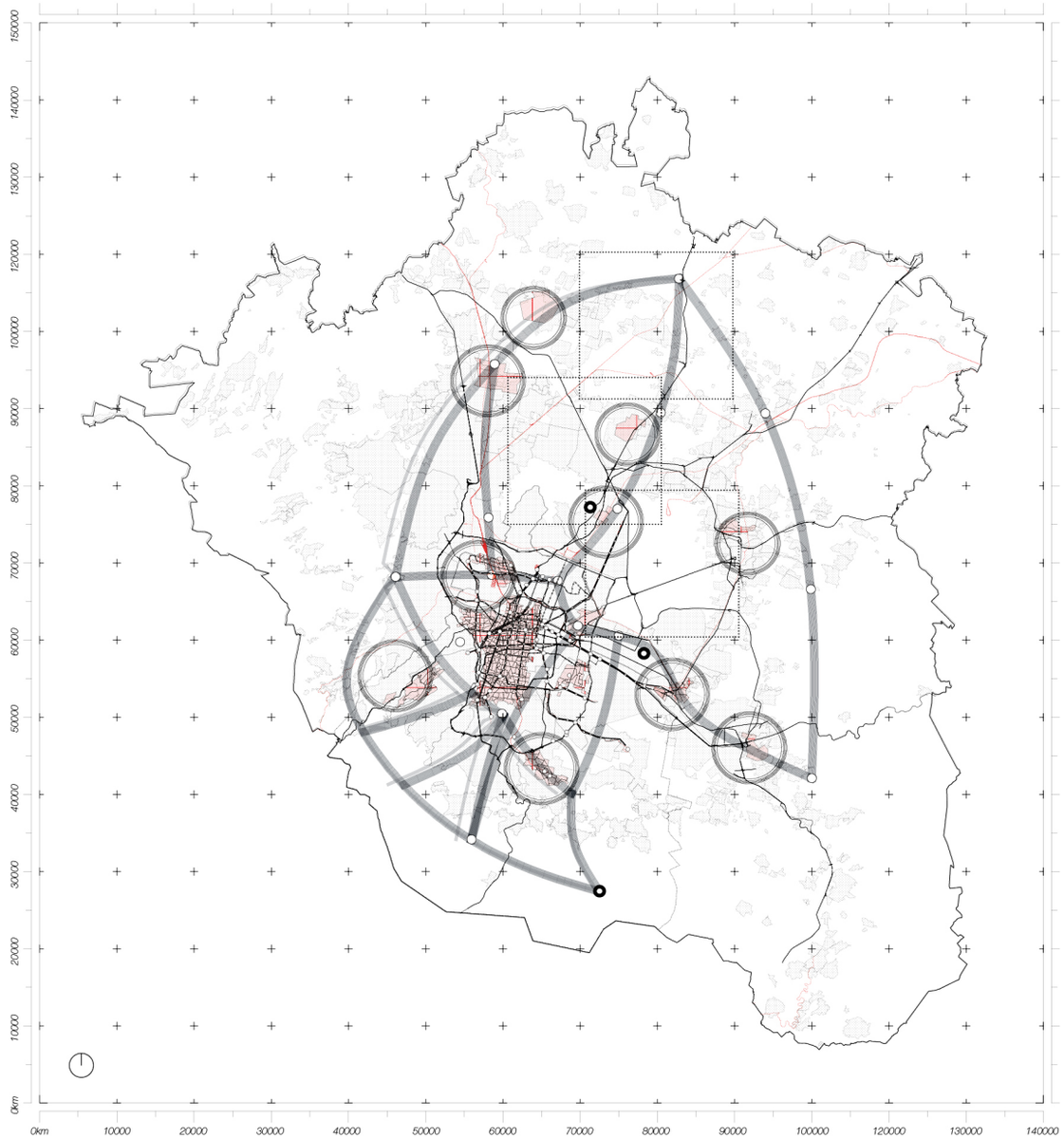
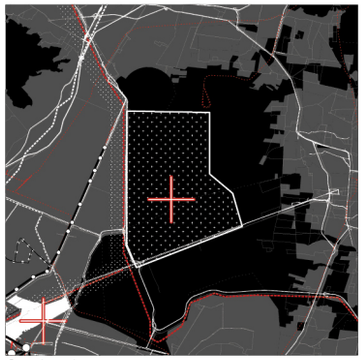


FIG. 4.14 POZMVM 2012 masterplan *(Redrawn from POZMVM, 2012 and based on data from INEGI, 2010) The figure shows the location of social housing and informal settlements in the MAVM.*

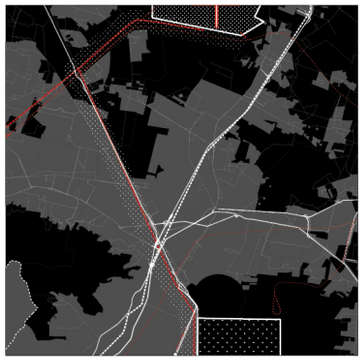
Large Strategic Urban Projects

Large urban projects (LUP) are public or private interventions in the urban structure which have a great impact in the morphology of cities. They can change the current infrastructure such as airports or massive transport modes of transport or can be implemented to improve the environmental conditions of areas such as metropolitan parks or other natural protected areas. They involve different stakeholders with different goals and strategic objectives, some of the roles they play vary according to their particular interests, but can be involved in the construction, founding, operation or maintenance of the projected LUP (Carmona, Burgess, and Badenhorst, 2009). Scale is one of the variables that can be used to categorize LUPs, their impact can be local, urban or metropolitan. The MAVM has developed several LUPs in the last 50 years; International Airport, SCT metro system, Metrobus, Mexibus, Mexicable among others, and their impact has affected the metropolis trough different scales. In recent years there has been a debate of the implementation of a new international airport, needed to cope with the high demand of travels already overcrowding the current facilities (AIMC). This lead to the projection of a new airport in one of the largest voids in the urban structure; the area of the former Texcoco Lake. As a result the construction started in 2016 but soon got cancelled in 2018 (IMG. 4.12, IMG. 4.13 and IMG. 4.14) with the new elected president, changing the course of the strategic project, relocating it in a further site losing the current structure. However the area got again attention since the proposal of a Metropolitan Park was presented by Iñaki Echeverria as the ecological park of Texcoco, changing the airport project for that of an ecological rescue one (IMG 4.15 and IMG. 4.16).

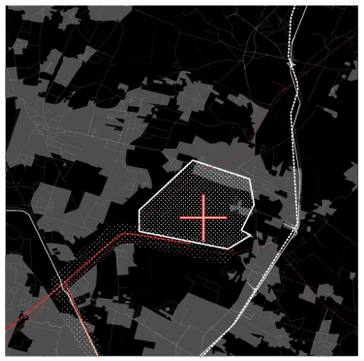
The project aims to reconnect the city to its lacustrine heritage, improving the environmental condition of the metropolis, reducing the risk of flooding and improving the conditions for the current flora and fauna that inhabits the area and is at risk. The park is projected as a 14 ha area that can make it the biggest in the world of its kind, among other facilities such as cultural, tourism and research programme.
To conclude the Large Urban Projects already being developed are strategic opportunities to improve the segregated conditions ruling the metropolis. They are specific in location, investment and interests, but with a careful and cohesive approach can turn around the current conditions of the MAVM



Section 1



Section 2



Section 3



IMG. 4.12 MAVM Distribution of housing typologies *(Source: Google earth, 2019) The figure shows the location of AICM airport underconstruction, now cancelled.*

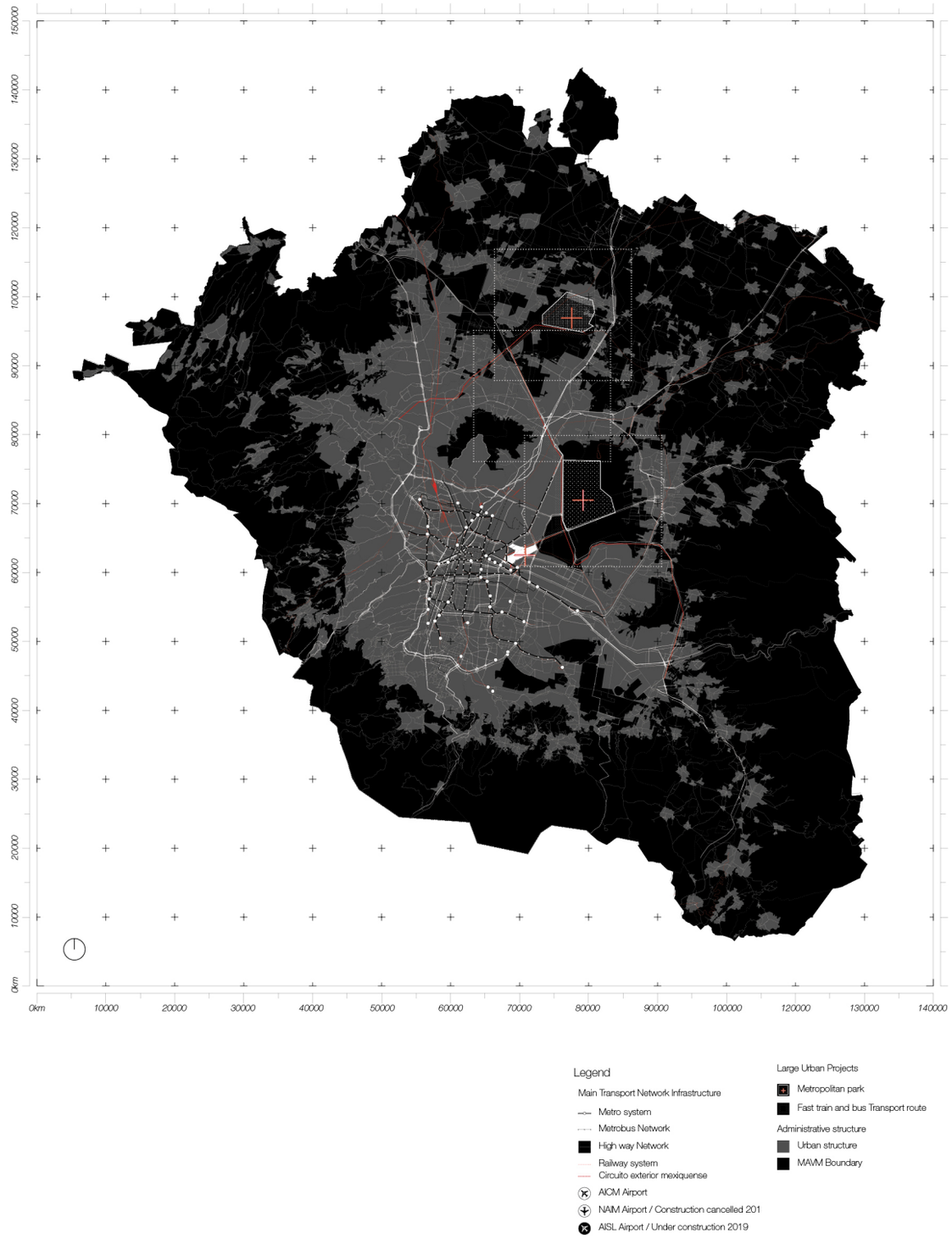
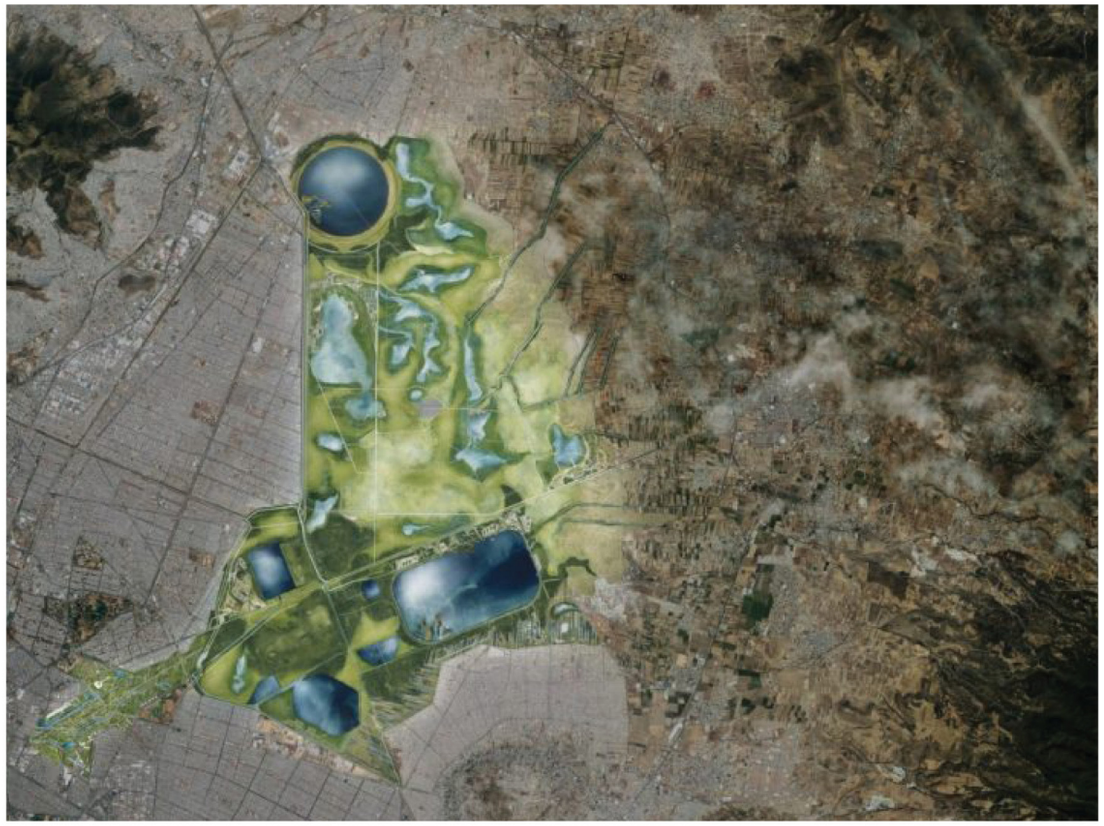


FIG. 4.15 MAVM Distribution of housing typologies *(Own elaboration based on data from INEGI, 2010) The figure shows the location of social housing and informal settlements in the MAVM.*





IMG. 4.13-up and 4.14-down AICM *(Google images, 2019) The image shows the advance condition in which the airport was cancelled.*





IMG. 4.15-up and 4.16-down Texcoco ecological park project *(Iñaki Echeverria, 2018) The image shows the vision for the future*

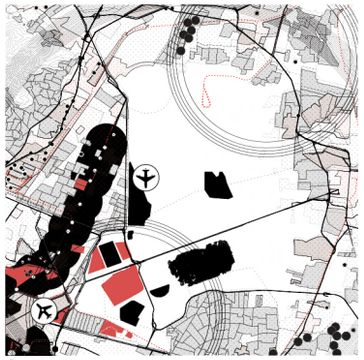
Assessment Conclusion

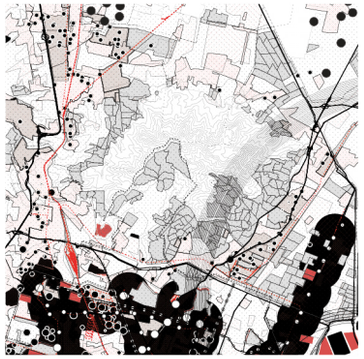
_Natural structure
The MAVM has the particular condition of being an urbanized metropolis enclosed by hills and with a lacustrine heritage that over the years has been lost. Moreover the fast urbanization and growth of the population has overstep the limits of the natural boundaries. Thousands of informal settlements have being developed in areas with high environmental value which shows the lack of a robust urban planning and control in the metropolitan area. Nevertheless there is still potential to maintain and rebuilt one of the natural water bodies that was lost some decades ago, the Texcoco Lake. The area has being segregated and it is now a void in the urban fabric. Its recovery can change the environmental conditions of the area which suffer from air pollution, and high risk of hazards such as earthquakes and flooding.

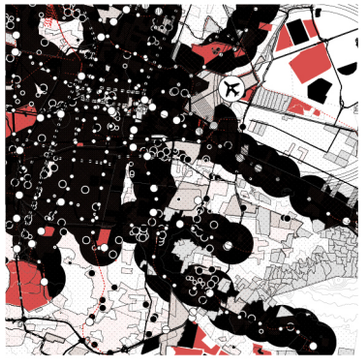
_Distribution of Population and vulnerabilities
The MAVM has an asymmetric distribution of its population. The high income and less vulnerable population lives in the west area of the metropolis while the middle income population is spread from south to center. But the low income population accounts for the majority the total inhabitants in the metropolis, and it is located in specific areas west (close to the high income developments proof of the fragmented structure) and mostly in the east side of the MAVM and the peripheral areas that are segregated from the metropolitan functions in low density housing estates with no accessibility to basic services either.

_Land Regulation and Impact in Urban Morphology
Land regulation or the lack of it has meant for the metropolis the availability to expand wherever possible worsening the environmental conditions of the area and the segregated condition of its population.
In a free market controlled by the private sector most of the new developments have been focusing on a strategy of maximizing profit, speculating with the value of land and its development. The later has a major morphological impact in the urban fabric which has being growing nonstop towards the periphery in a sprawl fashion.

_Transport and Mobility
Transport and mobility in the metropolis followed the monofunctional structure of the metropolis concentrating in the centre and spreading towards the periphery in a less effective way contributing in some regard to the segregated condition of the MAVM.
Massive public transport has proved to be insufficient to cope with the faster growth of the population and the periphery where the most vulnerable portion of the population lives.


Section 1


Section 2


Section 3

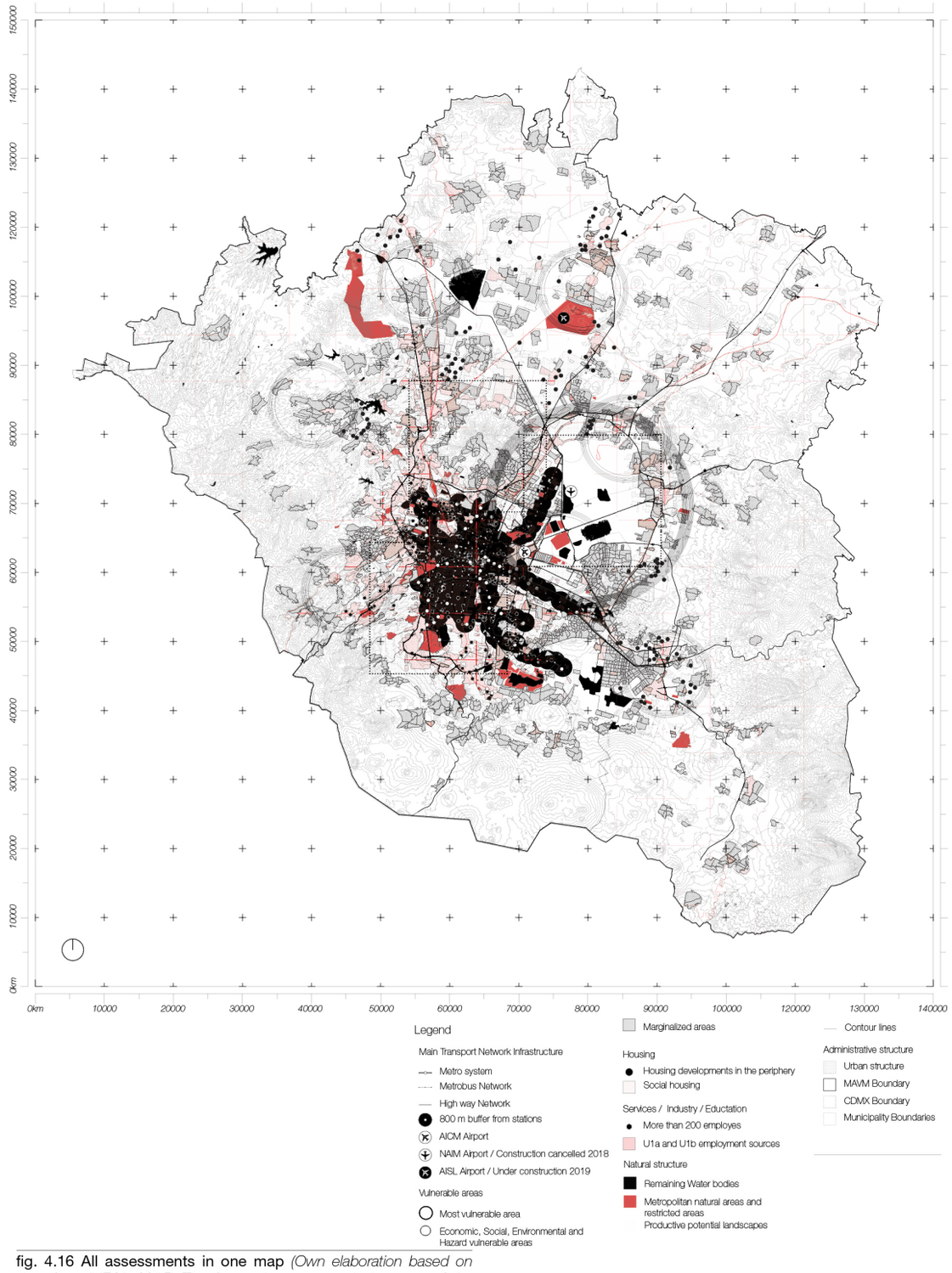


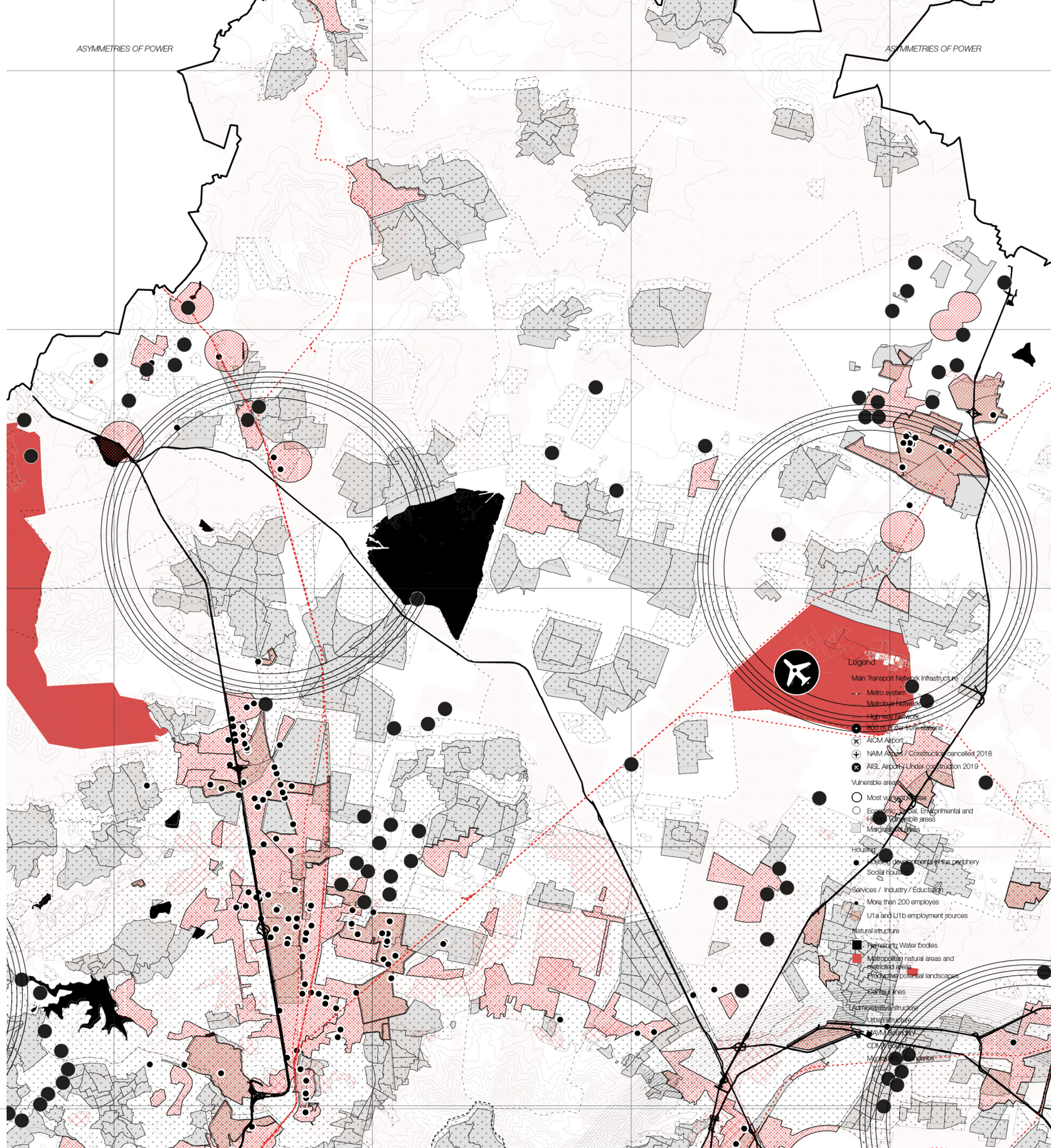
fig. 4.16 All assessments in one map *(Own elaboration based on data from INEGI, 2015) The figure shows a conclusion map of the assessments previously made depicting the most vulnerable areas, thus narrowing the specific area for further study in this report.*

_Work Places
Working places are distributed as follows: industrial areas close to the peripheral highway network, and specialized services and international businesses concentrated in the center which lead to a monofunctional relationship center- periphery. The neoliberal era has make this sector to grow at fast speed in order to cope with globalizing trends, meaning that a lot of jobs are offered in the central area setting a specific condition of mobility and accessibility to reach them. The latter is difficult for the high numbers of inhabitants living in the periphery. Commuting from the periphery to the center takes long periods of time (between 1.5-2.5 hours a single trip) making unsustainable and costly for the low income population to access the metropolitan functions.

_Housing
Housing is a crucial topic in the MAVM. From one side there are new housing estates under continuous development in the periphery with no access to suitable public transport, basic services or other metropolitan functions. This housing developments are inefficient and unsustainable for their long commutes and segregated condition. Moreover informal settlements (housing that has being developed in land illegally) have grown over the years in peripheral territory close to housing estates made for a higher income-population a phenomena that has worsen the fragmented condition of the urban tissue.

_Governance
Governance in the metropolis is currently weak. There is a tradition of a top-down approach regarding decision making processes in urban planning. It is clear that the municipalities are not collaborating due to the high pressure of land investment. The competition has affected the condition of the metropolis where most of the attention is focused on the beautification and maintenance of the central area without care of the periphery.

_Large Strategic Urban Projects
Large urban projects have also influenced how the city grew over the years until its consolidation as metropolis. The metro system and highways allowed the expansion of the urban tissue segregating the lower income population that soon enough was unable to cope with increasing living costs in the central areas. Nevertheless. there is potential in the new large urban projects currently taking place in the metropolis, which can lead to a collaborative adaptation with a new governance approach and cohesive practices that take into account the benefits of the population as a whole.



S OF POWER

ASYMMETRIES OF POWER

Legend

Main Transport Network Infrastructure

- Metro system
- Metrobus Network
- High way Network
- 800 m buffer from stations
- AICM Airport
- NAIM Airport / Construction cancelled 2018
- AISL Airport / Under construction 2019

Vulnerable areas

- Most vulnerable area
- Economic, Social, Environmental and Hazard vulnerable areas
- Marginalized areas

Housing

- Housing developments in the periphery
- Social housing

Services / Industry / Eductation

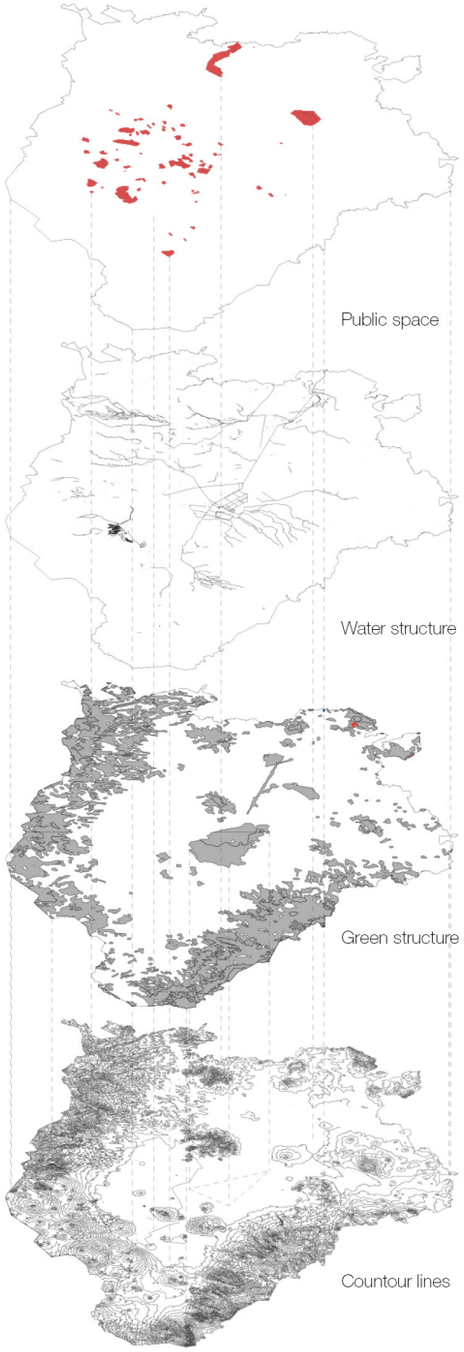
- More than 200 employes
- Ut1a and U1b employment sources

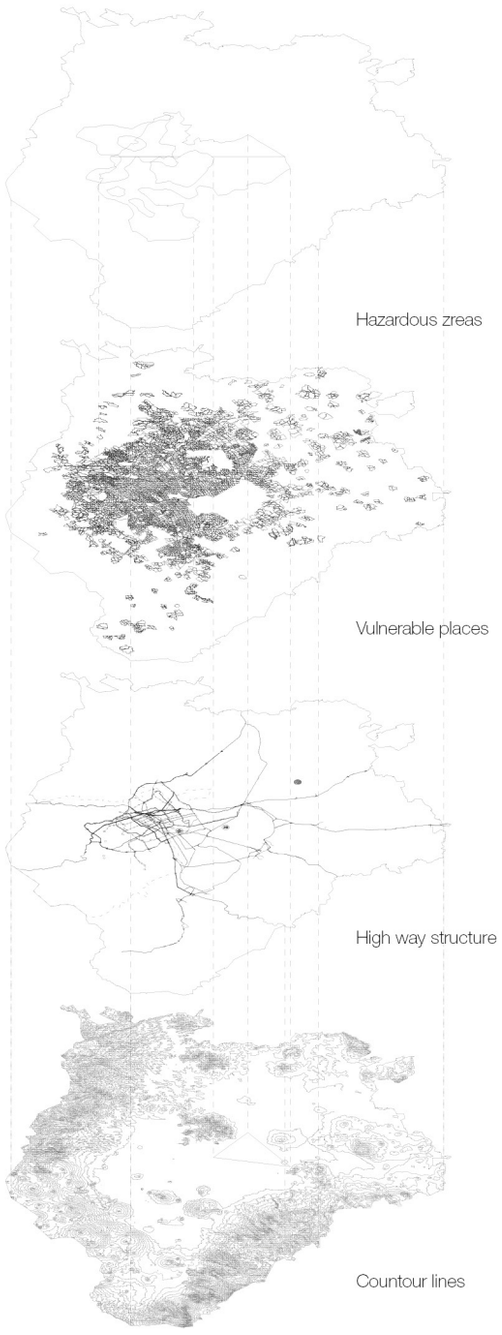
Natural structure

- Remaining Water bodies
- Metropolitan natural areas and restricted areas
- Productive potential landscapes
- Contour lines

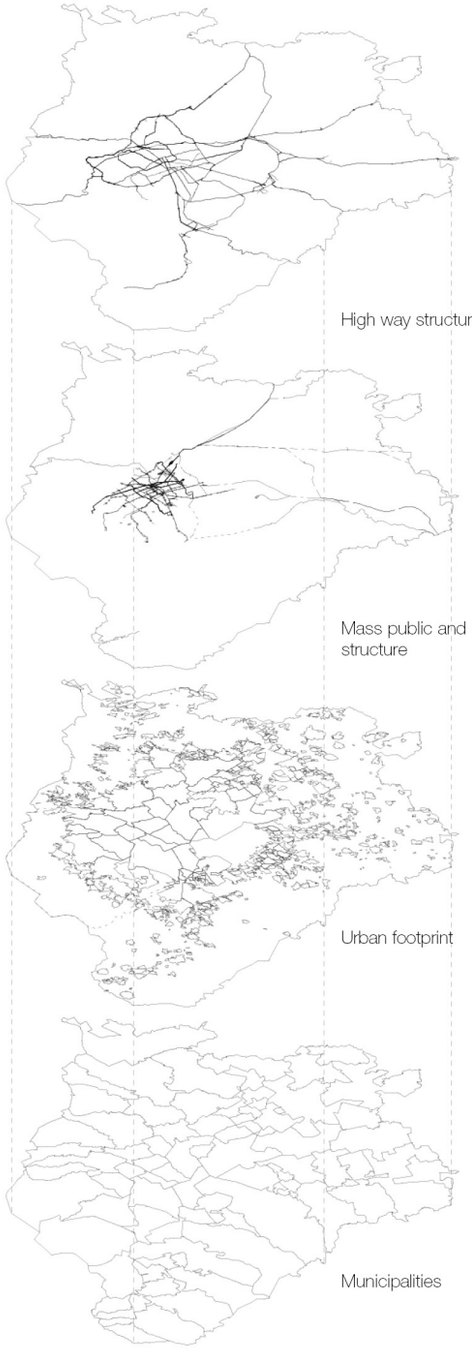
Administrative structure

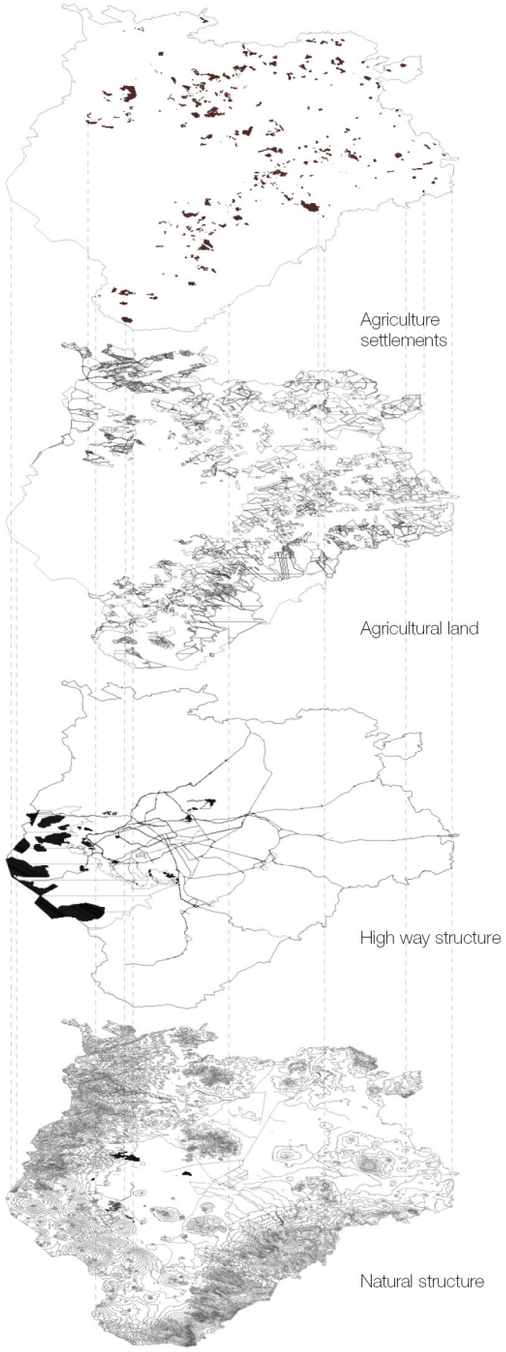
- Urban structure
- MAVM Boundary
- CDMX Boundary
- Municipality Boundaries

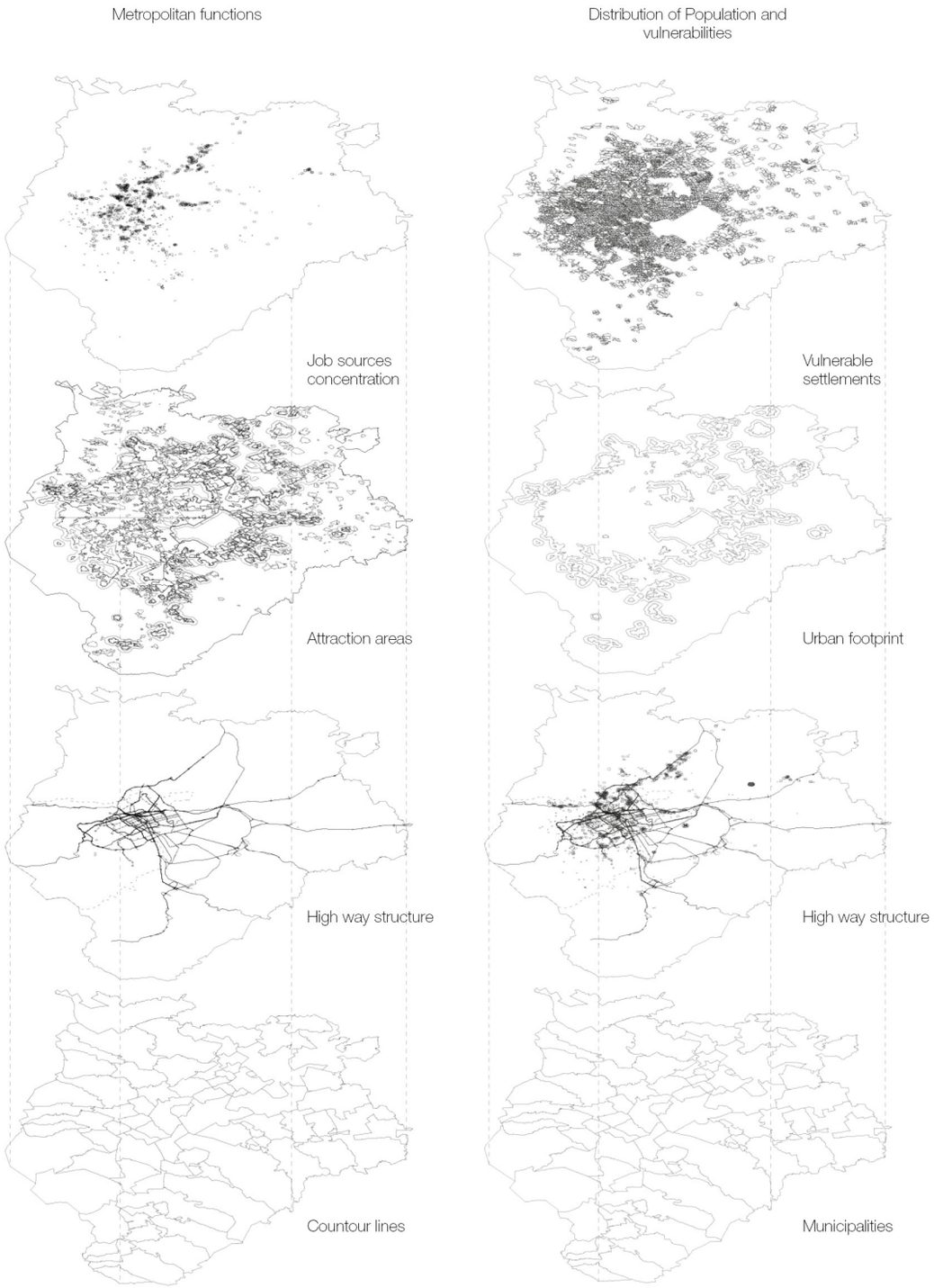




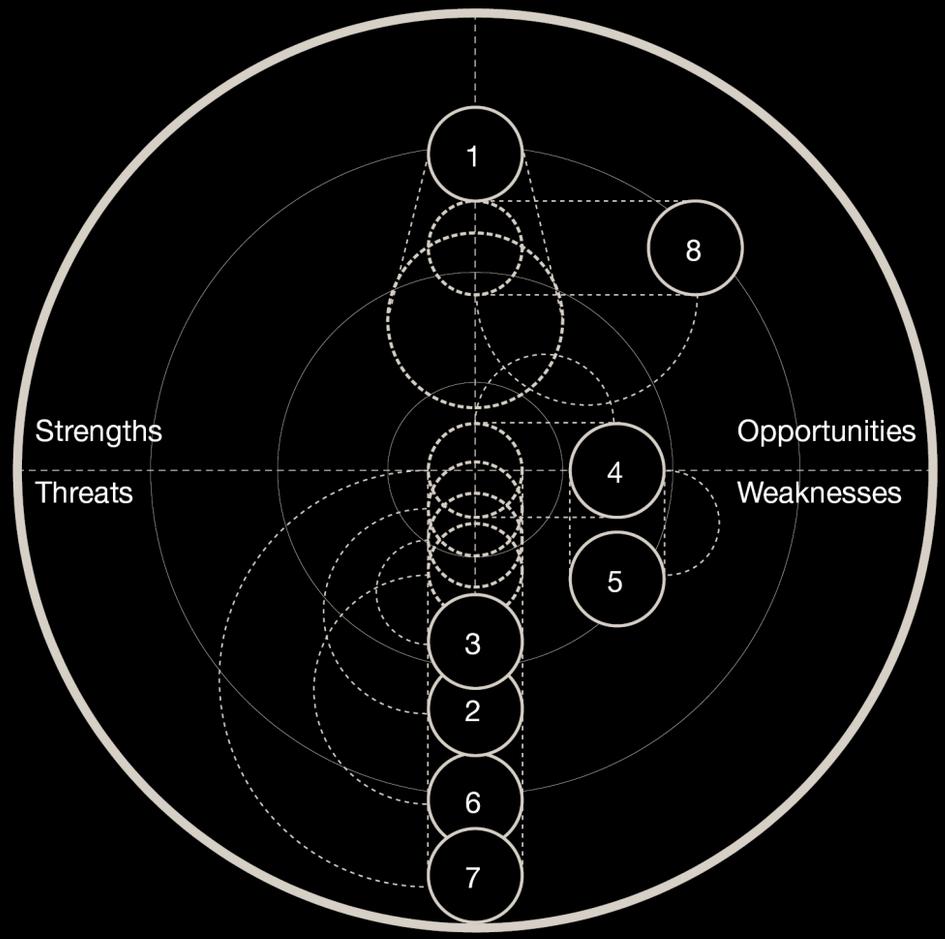
IMG. 4.13-up and 4.14-down AICM *(Google images, 2019) The image shows the advance condition in which the airport was cancelled.*







IMG. 4.13-up and 4.14-down AICM *(Google images, 2019) The image shows the advance condition in which the airport was cancelled.*



The following SWOT analysis emphasizes on the weaknesses and opportunities that are revealed in the metropolitan assessment and their respective desirable influence in the metropolis. These findings will be used to elaborate the adaptive strategic planning of the selected area.

1 - Natural Structure
2 - Distribution of Population and vulnerabilities
3 - Land Regulation and Impact in Urban Morphology
4 - Transport and Mobility
5 - Work Places
6 - Housing
7 - Governance
8 - Large Strategic Urban Projects

Desirable

FIG. 4.17 SWOT analysis of the MAVM *(Own elaboration)*

5 SITE AND SYSTEMIC GOALS

ASYMMETRIES OF POWER



Overview

The following chapter will elaborate five different systemic goals which depart as extreme case scenarios that deal with uncertainty dimensions within the area of study. This goals can stress new development in the area and transform it. In order to construct the scenario narratives, first a timeframe for elaboration of such goals needs selected, for the purpose of this narrative the year 2050 will be the time limit. Notwithstanding the speculative nature of the uncertain futures addressed by each one of them some potentials will be discovered with the capacity to help the elaboration of a cohesive strategy that adapts towards uncertainty.

Determination of the Area of Intervention

In the last chapter the assessment of the metropolis brought several concerns that affect different dimensions of the territory. It was pointed out how the metropolis functions, its natural conditions, weaknesses and threats as well as opportunities and potentials that could help the territory to adapt and evolve in a procedural cohesive way. It also has been stressed the asymmetric condition of the metropolis which shows a clear disadvantage for the most vulnerable people, a stratum of the population that accounts for its majority settling in the peripheral areas where the metropolitan functions are not connected or are not sufficient to cope with the demand.

However for the purpose of this research a specific area is selected, where both weaknesses and strengths can enable the metropolis to develop the adaptive strategic planning. A clear area is defined for further analysis located in the east of the MAVM, a 15km circumference (IMG. 5.2) is defined taking several considerations in advance, within the most important are:

- The high intensity of diverse metropolitan vulnerabilities
- The lack of connectivity to the rest of the metropolitan functions
- The natural potential of the location to recover the lacustrine heritage
- The importance of the large urban project currently under development as a potential trigger for the adaptive approach since several municipalities are directly affected by it.

Tthis area is located where one of the biggest large urban projects of the metropolis will take place, taking advantage of the possibilities that it can provide to the area at a local level but also at the metropolitan level; the project is the ecological park of Texcoco which was introduced earlier, and due to its location near one of the most vulnerable areas in the metropolis can trigger new collaborative practices of governance and urban planning that in the long term can modify the asymmetric dynamics of the MAVM.

But how the area will look like in the future? As part of the complementary approaches explained earlier in the methodology chapter one of the methods to be implemented in this report is the test by design of five different systemic goals. The goals represent key challenges that are aligned with the SWOT analysis addressed in the previous chapter, where natural potentials and vulnerabilities that threaten the area are contested by such goals, formulated specifically to stress the relationship between them in order to foster a new approach for future participatory development.

The systemic goals are:

- Water landscape integration and management
- Green infrastructure and quality of public and open space
- Densification of the built system
- Productive landscapes and means of production
- Transport and mobility system

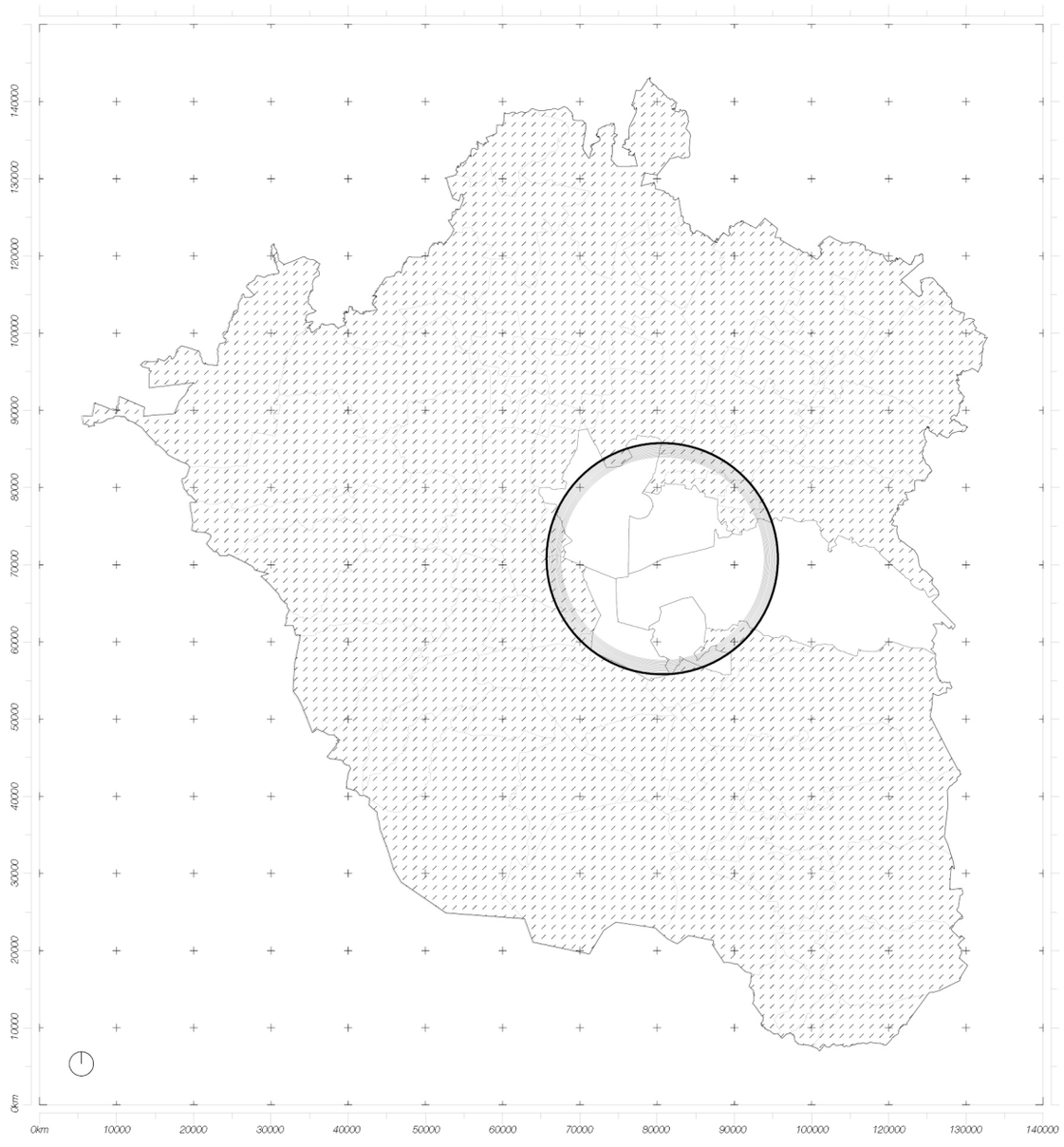
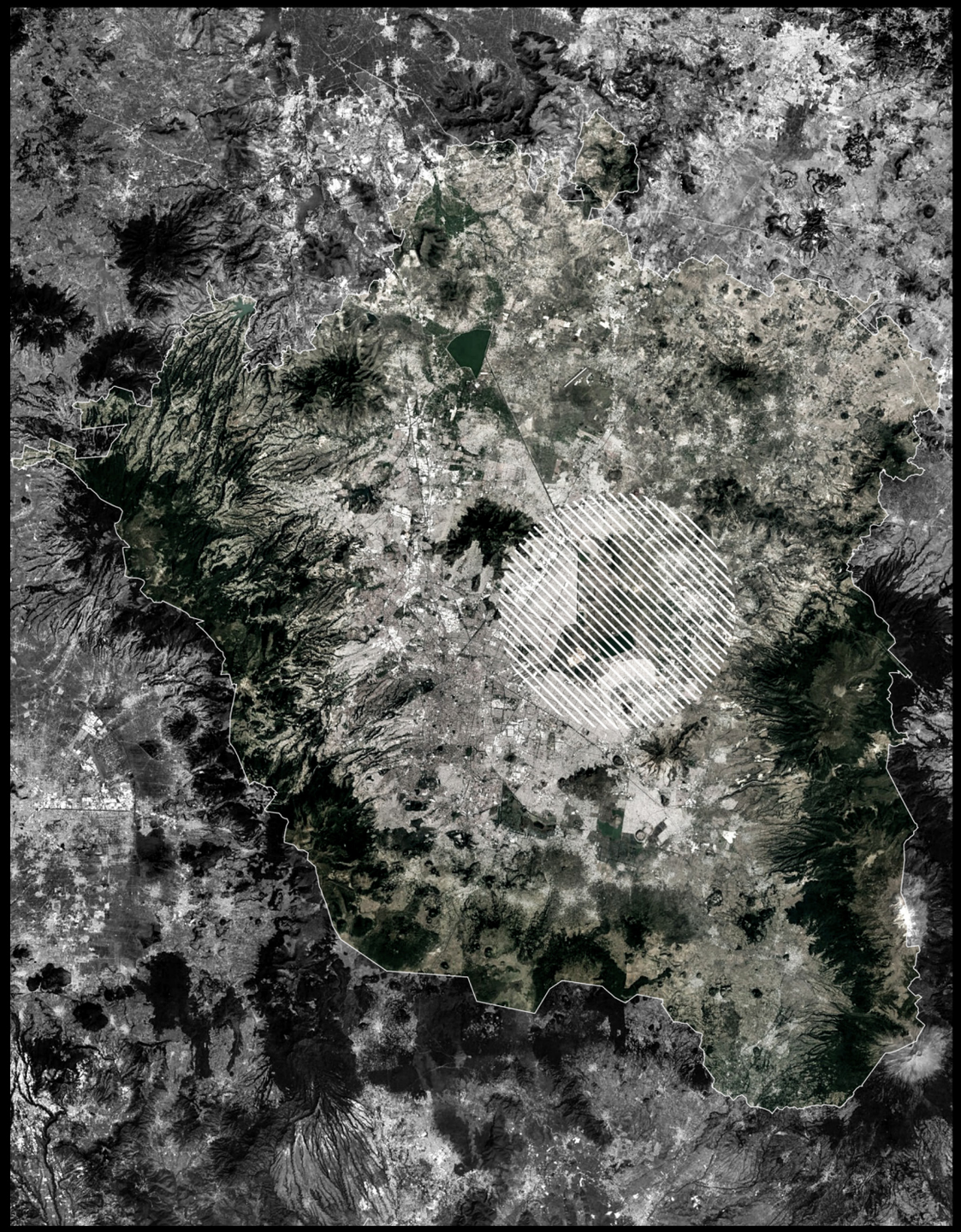
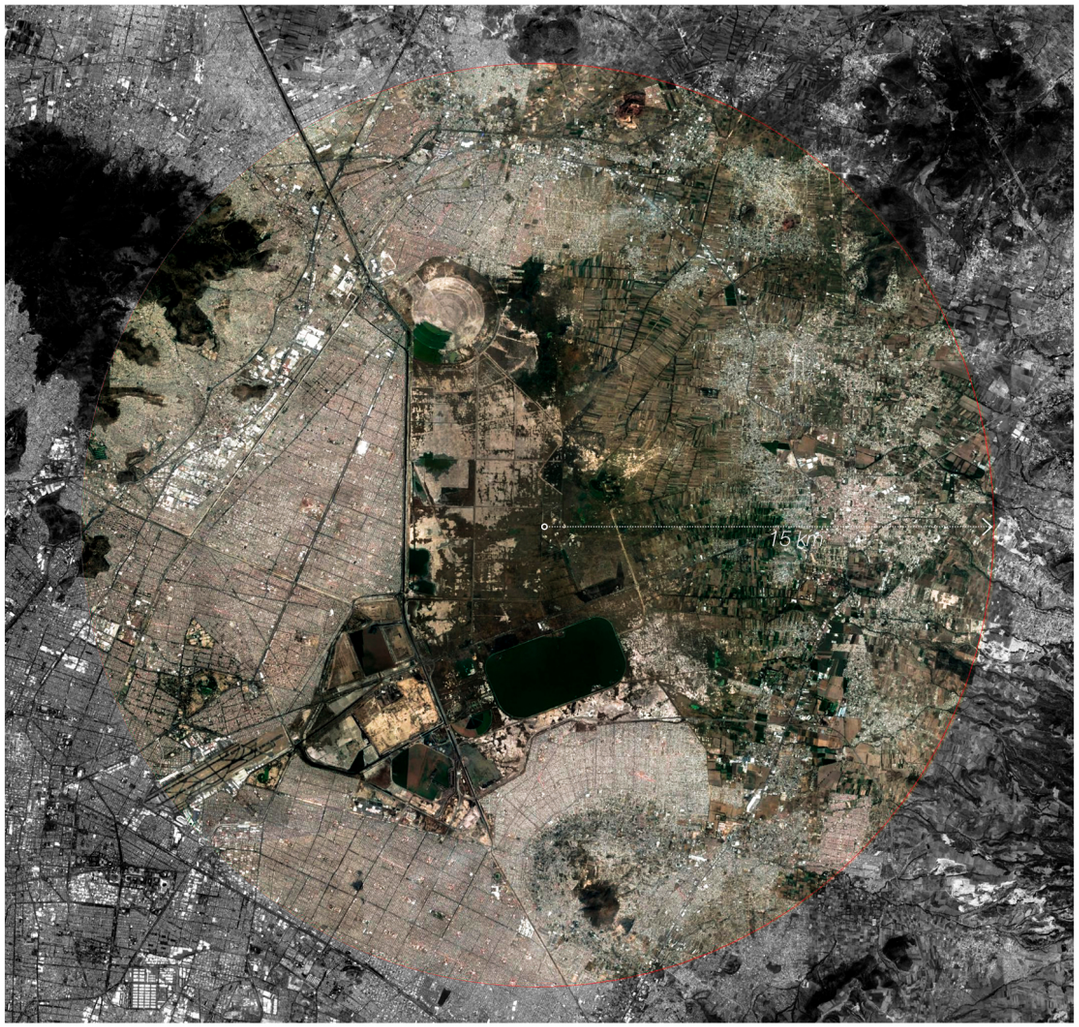


FIG. 6.2 Selected area *(Own elaboration based on data from INEGI, 2015) The figure shows selected area.*

The Site

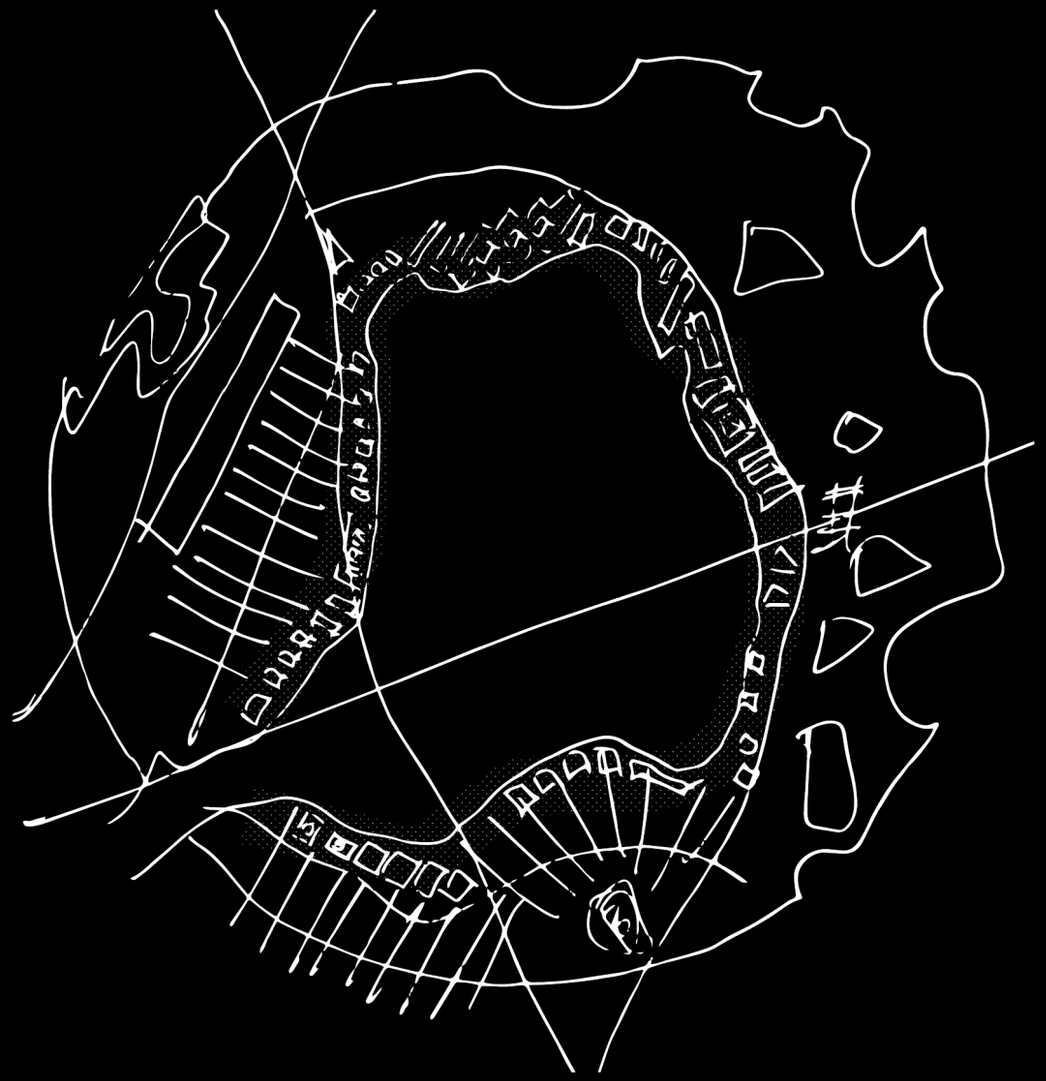


IMG. 5.1 The case study area within the MAVM satellite view *(Own elaboration with images from google earth) The image shows with a hatch the 15km radius area around the metropolitan park.*



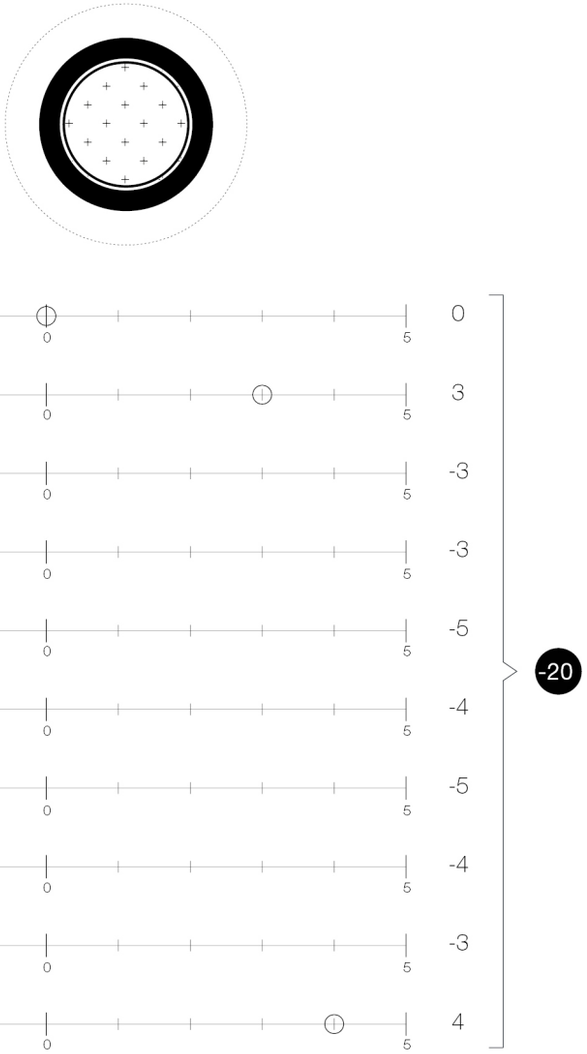
IMG. 5.2 15km radius area *(Own elaboration with images from google earth) The image shows the 15km radius area around the metropolitan park that will be used for the collaborative adaptive strategy.*

This systemic goals are different between each other, and each one stresses specific dimensions of the territory such as natural structure, mobility and transport, densification and production. It is important to mention that the timeframe taken into consideration for the systemic goals is that of 30 years until 2050 since it is uncertain that the potentials of the area can be stressed on a shorter timeframe. The systemic goals contain information that will be evaluated to further reflect on the possibilities that each one of them bring to the development of the adaptive strategic plan for the area.



V1 Densification of the Built System

FIG. 5.1 V1 *(Own elaboration)*



IMG. 5.2 V1 assessment *(Own elaboration) The figure shows an assessment of the systemic goal based in the following criteria: a - accessibility, b - public space, c - connectivity, d - mobility, e - endogenous development, f - governance, g - top down and bottom up approaches, h - public or private investment, i - ecological impact, j - density. Each one of the criteria is evaluated according to positive or negative impact, a negative number equals a negative effect or lower score depending the criteria in question.*

This systemic goal stresses the further development of the peripheral area corresponding to the outside of the metropolitan park's boundary by 2050. This development will have mostly private investment focusing on the densification and beautification of the area. By beautification I mean the removal of the unnecessary urban fabric in order to redevelop it, relocating local people in housing projects that will be founded by the developers. Another objective is to develop buildings with mix uses capable of hosting the future tourism and new potential buyers that want to invest taking into consideration the proximity to the biggest metropolitan park in the world.
a new linear green park close to the metropolitan park can be constructed, thus increasing the liveability of the new housing developments, the environmental quality and visual perception of their surroundings.

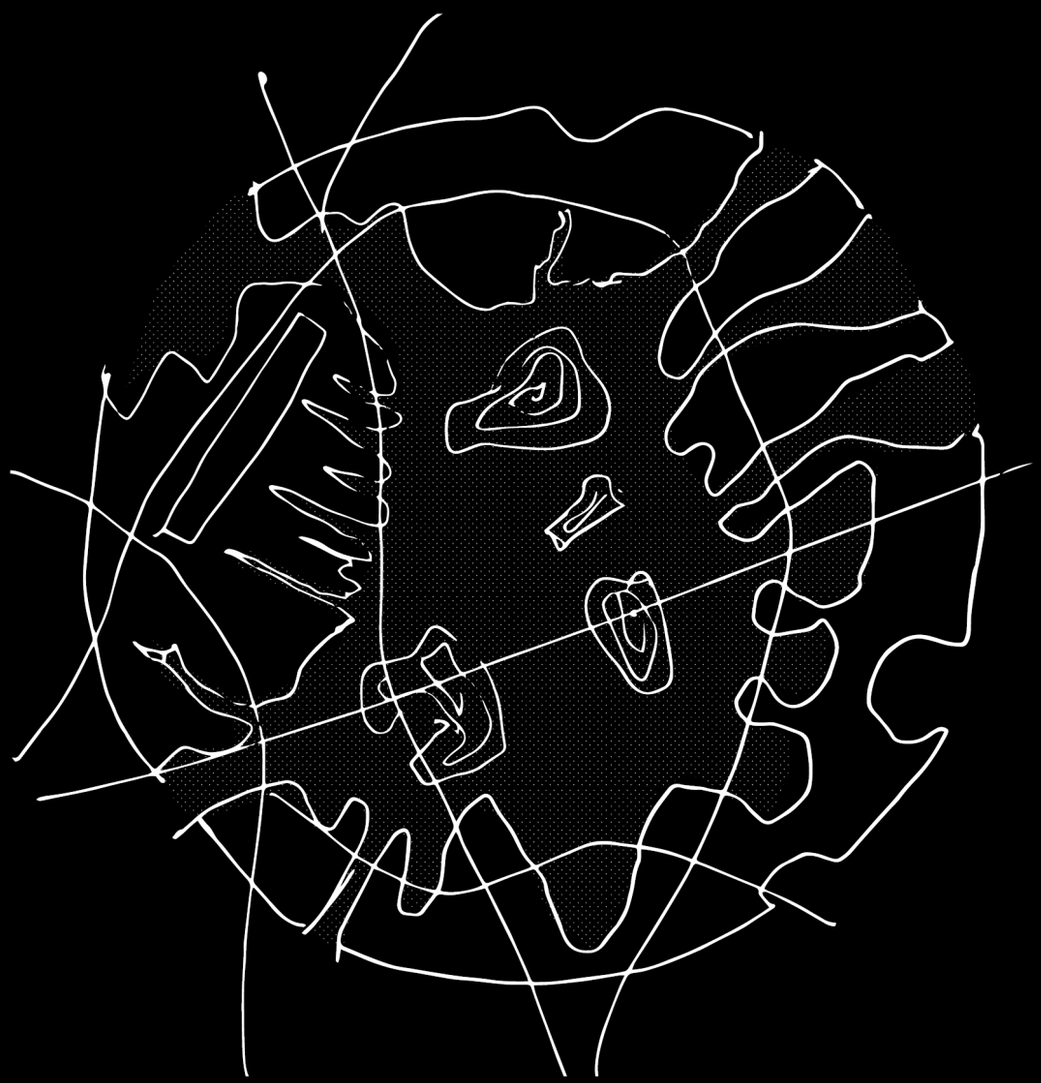


IMG. 5.3 Unequal land exploitation *(Source: UNEQUAL SCENES, 2019) The image shows informal settlements at the right close to what will be used to built housing estates or medium class developments worsening the fragmentation in the MAVM.*



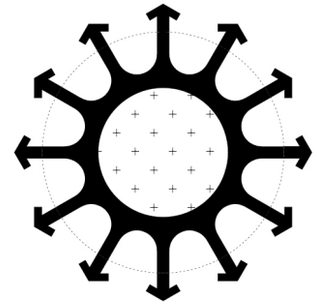
IMG. 5.4 V1 perspective *(Own elaboration) The image shows a future perspective of the periphery area with mixed use development.*

By maximizing the green areas in the peripheral area a new linear green park close to the metropolitan park can be constructed, thus increasing the liveability of the new housing developments, the environmental quality and visual perception of their surroundings.
However analysing the systemic goal it's only potential is that of densification since adding new public space in an area controlled by the private sector will mean in the longer term that could possibly be privatized, and closed to the general public. It will deal with private investment that can potentially change the course of the metropolitan park, nevertheless the top-down approach and lack of successful governance instruments and communication with local residents will only increase the segregated condition of the area.



V2 Green Infrastructure System and Quality of Public and Open Space

FIG. 5.3 V2 *(Own elaboration)*



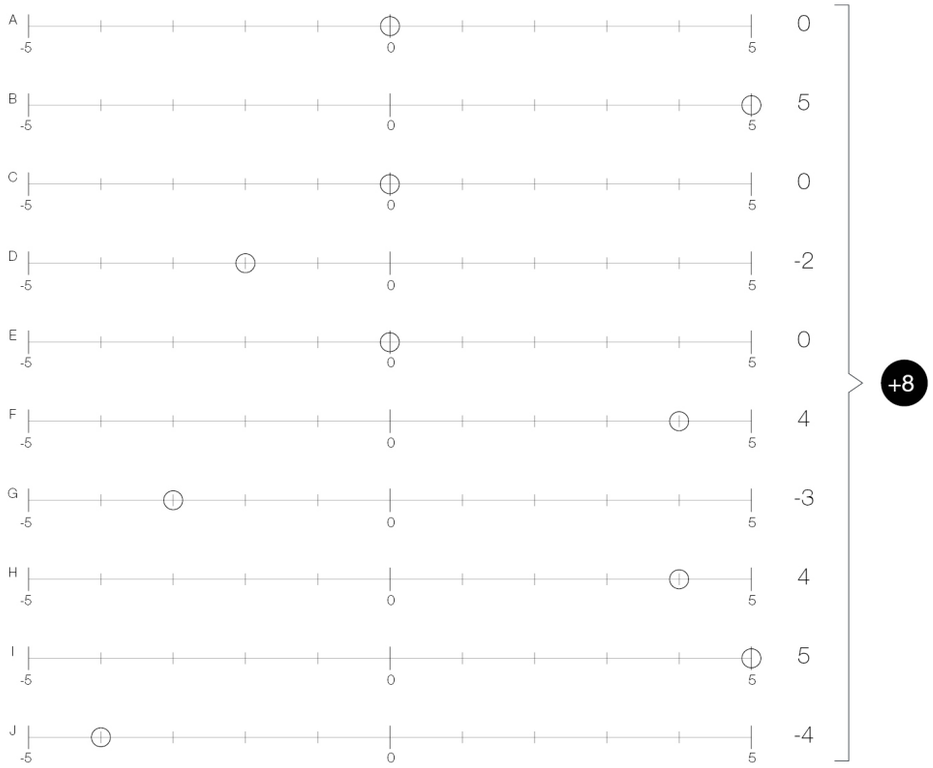
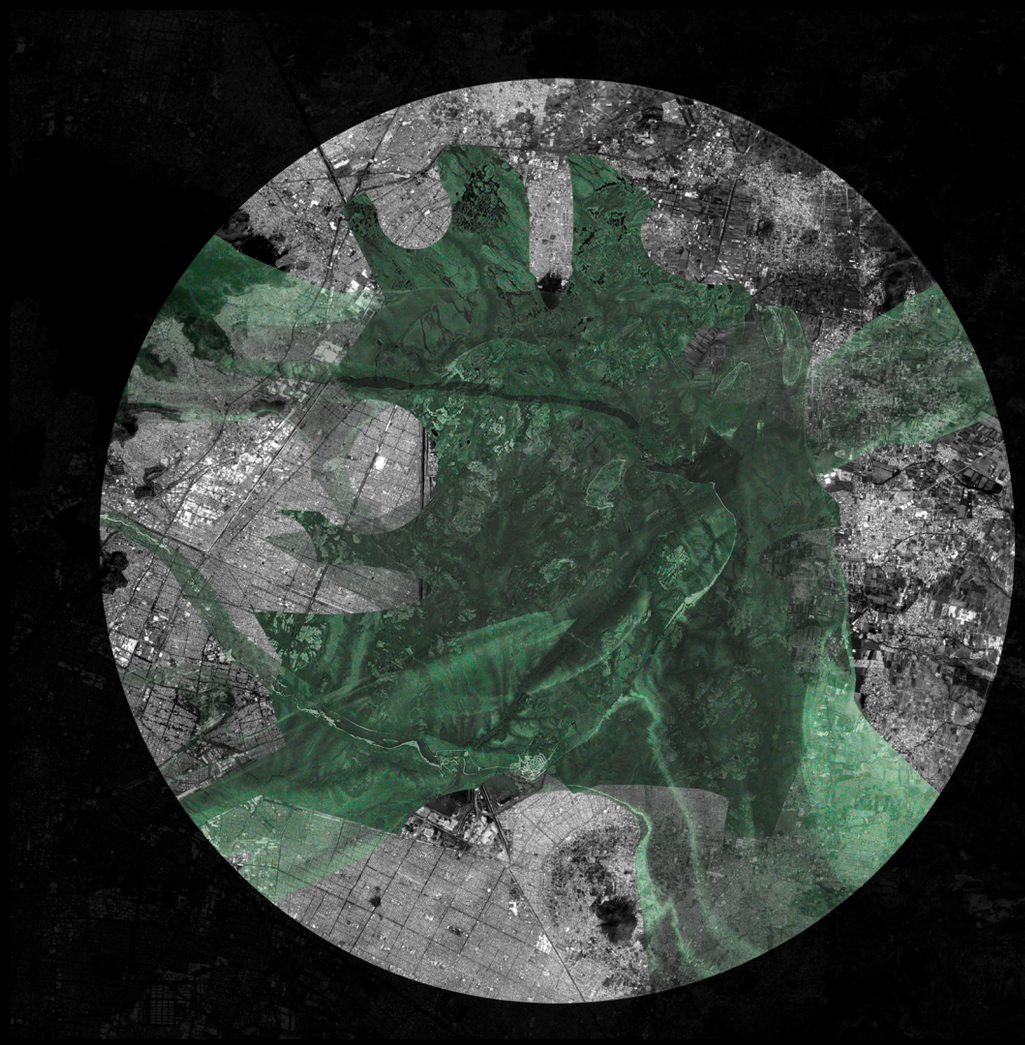


FIG. 5.4 V2 assessment *(Own elaboration)*

This systemic goal stresses the fact that the park can potentially spread towards the outside of the urban fabric slowly erasing its hard boundary. In order to erase the boundary some major interventions need to be addressed, such as changing the current highway structure to either make room for the green to come out or interventions that allow the green to cross successfully to the outside. Several examples worldwide can be used as prior knowledge, garden bridges, elevated park lines etc. Erasing the boundary will also mean a reconstruction of the outside since there is the need to host the green coming from the park. Some new developments can be triggered in areas close to the new green expansion. Furthermore the amount of green-public space will increase reducing the poor air quality characteristic of the area.

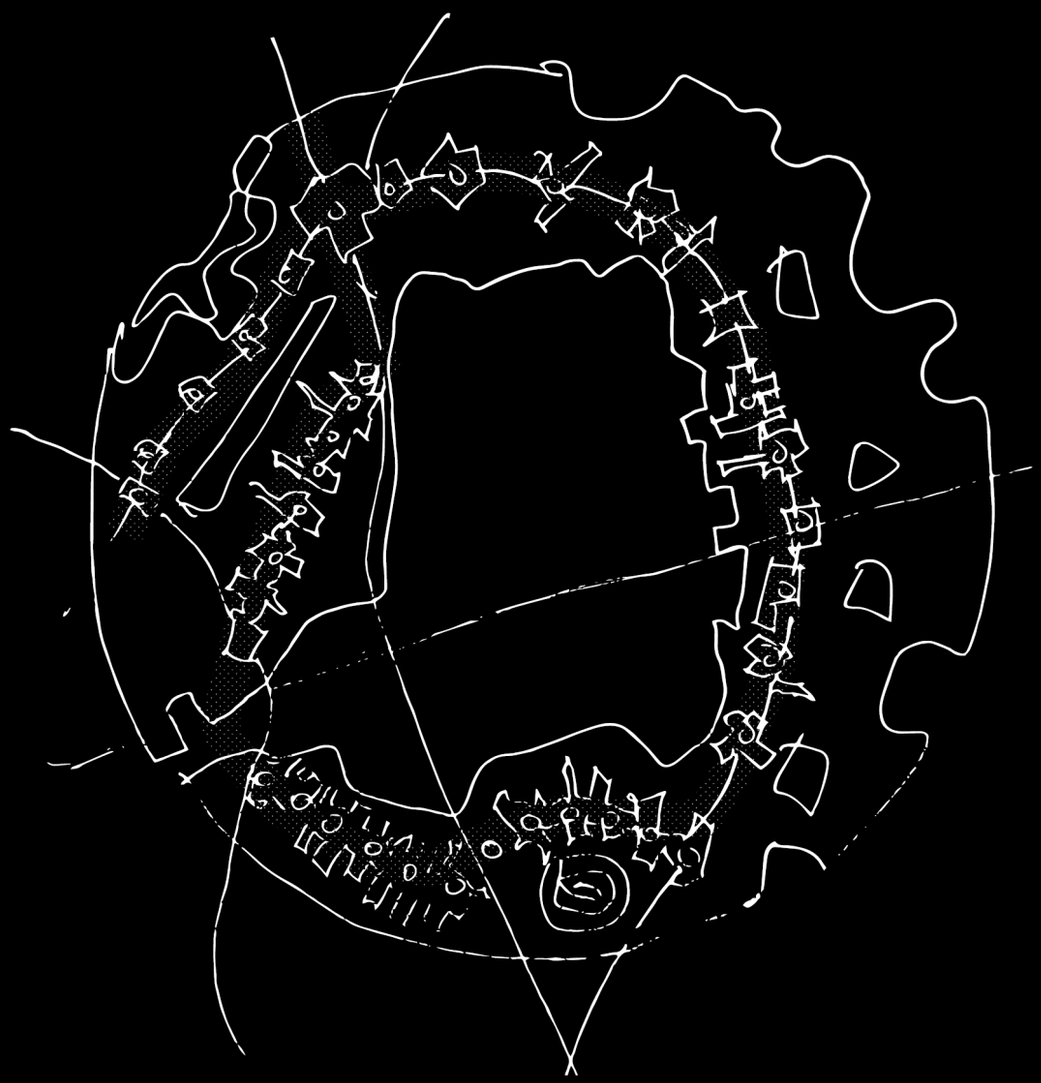


IMG. 5.5 Unequal land exploitation *(Source: UNEQUAL SCENES, 2019) The image shows informal settlements at the right close to what will be used to built housing estates or medium class developments worsening the fragmentation in the MAVM.*



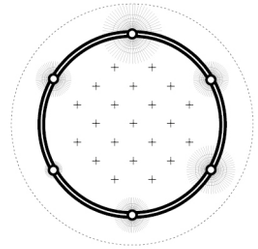
IMG. 5.6 V2 perspective *(Own elaboration) The image shows a future perspective of the new green areas outside the park.*

After the analysis of this potential systemic goal for 2050 several positive factors can be pointed out; the increase of public space and the positive environmental factors are within the best scored. However the approach to successfully develop it will change land uses and erase some of the existing fabric which as the first vision will cause a relocation of local citizens. The other negative factor will be the amount of investment needed to successfully get the park outside its boundaries. Since the investment will not be profitable for the private sector the financing of the project will have to be mostly made by the public sector, the municipalities lack of the necessary founding capacity to cope with current challenges. Overall the proposal increase the liveability of the inhabitants and can trigger new developments fostering a cohesion between the different developments of the area.



V3 Transport and Mobility System

FIG. 5.5 V3 *(Own elaboration)*



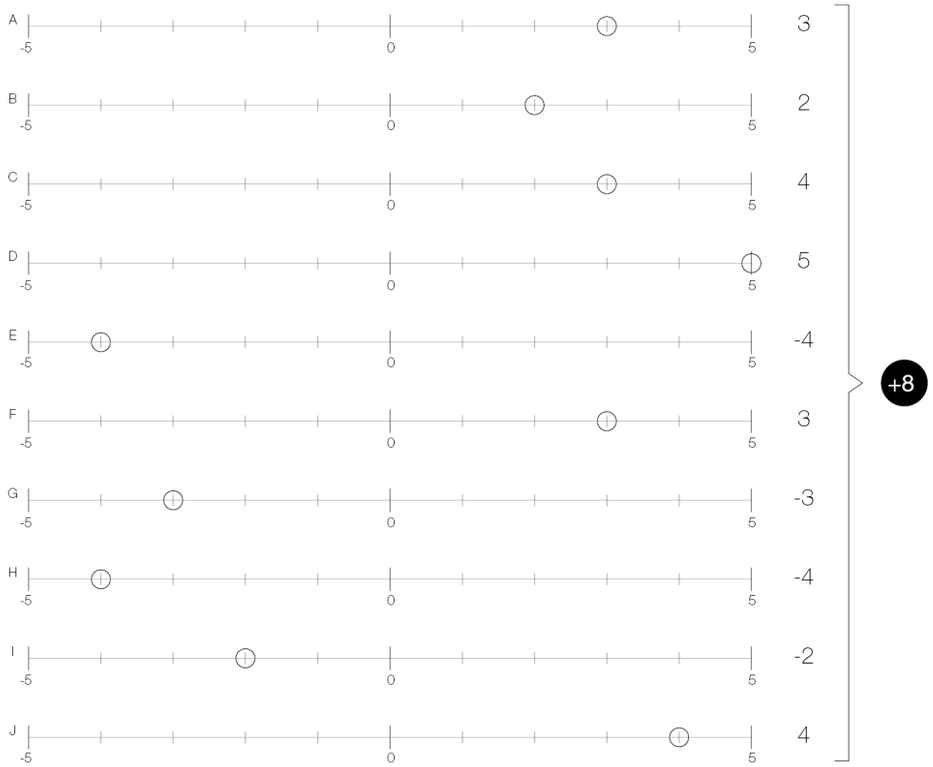
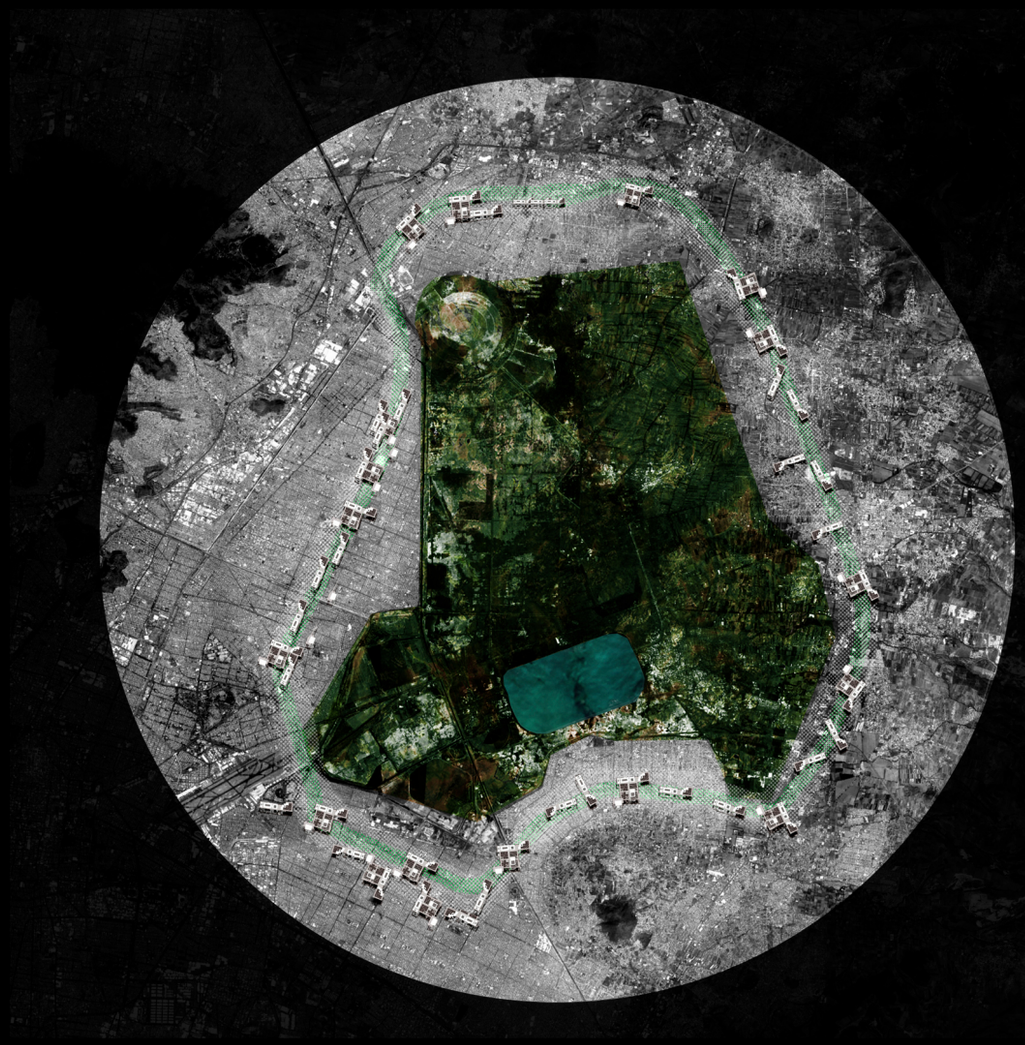


FIG. 5.6 V3 assessment *(Own elaboration)*

This systemic goal stresses the mix use developments around the most important multimodal transport stations in the area (CETRAMS), moreover the proposal increases the mobility capacity by implementing new stations and enhancing the current public transport system by improving the MEXIBUS lines reaching the areas far at the east of the park. This proposal will increase investment in specific areas by introducing new mix uses such as retail and commercial amenities. Most of the investment will be made by the private sector and the new projects will give a new identity to the area.

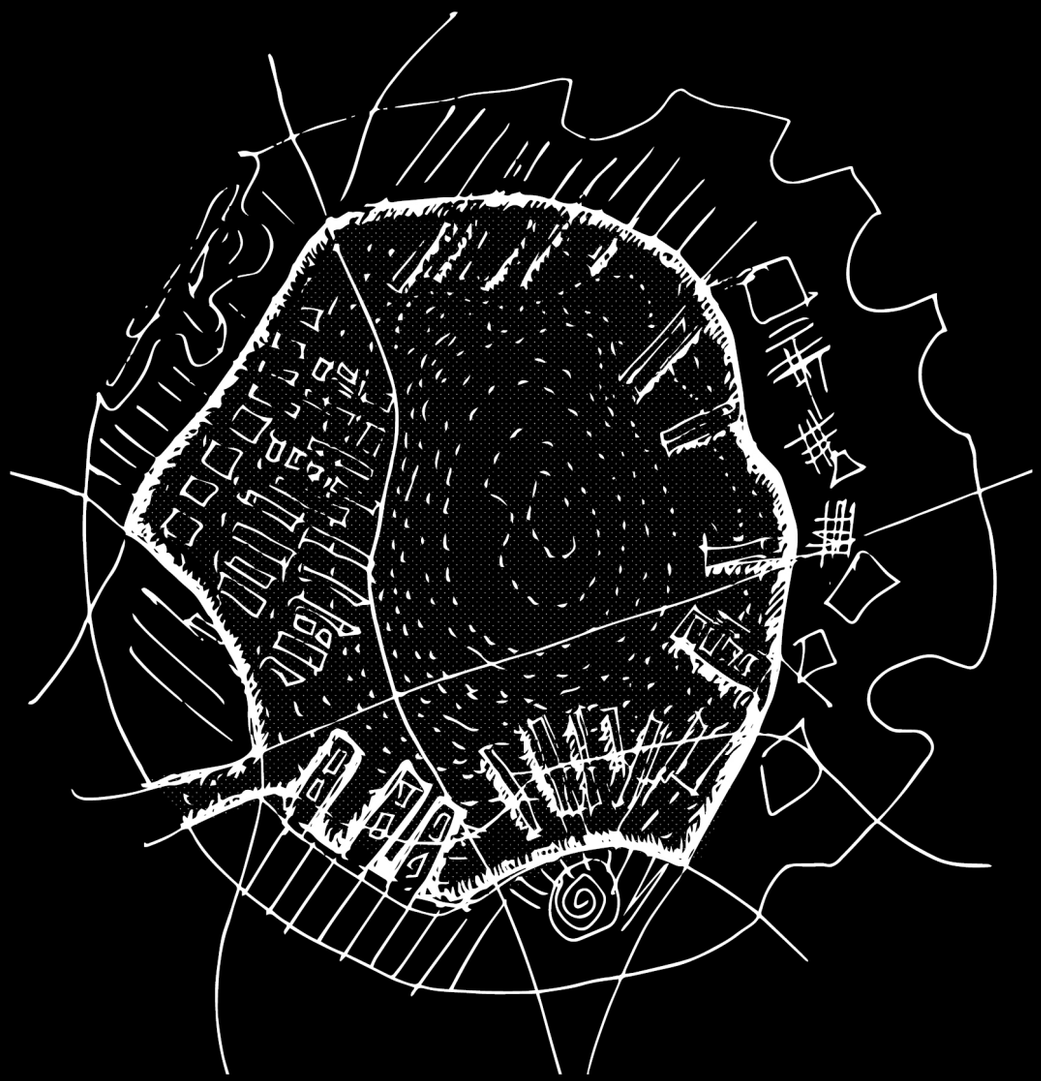


IMG. 5.7 Unequal land exploitation *(Source: UNEQUAL SCENES, 2019) The image shows informal settlements at the right close to what will be used to built housing estates or medium class developments worsening the fragmentation in the MAVM.*



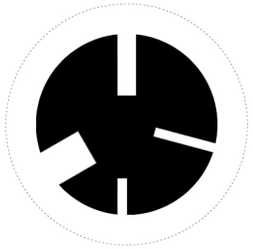
IMG. 5.8 V3 perspective *(Own elaboration) The image shows a future perspective of areas developed along with the multimodal public -trasnport stops .*

By analysing the systemic goal it is clear that mobility and densification are the stronger assets of the proposal. It can positively impact on the daily lives of the local citizens making it easier and more accessible to get into the public transport system. Moreover new employments resulting from the mix use developments can foster the economy of the weaker municipalities. It also improves the accessibility to public space by developing it near the strategic locations.
However the proposal has a top-down approach that is not considering the current identity of the area focusing in the economic benefits that can be achieved by it.



V4 Water Landscape Integration and Management

FIG. 5.7 V4 *(Own elaboration)*



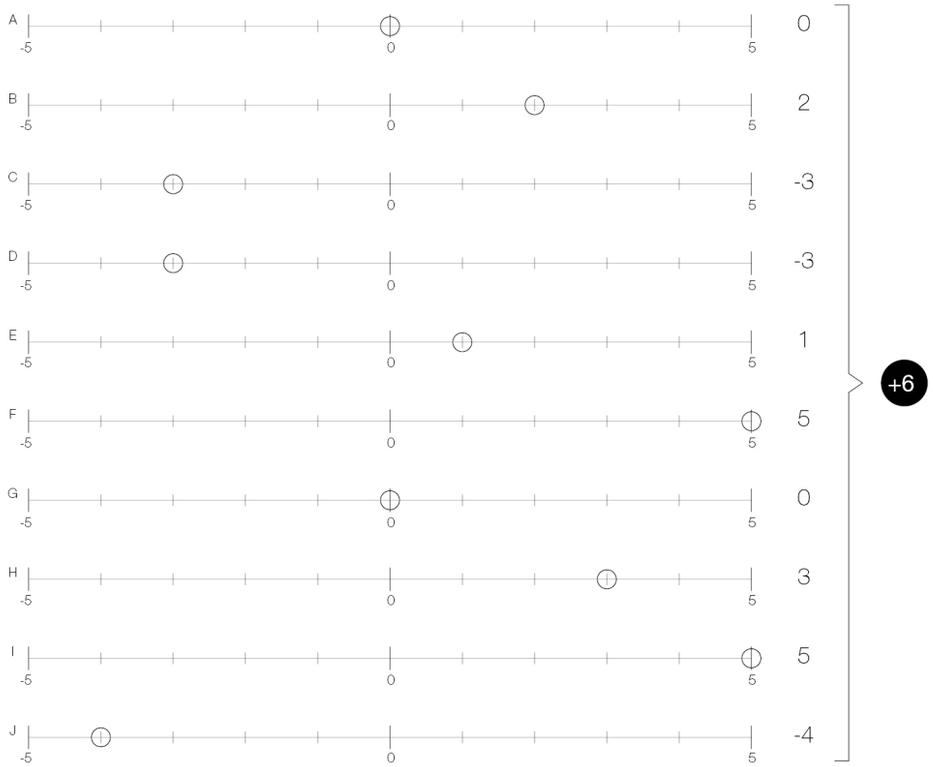
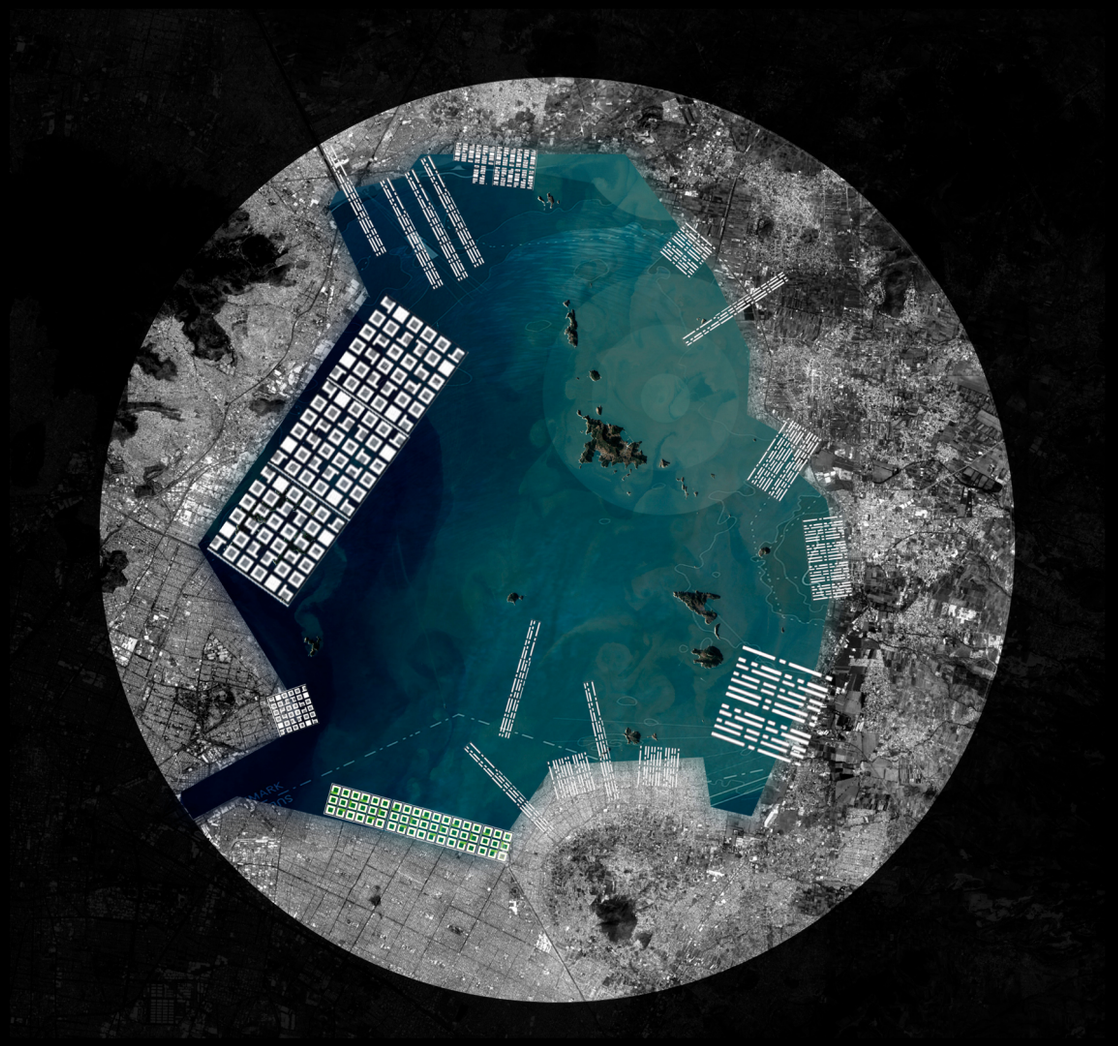


FIG. 5.8 V4 assessment *(Own elaboration)*

This systemic goal stresses the idea of returning the lacustrine heritage to what it used to be before the Spanish conquest. The park will be developed around the idea that water must return to the place. The goal itself can potentially increase the environmental qualities of the area and reduce flood risk since the developments around it must take this into consideration.
It is an extreme case where the urban structure must adapt to a new environment. New developments have to take into consideration their proximity with water and can potentially change the entire area, thus rediscovering the lost identity.



IMG. 5.9 Unequal land exploitation *(Source: UNEQUAL SCENES, 2019) The image shows informal settlements at the right close to what will be used to built housing estates or medium class developments worsening the fragmentation in the MAVM.*



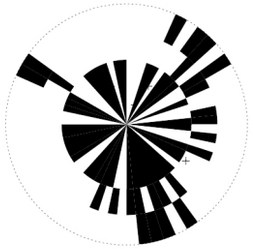
IMG. 5.10 V4 perspective *(Own elaboration) The image shows a future perspective of area surrounded by water with new developments and typologies.*

However the project erases most of the surrounding urban fabric which will affect the most vulnerable population due to the lack of private investment and interest to develop it. The public sector will guide the project and relocation of the existing residents. It can be stressed the idea of new housing projects close to the water, a sustainable infill that triggers new endogenous opportunities, but since the majority of the population around the park is under vulnerable conditions the systemic goal becomes unreliable if treted alienated from other variables.



V5 Productive Landscapes and Means of Production

FIG. 5.9 V5 *(Own elaboration)*



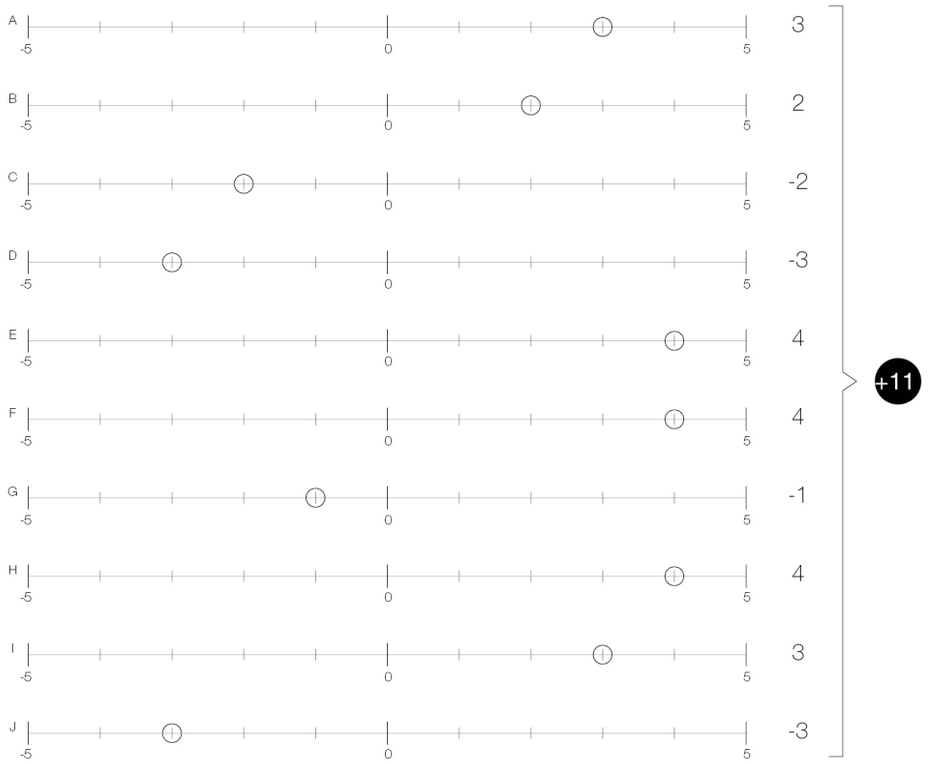
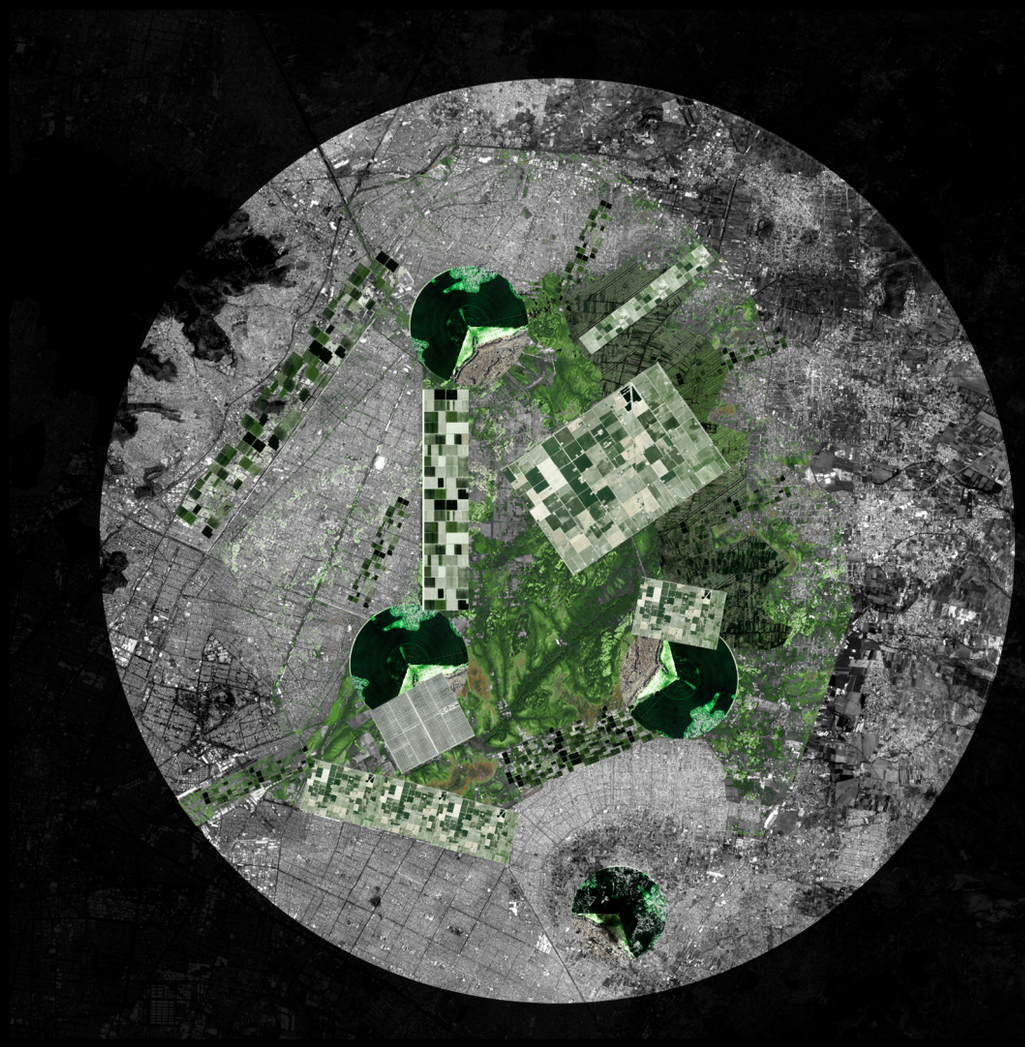


FIG. 5.10 V5 assessment *(Own elaboration)*

This systemic goal stresses the existing potentials in the east area of the park. The land in this location is mostly used for agriculture purposes. This agriculture land has slowly lost its potential in recent years and goal enables the strengthening of its role, making a positive use of it to enhance endogenous development in the area. Productive landscapes vary depending the location in the park, but agricultural land can be expanded and new solar farms can be implemented. Moreover governance plays a key role in this systemic goal since the project acts upon the local needs in order to make a greater positive influence in the metropolis.



IMG. 5.11 Unequal land exploitation *(Source: UNEQUAL SCENES, 2019) The image shows informal settlements at the right close to what will be used to built housing estates or medium class developments worsening the fragmentation in the MAVM.*



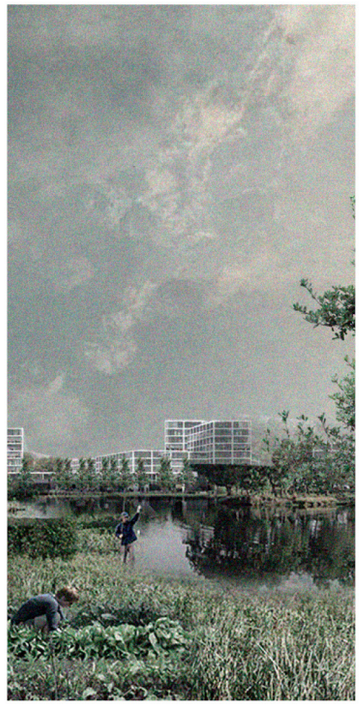
IMG. 5.12 V5 perspective *(Own elaboration) The image shows a future perspective of areas close to the park which are turning into productive landscapes such as agriculture, solar farms and wind farms.*

By analysing the systemic goal it can be learned that positive endogenous developments are in the agenda along with good practices of governance balancing the top-down and bottom-up approaches. However some of the biggest problems of the metropolis are not taken into consideration in the development of this vision, such as density and mobility. By focusing on expanding the agricultural capacity of the area the mobility is not properly addressed and the existing fabric will change from its congested fragmented situation to that of low density patched nature. The later can increase the segregated condition of the agricultural developments rather that integrate them with the city.

Densification of the Built System

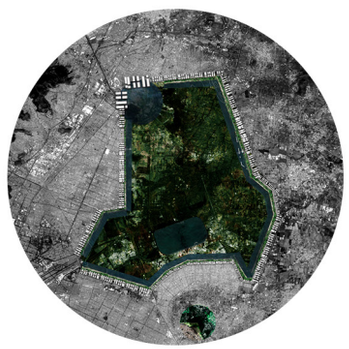


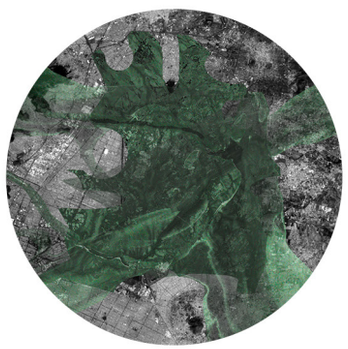
Green Infrastructure System and Quality of Public and Open Space

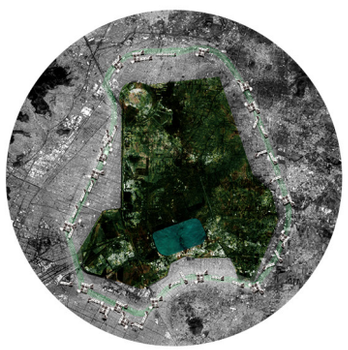


Transport and Mobility System









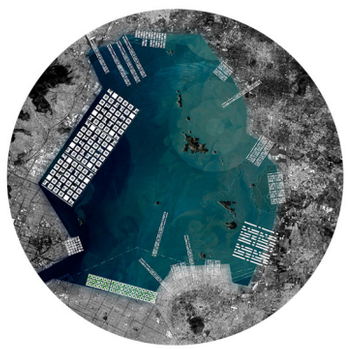
IMG. 5.13 *(Own elaboration) The image shows the 5 systemic goals.*

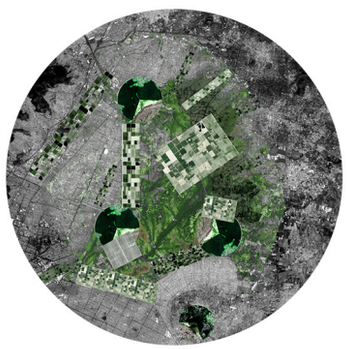
Water Landscape Integration and Management

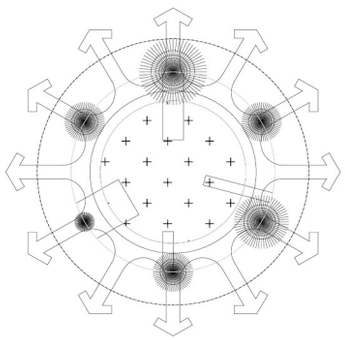


Productive Landscapes and Means of Production





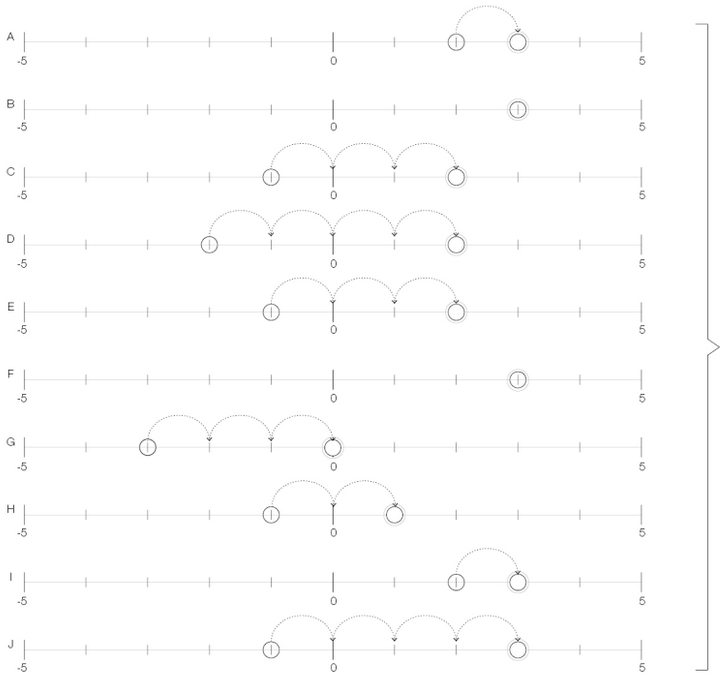




Taking the metropolitan assessment and the preliminary findings exposed by the systemic goals a clear scale of intervention is highlighted with several objectives to follow and further test by design capable of defining scenarios of adaptation towards a new strategic planning in the MAVM.

Conclusion

The five systemic goals presented in this chapter have stressed new territorial possibilities that can foster a positive transformation of the area. However some weaknesses and threats are also revealed such as the continuity of large projects that do not take local participation into account or the need for the systemic goals to work parallel rather than isolated. Their implementation as objectives of an adaptive strategy can guide the development of the area linking local development by people participation with other higher hierarchy powers, aiming for a new balanced and more collaborative process. Moreover due to the complexity of the systemic goals themselves the strategic planning will recognize the uncertainties of climate and social change and their effect towards a cohesive territorial transformation.



Goals	+	-
V1	J	E G
V2	B I	J
V3	D	E H
V4	F I	J
V5	E F H	D J
	F I	E J

The weak spots taking all systemic goals into account are endogenous development, density and governance, while the stronger aspect is the natural environmental value. This points out to the conclusive argument that environmental positive effect could be easier to achieve in some regard following the systemic goals, thus combining them will ensure an environmental improvement. In order to do so a successful governance approach needs to be addressed. Moreover mobility and density are key issues that need to be addressed in order to stablish strategies that allow a balance between private and public sectors, “one cannot be done without the other”.

Avarage score
Feasible improved score
Avarage per goal

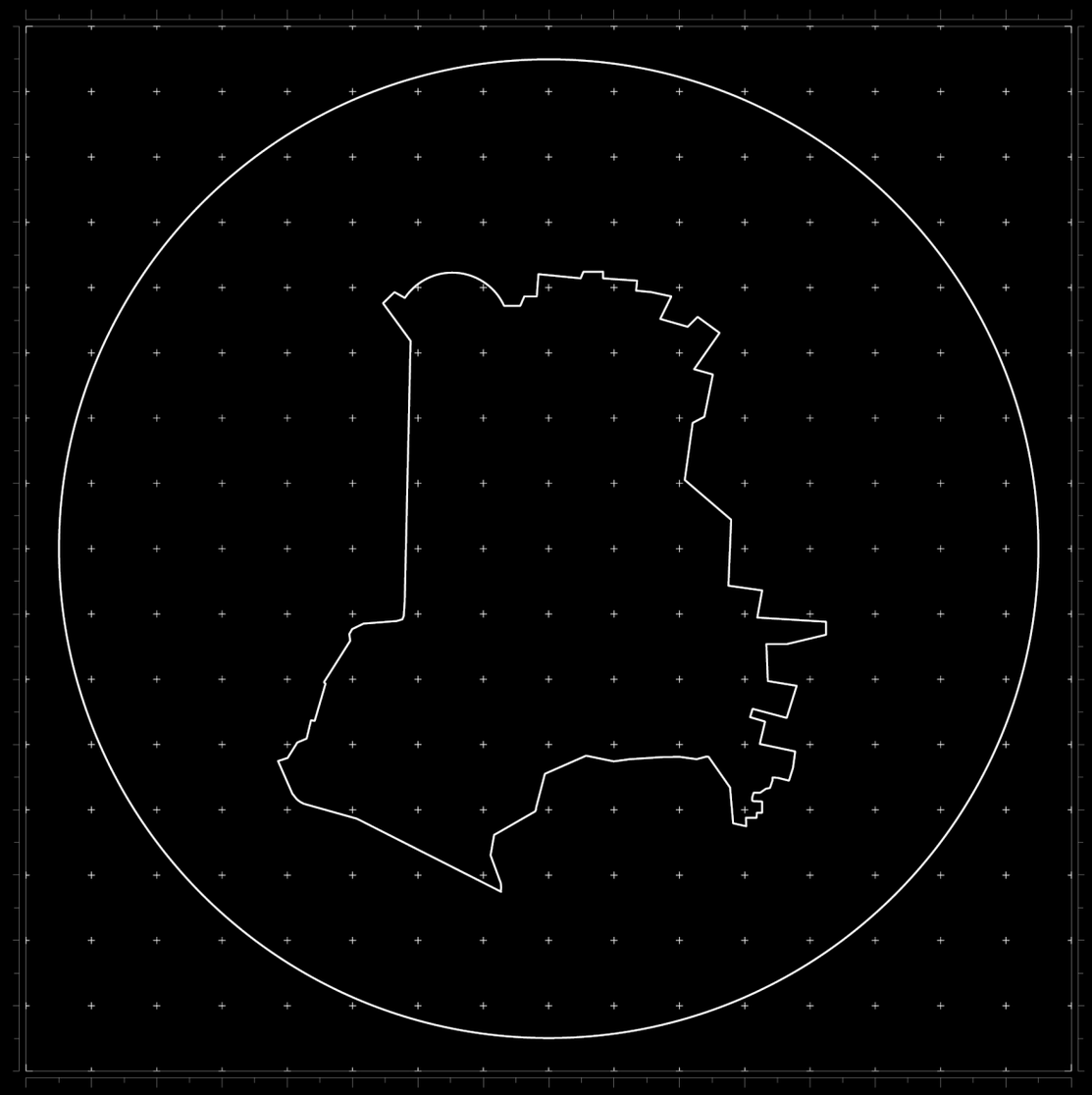
A - ACCESSIBILITY
B - PUBLIC SPACE
C - CONNECTIVITY
D - MOBILITY
E - ENDOGENOUS DEVELOPMENT
F - GOVERNANCE
G - TOP DOWN AND BOTTO UP APPROACHES
H - PUBLIC OR PRIVATE INVESTMENT
I - ECOLOGICAL IMPACT
J - DENSITY

FIG. 5.11 V5 assessment *(Own elaboration) The figure shows the conclusion of the assessment.*

ASYMMETRIES OF POWER

The 5 systemic goals can guide the development of the area trough the link of local development (by people participation) with other higher hierarchy powers, and by recognizing the uncertainties of climate and social change and their effect towards a cohesive territorial transformation.

ASYMMETRIES OF POWER



6 ANALYSIS

SITE

Overview

In this chapter several variables will be addressed in order to narrow the intervention areas capable of triggering new developments in the vulnerable selected area. Moreover the potentials of the variables will be assessed to further elaborate on an urban model capable of reducing the segregation and fragmentation while coping with the high urbanization processes and the population gain by 2050.

Municipalities Involved

The following pages will introduce the states which are subject of the future intervention, their selection was made because these are the states involved directly (location wise) in the development of the MAVM Metropolitan park Texcoco. While they belong only to one of the states (EDOMEX) the impact of such large urban project transcends its municipal and geographic limits, affecting the entire metropolis. Moreover the levels of power involved in the development of the MPT do not only concern the municipalities only but investment and involvement will take place across its boundaries.

MPT represents an opportunity to develop a multi-governance and multi-level power approach for a large urban project that can increase the cohesion in the metropolis. It will be the trigger for better and adaptive strategic planning taking into consideration the local actors which will be directly affected by the project.

_Nezahualcóyotl, Estado de México, México.
Nezahualcóyotl is one of the 125 municipalities of Estado de Mexico (From which only 40 are within the MAVM). It is located in the east side of the MAVM and is closely related to the municipalities of Mexico City.
Nezahualcóyotl adjoins with the municipality of Ecatepec (North), Texcoco and Chimalhuacan (East), La Paz (South) and with Gustavo I. Madero (West). Its origins start in 1950 as a way to locate the massive growing population product of industrialization and globalization. It started as a way to offer housing to the lowest income population in Mexico City, also one of the reasons why the area still has a close functional and spatial relationship with its neighbor, presenting permanent work flows, also sign of the still Monofunctional relationship the municipalities of the MAVM have with the center. However it has grown until a point where it cannot grow anymore, achieving 100% of land occupation.

MAVM has a total area of 6162.4km2 from which Nezahualcóyotl represents around 1%,62.9KM2 (CPI, 2018). Its urbanized surface is 57km2 which makes it an almost totally urbanized area. Its growth has stopped in the last years, between 2000-2015 its average annual growth rate decreased to -1.1%, while housing has shown a static 0% of growth (CPI, 2018). It is important to mention that Nezahualcóyotl as many other municipalities within the MAVM practice self-construction and most of the times this construction expansions are not monetarised or controlled by planning instruments, leaving the numbers with an important gap in this regard.

According to its demographics is one of the most populated municipalities in the MAVM, with 1039867 inhabitants (INEGI, 2015) and it has been projected that by 2030 its population will increase to 1334201 (CPI, 2018). It has a population density of 18682 inh/km2 and a housing density of 4922 housing/km2, numbers that clearly reflect its highly urbanised condition.

Regarding its economic active population (PEA), it is focused in the tertiary sector with an 80.4% while the secondary and primary sector account for 17.2% and less than 1% respectively.

In terms of its environment, Nezahualcóyotl due to its high urbanisation has difficulties with water provision and waste management. It is also vulnerable to to hazards such as earthquakes due to its close location to the Texcoco´s basin. A boundary has been

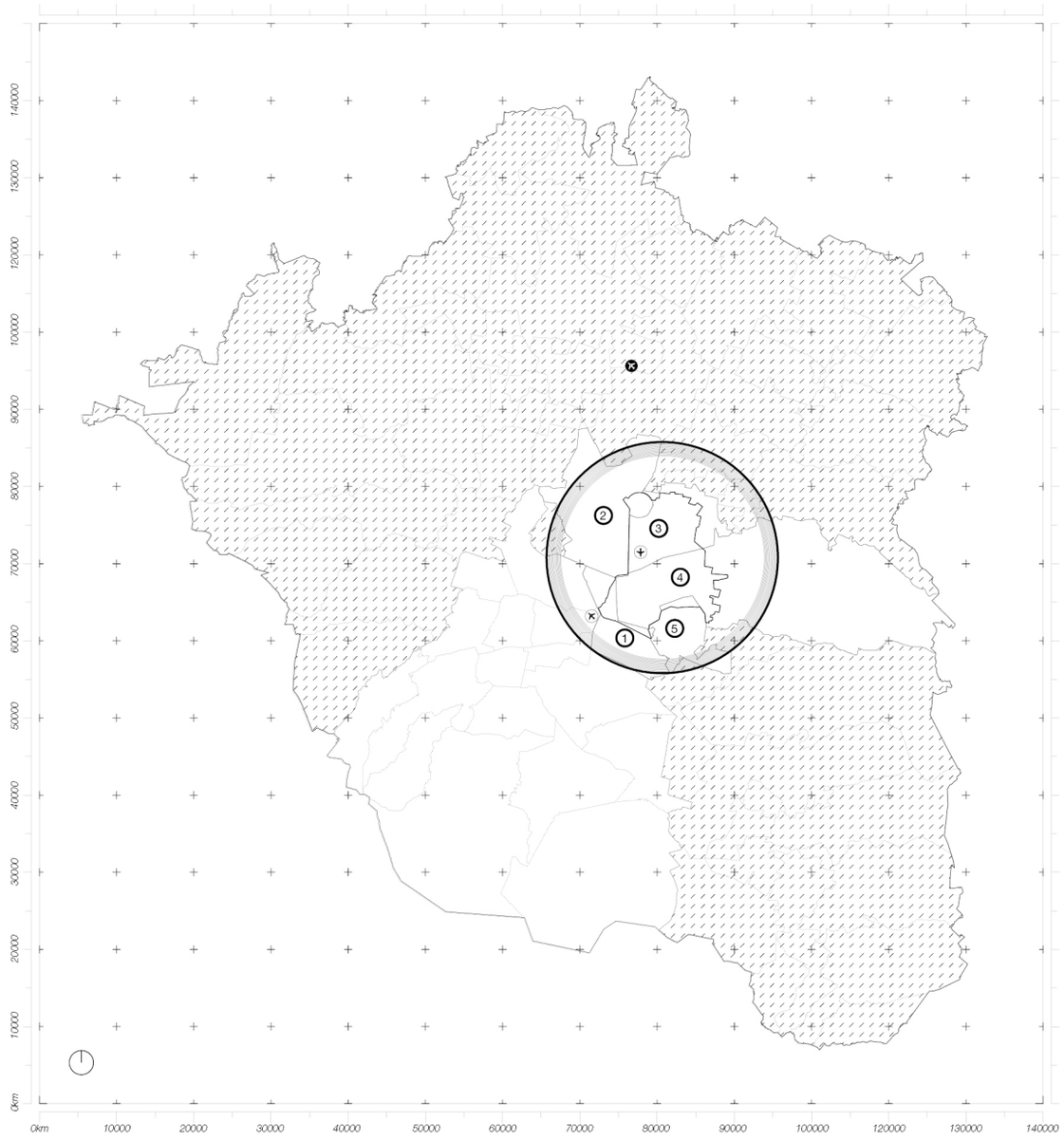


FIG. 6.1 Municipalities involved *(Own elaboration based on data from INEGI, 2015) The figure shows the MAVM and the main municipalities involved in the selected location.*

defined and revised in 2018 which shows the areas in danger due to earthquakes. (show image)

_Ecatepec de Morelos, Estado de México, México

Ecatepec de Morelos is one of the 125 municipalities of Estado de Mexico (From which only 40 are within the MAVM). It is located in the north-east side of the MAVM and is closely related to the municipalities of Mexico City. (SHOW A MAP)
Ecatepec de Morelos adjoins with the municipality of Tecamac (North), Atenco and Texcoco (East), Nezahualcóyotl (South) and with Sierra de Guadalupe (West).

MAVM has a total area of 6162.4km2 from which Ecatepec de Morelos represents around 2.5%,155.2KM2 (CPI, 2018). Its urbanized surface is 80.5% due to its irregular topography in the west (closest to Sierra de Guadalupe). Between 2000-2015 its average annual growth rate is 0.2%, while housing has shown growth of 1.2% (CPI, 2018). It is important to mention that Nezahualcóyotl as many other municipalities within the MAVM practice self-construction and most of the times this construction expansions are not monetarised or controlled by planning instruments, leaving the numbers with an important gap in this regard.

According to its demographics is the second most populated municipality in the MAVM, with 1677678 inhabitants, 8.2% of the total population in the MAVM (INEGI, 2015) and it has been projected that by 2030 its population will increase to 2039602 (CPI, 2018). It has a population density of 11342 inh/km2 and a housing density of 3500 housing/km2, one of the most populated conurbations with Mexico City.

Regarding its economic active population (PEA), it is focused in the tertiary (75.1%) and secondary (22.2%) sectors, while the primary sector accounts to less than 1%. Ecatepec de Morelos has a strategic location for trade, it is an obligated route for mobility between Mexico City and Pachuca, and a commercial route that enables the trade from the northeast. This specific condition makes it an attractive location for industrial companies which has been exploited since the 1950´s (CPI, 2018). Some big industries have been successful internationally while the smaller and medium size industries have shown difficulties due to several factors, such as; lack of presence in local markets, low investment and financing and obsolete technology. In this regard some industries have left the area.

In environmental terms Ecatepec faces some challenges regarding several factors. Firstly due to its unsustainable strategies regarding industrial concentration, informal settlements and uncontrolled urbanisation by housing gated communities for the low income which caused pollution and overuse of the natural local aquifer, secondly the unsuccessful waste management and thirdly the deterioration of soil and natural resources.

_Atenco, Estado de México, México
Atenco is one of the 125 municipalities of Estado de Mexico (From which only 40 are within the MAVM). It is located in the east side of the MAVM and it is located in what remains of the Texcoco´s basin, also an area where the construction of the new international airport of Mexico City was being built until is cancelation in 2018. (SHOW A MAP)
Atenco adjoins with the municipality of Acolman (North), Chiconcuac (East), Texcoco (South) and with Ecatepec de Morelos (West).

MAVM has a total area of 6162.4km2 from which Atenco represents around 1.4%,87.1KM2 (CPI, 2018). Its urbanized surface is 17.9% due to its particular location in the Texcoco´s basin.

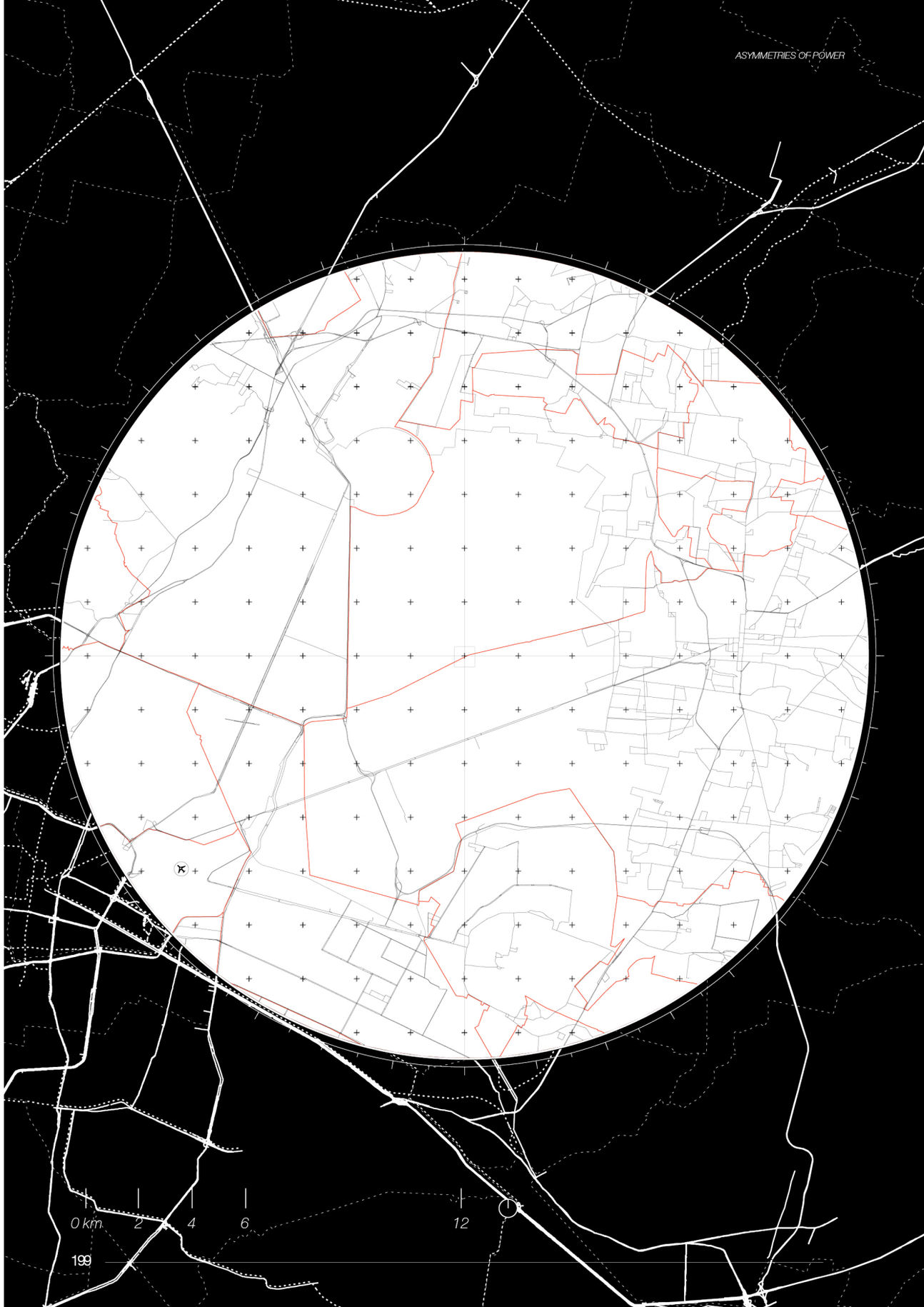


FIG. 6.2 Municipalities involved *(Own elaboration based on data from INEGI, 2015) The figure shows the main municipalities involved in the selected location.*

Between 2000 and 2015 its average annual growth rate is 4% five times higher than the average of the MAVM (0.8%), while housing has shown growth of 1.2% (CPI, 2018).

According to its demographics by 2015 the population was 62392 inhabitants, and it has been projected that by 2030 its population will increase to 83897 (CPI, 2018) nevertheless this statistical data needs to be revised due to the future influence that the MPT will have in the area. Atenco has a population density of 3697 inh/km2 and a housing density of 834 housing/km2. Regarding housing the average annual growth has been 5.1% almost four times higher than the MAVM average (1.9%). Nevertheless of the total housing offer in Atenco by 2010 only 87.2% was inhabited (INEGI, 2010). Their distribution has mainly focused in the north and east areas of the municipality due to the influence of the Texcoco´s basin and the large amount of agriculture land (ejidos) that still remained in 2014.

Regarding its economic active population (PEA), it is focused in the tertiary (62.7%) and secondary (32.5%) sectors, while the primary sector accounts to less than 3.2%.

Due to its conurbation and proximity to Mexico City, infrastructure has generated pressure in the municipality. Metropolitan functions as mobility and connectivity with other cities have influenced the area in a variety of factors such as new urban concentrations regardless of land use policies in the municipality which are predominantly non-urban. This new urban settlements are mostly irregular increasing the demand of urban basic services and urban equipment, that as has been shown before, if not carefully planned the result will end up in the overuse of aquifer and low living standards. Furthermore Atenco has been reported to be one of the worst areas regarding social security, housing quality, and income per population in 2015 (CONAPO, 2015; CONEVAL, 2017; SEDESOL, 2018). Moreover the environmental pollution due to the increase automotive mobility, overuse of aquifers due to demographic changes, deforestation and erosion of land due to land use changes and waste management are the most crucial environmental challenges in the area.

_Texcoco, Estado de México, México

Texcoco is one of the 125 municipalities of Estado de Mexico (From which only 40 are within the MAVM). It is located in the east side of the MAVM and it is located in what remains of the Texcoco´s basin. Texcoco adjoins with the municipality of Atenco (North), Tlaxcala (East), Nezahualcóyotl and Chimalhuacan (South) and with Ecatepec de Morelos (West). It is the biggest municipality incorporated to the MAVM agglomeration with 116.5Km2 (CPI, 2018). Between 2000 and 2015 its average annual growth rate is 1.1%, while housing has shown growth of 2.3% (CPI, 2018).

According to its demographics by 2015 the population was 240749 inhabitants from which 4.9% were indigenous, and it has been projected that by 2030 its population will increase to 317032 (CPI, 2018) nevertheless this statistical data needs to be revised due to the future influence that the MPT will have in the area.

Texcoco has a population density of 2189 inh/km2 and a housing density of 532 housing/km2. Regarding housing the average annual growth has been 2.3%. Nevertheless of the total housing offer in Texcoco by 2010 only 86.9% was inhabited (INEGI, 2010). Texcoco has been influenced by constant speculation regarding its territory. Firstly because of the influence that the NAIM (New international airport) had and secondly because of its influence as nodal point increasing infrastructure for automotive mobility influencing the interchange and connection between the municipality, Mexico City, and other regions of the country.

Regarding its economic active population (PEA), it is focused in the tertiary (71.9%) and secondary (22.6%) sectors, while the primary sector accounts to less than 3.7%.

According to productive value per economic activity the municipality excels in the fabrication of machinery and equipment.

The environment is a key challenge in Texcoco due to several factors: firstly several areas in the municipal territory are categorized as natural protected areas considered relevant for the preservation of endogenous species. And secondly in the west area of the municipality remains the last remanence of the lacustrine history of Texcoco´s Lake, a priority ecological area with several species of birds and aquifer species (CONABIO, 2015; SEMARNAT y CONABIO, 2015).

It is also an area with high levels of pollution in the environment due to its closeness with Mexico City, water pollution, overuse of aquifer resources, deforestation and erosion of land and waste management are the most crucial environmental challenges in the area. Moreover due to deterioration and abandonment of agricultural productive land, landowners are encourage to sell the land causing an increase of non-planned urban settlements.

Chimalhuacan, Estado de México, México

Chimalhuacan is one of the 125 municipalities of Estado de Mexico (From which only 40 are within the MAVM). It is located in the east side of the MAVM and it is located close to the Chimalhuache Hill (SHOW A MAP)

Chimalhuacan adjoins with the municipality of Texcoco (North), Chicoloapan (East), and Chimalhuache Hill (South) and with Nezahualcóyotl (West). Its urban footprint is 49km2, almost the entirety of its total area (54.1km) (CPI, 2018). Between 2000 and 2015 its average annual growth rate is 2.2%, while housing has shown growth of 3.2% (CPI, 2018).

According to its demographics by 2010 the population was 679811inhabitants (INEGI, 2010) with an increment projection of 875798 by 2030 (CPI, 2018). Chimalhuacan has a population density of 13499 inh/km2 and a housing density of 3394 housing/km2.

Regarding its economic active population (PEA), it is focused in the tertiary (72.5%) and secondary (24.9%) sectors, while the primary sector accounts to 0.1%.

According to productive value per economic activity the municipality excels in the fabrication of textile products. However the municipality is not the provider of the majority of employability, meaning that a big percentage of the population travels to nearby municipalities and the core of the metropolis giving Chimalhuacan the function of a bedroom city. Some of the urban challenges of the municipality are education, housing quality, increasing the average income of the population above the minimum wellness line (SEDESOL, 2018).

Transport Structure

As shown by Fig. 6.3 the higher concentration of mass public transport is located in Mexico city capital, while the State of Mexico reflects a lower concertation. There are 3 main massive transport methods in Mexico State, Mexibus, Mexicable and a section of line B of the metro system which only reaches the municipality of Ecatepec. Due to the insufficiency of public transport most of the citizens living in the periphery are not well connected to the rest of the metropolitan functions, as shown in the Fig. 6.3 even in one of the most vulnerable areas (the selected 15km radius site) accessibility continues to be harder in the east of the future metropolitan park.

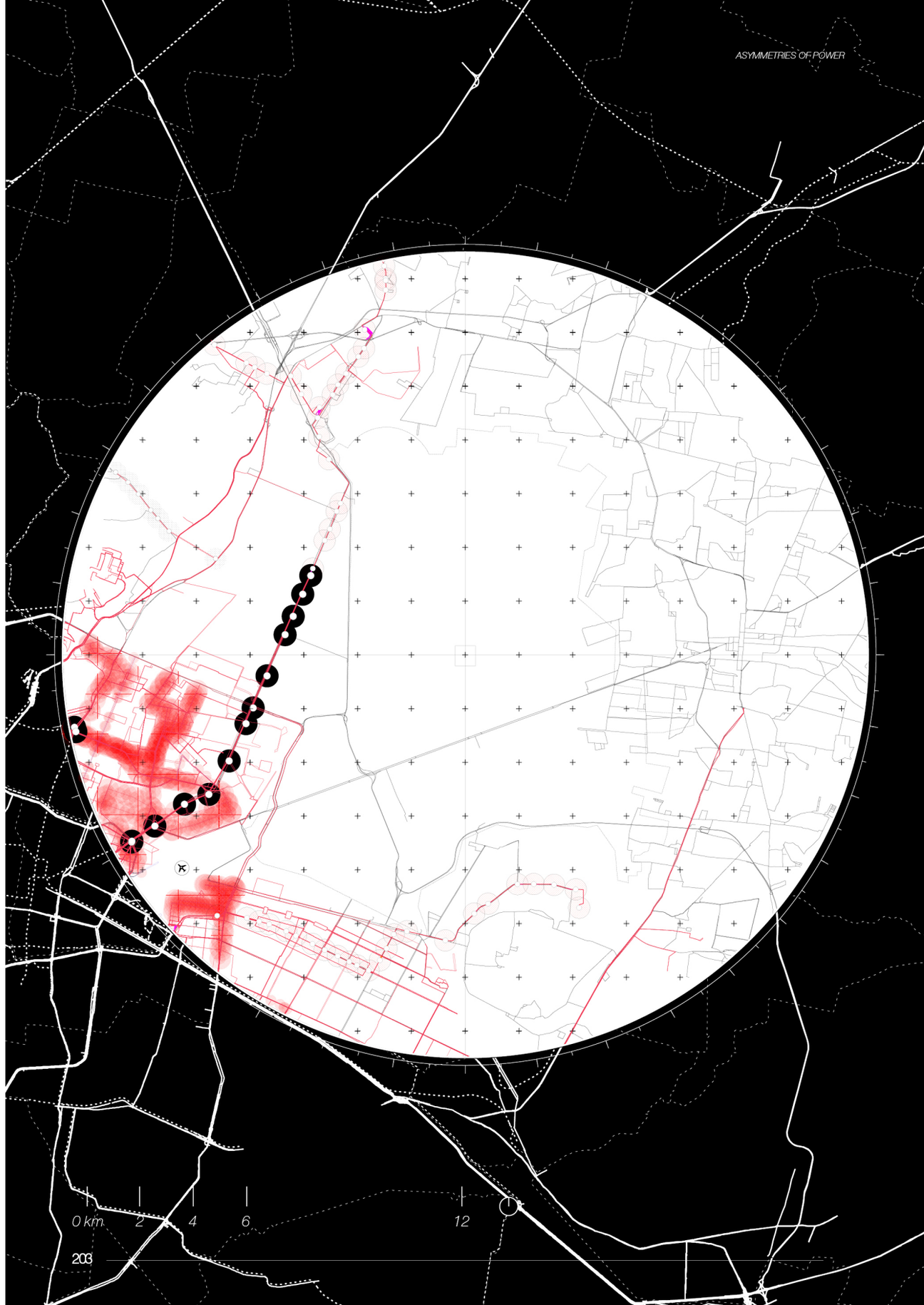


FIG. 6.3 Public Transport *(Own elaboration) The figure shows the final lines and stops of public masive transport around the selected area.*

Angular Integration 2000m

The angular analysis shoes the integration of that the motorized structure has in a 2000m radius which shows a higher integration in places that have been strategic for the development of public transport facilities such as Metro and Mexibus. Nevertheless the integrations seems to be higher in the west area of the selected area where de concentration of public transport of Mexico State is closer to the one of Mexico City. However the farther the urbanized area, the less integrated and connected from the metropolitan structure. The only area that shows after the analysis a higher value of integration is the centre of Texcoco municipality which is one of the places where the highway structure meet. Overall the integration is better in the most urbanized and populated area and further mobility projects need to be addressed in order to achieve a cohesive connectivity.

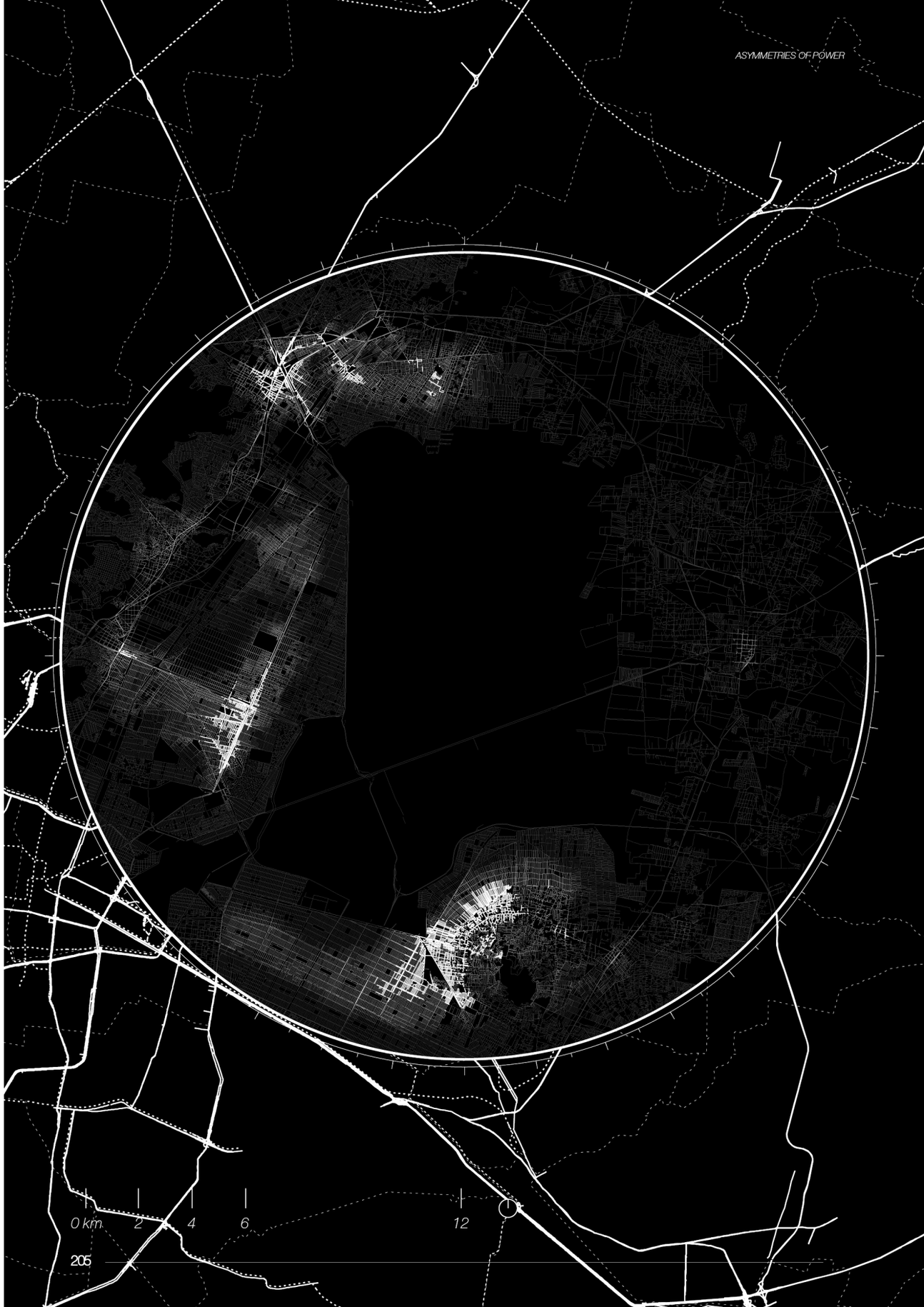


FIG. 6.4 Angular Integration Analysis *(Own elaboration based in data from INEGI, 2015) The figure shows the integration levels at 800m radius.*

Natural Structure

In chapter 3 the natural structure of the metropolis has been addressed, however it is important to highlight the great potential the area has regarding water bodies and the possibility of them to become the recovered identity of the study area. Most of this heritage is maintained in the centre where the metropolitan park will be developed, however as implemented in the vision V4, the integration of water with the city is elemental for a substantial change in the environmental conditions of the area, moreover the implementation of new strategies will allow the existence of new public spaces friendly with the lacustrine heritage that has been lost for more than 50 years.



FIG. 6.5 Natural Structure *(Own elaboration) The figure shows then natural elements within the selected area.*

Vulnerable population

The area was chosen due to its high levels of economic, social and environmental vulnerabilities coped with the high levels of segregation and fragmentation compared to the rest of the metropolis.
However among the places within the 15km periphery and as shown by the specific analysis, some areas in the less urbanized east-area have a higher vulnerable status. This is explained because of its segregated condition from the metropolitan functions and the lack of agricultural exploitation that has been changing since the introduction of globalization.

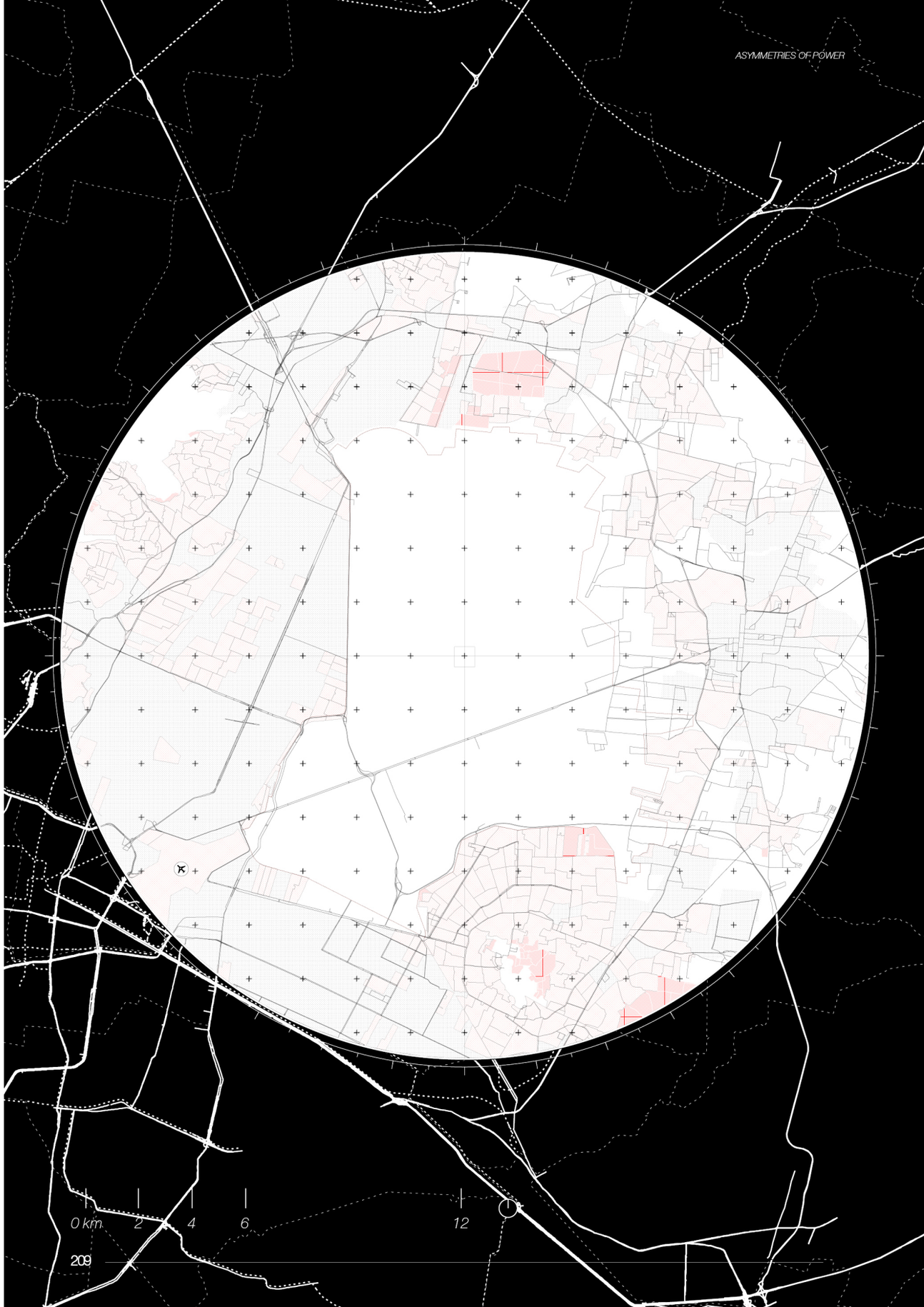


FIG. 6.6 Vulnerabilities *(Own elaboration) The figure shows the final the most vulnerable areas in the selected area.*

Agricultural Land

After the analysis of the agricultural potentials it is clear that the east side of the area remains with an agriculture shaped morphology. However as the city is growing most of the land used for agriculture is being transformed in housing estates with thousands of poor quality, unsustainable and inaccessible houses. The land belongs to communities and it has been stresses in this report the emergency to put a stop in the speculative agenda that the private sector has regarding this specific type of land. The vision V5 previously addressed highlights the possibility of developing new typologies of productive landscapes that can be implemented in some regard in areas such as the east where urbanization has not yet overstep its boundaries.

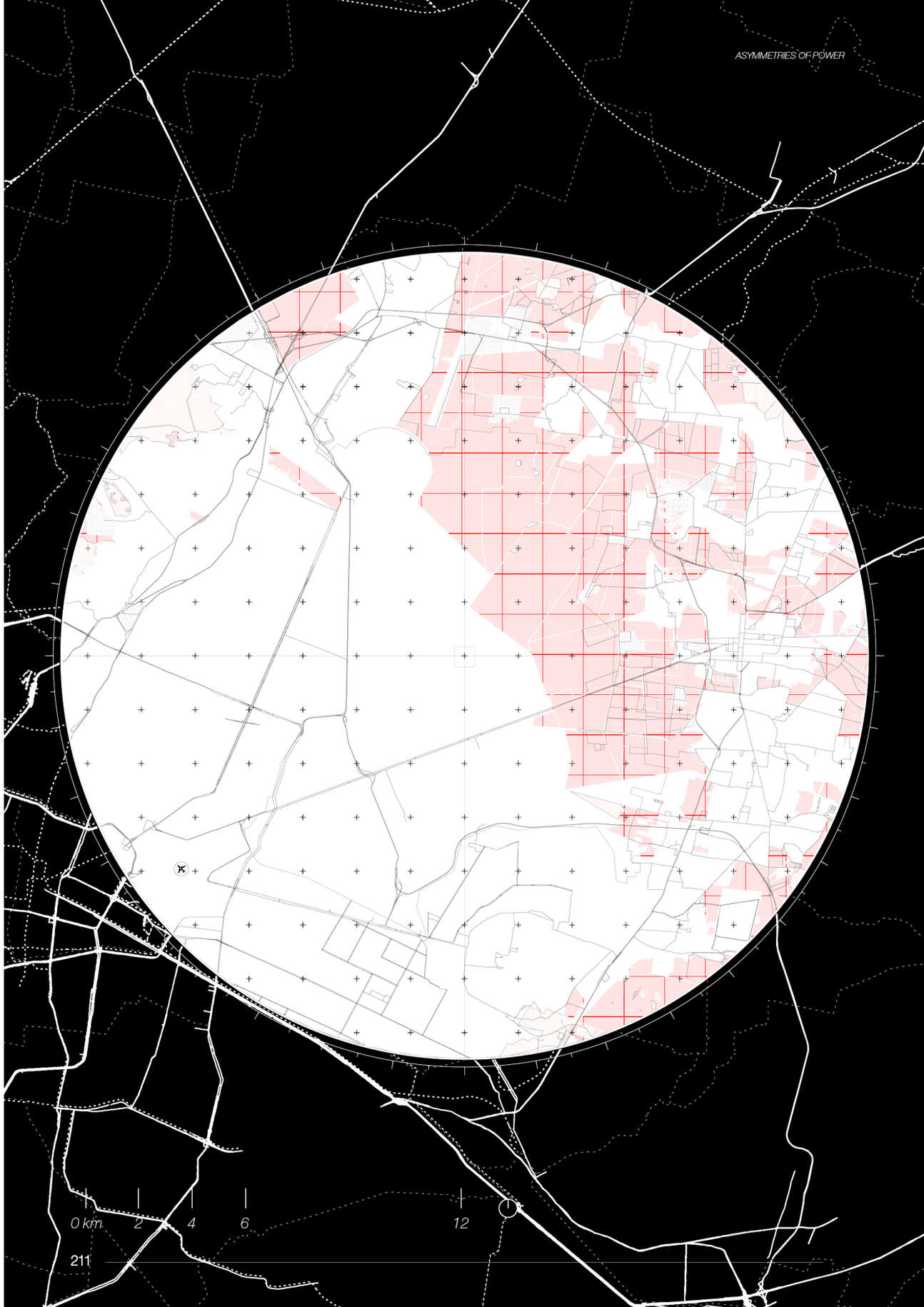


FIG. 6.7 Agriculture Potential Land *(Own elaboration) The figure shows the agriculture potential locations within the selected area.*

Conclusion Analysis

In order to develop a cohesive strategy able to adapt to the dynamics of the metropolis and at the same time reduce the precarious segregated conditions of the area, thus its fragmented structure, a collaboration between the 5 municipalities involved is essential, moreover the conclusion pointed out after the analysis of the visions a specific question was highlighted; where and how should the urban design and planning strategy start to develop in order to comply with the outcomes?
The answer lies in the where should this interventions start and the location should be strategic to rethink the border of the metropolitan park, a project that has shown to be concerned with the natural condition of the centre but has not addressed the outside. There is yet no connection with the park and the city and this specific locations can allow a 2 way connection that can further elaborate strategies and projects capable of improving the conditions of the area.
The points where the park and the metropolis meet will act as the Gates between them and will be addressed in the following chapter.



FIG. 6.8 Conclusion Map *(Own elaboration) The figure shows a conclusive map with all the layers at stake.*

Reflecting Over Current and Past Narratives

The former lake of Texcoco has been subject of a great variety of narratives aiming for its change and reestablishment as what it used to be ‘the greater lake of Texcoco’. Among them, the current narrative which was introduced in the previous chapter as a large urban project ‘Parque Ecologico Texcoco’ (PELT) is a project that aims to transform 12300 Ha of the void into a metropolitan park, with cultural, recreational and environmental facilities aiming for the reforestation of the salty soil and a better water sensitive awareness in the MAVM. This project is being developed by the federal government and its decentralized dependency CONAGUA along with a group of experts in charge of the design.

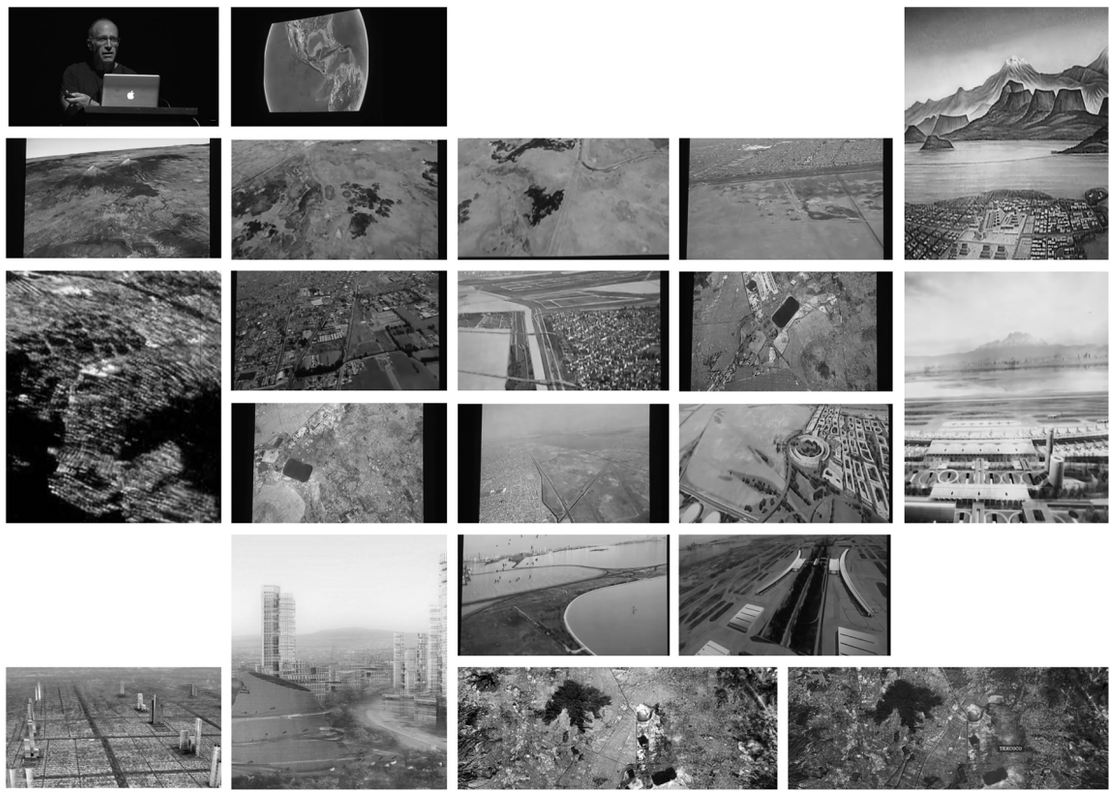
From past narratives, Alberto Kalach in his research called ‘Atlas de proyectos para la Ciudad de Mexico’ (Kalach, 2012) an exploration of 37 conceptual projects arises the concern of returning the lacustrine heritage to the city. He stablishes 3 main elements that function as the foundation of the proposed conceptual projects; water, territory and public space. The narrative puts the former lake of Texcoco as one of the main projects, aiming for its rescue as a water body, projecting 12000 Ha of water mass in the basin capable of new environmental benefits for the metropolis. Both narratives focused on the central area, the void, where more than 12000 Ha of available land is apparently waiting to transform it in the next mega project for the mega city. However both have shown a lack of sensitivity towards the communities around the void where other possibilities can be explored and one of the main motivations for this thesis.

Learning from other projects with different narratives, the recently awarded ‘Parque Hidrico la Quebradora’ (gold medal project of LafargeHolcim Awards 2018) a project that understands water as landscape infrastructure capable of reduce water risks in a vulnerable community in Mexico City under the concept of Hydropuncture. It is a project of no more than 3.84 ha with the capacity of storing, reused, and infiltrate water within its boundaries an open water pond that will transform the area functioning as public space for the vulnerable community around it. This project serves as evidence that in a mega city, mega projects are not always the best solution but rather careful and manageable smaller and local projects are a feasible strategy.

As a conclusive argument there is no immediate need for a large metropolitan park but rather a system of improvements over the surrounding vulnerable area, the periphery. A parallel project that works in smaller scales, easier to manage and faster to implement.

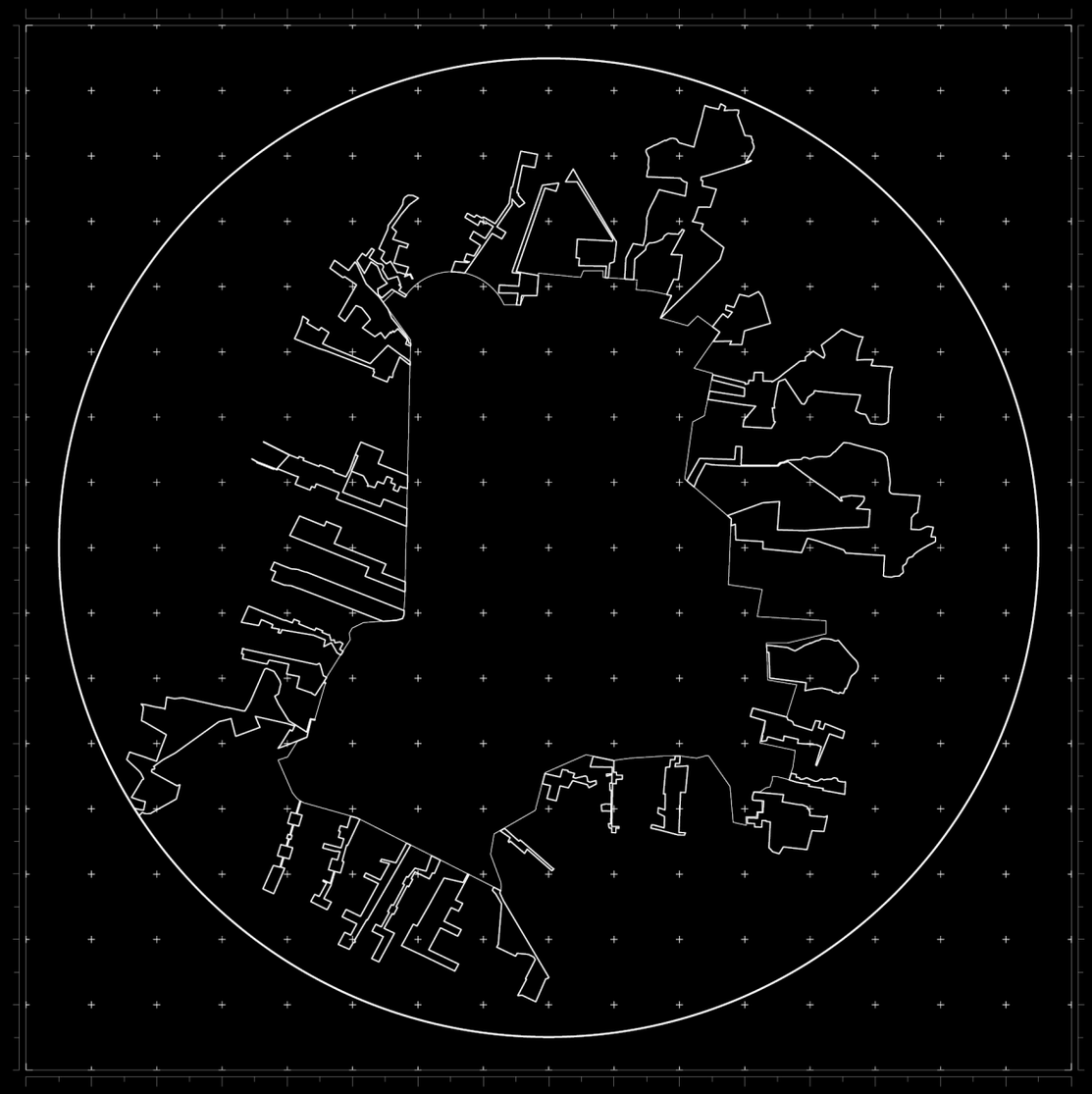


IMG. 6.10 Parque Ecologico Lago de Texcoco *(Source: Nebula Films, Mexico, CDMX, 2013) The collage shows several screenshots of the movieclip.*



IMG. 6.11 Arquine Mextropoli 2016 *(Source: Arquine, Mexico, CDMX, 2016) The collage shows several screenshots of the movieclip.*

7 THE GATES



Overview

The following chapter will elaborate on the ‘gate’ concept, its aims and objectives as a system of subscentralities and the method used to define their boundaries in the territory.

The Concept Behind the Gates

_Introduction to the gate system strategy

Historical urban development in the MAVM as mentioned in the last chapters, has been subject of speculation due to its fast and uncontrollable growth, reflecting a tradition of planning for the immediate critical problems which is a response that lacks of adaptability and strategic planning on a larger timeframe, where more than often large urban projects –the massive project for the massive metropolis- are consider as definite solutions. However the current response does not pay attention to the smallest of the urban scales, the micro-local which is the most affected one in the long term, a particularity that makes non-flexible strategies just a band-aid with short durability. therefore a shift is needed from the current urban paradigm of 'large mega projects for the metroplis' to a system of multiscalar interventions that strengthen local capacities and bottom-up development to activate vulnerable areas. The metropolitan park of Texcoco is then the chosen mega project with the potential of metropolitan transformation needed to trigger the strategic approach, thus, counteracting the current narrative of the project which generates transformation of a single concentrated area by acknowledging the edge (the segregated and fragmented periphery outside the border of the metropolitan park) and guide its transformation towards spatial cohesion.

The strategic concept aims to provoke a change in territorial decision based in the consideration of the opportunities given by:

- Reinforcing the local level (municipality and community)
- Reinforcing cross municipal perspective (intermunicipal collaboration)
- Considering the metropolitan structure and its connectivity to the socio-ecological conditions (climate change, environmental hazards),

in order to develop subscentralities in the territory, in short urban agglomerations capable of counteracting spatial fragmentation, creating more endogenous forces that enable the reduction of social segregation.

_The system of gates

The system of 'gates' proposed in this report is a careful selection of strategic locations, urban agglomerations that work as a system of multiscalar interventions that reinforce local capacities for activation trough participation. The strategy conveys the integration of 2 main issues: local development within a metropolitan system and local adaptation recognizing the uncertainties embedded in climate change and environmental effects capable of creating proper synergies by reinforcing the local forces of decision making, activating certain urban change and gradually connecting different levels of governance that together are able to improve the metropolitan system from a local adaptation perspective.

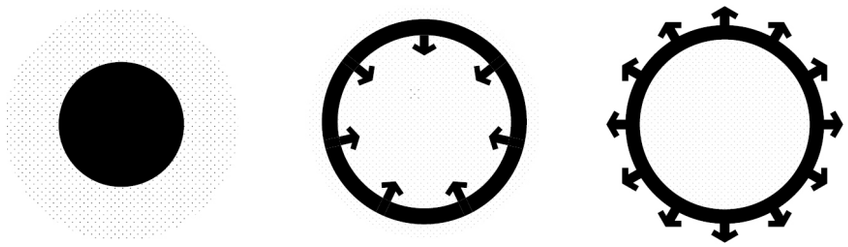


FIG. 7.10 Changing the dynamic of intervention
(Own elaboration) From left to right: center isolated, from the periphery to the inside; from the periphery to the outside

ASYMMETRIES OF POWER

The strategic concept aims to provoke a change in territorial decision based in the consideration of the opportunities given by:

- Reinforcing the local level (municipality and community)
- Reinforcing cross municipal perspective (intermunicipal collaboration)
- Considering the metropolitan structure and its connectivity to the socio-ecological conditions (climate change, environmental hazards)

The concept of the ‘gate’ enables systemic development through the implementation of actions that follow the 5 systemic goals introduced in the last chapter, goals that are guiding the conditions needed, shifting the role of the community participants from being only reactors (passive participates) to that of creators (active participants) of change, a non-linear process that takes into account different levels of actors, adapting through time towards common goals.

_Connectivity function of the gates

The gates are places that will create networks and links by connecting public spaces such as playgrounds, parks, and green corridors, allowing the diversification of the area by introducing multifunctional spaces as support to current local practices. The gates will be the places of transition from the urban metropolis to the natural void by the interconnection of various interstitial spaces, a fluid passage that acts as penetrator, increasing the environmental value of the area and changing the lives of thousands of vulnerable inhabitants.

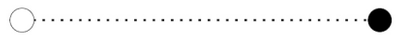
Interventions in the gates will vary depending the level of participation of the involved actors. The participation will not only ensure awareness but can potentially increase the local impact of the action addressed.
The approach will also be different depending on the demand and scale of the action at stake, meaning that some actions can function and be stressed from a bottom-up initiative and others from top-down one, carefully finding a balance between both to ensure the durability and potential evolution of the action taken.

The strategic approach was developed by taking into consideration the complexity behind the metropolis were collaborative participation is a key for successful spatial cohesion. By means of interviews and site visits, the strategic approach gained validation. Interviewees (several professionals and academics) came to agreement in two relevant issues: firstly there is a need for coordination among local communities in order to integrate them in decision making processes and secondly that the power asymmetries that mark/dictate urban planning decisions cannot be overlooked and will be impossible to avoid. In sum there is an urgency for adaptation in order to develop better just and resilient strategic decisions.

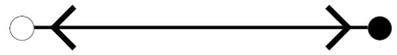
1. Metropolitan structure vs the void



2. Distance between Metropolitan Funcions and the void (future Parque Ecologico de Texcoco)



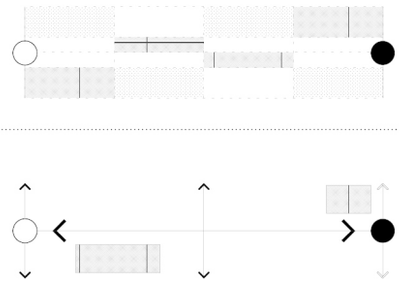
3. Linking the metropolis with the future park towards spatial cohesion



4. Aims of the Gate; Connect, Activate and Support

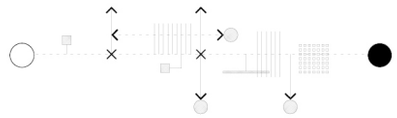


5. Analysis for strategic locations

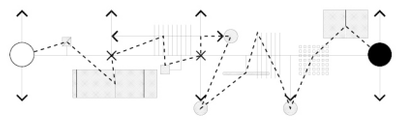


6. Indentification of Strategic Local Potential Areas

7. Indentification of Strategic Intermunicipal Potential Areas



8. A System of Actions



9. Activated Gate reduces Segregation and Fragmentation in the area

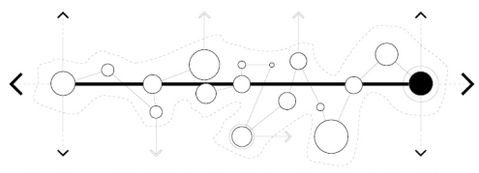
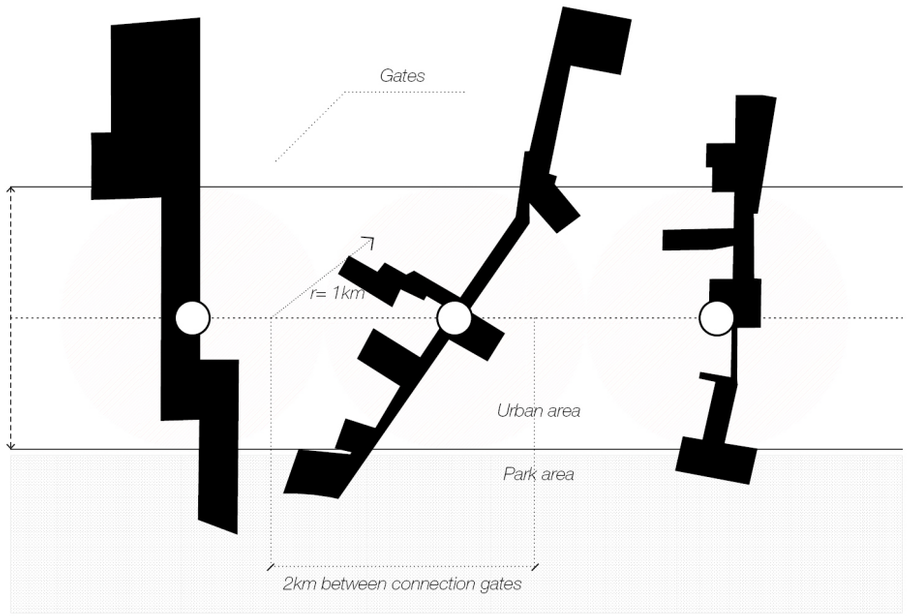


FIG. 7.11 Changing the dynamic of intervention *(Own elaboration) The figures shows the process behind the gate system*

Defining the gates

In order to define the gates that enable the connection between the metropolis and the park the next considerations are taken into consideration to develop a method that defines the connection points.

- 2km influence buffer from the periphery
- Points and buffer of r=2km
- Urban equipment and infrastructure concentration
- Economic influence areas for development
- Definition of the gates



IMG. 3.1 Process to define the gates *(Own elaboration) The figure shows the steps to define the gates.*



FIG. 7.13 Existing urban fabric *(Own elaboration) The figure shows the existing urban fabric around the 15km radius area.*

Urban Equipment and Infrastructure Concentration

The next step is identify the urban equipment capacities in the area, their quality and quantity. This preliminary study will depict specific areas with the potential to enable new development, strengthening local practices or identifying areas where urban equipment is insufficient as a way to cohesively ensure the connectivity of both, the metropolitan park and the urban surroundings.



FIG. 7.14 Urban Equipment and Public Space *(Own elaboration) The figure shows urban equipment areas that influence the selected area .*

2km Influence Buffer from the Periphery

The periphery of the park accounts for nearly 75km which will be influencing its neighbor surroundings. As the second step towards the definition of the areas of influence (later on called ‘gates’) a buffer zone of 2km away from the border is taken into consideration as an immediate influence area.



FIG. 7.15 Influence buffer area *(Own elaboration) The figure shows the influence area within 2km buffer from the periphery of the park.*

Points and Buffer of r=1km

In order to successfully connect the metropolitan park with its surroundings in a cohesive way several gates have to be defined, strategic areas for connection that enable accessibility for local communities and visitors. If the project is taken by a neoliberal agenda as many of the large urban projects in the metropolis have, accessibility to the metropolitan park will only be possible through one controlled gate. As such several gates, well distributed across municipalities will serve as strategic locations for further exploration, thus finding new possibilities to use the project as a way to reduce current vulnerabilities in its surrounding areas.

In this regard the following method is used to define such areas; the strategy consists in several points of influence approximately 2km away from each other guaranteeing accessibility for pedestrians as if they were transport mobility stops (similar accessibility measured used for transport stops), with this measurement the connectivity and accessibility to the park is ensured in the peripheral area in terms of distance across the region. Therefore a total of 34 buffer areas are defined which will lead to the development of the future ‘gates’, a concept that will be fully explained in the following pages.



FIG. 7.16 34 potential points of interest *(Own elaboration) The figure shows the distribution of the potential gates.*

Economic Influence Areas for Development

The fourth step will be to add the last layer which accounts forareas of attraction regarding employment and economic development, a study already defined by DENUE (2018) a governmental institution that defined different zones (Perimetros de contencion Urbana) that is used as a tool by the federal government to guide the subsidy support that housing will received according to its location, and relation with employment sources and basic urban services across the country.

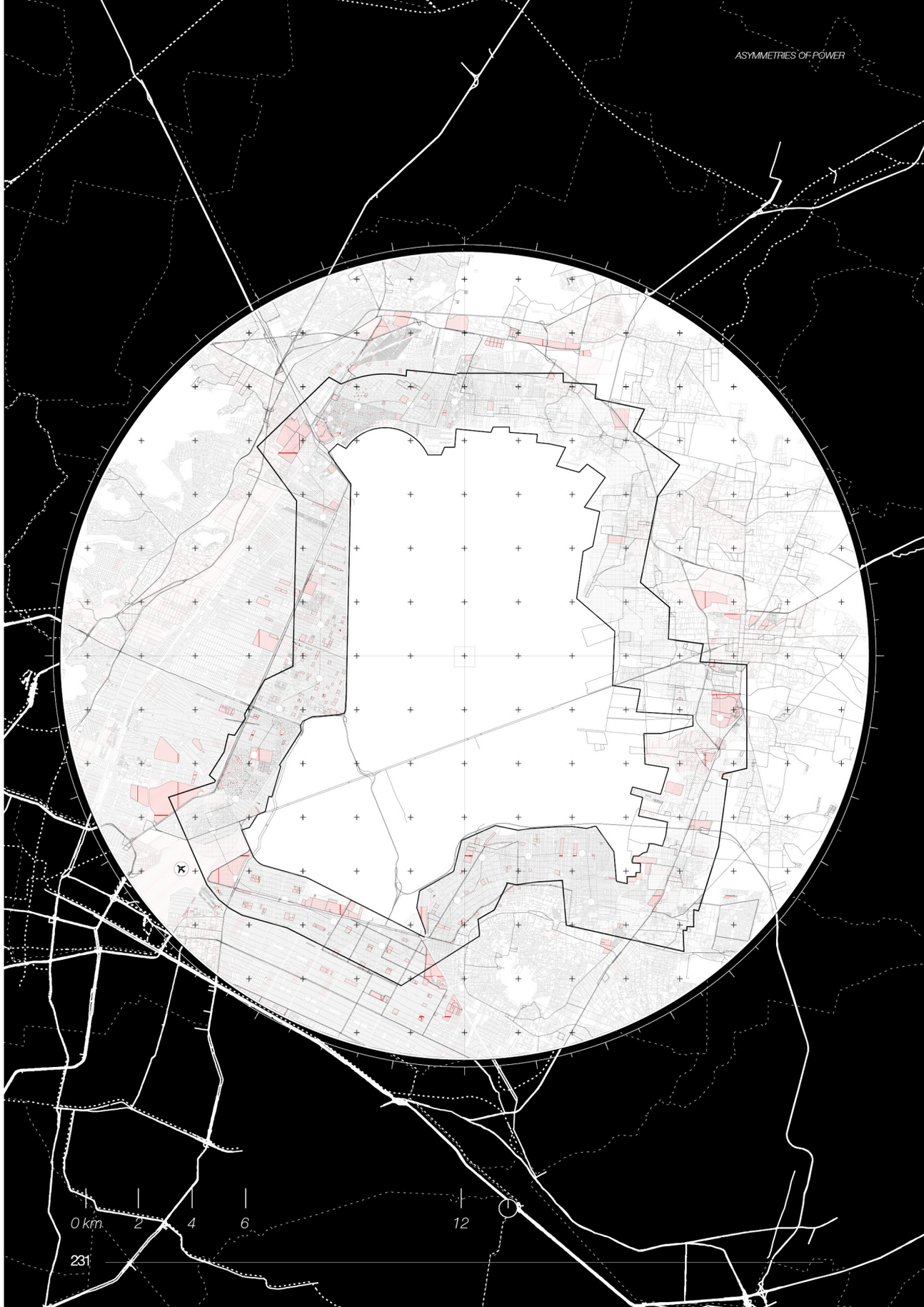


FIG. 7.17 Attraction areas of economic development *(Own elaboration based in data from DENUE, 2018) The figure shows U1 and U2 areas.*

ASYMMETRIES OF POWER

34 Gates

After making a cross relationship with the former steps (step 1, 2km buffer zone; step2, buffer point of 1km radius as first influence area; step 3, analysis of the urban equipment and step 4 defining attraction areas for economic development) taking each one as a different layer, an overlapped shaped is defined, thus functioning as the first ‘Gates’ that can enable a connection of both sides towards spatial cohesion.

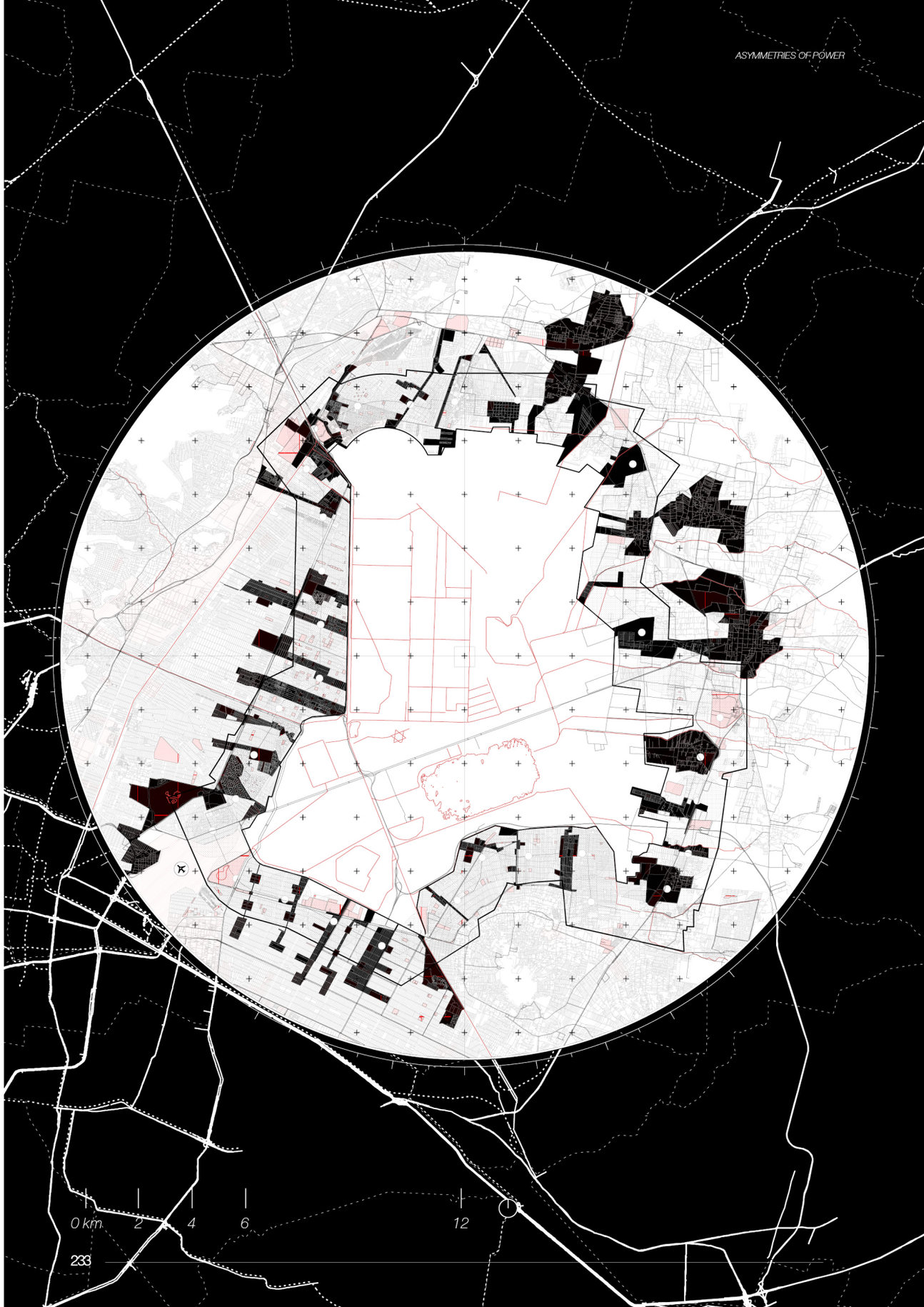
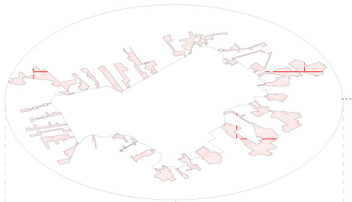
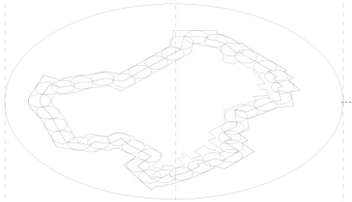


FIG. 7.18 34 Gates *(Own elaboration) The figure shows the final location of the gates.*



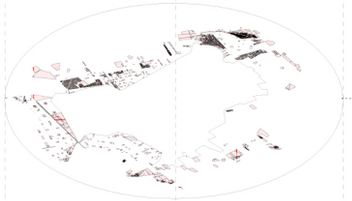
GATES



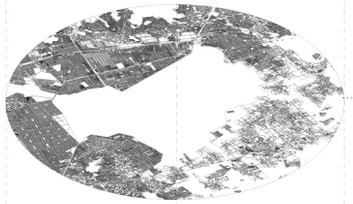
INFLUENCE AND POTENTIAL AREAS



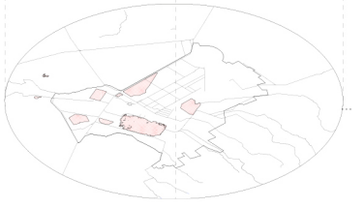
ATTRACTION AREAS OF ECONOMIC INTEREST



URBAN EQUIPMENT AND PUBLCI SPACE



URBAN STRUCTURE



NATURAL STRCUTURE

Legend

Main Transport Network Infrastructure

- High way Network
- AICM Airport
- Plots

Natural strucutre

- Water bodies
- Waterways

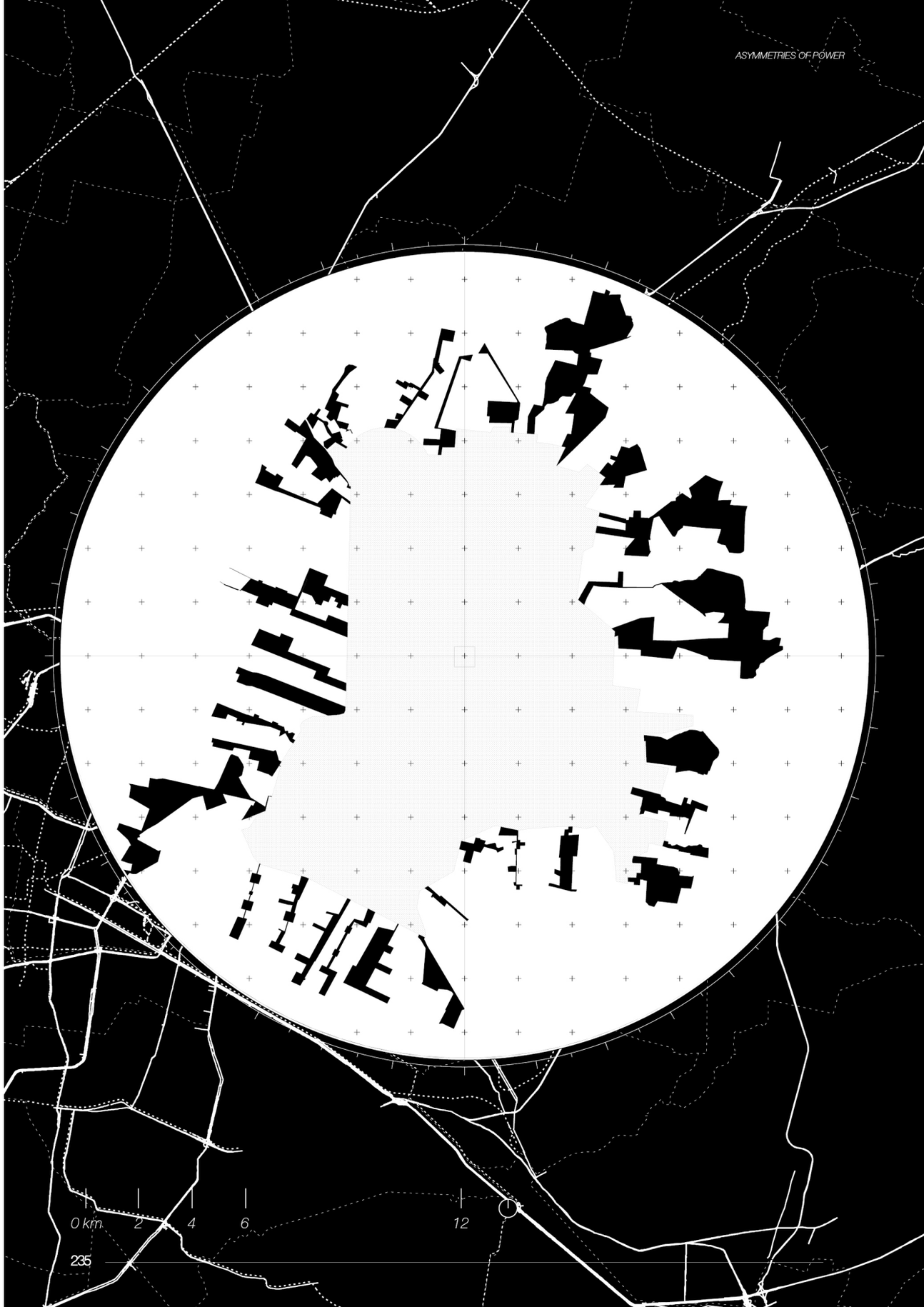
Administrative structure

- 15km Boundary
- Park Boundary

Gates analysis

- Gates
- Potential points for connection
- 2km radius buffer
- 2km periphery buffer from park boundary
- U1a and U1b employment
- Urban equipment

FIG. 7.19 Left-Exploded Axonometric Drawing *(Own elaboration) The figure shows the layers consider to select the location of the gates.*
FIG. 7.20 Right-Gates around the park *(Own elaboration) The figure shows the 34 doors around the periphery of the park, each 2km away from each other.*



ASYMMETRIES OF POWER



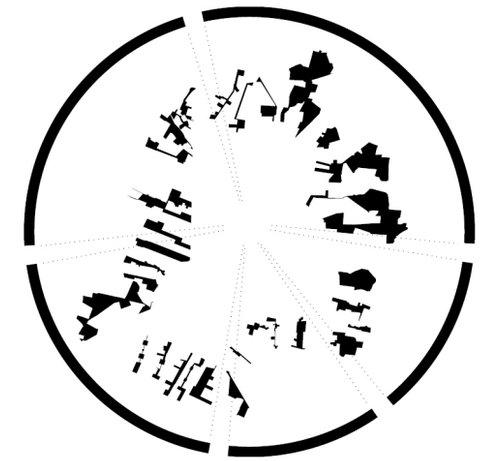
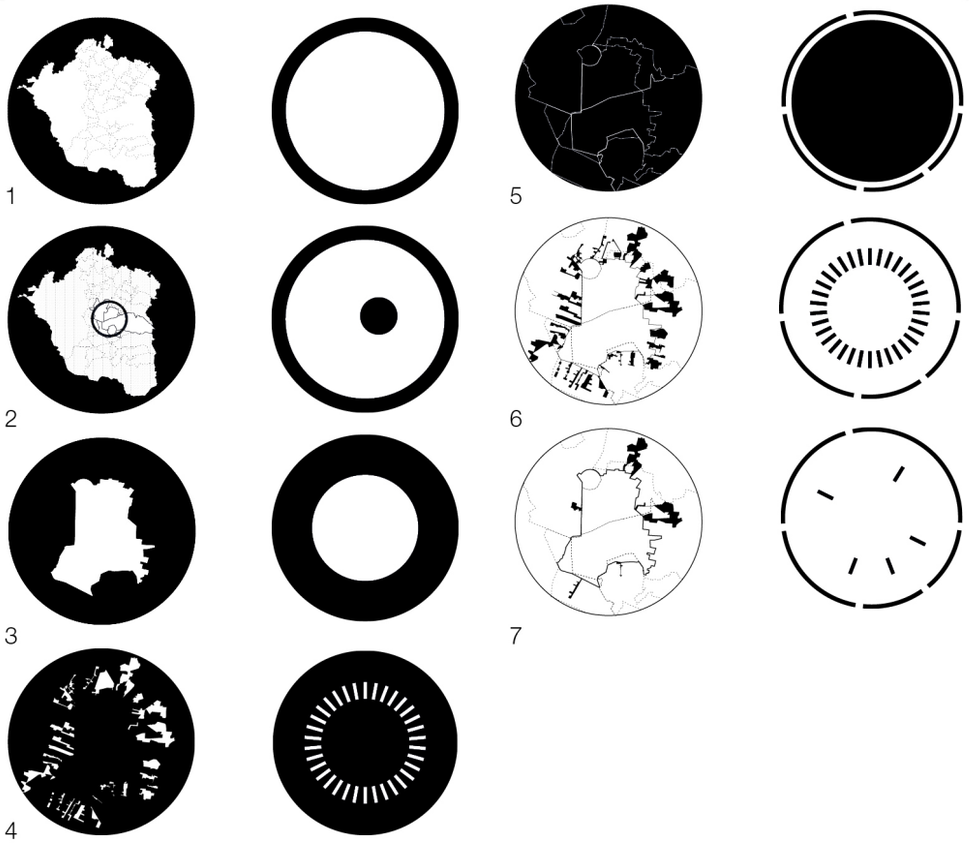


FIG. 7.21 Gate matrix *(Own elaboration) The figure shows he 34 gates, organized according to their municipality.*

Conclusion

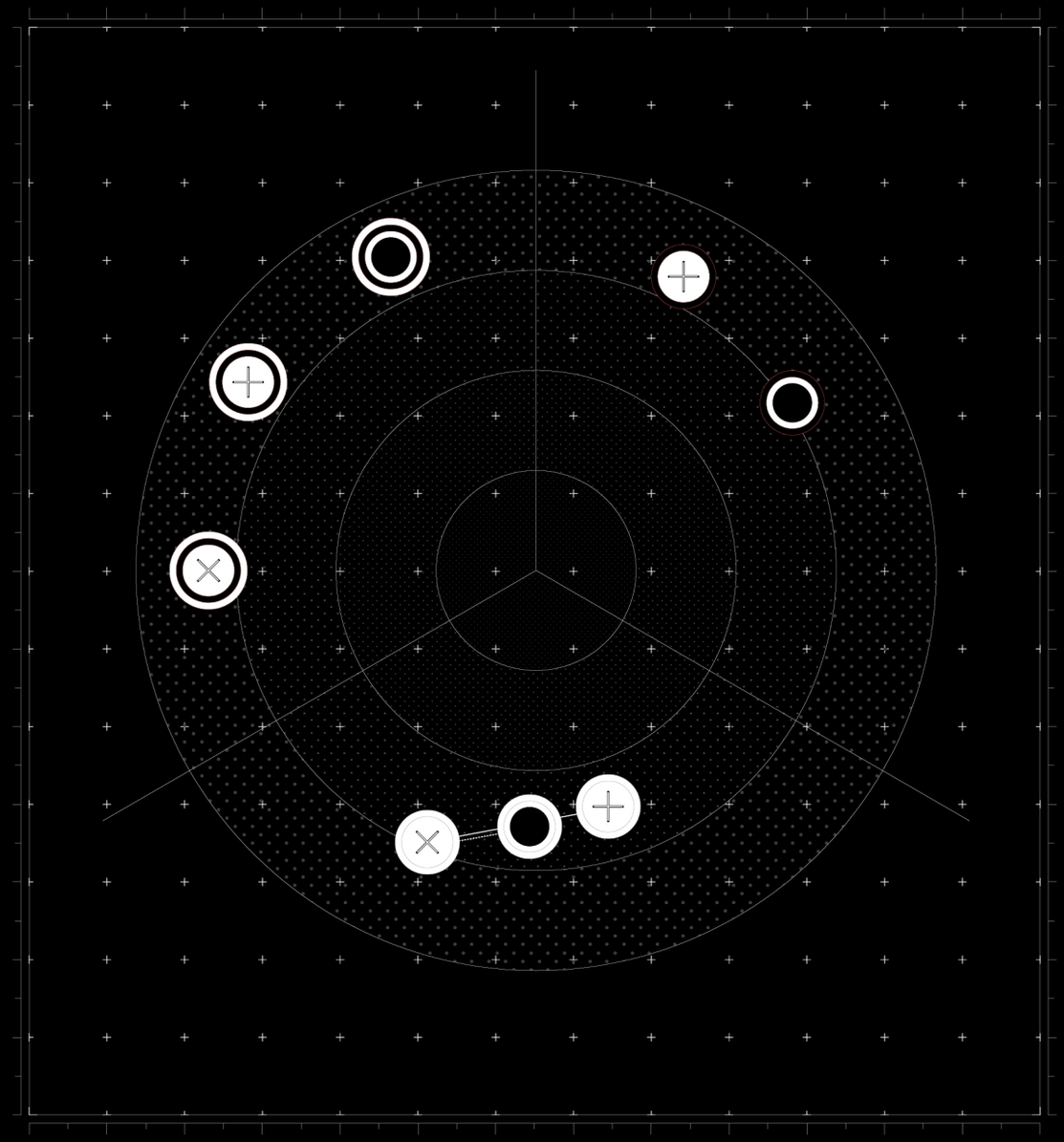


1. Metropolitan Analysis
2. Metropolitan strategic area with potential
3. Large Urban Project
4. 5 systemic goals
5. Analysis of the strategic are with metropolitan potential
6. Strategy for the beginning of the adaptive planning, a way to approach the area
7. Recognition and definition of strategic locations with intermunicipal potential; 34 gates for connectivity

FIG. 7.22 Steps taken to develop the gate *(Own elaboration)*

The gates are strategic selections, agglomerations in the territory that can be activated by integrating local development and local adaptation to social and climate forces of uncertainty. The gates create a system capable of enhancing the vulnerable area in a cohesive way, an evolutionary strategy for change following systemic goals that guide the conditions needed to achieve higher levels of spatial transformation, and governance.

8 GOVERNANCE CHALLENGE



Overview

During this chapter the governance challenge is elaborated by first, analysing the general governance structure in the MAVM regarding the strategic approach towards adaptive planning and secondly by analysing the current land development and ownership mechanisms embedded in irregular practices.

Introduction

Governance in the MAVM has the particularity that even when higher hierarchy power domain decision making processes regarding urban planning there are local organizations that work informally outside the legal system, working from the inside of the most vulnerable communities, guiding their urban development. This organizations have strong local power and are recognized by the higher power levels, which instead of abolishing them use them according to certain interests such as voting support or strategic manifestations. In this regard the scope of actors involved in the selected area of study is different than the regular normative governance that characterize areas closer to the centre of the metropolis.
The following diagrams are used to illustrate the current relationships of the stakeholders in the area.

_Diagram 1
The two dimensional matrix indicates the level of power and interest of the different stakeholders involved regarding collaborative participation towards the end goal, spatial cohesion, from higher to lower levels in a scale of 0-10.

_Diagram 2
The diagram indicates the relationships, position and level of involvement of the different stakeholders (Czischke Ljubetic, 2006). The diagram is divided in 3 realms that allow the positioning of the different actors; public sector, private sector and civil society. The distance from the centre of the diagram differentiates the level of operational involvement and power needed towards completing the specific action or goal and the lines indicate the relationship needed (direct or indirect) in order for the action to be implemented. Furthermore the diagram has been developed around the specific systemic goals introduced in chapter 5; transport and mobility system, water landscape integration and management, green infrastructure and quality of public and open space, densification of the built system, and productive landscapes and means of production.

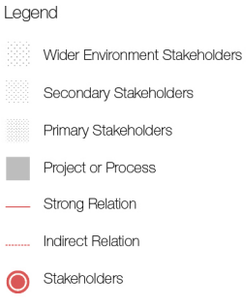


_Diagram 1

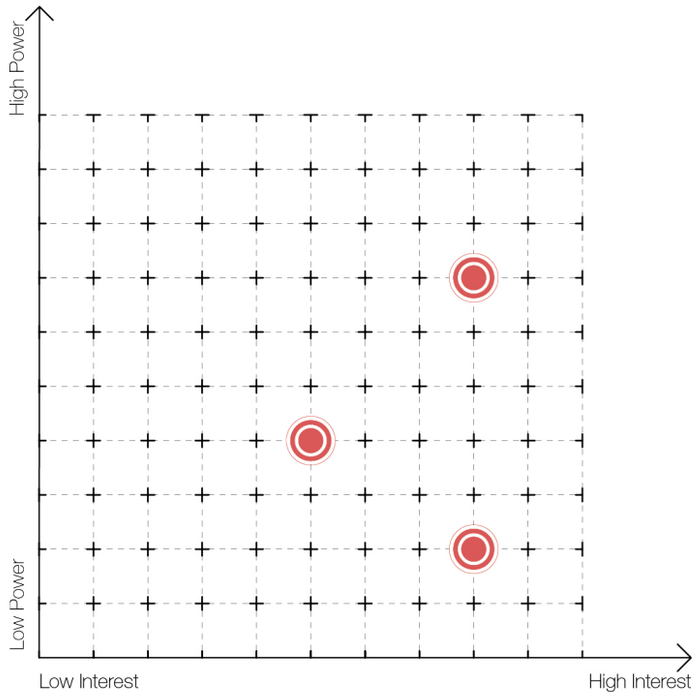


_Diagram 2

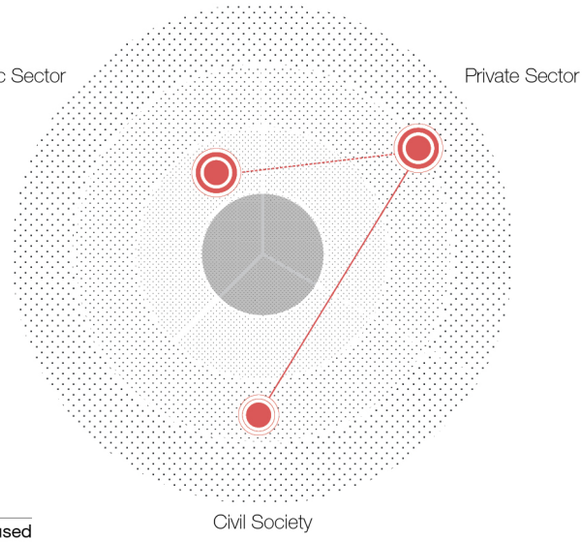


FIG. 8.10 Diagramas used for governance analysis *(Own elaboration)*

Governance Context

The governance context analysis is based on literature review and complemented by the interviews made during the fieldwork with different stakeholders that shared their personal experiences and feedback, helping the elaboration of a relational model that depicts the current levels of collaboration between the following stakeholders:

Federal government
The federal government is the highest hierarchical institutional organism in the country. The central government is stabilised to share sovereignty over the republic with the governments of the 31 individual Mexican states, and to represent such governments before international bodies such as the United Nations. Its different dependencies (SEGOB, SEDESOL, SEMARNAT, SENER, SEDATU, SCT) are in charge of issues concerning regional and territorial planning among others.

State and Municipal public institutions
Each of the 31 individual Mexican states has an institution called 'Gobierno estatal' of the issued state. For the purpose of this report this is the highest state institution in charge of its own regional planning (PDE) an instrument that functions as a guideline for the state, where the priorities, objectives, general strategies and lines of action in economic, political and social development are described. It fosters the sustainable development of the region.

The municipalities however are decentralized institutional organisms in control of the public administration within their municipal boundaries. They are in control of public services such as water distribution and production. Each municipality has its own municipal urban development plan (PMDU) where the basis of planning are settled identifying several phases of development, particular strategies and instruments for their implementation.

Private developers
This stakeholder is heterogeneous since different levels of developers are at stake. For purposes of this report the main private developers are construction companies, in charge of the current urban sprawl developments in the periphery of the metropolis.

Bank institutions
In this report banking institutions vary from different hierarchies and levels of participation. Several are identified from national to public and private. However their importance in the interrelations that will be described in the following chapters is that of a supporting credit fund regardless of its nature. For instance, 'INFONAVIT' is a public credit fund program for social active workers with its own regulations while private bank institutions offer credit to the wider population for land development purposes, particularly for private developers which have found in this institutions their primary business foundation model.

NGO's
Are organizations that are able to find economic resources by establishing direct relationships with governmental institutions or private developers in order to achieve specific goals. In the MAVM non-governmental organizations are often associated with the participation of civil society in an organized way to fight political corruption (masciudadania, nomasderroches) some dedicate their efforts to organize society towards blocking large urban projects that have no accountability measures within their process, such as the now cancelled NAIM (international airport of Texcoco).

Popular organization
Their function is to guide the participants (people in need for land or housing) in the process of land invasion, control them and act as intermediaries between the vulnerable populations, the representatives of political parties and actors from public institutions (Mora, 2015).

Social organization or neighbourhood organization
They are often spontaneous and are integrated by the interested neighbours with a clear and specific objective. However these organizations can easily become popular organizations or civil associations with strong influence in process such as finding agreements with public institutions to build new urban equipment. Their functions vary according to the settlement in question, but they are in charge of organizing the neighbours and have clean streets or empty plots that can be used in the future as public spaces, moreover they collect incentives for local parties or celebrations, or for the development of public facilities such as soccer fields, schools, or churches (Mora, 2015).

Civil society
For the purpose of this paper 'civil society' will be used to describe private land owners and neighbour residents which are not part of an organization or institution, public nor private and have not direct favour-benefit involvement with political parties.

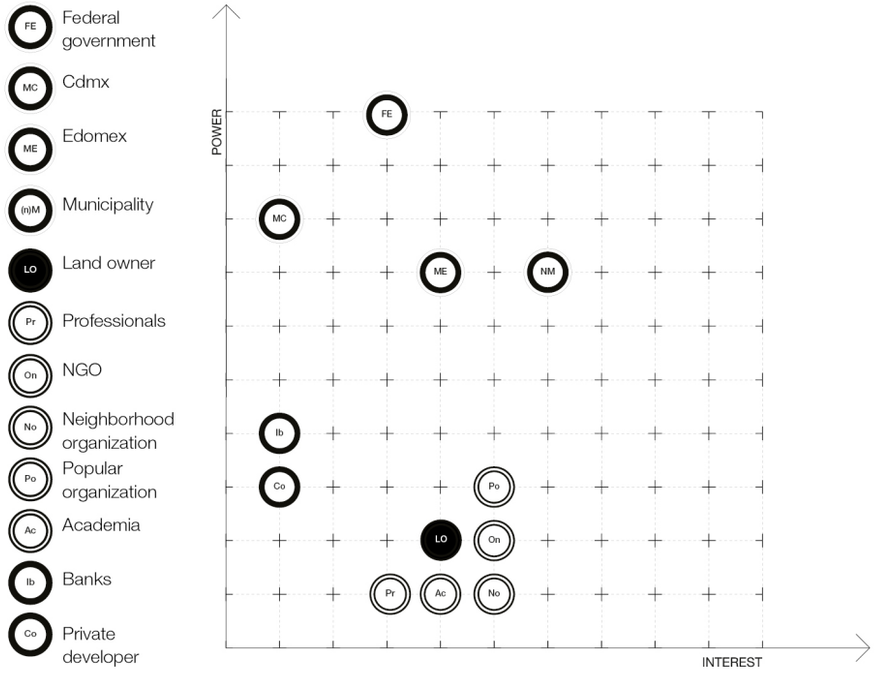


FIG. 8.11 Stakeholder relation of power and interest *(Own elaboration), The figure shows the current levels of power and interest of different actors towards metropolitan spatial cohesion in EDOMEX*

_Water landscape integration and management
The federal government is charge of the water management in a large scale. CONAGUA functions as a decentralized institution derived from SEMARNAT which is one of the departments of the Federal government in charge natural resources and the environment and is in charge of the administration regulation and control of national water bodies. Nevertheless each state and municipalities have institutions for the management of this resource.

_Green infrastructure and quality of public and open space
Regarding green infrastructure and public space the state and municipalities are In charge of designating it. The state has the capacity of formalizing the general guidelines in its PDU or urban development plan to later on be handled by municipalities, which have the responsibility of implementation through their individual PMDU.

_Densification of the built system
Similar to the designation of land for public space, land for housing and its right to be intensified lies in the power of the state and the municipality. Their planning tools are grounded in a land use tradition which policies and strategies lie in zoning methods. This zoning methods limit the densification and intensity of mix used in the entire country. However the interest of people by speculating with their land where the monitoring of the governmental institutions is weak is clear. Specifically in the context of the MAVM vulnerable communities that have thrived over the years have shown an increase on density usually adapting its original housing model, expanding it over a long period of time. The aim is often to pursue an increase in their income by none-legal renting agreements with the interested population, or by renting them as office buildings with commercial used in the ground floor such as corner shops. This phenomenon is a mutation of the informal context that nurtured the communities.
Notwithstanding the involvement of civil society in the densification of their own contexts, private investors and construction companies play a big role in the development of housing, thus the general built system. However as has been explained before, their interests are triggered by the neoliberal context currently ruling economy of the country. Tiny housing models with the lowest quality and land use intensity, the contemporary social-housing model that's has become the preferred way of land use speculation.

_Productive landscapes and means of production.
Agricultural land is regulated by the federal government which control the regulation and intensification of its use at a national level. However civil society play a crucial role since agricultural land is the preferred land for land speculation regarding the expansion of Mexican cities, one of the reasons that drove the MAVM to its current over expanded reality. However the agricultural productive value has been left aside. Looking to other ways of production that have been implemented in recent years such as solar energy farms, or wind energy farms their increase and promotion is in charge of the federal government which in collaboration with international investment from countries like Germany and China has shown successful results.

_Transport and mobility system
Transport infrastructure due to its large scale and investment requirements is in charge of the federal government at a regional level while the state and municipalities take charge of their local streets and highways. However the participation of private investors and construction companies not only for their development but for their promotion as well has become crucial. Thus both public and private sectors are involved in the development of such infrastructure developments in a context where civil society is not consulted or even taken into consideration for decision making processes regarding these large scale projects.



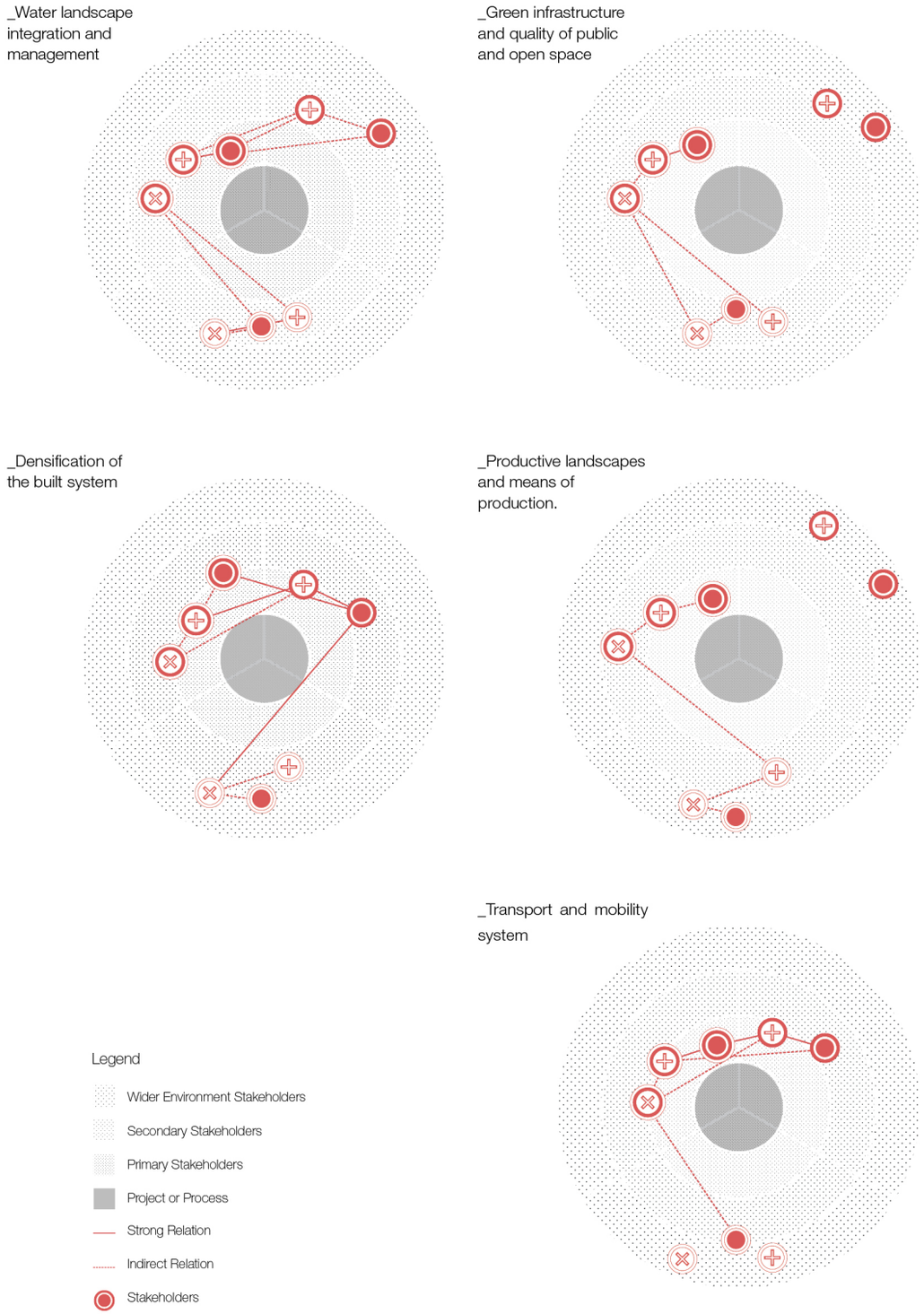


FIG. 8.12 Stakeholder participation per systemic goal *(Own elaboration)*

Land Ownership

In this report ‘illegal land ownership’ will be understand as the a process where certain individuals either by single participation or collaboration with other interested participants invade land that is not under their legal property which means that under the ‘eye of the law’ the right owner is other than the invader. Having clarify the terminology there are two ways trough which people can manage illegal appropriation of land: by receiving aid from a popular organizations, managers of a process of appropriation by means of collaborative effort and participatory labour tasks; the second one would be a ‘solo’ action without the help of any type of organization. The later laks of support from the general neighbourhood which can result in forced eviction from the local residents regardless of the illegality of the circumstances through which the entire neighbourhood was settled or by the public authorities.

Under this context it can be argued the role of public authorities to avoid illegal land ownership, which can be answer in two ways; first, the population already overpass the capabilities of the government to be controlled and monitored, there is not enough resources to keep track of the entire population, which is one of the reason of the lack of involvement regarding this mater coped with the location usually chosen by the invaders, usually far away unused land where municipalities in charge lack of power. The second reason is ‘clientelismo’ which is a common practice in vulnerable communities. Clientelismo is a process that has become the preferable tool for negotiation between local residents of vulnerable communities and interested political representatives in search for support for their benefit. Mora, defines the concept of clientelismo as follows:

“Clientelismo is understood as the exchange of favours, goods and services between the clients that had been involved in the negotiation that seeks political and popular benefit. This practice is not out of the law since it doesn’t require a monetary exchange and its result is rather an implicit exchange validated by the ‘word’ of the involved actors. The value of the exchange is directly proportional to the favour requested” (Mora, 2015. p.12, own translation).

Through this exchange that clearly benefits both parts, popular neighborhoods / vulnerable communities can thrive faster than by their own means, or by waiting for public ‘legal’ aid.

_Ejidal land

Ejidal land is agricultural land that has legal ownership by a community that produces in it or used to. It is a complex legal arrangement and goal of the 1910th revolution in the country. It is the preferred ground for invation since it is far from monitoring areas in the periphery of the urban agglomeration. Most of ejidal land is not being used for their defined purpose due to lack of government support, a condition that has affected the way the city has grown up until today. Several ways of appropriation can be described, first and most relevant for the issue of uncontrolled urban expansion is the role of the neoliberal market, which under the current circumstances and unavailability to the owners to work their land, purchase it at low prices. Private developers and constructions companies buy the land at low costs and develop social housing often without the necessary services. The second reason lies in the ejidatarios (ejidal owners) own speculation and urgency to deal with current external events. Speculation happens when the eminent gov-ernmental expropriation of their land is under discussion, usually this happens due to a large urban project, as a way to avoid

expropriation ejidatarios offer their land as fast as possible to potential buyers. An ex-ample of an external event would be when a popular organization or collaboration of individuals tries to land illegally in the land, which force them to negotiate a price of their land with the organizations thus managing the parcel division where an illegal purchase process takes place. To further explain this process the following graphic will elaborate on the topic.

_Land purchase

The process through which an individual or group of interested people can acquire land in order for them to develop it, and built their house several payments have to be taken into consideration. Because of the illegality of the process (land invasion or speculation through subdivision of ejidal land) the complexity of arrangements require a wide scope of actors. As mentioned before, popular organizations are collective that aids the interested people throughout the process of land purchase, development and subdivision, therefore this organization is the first step of the entire process. As such the organization and the buyer agree upon a price for the plot or land area desired. The payment method is a long process since is made in monthly or weekly instalments (depends of the agreement made with the popular organization). However this purchase lacks of legal background and cannot be recognized by the municipality institutions to further development of urban basic services. Because of this reason the now, local residents are in need to seek legal validation from the municipality. Legal validity for the acquisition and purchase of ejidal land can only be recognized if there is mutual agreement from the original owner and the buyer, thus the buyer pays to the land owner an agreed quantity to receive a document (second payment of the land) that cannot be validated until payment of documentation and legal processes to the municipality (third payment of the land). In sum, the interested buyer pays approximately 300% of the land value through 3 different payment processes to 3 different actors in order to get the right ownership of it.

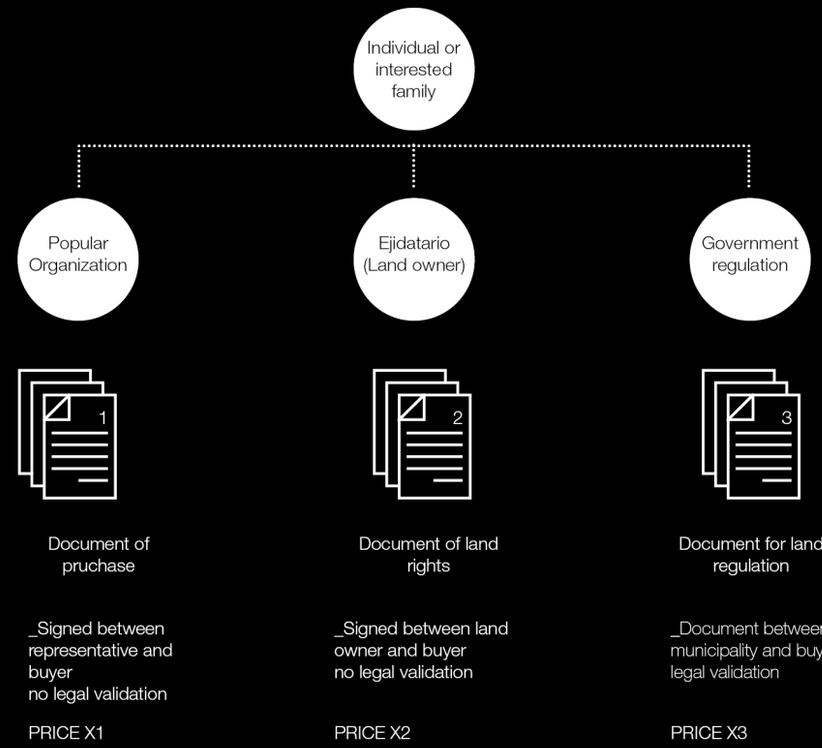


FIG. 8.13 Land purchase *(Own elaboration) The figure elaborates on 3 different stages needed to regularize informal land.*

Land Development

Both processes in vulnerable contexts where the urgency for shelter is the priority function under a slow but progressive way. Urban equipment, public spaces and housing units are developed during long periods of time, a progressive path that functions from a bottom-up perspective. Local participants and interested future residents collaborate in this progressive process through popular organizations and neighbourhood associations (Mora, 2015). Local organizations are a common tool used by population under vulnerable contexts in the MAVM used to acquire land (see figure 8.14), develop housing and ensure the provision of basic services such as water, sewage and electricity either by their own efforts of collaboration between residents or by demanding them to municipal institutions. They have become a well-structured way to fulfill their urgent collective needs and have worked to control and maintain the safety of their communities.

Popular urbanization (urbanizacion popular) is perhaps the only organizational process through which vul-nerable inhabitants of the metropolis can guarantee a liveable environment without the involvement of government institutions; a place where their essential needs are fulfilled even if it is at the most basic level.

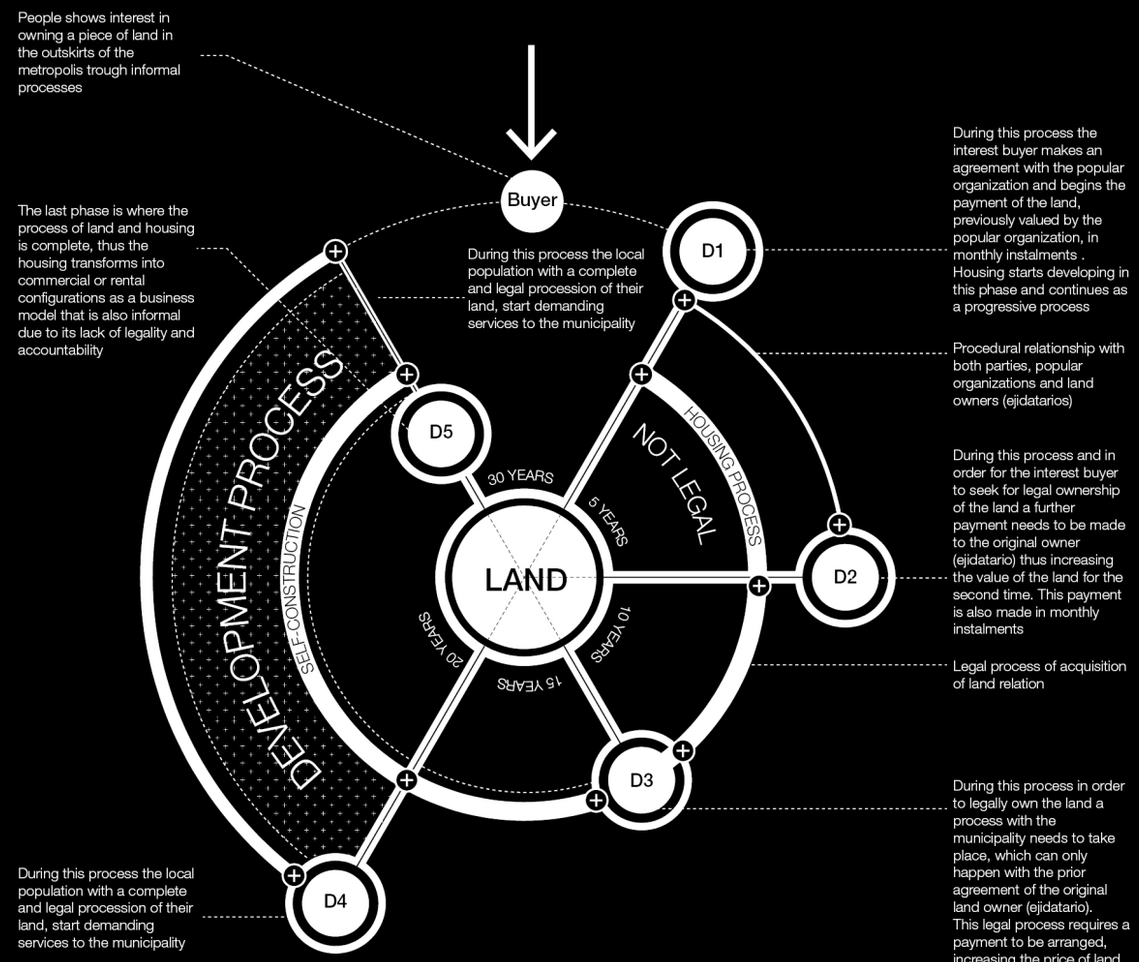
FIG. 8.14 Types of local organization *(Based from Mora, 2015)*

Types of local organization	Aim or functions	Who	Other
Independent, individual or collective organization	Any action of urban improvement or ant invasion (progressive land occupation without clear order)	Any individual, mostly family members and close friends	Can become civil organizations
Guided by popular organizations (organizaciones populares) that can be part of a political party or can be independent	Help the population to satisfy housing, and basic urban services (education, health) Recruitment of people for civil representation in favour of political parties or the same popular organiza-tion	Civil society organized by representatives of a particular association/ organization Leaders are called profesores or activistas	Clientelar system “favores por votos y votos por favores”, With this system people negotiate; land, housing, food, basic services, medicines
Independent, individual or collective organization	Independent, individual or collective organization	Both	The most problematic due to incapability to arrange common goals

It can be argued the lack of legality of the process since most of the land occupation as will be explained later is done by illegally landing on available unused land usually in agricultural land far from metropolitan functions which in previous chapters has been addressed as one of the reasons that had worsen their vul-nerable situation.

The following figures elaborate on the process of land development of a neighborhood or local community, its different phases and actors involved until its complete consolidation.

FIG. 8.15 Land development phases *(Own elaboration)*



ASYMMETRIES OF POWER

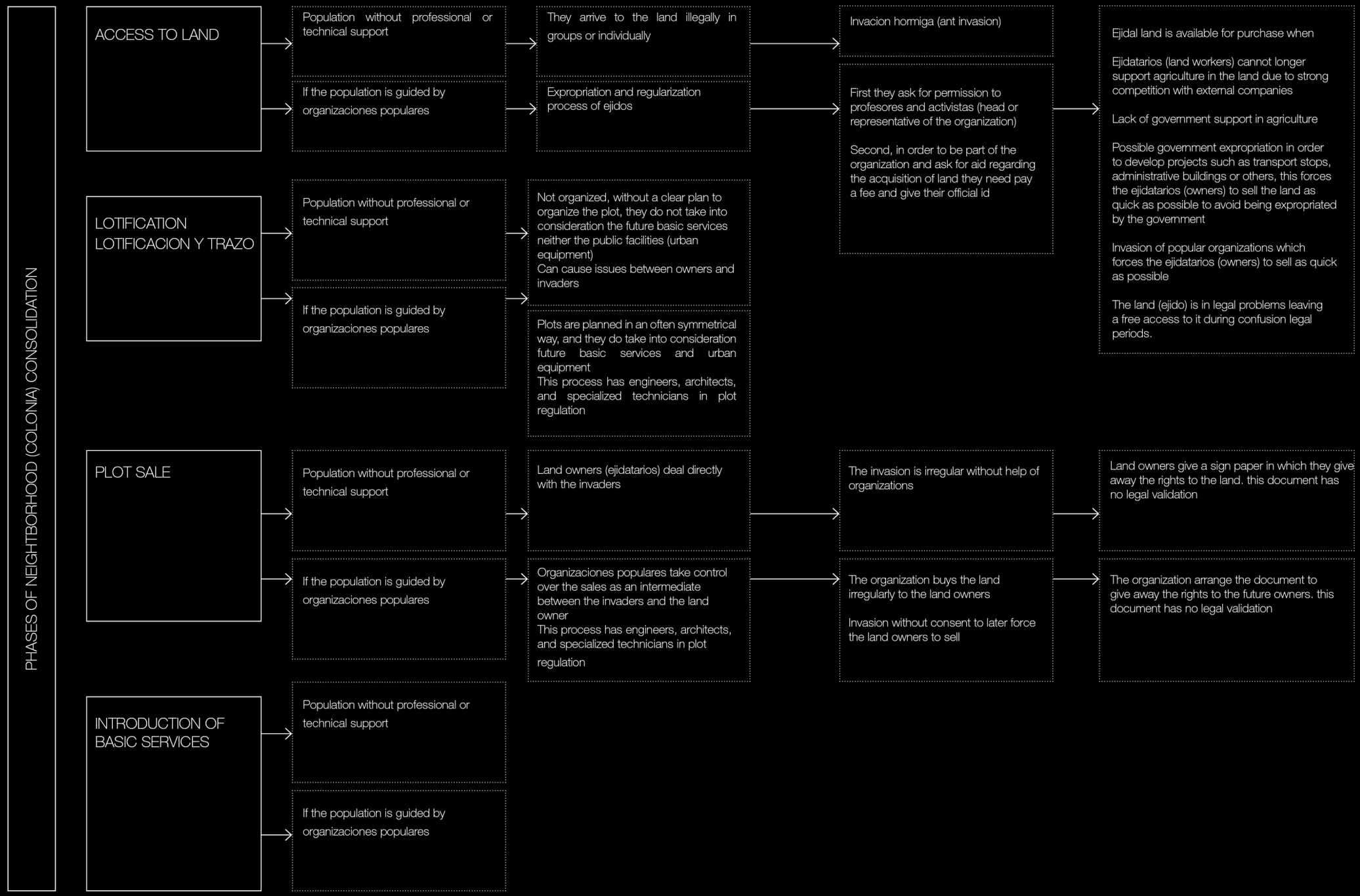


FIG. 8.16 Neighborhood consolidation phases *(Based from Mora, 2015)*

Informal Process of Land-Housing (construction phases)

Housing under a vulnerable context such as the outskirts of the MAVM is developed by informal processes at all stages of development, from the land acquisition or invasion, the construction of houses and the speculation with them. However housing works with a progressive dynamic that allows the house to have different stages at different times. It continuously evolves reflecting on the capacity of each family (owners) to develop it. Since the consolidation as previously addressed has shown to take up to 15 years, the process of construction takes a long time as well. The first stages of housing development are fast and done with individual and some of the times with collective efforts using any means necessary to shape a shelter (brick, steel panels, tires, plastic, sand, stones etc.) most of which they find in nearby wastelands. Later stages take longer periods of time, parallel processes such as consolidation arrangements of the land itself take most of their income slowing down the process. Interviews made with local residents help to grasp the entire process. The final stages are always related with the speculation of land, this means that land owners make their house's ground floors commercial, they can place their own business (small stores, coffee shops or corner shops) or rent the space to someone else. The upper floors usually are used for rental purposes, one of the reasons behind the 5 story housing buildings that can be encounter in the areas selected for the site visit.

The process can be seen as informal since it lacks of legal validity or accountability. But it is a process done due to vulnerable circumstances as an effort for the population to make themselves participants of urban live.

- One of the interviews took place in a coffee stand inside the garage of an orange house, the interview was made while the interviewee was serving coffee to the people arriving, a simple styrofoam cup with soluble coffee with sugar and sometimes cream, sold at $10 Mexican pesos (0.38 euros), an activity that not only creates a different atmosphere in the small space where it takes place, but enhances people to stablish small talk with each other. This is how most of the population works in this contexts, or as put by the interviewee, "asi nos ganamos la vida" (that is how we make a living).

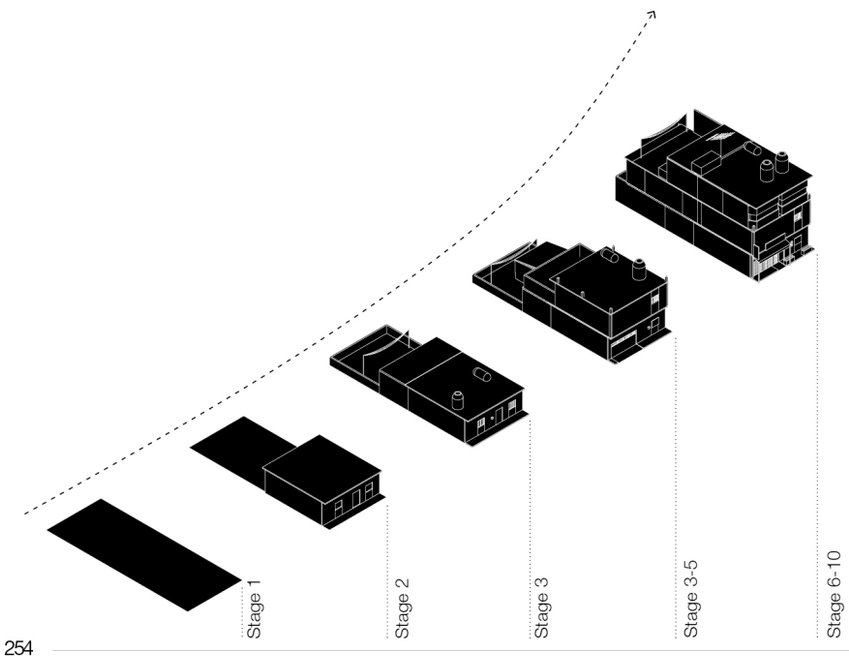
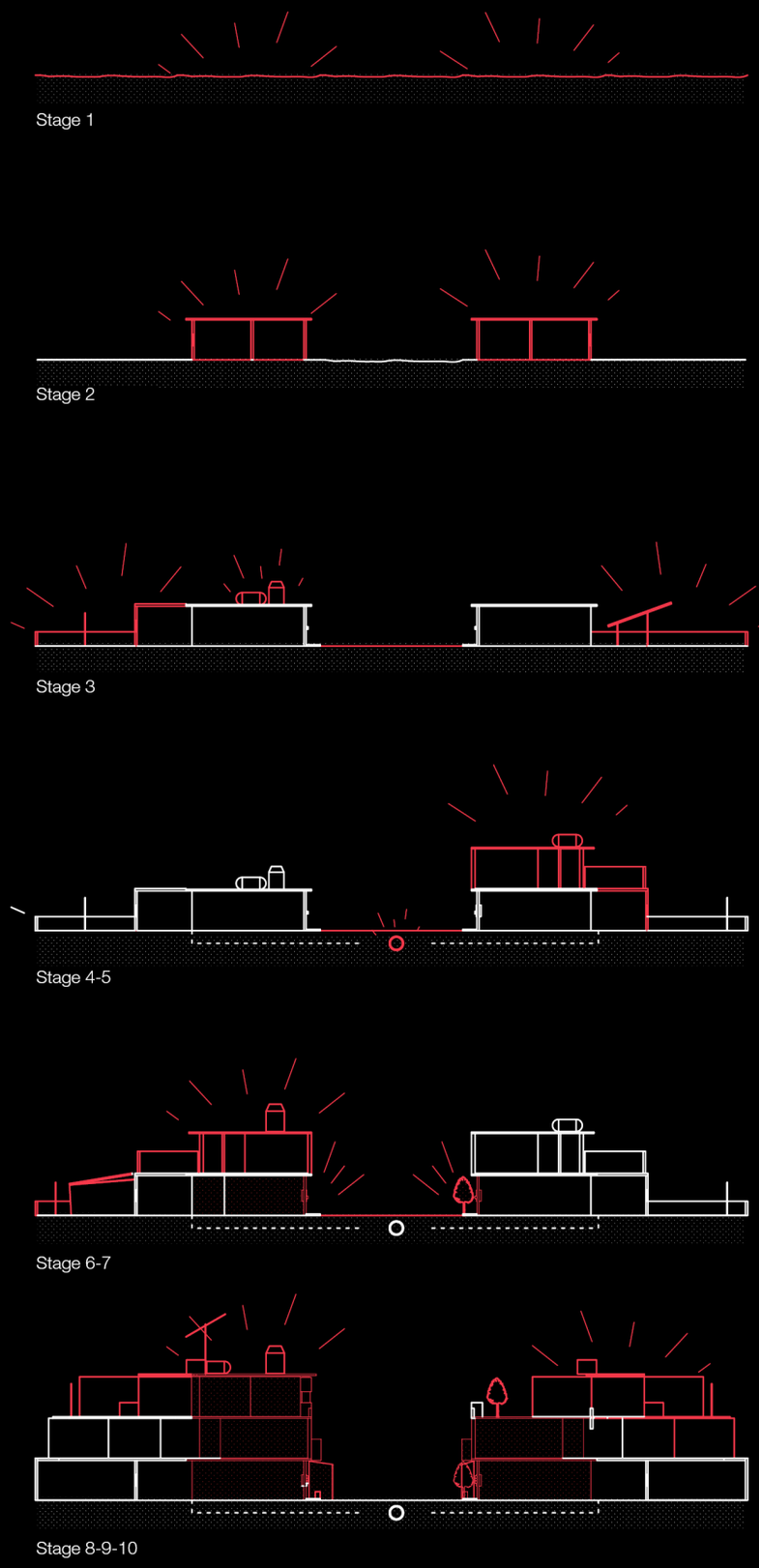


FIG. 8.17- Left and 8.18, Progressive process of housing's phases *(Own elaboration).*



Stage 1 – empty plot

Stage 2 – self construction, house building, first floor

Stage 3 – street consolidation, car-way and walkway, sanitation and water (not always)

Stage 4 – self construction, expansion of the house building, second floor

Stage 5 – use the first floor as a commercial space/ business

Stage 6 – appropriation of the street by building pots, benches, improvised ceilings, or by changing the floor to accommodate the business

Stage 7 - self construction, expansion of the house building, third floor

Stage 8 – renting first and second floor

Stage 9 - appropriation of the street to build new businesses

Stage 10 – renting most of it and start over

ASYMMETRIES OF POWER

IMG. 8.10 Unequal land exploitation *(Source: UNEQUAL SCENES, 2019) The image shows informal housing typologies*

ASYMMETRIES OF POWER

IMG. 8.11 Unequal land exploitation (Source: UNEQUAL SCENES, 2019) The image shows a bird eye view of informal housing.

Interviews and Site Visit

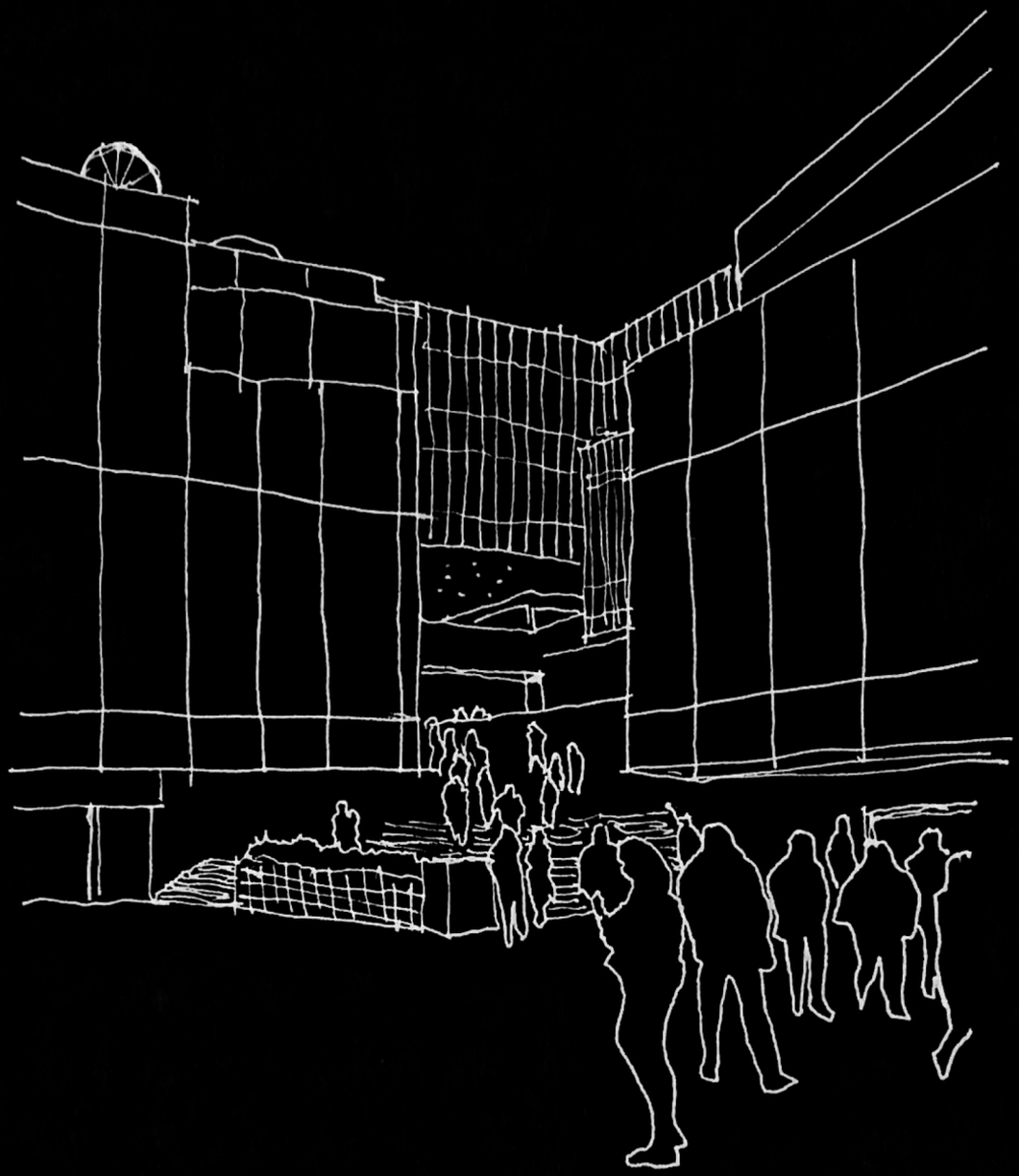
The following paragraphs will elaborate on 2 of the methods selected by the author, interviews and site visit. Several interviews were conducted in order to gain knowledge beyond that of literature review and the author own preconceptions, the objective was to find ideas and critics from an insider perspective rather than looking at the problematization from the point of view of an outsider. From professionals, to academics and local residents the conversations and sharing of knowledge was thrilling. Conclusions from the interviews are described next (ordered as they took place):

_Interview with Diana Garcia – smaller projects is a way to start, those are measurable and do not require many stakeholders
_Interview with Marcelo Sanchez– design the process not the building, you cannot attack with a render
_Interview with David Mora – communities are strong, they share, help and know each other. Is better to ask forgiveness than to ask for permission, if people is organized they can manage.
_Interview with Roberto Rodriguez – Self construction will always be there, a construction manual developed from a bottom up is key, reducing risk against hazards.
_Interview with Alejandro Pareyon– imagine the mechanism to better arrange land ownership, there is a need for continuity re-garding urban planning, the law needs to change in order for something to actually happen.
_Pablo Landa – Build a process of organization and communication where the norm is disinformation and opacity.

As for the second method, the site visit help the better understanding of the context. Vulnerable areas are all over across the country, however experiencing in-situ how the city works focusing on the specific problematizations that caused social segregation and spatial fragmentation is crucial in order to continue with the conceptualization of actions capable of enhancing, supporting and activating the studied areas. During fieldwork there were limitations due to safety issues and the potential widespread of the coronavirus that was at that time just beginning. The author used several methods to conduct the visit, from public transport to pedestrian pathways as a way to experience the day to day of a local resident at specific timelines where streets were full and sometimes when they were empty, a strategy used to experience the both sides of the coin. Advancing to a strong critic of the experienced by the author, the patterns observed were:

_Long distances from one place to the other, either from home to work or from public transport node to home.
_Lack of public transport options to move across municipalities, regardless of the great amount modes used by people to translate to one side of the metropolis to the other.
_Lack of accessibility to public space, or completely lack of it for more than 3 km distances
_A continuous prevalence of wasteland usually used as dumpster
_Permanent appropriation of streets for commercial purposes (extension of business area, or new markets)
_Informal commercial businesses around interest areas such as public transport nodes, cemeteries, governmental buildings, hospitals and any building with a high concentration of people.
_Micro spatial fragmentation interventions in houses and local businesses as a way to decrease criminal activities or avoid them.

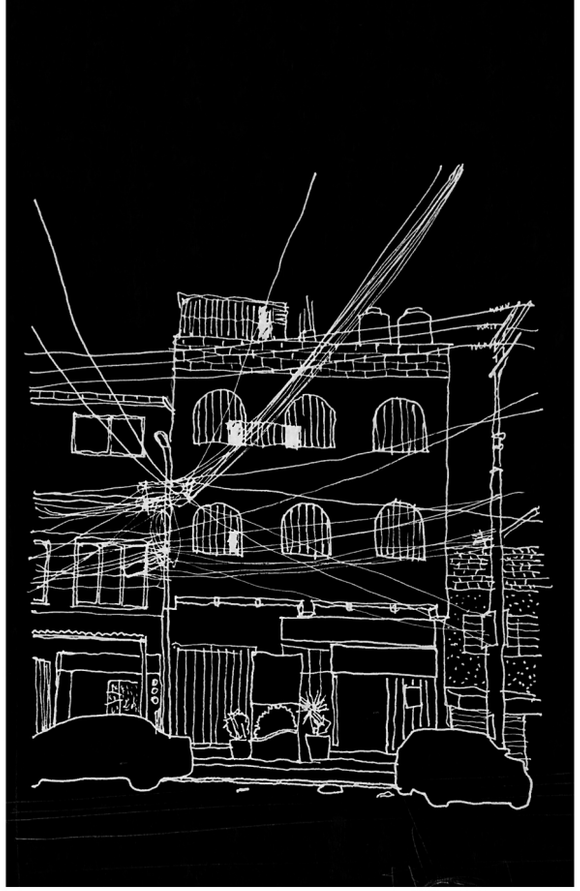
ASYMMETRIES OF POWER



IMG. 8.12 Access to Ciudad Azteca CETRAM *(Own elaboration)*

Ecatepec site visit. The gate selected in this municipality is close to one of the busiest CETRAMS (multimodal transport nodes) in the metropolis. Once you are out of the station the perspective you get is almost as if you were in the wrong place since the building does not reflect the actual conditions of the area the first sign of the involvement of private investors.

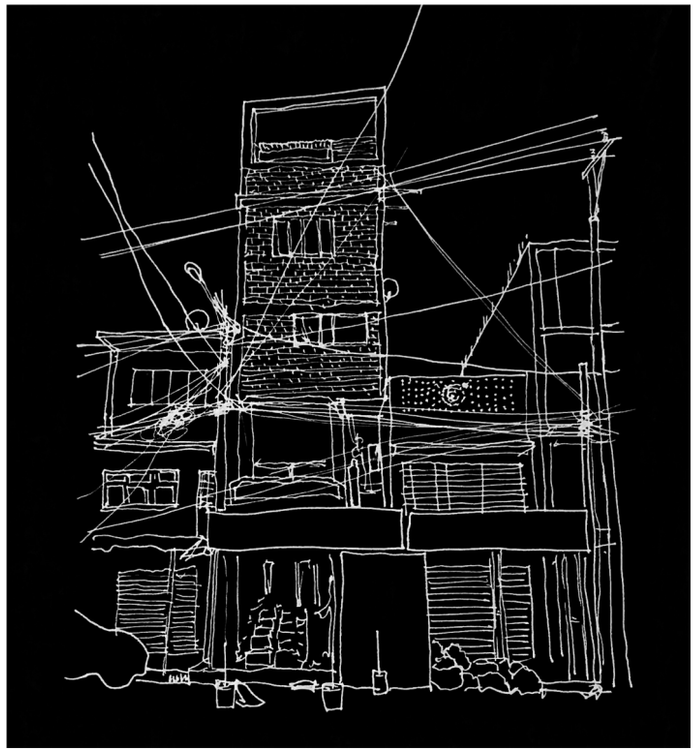


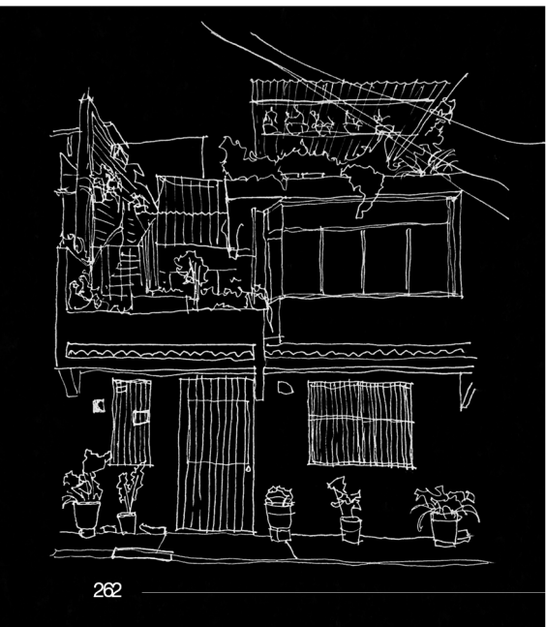


IMG. 8.13 top corner left, 8.14 middle left, 8.15 bottom corner left, 8.16 top corner right, 8.17 bottom corner right *(Own elaboration), The images illustrate the pathway followed by the author during Ecatepec's site visit in February 2020.*

These pages elaborate on the current situation of gate [GE7] the spatial experience was sketch throughout the walk made from the last metro stop (see last page) to the border between the urbanized area and the future metropolitan park of Texcoco.

Once you take the pedestrian bridge a complete different built landscape can be perceived in the rooftops of every single house.





Self-construction is found everywhere in the area, the buildings sometimes reach 5 floors in height. Every building has an incomplete yet distinctive personality.I back up this reflection with the interviews made to the above mentioned professionals and to local

Approaching to the end of the road where a connection is formulated in this report a glimpse of emptiness surrounds the boundary which is wasteland used by local residents to throw trash. However a noise prevails, the passing-by of cars since the edge is parallel to an inter-municipal main road.



Governance Challenge

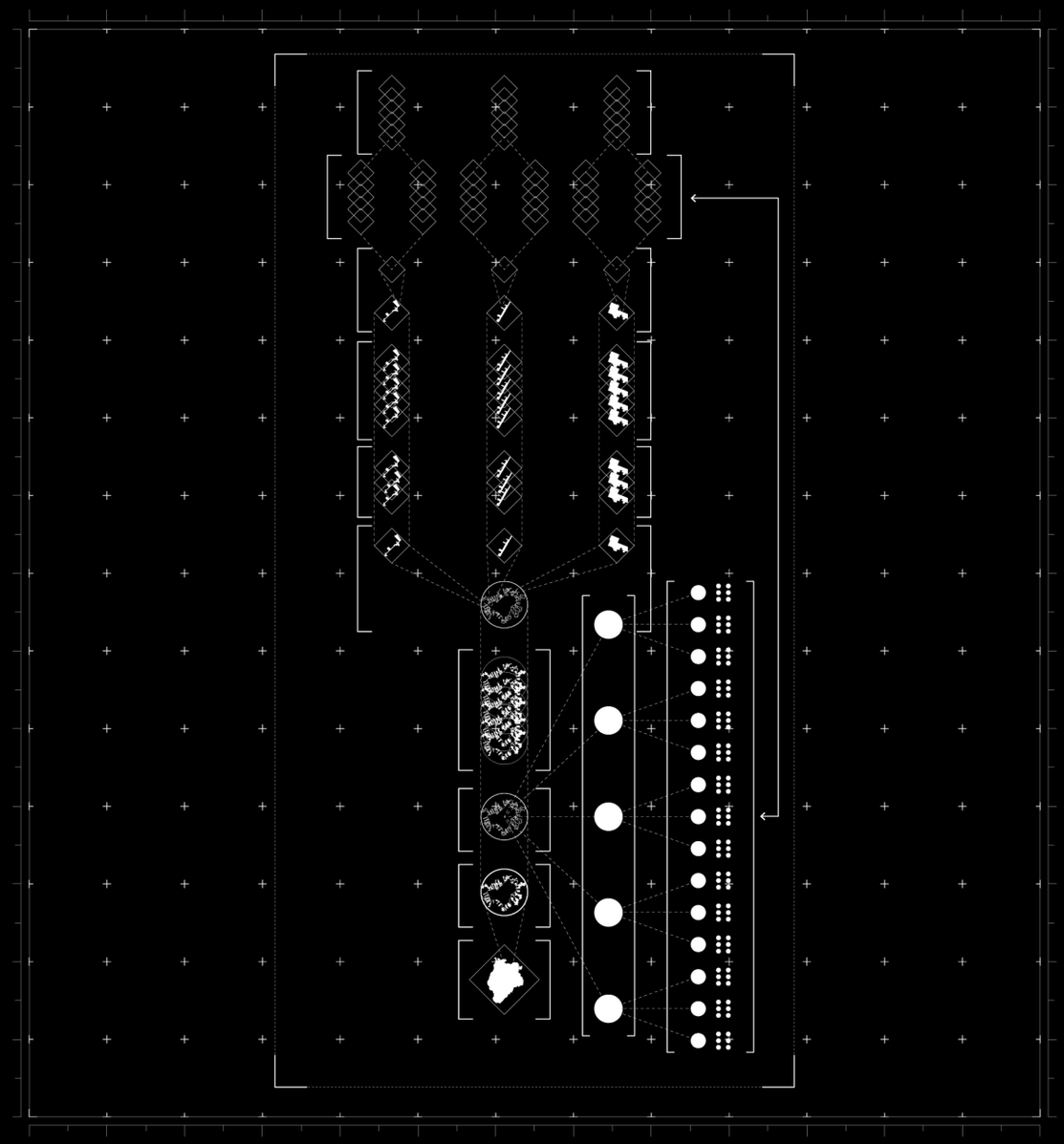
Segregation and fragmentation are consequences of current and past asymmetries of power, interests and players at stake, pressures, and illegal practices at a multidimensional level. However the vulnerable population adapted to this specific reality and it is in that process of adaptation where there is a possibility for change.
Within the area of study strong popular organizations are arranged by local residents whiling to collaborate with their neighbors if there is a common goal at stake, evidence that collaboration towards bigger challenges may be possible throughout a different approach. The possibility of grounding visions and ideals from a bottom-up approach is possible if certain stakeholders are whiling to share power. Certainly law and policies need to change, adapting to new needs and possibilities, but it is in the process where a true change can be originated from a local perspective that enables higher levels of participation. The incremented evolution of the adaptation will reveal new local potentials capable of enhancing the area through a wider range of participation and actors reducing significantly local competitiveness and its connectedness with the higher metropolitan structure.

As such the governance challenge lies in the process itself and in its capacity of adaptability, on how the different stakeholders involved can collaborate, and find agreements, where the decision making process of any future project is balanced, integrating local development and local adaptation, a consolidated process of activation able to diminish the segregated conditions of the area and not a process that results on imposed normative actions as has been done over the years.

ASYMMETRIES OF POWER

The governance challenge lies in the process and its capacity of adaptability, on how different stakeholders involved can collaborate, and find agreements, where the decision making process is balanced, integrating local development and local adaptation, a consolidated process of activation able to diminish the segregated conditions of the area as an alternative to the imposed normative process.

ASYMMETRIES OF POWER



9 ADAPTIVE PLANNING

Overview

The next chapter will introduce the adaptive planning framework used in this research, the objectives of each systemic goal (introduced in chapter 5) and their respective spatial actions. It will also elaborate on the multiscalar strategy taken in order to reveal the local capacities of the gates for adaptation. Furthermore, in this chapter the XL potentials (potentials with the capacity to influence the general metropolitan structure) are mapped according to the spatial actions developed to foster the adaptive planning.

Adaptive Strategic Planning in the MAVM

The Metropolitan Area of the Valley of Mexico is a complex metropolitan system that has grown in a monocentral and monofunctional fashion towards the capital city, a condition that has caused an excessive growth in its territory as a response to the demand of land needed to host its inhabitants, most of which suffer from vulnerable conditions seeking land at the outskirts of the territory, worsening social segregation and spatial fragmentation. It is imperative to think of a change in urban planning, shifting it towards reducing this condition from a local perspective.
As a response adaptive strategic planning is taken in this report as an alternative to change this situation, developing new strategies, actions, policies and overall reformulating its goals towards the capacities and potentials at the local level. Some efforts to formulate adaptive strategic planning have been done in other contexts, examples that have been taken as background of the approach used in this report (see Healey, 1997; Albrechts, 2004; 2006; Albrechts et al, 2001, Albrechts et al, 2003; Motte, 2006; Healey, 2007), relevant and important inputs that were taken into consideration in a contextualised way (Latin America and developing countries).

“spatial strategic planning is a transformative and integrative, public sector led socio-spatial process through which visions/frames of reference, justification for coherent actions and means for implementation are produced that shape and frame what a place is and what it might become (Albrechts, 2001; 2004; 2006; Motte, 2006)”

From his own definition it can be understood the need for integration in a continuous process of collaboration and coordination are a strong asset of this new way of planning because it allows a multilevel-governance, involving a diverse series of actors, from public to private into the decision-making and implementation process, creating long term visions with strategies a at different levels of power structures rather than rigid unilateral blueprints (Albrechts, 2009).

In this regard the MAVM needs to formulate its own adaptive strategic planning fitted to its own challenges, social and environmental with the implementation of a new governance system grounded in the local level taking it as essential part of decision-making processes, thus, stressing collaboration and coordination among public and private actors (See figure 9). The goal is to achieve better results in a long-term basis finding an appropriate balance between top-down and bottom-down approaches, combining local adaptation to socio-ecological concerns and local development in areas that can potentially create certain levels of concentration for transformation, facilitating flows and urban dynamics in alignment with the development of the future metropolitan park, thus reinforcing and integrating them rather than exile them worsening the problematics currently at stake.

ASYMMETRIES OF POWER

The goal is to achieve a long-term plan balancing top-down and bottom-up approaches, combining local adaptation to socio-ecological concerns and local development in areas that can potentially create certain levels of concentration for transformation, facilitating flows and urban dynamics towards the metropolis, reinforcing and integrating them rather than exile them worsening the problematics currently at stake.

Building the Adaptive Framework

This report finds its backbone in an adaptive approach grounded in the findings of the previous research. By analyzing the monofunctional metropolitan area, certain areas of interest due to their vulnerable conditions are depicted in the outskirts, coped with the current large urban projects that are being implemented or conceptualised in the country that despite their normative approach a new path for exploration of the aforementioned adaptiveness is open.

The already selected area has been a common ground for speculation, it is widely known in the metropolis and the country because of its history and for functioning as a game board for the different power asymmetries of the MAVM. Currently the ecological park of Texcoco is the next mega project at stake in the selected area, and its development will drastically change metropolitan dynamics. However the strategy of implementing large urban projects for large metropolises is described in this report as not the best way to counteract vulnerable conditions suffered by the lowest income population that lives around them.

The ecological park of Texcoco aims to develop 12300 Ha of land to become the biggest metropolitan park in the world, which is a huge task that if implemented will take a long time to be completed. For this reason the strategy in this report seeks to counteract the focus of the metropolitan park, rather than just developing the ‘inside’ , changing the scope towards the vulnerable periphery that urgently needs improvements, taking advantage of their current potentials and procedural practices.

_The gate and the systemic goals as general strategy

The gates are the strategic concept used in this thesis to counteract the metropolitan park; new defined subcentralities embedded in the territory capable of reducing the segregated conditions of the surrounding settlements by linking local development with the adaptation capacities to social-ecological changes.

Its adaptive character envisions a long term scope activating vulnerable areas through time with actions that can change and upgrade the area depending on their scale, and level of participation of the actors involved. Moreover the actions driven the design also support current local practices in order to enable transformation from a bottom-up approach, a necessary condition to reduce segregation in decision making processes. In short, the adaptive strategic planning proposed suggests a set of guidelines aiming for the local activation, support and connectivity of strategic places that surround the vulnerable selected area transforming them into agglomerations (the gates) that become part of the general metropolitan structure rather than continue alienated from it.

The thematic framework, identified in the field-based analysis is led to 5 strategic issues or systemic goals: transport and mobility system, water landscape integration system and management, green infrastructure system and quality of public and open space, densification of the built system, and productive landscapes and means of production (see chapter 5).

ASYMMETRIES OF POWER

The gates are the strategic concept used in this thesis to counteract the metropolitan park; new defined subcentralities embedded in the territory capable of reducing the segregated conditions of the surrounding settlements by linking local development with the adaptation capacities to social-ecological changes. Its adaptive character envisions a long term scope activating vulnerable areas through time with actions that can change and upgrade the area.

The guidelines identify a set of design strategies, objectives (see figure 8.19 and 8.20), and multi-scalar actions (see matrix of actions on page 350) per systemic goal aimed at guiding the connectivity and activation of the selected gates. Moreover the guidelines apply to three types of strategic potential areas influencing different levels of governance and stressing different local capacities:

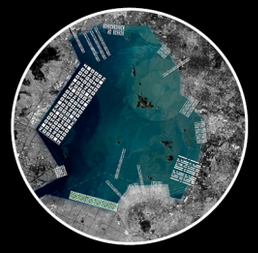
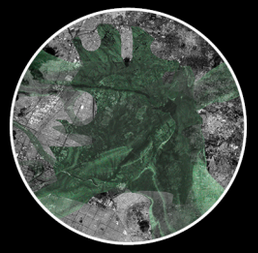
_Individual plot areas
This are isolated and/or internal fragments in the consolidated urban tissues, with a single mono-functional character such as housing areas or small commercial businesses.

_Local strategic areas
Local strategic areas such as streets, parks and urban equipment are existing areas that function as support for local activities.

_Inter-municipal strategic areas
Inter-municipal strategic areas such as main roads, massive transport nodes or metropolitan parks are existing large size locations which function as connections at a territorial level or have the potential of attraction towards other municipalities.

The thematic framework, identified in the field-based analysis is led to 5 strategic systemic goals:
_water landscape integration and management,
_green infrastructure system and quality of public and open space,
_densification of the built system,
_productive landscapes and means of production’ and
_transport and mobility system.

ASYMMETRIES OF POWER

		
SYNTHETIC DESCRIPTION OF THE SYSTEMIC GOAL	WATER LANDSCAPE INTEGRATION AND MANAGEMENT	GREEN INFRASTRUCTURE SYSTEM AND QUALITY OF PUBLIC AND OPEN SPACE
Main strategy description	Ensure a high level of water landscape integration in the area, enhancing current management infrastructure and integrating new measures for risk vulnerabilities.	Ensure a high quality of open and public space in the area, generating new places for intermunicipal connection and recreation.
Main objective description	1. Ensure hydrogeological safety and reduce vulnerability against flood risk. 2. Integrating the water structure to the public space and Decentralizing its management, ensuring the water quality, local purification, accumulation and reuse. 3. Maximize the sponge qualities by slowing the water down (delay) and creating more open water bodies.	1. Renaturalising the urban fabric and strengthen biodiversity of the areas, contributing to the realization of ecological networks. 2. Updating facilities and public services for community activities. 3. Creating a network of public spaces ensuring the quality and integrating them to the landscape.

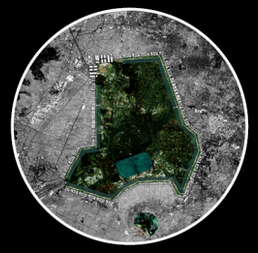
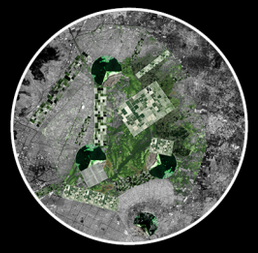
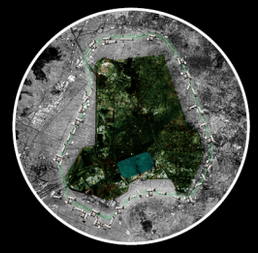
			
	DENSIFICATION OF THE BUILT SYSTEM	PRODUCTIVE LANDSCAPES AND MEANS OF PRODUCTION	TRANSPORT AND MOBILITY SYSTEM
	Ensure a high diversity by promoting multifunctional areas where living and working coexist, defining new programmatic elements that respond and support local practices.	Explore new ways of production promoting a sustainable adaptation with the landscape, promoting endogenous development.	Integrate infrastructure, mobility and landscape for accessibility and sustainability.
	1. Updating and reprogramming monofunctional buildings to multifunctional mix buildings. 2. Urban infill, densify the existing urban fabric. 3. Urban infill and new housing.	1. Recovering agricultural uses. 2. Exploring new productive approaches in the different landscapes in the area. 3. Ensure the profitability, and competitiveness of the area by the transformation the local business structure.	1. Optimize the area accessibility in relation to main roads, reducing the outside traffic pressures guaranteeing connectivity. 2. Optimize the internal roadside area, rationalizing traffic and parking spaces. 3. Ensure the sustainable mobility of people and goods, maximazing safety.

FIG. 8.19 Main objectives *(Own elaboration), the figure shows the specific objectives per systemic goal.*

ASYMMETRIES OF POWER

An application matrix of the guidelines is developed for the different systemic goals according to different degrees of application priority such as scale (micro, small. medium and large actions) and levels of participation regarding the actors involved (from local to intermunicipal power levels).

	SYSTEMIC GOALS	Water landscape integration and management			Green infrastructure system and quality of public and open space			Densification of the built system			Productive landscapes and means of production			Transport and mobility system		
	OBJECTIVES	1 Ensure hydrogeological safety	2 Integrating the water structure to the public space	3 Maximize the sponge qualities	1 Renaturalising the urban fabric	2 Updating facilities and public services	3 Creating a network of public spaces	1 Updating monofunctional buildings	2 Urban infill densify the existing urban fabric	3 New housing	1 Recovering agricultural uses	2 New productive approaches in the different landscapes	3 Transformation the local business structure	1 Optimize the area accessibility in relation to main roads	2 Optimize the internal roadside area	3 Ensure the sustainable mobility of people
SCALE OF SPATIAL ACTION	MICRO [MI]	——	W-MI [3.2] W-MI [4.2]	W-MI [10.3]	G-MI [17.1] G-MI [18.1]	——	G-MI [26.3]	——	——	——	——	P-MI [42.2]	——	——	——	——
	SMALL [S]	——	W-S [5.2]	W-S [11.3]	G-S [19.1]	G-S [23.2]	——	——	D-S [33.2]	——	P-S [39.1]	P-S [43.2]	P-S [47.3]	——	T-S [52.2]	T-S [56.3]
	MEDIUM [M]	——	W-M [6.2] W-M [7.2] W-M [8.2]	W-M [12.3] W-M [13.3]	G-M [20.1]	G-M [24.2]	G-M [27.3] G-M [28.3]	D-M [31.1]	D-M [34.2]	D-M [36.3]	P-M [40.1]	P-M [44.2]	P-M [48.3]	T-M [50.1]	T-M [53.2]	T-M [57.3]
	LARGE [L]	W-L [1.1] W-L [2.1]	W-L [9.2]	W-L [14.3] W-L [15.3] W-L [16.3]	G-L [21.1] G-L [22.1]	G-L [25.2]	G-L [29.3] G-L [30.3]	D-L [32.1]	D-L [35.2]	D-L [37.3] D-L [38.3]	P-L [41.1]	P-L [45.2] P-L [46.2]	P-L [49.3]	T-L [51.1]	T-L [54.2] T-L [55.2]	T-L [58.3] T-L [59.3] T-L [60.3]

FIG. 8.20 Matrix for application *(Own elaboration), the figure shows the specific spatial actions taken by each of the specific objectives per systemic goal*

_Scenario making, Adaptive tipping points (ATP) and adaptive pathways (AP)

As a way to adapt and respond to the dynamic changes triggered by the metropolitan park of Texcoco towards reducing the vulnerable conditions of the selected area, two methods are used to complete the adaptive strategic planning: Adaptive tipping points (ATP's) revealed by scenario making method and adaptive pathway (AP) method.
After identifying the guidelines, design strategies and multi-scalar actions certain scenarios need to be constructed in order to reveal the capacities of the local level to adapt, future perspectives based on assumptions of participation towards transformation.

The scenario making method in this report will stress 2 particular levels of participation, the first one (the immediate possible) is a scenario based on thorough local participation without players with high hierarchy levels of power, the second one (the desirable) is a scenario based on a high level of integration with the participation of both, local and the most powerful actors. Both scenarios will be constructed at the local level of 3 selected gates in order to study their evolutionary changes through time (see chapter 10).

Furthermore the aim of the scenarios will depict several focus points or thresholds, conditions at which the participatory strategy taken will no longer achieve the formulated objectives thus revealing a needed change or adaptation to higher participation levels, in short the adaptive tipping points or ATP's (van Veelen et Al., 2015, Kwadijk et Al., 2010; Renaud et Al., 2013).

Once ATP's are revealed thus understanding when in time adaptation is necessary, the second method is introduced 'adaptive pathway'. AP is used as way to change from one action to another (van Veelen et Al., 2015) allowing the transformation to continue. Several pathways are tested in this report (see chapter 11) as an evaluation method of the local adaptation capacity. Moreover it will show until what extent an action is not able to reach higher transformation and participation levels adapting other measures either from the same original systemic goal or coupled with other actions from different systemic goals. These new incorporated actions will accelerate, reduce or stagnate the speed of transformation, nevertheless the adaptation nature is embedded in the increasing options or pathways through which the scenario can successfully reach the goal.

ASYMMETRIES OF POWER

As a way to adapt and respond to the dynamic changes triggered by the metropolitan park of Texcoco towards reducing the vulnerable conditions of the selected area, two methods are used to complete the adaptive strategic planning: Adaptive tipping points (ATP's) revealed by scenario making method and adaptive pathway (AP) method.

_Steps taken in the report

The following pages elaborate on the steps taken in this report to develop the adaptive planning, from analysis of the metropolis to the tested local areas where the adaptive pathways are used to evaluate their adaptability capacity regarding the systemic goals proposed.

[1]_ Metropolitan assessment
Previously analysed metropolitan region (chapter 4).

[2]_ The concept of the gate
34 areas are defined according to the metropolitan analysis. These areas will function and develop under 3 main concepts for adaptation; connection, activation and support.

[3]_ Introduction of the 5 systemic goals
In order to connect the gates with the future metropolitan park thus activating the vulnerable areas 5 systemic goals are selected to formulate the different strategies that need to be followed; (1) Water landscape integration and management, (2) Green infrastructure and quality of public and open space, (3) Densification of the built system, (4) Productive landscapes and means of production and (5) Transport and mobility system. Each of the goals can generate different spatial interventions at different scales within the boundaries of the gates, and will function and evolve according to the collaboration between the stakeholders involved.

[4]_ Matrix for Adaptation.
The Matrix for Adaptation is a collection of strategies and objectives stressed and in alignment with the 5 systemic goals. It also elaborates on their respective multiscalar spatial actions and procedural relationships.

[5]_ XL Potentials in the selected region according to the matrix for adaptation
The 15km radius area selected for intervention will be evaluated according to the metropolitan analysis, revealing the potentials hidden in its urban structure according to the 5 systemic goals and their respective strategies.

[6]_ Selection of specific gate (s) as testing ground (s)
For this thesis 3 of the 34 gates will be selected to further test by design. The gates will have to be located within one of the municipalities' boundaries allowing the testing by design to manifest different results across boundaries.

[7]_ Morphological and functional analysis of the gate
The gates will be analysed according to the concepts developed in the conceptual framework; form, function and governance. Their relationships will allow the definition of specific priorities in the urban system.

[8]_ Systemic goal analysis of the gate and definition of potentials according to 3 scales; plot, local and inter-municipal
By analysing the gates according to the 5 systemic goals in combination with the morphological analysis, the potentials according to each one of them will be revealed. Thus in order to define the general strategy of the gate these potentials will be categorized according to 3 different scales; plot scale (stresses micro and small scale spatial actions), local scale (stresses small, and medium scale spatial actions) and inter-municipal scale (stresses large scale spatial interventions).

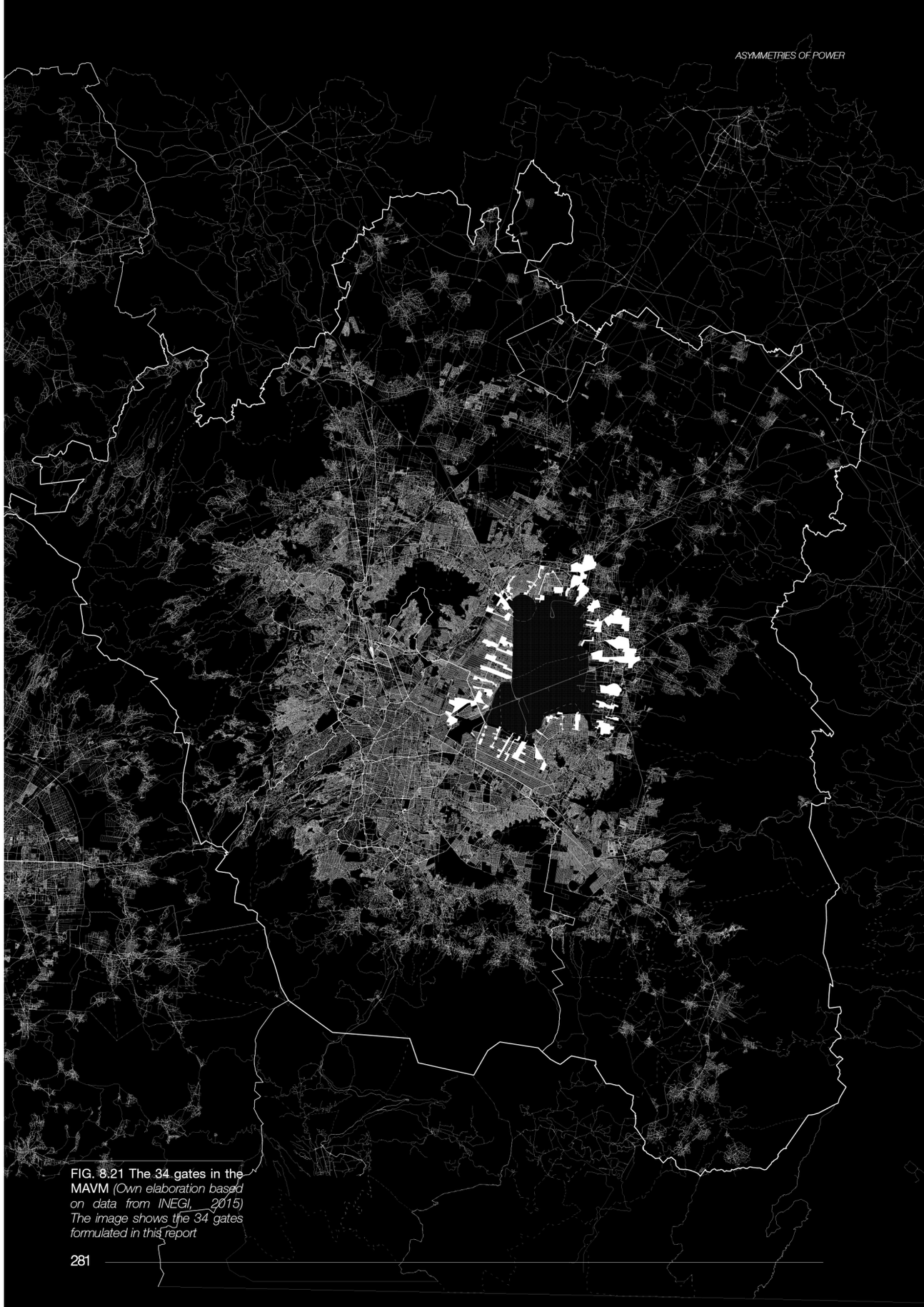


FIG. 8.21 The 34 gates in the MAVM *(Own elaboration based on data from INEGI,__ 2015) The image shows the 34 gates formulated in this report*

[9]_ Selection of a 250x250m detail area for design explorations
Since the gate works at a metropolitan level some specific detailed areas need to be further explored by design to study the local level. Areas of 250m x 250m are selected in each of the 3 gates. The most important reason of this new scale of exploration is due to the variety of spatial actions involved.

[10]_ Developing scenarios at the local level
Each selected area will be tested by design using the scenario making method following 2 different scenarios built around two main drivers of change, the first one (the immediate possible) is a scenario based on the thorough local participation without players with high hierarchy levels of power, the second one (the desirable) is a scenario based on a high level of integration with the participation of the most powerful actors. This exploration will allow to reveal the hidden potentialities of the area that can only flourish with a continuous collaboration. The democratic direction in this level is crucial to achieve a cohesive transformation, and it requires to adjust to the demands of a bigger gap of stakeholders.
The scenarios will depict the adaptive tipping points or ATP's (van Veelen et Al., 2015, Kwadijk et Al., 2010; Renaud et Al., 2013), several conditions at which the participatory strategy taken will no longer achieve the formulated objectives.

[11]_ Evaluation phase through adaptive pathways
The evaluation of scenarios will be evaluated by exploring the different pathways (AP) through which the objectives set by the strategic systemic goals can be reached thus revealing the local capacities limitations an abilities to reach higher participation levels and greater transformation impact.

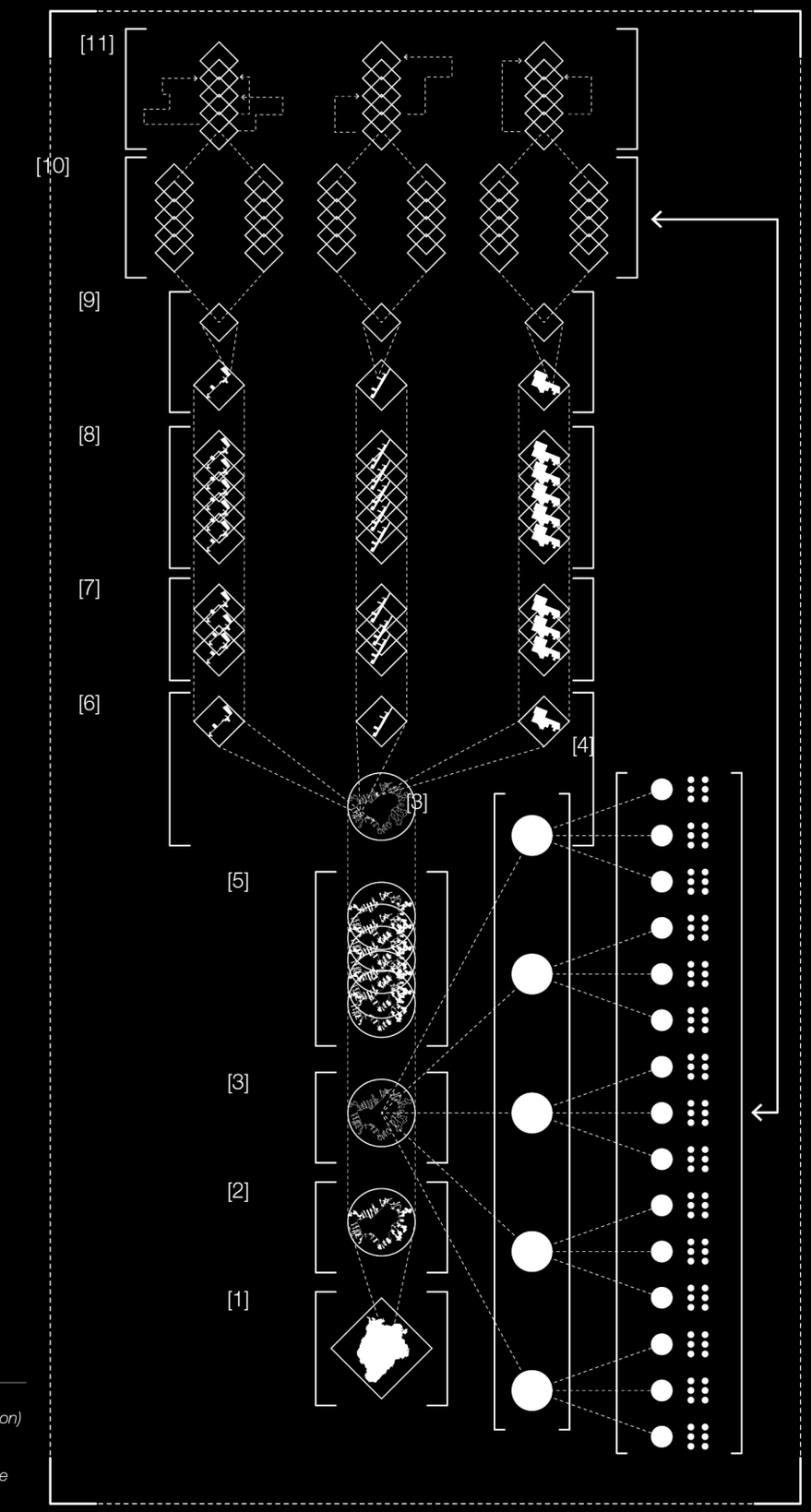


FIG. 8.22 Adaptive Framework *(Own elaboration) The image shows all the stages required for the development of the adaptive approach.*

XL Potentials and Actions

In order to address the different actions first the potentials are revealed in the largest scale (XL scale), potentials that involve the 5 municipalities surrounding the future metropolitan park. These potentials in a later stage of this report will be revisited in order to evaluate the inter-municipal possibilities hidden in them, a prerequisite capable of triggering a new decision making process towards spatial cohesion of the area.
Using the matrix previously introduced, the spatial actions are categorized according to scale (micro, small, medium and large) and to their specific systemic goal. A total of 60 actions are considered in this exploration, and their capacity to work together as a system of interconnected areas capable of guaranteeing not only continuity but a successful transition from city to nature and vice-versa (one of the main functions of the gates as penetrators) depends on the levels of participation between the different actors involved.

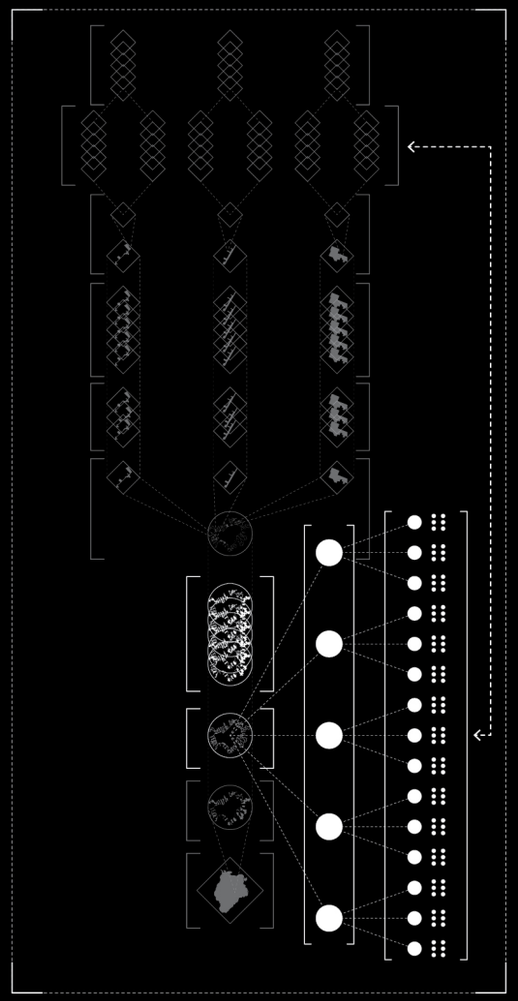


FIG. 8.23 Adaptive Framework *(Own elaboration) The figure focus on the potentials and actions.*

Potentials SG5 - Transport and Mobility System

Potentials SG4 - Productive Landscapes and Means of Production

Potentials SG3 - Densification of the Built System

Potentials SG2 - Green Infrastructure System and Quality of Public and Open Space

Potentials SG1 - Water Landscape Integration and Management

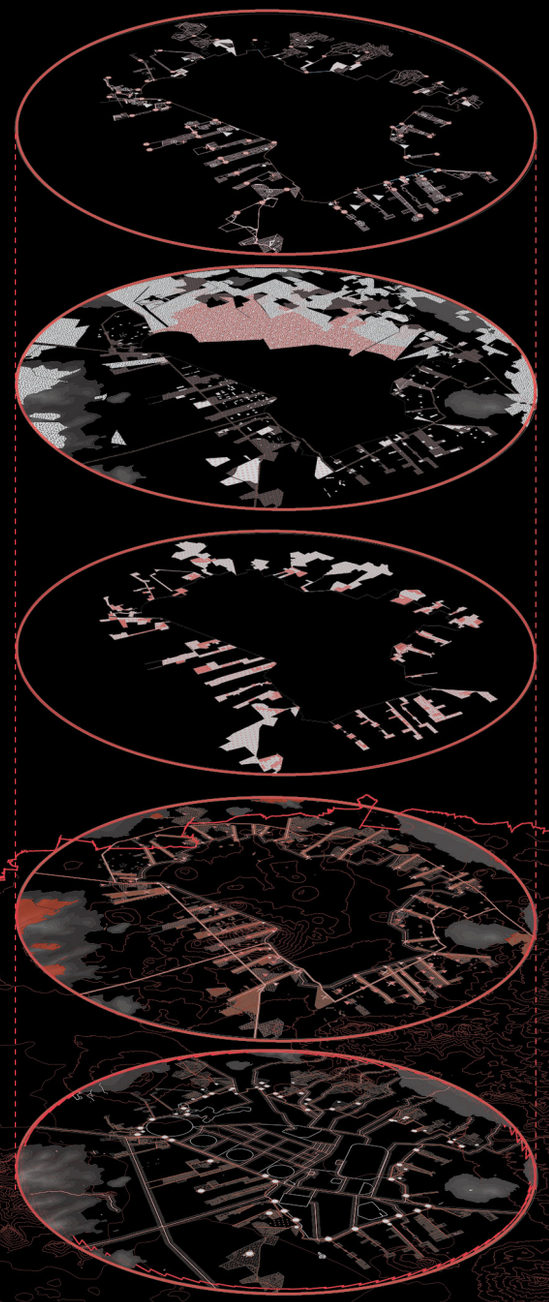
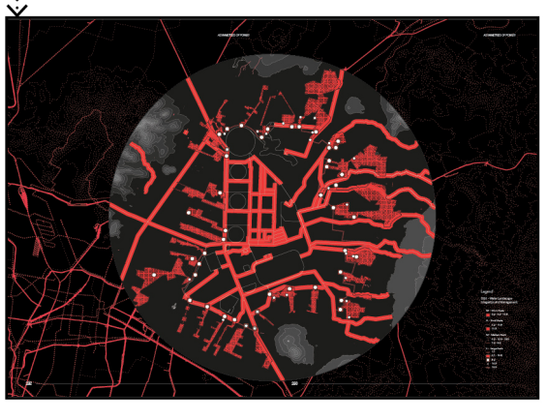


FIG. 8.24 Potentials *(Own elaboration) The image shows the regional potentials according to the 5 systemic goals.*

Instructions

The following drawings function as a guide for the appropiate readability of the following pages.

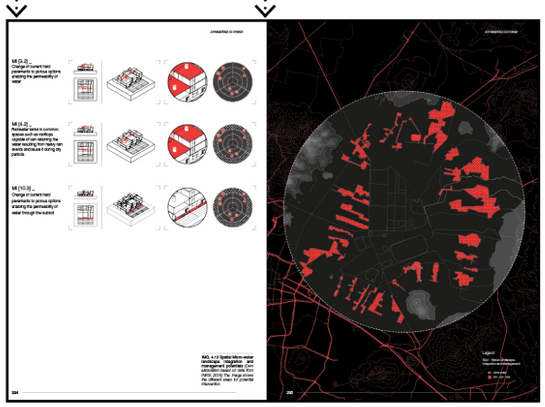
XL Potential map



The map shows the overall potentials of the systemic goal analyzed located along the gates

Actions according to scale (MI=micro, S=small, M=medium and L=large)

XL Potential map per scale of action



This pages emphasize on the actions of the specific systemic goal according to scale, depicting their potential locations in the gates

FIG. 8.25 Instructions for readability of potenials and actions *(Own elaboration).*

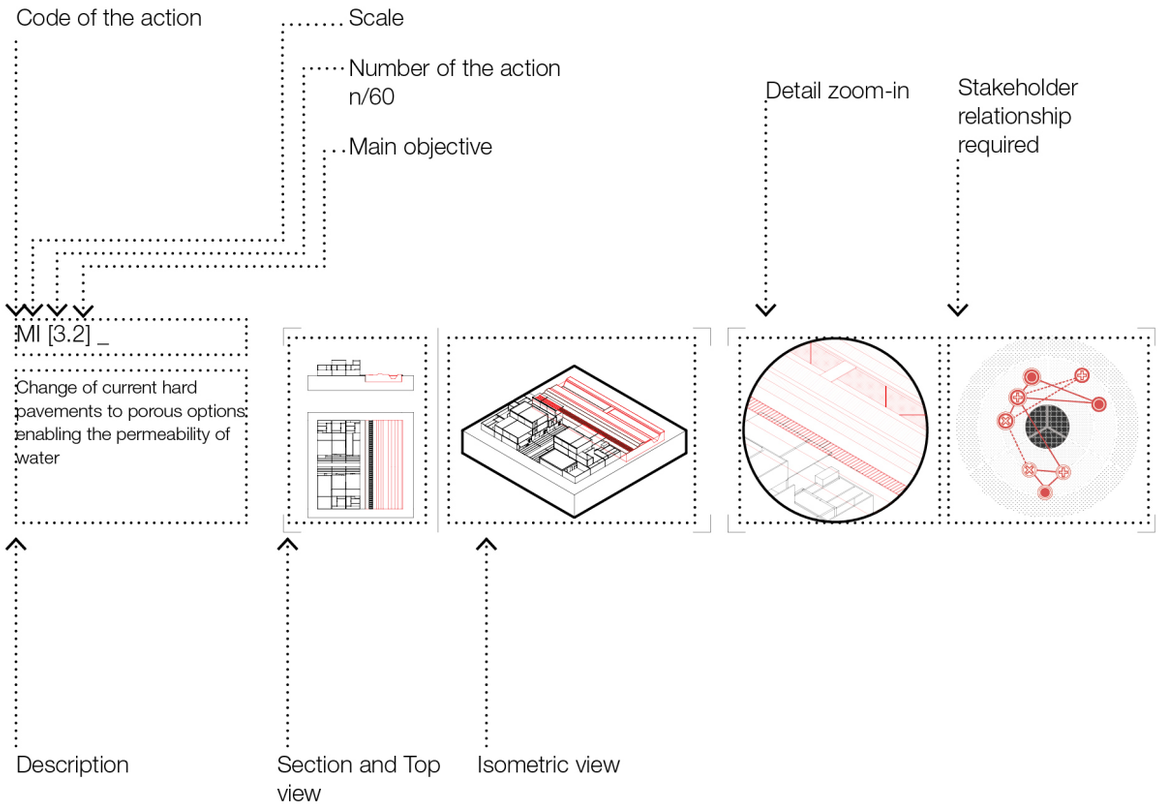
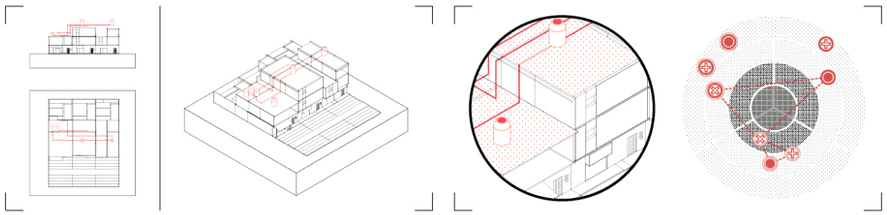


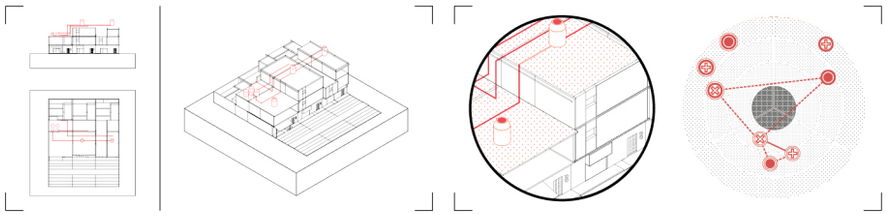


FIG. 8.26 XL Potentials Water Landscape Integration and Management *(Own elaboration)*

MI [3.2] _
Change of current hard pavements to porous options enabling the permeability of water



MI [4.2] _
Rainwater tanks in common spaces such as rooftops capable of can retaining the water resulting from heavy rain events and reuse it during dry periods



MI [10.3] _
Change of current hard pavements to porous options enabling the permeability of water through the subsoil

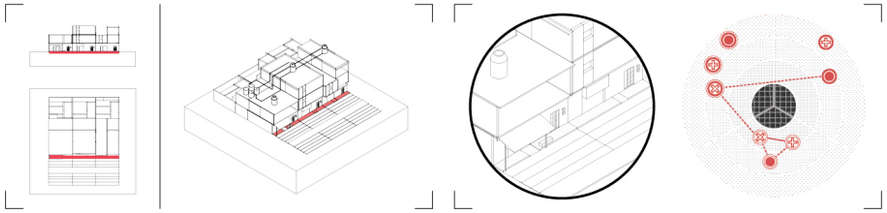
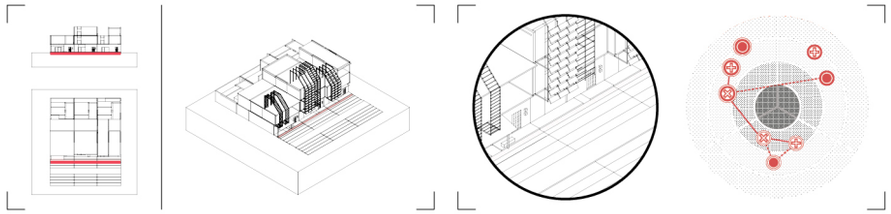


FIG. 8.27 left, 8.28 right, *(Own elaboration) The figures show the potentials areas where the actions are to be implemented and the catalogue of actions at the micro scale respectively.*



S [5.2] _
Infiltration strips enabling the permeability of water through the subsoil



S [11.3] _
Retention and infiltration ponds

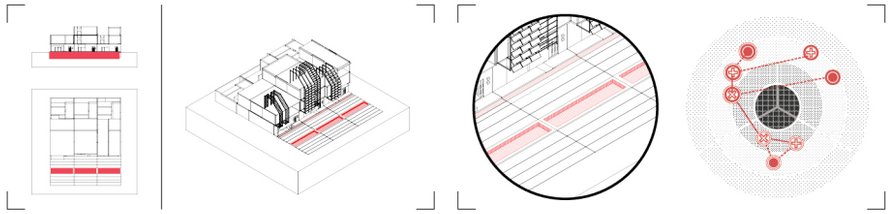
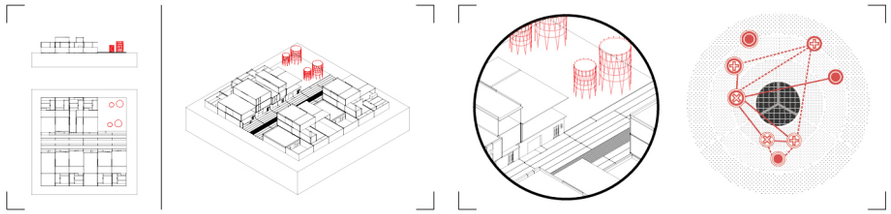


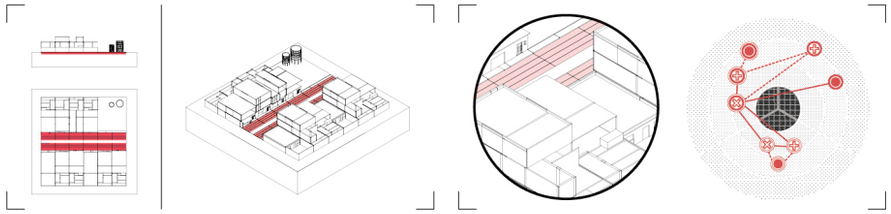
FIG. 8.29 left, 8.30 right, *(Own elaboration) The figures show the potentials areas where the actions are to be implemented and the catalogue of actions at the small scale respectively.*



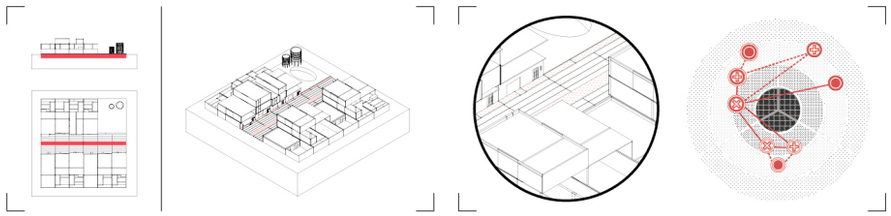
M [6.2] _
Storage tanks, construction of underground storage tanks will be required in order to provide enough water



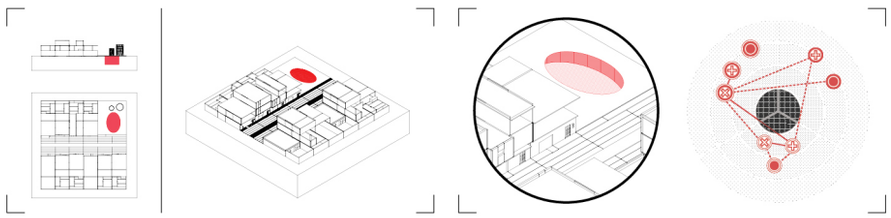
M [7.2] _
Water streets as floodable infrastructure



M [8.2] _
Building of street side canals, retaining water and enabling its natural infiltration to the subsoil



M [12.3] _
Retention ponds of medium scale used as public spaces that can retain the water resulting from heavy rain events and reuse it during dry periods



M [13.3] _
Reduction of paved areas

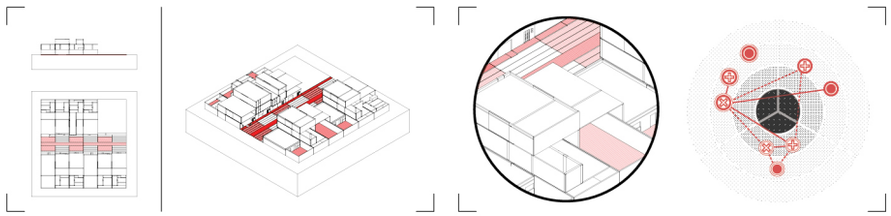
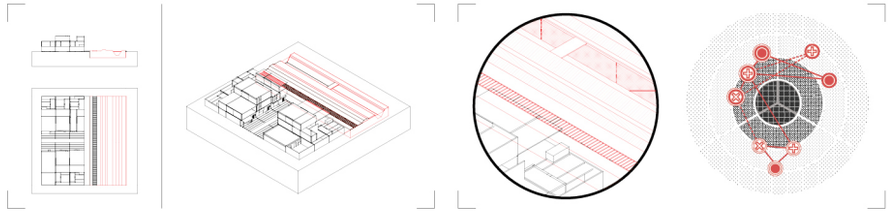


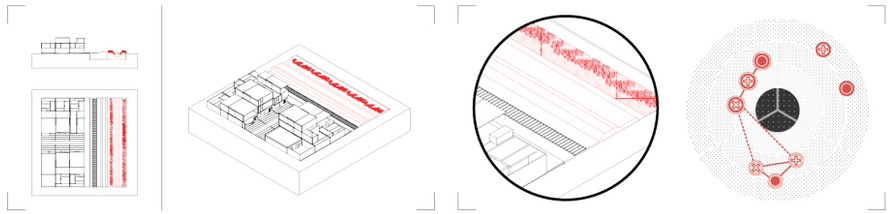
FIG. 8.31 left, 8.32 right, *(Own elaboration) The figures show the potentials areas where the actions are to be implemented and the catalogue of actions at the medium scale respectively.*



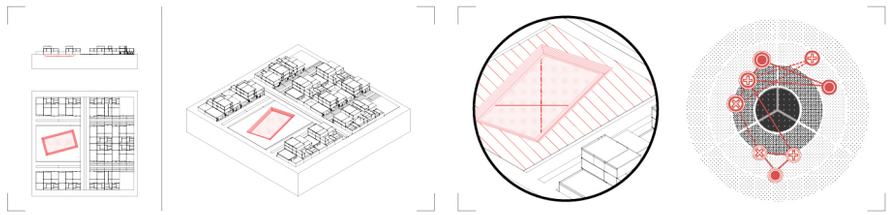
L [1.1] _
Creating new defenses against flooding, retaining water during heavy rain seasons



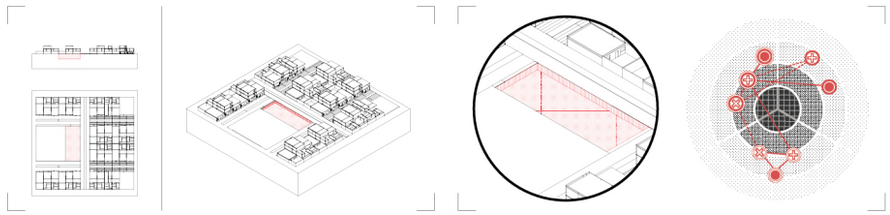
L [2.1] _
Avoid taking surface water and modification of drainage flows and water disposal, filling of ditches or canals, and realizing its re-naturalization with buffer bands that could act as natural filters.



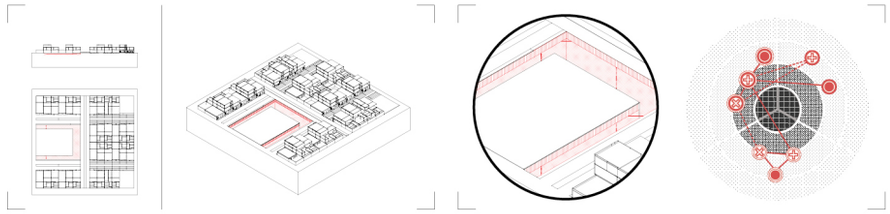
L [9.2] _
Water plazas/square. The water square combines water storage with the improvement of the quality of urban public space. Water storage facilities are visible and enjoyable and creates opportunities to create environmental quality.



L [14.3] _
Retention and infiltration ponds to capture the water in times of heavy rainfall and then reuse it during the dry periods



L [15.3] _
Expand the canals surface in order to maximize easonal storage and increasing the amount of hectares under conservation soil status



L [16.3] _
Renaturalisation of waterfronts supported by natural purification and infiltration areas

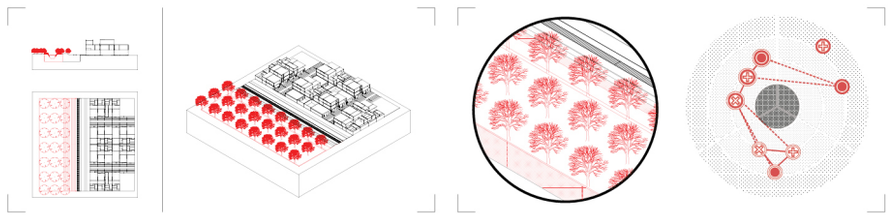
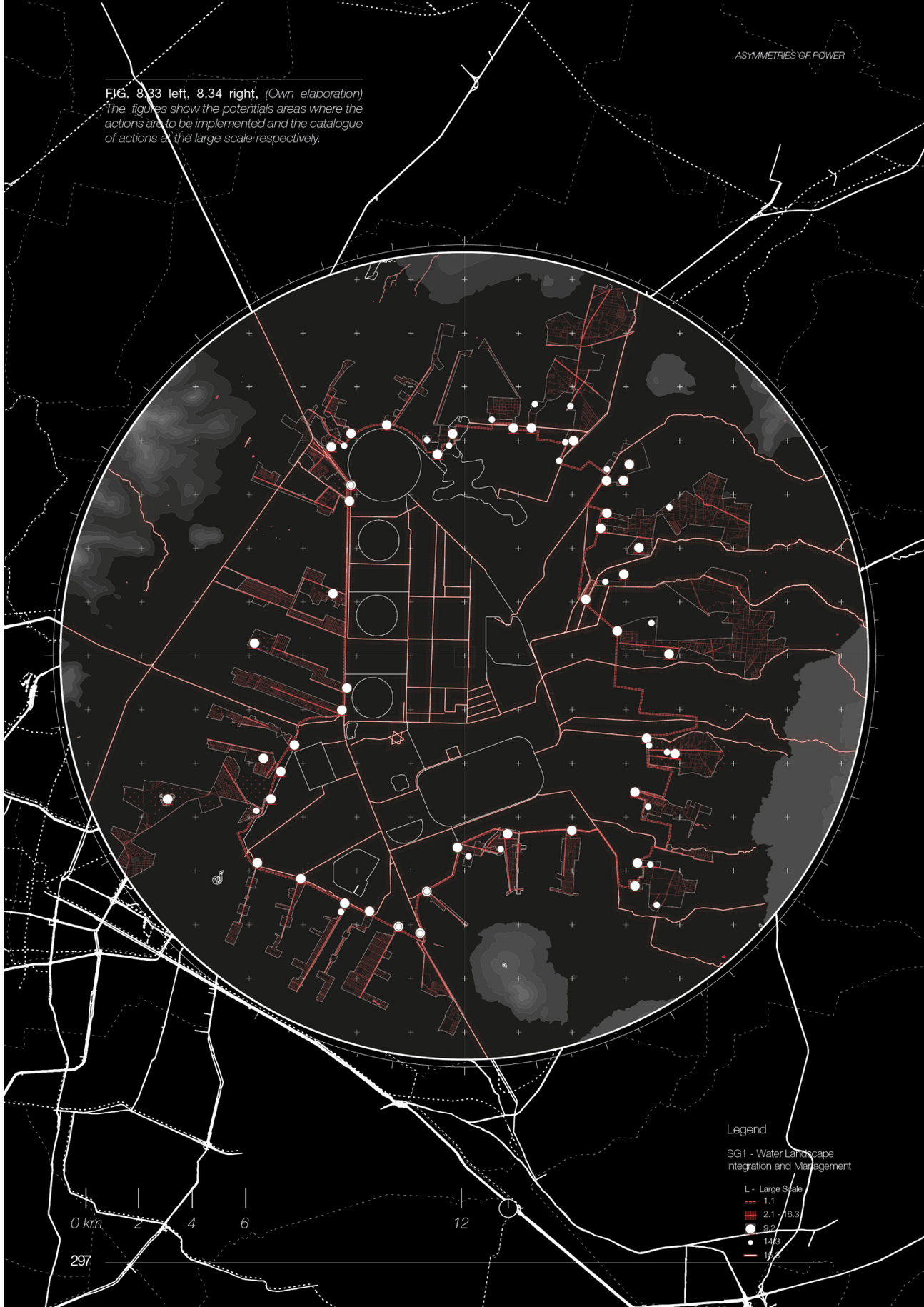


FIG. 8.33 left, 8.34 right, *(Own elaboration) The figures show the potentials areas where the actions are to be implemented and the catalogue of actions at the large scale respectively.*



ASYMMETRIES OF POWER

Potentials and Actions SG2 - Green Infrastructure System and Quality of Public and Open Space

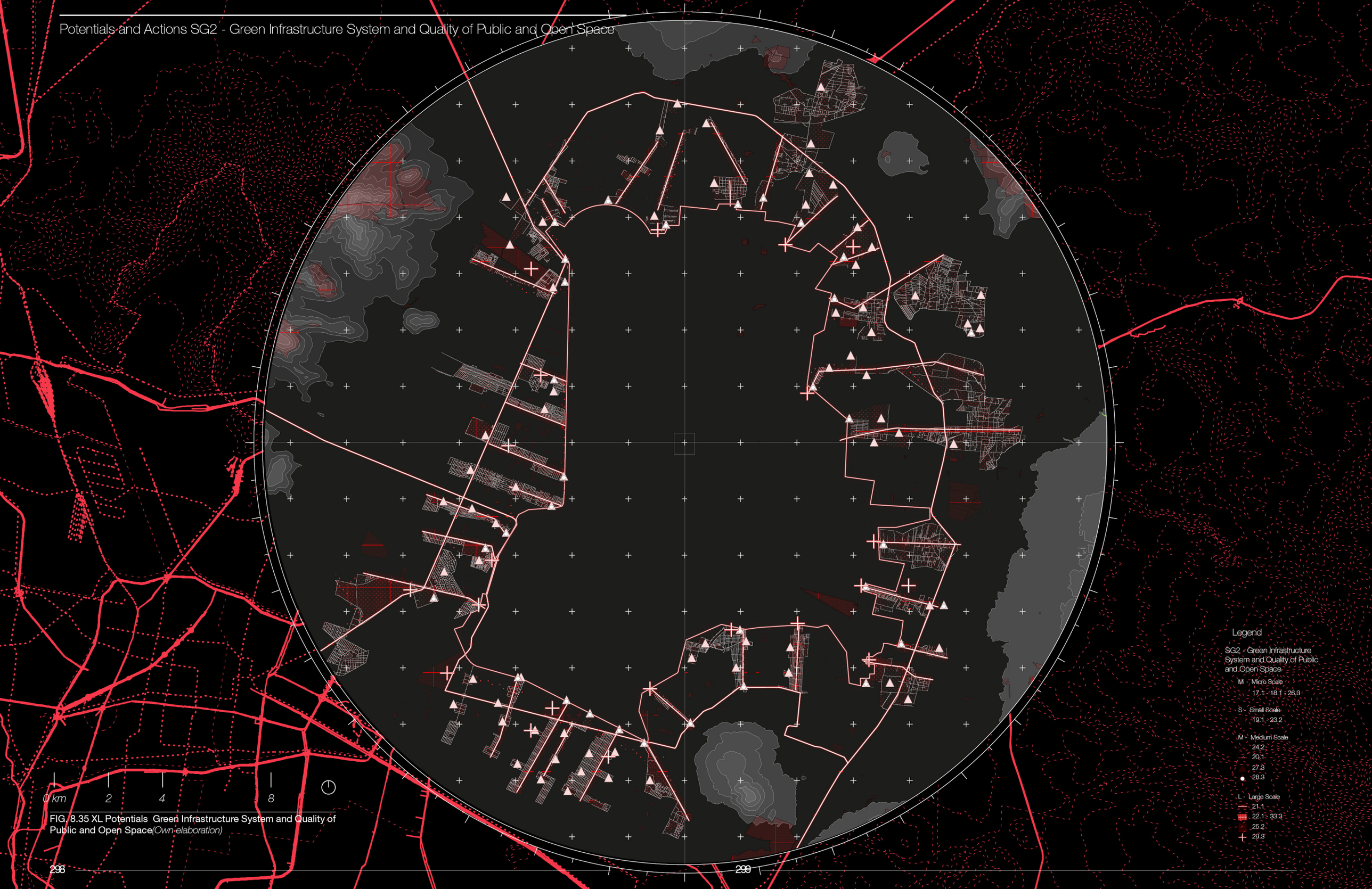
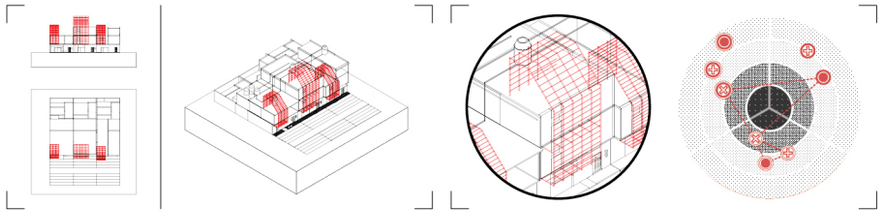
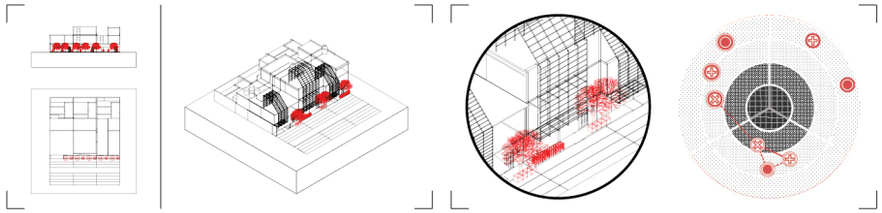


FIG. 8.35 XL Potentials Green Infrastructure System and Quality of Public and Open Space*(Own elaboration)*

MI [17.1] _
Foster the increase of green natural elements by using the facades of the current housing typologies, integrating them primarily by using native species or through the use of climbing plants



MI [18.1] _
Increase the micro green pedestrian network by giving incentives to local communities or facilitating the acquisition of native plants that are suitable with climate conditions



MI [26.3] _
Benches as a micro public space network giving incentives to local communities or facilitating a process through which they can self-built in an organized way

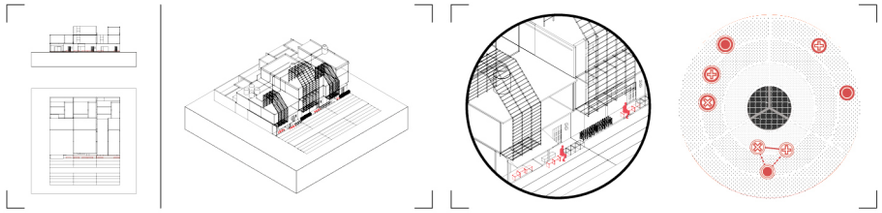
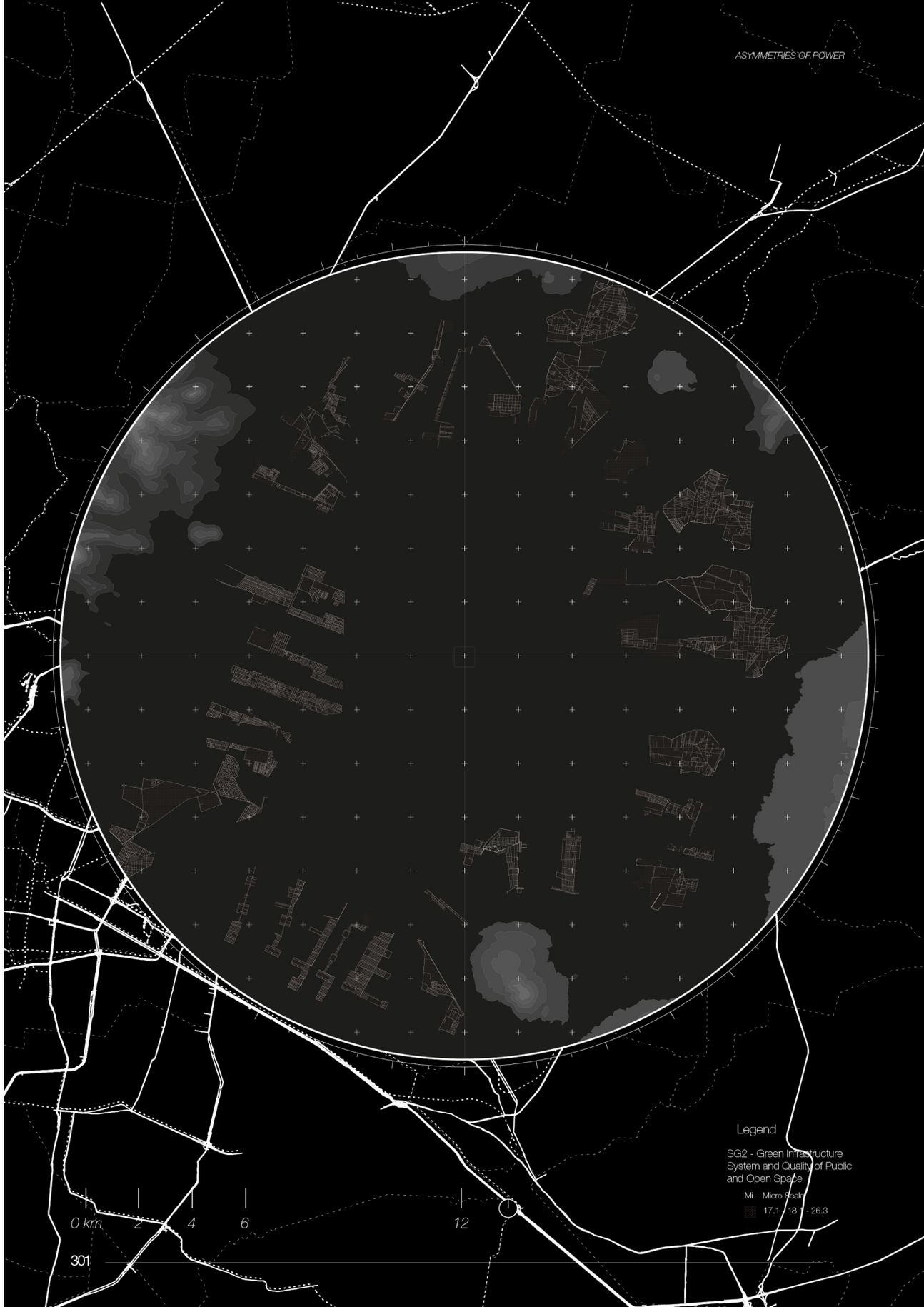
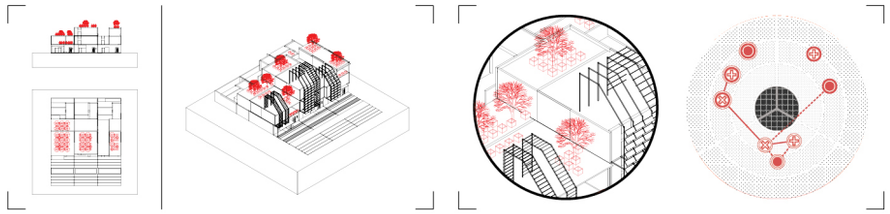


FIG. 8.36 left, 8.37 right, *(Own elaboration) The figures show the potentials areas where the actions are to be implemented and the catalogue of actions at the micro scale respectively.*



S [19.1] _
Foster the increase of green natural elements in Roofs (fifth facade), integrating them primarily by using native species and by giving incentives to local communities



S [23.2] _
Active community gardens in vacant lots or wasteland

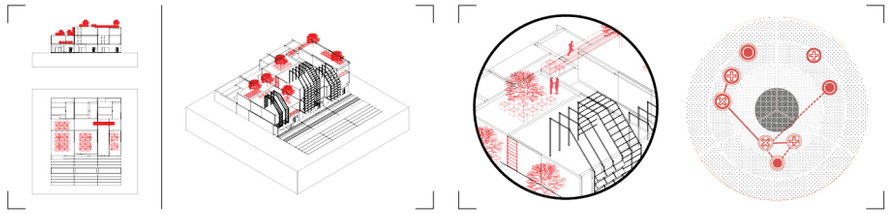
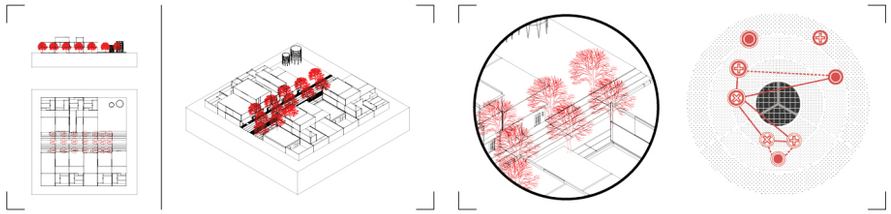
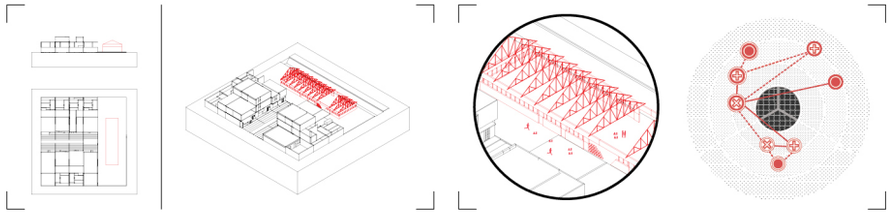


FIG. 8.38 left, 8.39 right, *(Own elaboration) The figures show the potentials areas where the actions are to be implemented and the catalogue of actions at the small scale respectively.*

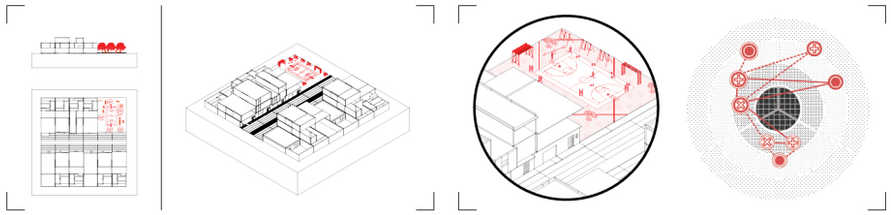
M [20.1] _
Foster the greenification of streets and roads as potential green corridors. Oversized streets with left-over spaces can turned into linear parks or expand the pedestrian system



M [24.2] _
Reuse abandoned buildings for public activities by refurbishing them, allowing the participation of the community



M [27.3] _
Neighborhood parks, in unused wasteland integrating the community in a participative process for its development



M [28.3] _
Building new capacitation centers, places/hubs for community knowledge

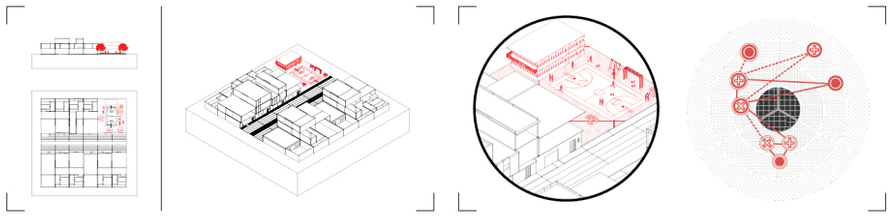
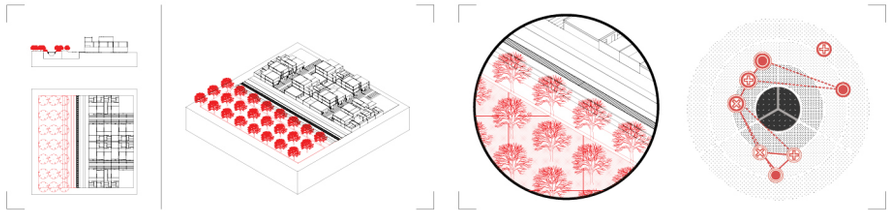
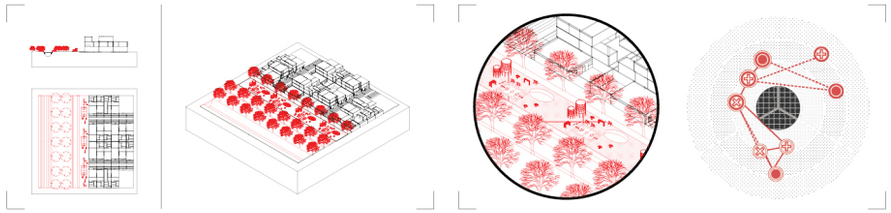


FIG. 8.40 left, 8.41 right, *(Own elaboration) The figures show the potentials areas where the actions are to be implemented and the catalogue of actions at the medium scale respectively.*

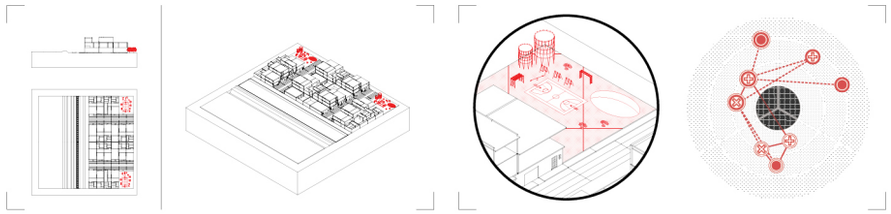
L [21.1] _
Create ecological corridors / green corridors enhancing natural habitats through regenerative interventions



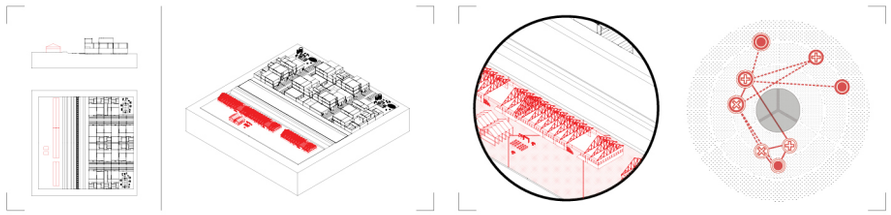
L [22.1] _
Create linear parks maximizing natural elements, and creating continuity and porosity of the green landscape



L [25.2] _
Restoration and activation of public spaces that are currently unused or lack of definition



L [29.3] _
Social hub / civic centers with new cultural program



L [30.3] _
Create linear parks maximizing greenery, and creating continuity and porosity of the green landscape

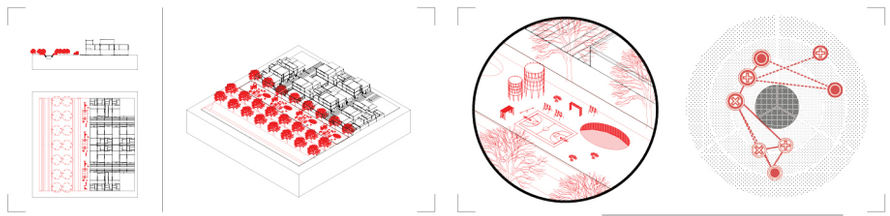
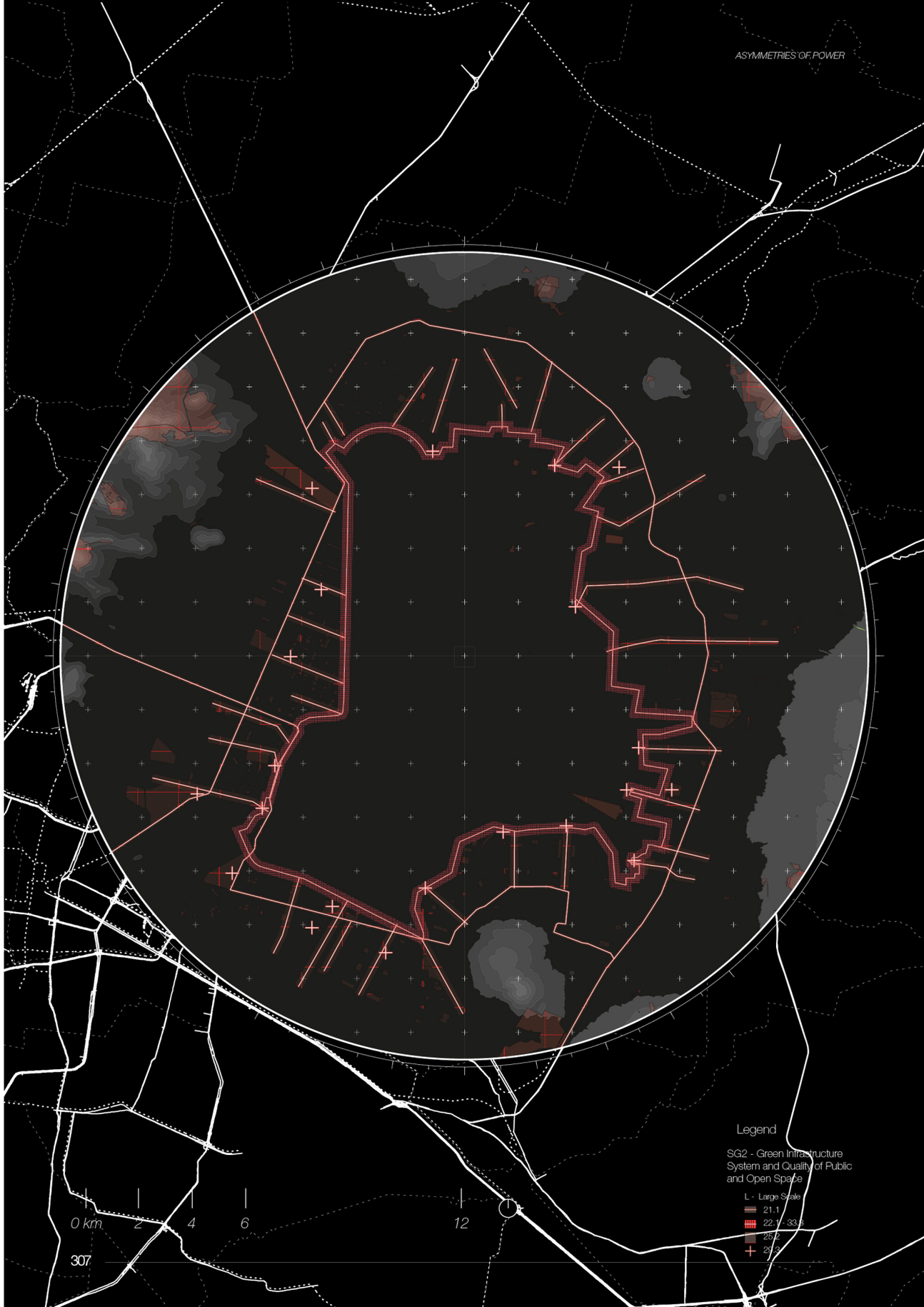


FIG. 8.42 left, 8.43 right, *(Own elaboration) The figures show the potentials areas where the actions are to be implemented and the catalogue of actions at the large scale respectively.*



ASYMMETRIES OF POWER

Potentials and Actions SG3 - Densification of the Built System

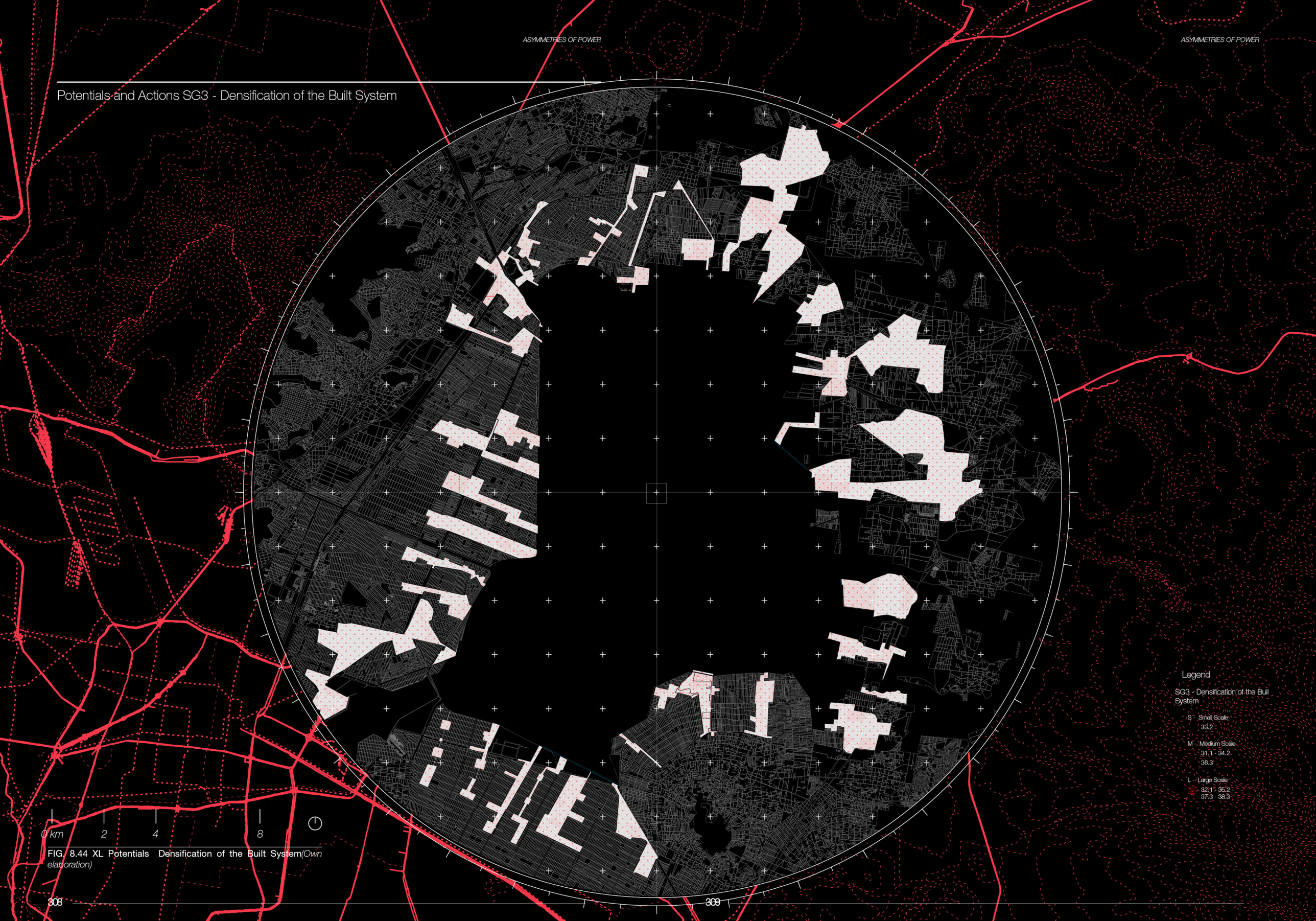


FIG. 8.44 XL Potentials Densification of the Built System*(Own elaboration)*

S [33.2] _
Housing co-production in terraces or rooftops (fifth facade)

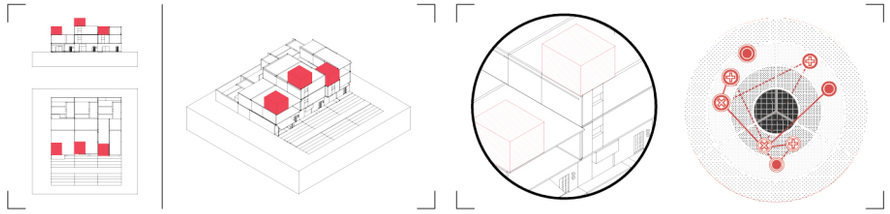
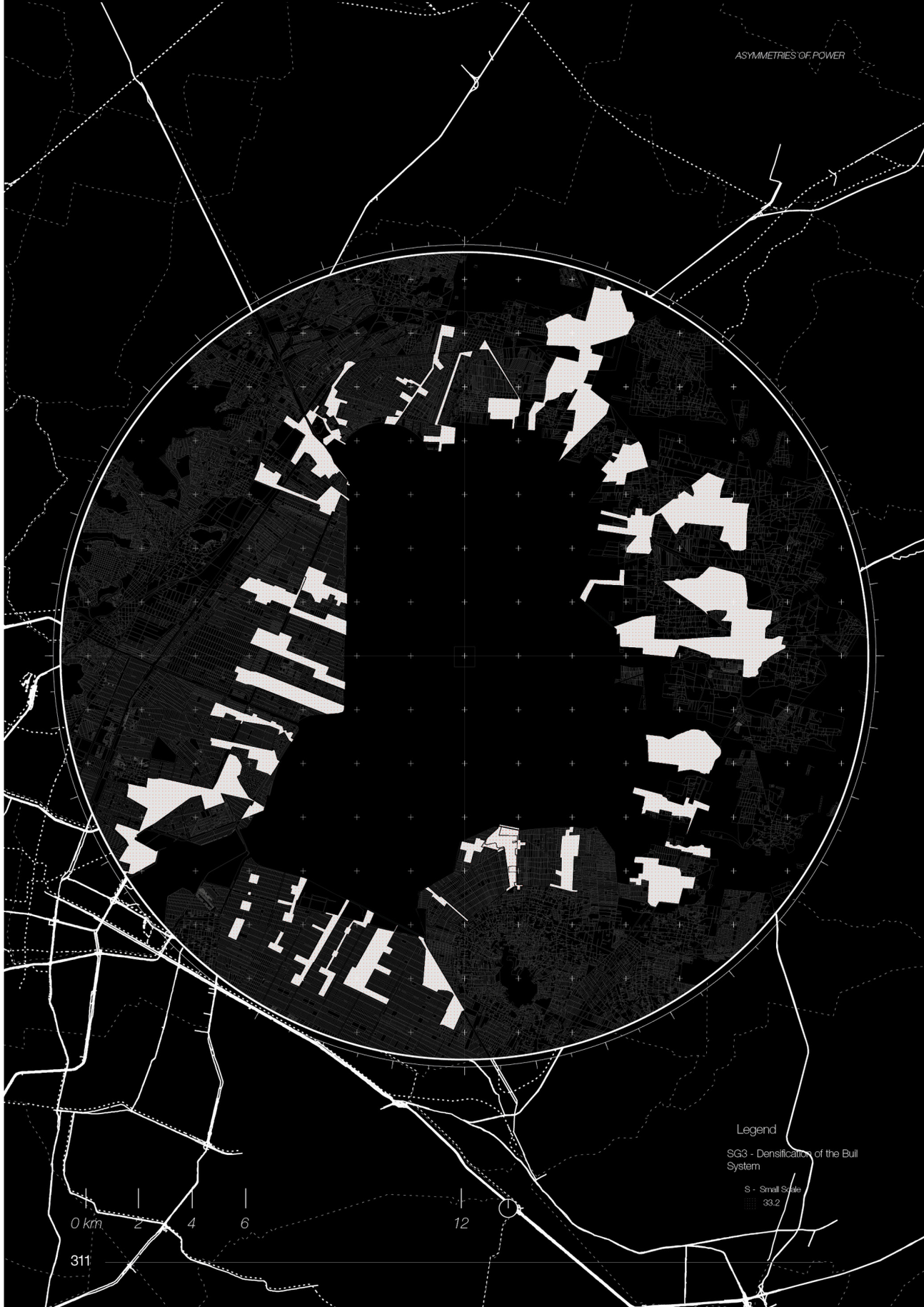
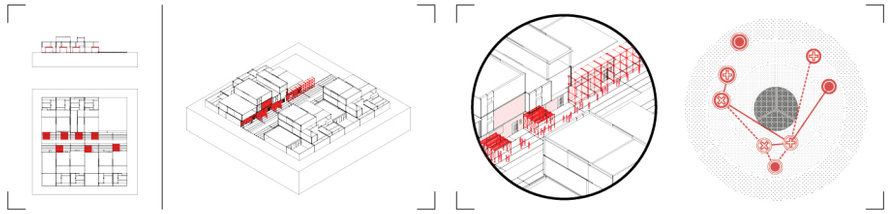


FIG. 8.45 left, 8.46 right, *(Own elaboration) The figures show the potentials areas where the actions are to be implemented and the catalogue of actions at the small scale respectively.*

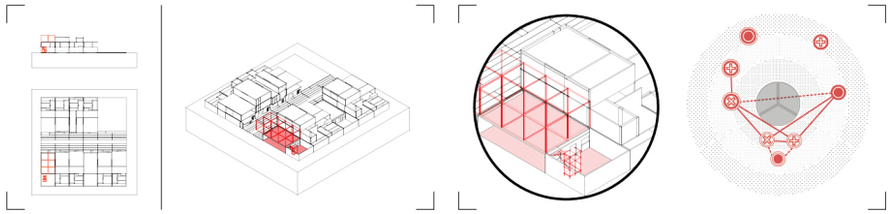
ASYMMETRIES OF POWER



M [31.1] _
Reprograming unused buildings providing uses, spaces and services that ensure high urban quality and compatible functions



M [34.2] _
Densification thorough self-built housing typologies and insertion of mixed uses in current urban fabric



M [36.3] _
Self-built housing typologies through cooperative production

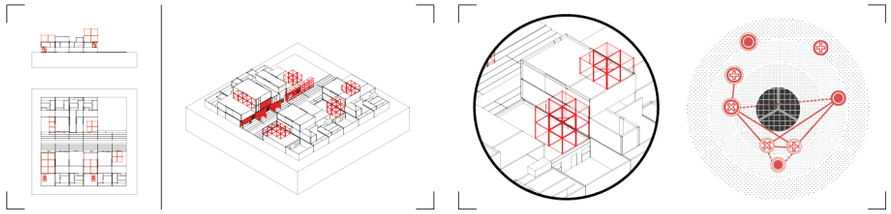
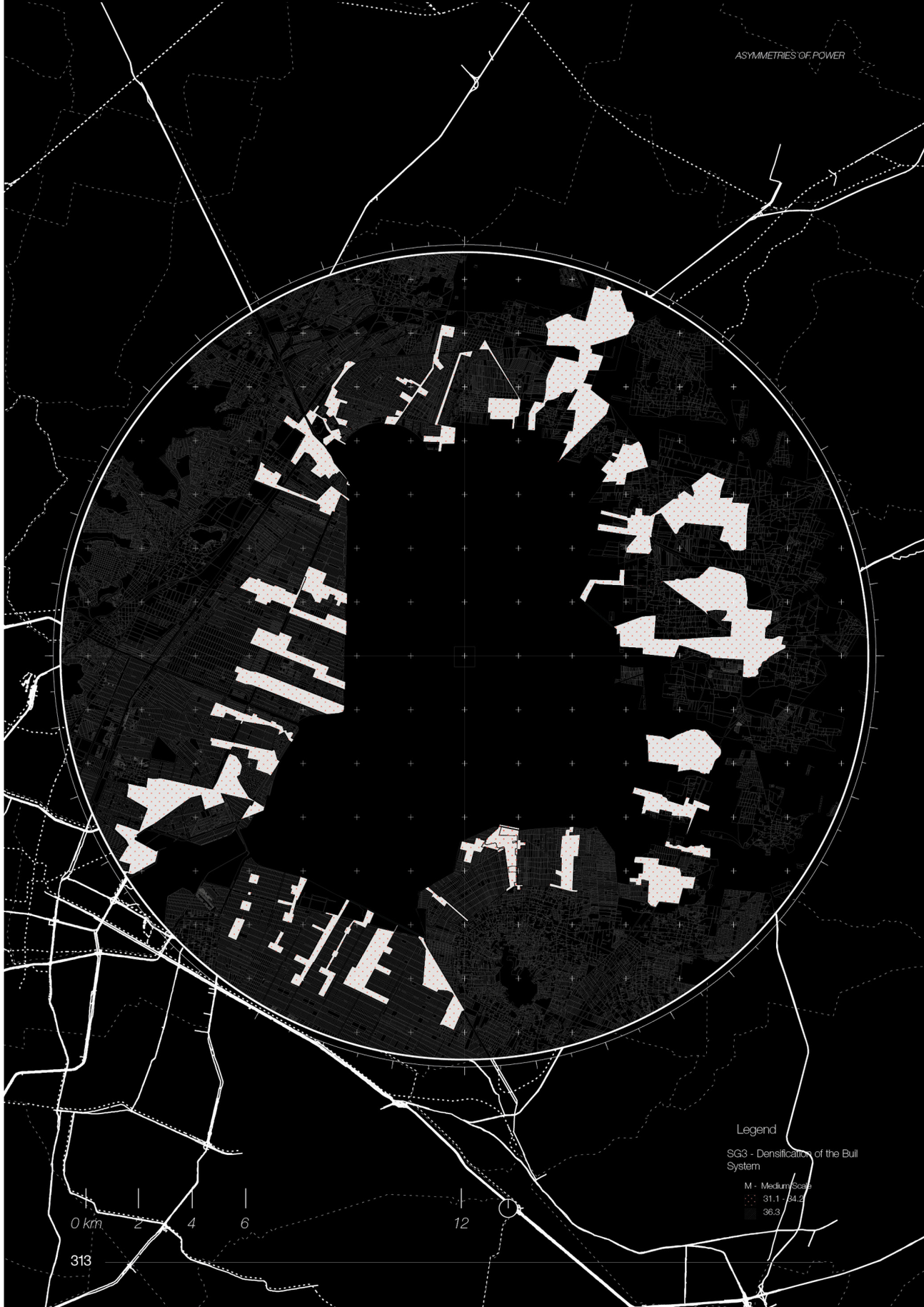
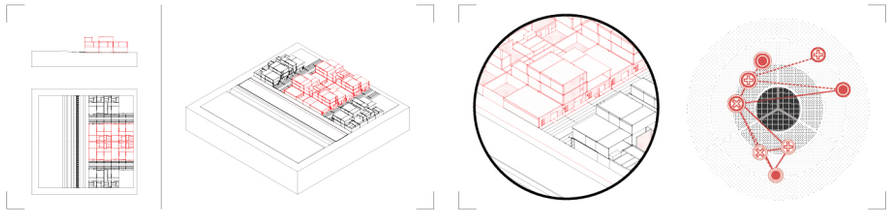


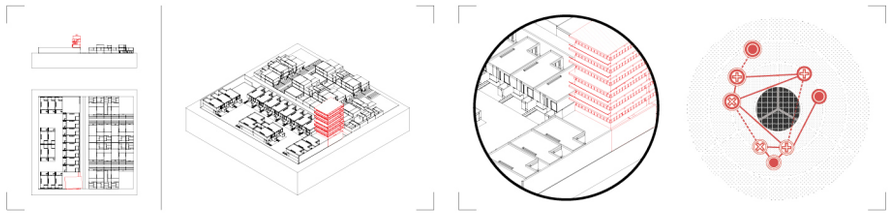
FIG. 8.47 left, 8.48 right, *(Own elaboration) The figures show the potentials areas where the actions are to be implemented and the catalogue of actions at the medium scale respectively.*



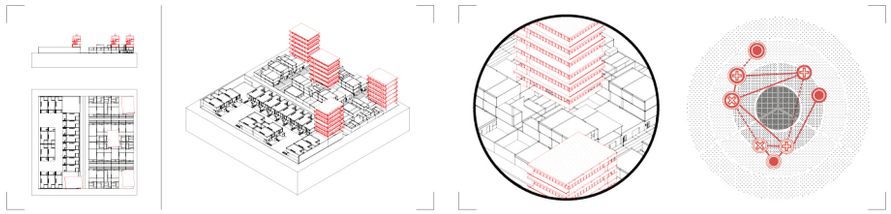
L [32.1] _
Reprograming unused buildings by introducing new uses or infill program that fosters endogenous development



L [35.2] _
Densification infill through opening up gated communities allowing new uses and diversification



L [37.3] _
Take advantage of local climatic and solar conditions with the new mixed-use volumes



L [38.3] _
Build new multifunctional and multifamily housing complexes in vacant land, or underused land, increasing FSI and GSI indexes

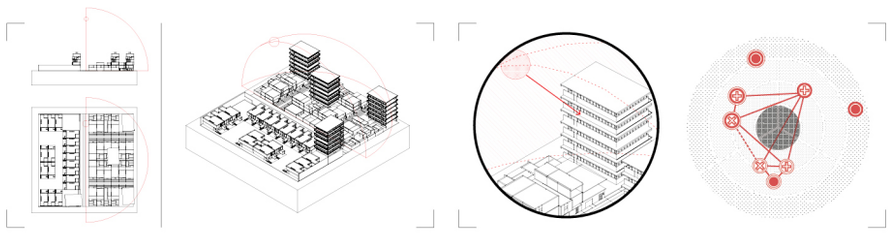
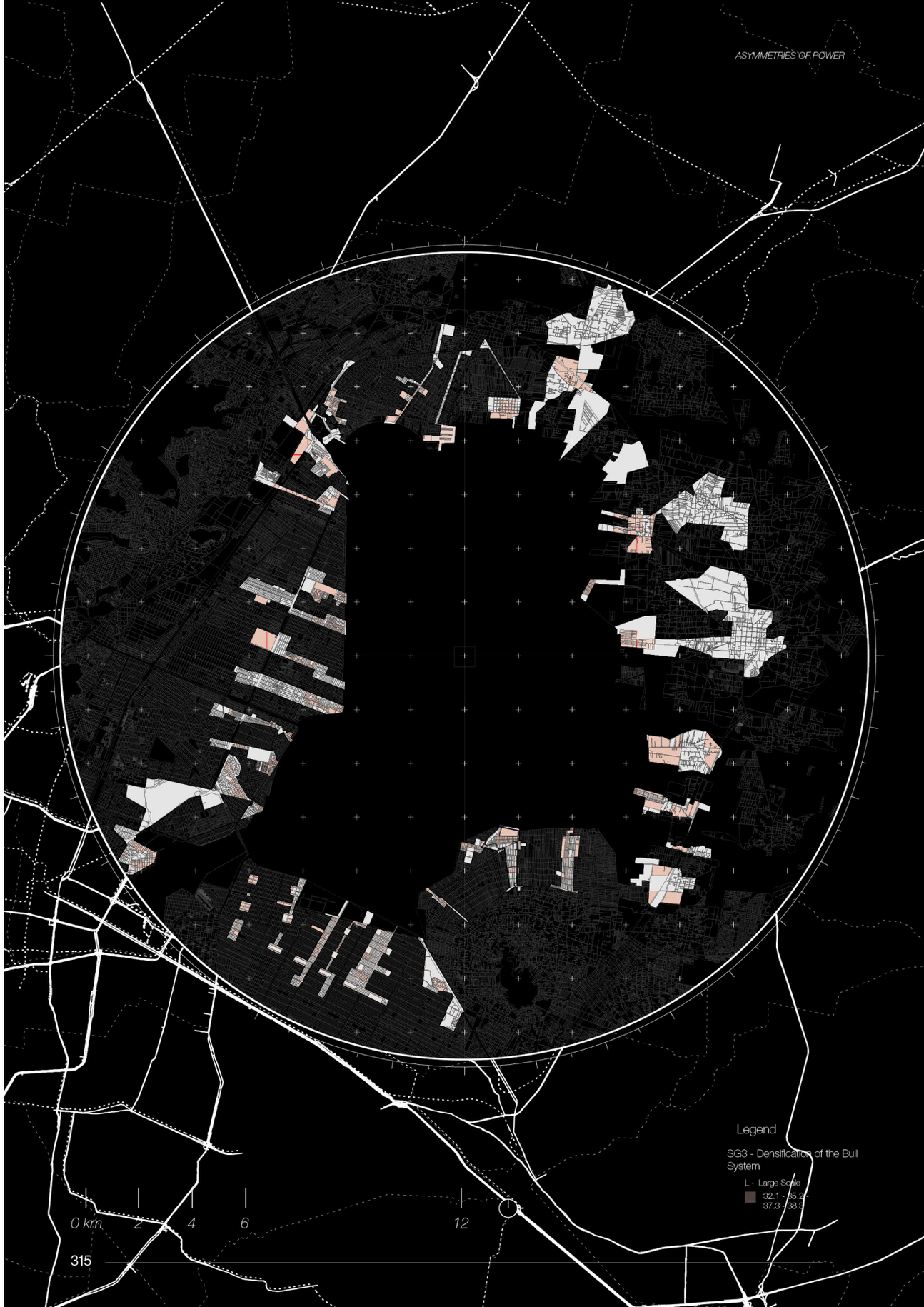


FIG. 8.49 left, 8.50 right, *(Own elaboration) The figures show the potentials areas where the actions are to be implemented and the catalogue of actions at the large scale respectively.*



ASYMMETRIES OF POWER

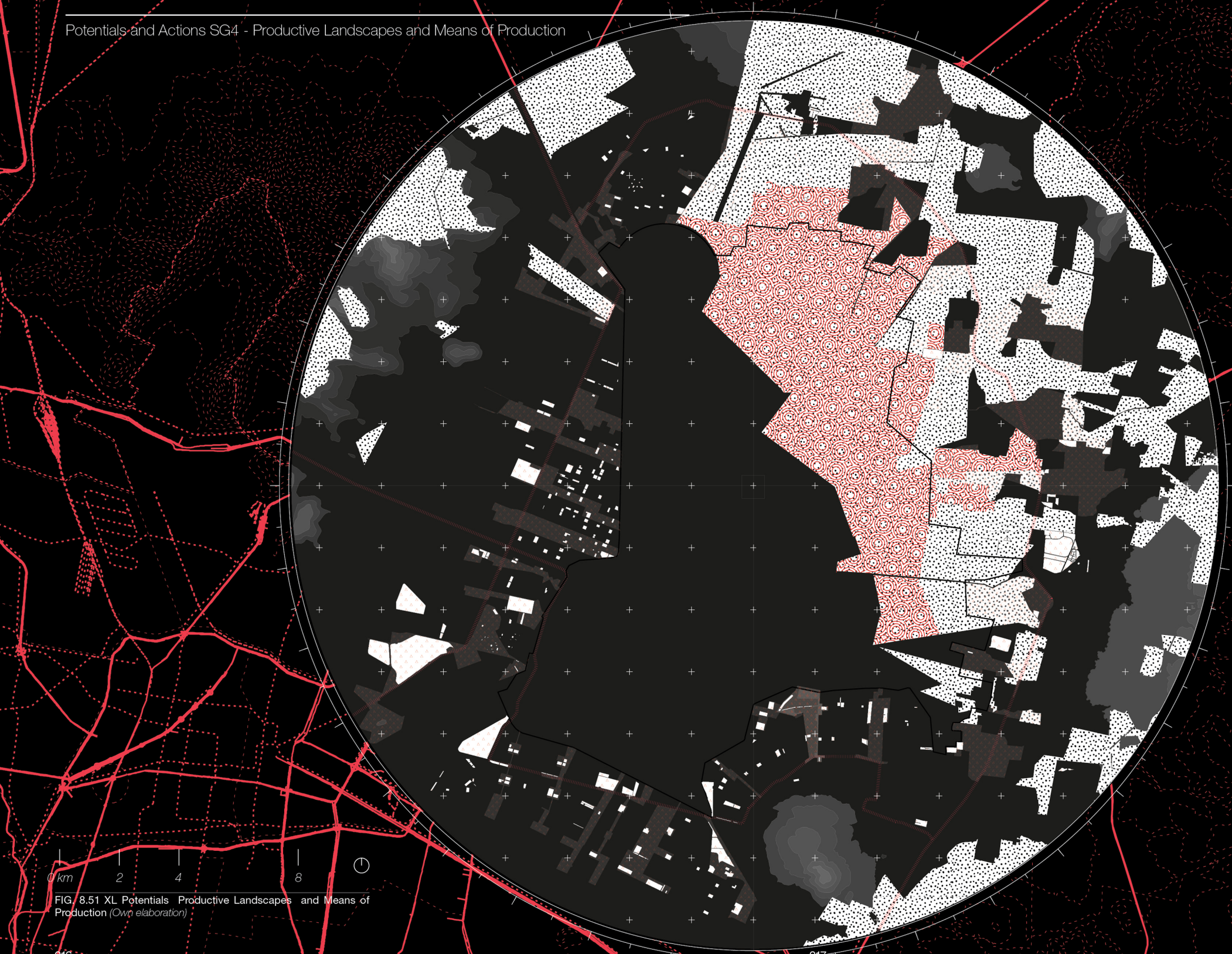


FIG. 8.51 XL Potentials Productive Landscapes and Means of Production *(Own elaboration)*

MI [42.2] _
Micro production of vegetables in facades and solar panels in the facade of a single unit

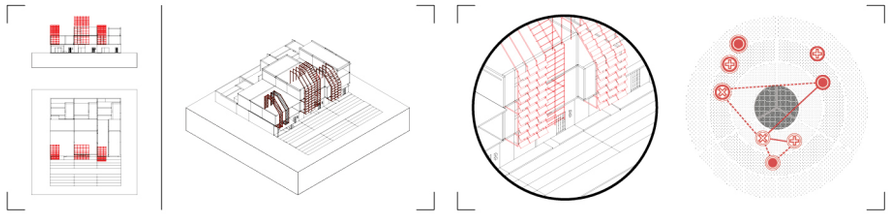
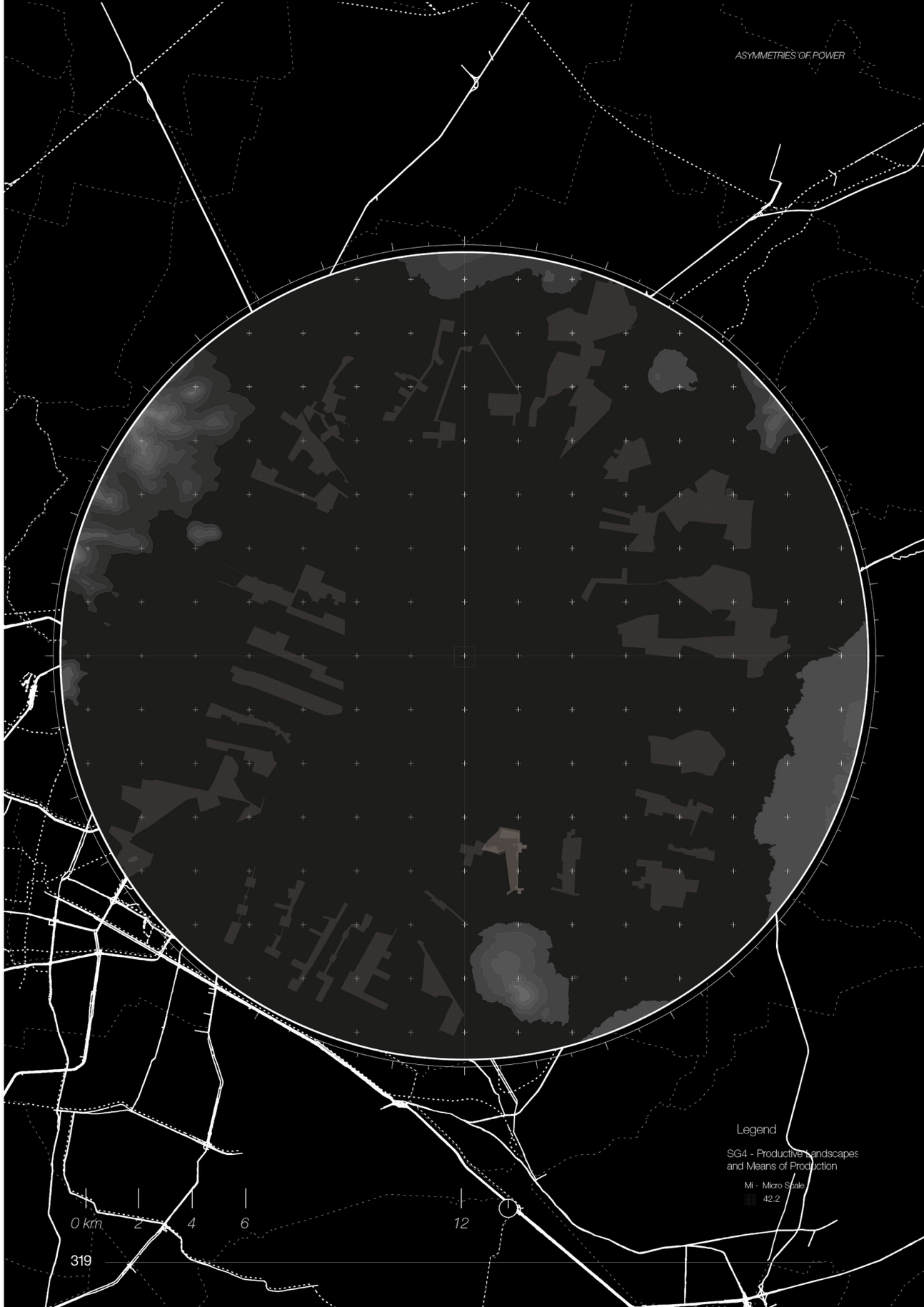
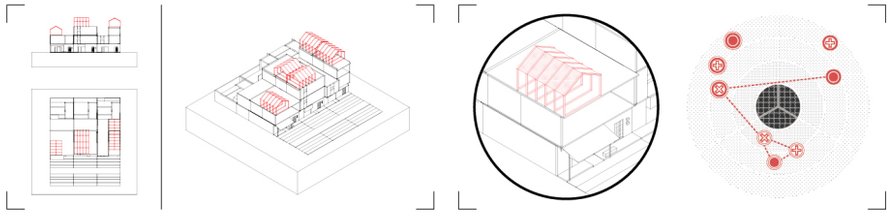


FIG. 8.52 left, 8.53 right, *(Own elaboration) The figures show the potentials areas where the actions are to be implemented and the catalogue of actions at the micro scale respectively.*

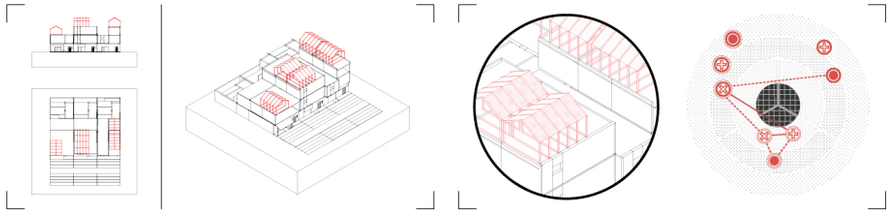
ASYMMETRIES OF POWER



S [39.1] _
Vegetable gardens and small cultivation areas in wasteland available



S [43.2] _
Self-built greenhouses on roof tops and solar panels rooftops



S [47.3] _
Micro temporary additions/ extensions to existing housing units that facilitate flexibility for commercial and productive use of street fronts

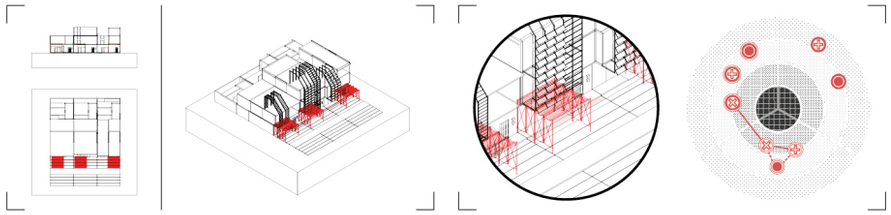
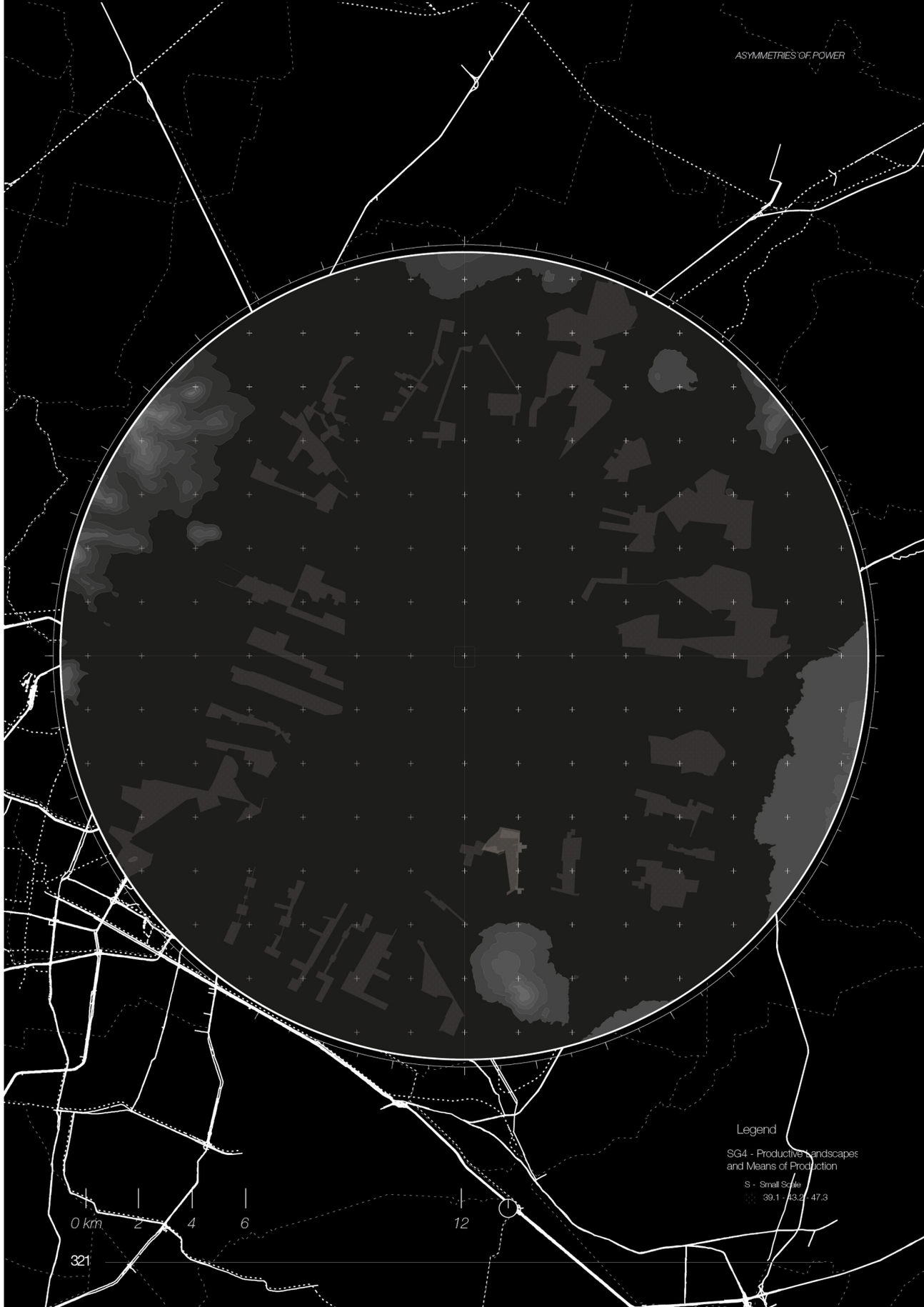
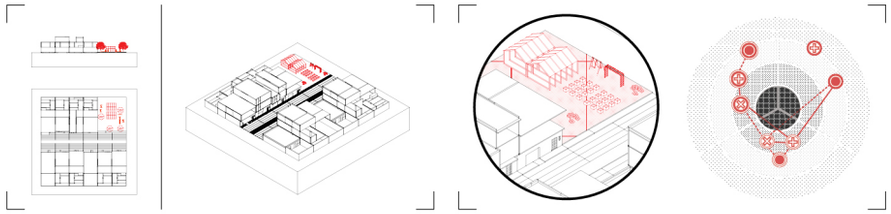


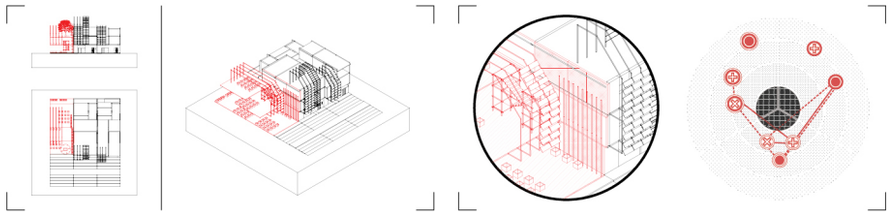
FIG. 8.54 left, 8.55 right, *(Own elaboration) The figures show the potentials areas where the actions are to be implemented and the catalogue of actions at the small scale respectively.*



M [40.1] _
Cooperative agriculture in neighbourhood parks or available open space



M [44.2] _
Self-built greenhouses through cooperative production in open space or interstitial spaces



M [48.3] _
Introducing spaces for commercial and local productive activities such as small workshops on street level enforces alternative inhabitation modalities

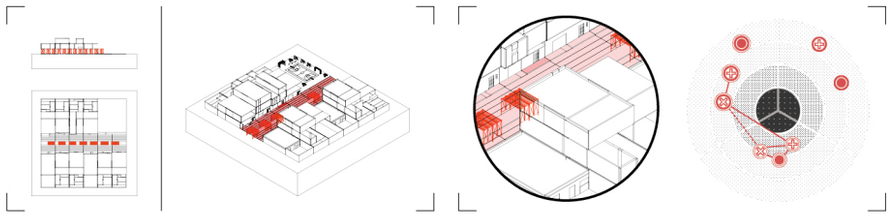
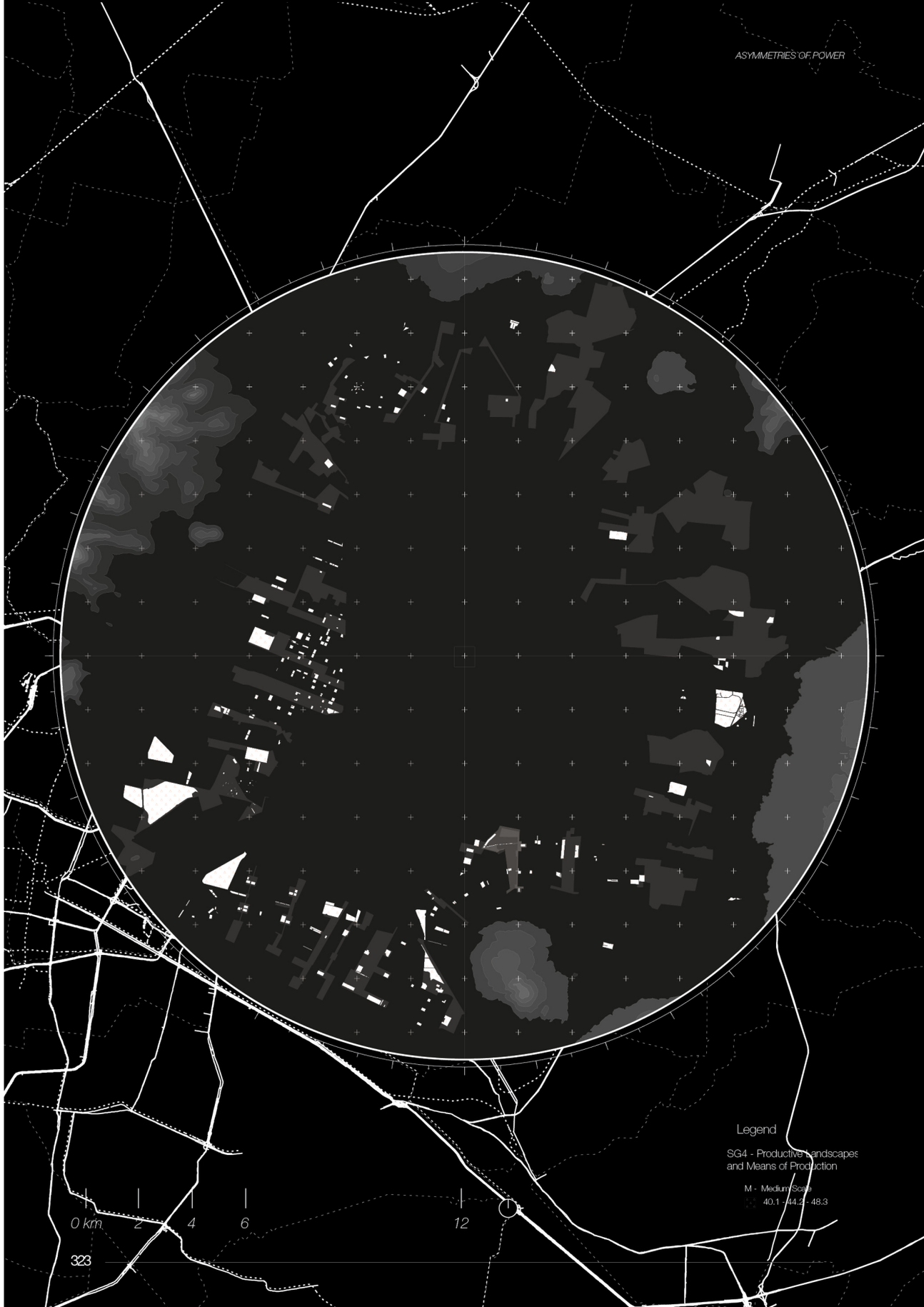
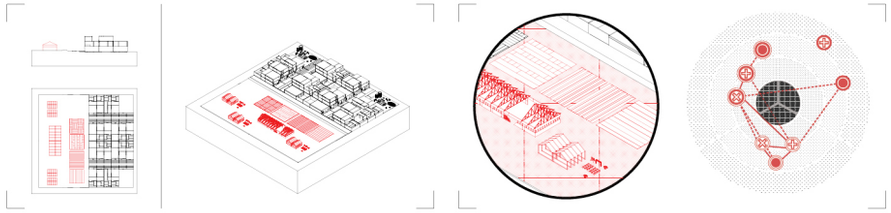


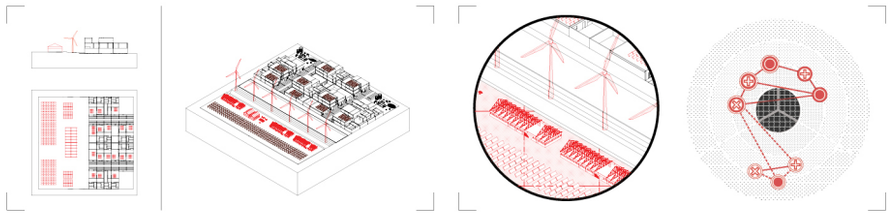
FIG. 8.56 left, 8.57 right, *(Own elaboration) The figures show the potentials areas where the actions are to be implemented and the catalogue of actions at the medium scale respectively.*



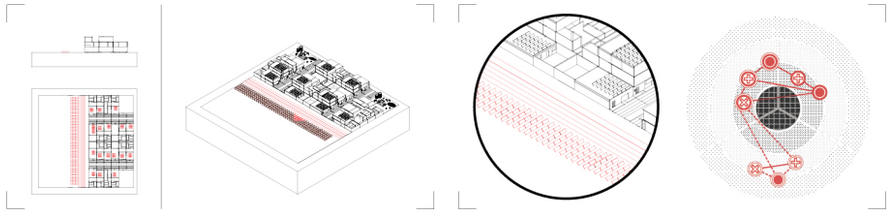
L [41.1] _
Cooperative agriculture in large areas suitable for cultivation



L [46.2] _
Insertion of productive landscapes by private investors / wind farms, solar farms in available land



L [45.2] _
Solar panels along infrastructure such as the inter-municipal highway ring along the void or regional connection routes



L [49.3] _
Insertion of commercial activities along important streets or wasteland open spaces.

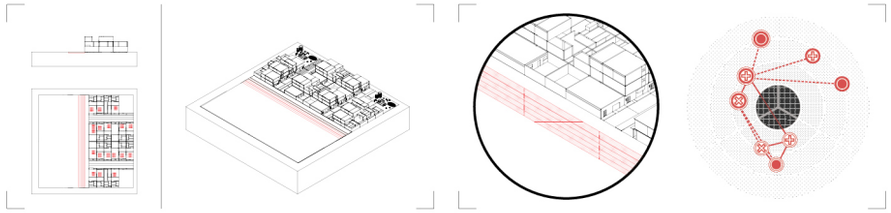




FIG. 8.58 left, 8.59 right, *(Own elaboration) The figures show the potentials areas where the actions are to be implemented and the catalogue of actions at the large scale respectively.*

ASYMMETRIES OF POWER

Potentials and Actions SG5 - Transport and Mobility System

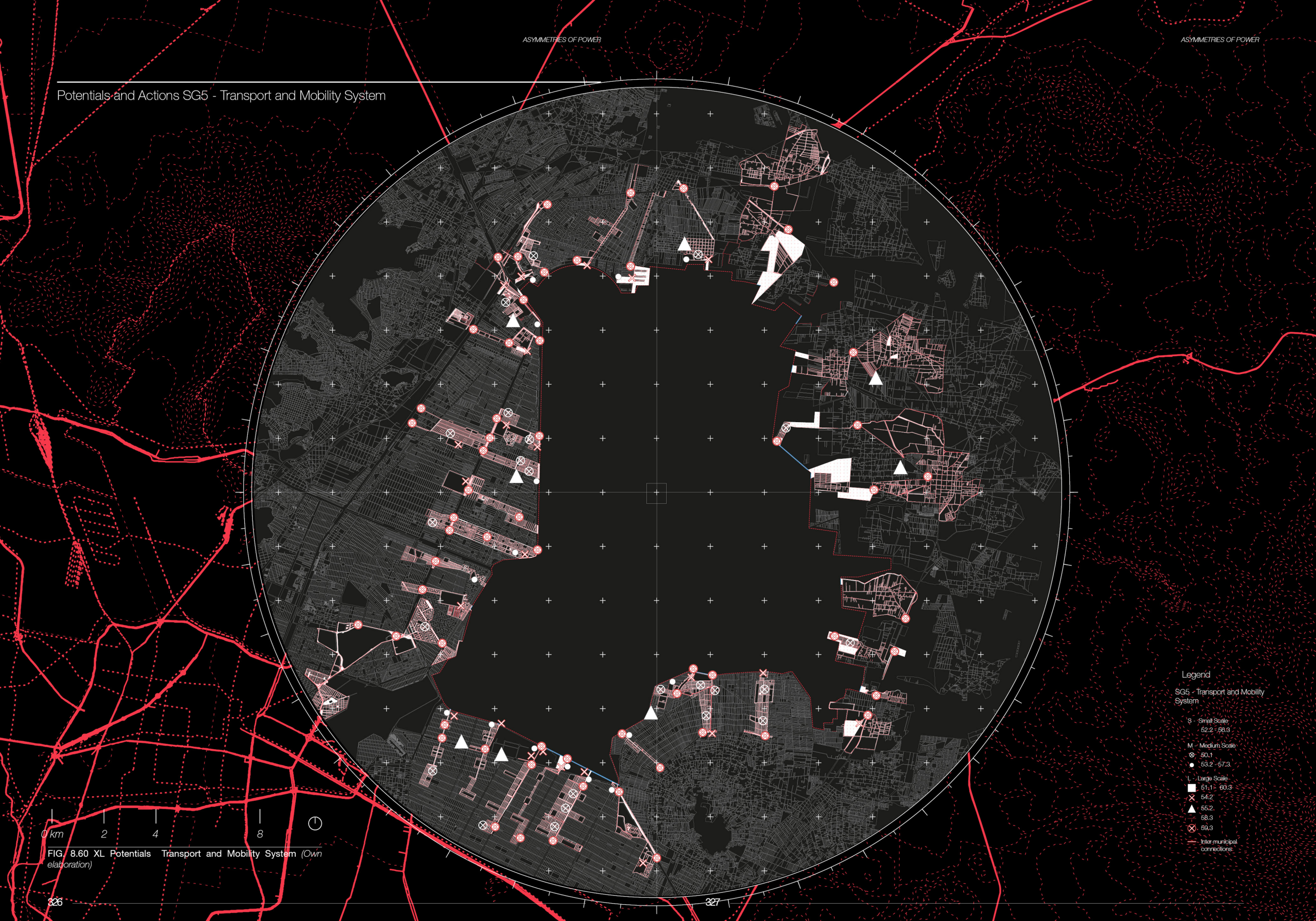
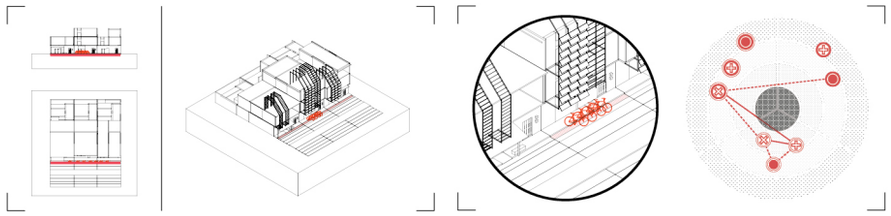


FIG. 8.60 XL Potentials Transport and Mobility System *(Own elaboration)*

S [52.2] _
Arrange proper lot access to allow the clear distribution and easy orientation



S [56.3] _
Make bicycle parking areas, provide the reserved parking area for car sharing and carpooling spaces

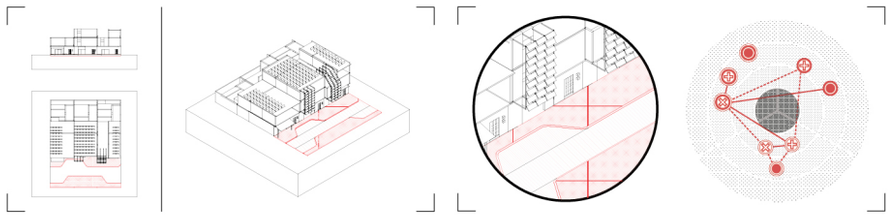
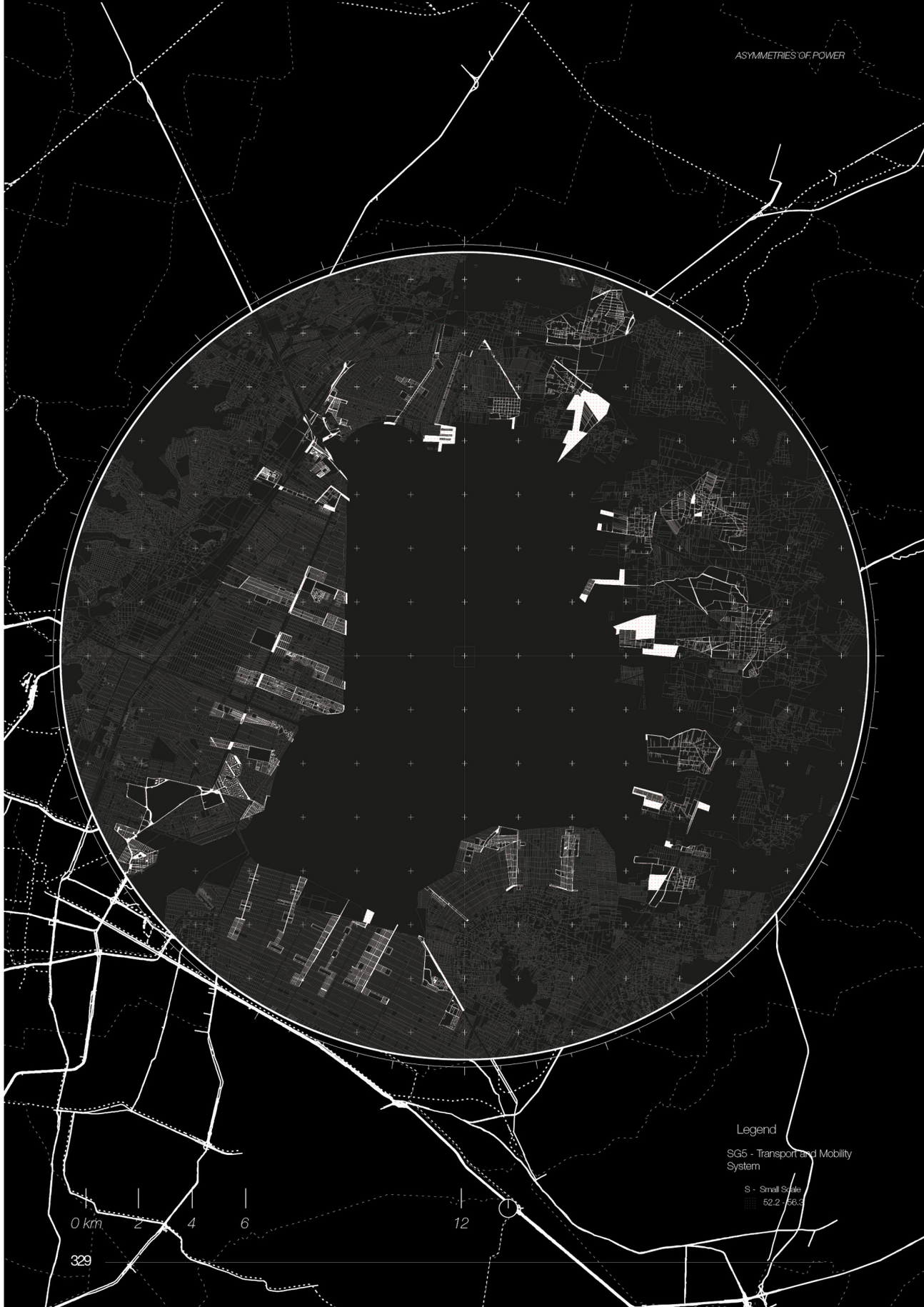
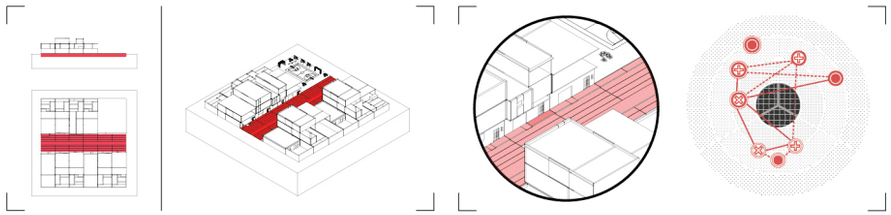


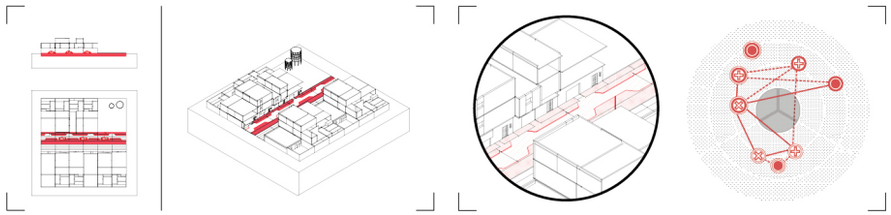
FIG. 8.61 left, 8.62 right, *(Own elaboration) The figures show the potentials areas where the actions are to be implemented and the catalogue of actions at the small scale respectively.*



M [50.1] _
Scheduled seasonal street closing by community participation



M [53.2] _
Adapt the parking system, reducing interference with vehicular traffic and facilitating circulation



M [57.3] _
Locate strategically parking/ waiting spaces for public transport, ensuring the adequate visibility recognition and protection

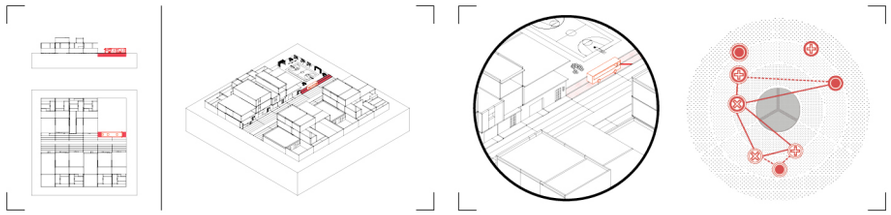
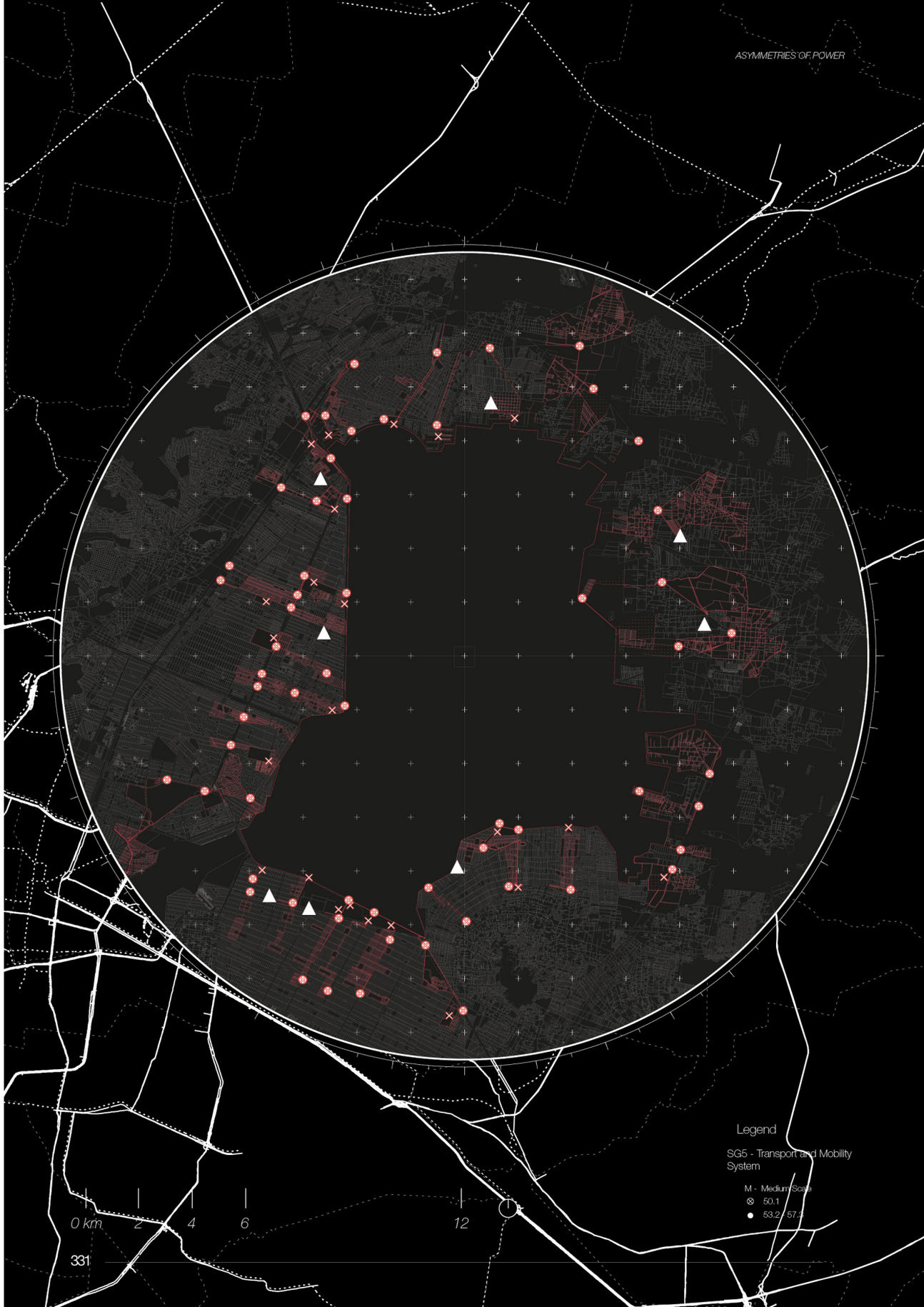
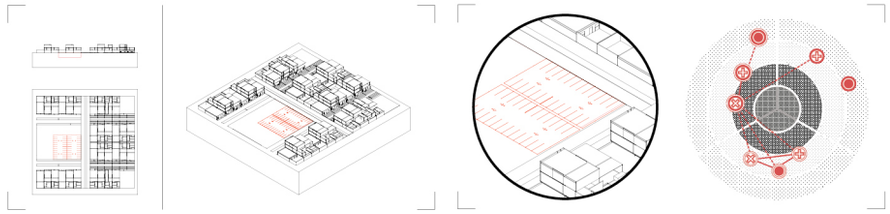


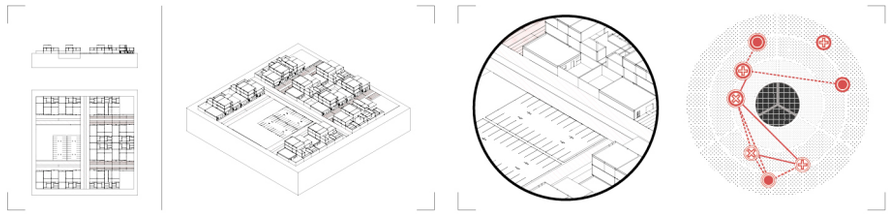
FIG. 8.63 left, 8.64 right, *(Own elaboration) The figures show the potentials areas where the actions are to be implemented and the catalogue of actions at the medium scale respectively.*



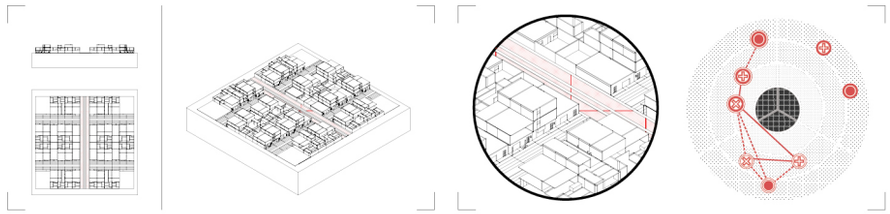
L [51.1] _
Solve the critical points in the area's accessibility system, separating internal flows to external ones, with adaptations to the existing networks



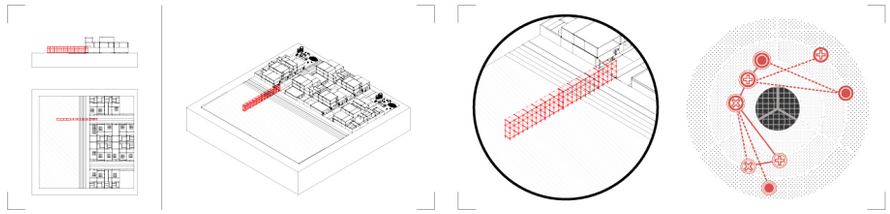
L [54.2] _
Arrange proper parking lots in available plots or underused land



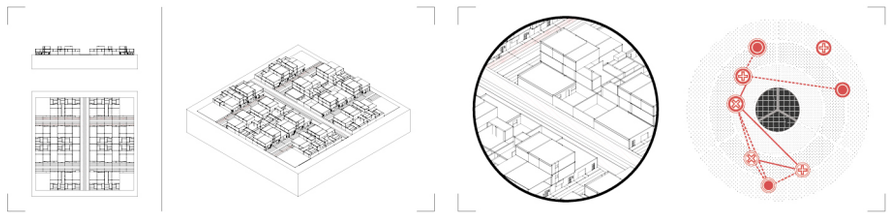
L [55.2] _
Realize dedicated areas for freight/material storage and manoeuvring/parking areas for heavy vehicles by mitigating them appropriately in the land-scape



L [58.3] _
Ensure a multifunctional territorial connection, creating cycle and pedestrian paths for home/work moving, linking the area with city centers and railway stations



L [59.3] _
Provide a continuous and secure cycling and pedestrian network



L [60.3] _
Rationalize internal circulation in terms of accessibility of emergency vehicles by ensuring the presence of spaces necessary for the joint management of emergencies and safety

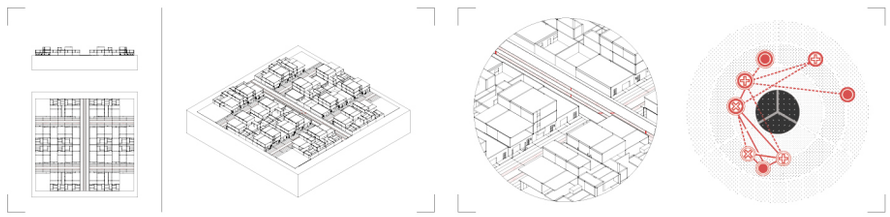
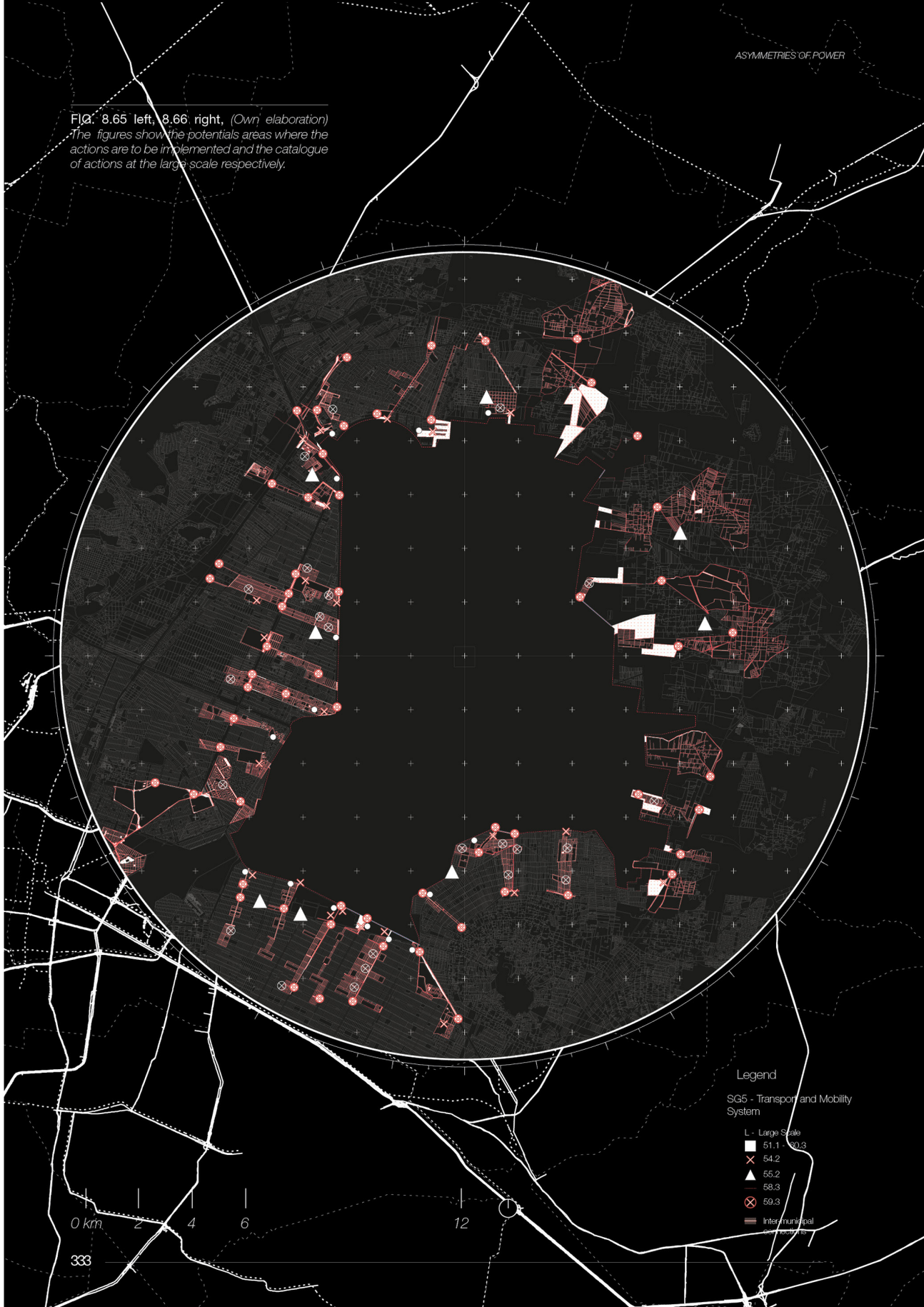


FIG. 8.65 left, 8.66 right, *(Own elaboration)*
The figures show the potentials areas where the actions are to be implemented and the catalogue of actions at the large scale respectively.



Conclusions

_Potentials SG1 - Water Landscape Integration and Management

Local initiatives towards micro and small interventions trigger the systemic change of the gates. However the systemic goal aims for higher integration between actors since larger scale actions which are necessary for an effective transformation require intermunicipal collaboration to be developed.

_Potentials SG2 - Green Infrastructure System and Quality of Public and Open Space

SG2 can accomplish systemic development with high ecological value and local integration from a bottom-up initiative, locally the gates foster micro, small and medium interventions that can be arranged faster than larger interventions. However potentials at a larger scale need intermunicipal collaboration to effectively connect the gates.

_Potentials SG3 - Densification of the Built System

In order for systemic change to happen regarding densification potentials, the gates need to engage the transformation of more than the existing building typologies, pairing its development with other goals to reprogram the existing fabric effectively. Most of the change needs investment and a high integration between actors.

_Potentials SG4 - Productive Landscapes and Means of Production

Means of production is a goal that can be stressed from a bottom up perspective supporting current practices in the gates. The potential lies in the collaborative effort of local communities to engage a more productive live, becoming themselves prosumers rather than just consumers. Agricultural land in the north east requires higher participation levels of powerful stakeholders to continue with a sustainable production and to experiment new effective measures.

_Potentials SG5 - Transport and Mobility System

Potentials regarding transport and mobility require higher levels of participation and interest, moreover systemic change can only be possible with an appropriate engagement with local communities enabling the transformations to support the endogenous development activated by the other goals. Active participation will also guarantee connectivity between the municipalities.

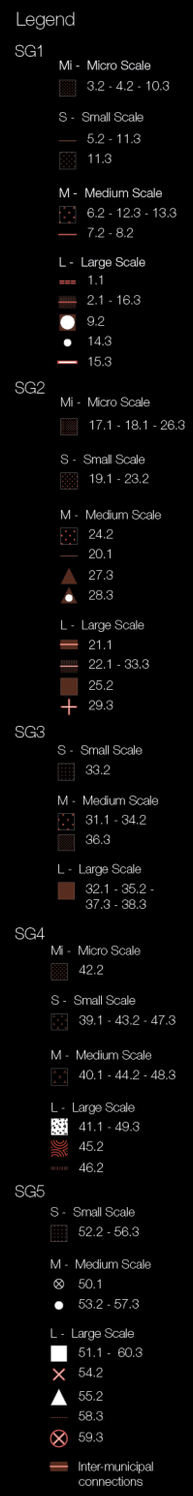
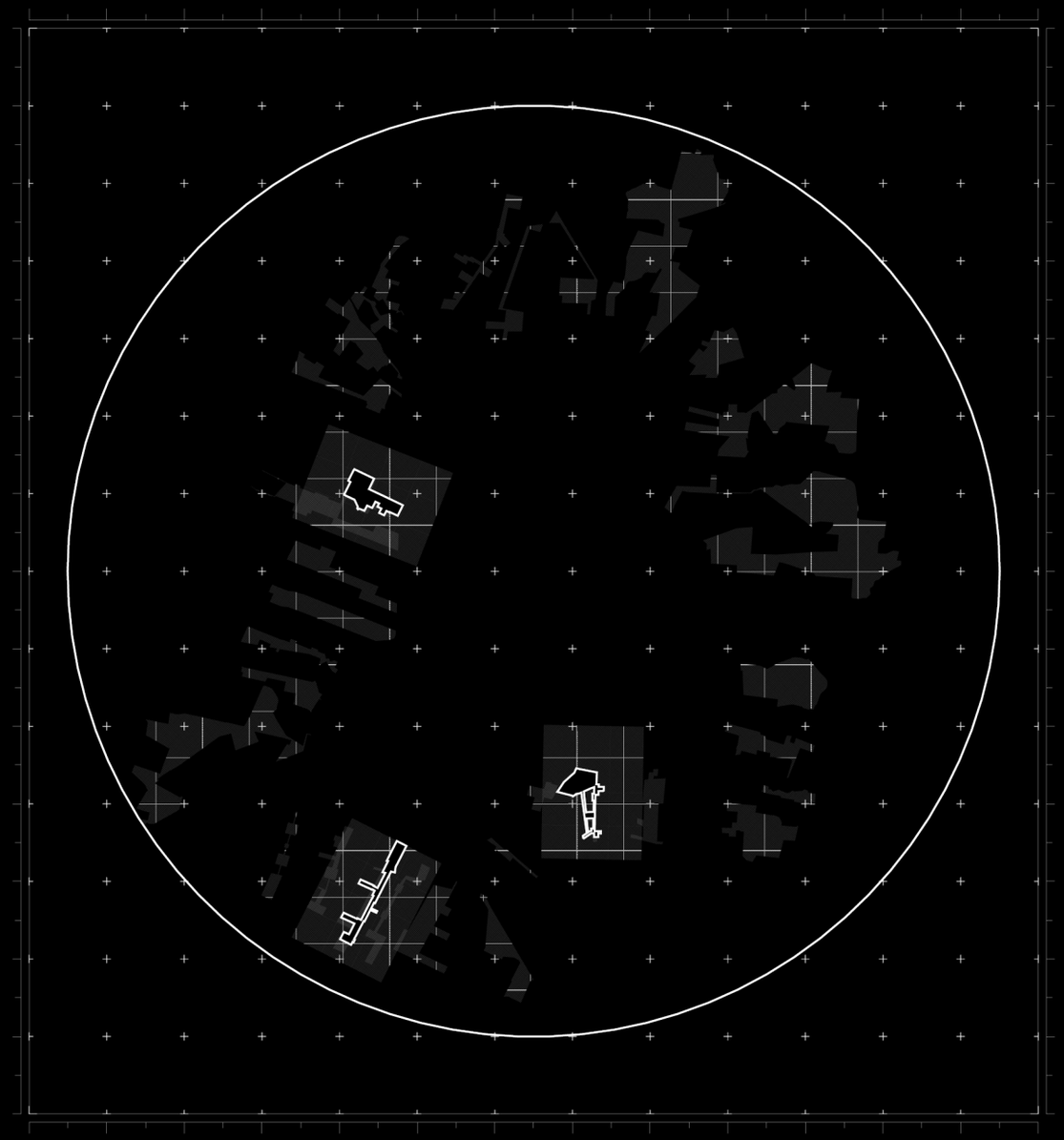


FIG. 8.67 *(Own elaboration) The figures show all the potentials*

ASYMMETRIES OF POWER



10 TESTING GROUNDS



Overview

The following chapter will elaborate on the strategic gates selected as testing grounds by analysing their urban morphological structure as well as its potentialities towards the systemic goals. Moreover in this chapter the multiscalar approach coupled with the potentials of each gate will reveal strategic locations within the urban agglomerations capable of adaptation.

Selection of the 3 Gates

Nezahualcoyotl, Ecatepec and Chimalhuacan are 3 of the municipalities around the periphery of the future metropolitan park. The three of them share some metropolitan functions such as metro stations (Nezahualcoyotl and Ecatepec) and are connected intermunicipaly by the Mexibus transport system. Moreover the three municipalities share the following characteristics:

_Within the 5 municipalities around the defined boundary of the metropolitan park, Nezahualcoyotl, Ecatepec and Chimalhuacan have the highest concentration of population

_The above mention municipalities because of their higher population concentration reveal the highest inequalities within the territory selected (See metropolitan analysis in chapter 4)

_The 3 municipalities have a more complex mobility system (See metropolitan analysis in chapter 4)

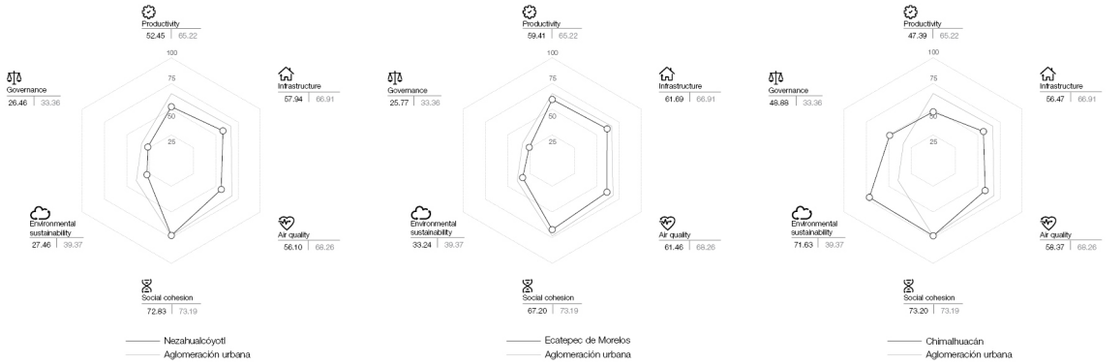
_ Their weakest characteristic is governance, infrastructure and productivity

_Flooding is one of the most urgent concerns of these 3 municipalities since their latitude is the lowest of the 5 making them more vulnerable in this regard.

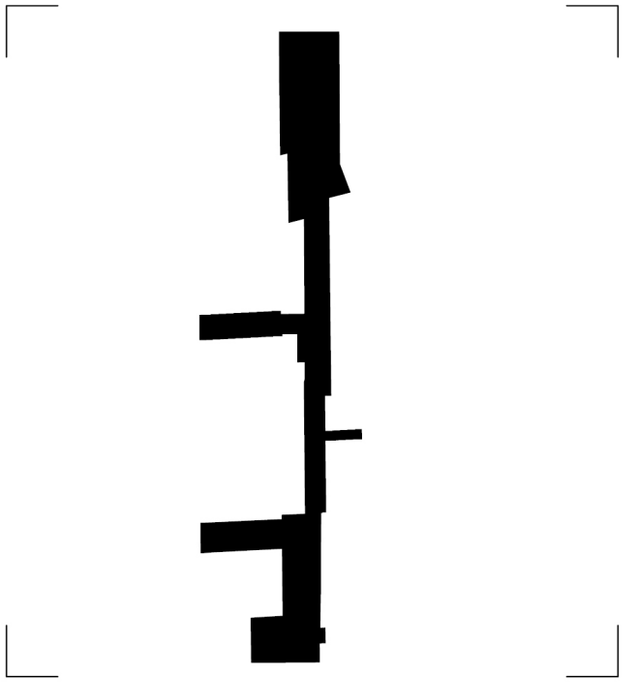
_Since the 3 municipalities are closer to the capital Mexico City, the impact of the metropolitan park will be greater, in this regard their priority is clear.

_The conditions of their border (boundary between the urbanized area and the void) are similar, the three manifest hard boundaries such as highways (autopista Mexiquense) and the railway system.

FIG. 10.10 Municipal assessment *(Redrawn from ONU-Habitat, CPI, 2018) The figure shows the assessment realized by ONU-Habitat of the municipalities selected according to the CITY PROSPERITY INDEX, CPI, 2018 .*



IMG. 10.11 Selection of 3 gates as testing grounds *(Own elaboration)*



NEZA GATE [GN6]

ASYMMETRIES OF POWER

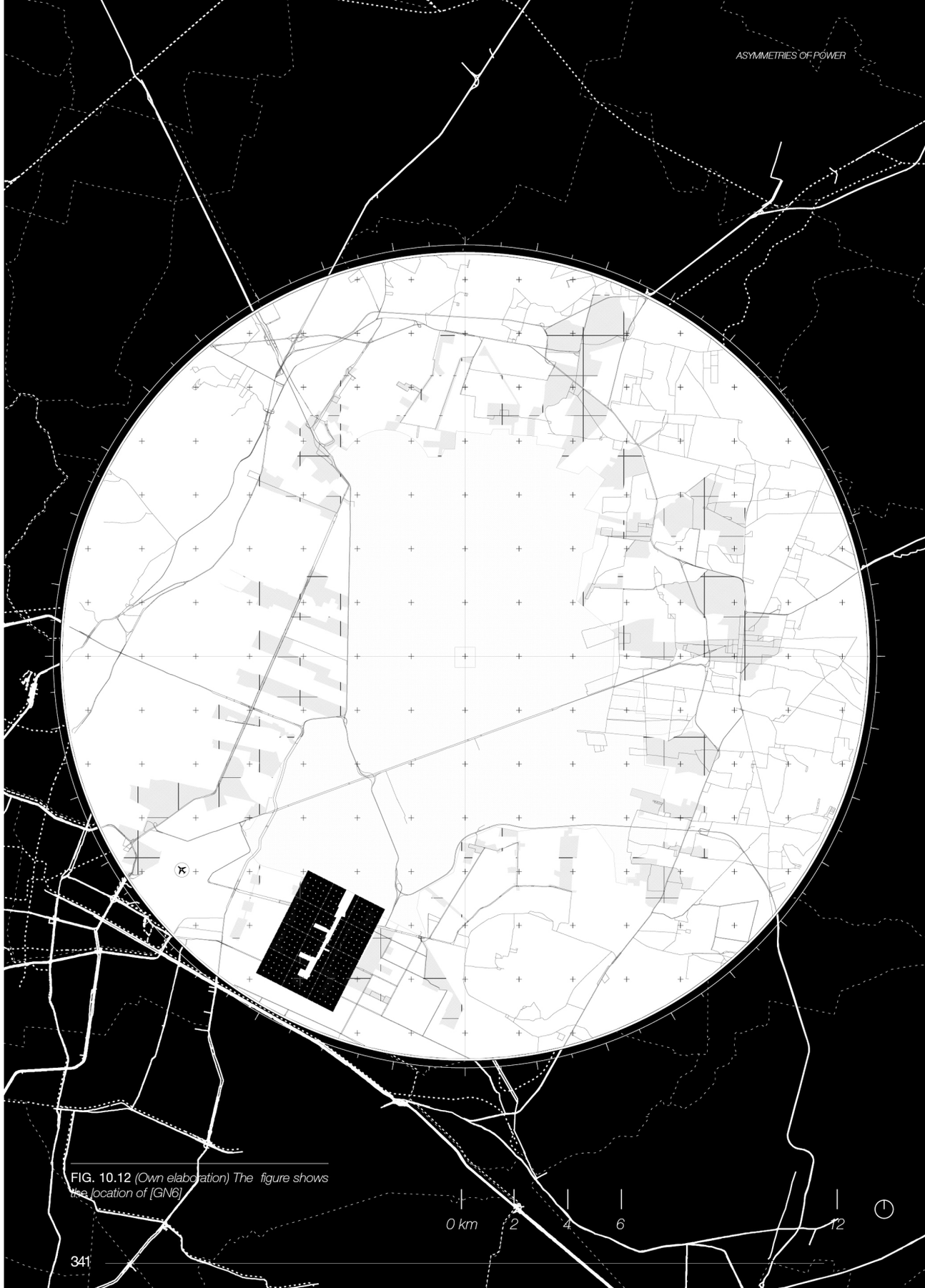


FIG. 10.12 *(Own elaboration) The figure shows the location of [GN6].*

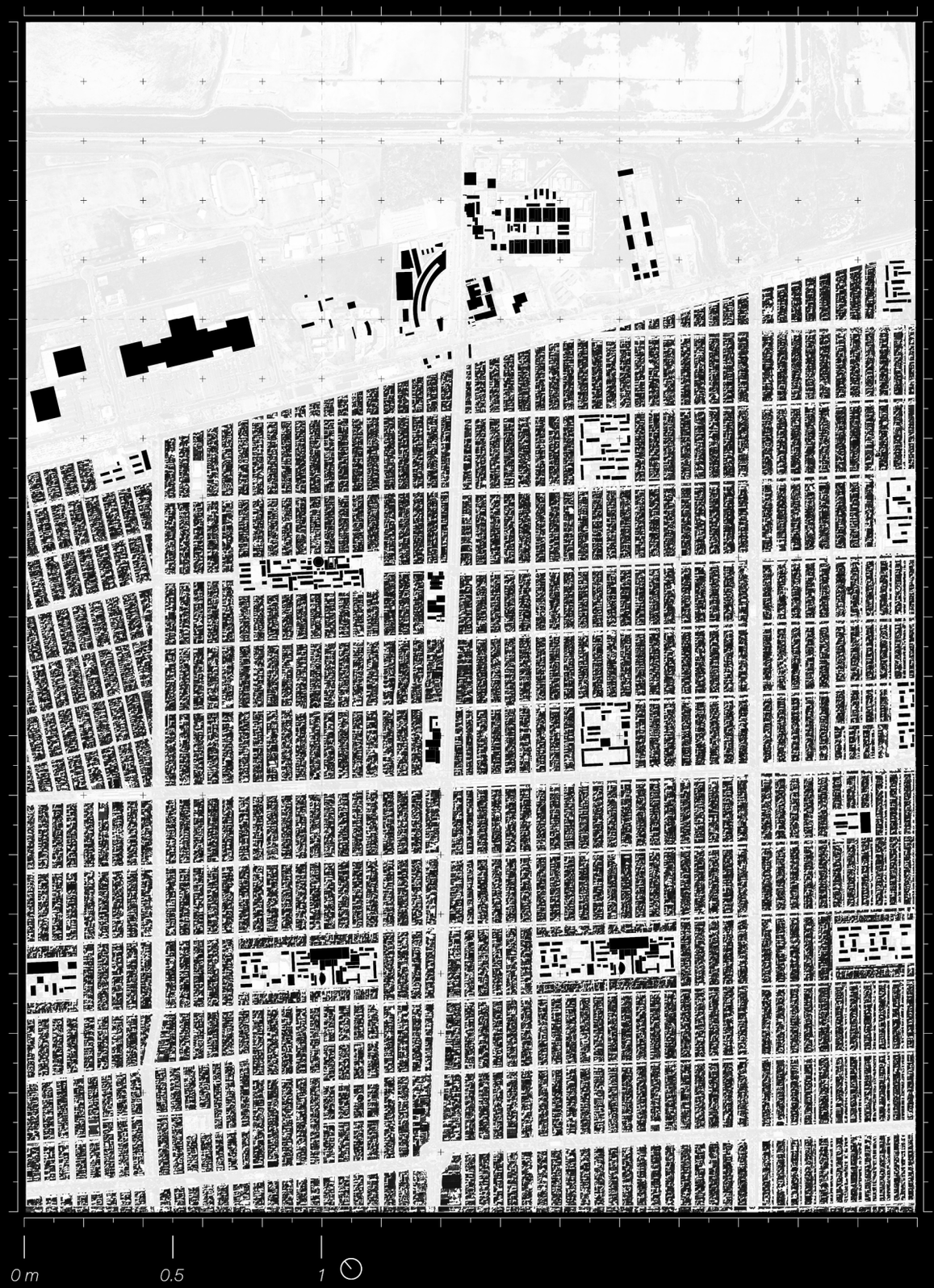
Introduction to GN6

The selected gate [GN6] sets its ground within a boundary directly influenced by Av. Adolfo Lopez Mateos in the municipality of Nezahualcoyotl, a long straightforward road of nearly 5.2km which has the potential to contribute to a faster development of the area, functioning as a trigger for economic development where it is clear that densification, introduction and intensification of new functions is possible. The avenue is characterized by an almost completely commercial ground floor, with small shops, restaurants and coffee shops, buildings up to 5 floors where apartments and offices are in place under an uncontrolled rent system (not legally recognized by the government avoiding tax payments). Moreover the avenue is an important artery that connects the surrounding neighborhoods with the metro system of the metropolis located in south-west ending of the avenue.

However the avenue was made as and remains a car based street even its latest transformation still favors automotive vehicles over pedestrians and natural elements. It is evident that the impact of the car helped urban development and contributed local businesses to thrive, but the liveability has been left behind in current urban planning in the area, literally and figuratively behind, since the streets parallel to the commercial avenue are not always in the best condition but have been subject of speculation and micro utopian solutions that are outside the planning codes or even the law.



Left - IMG. 10.10 [GN6] (Source: NezaYork facebook group, 2018), Bird-eye perspective of the gate. **Right - FIG. 10.13 [GN6] Urban structure** (Own elaboration).



Morphological and Functional Composition

_1. The selected area has the presence of rational morphological urban structure characterized by a simple grid of regular blocks and long avenues that slowly had transformed into attractive areas for commercial and office purposes.

_2. As shown in the right image the area is almost completely urbanized, most of its urbanization manifests the prevalence of the working class residential areas and its mono-functional structure

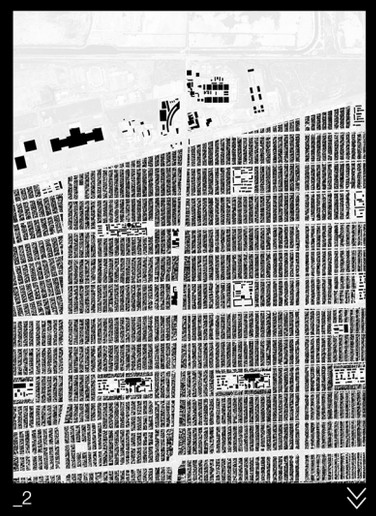
_3. The hard open space is mostly concrete and asphalt paved surfaces for car based use

_4. Public space in the urbanized area is scarce, and its structure is limited to the hard rational grid and its mono functional character. Recently public spaces facilities have been developed along corridors, however the current state of the facilities is not fully accessible and its qualitative value has decreased over the years

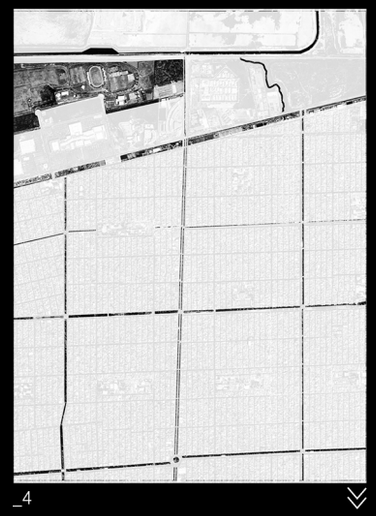


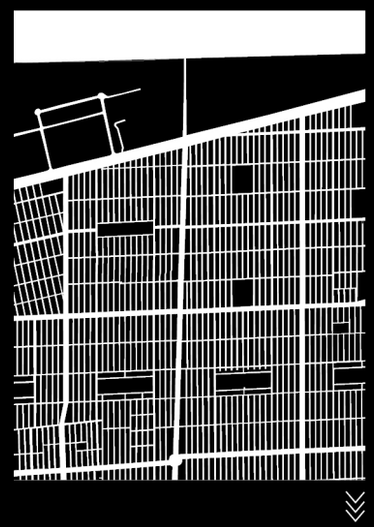
Left - IMG. 10.11 34 Tianguis San Juan (Source: NezaYork facebook group, 2018). The photography shows an informal temporal market in the municipality of Nezahualcóyotl. **Right - FIG. 10.14 Morphological and Functional composition** (Own elaboration)

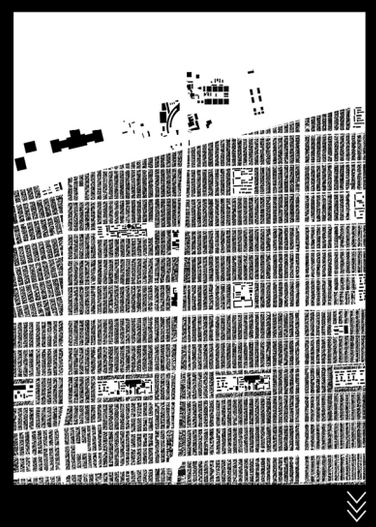


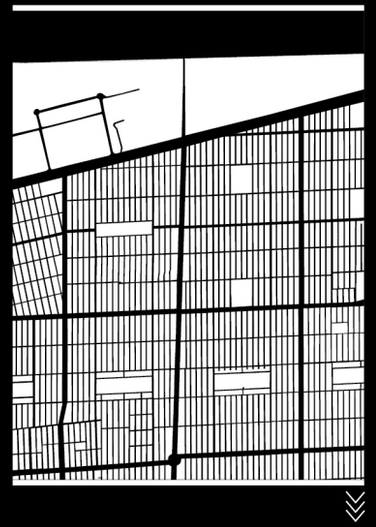


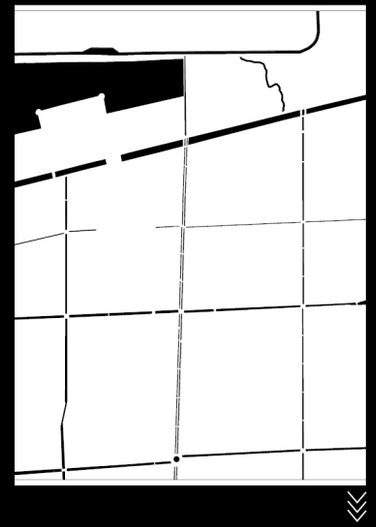




















_5. Urban equipment facilities are organized in a cluster typology in the center of high residential concentration areas, this clusters have basic urban equipment such as churches, schools and markets with a single block configuration

_6. The lack of public spaces and green structure leaves the open space such as streets as the only available land where green can be found and in the interstitial spaces of urban equipment facilities often under used or forgotten, functioning as parking lots

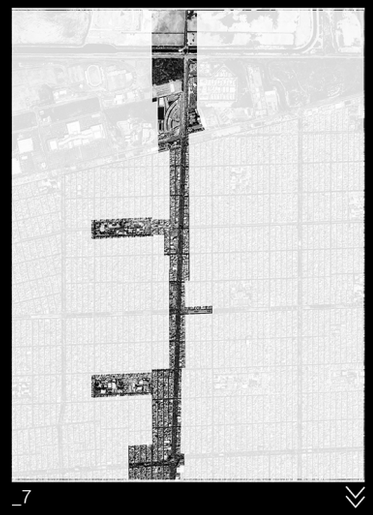
_7. The boundary of the gate wraps up areas with the potential to change and trigger new configurations in the urban structure.

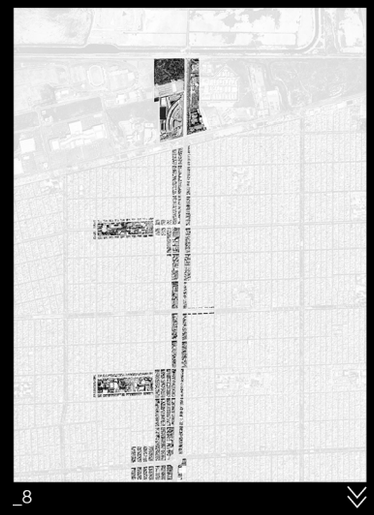
_8. From the long avenue to the closer urban equipment clusters to areas of residential use that can be reconfigured. It ends up connecting the residential area with the northeast section

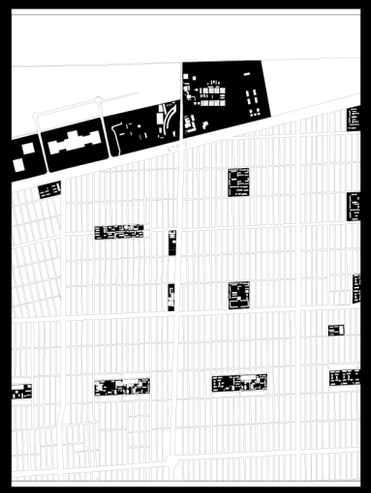


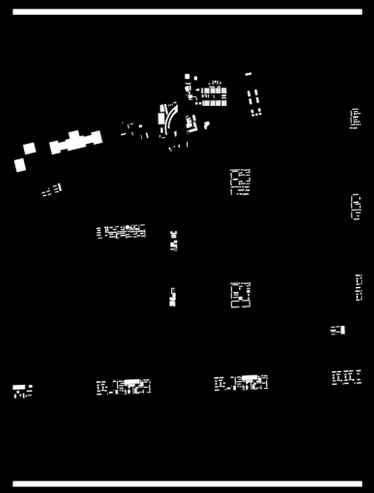


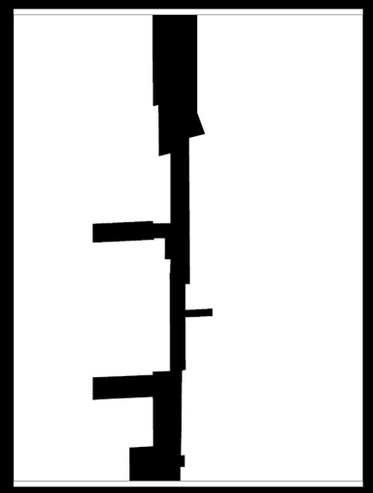


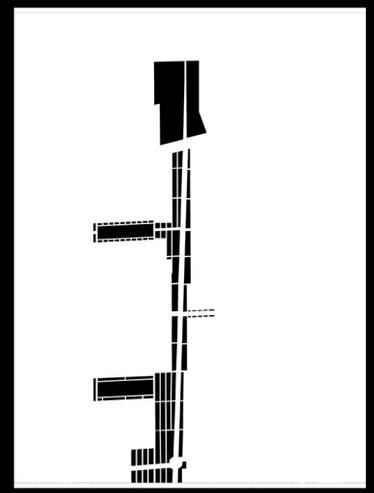


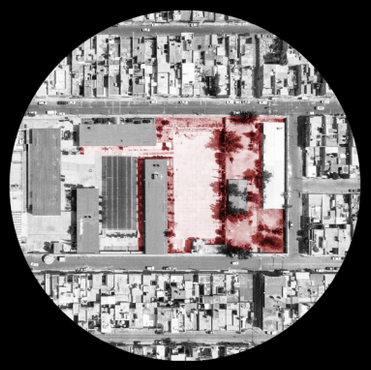














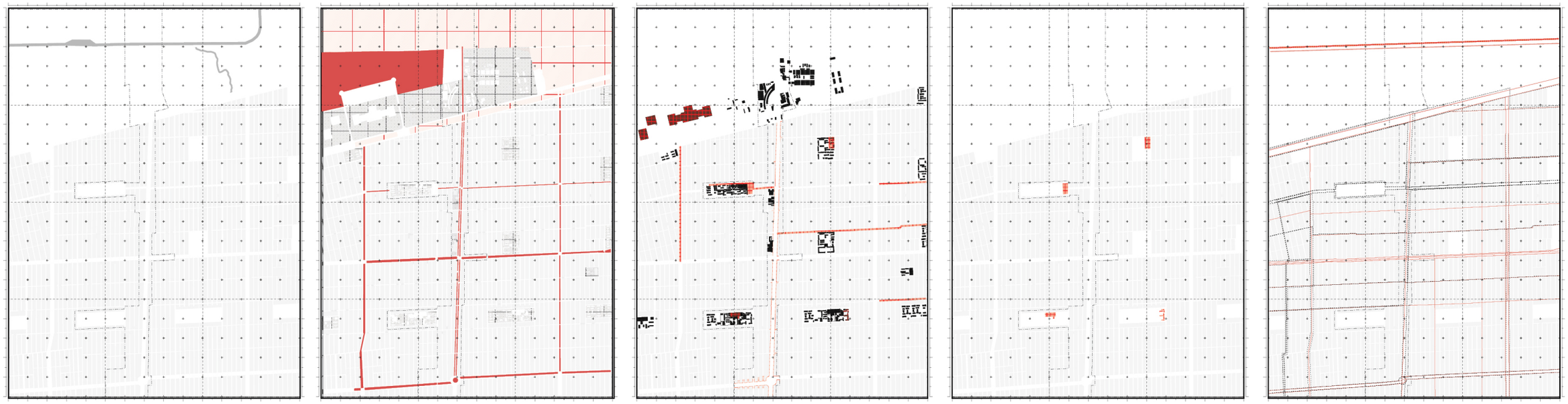




Left - IMG. 10.12 Neza's wasteland (Photography by the author). The photography shows wasteland in Nezahualcóyotl near the border. **Right - FIG. 10.15 Morphological and Functional composition** (Own elaboration)

ASYMMETRIES OF POWER

Elements of the Area According to the 5 Systemic Goals



Water landscape integration and management

Inside the boundary that clearly separates the urban tissue of Nezahualcoyotl and the former Texcoco lake, there are water canals, open infrastructure that also functions as a barrier against flooding, nevertheless this water body is not enough for the demand of the area.

Green infrastructure and quality of public and open space

Regarding green and public space infrastructure is scarce in the the municipality. Moreover it lacks of a substantial ecological value limiting its presence to only green corridors without proper maintenance and lack of accessibility, however a new park has been implemented in the north side close to the limit, an area that can contribute largely to the general public structure if its accessibility and support is increased

Densification of the built system

Nezahualcoyotl is characterized for having almost its entire territory urbanized, with the highest concentration of mono functional residential land use. Its build landscape is shaped by self-built housing units of low density concentrations despite the amount of inhabitants living in them, the municipality has high overcrowding levels per plot area (INEGI, 2010) one of its crucial vulnerabilities

Productive landscapes and means of production

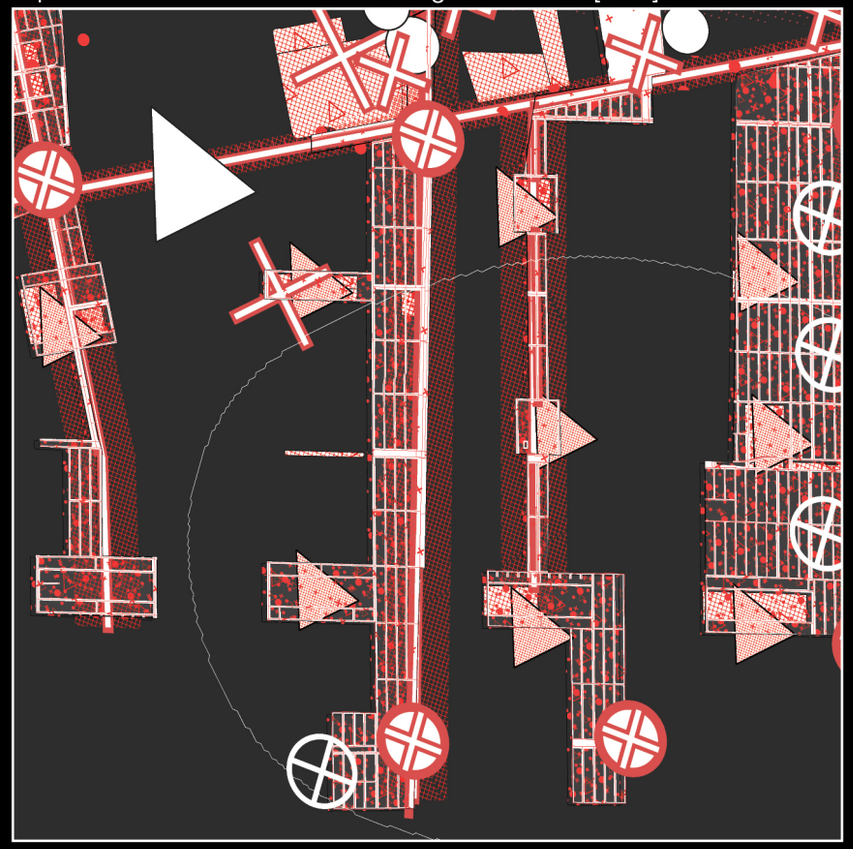
Means of production in the area are scarce, only some community gardens can be found where people grow food, such as vegetables and cactuses. Markets are the facilities with the highest concentrations of labor in the area and along with temporary seasonal street markets are production typologies rooted to the area

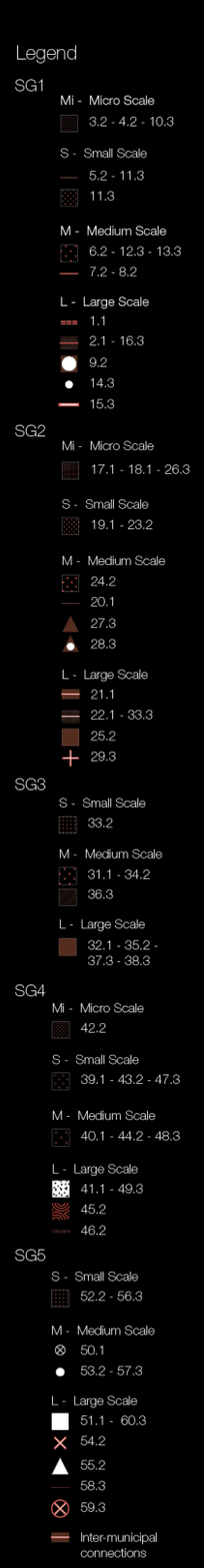
Transport and mobility system

Public transport is mostly privatized and the area lacks of sufficient infrastructure to satisfy the demand of its inhabitants. Mobility functions through private car, taxi, bicitaxi and buses of various types. Most of the hard open structure is car-based paved roads

FIG. 10.16 Elements of the area according to the 5 systemic goals
(Own elaboration)

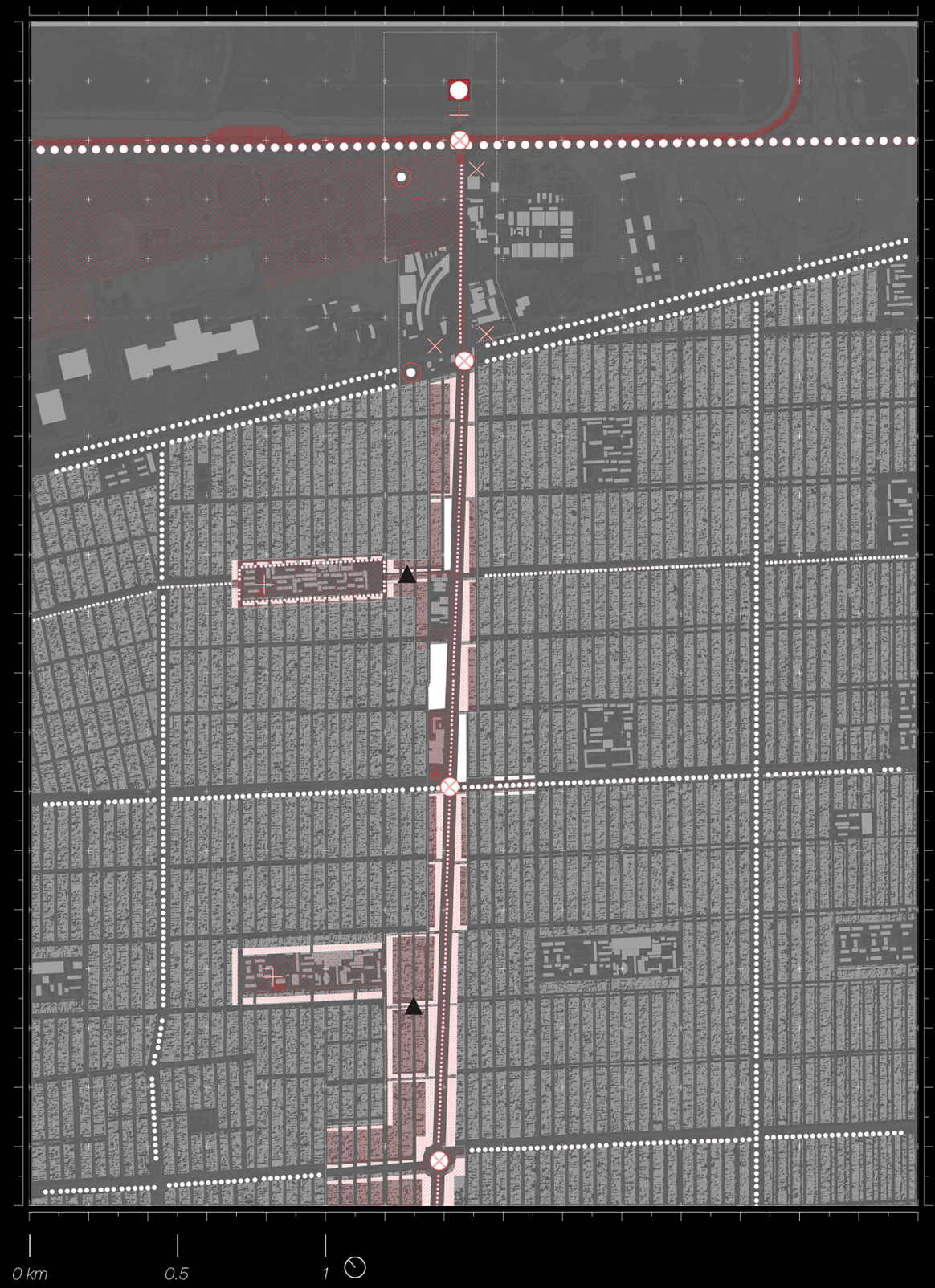
Spatial Actions and Potential Strategic Locations [GN6]





Within the potentials revealed by the previous analyses are intermunicipal connections of transport at both ends of the gate, the potential to connect through green corridors and the possibility to develop an ecological corridor at the border where the connectivity with the metropolitan park will take place. However most of its potentials lie in the local level. The area is almost completely urbanized and has developed certain commercial and housing patterns that define it. Both can be reprogrammed in order to consolidate a mix use corridor adding variety and allowing accessibility to services to nearby areas. Moreover urban equipment elements in the urban structure can also be integrated, transforming their interstitial spaces into public spaces. Housing has become the preferred spatial manifestation of speculation in the area, but it can change into a potential with higher value if through participation the community is able to reshape its current monofunctional pattern.

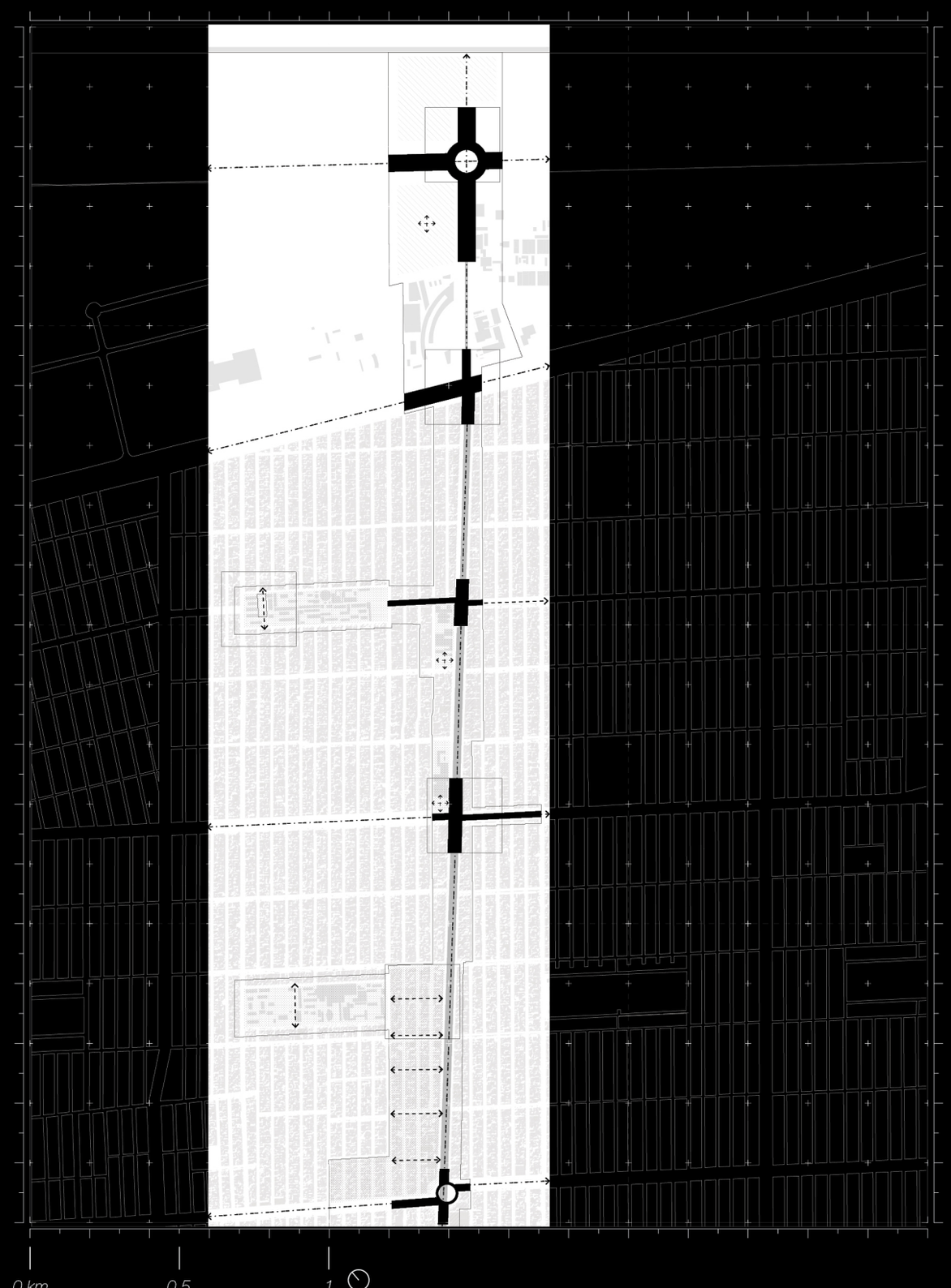
Left - FIG. 10.17 Map of potentials [GN6] (Own elaboration) Right - FIG. 10.18 Detail map of the potentials [GN6] (Own elaboration)

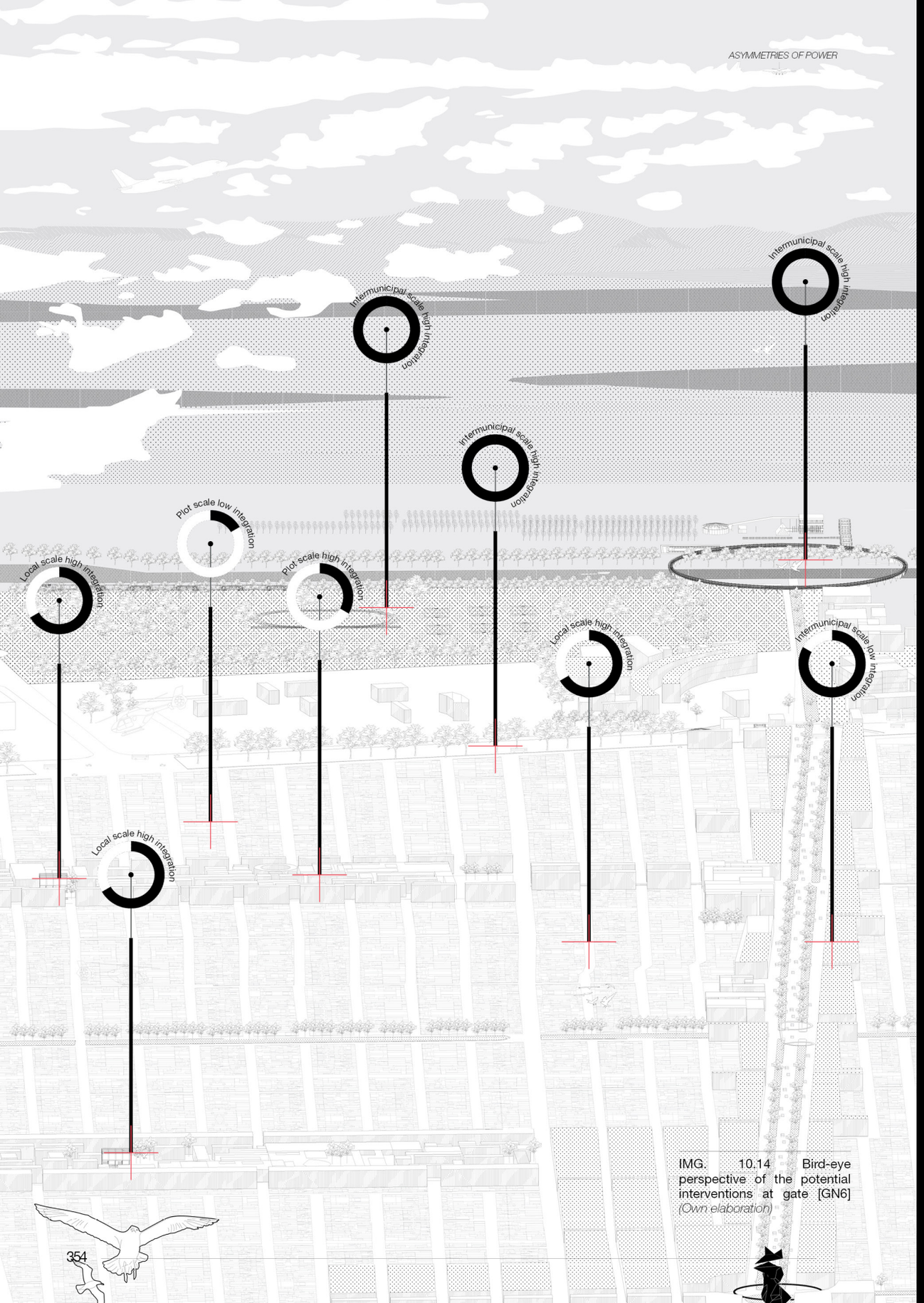




Left - FIG. 10.19 Exploded axonometric *(Own elaboration) The figure shows the different multiscalar layers revealing the potential locations*

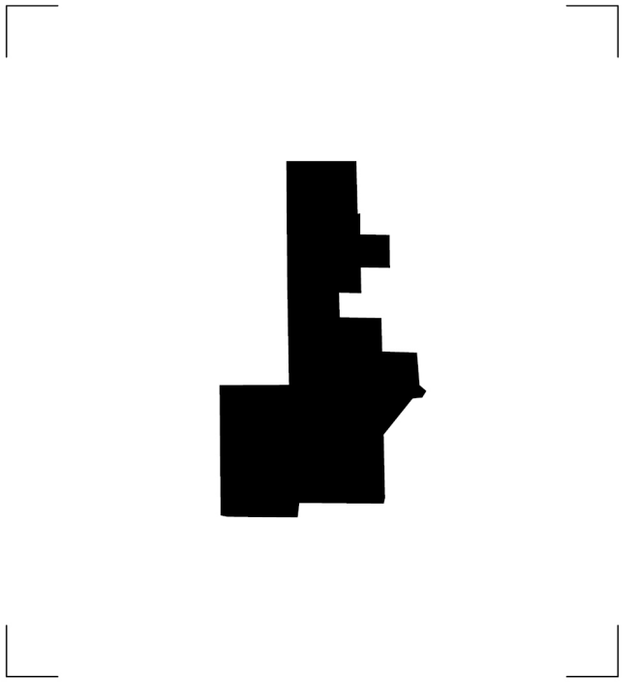
Right - FIG. 10.20 Map of multiscalar potential locations *(Own elaboration)*





IMG. 10.14 Bird-eye perspective of the potential interventions at gate [GN6] *(Own elaboration)*

Potentials of [GN6] are revealed mostly at the local level, where density strategies focused on reprogramming the urban fabric are essential. This potentials can be achieved by a continuous participation between local residents and a balanced decision making process with higher power actors. Connections at the intermunicipal level are needed to engage the urban fabric with the metropolitan park. In this regard public space and transport and mobility are strategic for a cohesive development of the gate.



ECATEPEC GATE [GE7]

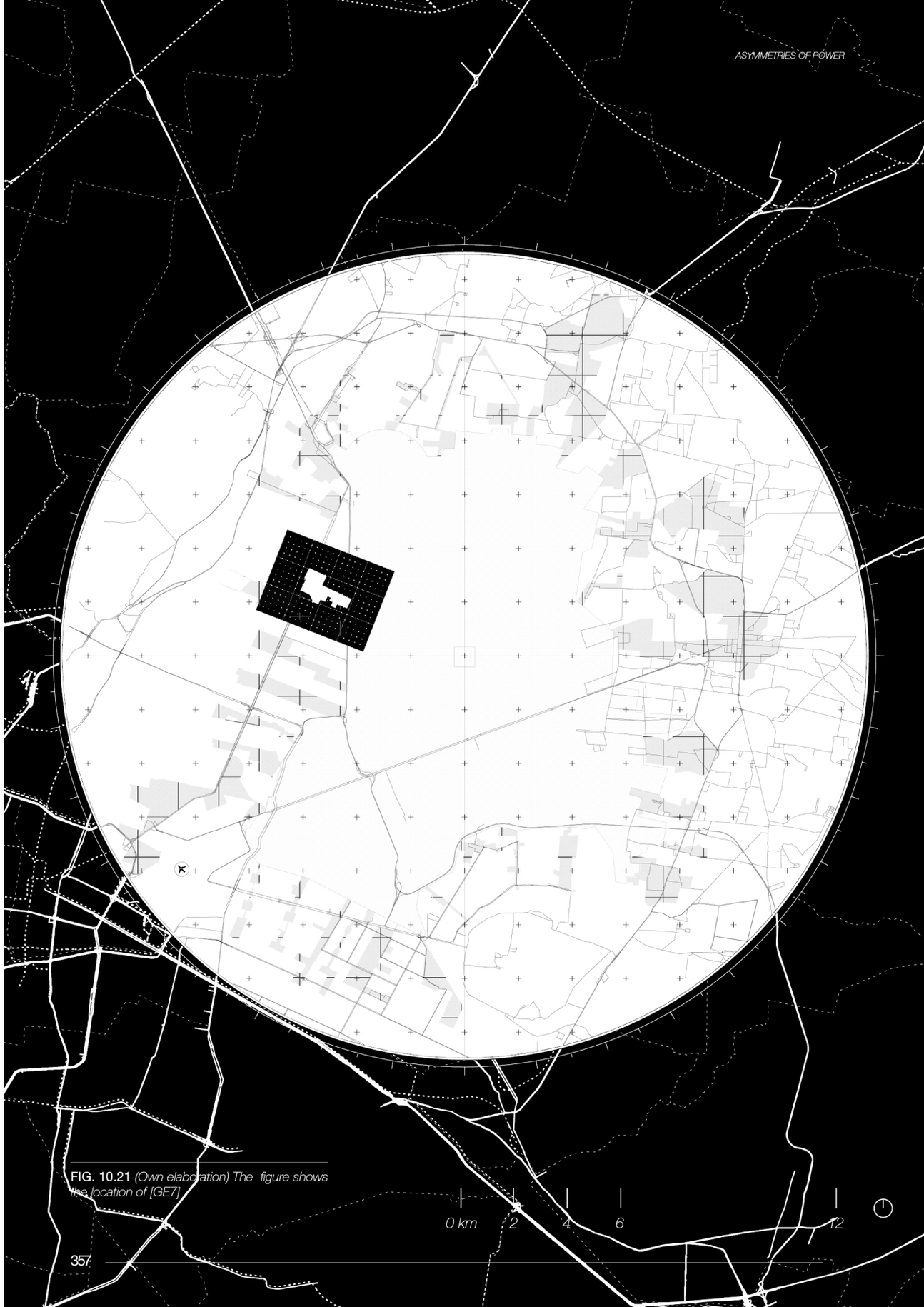


FIG. 10.21 *(Own elaboration) The figure shows the location of [GE7]*

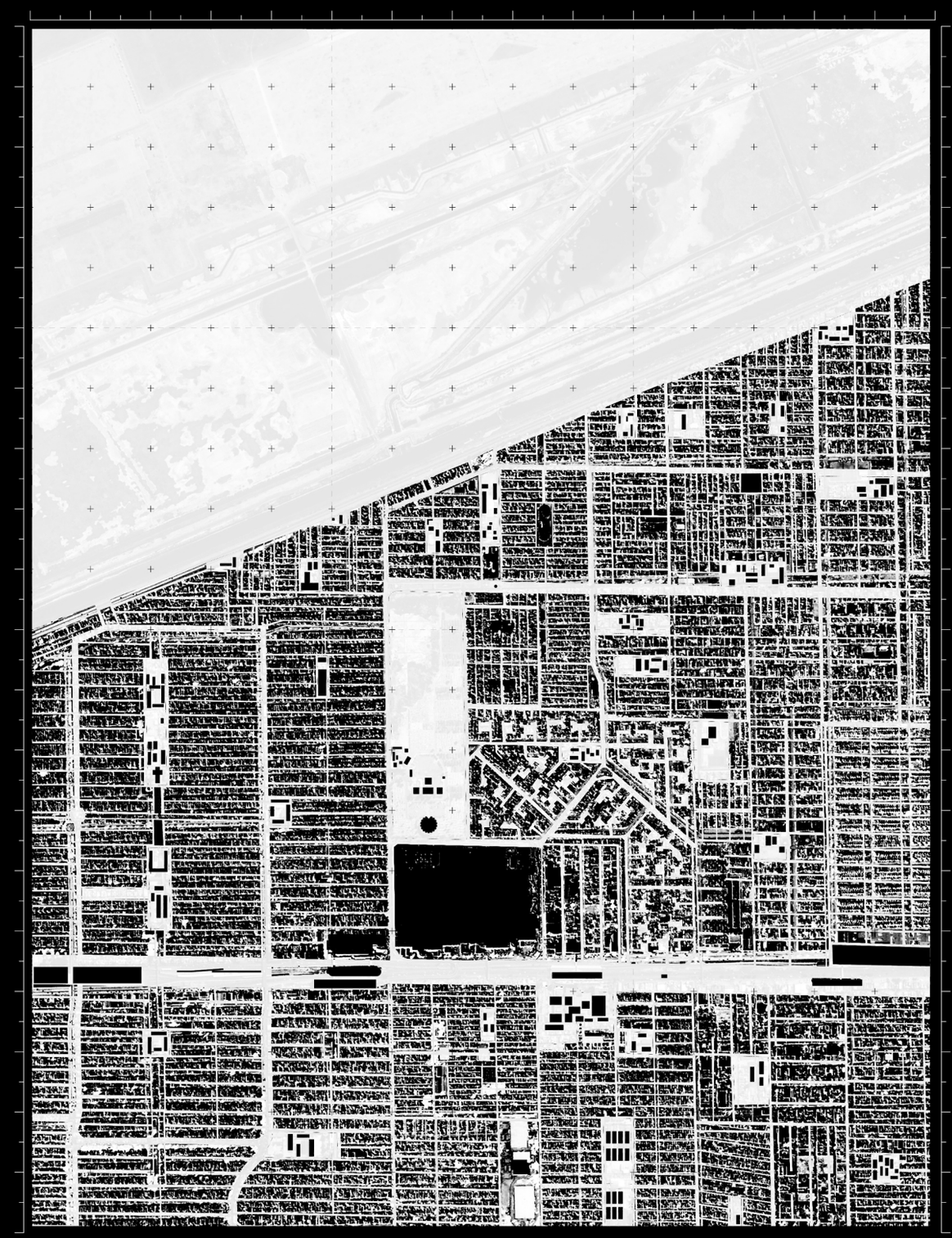
Introduction to GE7

The selected gate [GE7] sets its ground within a boundary directly influenced by Av. De los Guerrero the cemetery Jardín Guadalupano and Ciudad Azteca' CETRAM (multimodal transfer centre) in the municipality of Ecatepec, a straightforward road of nearly 1.5km that connects the surrounding neighborhoods with one of the busiest multimodal transfer centers for public transport CENTRAM Ciudad Azteca because of its location as a final station.
Due to the surrounding facilities such as the cemetery and the shopping mall the area has the potential transform from its densification, introduction and intensification of new functions.
The avenue is characterized by an almost completely deserted avenue that only manifests informal commercial activities close to the accesses of both, the cemetery and the CETRAM. With small shops are encountered at the end of the rode and buildings are mostly mono functional residential units with an average of 2 floors.

The area within the boundary of the gate wraps up a specific informal neighborhood and a gated community near Plutarco Elias Calles Street, which has been transformed into a public space corridor.



IMG. 10.15 Bird-eye perspective gate [GE6] (Source: Photograph by Zaickz Moz , 2018). **Right - FIG. 10.22 [GE7] Urban structure** (Own elaboration).



Morphological and Functional Composition

_1. The selected area has the presence of rational morphological urban structure characterized by a simple grid of regular blocks. However a different grid is found at the south of the cemetery where a gated community sets ground.

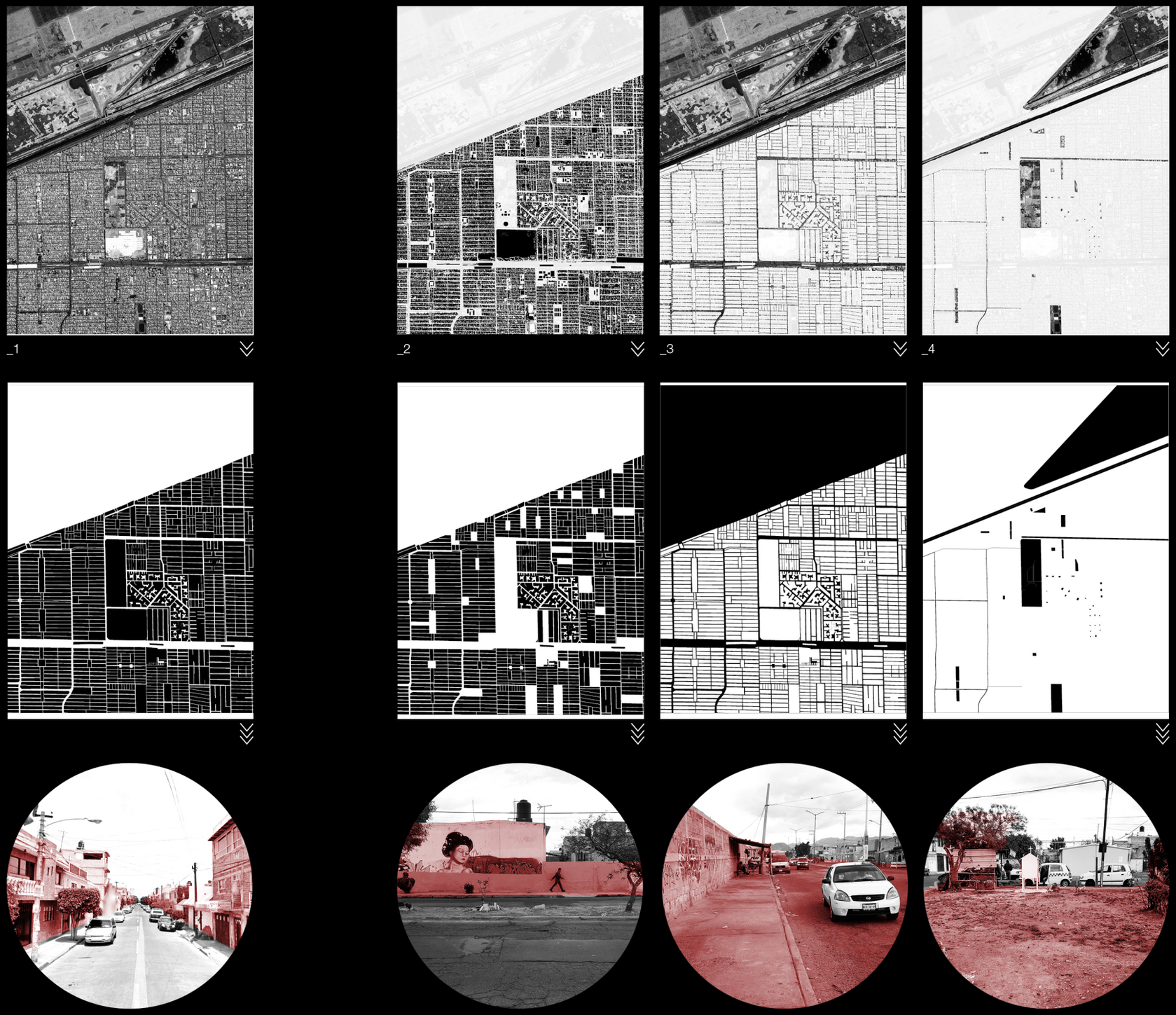
_2. As shown in the right image the area is almost completely urbanized, most of its urbanization manifests the prevalence of the working class residential areas and its mono-functional structure. The presence of the cemetery is the only relief (open space) of the urban structure.

_3. The hard open space is mostly concrete and asphalt paved surfaces for car based use, in some areas this pavement has been customized by the communities

_4. Public space in this specific area is one of its assets and key elements for transformation. The cemetery has available land that is fragmented from the neighboring communities, a common safety and control measure of this urban equipment structures.



Left - IMG. 10.16 Ecatepec bird-eye perspective view (Source: Photograph by Zaickz Moz , 2018). The photography shows the area close to the void. **Right - FIG. 10.23 Morphological and Functional composition** (Own elaboration)



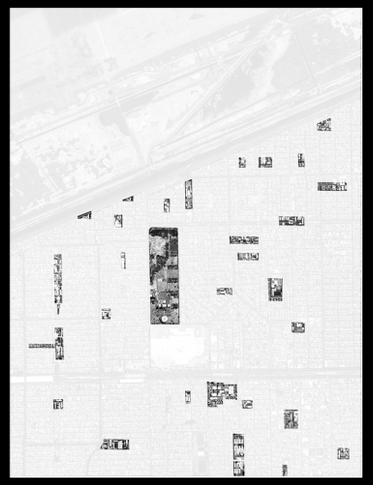
_5. Urban equipment facilities are organized in a cluster typology in the center of high residential concentration areas, this clusters have basic urban equipment such as churches, schools and markets similar to gate GN6, however the cemetery and CETRAM infrastructures play a more important role within the boundaries of the gate.

_6. Interstitial spaces of urban equipment facilities are often under used or forgotten, functioning as parking lots

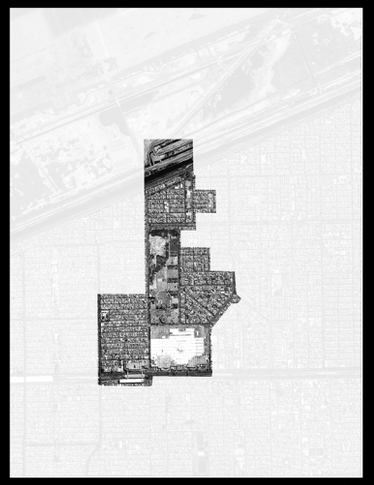
_7. The boundary of the gate wraps up areas with the potential to change and trigger new configurations in the urban structure.

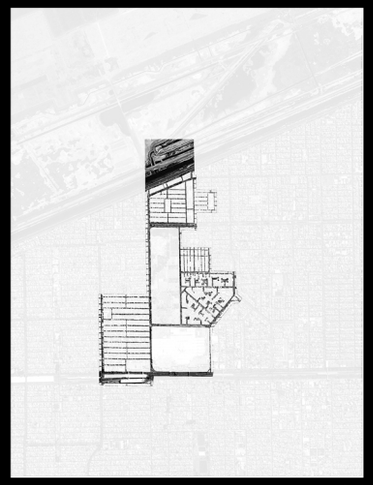
_8. It ends up connecting the residential area with the west-north section closer to the CETRAM and to the east-south to the area closer to the void (future Texcoco Park)

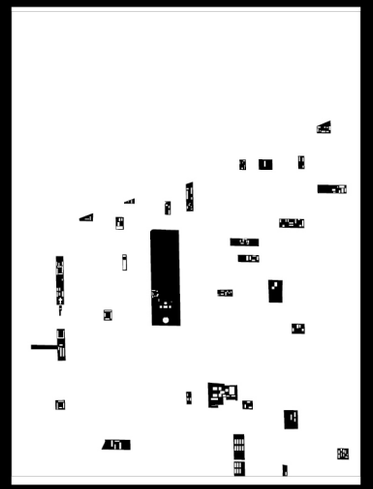


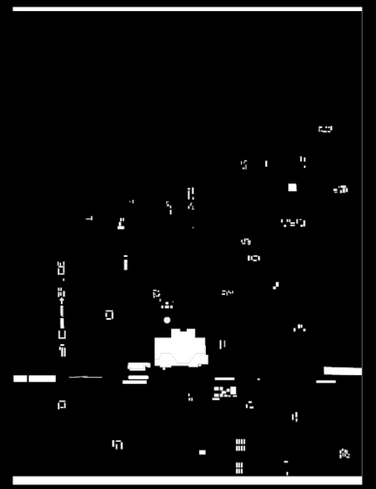

_5

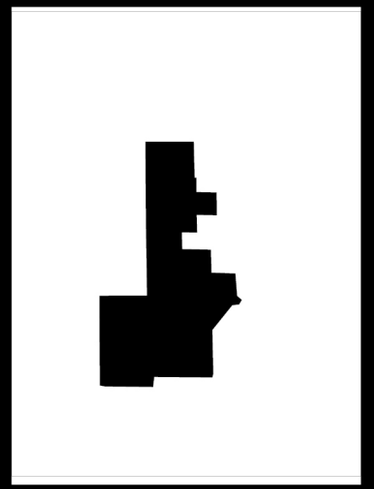

_6

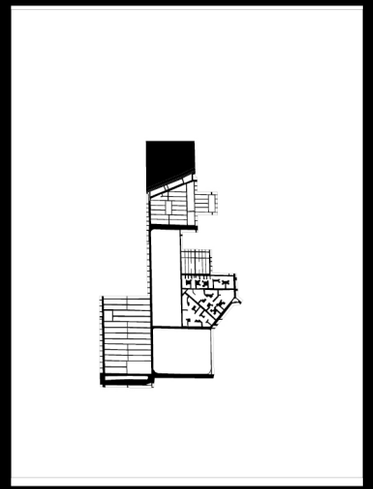

_7


_8













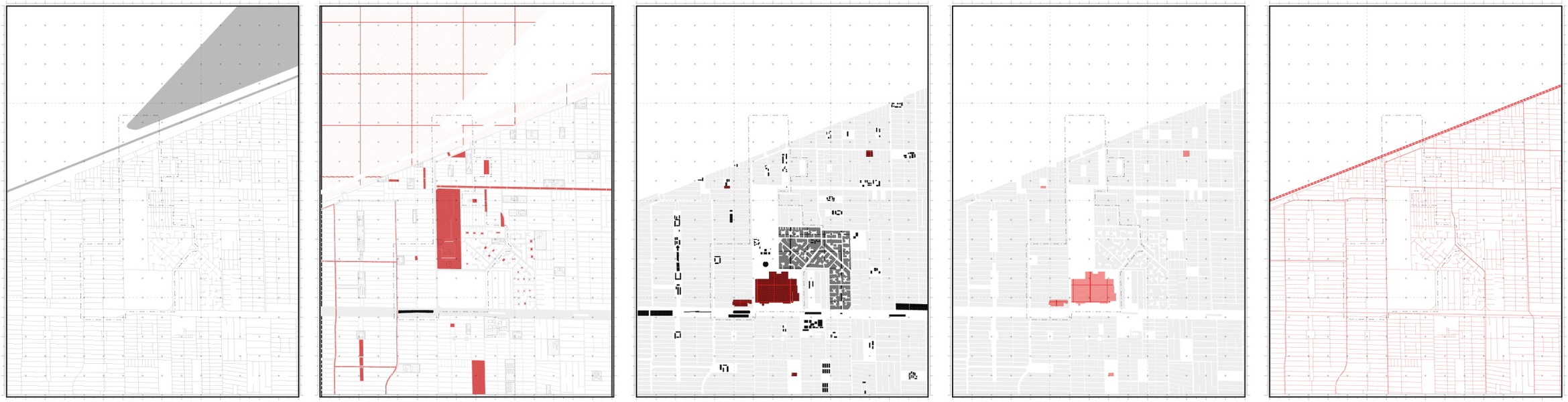




Left - IMG. 10.17 Ecatepec unused urbna equipment (Source: Photograph by Zaickz Moz , 2018). The photography shows an informal temporal market in the municipality of Nezahualcóyotl. **Right - FIG. 10.24 Morphological and Functional composition** (Own elaboration)

ASYMMETRIES OF POWER

Elements of the Area According to the 5 Systemic Goals



Water landscape integration and management

Inside the boundary that clearly separates the urban tissue of Ecatepec and the former Texcoco lake, there are water canals, open infrastructure that also functions as a barrier against flooding, and until the beginning of the cancelled airport construction there was an artificial lake that has been reduced in size, one of the artificial barriers that protected the area from flooding risks

Green infrastructure and quality of public and open space

Regarding green and public space infrastructure as mentioned in the morphological description is one of the key aspects having the potential to transform the character of the entire area

Densification of the built system

Ecatepec is characterized for having almost its entire territory urbanized, with the highest concentration of mono functional residential land use. Its build landscape is shaped by self-built housing units of low density concentrations

Productive landscapes and means of production

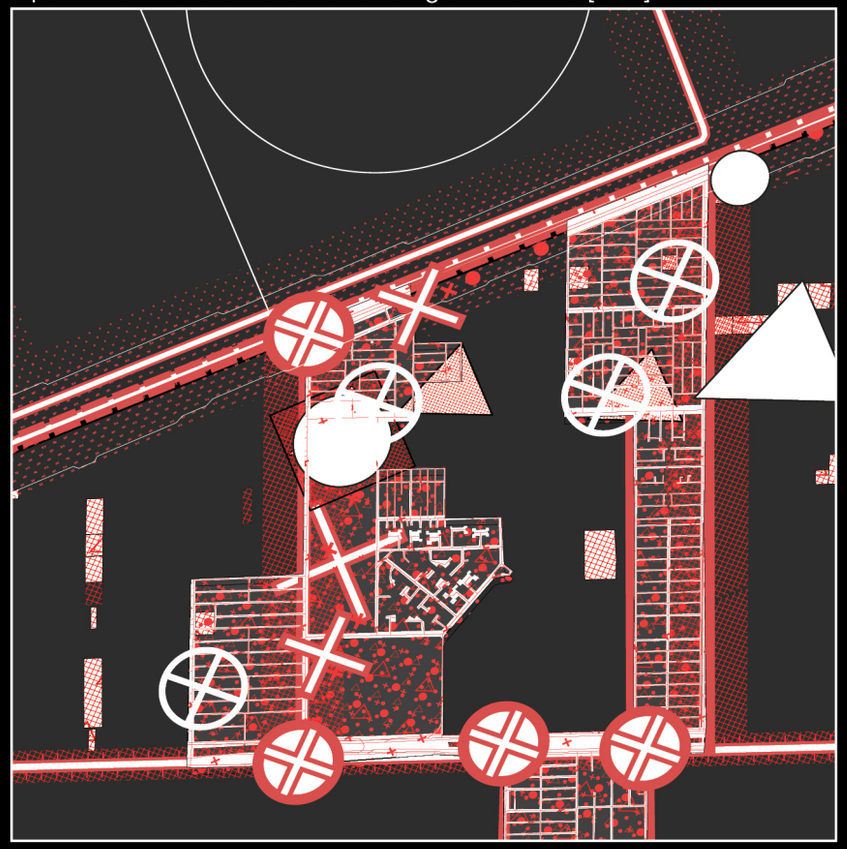
Means of production in the area are scarce, only some community gardens can be found where people grow food, such as vegetables and cactuses. Informal commercial activities close to the CETRAM and cemetery entrances are the highest concentrations of labor and along with temporary seasonal street markets are production typologies rooted to the area

Transport and mobility system

Public transport is mostly privatized and the area lacks of sufficient infrastructure to satisfy the demand of its inhabitants. However due to its closeness with the CETRAM thus the metro system the gate is connected to the general metropolitan area. Other means of transport are private car, taxis, buses and bicitaxi which are used as mobility measures to reach local areas

FIG. 10.25 Elements of the area according to the 5 systemic goals
(Own elaboration)

Spatial Actions and Potential Strategic Locations [GE7]



Legend

SG1
- Mi - Micro Scale
  - 3.2 - 4.2 - 10.3
- S - Small Scale
  - 5.2 - 11.3
  - 11.3
- M - Medium Scale
  - 6.2 - 12.3 - 13.3
  - 7.2 - 8.2
- L - Large Scale
  - 1.1
  - 2.1 - 16.3
  - 9.2
  - 14.3
  - 15.3

SG2
- Mi - Micro Scale
  - 17.1 - 18.1 - 26.3
- S - Small Scale
  - 19.1 - 23.2
- M - Medium Scale
  - 24.2
  - 20.1
  - 27.3
  - 28.3
- L - Large Scale
  - 21.1
  - 22.1 - 33.3
  - 25.2
  - 29.3

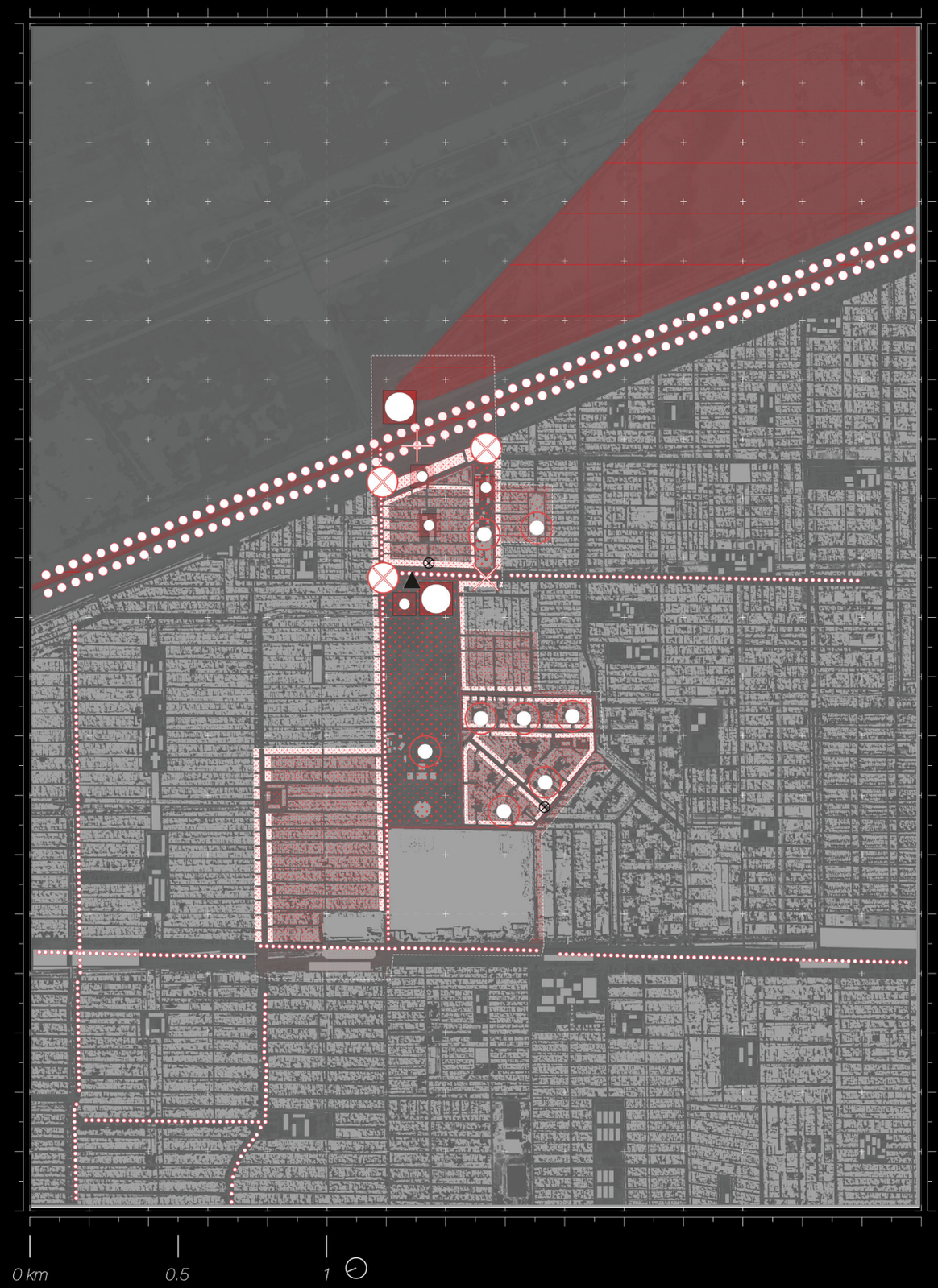
SG3
- S - Small Scale
  - 33.2
- M - Medium Scale
  - 31.1 - 34.2
  - 36.3
- L - Large Scale
  - 32.1 - 35.2 - 37.3 - 38.3

SG4
- Mi - Micro Scale
  - 42.2
- S - Small Scale
  - 39.1 - 43.2 - 47.3
- M - Medium Scale
  - 40.1 - 44.2 - 48.3
- L - Large Scale
  - 41.1 - 49.3
  - 45.2
  - 46.2

SG5
- S - Small Scale
  - 52.2 - 56.3
- M - Medium Scale
  - 50.1
  - 53.2 - 57.3
- L - Large Scale
  - 51.1 - 60.3
  - 54.2
  - 55.2
  - 58.3
  - 59.3
- Inter-municipal connections

Within the findings revealed by the previous analyses the gate shows the potential to strengthen the public space capacity at the local level, improving not only its quality but increasing its accessibility and quantity per inhabitant. The gate above all of the three selected cases presents the highest integration to the metro system, being one of the main stops the starting point of its future development. Due to this reason its intermunicipal value increases, allowing the gate to link functions with other gates. Furthermore the connection with the metropolitan park enables new forces capable of changing the area such as the adaptation of the current cemetery. Transport mobility and public space are strong potentials in the area that can trigger other systemic goals such as densification and water management as will be studied locally in the next chapter.

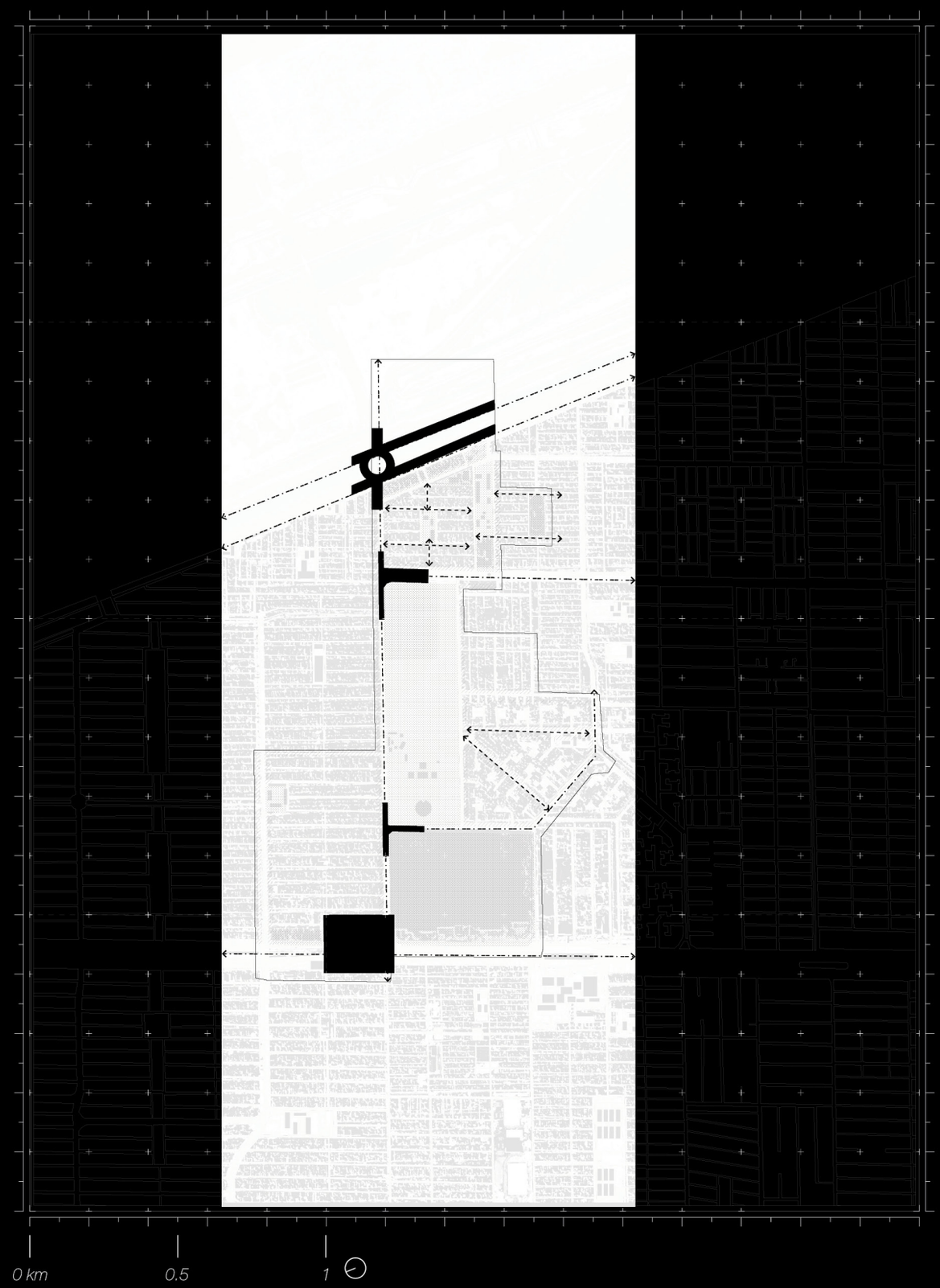
Left - FIG. 10.26 Map of potentials [GE7] (Own elaboration) **Right - FIG. 10.27 Detail map of the potentials [GE7]** (Own elaboration)

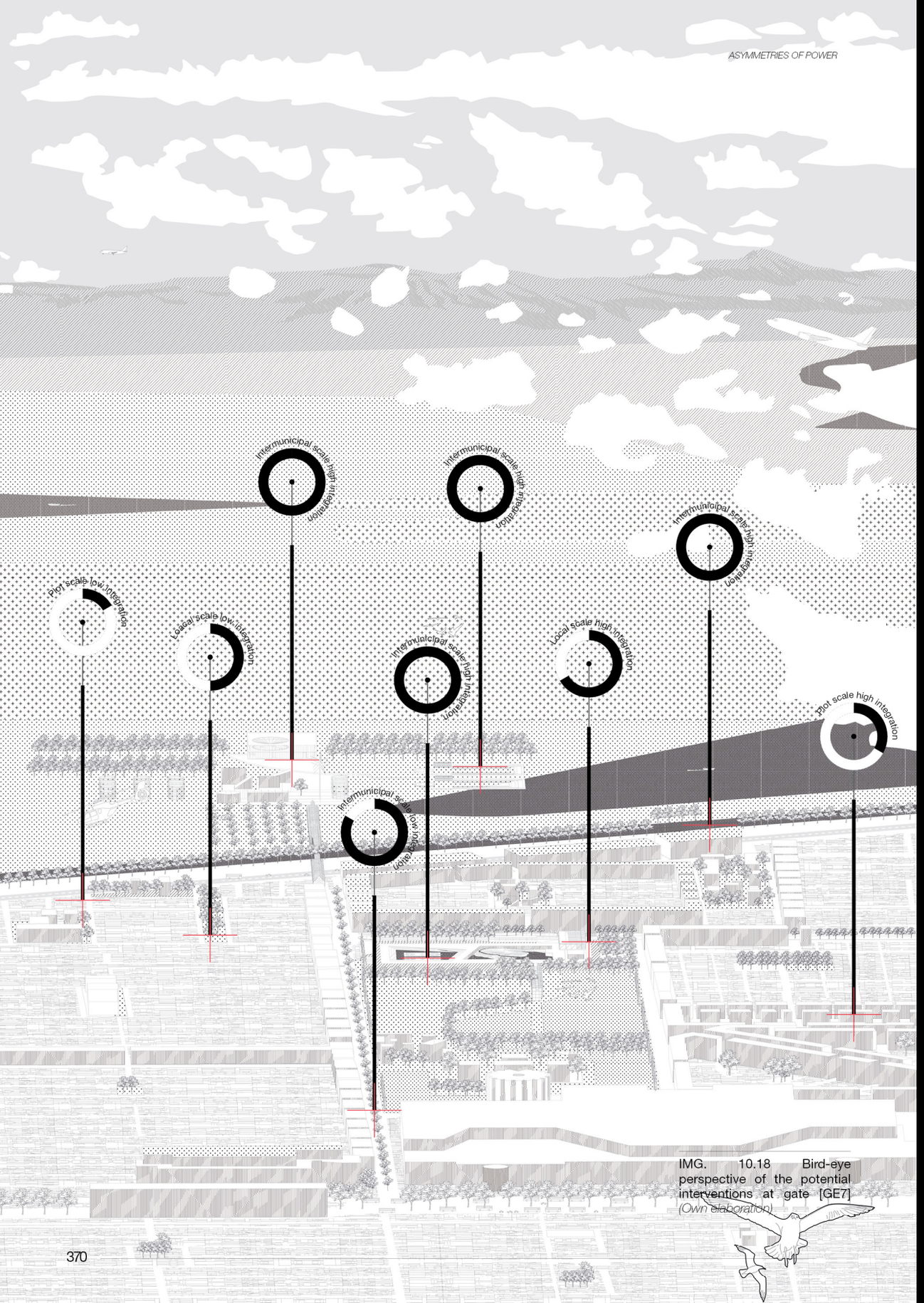




Left - FIG. 10.28 Exploded axonometric *(Own elaboration)*
The figure shows the different multiscalar layers revealing the potential locations

Right - FIG. 10.29 Map of multiscalar potential locations *(Own elaboration)*





IMG. 10.18 Bird-eye perspective of the potential interventions at gate [GE7] *(Own elaboration)*

Gate [GE7] has several potentials at an intermunicipal scale (ecological corridors, and a large public space), which require higher levels of participation between stakeholders such as federal government and an empowered municipality since their implementation needs flexibility regarding land use. Locally the gate can accomplish higher transformation levels by focusing on transport and mobility, public space and densification as the main drivers of change reprograming the area starting from the public transport node which already adds value to the site.



CHIMALHUACAN GATE [GC3]

ASYMMETRIES OF POWER



FIG. 10.30 *(Own elaboration) The figure shows the location of [GC3].*

Introduction to GC3

The selected gate [GC3] sets its ground within a boundary directly influenced by Av. Ignacio Manuel Altamirano a straightforward road of nearly 2.0km that connects the surrounding neighborhoods with one the stations of the metrobus transport system (MEXIBUS). The avenue is characterized by an almost completely commercial ground floor, with small shops, and buildings up to 3 floors where apartments and offices are in place under an uncontrolled rent system (not legally recognized by the government avoiding tax payments) similarly to that of gate GN6.

The area within the boundary of the gate wraps up a specific informal neighborhood that struggles with continuous hazards due to its closeness with the urban void (contamination, sand blizzards, flooding and lack of drinkable water)



IMG. 10.19 Bird-eye perspective gate [GC3] (Source: CITP, 2012).



Right - FIG. 10.31 [GC3] Urban structure (Own elaboration).

Morphological and Functional Composition

_1. The selected area has the presence of rational morphological urban structure characterized by a simple grid of regular blocks that deviates from a central radius.

_2. As shown in the right image the area is almost completely urbanized, most of its urbanization manifests the prevalence of the working class residential areas and its mono-functional structure. The presence of the cemetery is the only relief (open space) of the urban structure.

_3. The hard open space is mostly concrete and asphalt paved surfaces for car based use, in some areas that have not been urbanized entirely the floor remains soft sand that easily can turn into mud during raining seasons. However the area presents a large open space directly connected to the urban void, currently wasteland with a water treatment plant within its boundary

_4. Public space in this specific area is one of its assets and key elements for transformation. From the year 2002 up until now a central hub for urban equipment has been developed with public spaces along corridors



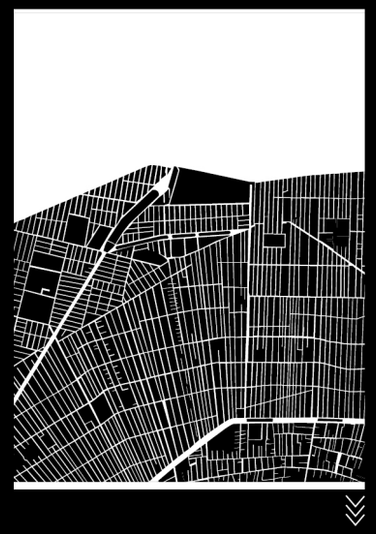
Left - IMG. 10.20 Bird-eye view Chimalhuacan gate [GC3] (Source: CITP, 2012). Right - FIG. 10.32 Morphological and Functional composition (Own elaboration)

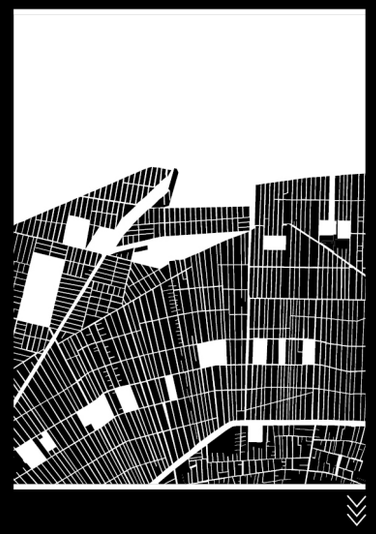


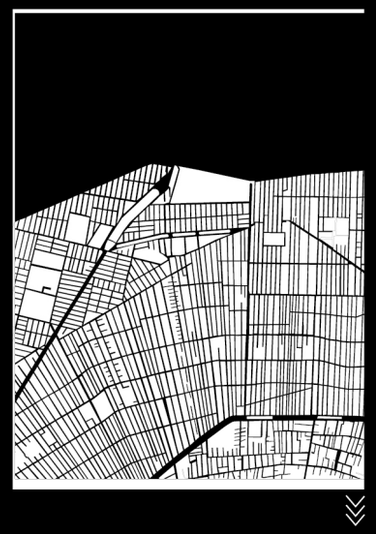


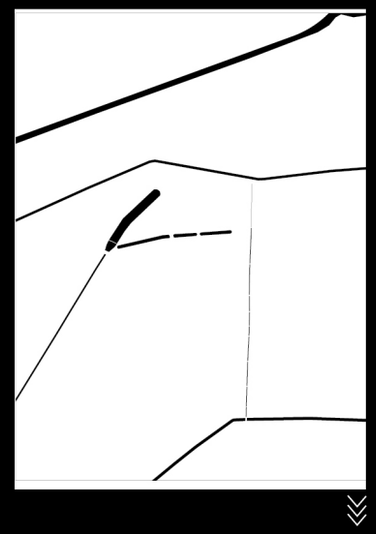


















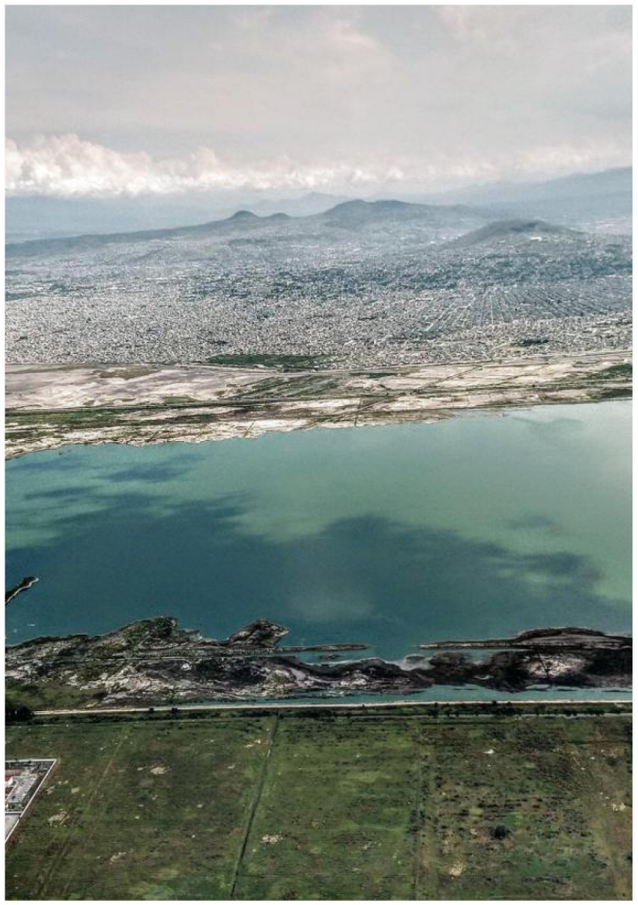


_5. Urban equipment facilities are organized in a cluster typology in the center the area, with high concentration of educational facilities that serves a wider range of inhabitants making it strategic for enhancing connectivity

_6. Interstitial spaces of urban equipment facilities are often under used or forgotten, functioning as parking lots

_7. The boundary of the gate wraps up areas with the potential to change and trigger new configurations in the urban structure due to the possibility hidden in the open space

_8. It ends up connecting the residential area with the south section closer to the metrobus station and to the north with the urban equipment cluster and the open space connected to the void (future Texcoco Park)



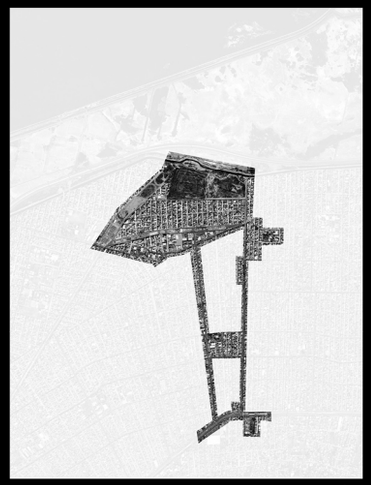
Left - IMG. 10.21 Bird-eye view of Nabor Carrillo artificial lake close to Chimalhuacan border. (Source: Terceravia.mx, 2018). Right - FIG. 10.33 Morphological and Functional composition (Own elaboration)



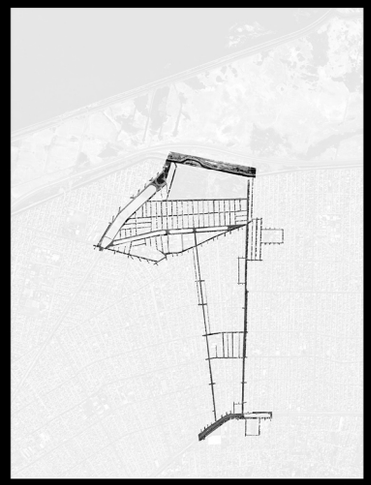
_5



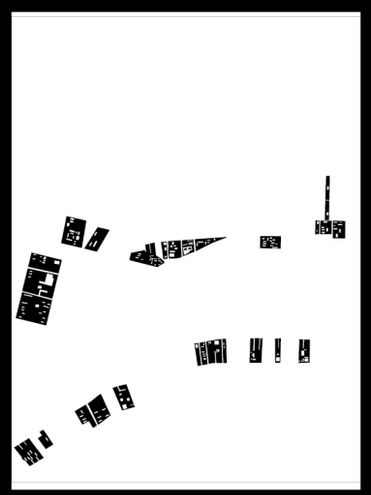
_6



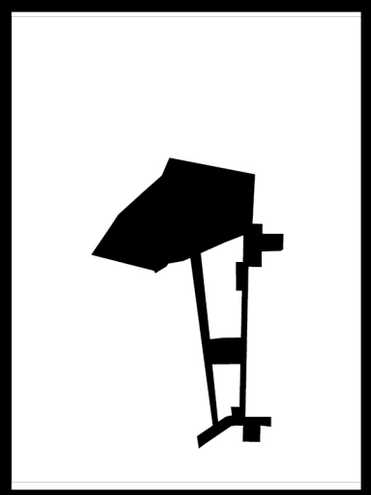
_7

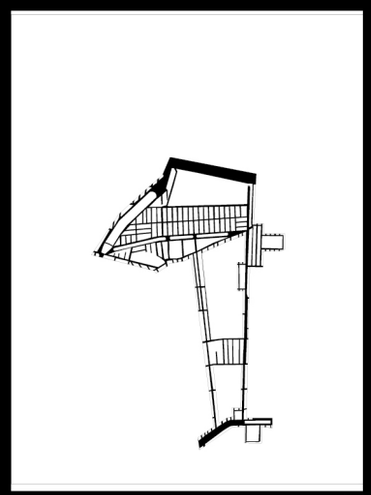


_8



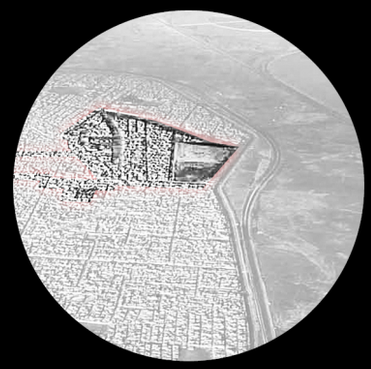








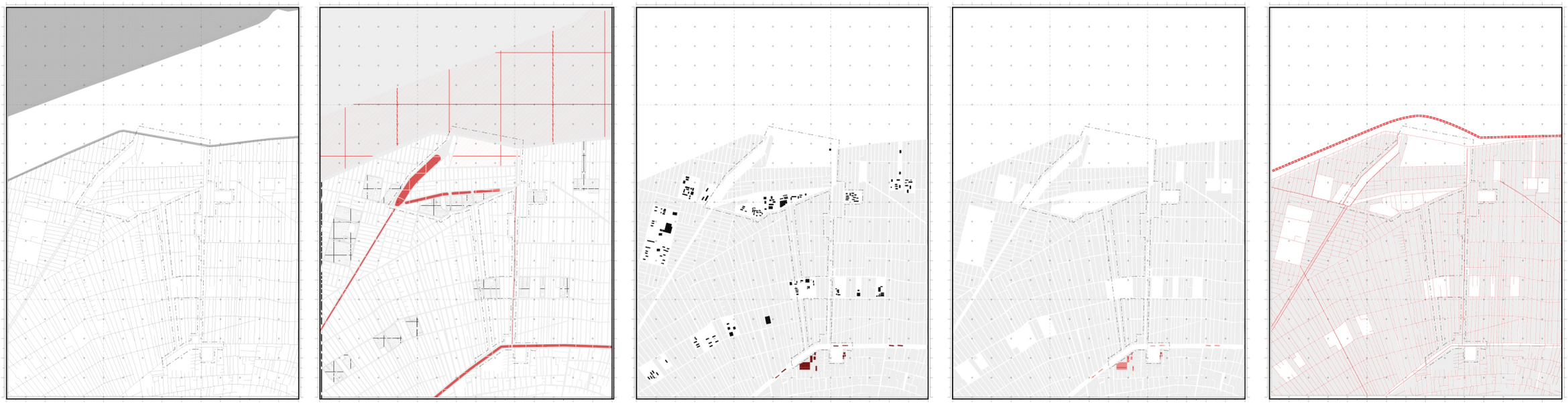






ASYMMETRIES OF POWER

Elements of the Area According to the 5 Systemic Goals



Water landscape integration and management

Inside the boundary that clearly separates the urban tissue of Chimalhuacan and the former Texcoco Lake, there are water canals, open infrastructure that also functions as a barrier against flooding and Nabor Carrillo artificial lake, one of the most important water bodies for water supply in the metropolis

Green infrastructure and quality of public and open space

Regarding green and public space infrastructure as mentioned in the morphological description is scarce in the urban tissue of the municipality showing a particular concentration in the selected area where in recent years has been adapted to host schools and basic urban equipment

Densification of the built system

Chimalhuacanis characterized for its highest concentration of mono functional residential land use which is mostly of informal processes. Its build landscape is shaped by self-built housing units of low density concentrations despite the amount of inhabitants living in them, the municipality has along with nezahualcoyotl a high overcrowding per plot area (INEGI, 2010)

Productive landscapes and means of production

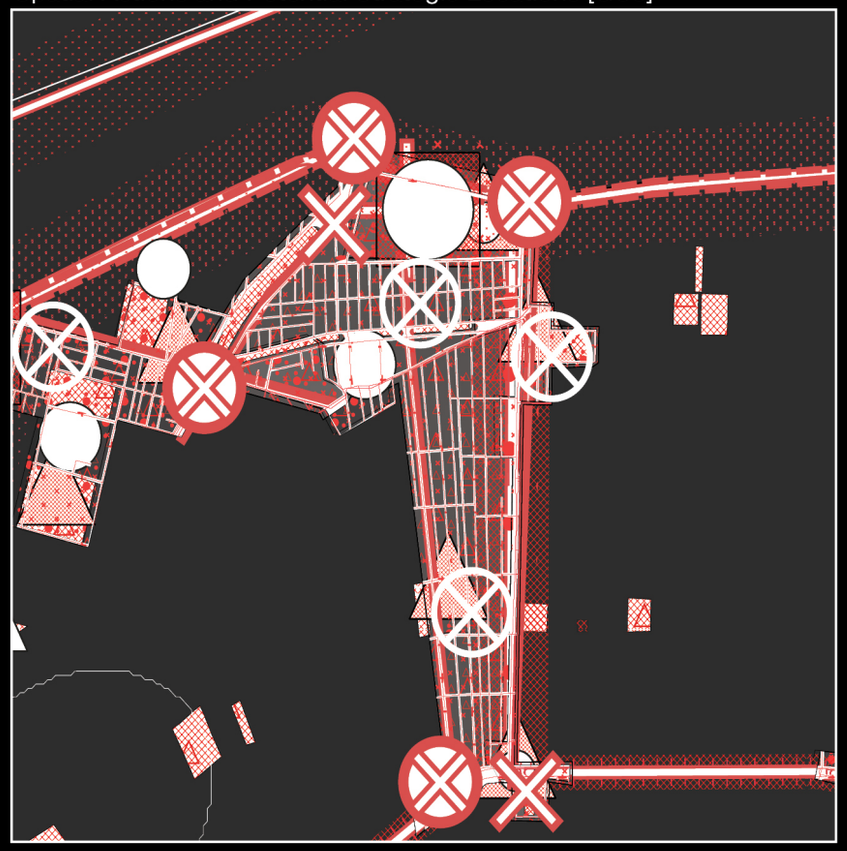
Means of production in the area are scarce, only some community gardens can be found where people grow food, such as vegetables and cactuses

Transport and mobility system

Public transport is mostly privatized and the area, however the MEXIBUS line has reached the area significantly improving its mobility. Nevertheless Chimalhuacan still lacks of sufficient infrastructure to satisfy the demand of its inhabitants. Other mobility measures are private car, taxi, bicitaxi and buses of various types

FIG. 10.34 Elements of the area according to the 5 systemic goals
(Own elaboration)

Spatial Actions and Potential Strategic Locations [GC3]



Legend

SG1
- Mi - Micro Scale
  - 3.2 - 4.2 - 10.3
- S - Small Scale
  - 5.2 - 11.3
  - 11.3
- M - Medium Scale
  - 6.2 - 12.3 - 13.3
  - 7.2 - 8.2
- L - Large Scale
  - 1.1
  - 2.1 - 16.3
  - 9.2
  - 14.3
  - 15.3

SG2
- Mi - Micro Scale
  - 17.1 - 18.1 - 26.3
- S - Small Scale
  - 19.1 - 23.2
- M - Medium Scale
  - 24.2
  - 20.1
  - 27.3
  - 28.3
- L - Large Scale
  - 21.1
  - 22.1 - 33.3
  - 25.2
  - 29.3

SG3
- S - Small Scale
  - 33.2
- M - Medium Scale
  - 31.1 - 34.2
  - 36.3
- L - Large Scale
  - 32.1 - 35.2 - 37.3 - 38.3

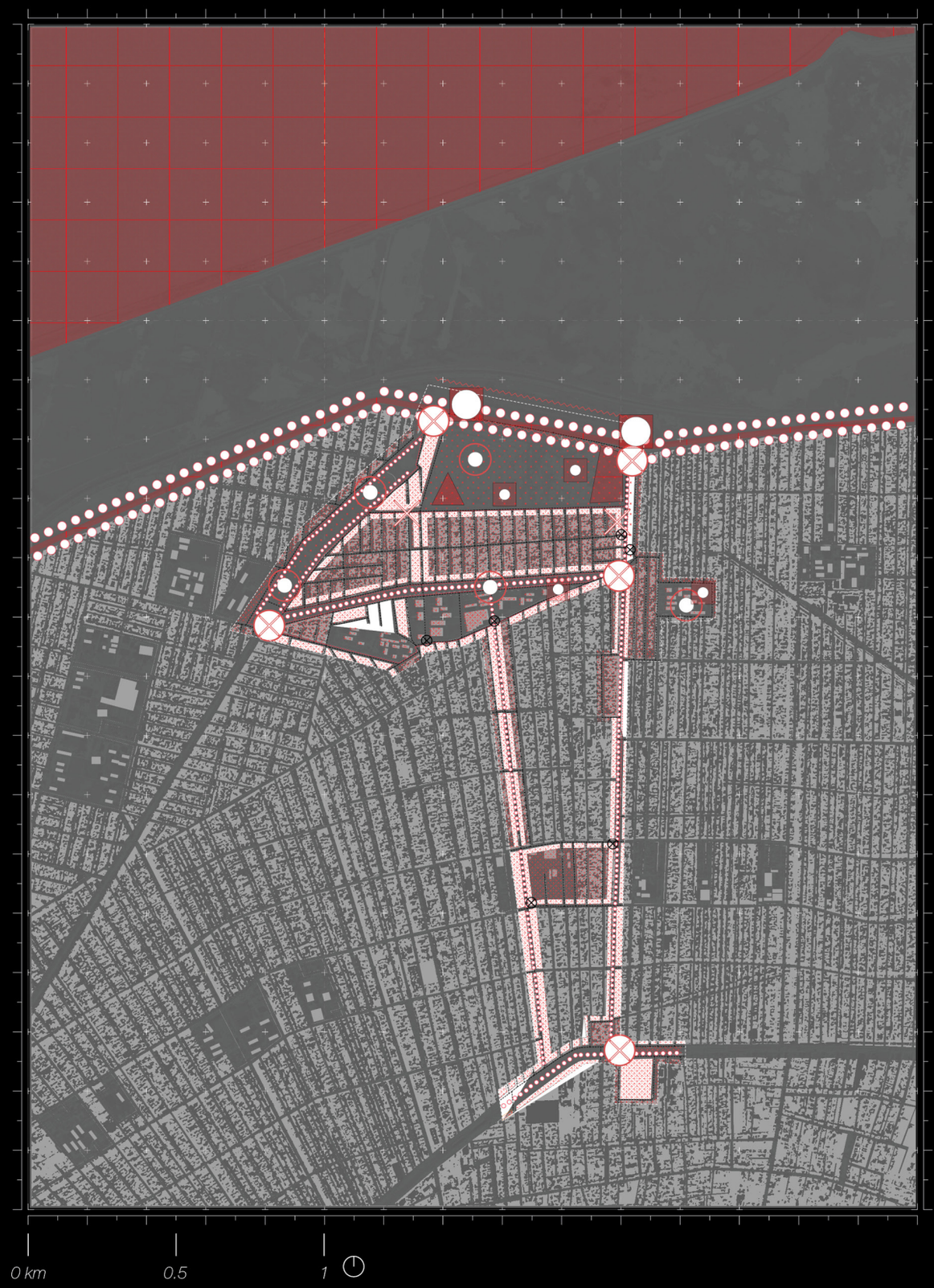
SG4
- MI - Micro Scale
  - 42.2
- S - Small Scale
  - 39.1 - 43.2 - 47.3
- M - Medium Scale
  - 40.1 - 44.2 - 48.3
- L - Large Scale
  - 41.1 - 49.3
  - 45.2
  - 46.2

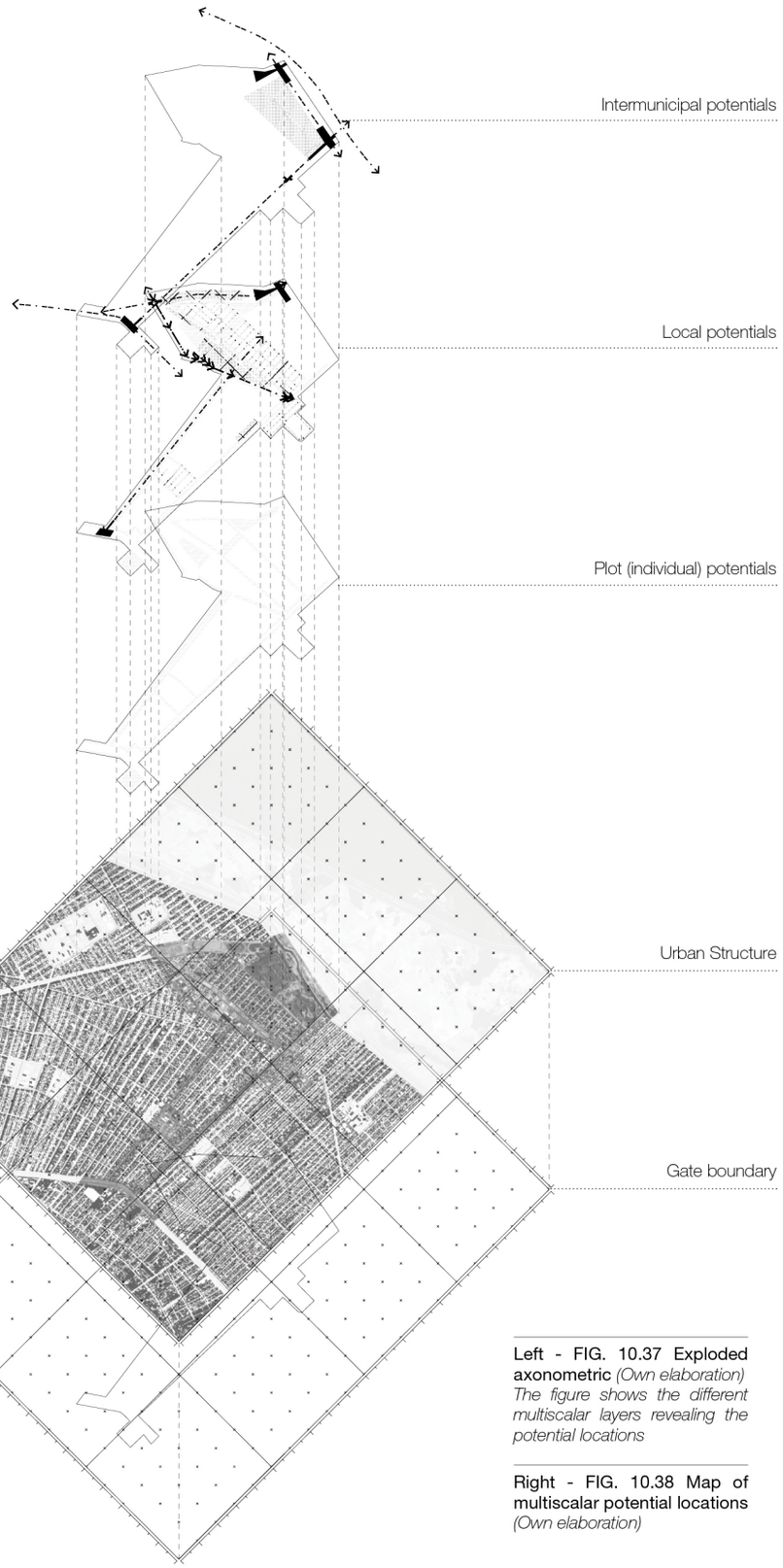
SG5
- S - Small Scale
  - 52.2 - 56.3
- M - Medium Scale
  - 50.1
  - 53.2 - 57.3
- L - Large Scale
  - 51.1 - 60.3
  - 54.2
  - 55.2
  - 58.3
  - 59.3

Inter-municipal connections

The previous analysis revels several potentials in the gate such as its intermunicipal connection trough ecological and green corridors and the development of new mix use patterns along the main artery of the gate. However there is an inherited local potential for water management and public space due to wasteland in the north of the gate. This section has shown the newest developments of urban equipment since the early 2000's, program that can be complemented and attract actors whiling to invest in the area surrounding the connection point between the metropolitan park and the urbanized tissue. Furthermore local potentials regarding densification and public space can be strengthen with the cohesive development of the gate. Most of its potential lies in public space and water management. While the later requires a higher participation of actors with power such as the municipality, the process can be accelerated by the local development of the public space.
Regarding densification of the built system the systemic goal can also become reality if the area develops the necessary urban equipment, it will not only be an attractive place for reprogramming and mixing uses but of new typologies due to its closeness to the south intermunicipal transport connection and the influence for development attracted by the connection with metropolitan park.

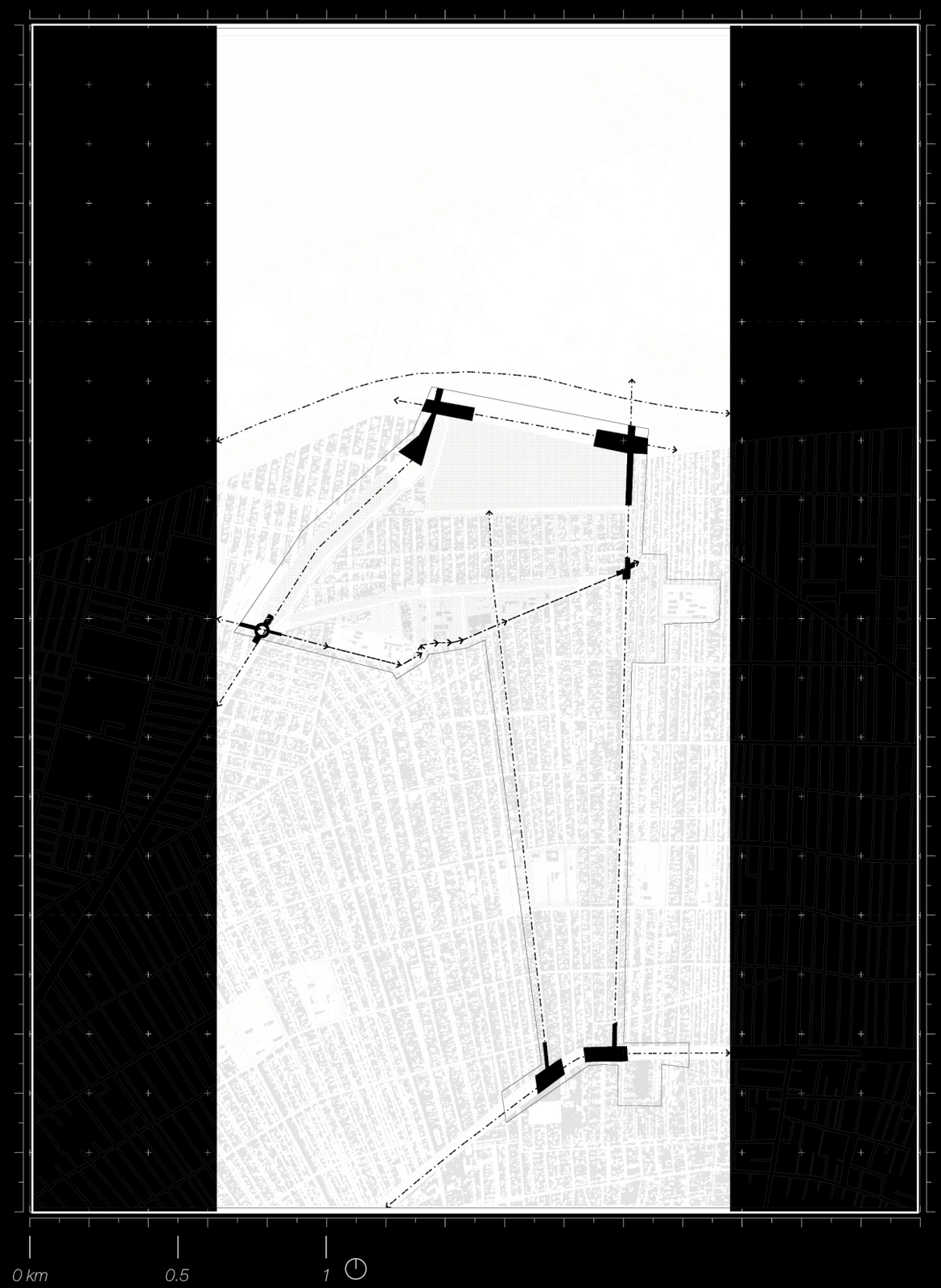
Left - FIG. 10.35 Map of potentials [GC3] (Own elaboration) **Right - FIG. 10.36 Detail map of the potentials [GC3]** (Own elaboration)

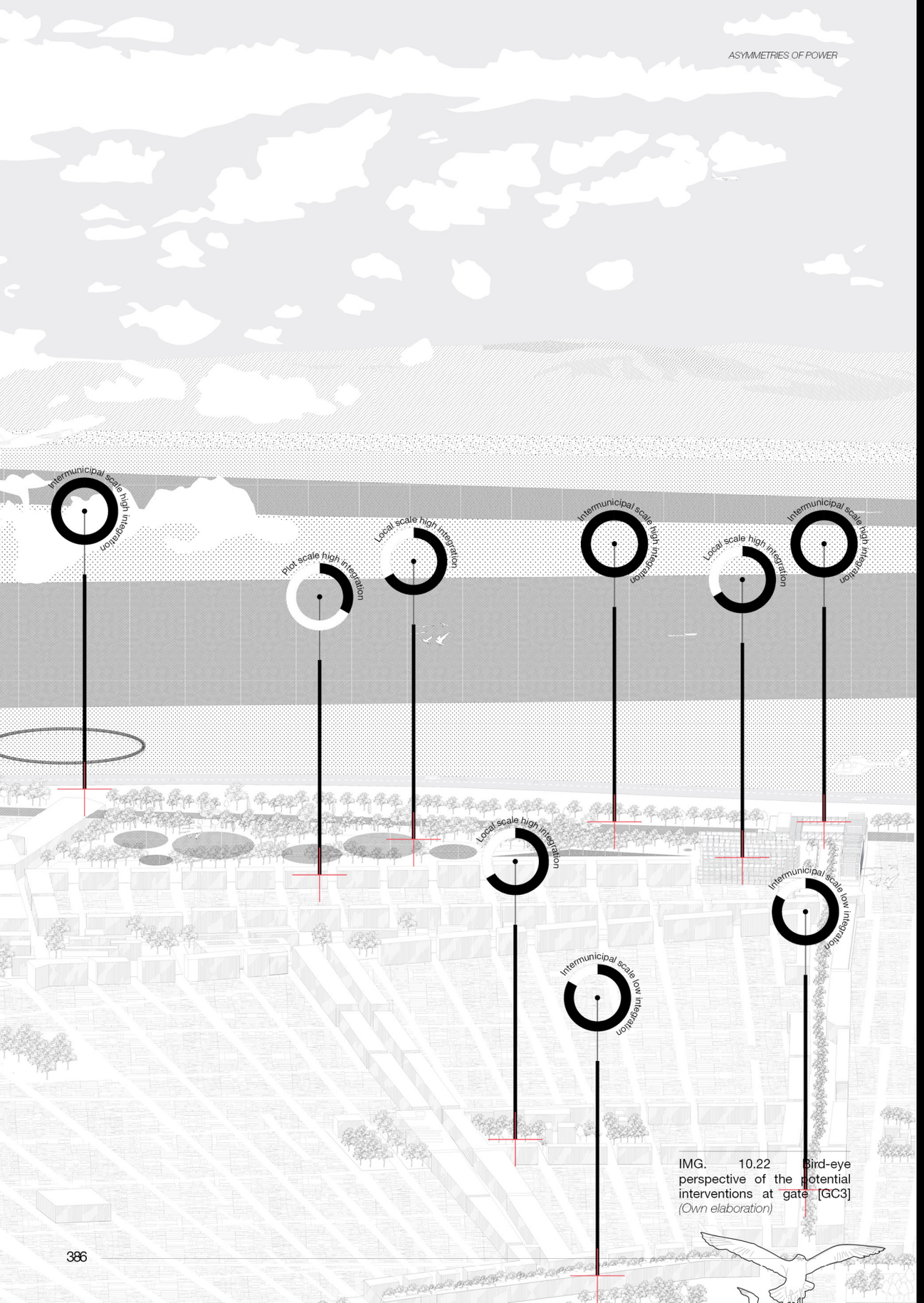




Left - FIG. 10.37 Exploded axonometric *(Own elaboration) The figure shows the different multiscalar layers revealing the potential locations*

Right - FIG. 10.38 Map of multiscalar potential locations *(Own elaboration)*

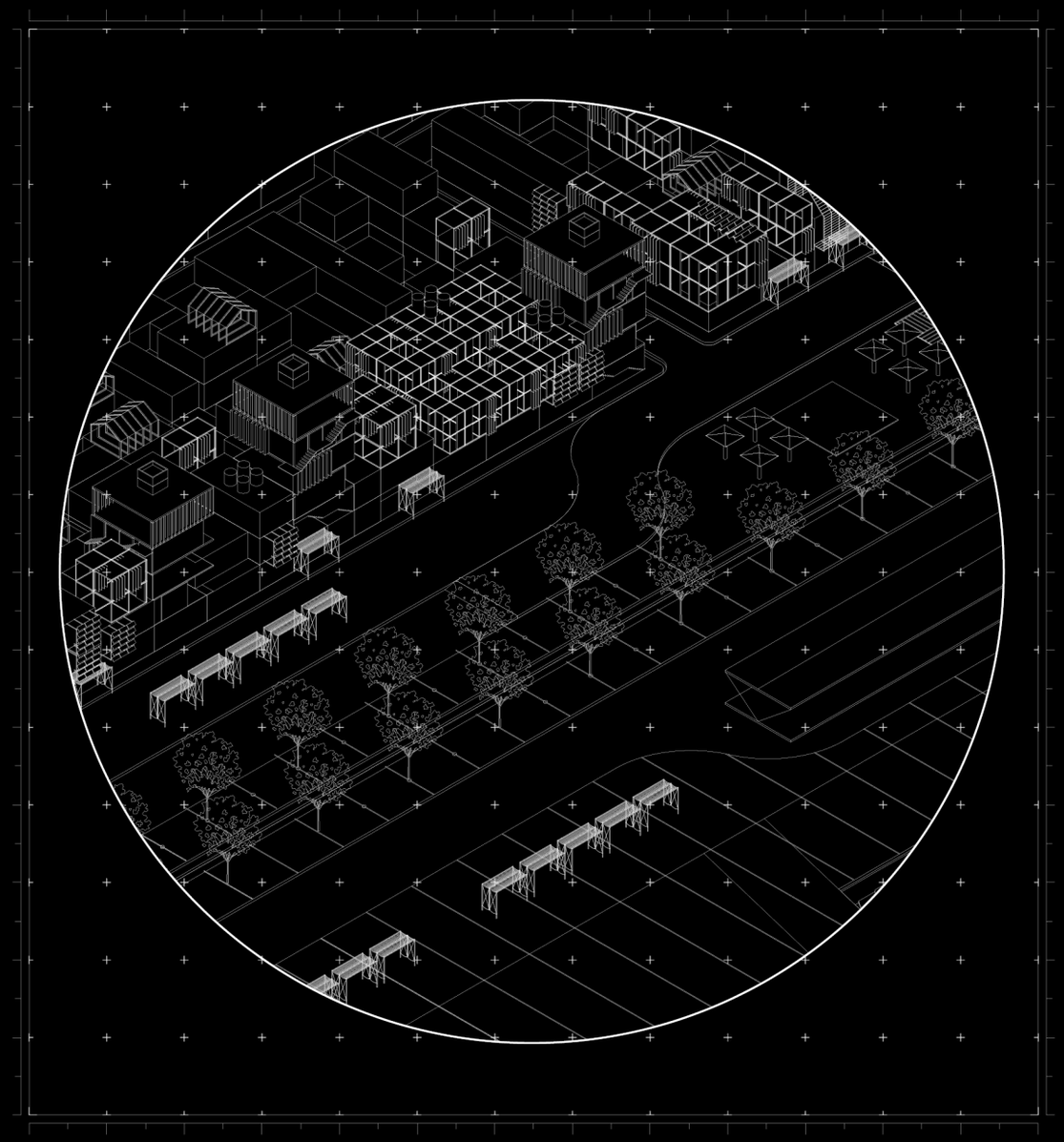




IMG. 10.22 Bird-eye perspective of the potential interventions at gate [GC3] *(Own elaboration)*

Potentials in gate [GE3] are focused on the area close to the boundary between the urban tissue and the future metropolitan park. At intermunicipal level the intrinsic capacity of the area to successfully connect with the park is clear, current urban projects have been focusing on urban equipment which can be supported by stressing water and management and public space systemic goals. Locally the gate reveals better capacities in locations closer to the public transport system where density and reprograming of the existing urban fabric are more effective.

11 DESIGNING THE LOCAL LEVEL



Overview

The following chapter elaborates on three locations chosen due to their possible local capacities for adaptive development. Two main scenarios per location will be constructed to reveal the later and one will be chosen in order to evaluate its adaptable capacities.

Selection of the Areas for Design Exploration

The gates work at a metropolitan level influencing higher functional flows linking the system of sub-centralities and urban interventions to the overall system, in this regard some specific local areas (neighborhood level) need to be further explored by design in order to reveal the capacities of local transformation and adaptation patterns that can be stressed by the approach. Therefore a selection of one specific area of 250m x 250m per gate will be selected. Each local area will stress different development and different levels of participation in order to reach the systemic goals. By zooming in to this specific local scale the design explorations at the micro and small level can be studied thoroughly.

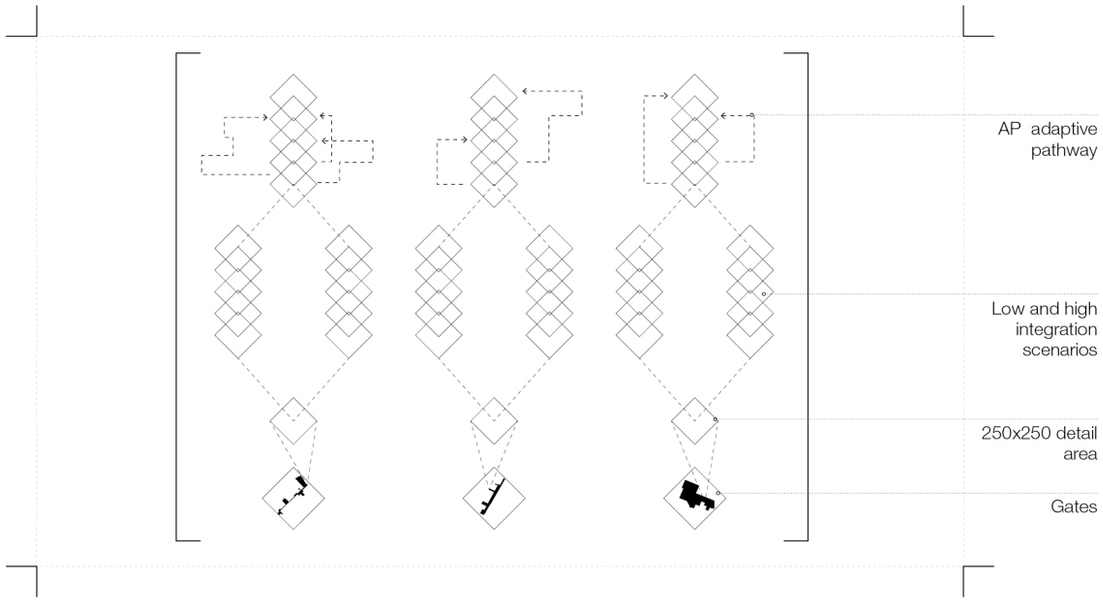


FIG. 11.10 Last section of the adaptive *(Own elaboration) The figure shows the last steps needed to test the adaptive approach.*

The gates work at a metropolitan level influencing higher functional flows linking the system of sub-centralities and urban interventions to the overall network, in this regard some specific local areas (neighborhood level) need to be further explored by design in order to reveal the capacities of local transformation and adaptation thus constructing scenarios with different levels of integration between stakeholders.

_Scenario construction

The scenario making method in this report will stress 2 particular levels of participation, the first one (the immediate possible) is a scenario based on thorough local participation without players with high hierarchy levels of power, the second one (the desirable) is a scenario based on a high level of integration with the participation of both, local and the most powerful actors. Both scenarios will be constructed at the local level of 3 selected gates in order to study their evolutionary changes through time (see chapter 10). Furthermore the aim of the scenarios will depict several focus points or thresholds, conditions at which the participatory strategy taken will no longer achieve the formulated objectives thus revealing a needed change or adaptation to higher participation levels, in short the adaptive tipping points or ATP's (van Veelen et Al., 2015, Kwadijk et Al., 2010; Renaud et Al., 2013).
As a tool to elaborate the desire scenarios, a multidimensional (e.g. scale of actions, stakeholders involved, systemic goal stressed) diagram is used to depict the following:

_The time frame of the transformation (phases)
_ When and which stakeholder is needed in order to advance to the next stage/phase
_The spatial actions an their incrementive scale involved in the development of the scenario
_ The adaptive tipping points ATP's where a change in strategy is needed functioning as evaluation points

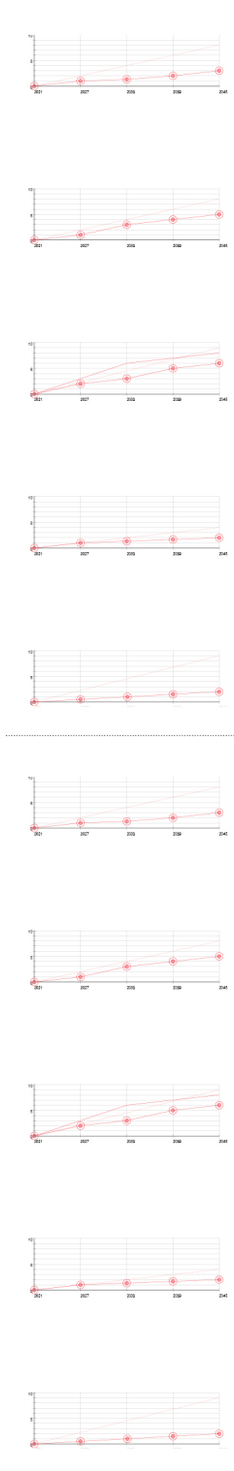
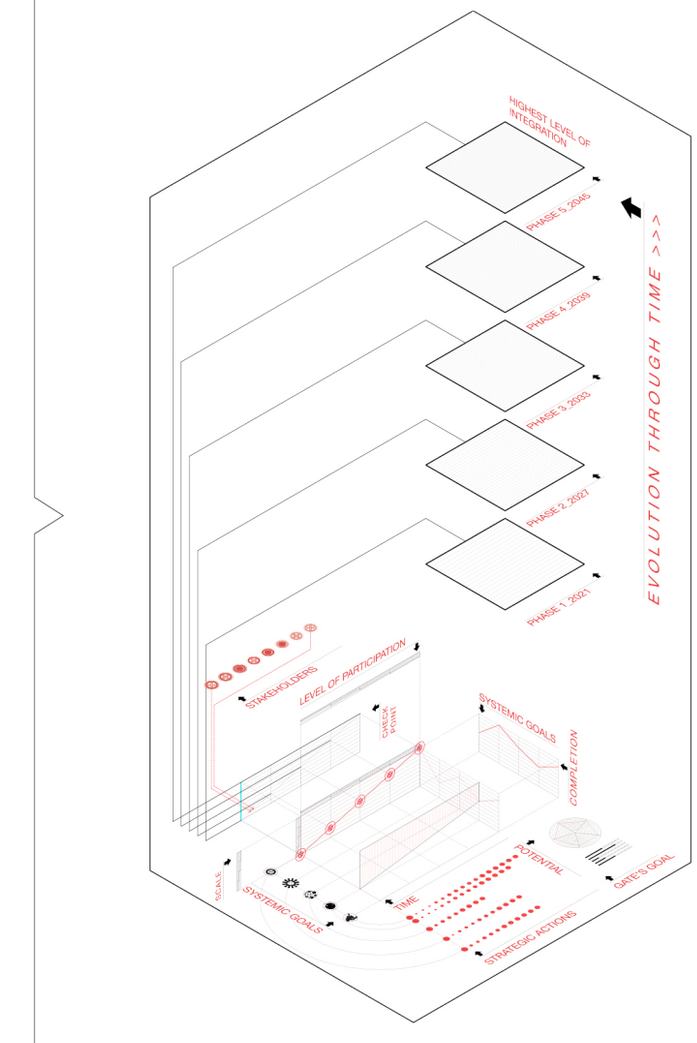
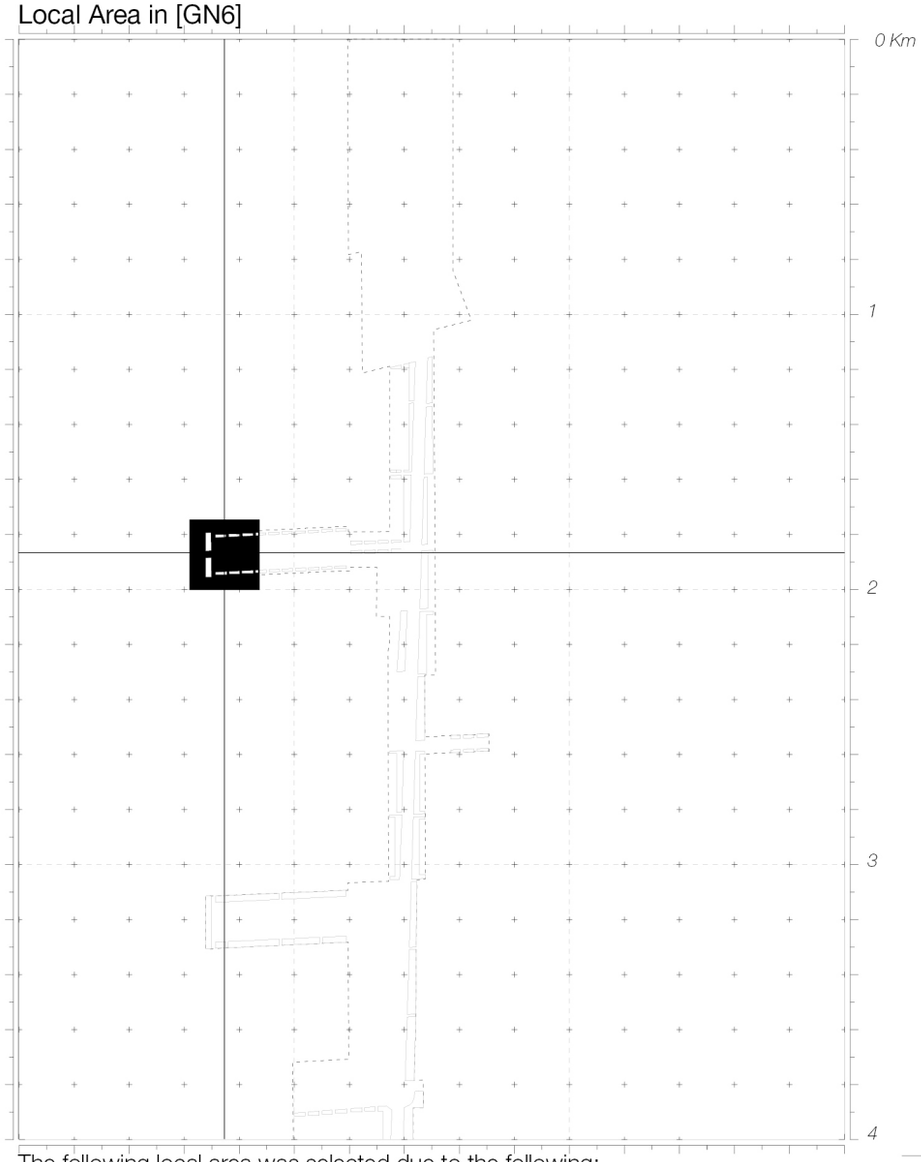


FIG. 11.11 Instruction drawings used to develop the different scenarios *(Own elaboration).*



Left – Low integration and high integration of stakeholder participation levels per systemic goal
Right- diagram of adaptation depicting the different paths, stakeholders involved, scale of actions taken and desirable scenario as the conclusive goal.

Local Area in [GN6]



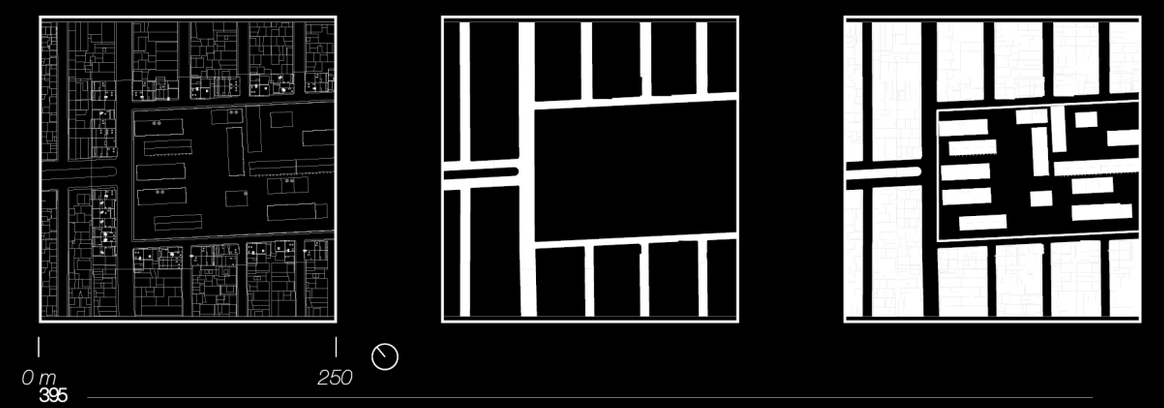
The following local area was selected due to the following:

_The area is completely urbanized and has no public space available .
_It is an example of the Node pattern of urban equipment in the municipality.
_ The area has an immediate influence from a main road artery.
_There are commercial areas around the perimeter of the central node.
_Streets have the average size if width despite the efforts of introducing a bicycle-path.
_Urban equipment is fragmented from its surroundings by means of division walls usually made for safety issues.
_Housing is still growing informally following the same patterns across the municipality (see urban development and housing in chapter 7).
_Appropriation of streets is a regular pattern in the area since people use them to plant new trees, building benches to gather outside their doorstep or changing the street concrete floor to fit their own personal aesthetic.

Left - FIG. 11.12 Selection of the are of study *(Own elaboration).*

Right - IMG. 11.10 Satellite image of the selected area *(Source: Google Earth, 2018).*
FIG. 11.13 Urban structure of the selected area *(Own elaboration).*









IMG. 11.11-Up and 11.12-Bottom *(Google maps, 2020) The images show the current state of the selected area.*





IMG. 11.13-up and 11.14-Bottom *(Google maps, 2020) The images show the current state of the selected area.*

Scenarios Gate [GN6]

Lowest Integration Scenario

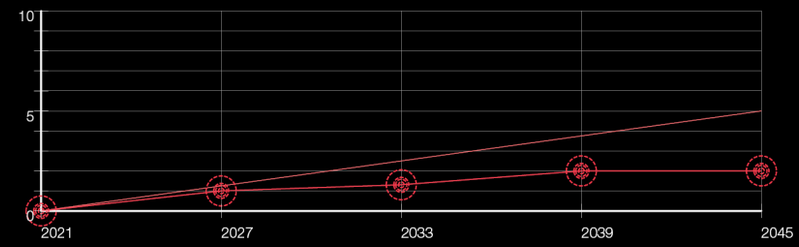
This pathway stresses a bottom-up approach with only the participation of local residents to collectively achieve the systemic goals formulated by the approach. It is based on local agreements without major involvement from big power actors. However the local participatory process involves NGO's and organizations that will help the mediation of decisions with municipal authorities. This is required to continue with an organized transformation that is recognized by the municipality as a formal process.

_Water landscape integration and management
2021-2027_ The process begins with the involvement of the community, by informing and teaching them the process through which they can accomplish a water sensitivity, not only for sustainability purposes but as a strategy that allows them to spend less and ensure the use of it throughout the year. Micro scale interventions can be accomplished by reducing paved surfaces inside plots.
2027-2033_ The process continues and several NGO help the community to develop a strategy in order to ask for subsidies and expand the system.
2033-2039_ The Municipality and the State stablish a subsidy with help of the federal government and Bank institutions in order to facilitate the necessary tools to develop a collective collecting water system in the neighbourhood
2039-2045_ The process cannot go further than this stage unless the public institutions provide new infrastructure and the possibility to change the current one into a more water sensitive dynamic.

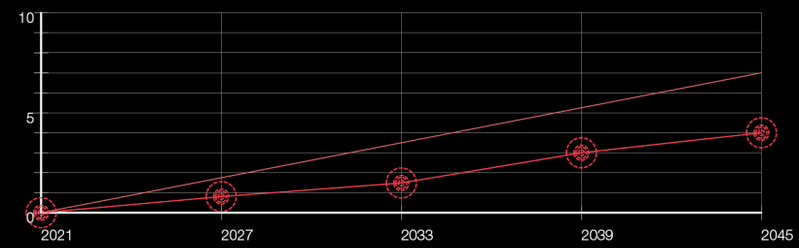
_Green infrastructure and quality of public and open space
2021-2027 _ The process begins with the involvement of the community, by informing and teaching them the process through which they can accomplish a water sensitivity, not only for sustainability purposes but as a strategy that allows them to spend less and ensure the use of it throughout the year. Micro scale interventions can be accomplished by reducing paved surfaces inside plots.
2027-2033_ The process continues and several NGO help the community to develop a strategy in order to land subsidies which can help them improve the area by implementing new trees
2033-2039_ The process developed new collective ways of developing green roof gardens by the community arose thus increasing the green surface in the area
2039-2045_ Community gardens and the greenfication of the current urban equipment start changing the area. The community develops strategies to change and increase the walking sides reducing parking spots or transforming them into new gardens.

_Densification of the built system
2021-2027 _ The process begins with the involvement of the community, by informing and teaching them the process through which they can accomplish a denser community in a sustainable control way, the aim is to stress and support the current self-construction practice with new typologies, the process requires the involvement of professionals, NGO's and the community to develop a cohesive strategy.
2027-2033_ With the strategy the community starts acting collectively increasing the density levels while the new typologies need investment and subsidies, several NGO's are required to find them.

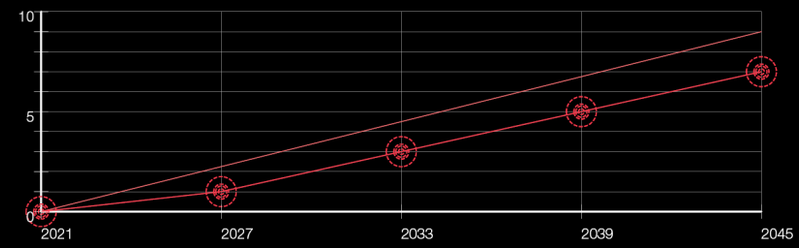
FIG. 11.14 Low integration scenario per systemic goal *(Own elaboration).*



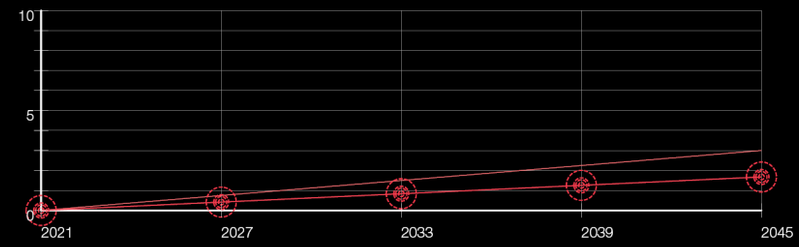
SG1 - Water Landscape Integration and Management



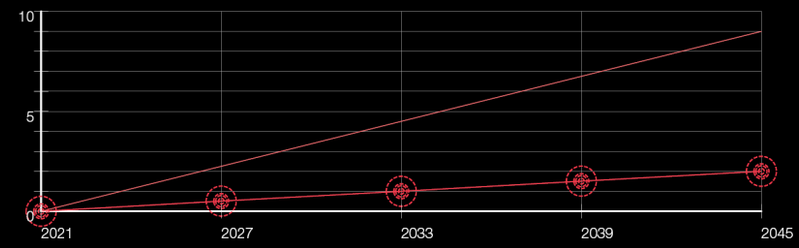
SG2 - Green Infrastructure System and Quality of Public and Open Space



SG3 - Densification of the Built System



SG4 - Productive Landscapes and Means of Production



SG5 - Transport and Mobility System

2033-2039_ The process of densifications continues with self-construction, the supervision and evaluation of the structures are taken by universities and professionals as a community service requested by the community.
2039-2045_ Between neighbours new typologies are developed co-inhabiting new spaces beyond the limitations of the plot area. The self-construction process continues with the introduction of new models easier to reproduce.

_Productive landscapes and means of production
2021-2027 _ The process begins with the involvement of the community with aid of NGO's. During this stage the awareness of the possibilities for production within the area are depicted. Two main ways of production can be explored, solar energy and small scale food production.
2027-2033_ Several NGO help the community to develop a strategy in order to land subsidies which can help them improve production measures
2033-2039_ the community develops new shared spaces in the 5th façade, allowing them to grow food collectively.
2039-2045_ New businesses develop in the area facilitating the provision and installation of solar panels. With help of NGO's new subsidies are requested to the municipality in order to increase production of energy.

_Transport and mobility system
2021-2027 _ The process begins with the involvement of the community, by informing and teaching them the process through which they can accomplish a water sensitivity, not only for sustainability purposes but as a strategy that allows them to spend less and ensure the use of it throughout the year. Micro scale interventions can be accomplished by reducing paved surfaces inside plots.
2027-2033_ The process continues and several NGO help the community to develop a strategy in order to land subsidies which can help them improve the area by implementing new trees
2033-2039_ The process developed new collective ways of developing green roof gardens by the community arose thus increasing the green surface in the area
2039-2045_ Community gardens and the greenfication of the current urban equipment start changing the area. The community develops strategies to change and increase the walking sides reducing parking spots or transforming them into new gardens.

Highest Integration Scenario

This pathway stresses a desirable scenario that balances a bottom-up and top-down approaches including the participation of public, private and civil society sectors. This pathway also is the way through which the area can stress its potentials to a higher level.

_Water landscape integration and management
2021-2027 _The process begins with the involvement of the community, by informing and teaching them the process through which they can accomplish a water sensitivity, not only for sustainability purposes but as a strategy that allows them to spend less and ensure the use of it throughout the year. Micro scale interventions can be accomplished by reducing paved surfaces inside plots.

2027-2033_ The Municipality and the State stablish a subsidy with help of the federal government and Bank institutions in order to facilitate the necessary tools to develop a collective collecting water system in the neighbourhood
2033-2039_ The Municipality implements water ponds in the interstitial spaces of the current urban equipment, increasing the resilience of the area. Collectively with the neighbourhood association, the municipality evaluates de possibility of implementing new porous pavements and the introduction of water streets in proprietary areas.
2039-2045_ Water streets and other small and micro interventions continue being developed, water strips regardless of their small scale need the participation of the municipality in order to implement them.

_Green infrastructure and quality of public and open space
2021-2027 _The process begins with the involvement of the community, by informing and teaching them the process through which they can accomplish a greener neighbourhood with public space accessible to the community. This first stage aims to stress and support the current practices of the community by self-implementation of micro green spaces
2027-2033_ The Municipality and the State stablish a subsidy with help of Bank institutions and the participation of interested entrepreneurs or private investors in order to develop façade models for plant cultivation, this new micro structures can be implemented per plot or collectively and can be easily reproduced.
2033-2039_ The Municipality and the state develop a participation process with the community which allows them to spot the crucial streets that can be improved thus increasing the accessibility of public space to the local community. The implementation starts redefining street patterns
2039-2045_ The municipality and the community work together in order to open the interstitial space of the current urban equipment for public space facilities, the access must be controlled and the implementation of the first community centre in the neighbourhood begins. With the completion of the community centre and the new open space configuration the area increases drastically their quantity of public space, accessible and compatible with the urban equipment which is changing due to the new improvements.

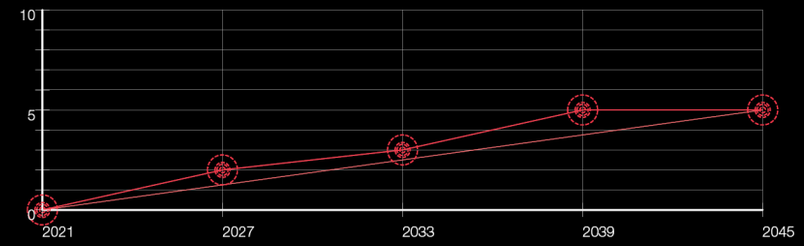
_Densification of the built system
2021-2027 _The process begins with the involvement of the community, by informing and teaching them the process through which they can accomplish a denser community in a sustainable control way, the aim is to stress and support the current self-construction practice with new typologies, the process requires the involvement of professionals, NGO's and the community to develop a cohesive strategy.
2027-2033_ The Municipality and the State stablish a subsidy with help of Bank institutions and the partici-pation of interested entrepreneurs or private investors in order to develop new density models taking the current urban structure as the start ground avoiding eviction or demolishing practices. The municipality will have to change the current urban use limitations in the current urban planning and together with the state develop new adaptive models of construction.
2033-2039_ Land use becomes flexible with land borrowed policies allowing the development of other areas such as the public space connecting the gate with the void. Due to this flexibility new mix uses can be implemented legally in the urban structure, which attract private investment.
2039-2045_ The area starts developing at a fast speed with new Co-housing typologies. The introduction of rent incentives by bank institutions facilitate the community or interesting participants to rent a place in these new buildings.

_Productive landscapes and means of production
2021-2027 _The process begins with the involvement of the community with aid of NGO's. During this stage the awareness of the possibilities for production within the area are depicted. Two main ways of production can be explored, solar energy and small scale food production.
2027-2033_ The Municipality through subsidies starts helping the community enabling them to use their flat rooftop as an area where small green houses can be built in order to locally produce food or by implementing new solar panels that can contribute to the general structure.
2033-2039_ This process grows collectively and new typologies for production with share spaces in the 5th façade are visible, managed by the owners of the shared space.
2039-2045_ by supporting current practices such as vegetable plants in front gardens, new typologies are developed by entrepreneurs and private investors implemented in the facades. The production can be combined with solar energy panels. The current urban equipment is used by the municipalities as another productive land fostering solar energy.

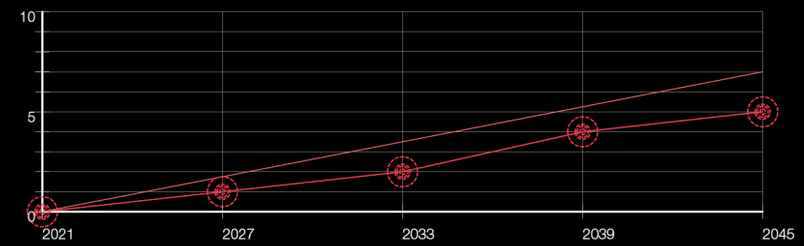
_Transport and mobility system
2021-2027 _The process begins with the involvement of the community, by workshops that allow the municipality to depict critical points where mobility and access are not performing correctly. With this assessment new strategies are put in motion.
2027-2033_ The Municipality and the State re-evaluate the mobility strategy and develop new policies for the seasonal closure of the streets and a reorganization of the traffic flows within the neighbourhood.
2033-2039_ New routes are designated for the market nearby which do not interrupt with the school of the area, making it safer for children to access to the building.
2039-2045_ since the area is changing due to the new typologies for densification, new strategies for parking need to be taken into account, opening up the possibility for private investment in underdeveloped land for parking purposes.

FIG. 11.15 High integration scenario per systemic goal *(Own elaboration).*

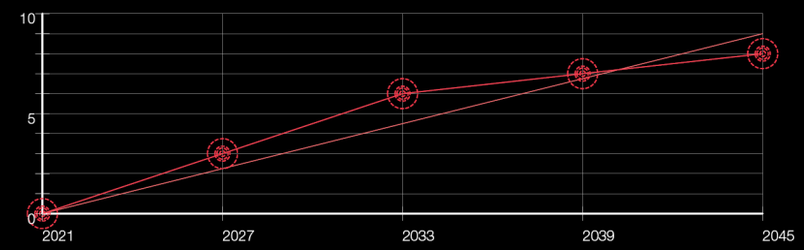
ASYMMETRIES OF POWER



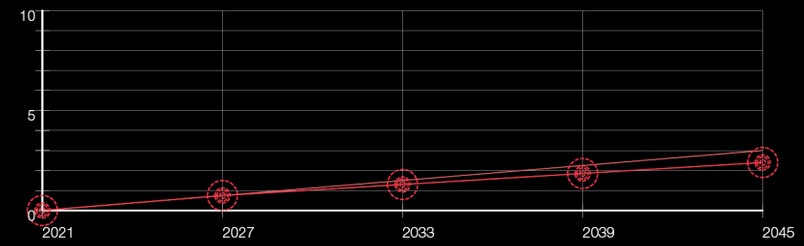
SG1 - Water Landscape Integration and Management



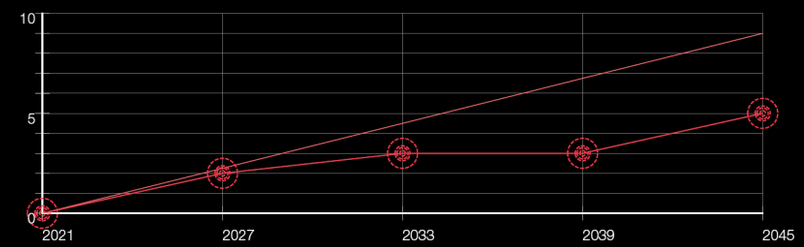
SG2 - Green Infrastructure System and Quality of Public and Open Space



SG3 - Densification of the Built System



SG4 - Productive Landscapes and Means of Production



SG5 - Transport and Mobility System

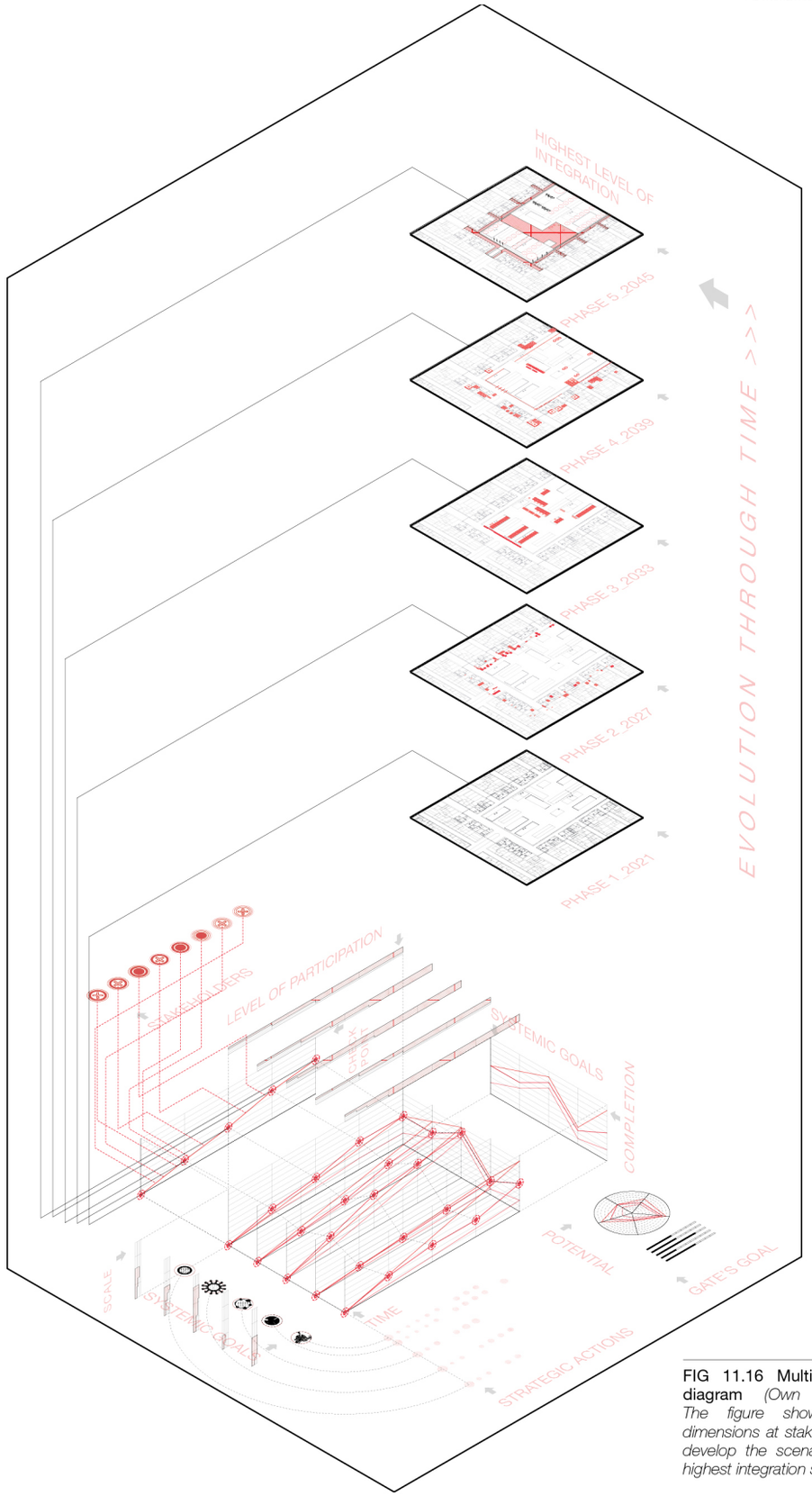


FIG 11.16 Multidimensional diagram *(Own elaboration) The figure shows different dimensions at stake in order to develop the scenario with the highest integration score.*

Local streets take the longer period of time to be modified, however their transformation allows new public space in the area, reducing outside parking spaces to the minimum, fostering the implementation of green natural elements thus experimenting with new materials to allow natural filtration of water to the subsoil reducing flooding risks

This are in the fourth phase consolidates new density typologies taken several actions such as typologies developed by private developers in order to increase social housing density or self-production of housing from local residents through auto construction manuals developed in previous workshops with professionals and experts (e.g. architects, engineers)

Urban equipment privatized spaces are being reshaped allowing the interstitial spaces to transform into new public spaces that function under seasonal openings

Reprogramming buildings to consolidate mix use areas is taking place mostly in ground floor areas that will be benefited directly from the upgrades made in public space and street configurations. However policies allow a fear distribution of tasks to the benefited owners contributing to green areas and public space maintenance

Current state, conversations, workshops and dialogs are under process

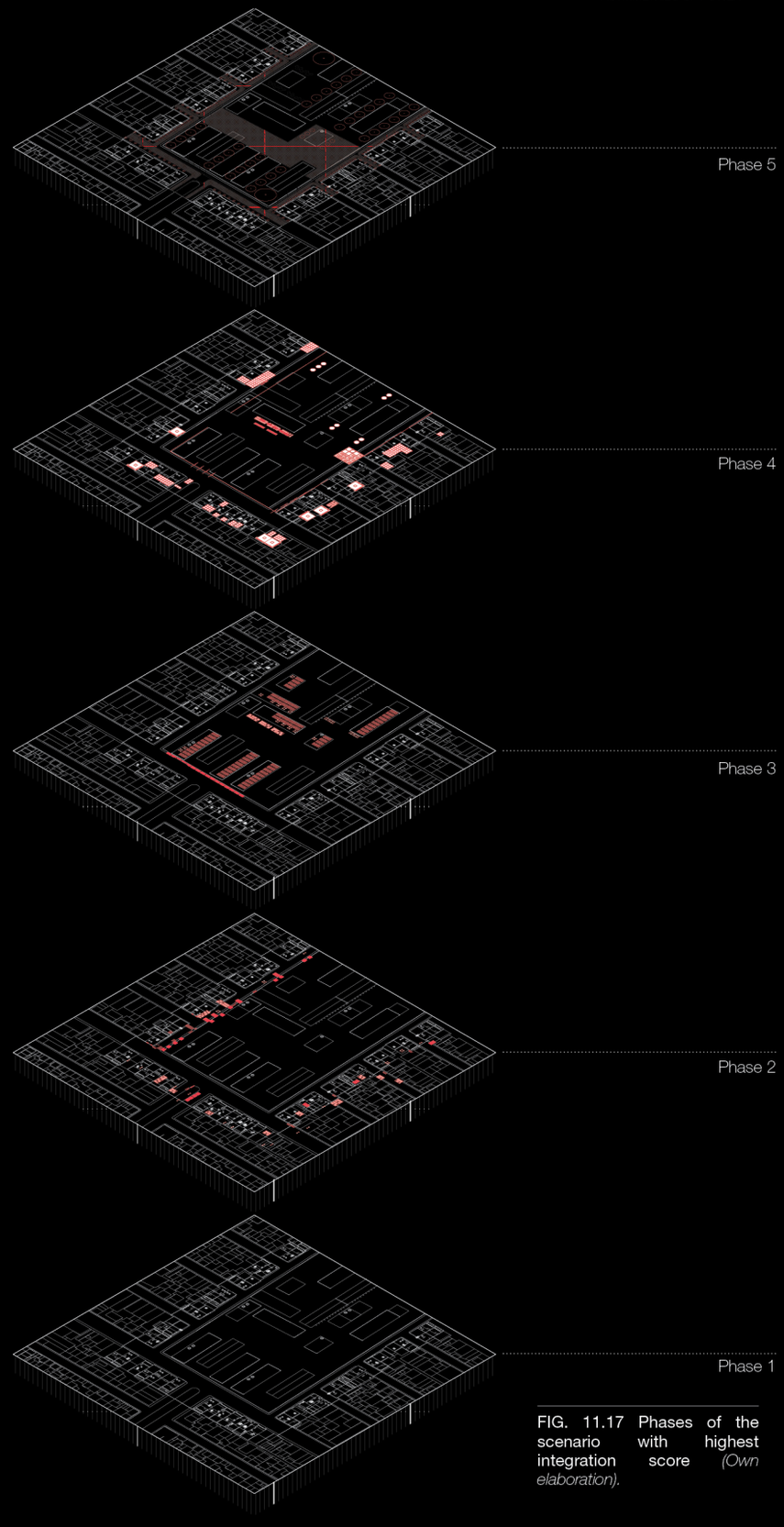
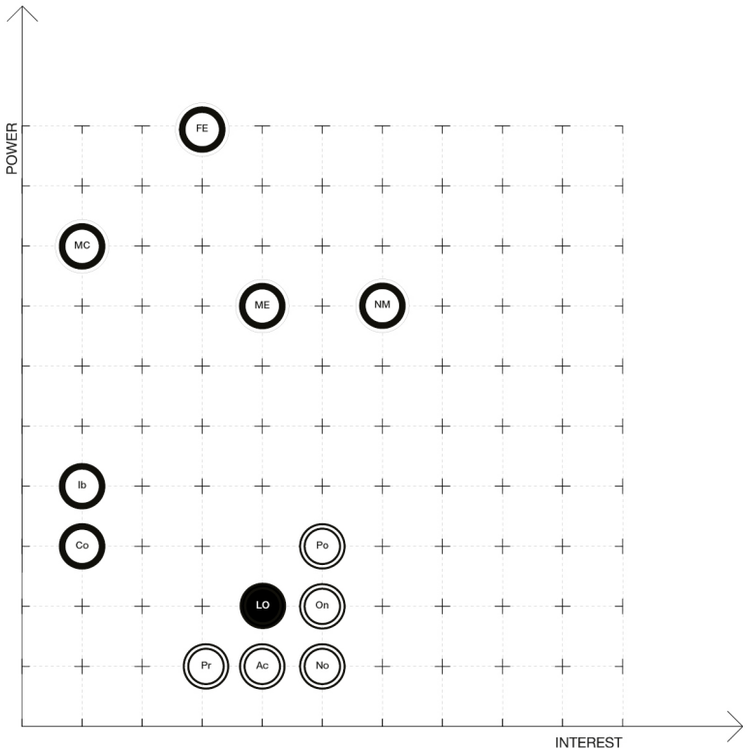


FIG. 11.17 Phases of the scenario with highest integration score *(Own elaboration).*

Phase 1

Nezahualcoyotl is one of the municipalities in edomex (Mexico State) with the highest power level. Nevertheless for the consolidation of the area other actors such as private developers and bank institutions lack of interest regarding the consolidation of strategies. As shown in the figure 3.4 civil society lacks of power and its interest is low. Despite of this most of the actors are share similar attitudes and can be influenced as a group.
Regarding physical and functional capacities the area presents a high traffic influence, several businesses take place at ground floor level such as construction material suppliers worsening the conditions of internal flows. Due to this reason accessibility to urban equipment is compromised in pick hours.



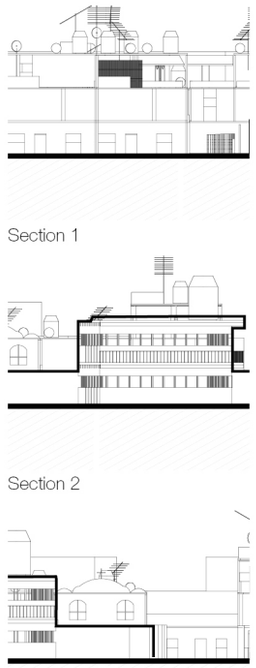


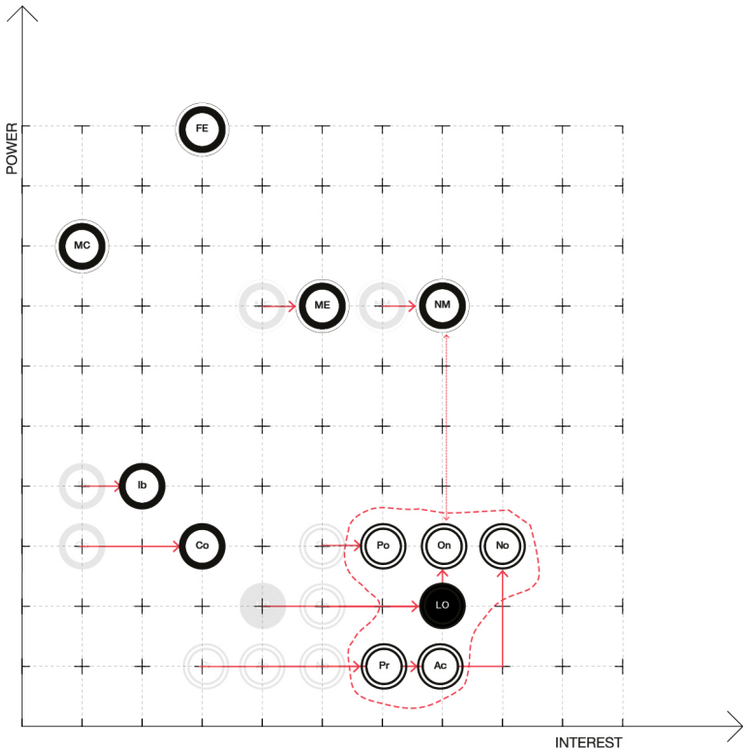
FIG 11.18 stakeholder matrix *(Own elaboration) The matrix shows current relationships of power and interest in the area towards spatial cohesion*

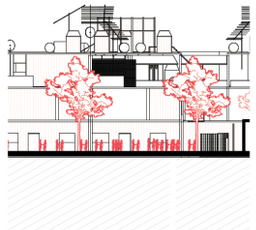
FIG 11.19 Top view and section view *(Own elaboration) the figure shows the current state emphasizing three zoom ins in the section area (left page, right side.*



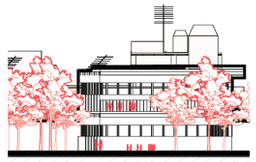
Phase 2-3

Interest rises among the higher levels of power for more cohesive strategies in their territory. As a result private developers and bank institutions start developing their own strategic plans in order to adapt their business model to the new modifications in urban planning. Popular organizations along with NGO's professionals and academia start developing collaborative strategies such as self-construction manuals and workshops in order to sharpen key actions that can be activated at a local level. Moreover production of solar energy in existing urban equipment such as schools is possible.

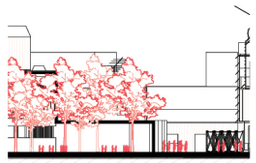




Section 1



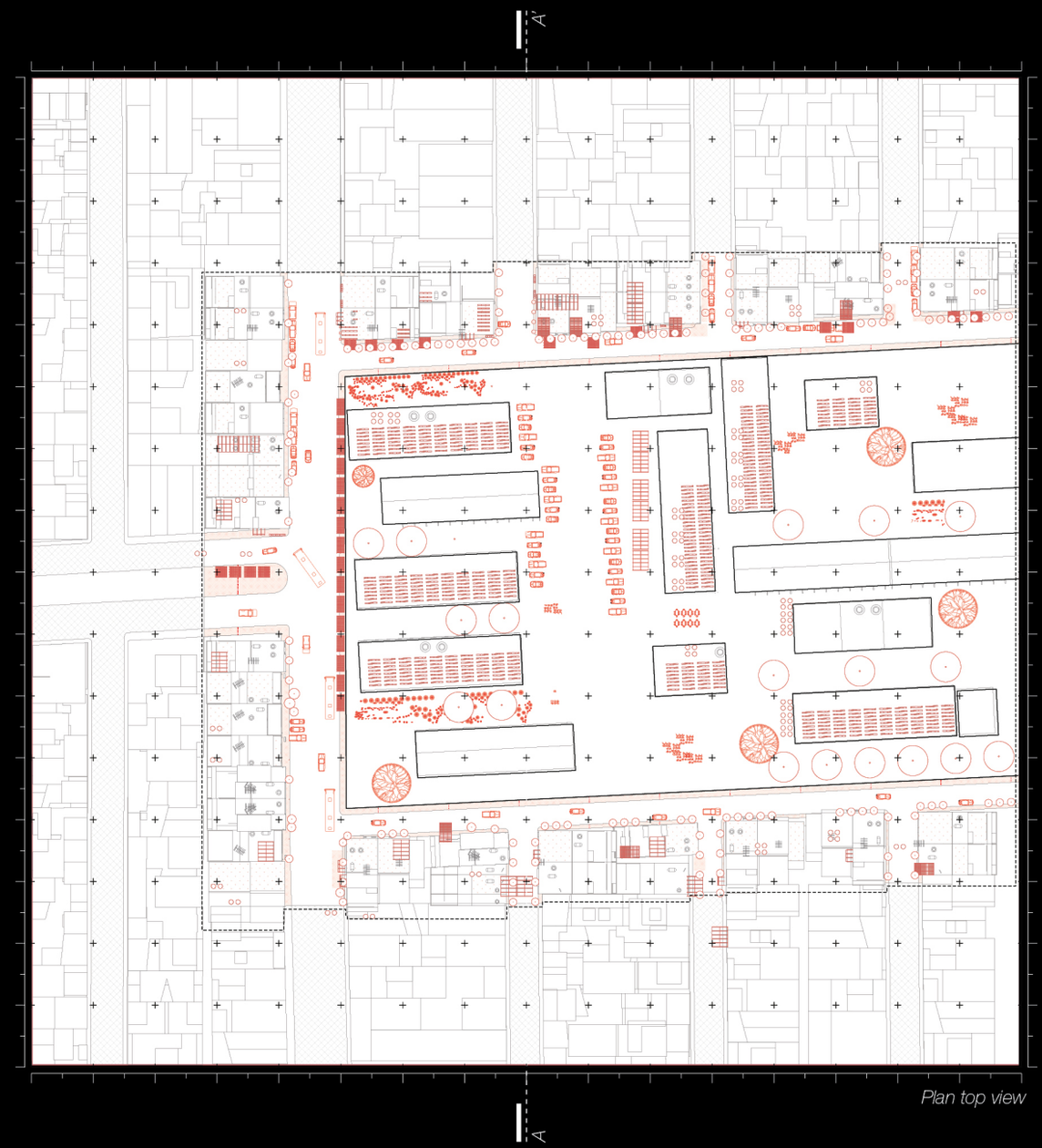
Section 2



Section 3

FIG 11.20 stakeholder matrix *(Own elaboration) The matrix shows current relationships of power and interest in the area towards spatial cohesion based in the lowest integration scenario.*

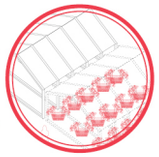
FIG 11.21 Top view and section view *(Own elaboration) the figure shows potential spatial change based on the lowest integration scenario.*





ASYMMETRIES OF POWER

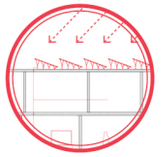
M [44.2]
Cooperative green houses are implemented as part of the autocosns. manuals elaborated at workshops with professionals



M [31.1]
Current buildings are reprogrammed in order to host new flexible uses according to the strategic goals



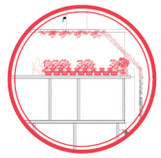
S [43.2]
Solar panels are implemented in school facilities to produce energy for their consumption



M [23.2]
Community gardens are implemented in available plots



S [19.1], S [39.1]
Neighbours collaborate to build collective gardens where they can grow vegetables and increase natural elements in rooftops



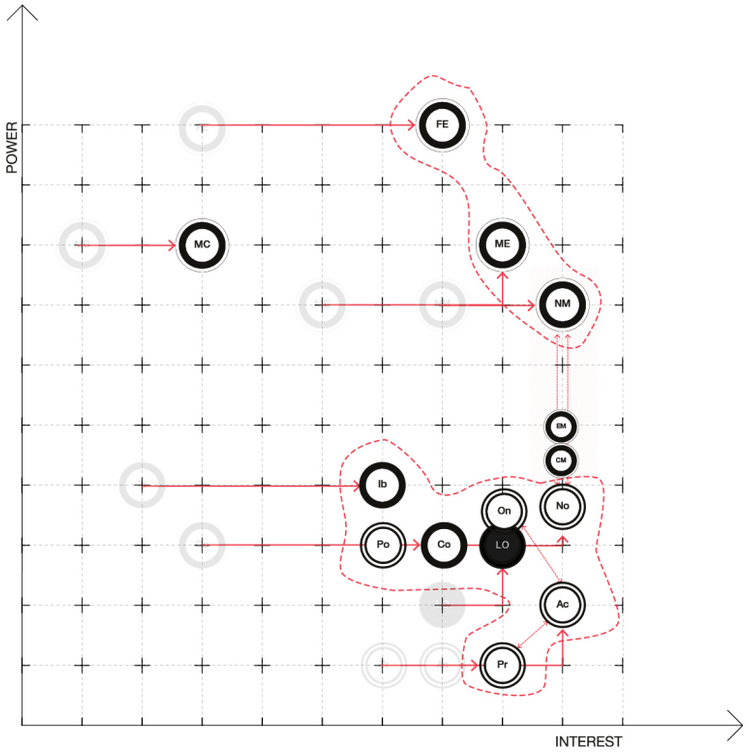
M [43.2]
Solar panels are implemented in rooftops and facades with new typologies for their proper installation and functionality



FIG. 11.22 Axonometric view *(Own elaboration) the figure shows the transformation stressed by the lowest integration scenario, revealing some of the actions neeeded for change.*

Phase 4-5

During phase 4 through 5 Interest rises among the higher all levels of power. The municipality reaches a higher interest in the systemic goals capacity to increase by reaching other neighbouring municipalities such as Ecatepec or Chimalhuacan. Federal government allows flexibility in decision making giving the municipality and the state more autonomy regarding bigger tasks such as water management and transport and mobility. Due to the high transformation capacity of the area private developers invest in density typologies mix use facilities while bank institutions -through subsidies for local resident- aid densification measures based on self-construction.



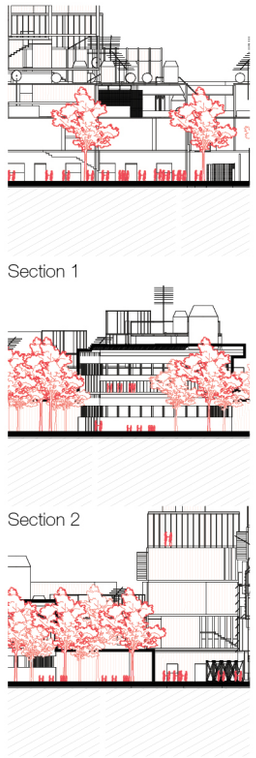
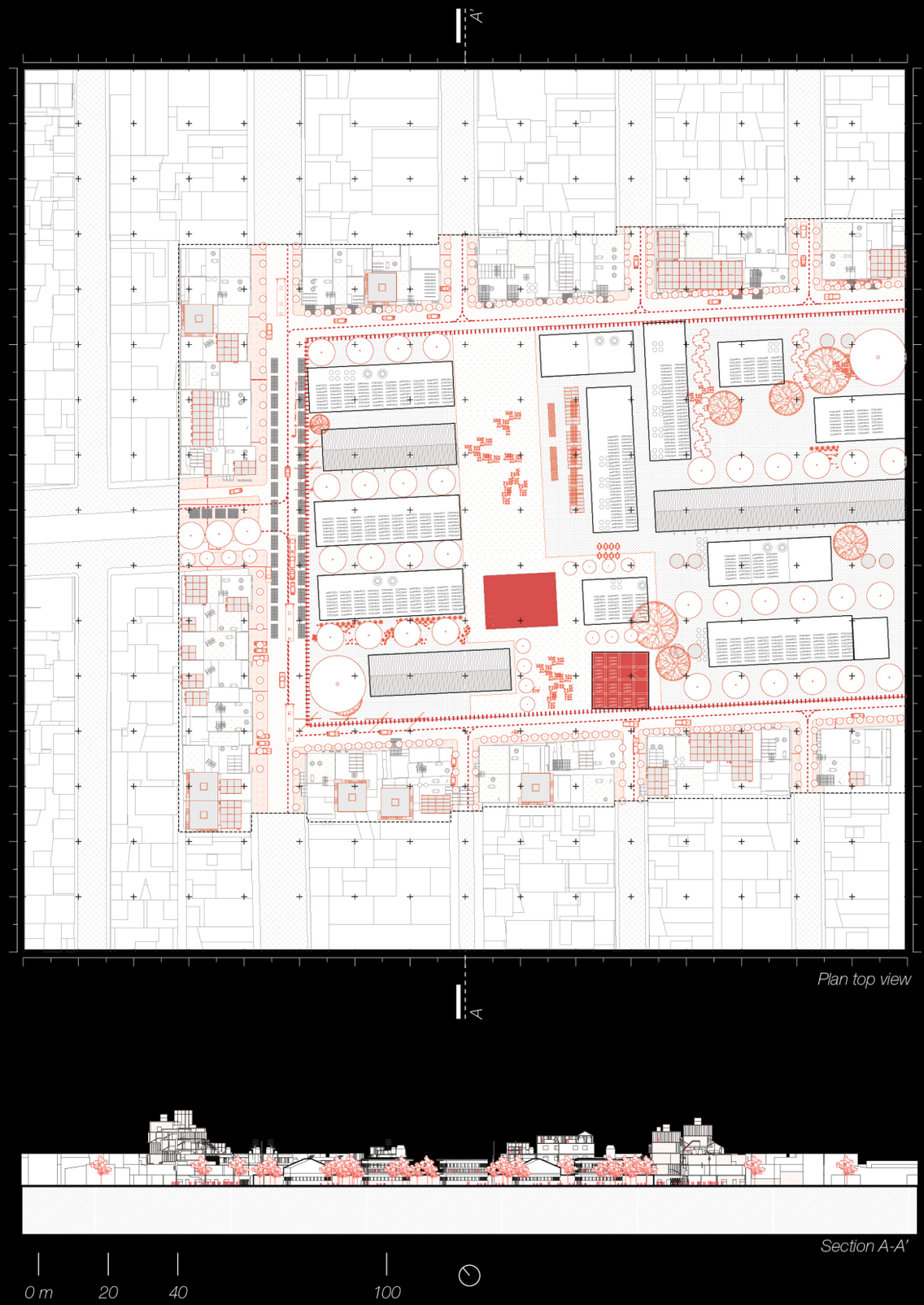


FIG 11.23 stakeholder matrix *(Own elaboration) The matrix shows current relationships of power and interest in the area towards spatial cohesion based on the highest integration scenario.*

FIG 11.24 Top view and section view *(Own elaboration) the figure shows potential spatial change based on the highest integration scenario.*



ASYMMETRIES OF POWER

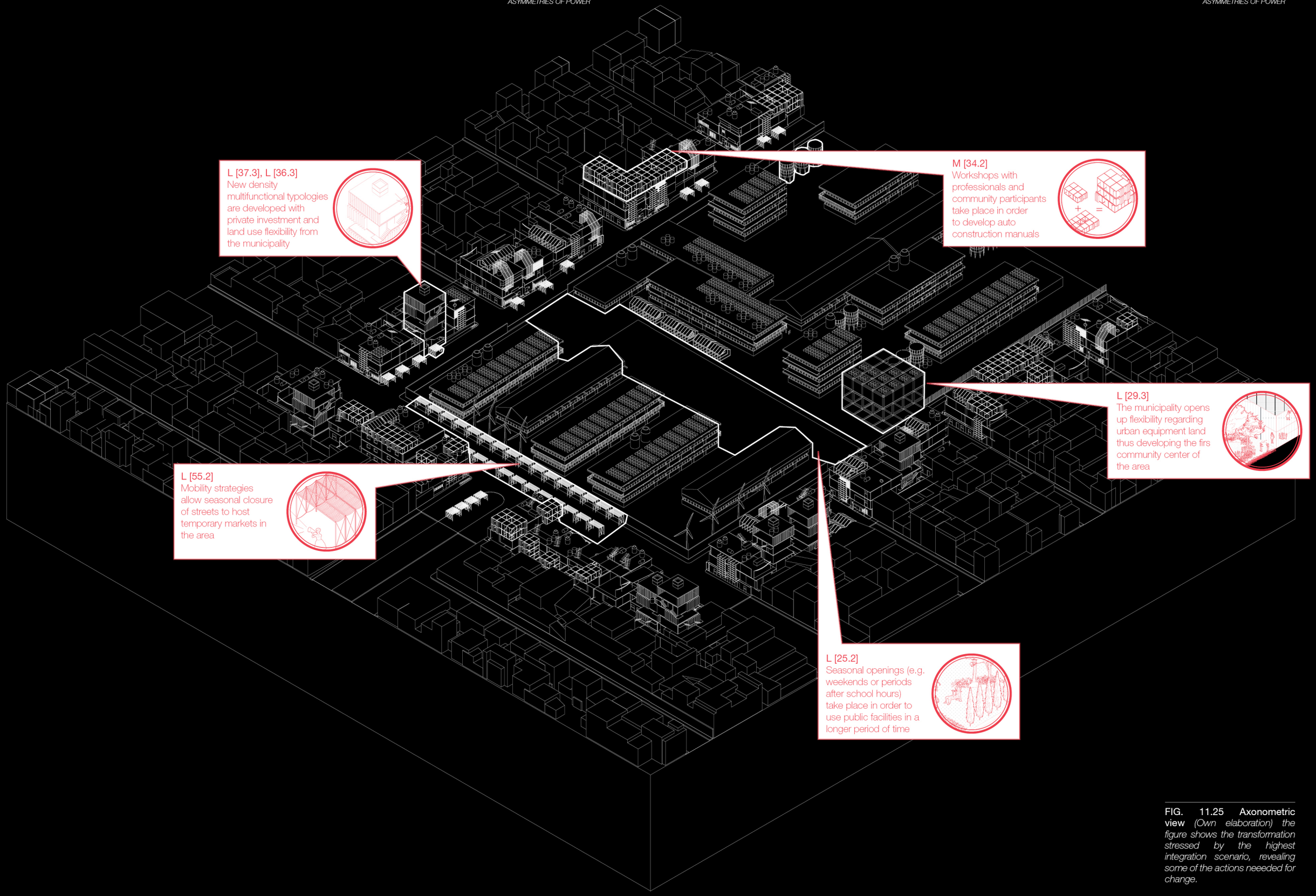


FIG. 11.25 Axonometric view *(Own elaboration) the figure shows the transformation stressed by the highest integration scenario, revealing some of the actions neeeded for change.*

Comparison Between Low and High Integration at Local Level

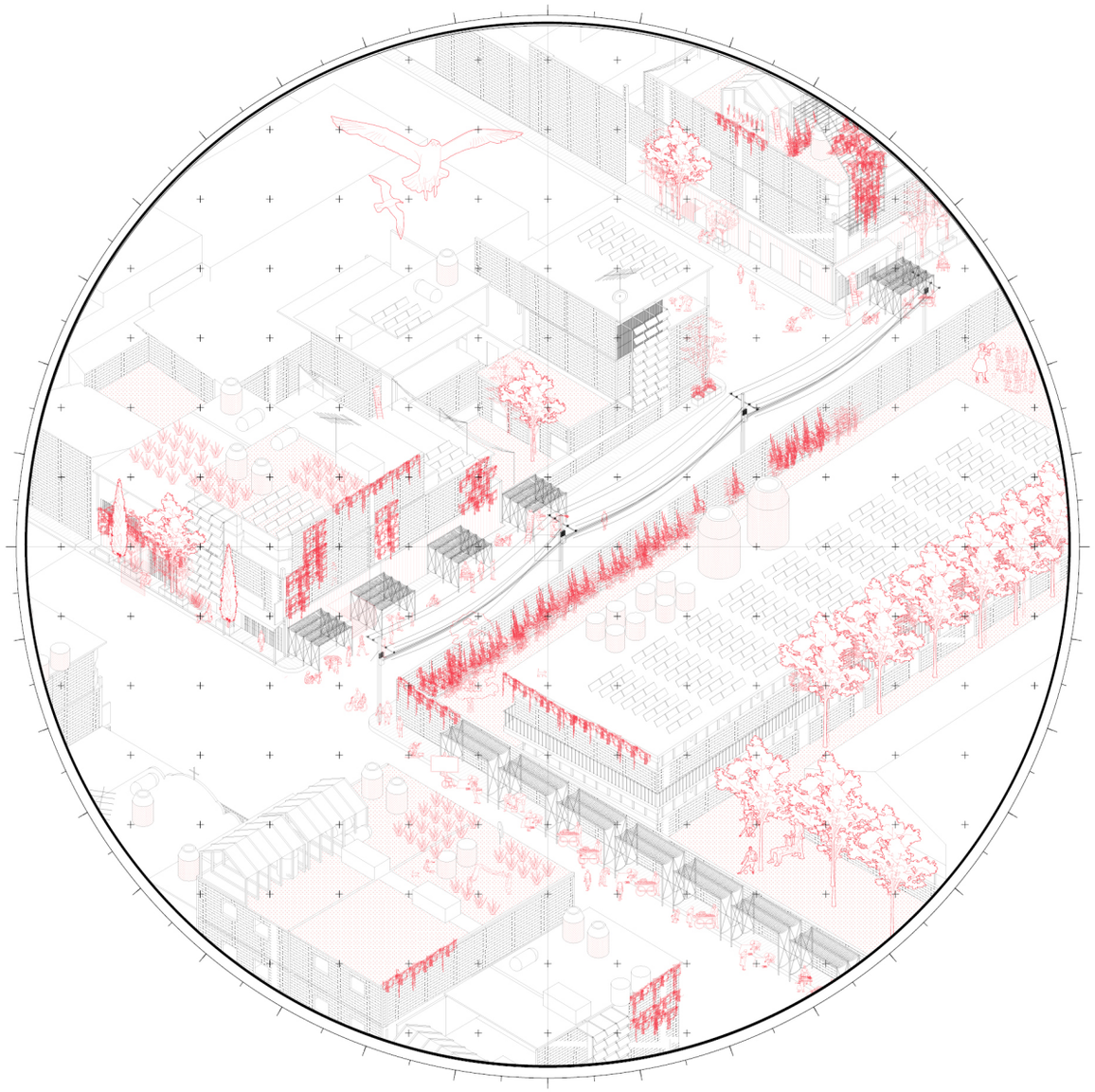


FIG. 11.26 Axonometric Detail view *(Own elaboration) the figure shows the transformation stressed by the lowest integration scenario*

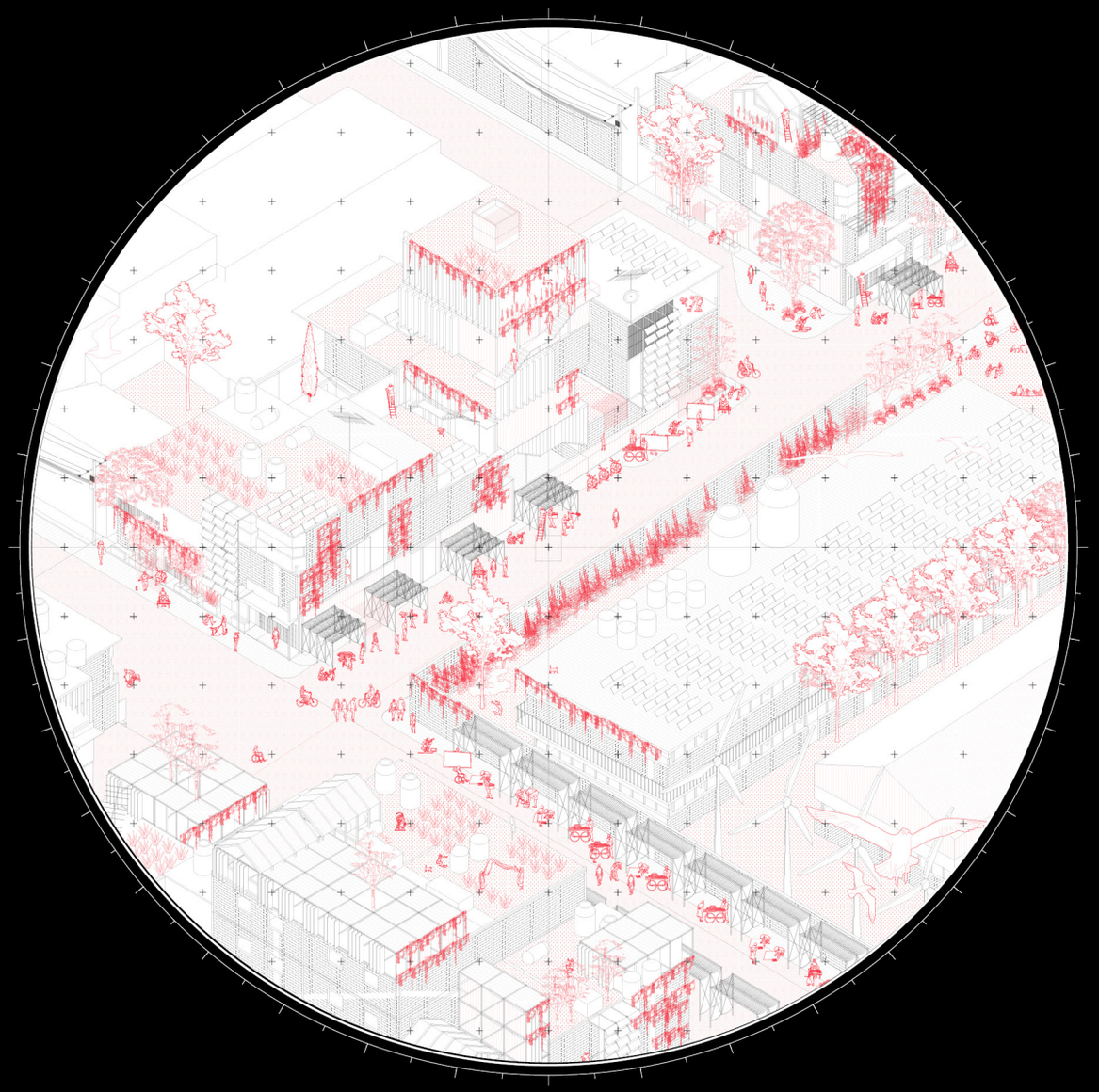


FIG. 11.27 Axonometric Detail view *(Own elaboration) the figure shows the transformation stressed by the highest integration scenario*

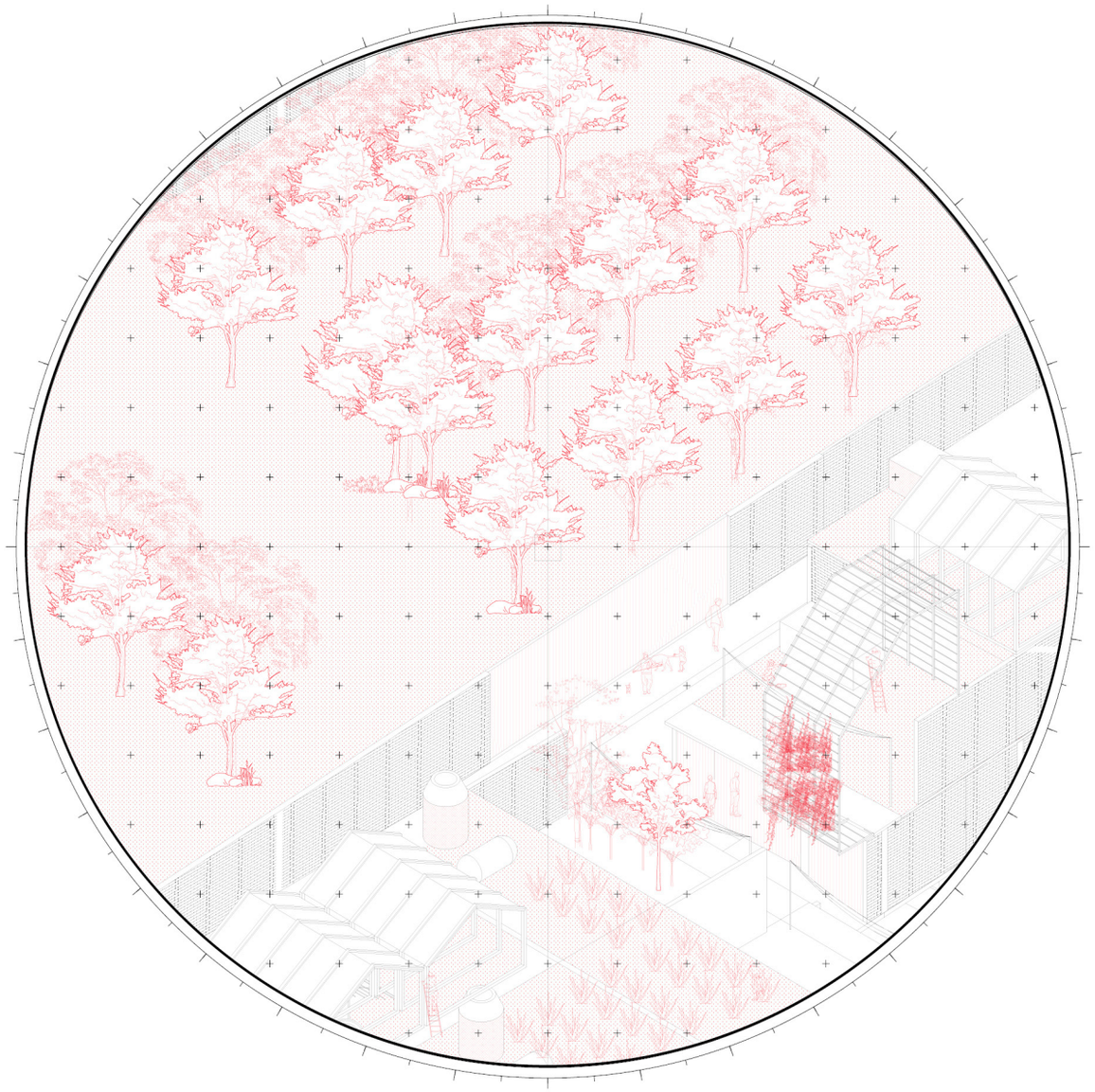


FIG. 11.28 Axonometric Detail view *(Own elaboration) the figure shows the transformation stressed by the lowest integration scenario*

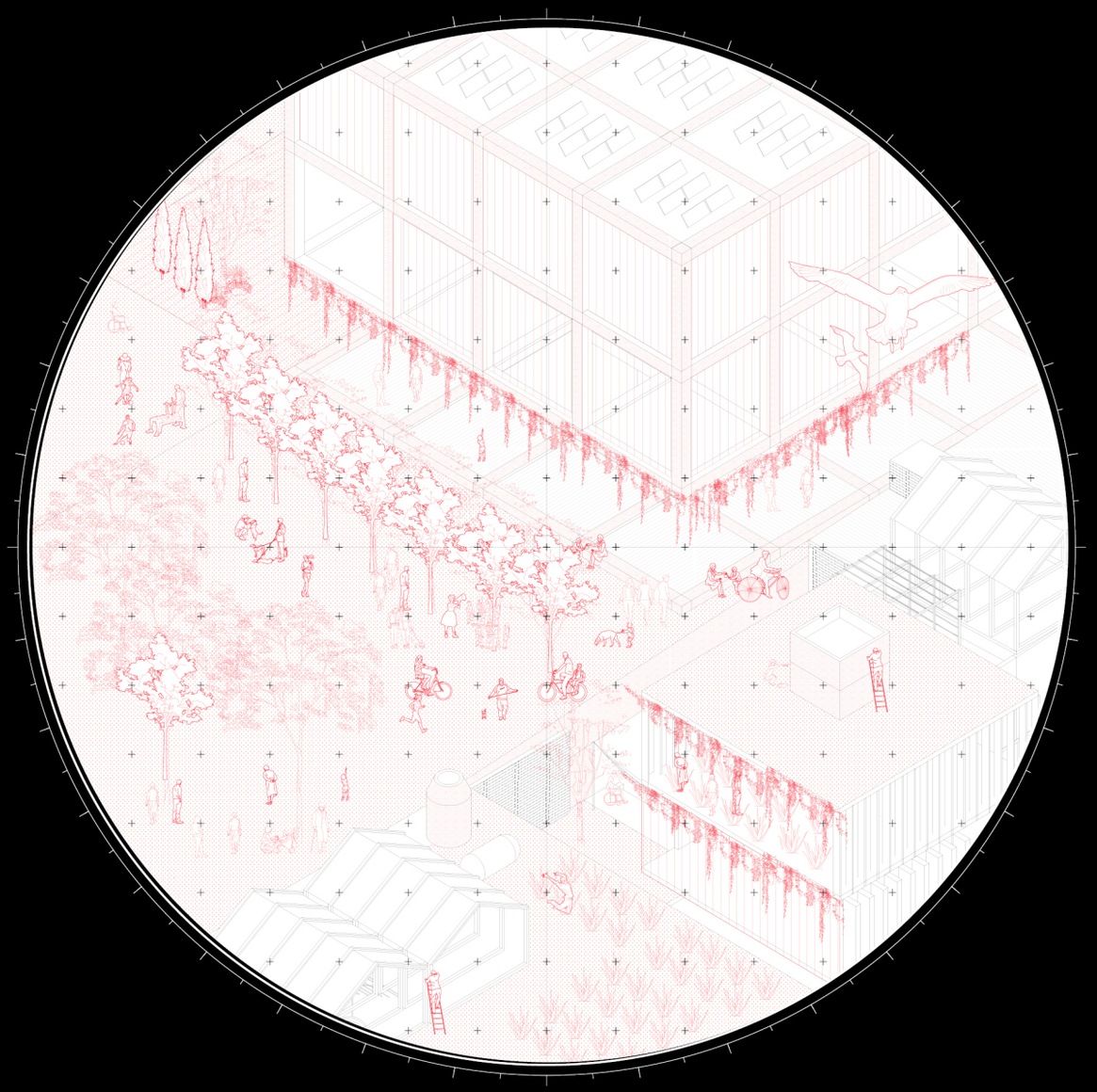


FIG. 11.29 Axonometric Detail view *(Own elaboration) the figure shows the transformation stressed by the highest integration scenario*

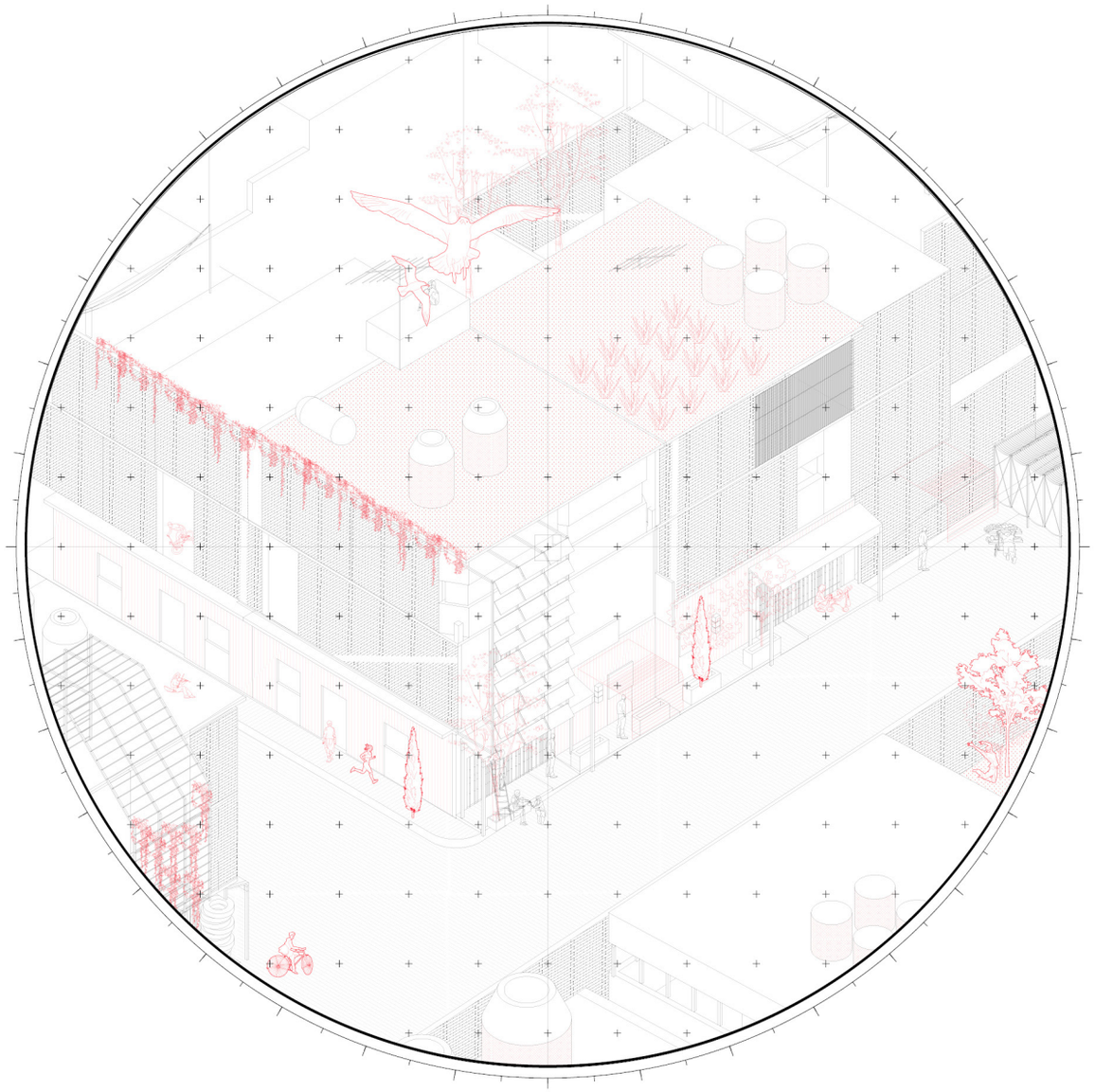


FIG. 11.30 Axonometric Detail view *(Own elaboration) the figure shows the transformation stressed by the lowest integration scenario*



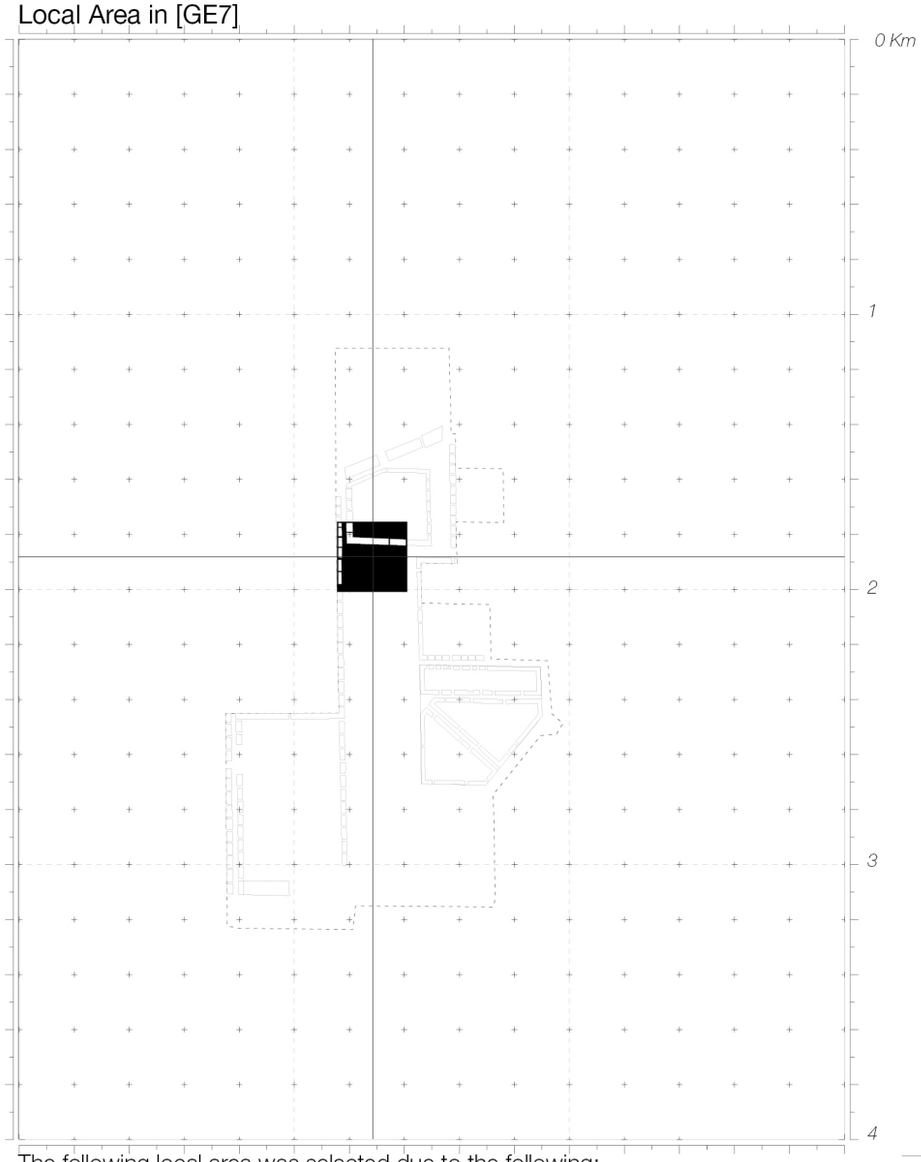
FIG. 11.31 Axonometric Detail view *(Own elaboration) the figure shows the transformation stressed by the highest integration scenario*



IMG. 11.18 Visualization of the area with its full potential achieved (own elaboration) The image shows the public space open in the interstitial spaces of the urban equipment

Gate [GN6] overall has a high potential regarding density intensification due to its high urbanization level and low density typologies which can be easily adapted or transform into new densified multifunctional structures. Moreover the local capacity embedded in urban equipment centralities (interstitial spaces) such as the one located in the selected neighbourhood can become flexible in use, introducing quality public spaces where is most needed.

Local Area in [GE7]



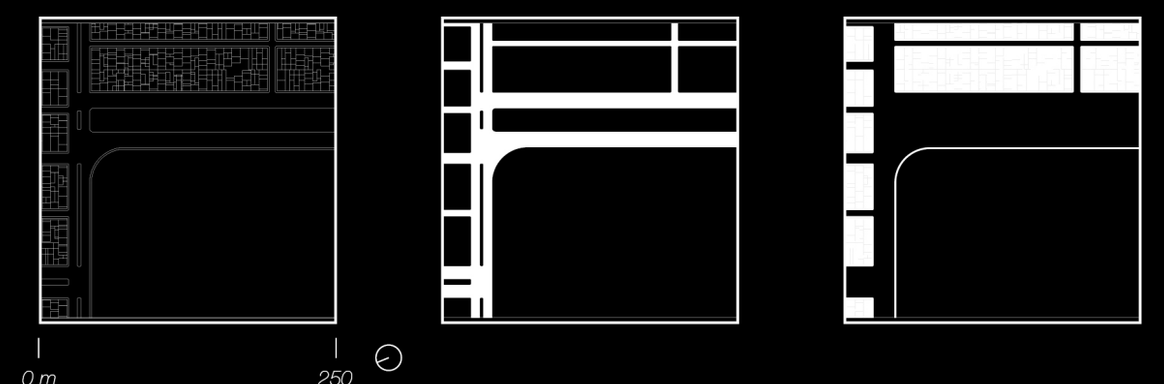
The following local area was selected due to the following:

_It is influenced by the cemetery which attracts several flows from the municipality.
_Informal temporary markets take place close to the border of the cemetery having a negative effect in the public space available, while the open space is used for parking purposes.
_It presents oversize streets increasing the hard open space surface .
_The area is the limit where the influence of the metro station (CETRAM Ciudad Azteca) does not reach.
_Housing is still growing informally, however the patterns fragment themselves from the cemetery, avoiding openings towards its direction, unless there are for commercial pruposes.
_Appropriation of streets is a regular pattern in the area since people use them to plant new trees, building benches to gather outside their doorstep.
_A communal garden takes place in the area.

Left - FIG. 11.32 Selection of the are of study *(Own elaboration).*

Right - IMG. 11.16 Satellite image of the selected area *(Source: Google Earth, 2018).*
FIG. 11.33 Urban structure of the selected area *(Own elaboration).*









IMG. 11.17-Up and 11.18-Bottom *(Google maps, 2020) The images show the current state of the selected area.*





IMG. 11.19-up and 11.20-Bottom *(Google maps, 2020) The images show the current state of the selected area.*

Scenarios Gate [GE7]

Lowest Integration Scenario

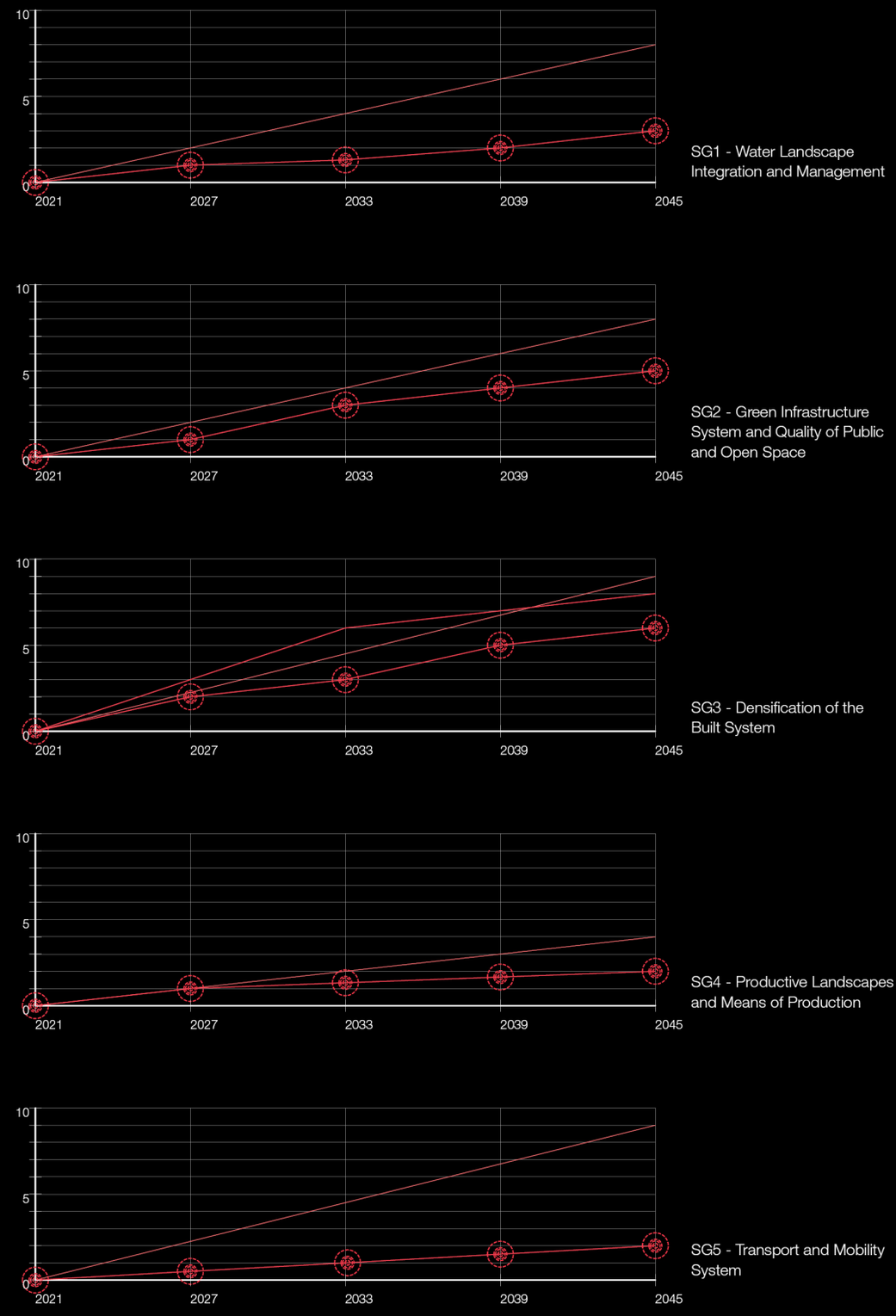
This scenario stresses a bottom-up approach with only the participation of local residents to collectively achieve the systemic goals formulated by the approach. It is based on local agreements without major involvement from big power actors. However the local participatory process involves NGO's and organizations that will help the mediation of decisions with municipal authorities. This is required to continue with an organized transformation that is recognized by the municipality as a formal process.

_Water landscape integration and management
2021-2027 _ The process begins with the involvement of the community, by informing and teaching them the process through which they can accomplish a water sensitivity, not only for sustainability purposes but as a strategy that allows them to spend less and ensure the use of it throughout the year. Micro scale interventions can be accomplished by reducing paved surfaces inside plots.
2027-2033_ The process continues and several NGO help the community to develop a strategy in order to ask for subsidies and expand the system.
2033-2039_ The Municipality and the State stablish a subsidy with help of the federal government and Bank institutions in order to facilitate the necessary tools to develop a collective collecting water system in the neighbourhood
2039-2045_ The process cannot go further than this stage unless the public institutions provide new infrastructure and the possibility to change the current one into a more water sensitive dynamic.

_Green infrastructure and quality of public and open space
2021-2027_ The process begins with the involvement of the community, by informing and teaching them the process through which they can accomplish a water sensitivity, not only for sustainability purposes but as a strategy that allows them to spend less and ensure the use of it throughout the year. Micro scale interventions can be accomplished by reducing paved surfaces inside plots.
2027-2033_ The process continues and several NGO help the community to develop a strategy in order to land subsidies which can help them improve the area by implementing new trees in the current underused public space.
2033-2039_ The process developed new collective ways of developing green roof gardens by the community arose thus increasing the green surface in the area
2039-2045_ Community gardens and the greenfication of the current urban equipment start changing the area. The community develops strategies to change and increase the walking sides reducing parking spots used temporarily during the street market days or transforming them into new community gardens.

_Densification of the built system
2021-2027_ The process begins with the involvement of the community, by informing and teaching them the process through which they can accomplish a denser community in a sustainable control way, the aim is to stress and support the current self-construction practice with new typologies, the process requires the involvement of professionals, NGO's and the community to develop a cohesive strategy.
2027-2033_ With the strategy the community starts acting collectively increasing the density levels while the new typologies need investment and subsidies, several NGO's are required to find them.

FIG. 11.34 Low integration scenario per systemic goal *(Own elaboration).*



2033-2039_ The process of densification continues with self-construction, the supervision and evaluation of the structures are taken by universities and professionals as a community service requested by the community and the municipality. During this phase new typologies are introduced in the area allowing local residents to develop new cooperatives for their implementation.
2039-2045_ Between neighbours co-habitation practices are in practice, and the buildings start growing in a collective way rather than individual plot areas (for instance, 3 neighbours can join their rooftops to develop a housing unit for rent) this new practice will enforce a change in the land use policies.

_Productive landscapes and means of production
2021-2027 _ The process begins with the involvement of the community with aid of NGO's. During this stage the awareness of the possibilities for production within the area are depicted. Two main ways of production can be explored, solar energy and small scale food production.
2027-2033_ Several NGO help the community to develop a strategy in order to land subsidies which can help them improve production measures. During this phase the neighbourhood association appropriates the open unused space for community gardens building around it a fence for security.
2033-2039_ The community develops new shared spaces in the 5th façade, allowing them to grow food collectively. New businesses develop in the area facilitating the provision and installation of solar panels.
2039-2045_ With help of NGO's new subsidies are requested to the municipality in order to increase production of energy.

_Transport and mobility system
2021-2027_ The neighbourhood association and several NGO's work together with the objective of finding new strategies for local flows.
2027-2033_ The actions taken could be locally approved by the community and implemented as has been done in the past. However the interventions lack of legality and authorities can easily demolish any intervention made by locals.
2033-2039_ Local groups successfully find support from municipal authorities
2039-2045_ The interventions are locally produced, such as a redefinition of the street walkways and new speedbumps to control automotive vehicles speed.

Highest Integration Scenario

This scenario stresses a desirable scenario that balances a bottom-up and top-down approaches including the participation of public, private and civil society sectors. This pathway also is the way through which the area can stress its potentials to a higher level.

_Water landscape integration and management
2021-2027 _The process begins with the involvement of the community, by informing and teaching them the process through which they can accomplish a water sensitivity, not only for sustainability purposes but as a strategy that allows them to spend less and ensure the use of it throughout the year. Micro scale interventions can be accomplished by reducing paved surfaces inside plots. In this phase in order to make a major impact the Municipality and the State stablish a subsidy with help of the federal government and Bank institutions in order to facilitate the necessary tools to develop a collective collecting water system in the neighbourhood

2027-2033_ The Municipality implements a water pond in interstitial space that together with the objectives of public space will transform a former closed area of the cemetery into a public neighbourhood park. Collectively with the neighbourhood association, the municipality evaluates de possibility of implementing new porous pavements and the introduction of water streets in proprietary areas.
2033-2039_ A water square is introduced in the public space increasing the capacity for water storage helping the community which suffers from flooding risks during raining seasons.
2039-2045_ Water streets and other small and micro interventions continue being developed, water strips regardless of their small scale need the participation of the municipality in order to implement them.

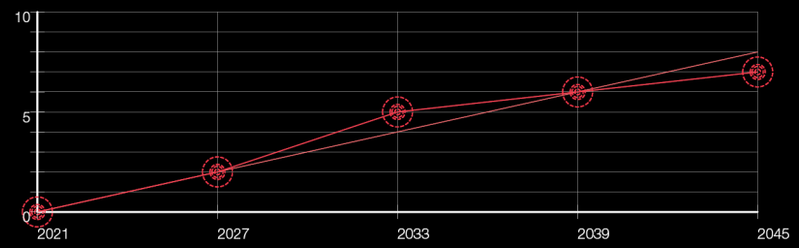
_Green infrastructure and quality of public and open space
2021-2027_ The process begins with the involvement of the community, by informing and teaching them the process through which they can accomplish a greener neighbourhood with public space accessible to the community. This first stage aims to stress and support the current practices of the community by self-implementation of micro green spaces. The Municipality and the State stablish a subsidy with help of Bank institutions and the participation of interested entrepreneurs or private investors in order to develop façade models for plant cultivation, this new micro structures can be implemented per plot or collectively and can be easily reproduced.
2027-2033_ The Municipality and the state develop a participation process with the community which allows them to spot the crucial streets that can be improved thus increasing the accessibility of public space to the local community. The implementation starts redefining street patterns and traffic flows. During this phase the state opens up the unused space of the cemetery in order to expand the public space surface of the area (In order to make this happen the state and the municipality will make open competitions not only to develop the new park but to find future solutions for the cemetery, using it as a water sensitive infrastructure).
2033-2039_ The municipality and the community work together in order to open the interstitial space of the current urban equipment for public space facilities, the access must be controlled and the implementation of the first community centre in the neighbourhood begins.
2039-2045_With the completion of the community centre and the new open space configuration the area increases drastically their quantity of public space, accessible and compatible with the urban equipment which is changing due to the new improvements.
_Densification of the built system
2021-2027 _The process begins with the involvement of the community, by informing and teaching them the process through which they can accomplish a denser community in a sustainable control way, the aim is to stress and support the current self-construction practice with new typologies, the process requires the involvement of professionals, ONG's and the community to develop a cohesive strategy.
2027-2033_ The Municipality and the State stablish a subsidy with help of Bank institutions and the participation of interested entrepreneurs or private investors in order to develop new density models taking the current urban structure as the start ground avoiding eviction or demolishing practices. The municipality will have to change the current urban use limitations in the current urban planning and together with the state develop new adaptive models of construction.

2033-2039_ Land use becomes flexible with land borrowed policies allowing the development of other areas such as the public space connecting the gate with the void. Due to this flexibility new mix uses can be implemented legally in the urban structure, increasing commercial areas that are currently working under informal legality thus fostering the endogenous development of the area.
2039-2045_ The area starts developing at a fast speed with new Co-housing typologies. The introduction of rent incentives by bank institutions facilitate the community or interesting participants to rent a place in these new buildings. The endogenous commercial capacity is complete in this stage defining a new mixed-use area close to the recently opened public space.

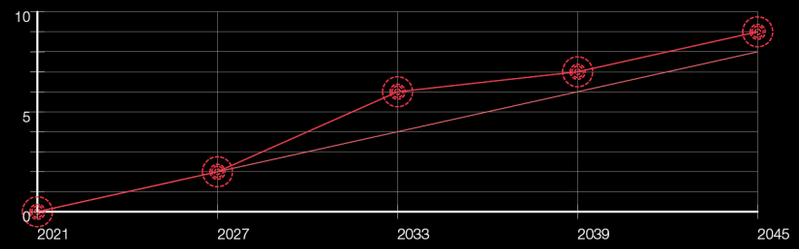
_Productive landscapes and means of production
2021-2027_The process begins with the involvement of the community with aid of ONG's. During this stage the awareness of the possibilities for production within the area are depicted. Two main ways of production can be explored, solar energy and small scale food production. During this phase the neightborhood association works with the municipality in order to use the open space available in the existing corridor between the cemetery and their houses to create community gardens for food production.
2027-2033_ The Municipality through subsidies starts helping the community enabling them to use their flat rooftop as an area where small green houses can be built in order to locally produce food or by implementing new solar panels that can contribute to the general structure.
2033-2039_ This process grows collectively and new typologies for production with share spaces in the 5th façade are visible, managed by the owners of the shared space.
2039-2045_ by supporting current practices such as vegetable plants in front gardens, new typologies are developed by entrepreneurs and private investors implemented in the facades. The production can be combined with solar energy panels. The current urban equipment is used by the municipalities as another productive land fostering solar energy.

_Transport and mobility system
2021-2027 _The process begins with the involvement of the community, by workshops that allow the municipality to depict critical points where mobility and access are not performing correctly. With this assessment new strategies are put in motion such as the transformation of one of the main local roads that is often used by the street market. The size of the street is excessively big for the current use and will be transformed to further expand the public space.
2027-2033_ The Municipality and the State re-evaluate the mobility strategy and develop new policies for the seasonal closure of the streets and a reorganization of the traffic flows within the neighbourhood. New public transport stops are located in the area distributing the traffic flows guaranteeing accessibility to the local inhabitants.
2033-2039_ New routes are designated for the market nearby which do not interrupt with the new public transport stops. Also during this stage the municipality works together with the neighbourhood association in order to develop new local street patterns enforcing a speed reduction of automotive vehicles and enabling only local-controlled access through some of the streets.
2039-2045_ Since the area is changing due to the new typologies for densification and public space, new strategies for parking need to be taken into account, opening up the possibility for private investment in underdeveloped land for parking purposes.

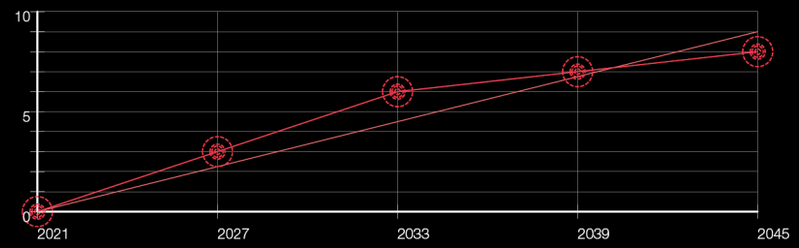
FIG. 11.35 High integration scenario per systemic goal *(Own elaboration).*



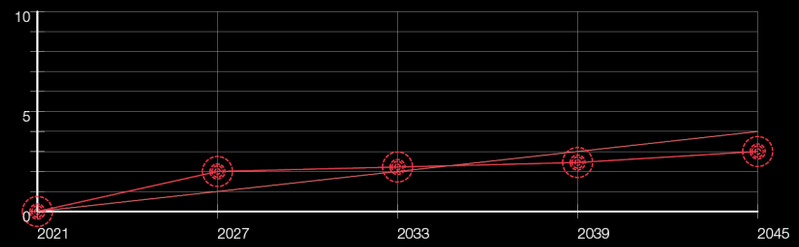
SG1 - Water Landscape Integration and Management



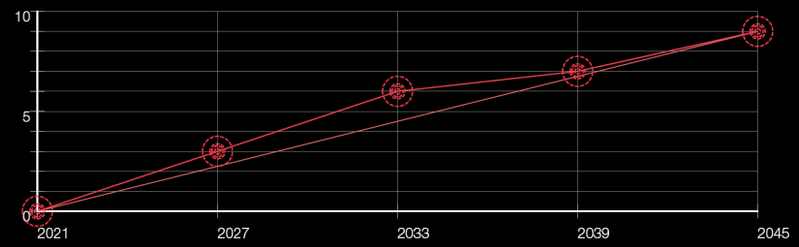
SG2 - Green Infrastructure System and Quality of Public and Open Space



SG3 - Densification of the Built System



SG4 - Productive Landscapes and Means of Production



SG5 - Transport and Mobility System

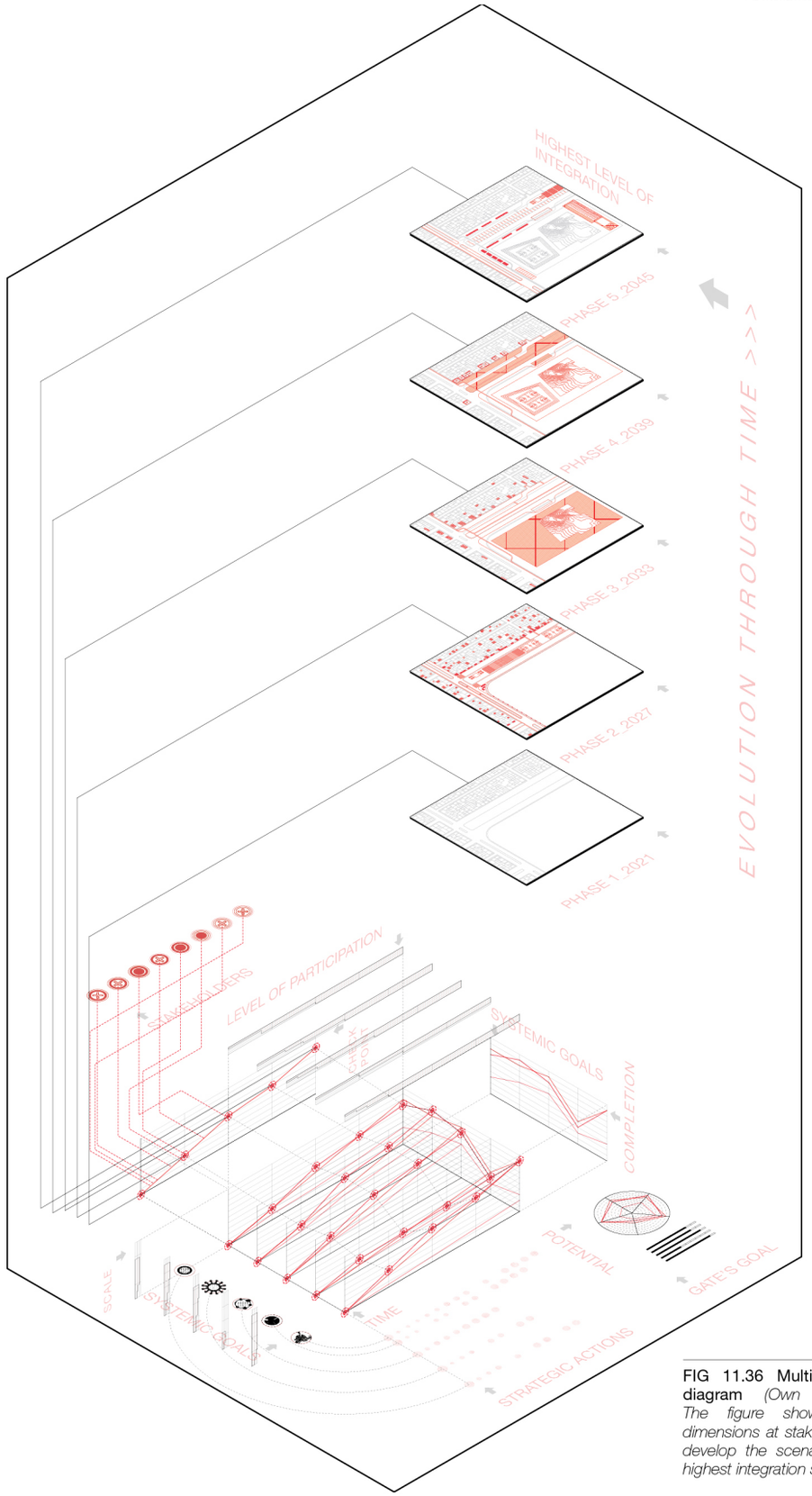


FIG 11.36 Multidimensional diagram *(Own elaboration) The figure shows different dimensions at stake in order to develop the scenario with the highest integration score.*

The last stage phases public infrastructure challenges, however the municipality along with private investment is able to develop the community centre and increasing natural elements in the area in order to consolidate the area as a public space patch in the network

Configuration to the street pattern have been finished, increasing local accessibility to public space, reducing risks to traffic accidents and enabling new patterns for temporary markets to take place in the area

Initiatives from federal government and municipal upgrades in planning strategies start shaping the open space into public space where water sensitive strategies take place such as water ponds, water squares and plazas and storage of water in order to reduce risks in the area thus its vulnerable conditions regarding water management

Reprogramming buildings to consolidate mix use areas is taking place mostly in ground floor areas that will be benefited directly from the upgrades made in public space and street configurations. However policies allow a fear distribution of tasks to the benefited owners contributing to green areas and public space maintenance

Current state, conversations, workshops and dialogs are under process

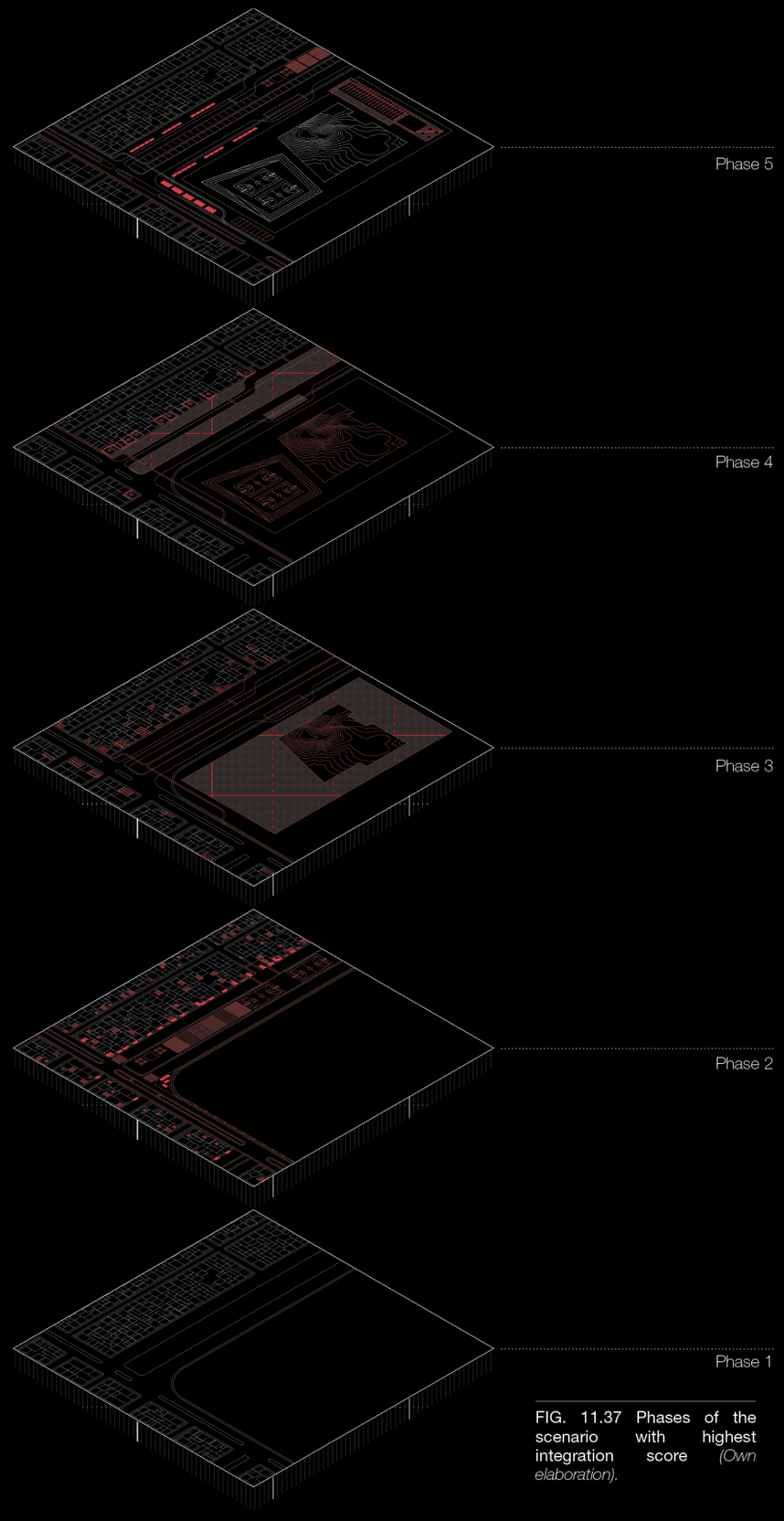
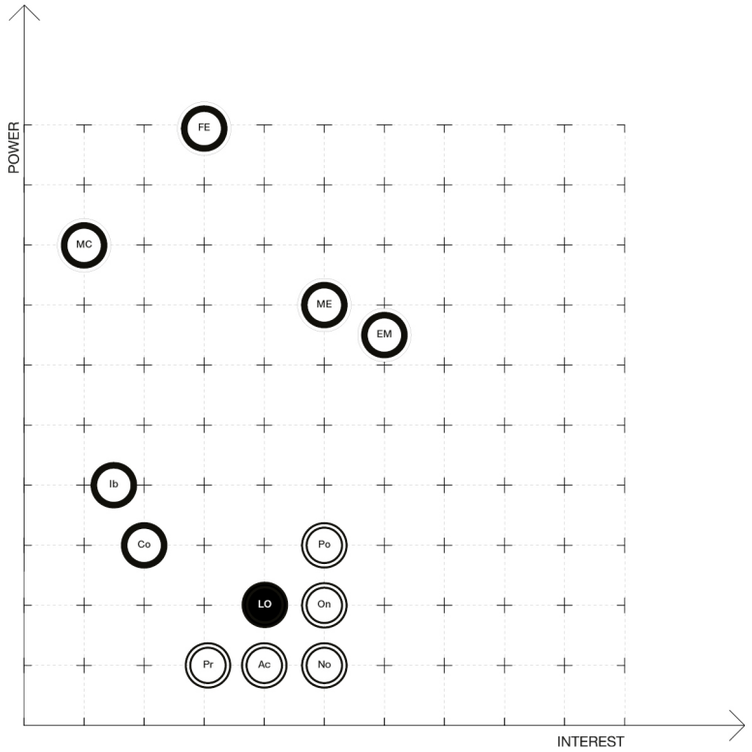


FIG. 11.37 Phases of the scenario with highest integration score *(Own elaboration).*

Phase 1

Ecatepec is one of the municipalities in edomex (Mexico State) with the highest power level along with Nezahualcoyotl. Nevertheless for the consolidation of the area other actors such as private developers and bank institutions lack of interest regarding the consolidation of strategies despite the possibilities embedded in the area due to the influence of CETRAM (Ciudad Azteca) one of the most important multimodal transport stops in the metropolis. As shown in the figure 3.4 civil society lacks of power and its interest is low. Despite of this most of the actors are share similar attitudes and can be influenced as a group.

Regarding physical and functional capacities the area presents a high traffic influence mostly of public transport modes such as taxis and buses. Its most relevant attribute is the cemetery which accounts for the majority of the area's surface. The later can be seen as a strong potential for public space if highest power actors collaborate towards flexibility of land use development.



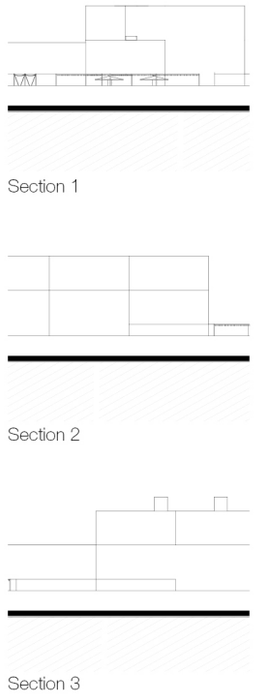
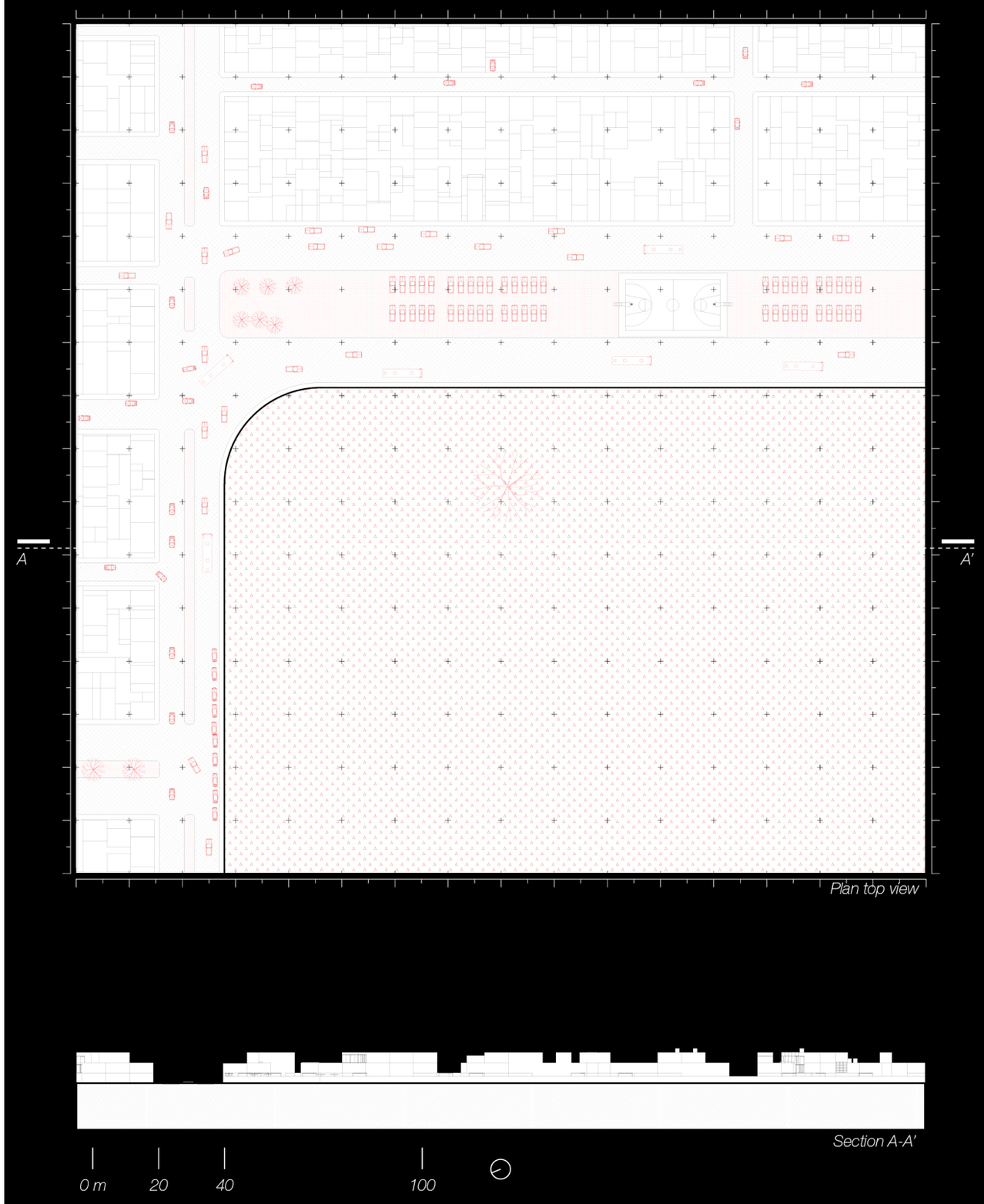


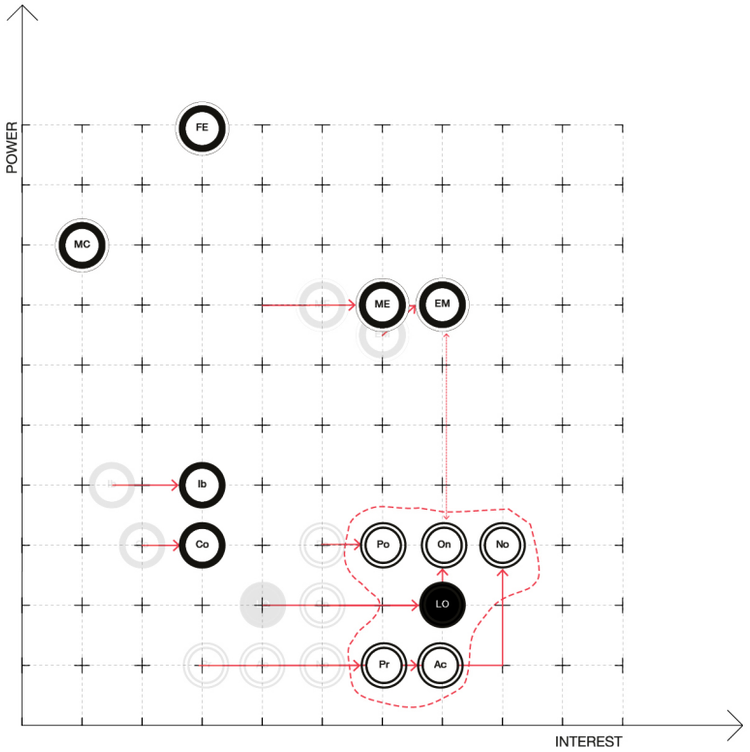
FIG 11.38 stakeholder matrix *(Own elaboration) The matrix shows current relationships of power and interest in the area towards spatial cohesion*

FIG 11.39 Top view and section view *(Own elaboration) the figure shows the current state emphasizing three zoom ins in the section area (left page, right side.*



Phase 2-3

During phase 2 and 3 the municipality works together with NGO's and civil organizations to develop new strategies capable of stressing local potentials. Reprogramming open spaces into public spaces and introducing mix uses are some of the immediate actions taken. The development attracts investment from the private sector giving subsidies to local residents to increase density intensification by means of self-construction. Interests of civil society are aligned in order to seek for higher participation levels.



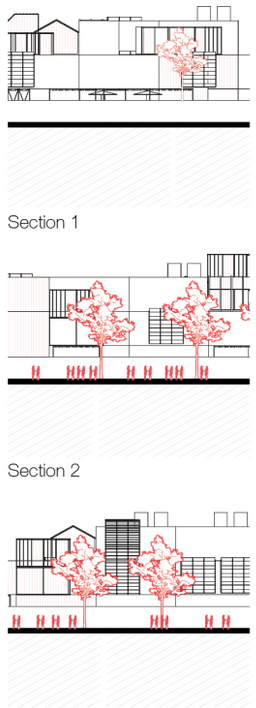
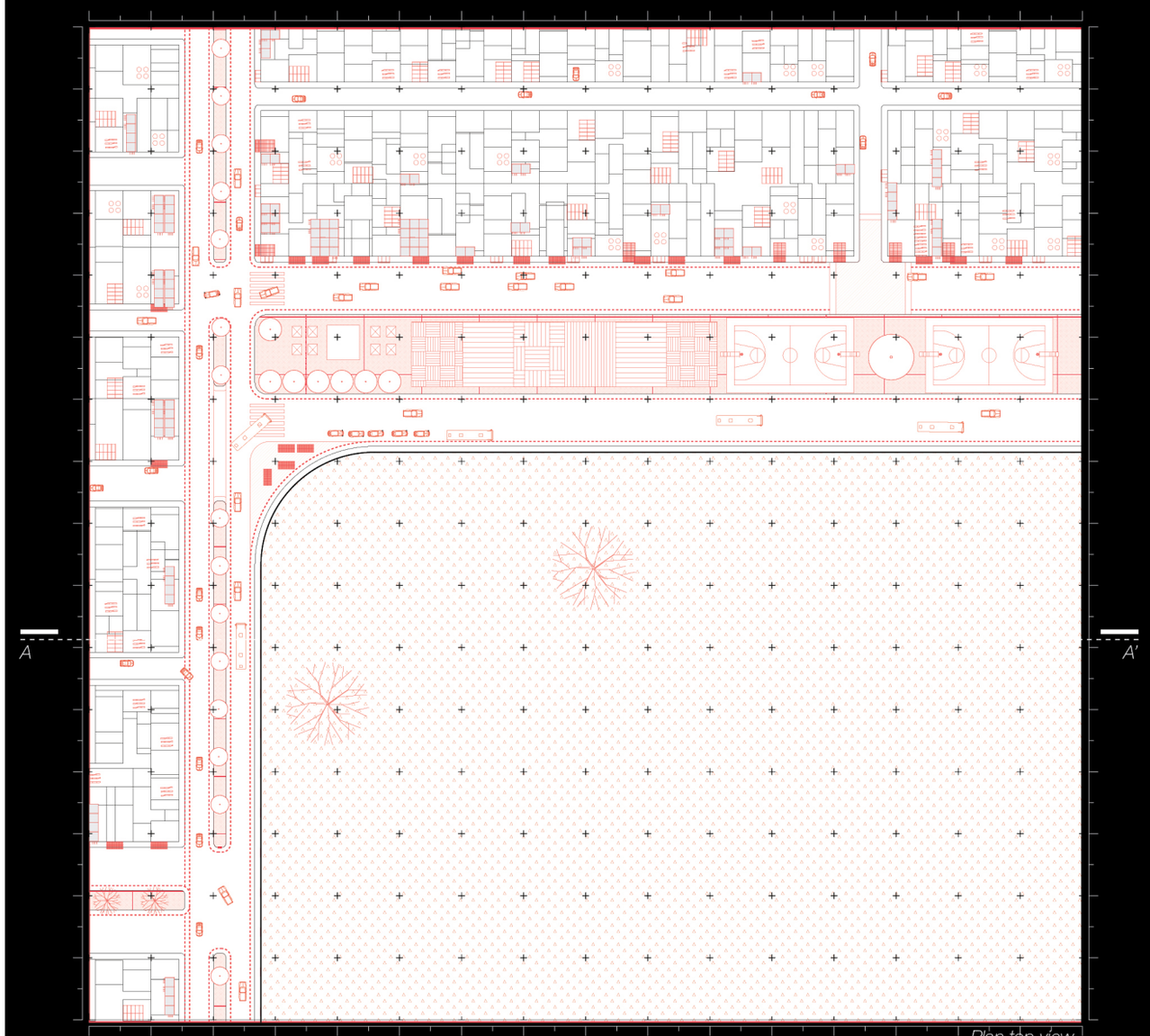
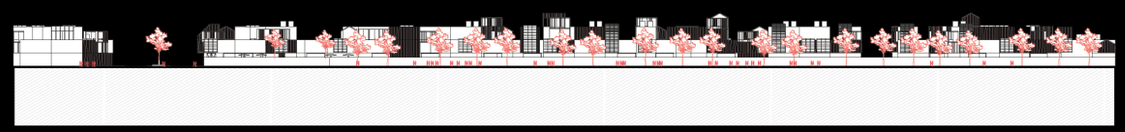


FIG 11.40 stakeholder matrix *(Own elaboration) The matrix shows current relationships of power and interest in the area towards spatial cohesion based in the lowest integration scenario.*

FIG 11.41 Top view and section view *(Own elaboration) the figure shows potential spatial change based on the lowest integration scenario.*





0 m 20 40 100

ASYMMETRIES OF POWER

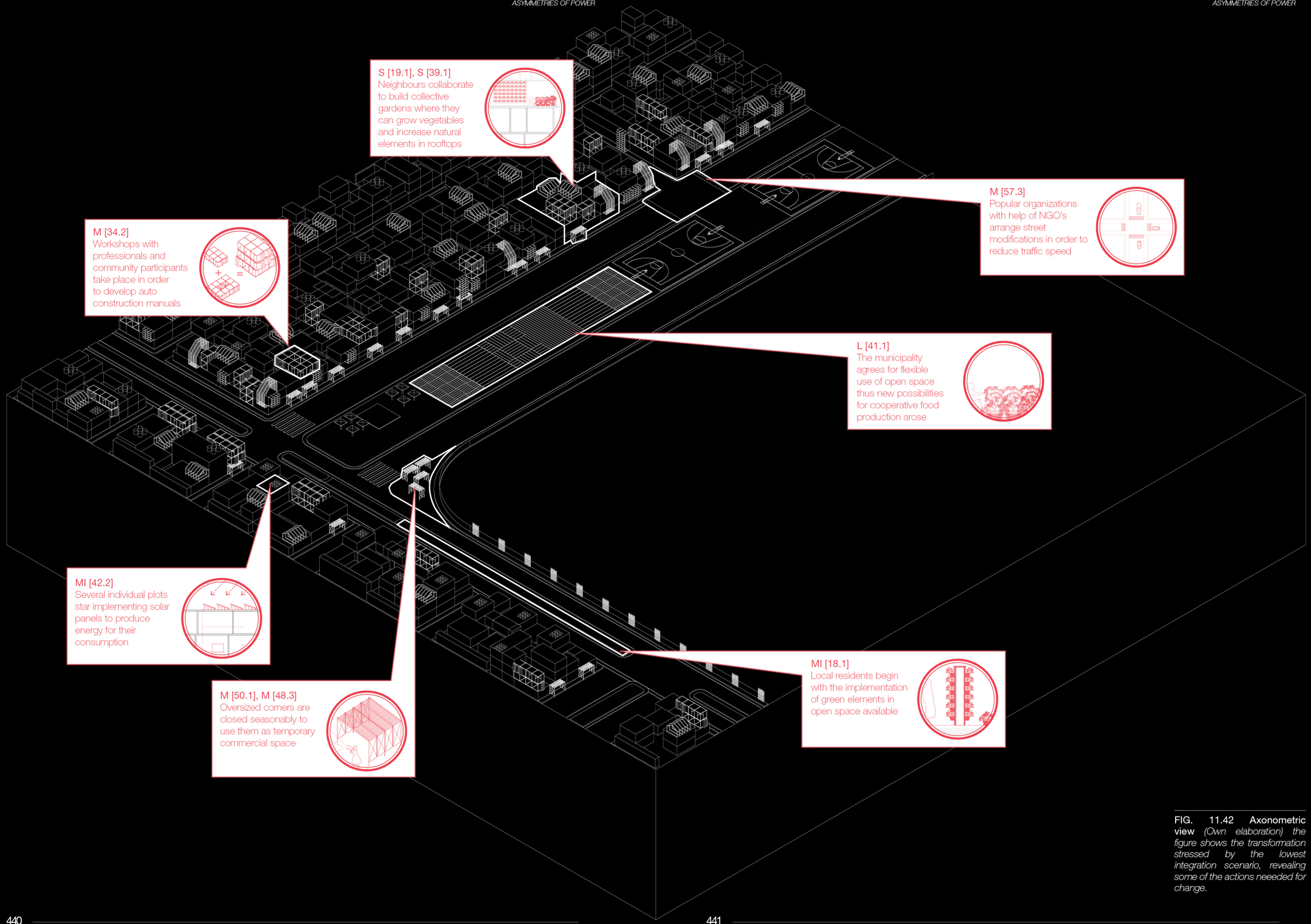
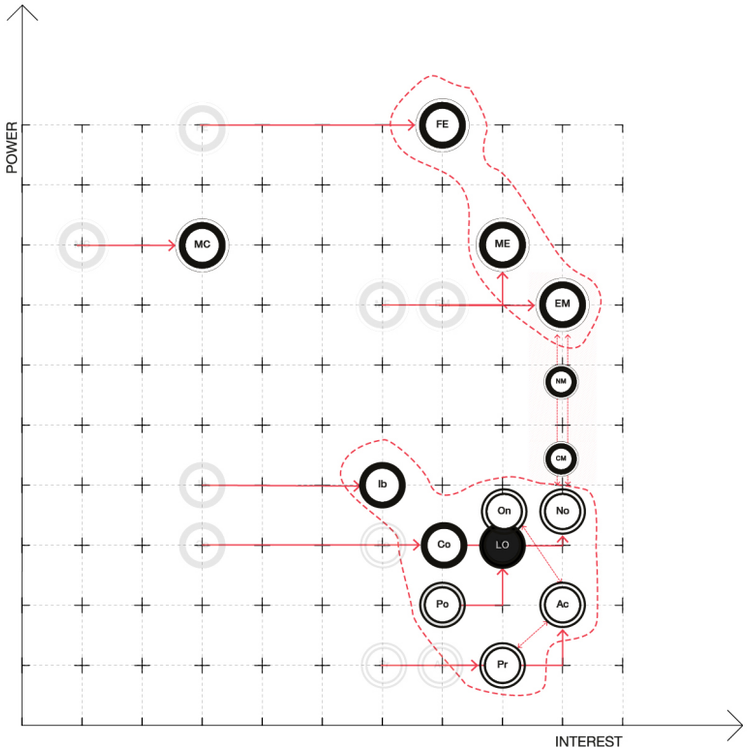


FIG. 11.42 Axonometric view *(Own elaboration) the figure shows the transformation stressed by the lowest integration scenario, revealing some of the actions neeeded for change.*

Phase 4-5

Phase 4 and 5 focus on the collaboration between the federal government, the state and municipality towards the systemic goals of the adaptive planning. The 3 highest power actors increase their interest levels joining forces with the nearby municipalities, thus growing collaborative efforts.

A new planning agenda allows flexibility of land use in the cemetery, transforming current wasteland into a public space capable of hosting new local public-transport-stops. This arrangement requires private investment which has shown an increase in interest due to the later development. Public space becomes a key strategy thus enhancing transformation of the urban fabric into a mixed use area.
Benefited users through policies and incentives contribute with local tasks such as maintenance and increasing the public infrastructure. Moreover strategies for water management are tested as part of a pilot project that seeks new water sensitivity in vulnerable communities.



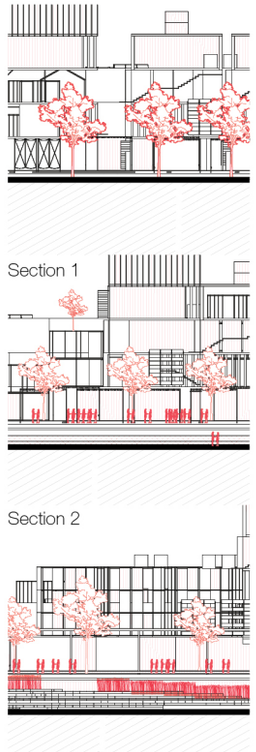
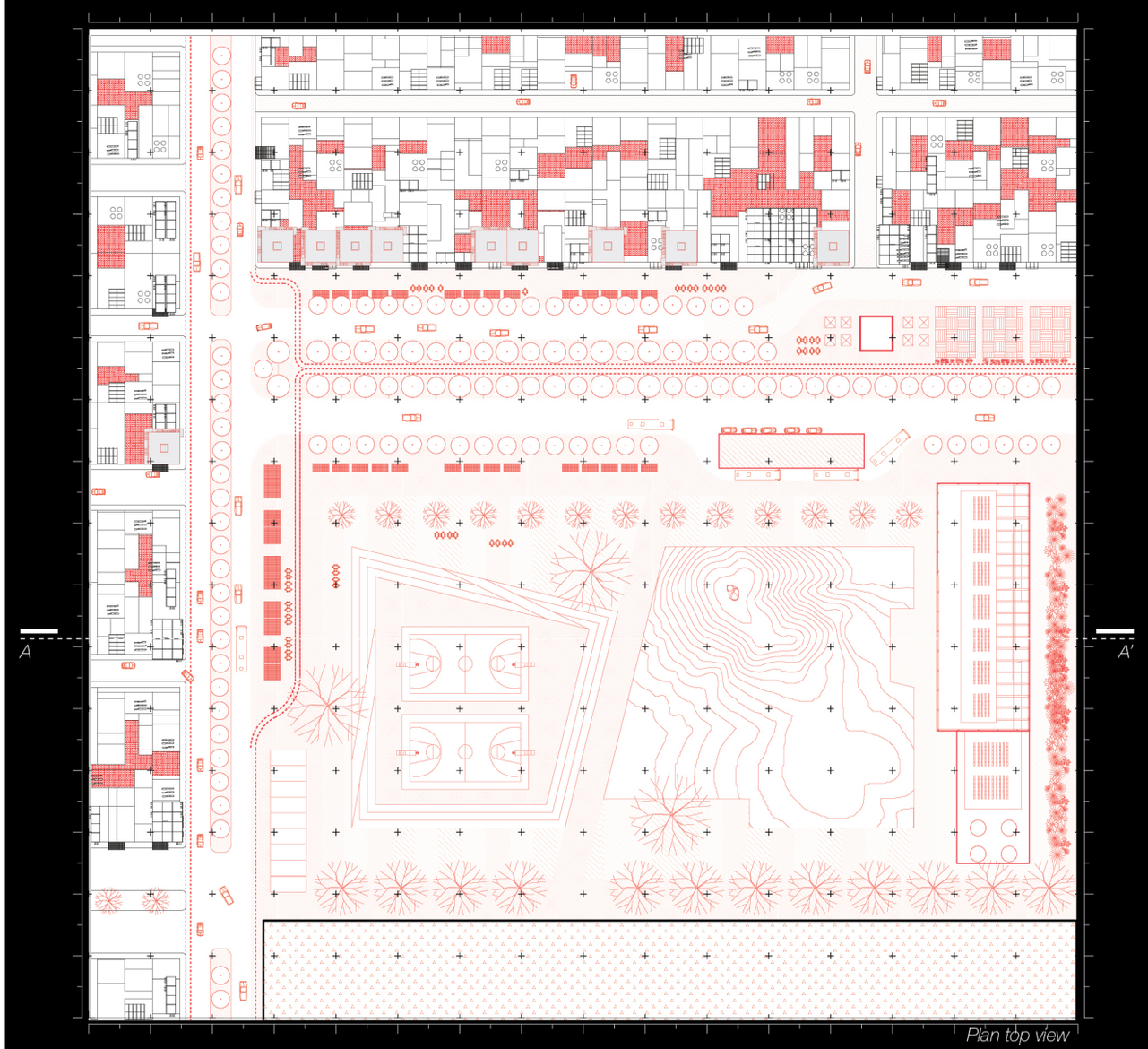


FIG 11.43 stakeholder matrix *(Own elaboration) The matrix shows current relationships of power and interest in the area towards spatial cohesion based on the highest integration scenario.*

FIG 11.44 Top view and section view *(Own elaboration) the figure shows potential spatial change based on the highest integration scenario.*





ASYMMETRIES OF POWER

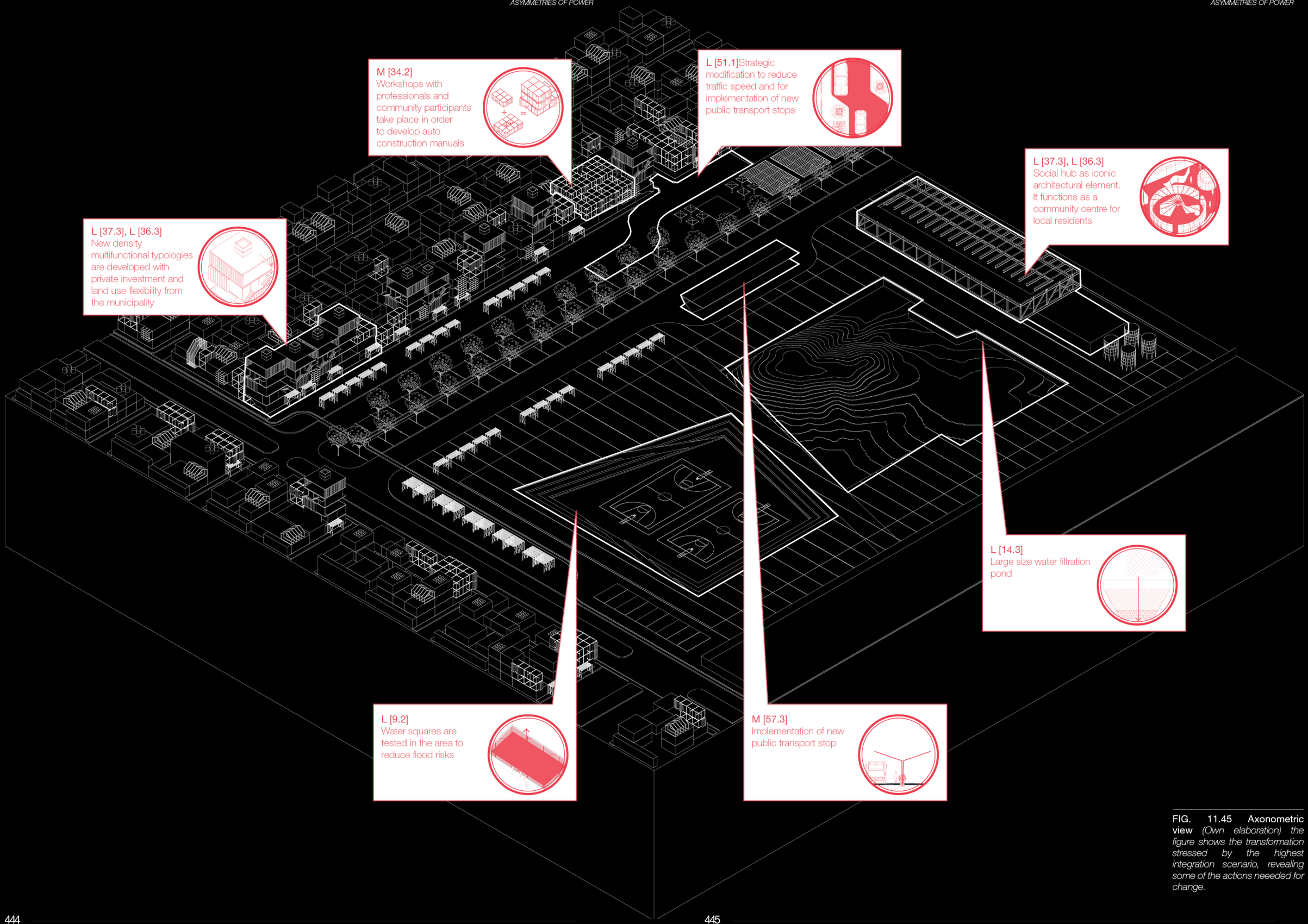


FIG. 11.45 Axonometric view *(Own elaboration) the figure shows the transformation stressed by the highest integration scenario, revealing some of the actions neeeded for change.*

Comparison Between Low and High Integration at Local Level

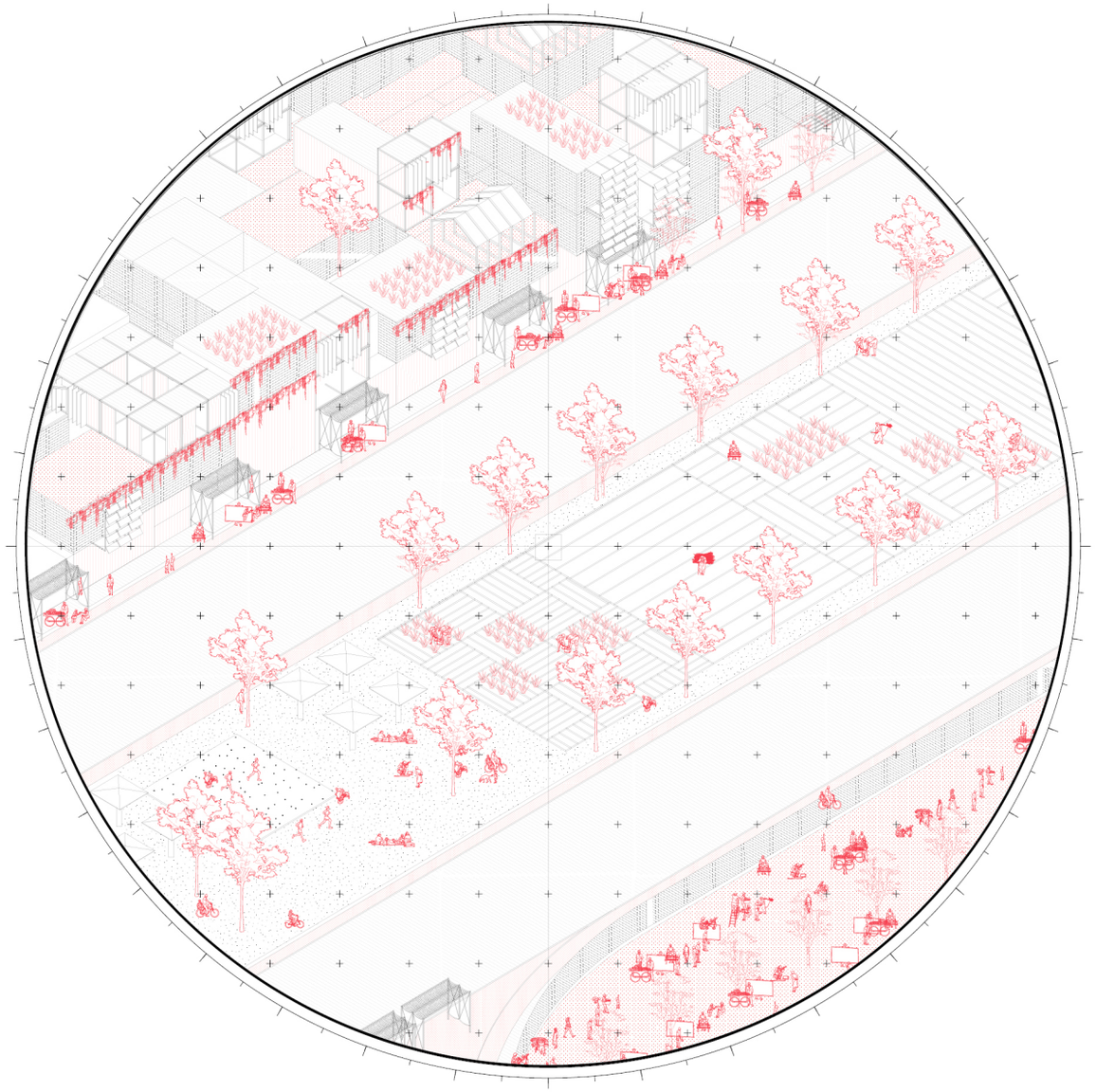


FIG. 11.46 Axonometric Detail view *(Own elaboration) the figure shows the transformation stressed by the lowest integration scenario*

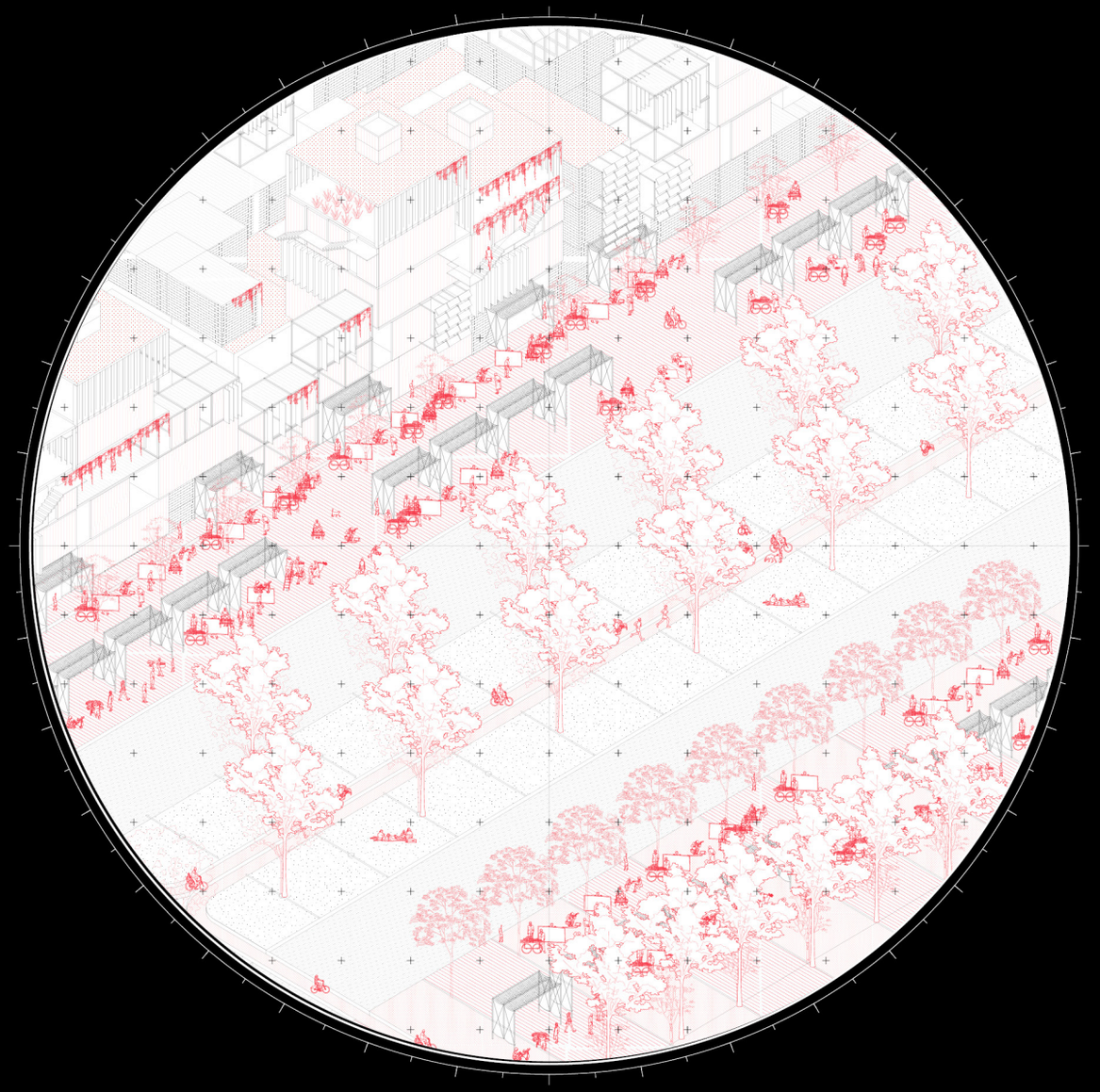


FIG. 11.47 Axonometric Detail view *(Own elaboration) the figure shows the transformation stressed by the highest integration scenario*

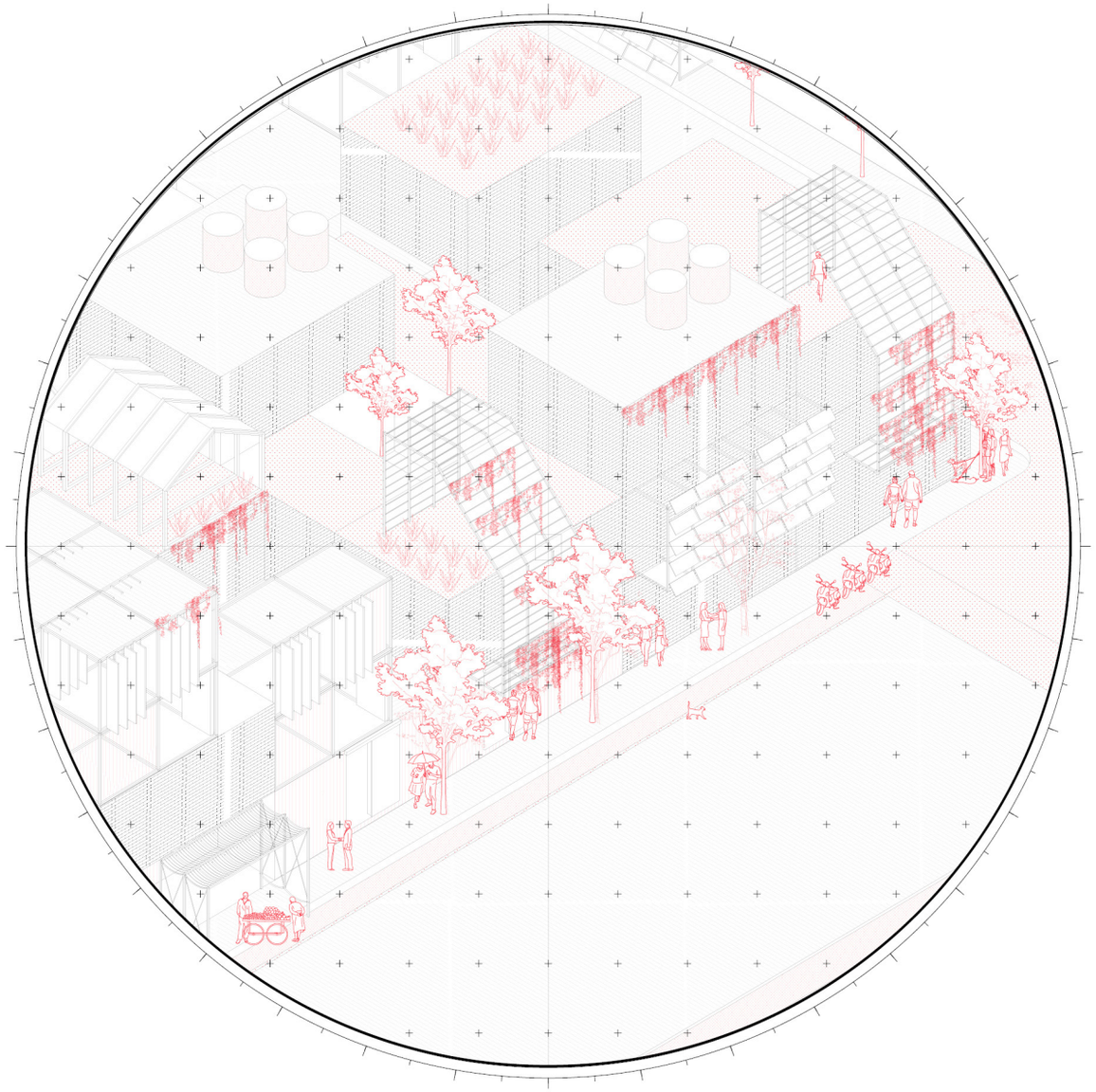


FIG. 11.48 Axonometric Detail view *(Own elaboration) the figure shows the transformation stressed by the lowest integration scenario*

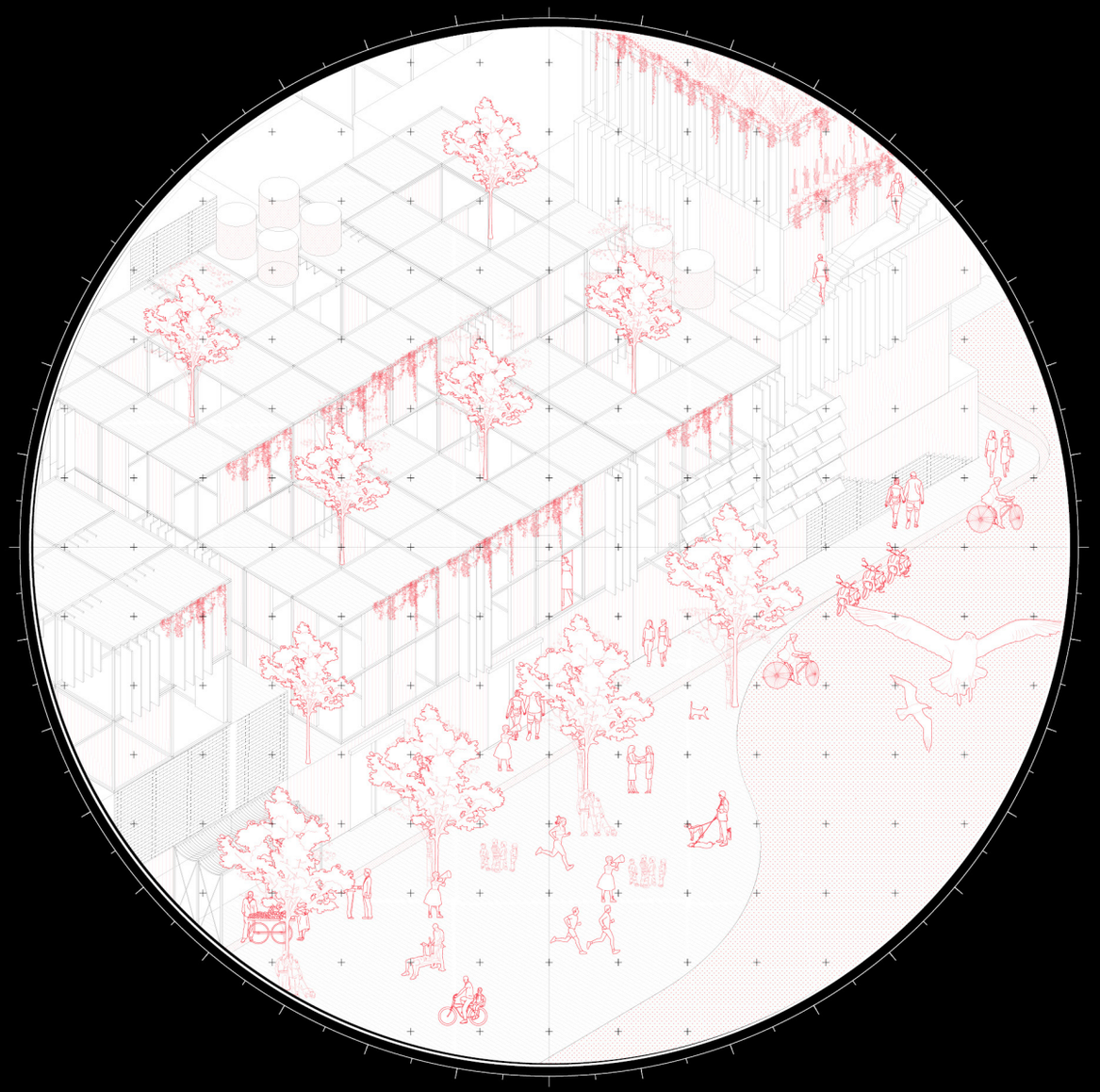


FIG. 11.49 Axonometric Detail view *(Own elaboration) the figure shows the transformation stressed by the highest integration scenario*

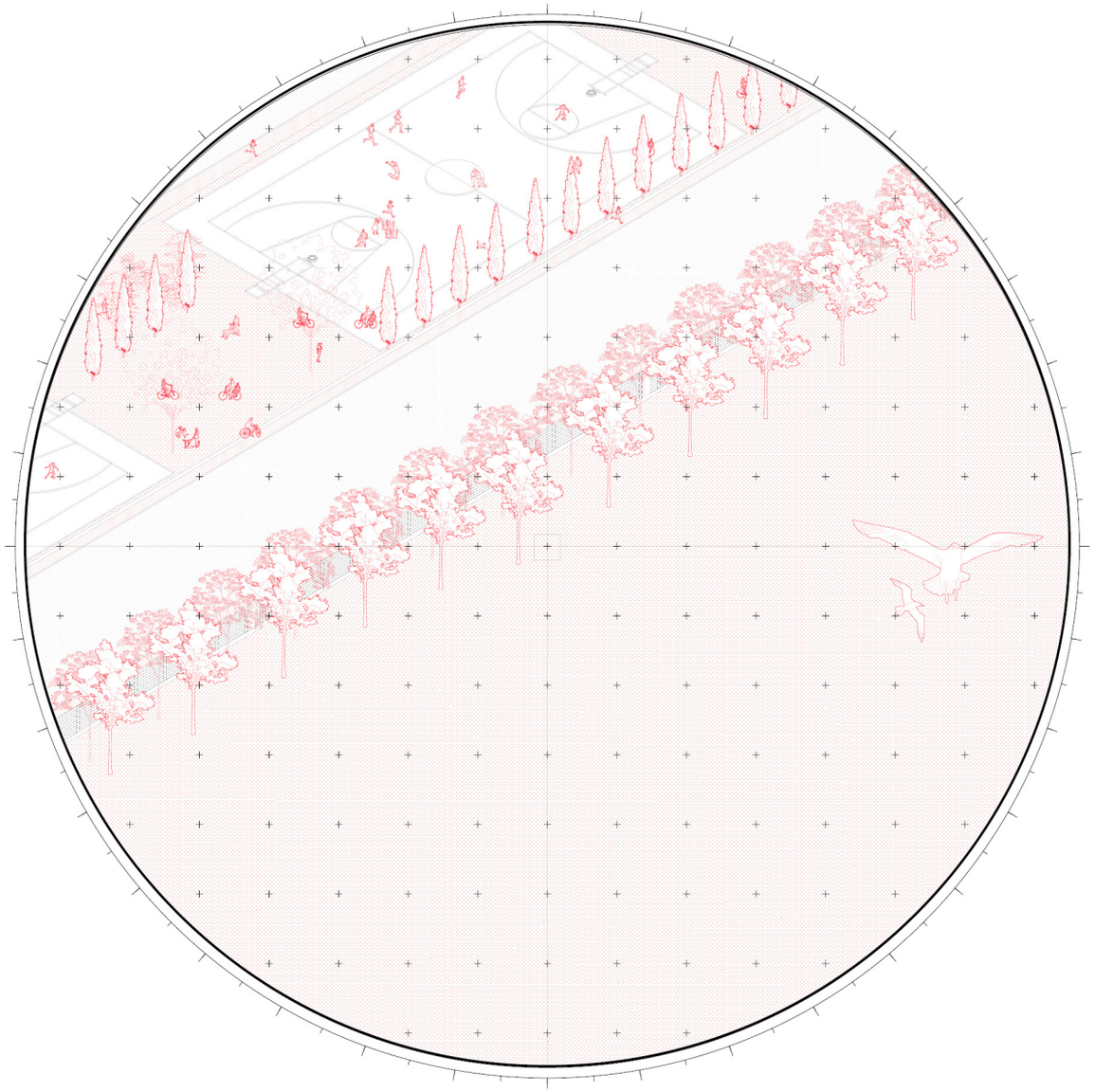


FIG. 11.50 Axonometric Detail view *(Own elaboration) the figure shows the transformation stressed by the lowest integration scenario*

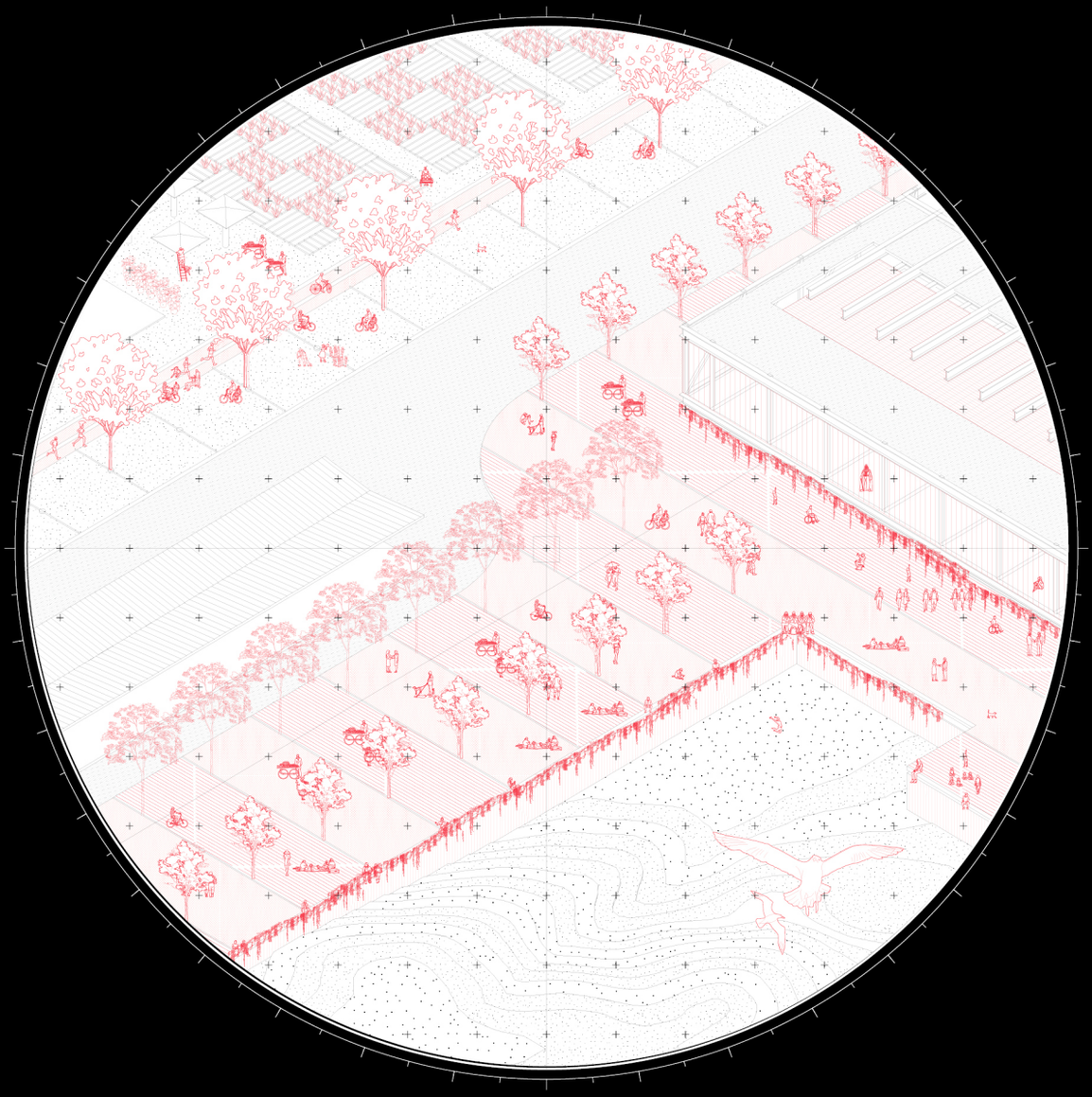


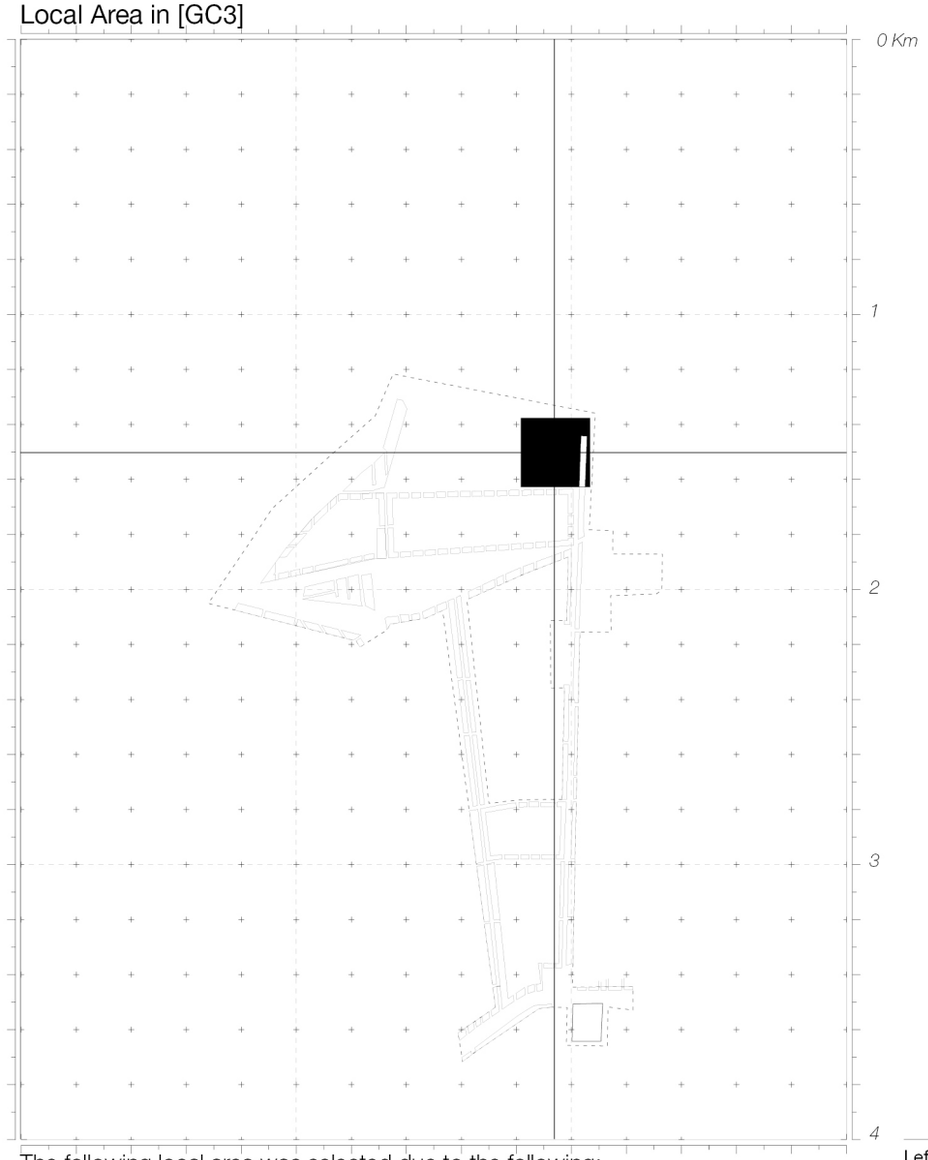
FIG. 11.51 Axonometric Detail view *(Own elaboration) the figure shows the transformation stressed by the highest integration scenario*



IMG. 11.21 Visualization of the area with its full potential achieved
(Own elaboration) The image shows the public space open in the cemetery.

The selected area allows the adaptive strategy to test a scenario where the highest levels of power become increasingly interested in the process since vulnerabilities towards water management, public space and transport & mobility can be substantially reduced with a simple action, flexibility of land use. The cemetery has the potential of transformation for the entire area adding a new patch to the general network of the gate [GE7].

Local Area in [GC3]



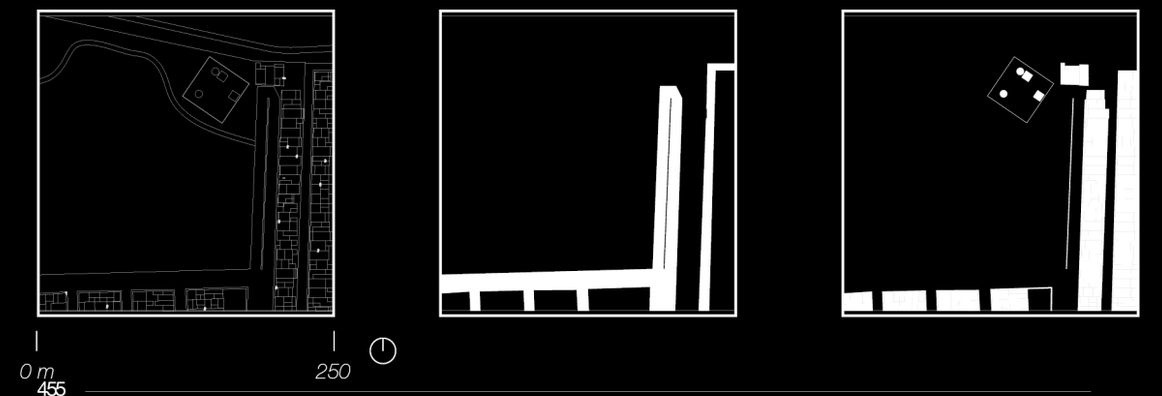
The following local area was selected due to the following:

_Public space is insufficient.
_It is placed as the final connection between the metropolitan park and the urban tissue.
_Wastecapes are present in the area usually used as dumpsters.
_It has a close relations with one of the canals that border on the void.
_A small water treatment plant is located in the area.
_Housing is still growing informally, however the patterns reveal lower density levels.
_The area is highly vulnerable to hazards such as flooding, and dust bowls coming from the north.
_A communal garden takes place in the area.
_The only border between the urban tissue and the void is a canal, this soft border characteristic is unique among the selected areas with harder borders (main roads or railways).

Left - FIG. 11.52 Selection of the are of study *(Own elaboration).*

Right - IMG. 11.22Satellite image of the selected area *(Source: Google Earth, 2018).*
FIG. 11.53 Urban structure of the selected area *(Own elaboration).*









IMG. 11.23-Up and 11.24-Bottom *(Google maps, 2020) The images show the current state of the selected area.*





IMG. 11.25-up and 11.26-Bottom *(Google maps, 2020) The images show the current state of the selected area.*

Scenarios Gate [GC3]

Lowest Integration Scenario

This pathway stresses a bottom-up approach with only the participation of local residents to collectively achieve the systemic goals formulated by the approach. It is based on local agreements without major involvement from big power actors. However the local participatory process involves NGO's and organizations that will help the mediation of decisions with municipal authorities. This is required to continue with an organized transformation that is recognized by the municipality as a formal process.

_Water landscape integration and management
2021-2027 _ The process begins with the involvement of the community, by informing and teaching them the process through which they can accomplish a water sensitivity, not only for sustainability purposes but as a strategy that allows them ensure the use of the resourse throughout the year. Micro scale interventions can be accomplished by reducing paved surfaces inside plots.
2027-2033_ Several local residents implement water tanks and other means for collecting water.
2033-2039_ The process continues and several NGO help the community to develop a strategy to get subsidies and expand the system. The Municipality and the State stablish a subsidy with help of the federal government and Bank institutions in order to facilitate the necessary tools to develop a collective collecting water system in the neighbourhood.
2039-2045_ The process cannot go further than this stage unless the public institutions provide new infrastructure and the possibility to change the current one suitable for new water sensitive strategies.

_Green infrastructure and quality of public and open space
2021-2027_ The process begins with the involvement of the community, by informing and teaching them via workshops the process through which they can accomplish a greener and healthier neighbourhood. Several micro and small scale interventions take place in the open space available.
2027-2033_ The process continues and several NGO help the community to develop a strategy in order to land subsidies which can help them improve the green area by implementing new trees in the current underused public space and adding new sports and leisure facilities such as soccer fields.
2033-2039_ The process developed new collective ways of developing green roof gardens by the community thus increasing the green surface in the area. Open spaces become a collective ground for green micro interventions by local residents.
2039-2045_ Community gardens and the greenfication of the current urban equipment start changing the area. The community develops strategies to change and increase the walking sides reducing the external traffic flows.

_Densification of the built system
2021-2027_ The process begins with the involvement of the community, by informing and teaching them in workshops the process through which they can accomplish a denser community in a sustainable controlled way, the aim is to stress and support the current self-construction practice with new typologies, the process requires the involvement of professionals, NGO's and the community to develop a cohesive strategy and self-construction manuals.

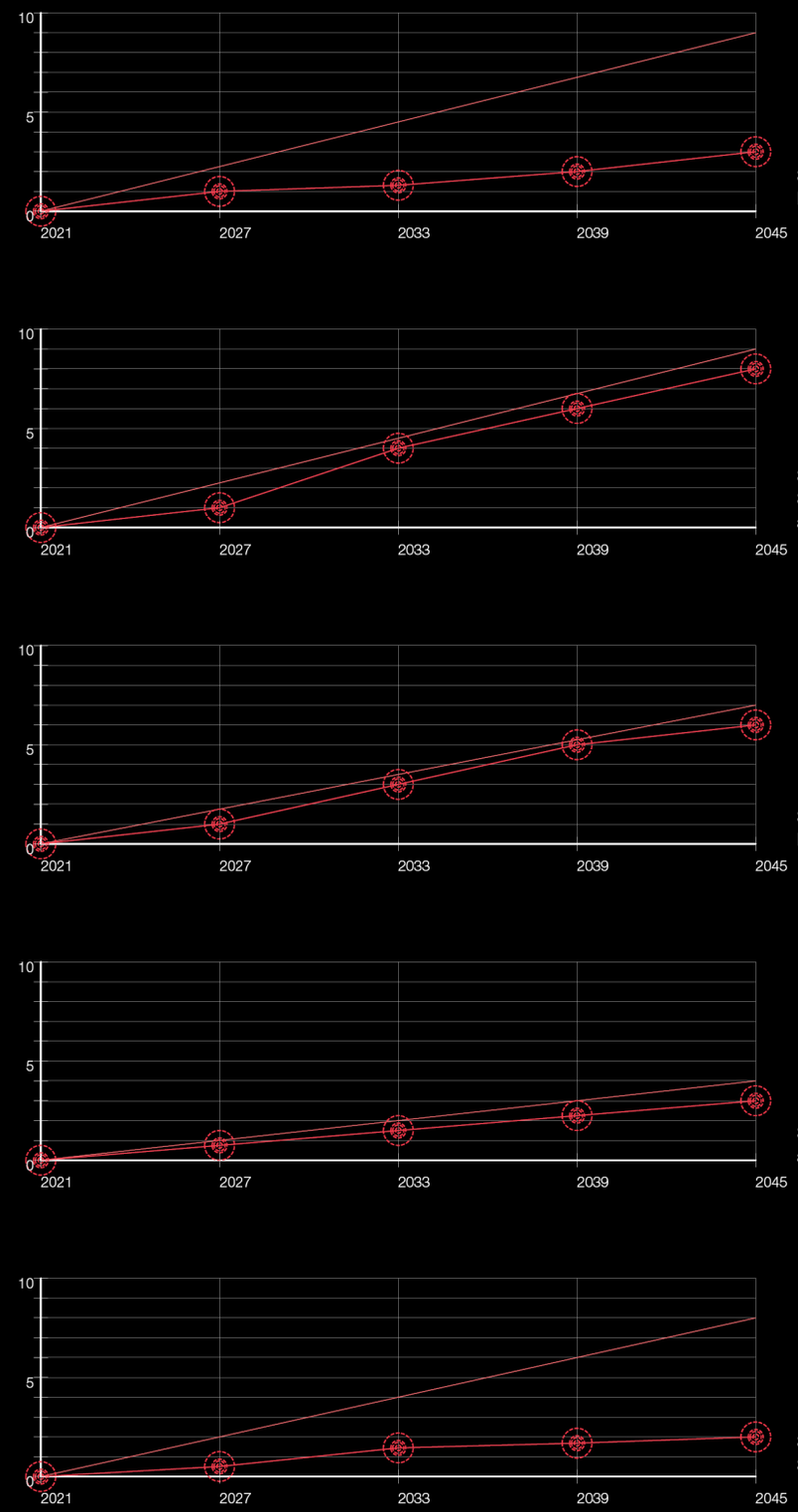


FIG. 11.54 Low integration scenario per systemic goal *(Own elaboration).*

2027-2033_ With the strategy the municipality allows the development of some of the open land enabling new residents to develop their houses. Nevertheless this process will now be monitored by the neighbourhood association and NGO's which already acted collectively increasing the current density levels tand adapting the new typologies to the current strategy.
2033-2039_ The process of densification continues with self-construction, the supervision and evaluation of the structures are taken by universities and professionals as a community service requested by the community and the municipality. During this phase new typologies are introduced in the area allowing local residents to develop new cooperatives for their implementation.
2039-2045_ Between neighbours 'co-habitation' practices are in practice, and the buildings start growing in a collective way rather than individual plot areas.

_Productive landscapes and means of production
2021-2027 _ The process begins with the involvement of the community with aid of NGOs. Two main ways of production can be explored, solar energy and small scale food production. During this phase the community develops a strategy to use the open land for food production. This strategy supports current practices where local residents use some of the open space to develop their own productive gardens.
2027-2033_ Several NGO's help the community to develop a strategy in order to land subsidies which can help them improve production measures. During this phase the neighbourhood association appropriates the open unused space for community gardens building around it a fence for security.
2033-2039_ The community develops new shared spaces in the 5th façade, allowing them to grow food collectively. New businesses develop in the area facilitating the provision and installation of solar panels.
2039-2045_ With help of NGO's new subsidies are requested to the municipality in order to increase production of energy.

_Transport and mobility system
2021-2027_ The neighbourhood association and several NGO's work together with the objective of finding new strategies for local flows.
2027-2033_ The first action taken is seasonal closure of Xochiaca Street.
2033-2039_ New public transport stops are implemented in the area due to the increase of local residents.
2039-2045_ The interventions are locally produced, such as a redefinition of the street walkways and new speedbumps to control automotive vehicles speed.

Highest Integration Scenario

This pathway stresses a desirable scenario that balances a bottom-up and top-down approaches including the participation of public, private and civil society sectors. This pathway also is the way through which the area can stress its potentials to a higher level.

_Water landscape integration and management
2021-2027 _The process begins with the involvement of the community, since it is one of the areas suffering from flooding risk due to the rainwater flows.
The process starts by informing and teaching them the process through which they can accomplish a water sensitivity, not only for sustainability purposes but as a strategy that allows them to spend less and ensure the use of it throughout the year.

Micro scale interventions can be accomplished by reducing paved surfaces inside plots. In this phase in order to make a major impact the Municipality and the State together with the Federal government develop a strategic project that enables a substantial increase in wet land capable of reducing flooding risks in the biggest open space available.
2027-2033_ The Municipality implements new water canals alongside the new housing developments bringing water infrastructure as part of the local landscape, creating awareness in the community. Collectively with the neighbourhood association, the municipality evaluates de possibility of implementing new porous pavements and the introduction of water streets in proprietary areas.
2033-2039_ large intermunicipal interventions take place along the canal that functions as physical boundary. The interventions include the renaturalization around its inmediate bufferzone.
2039-2045_ A water pond is created in the available open space to become part of the future metropolitan park. Water streets and other small and micro interventions continue being developed, water strips regardless of their small scale need the participation of the municipality in order to implement them.

_Green infrastructure and quality of public and open space
2021-2027_ The process begins with the involvement of the community, by informing and teaching them the process through which they can accomplish a greener neighbourhood with public space accessible to the community. This first stage foster the activation of the biggest open space in the area. The Gate is known for recently developing urban equipment such as schools and the beginning of a linear park, which can be complemented by the introduction of a larger park. Muncipal authorities work together with the State and Neighborhood associations to develop the program.
2027-2033_ the area functions as the entrance point from the urban structure to the void (future ecological park). These specific condition requires the adaptation of the street that connects them. Its transformation will increase the hard public space in the area that can be easily used for multipurpose activities such as street markets. This intervention needs the participation of the local community, the municipality and the federal government.
2033-2039_ During this phase the formal access to the park transforms in a social hub, where the community centre is placed, having multifunctional purposes. During this stage the water management plant relocates to become part of the structure functioning as a display for visitors.
2039-2045_ The municipality and the community work together in order to open the interstitial space of the current urban equipment for public space facilities adding to the now excisting new public space.

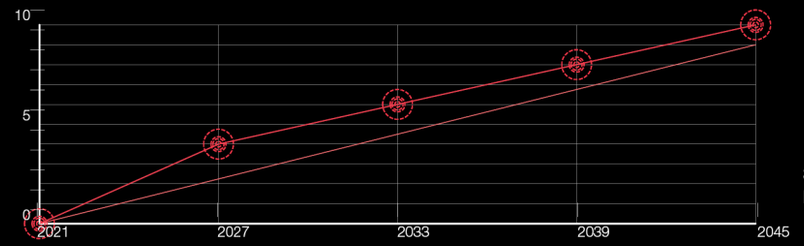
_Densification of the built system
2021-2027 _The process begins with the involvement of the community, by informing and teaching them the process through which they can accomplish a denser community in a sustainable control way. It is also a crucial point where the community is informed about the new social-housing developments with flexible mix uses that will be built having the direct participation of the private market. During this negotiation a specific area closer to the canal with the highest flood-risk vulnerability is evicted in the last stage of the housing development.

2027-2033_ The last stage of the new housing typology is finalized. The Municipality and the State stablish a subsidy with help of Bank institutions and the participation of interested entrepreneurs or private investors in order to develop new density models that work with the current urban structure.
2033-2039_ Land use becomes flexible with land borrowed policies allowing the development of other areas such as the public space connecting the gate with the void. Due to this flexibility new mix uses can be implemented legally in the urban structure, increasing commercial areas that are currently working under informal legality thus fostering the endogenous development of the area.
2039-2045_ The area starts developing at a fast speed with new Co-housing typologies. The introduction of rent incentives by bank institutions facilitate the community or interesting participants to rent a place in these new buildings.

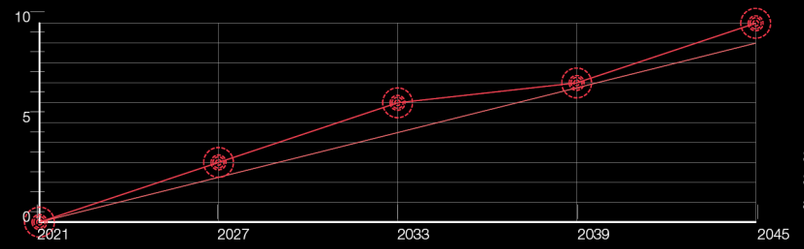
_Productive landscapes and means of production
2021-2027_The process begins with the involvement of the community with aid of ONG's. During this stage the awareness of the possibilities for production within the area are depicted. Two main ways of production can be explored, solar energy and small scale food production. During this phase the neightborhood association works with the municipality in order to use the open space available in the existing corridor between the cemetery and their houses to create community gardens for food production.
2027-2033_ The Municipality through subsidies starts helping the community to locally produce food in the open space that is currently transforming into a new public space. The community with help of ONG's starts with the subsidy request process for implementation of solar panels that can contribute to the general structure.
2033-2039_ The municipality works together with the community in order to develop new greenhouses close to the future metropolitan park. This areas will be worked and monitored by the community. The federal government gives incentives to the municipality for a greater increase in solar energy production.
2039-2045_ The current urban equipment is used by the municipalities as another productive land fostering solar energy.

_Transport and mobility system
2021-2027 _The process begins with the involvement of the community, by workshops that allow the municipality to depict critical points where mobility and access are not performing correctly. With this assessment new strategies are put in motion along with the density strategies currently taking place. Xochiaca Street is redeveloped to function as one of the two main access points to the ecological park in the area. New public transport stops are located in the area distributing the traffic flows guaranteeing accessibility to the local inhabitants.
2027-2033_ New routes are designated for water plant which do not interrupt with the new public space facilities.
2033-2039_ During this stage the municipality works together with the neighbourhood association in order to develop new local street patterns enforcing a speed reduction of automotive vehicles and enabling only local-controlled access through some of the streets.
2039-2045_ Since the area is changing due to the new typologies for densification and public space, new strategies for parking need to be taken into account, opening up the possibility for private investment in underdeveloped land for parking purposes.

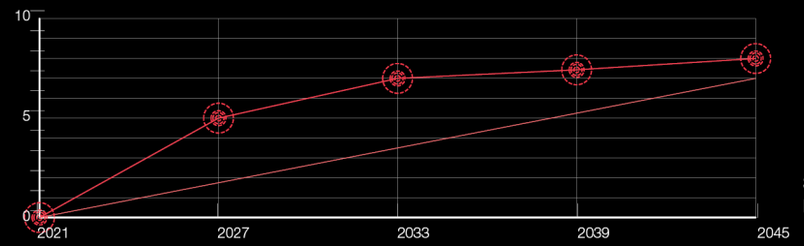
FIG. 11.55 High integration scenario per systemic goal *(Own elaboration).*



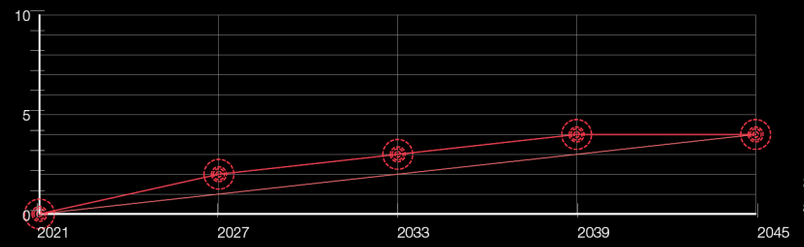
SG1 - Water Landscape Integration and Management



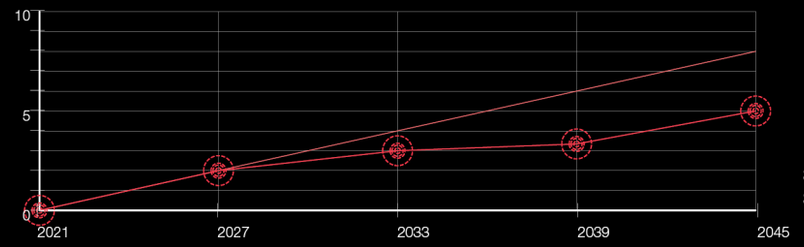
SG2 - Green Infrastructure System and Quality of Public and Open Space



SG3 - Densification of the Built System



SG4 - Productive Landscapes and Means of Production



SG5 - Transport and Mobility System

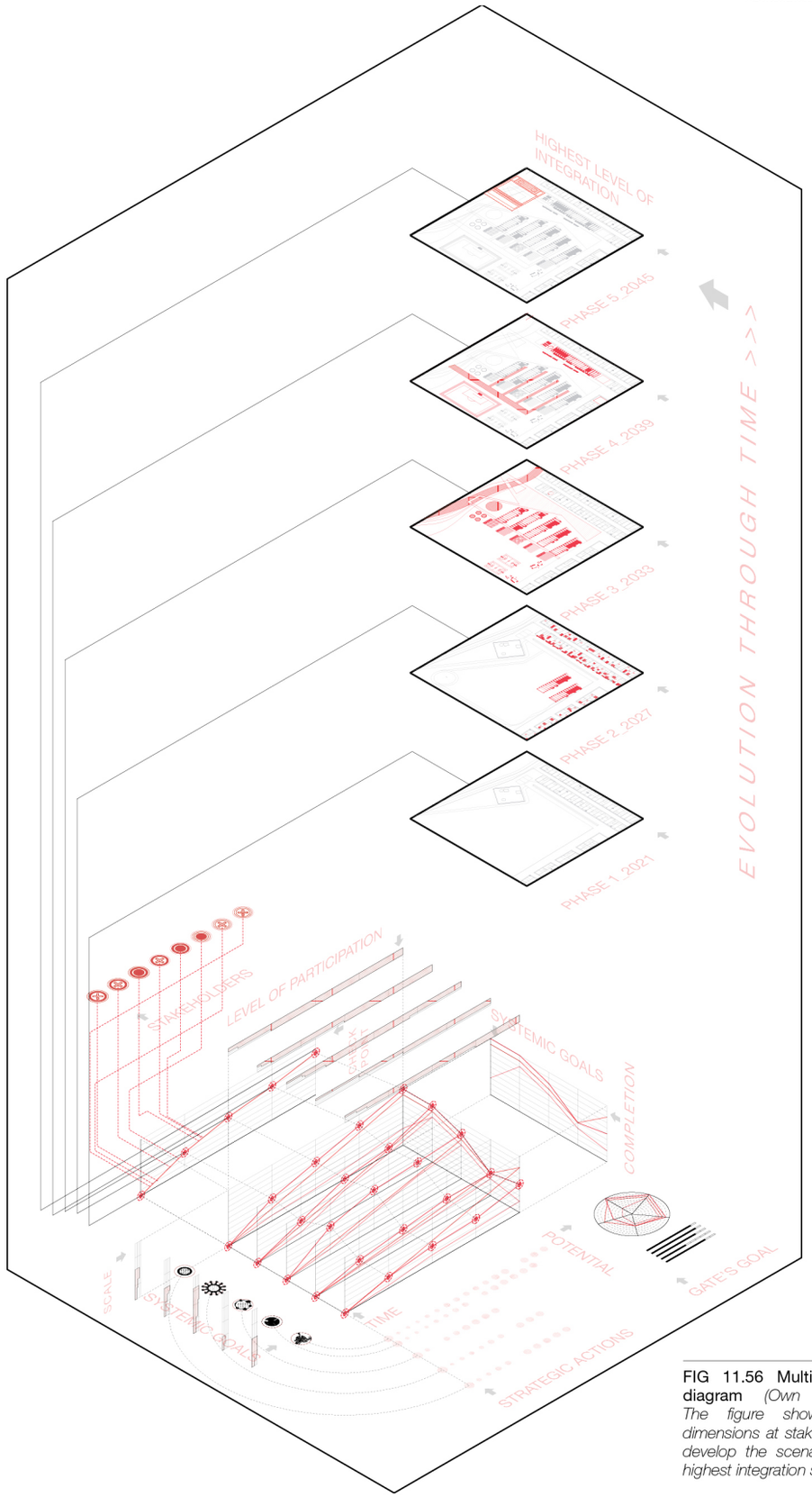
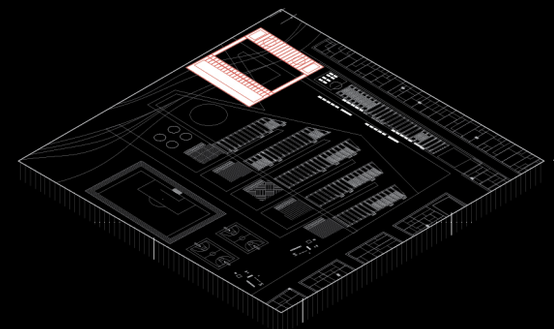


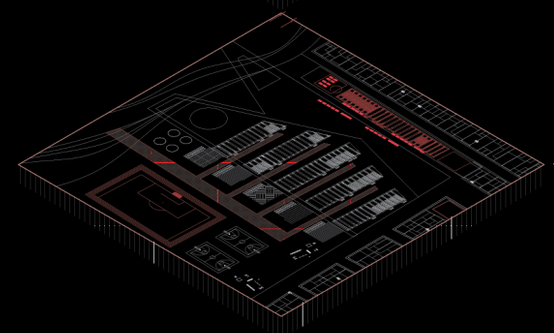
FIG 11.56 Multidimensional diagram *(Own elaboration) The figure shows different dimensions at stake in order to develop the scenario with the highest integration score.*

Current state, conversations, workshops and dialogs are under process



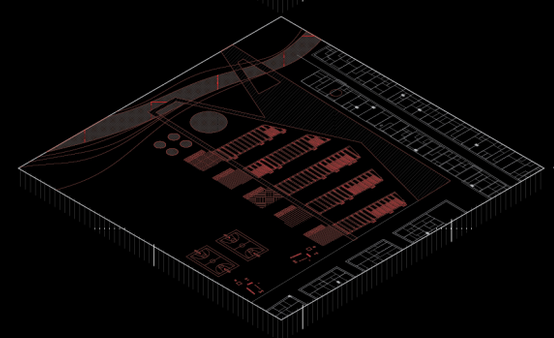
Phase 5

Initiatives from federal government and municipal upgrades in planning strategies start shaping the open space into public space where water sensitive strategies take place such as water ponds, water squares and plazas and storage of water in order to reduce risks in the area thus its vulnerable conditions regarding water management



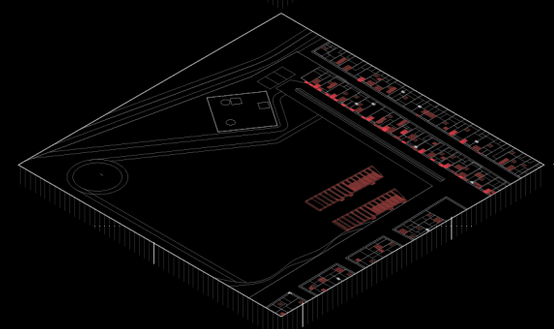
Phase 4

The access to the gate is being developed by the municipality and private investment as a strategic action required for its fast implementation



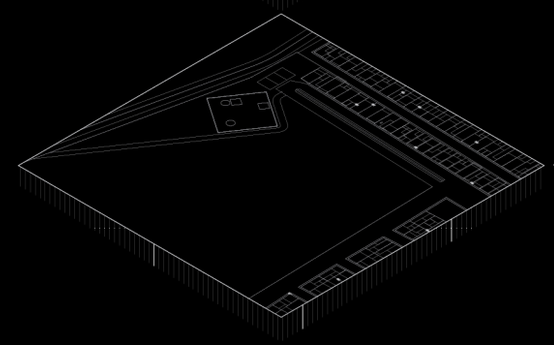
Phase 3

Due to agreements with the municipality the flexibility in land use allows private developers to work with the community in order to develop new social housing typologies for new residents and upgrades in the current urban fabric, increasing density concentrations



Phase 2

Current state, conversations, workshops and dialogs are under process

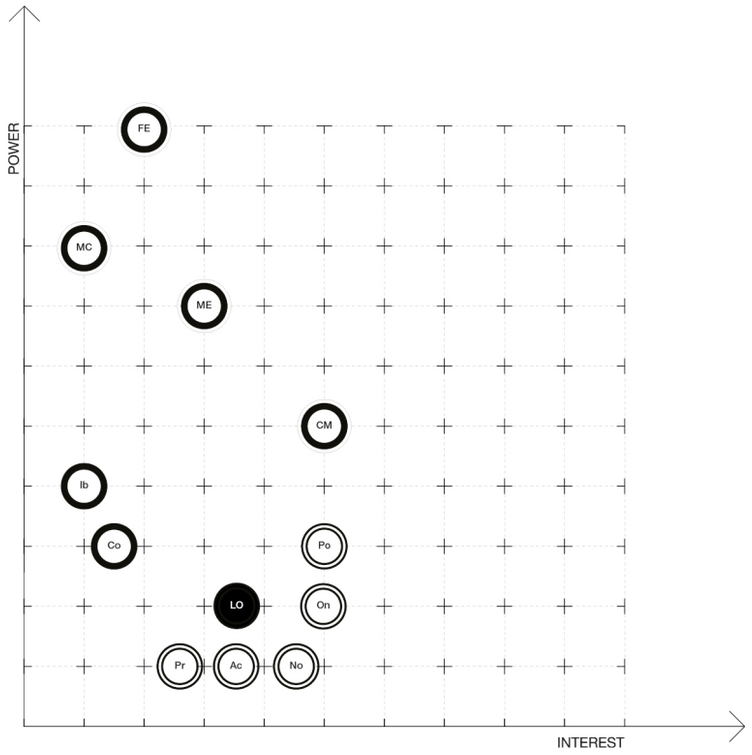


Phase 1

FIG. 11.57 Phases of the scenario with highest integration score *(Own elaboration).*

Phase 1

Chimalhuacan municipality is the weakest in power among the three issued in this report. This isbecause it is still a municipality under development while Ecatepec and Nezahualcoyotl are entirely urbanized. The private sector remains steady rearding interest while civil society despite their interest towards reducing their vulnerabilities has not enough power or consolidation as a collective entity able to achieve higher goals.
The selected area is relatively new regarding its urban development, thus the municipality prioritize the area due to its closeness with the federal border which separates the urban tissue from the void.



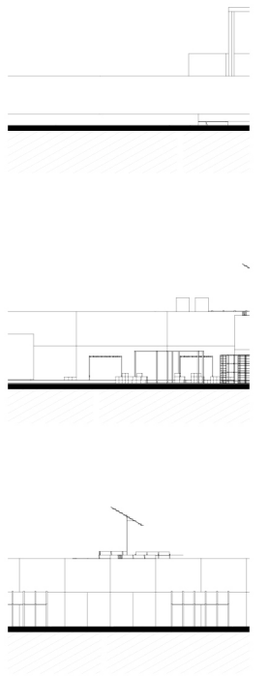
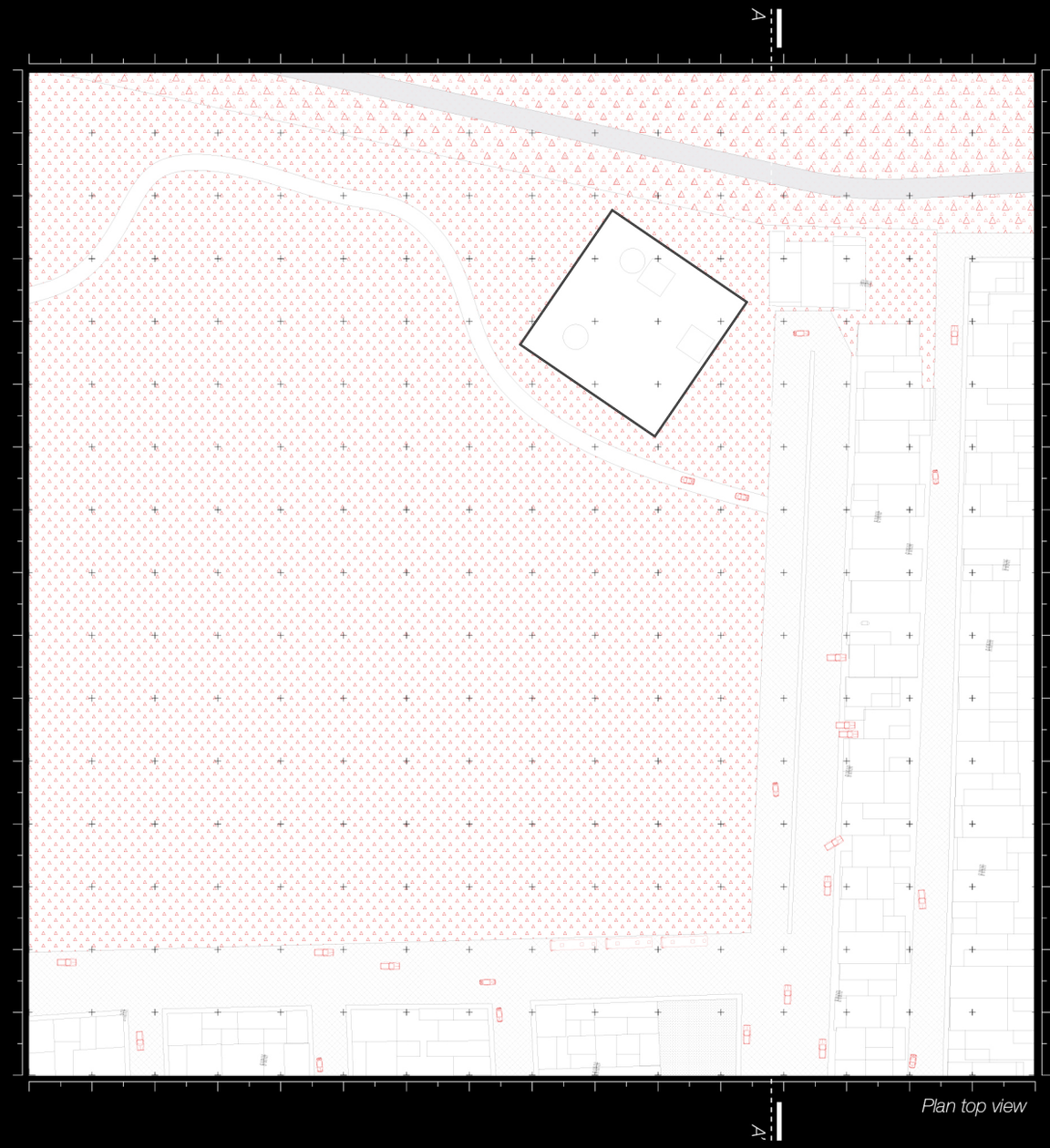


FIG 11.58 stakeholder matrix *(Own elaboration) The matrix shows current relationships of power and interest in the area towards spatial cohesion*

FIG 11.59 Top view and section view *(Own elaboration) the figure shows the current state emphasizing three zoom ins in the section area (left page, right side.*



Phase 2-3

Collaboration between civil society sector is imperative to arrange a cohesive transformation in the area. In this regard their awareness and interest must increase as a collective which increases their power to achieve greater goals.
Higher levels of power increase their interest in a low transition, however the municipality starts gaining power over the strategic decisions concerning the border limits as a way to consolidate ne intermunicipal connections by means of green corridors or ecological corridors along the exiting canals and their potential to become public spaces for the communities located nearby.

Systemic goals such as public space and density are the first to be implemented. Strategic locations are depict as potentials for the actions to foster endogenous development such as participatory housing production or co-production of housing and public space. Since the connection with the metropolitan park is necessary,

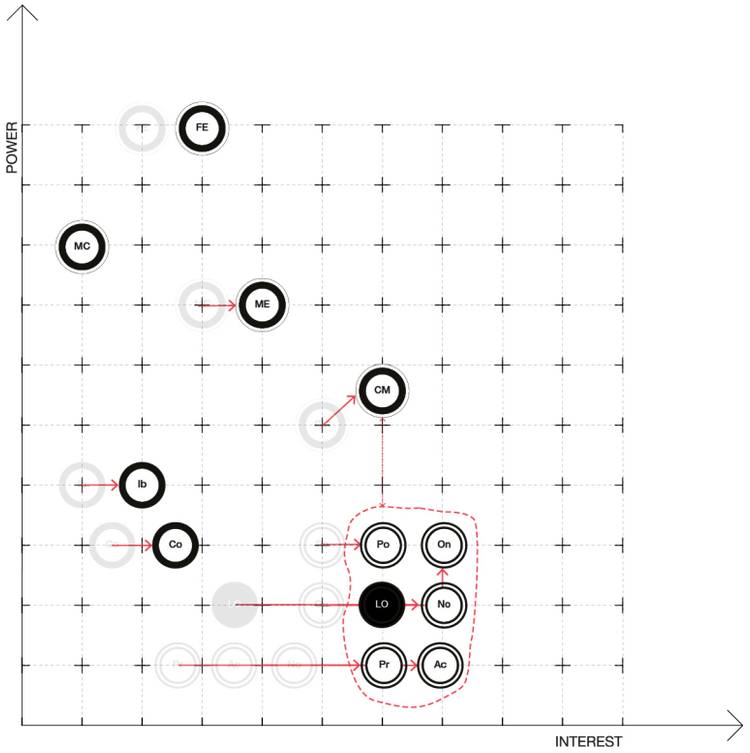
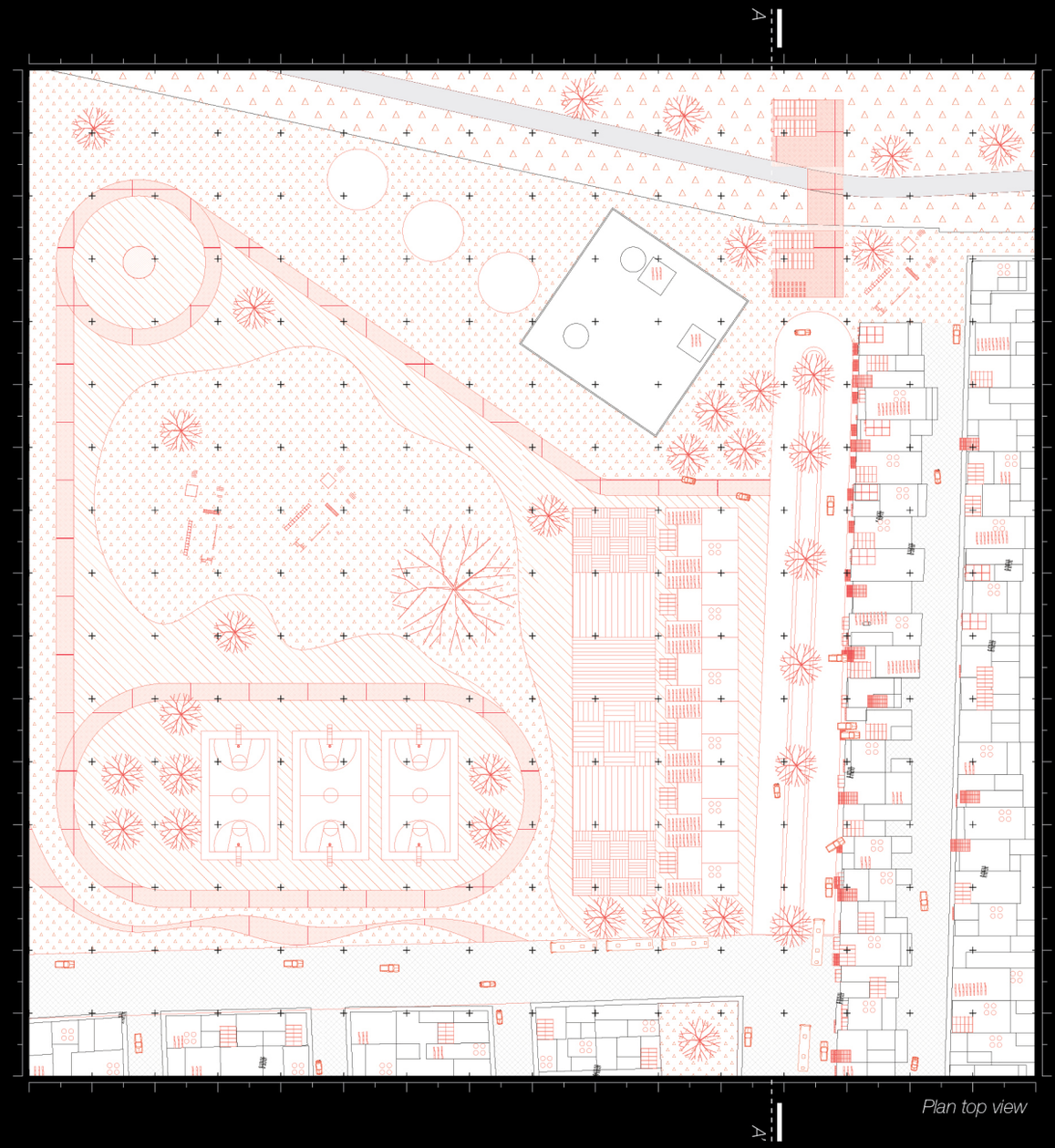




FIG 11.60 stakeholder matrix *(Own elaboration) The matrix shows current relationships of power and interest in the area towards spatial cohesion based in the lowest integration scenario.*

FIG 11.61 Top view and section view *(Own elaboration) the figure shows potential spatial change based on the lowest integration scenario.*



ASYMMETRIES OF POWER

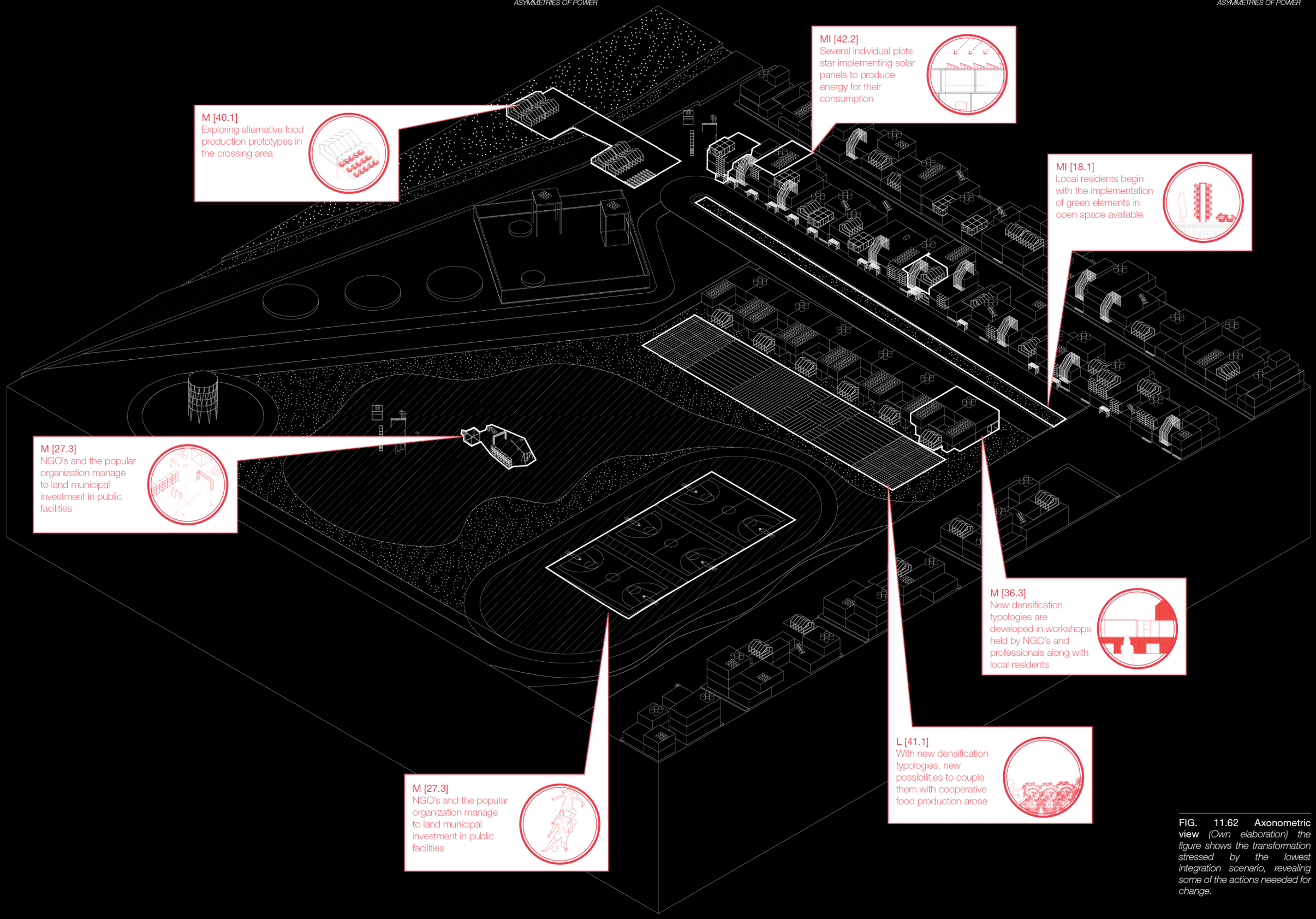


FIG. 11.62 Axonometric view *(Own elaboration) the figure shows the transformation stressed by the lowest integration scenario, revealing some of the actions neeeded for change.*

Phase 4-5

The last faces of development reveal a necessary collaboration between municipalities. Intrmunicipal connections demand ther continuous involvement to achieve the goals effectively.

The area becomes highly attractive to the private sector which shows interest thus investing in new social housing models. Their implementation and planning takes several workshops with local organizations in order for the development to become integrative instead of the fragmented typologies often taken by this sector. Its integration enhances local businesses and multifunctional uses that couple with the transformation of public space close to the gate reinforce local capacities.

Public space is developed by high power actors concern in reducing vulnerabilities of the area against hazards and their own particular interests such as increasing tourism, safety and higher liveability scores.

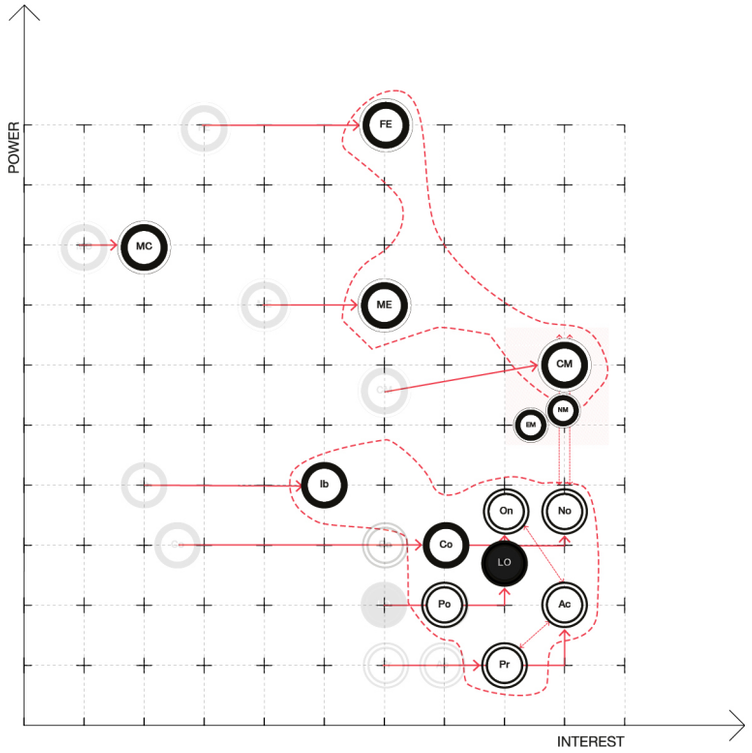




FIG 11.63 stakeholder matrix *(Own elaboration) The matrix shows current relationships of power and interest in the area towards spatial cohesion based on the highest integration scenario.*

FIG 11.64 Top view and section view *(Own elaboration) the figure shows potential spatial change based on the highest integration scenario.*



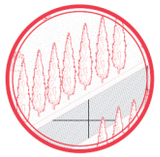


ASYMMETRIES OF POWER

L [29.3]
Social hub as iconic architectural element. It functions as the access control to the park and as a community centre for local residents



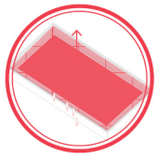
L [21.1]
Connection of the periphery through an ecological corridor natural elements are used to shape the canal



L [37.3], L [36.3]
New density multifunctional typologies are developed with private investment and land use flexibility from the municipality



L [9.2]
Water squares are tested in the area to reduce flood risks



M [6.2]
Water tanks are implemented to complement the water sensitivity strategies of the new public space



L [41.1]
With new densification typologies, new possibilities to couple them with cooperative food production arose



L [54.2]
Wasteland is used to attract private investment and develop parking lots capable to fulfill the needs of the gate



FIG. 11.65 Axonometric view *(Own elaboration) the figure shows the transformation stressed by the highest integration scenario, revealing some of the actions neeeded for change.*

Comparison Between Low and High Integration at Local Level

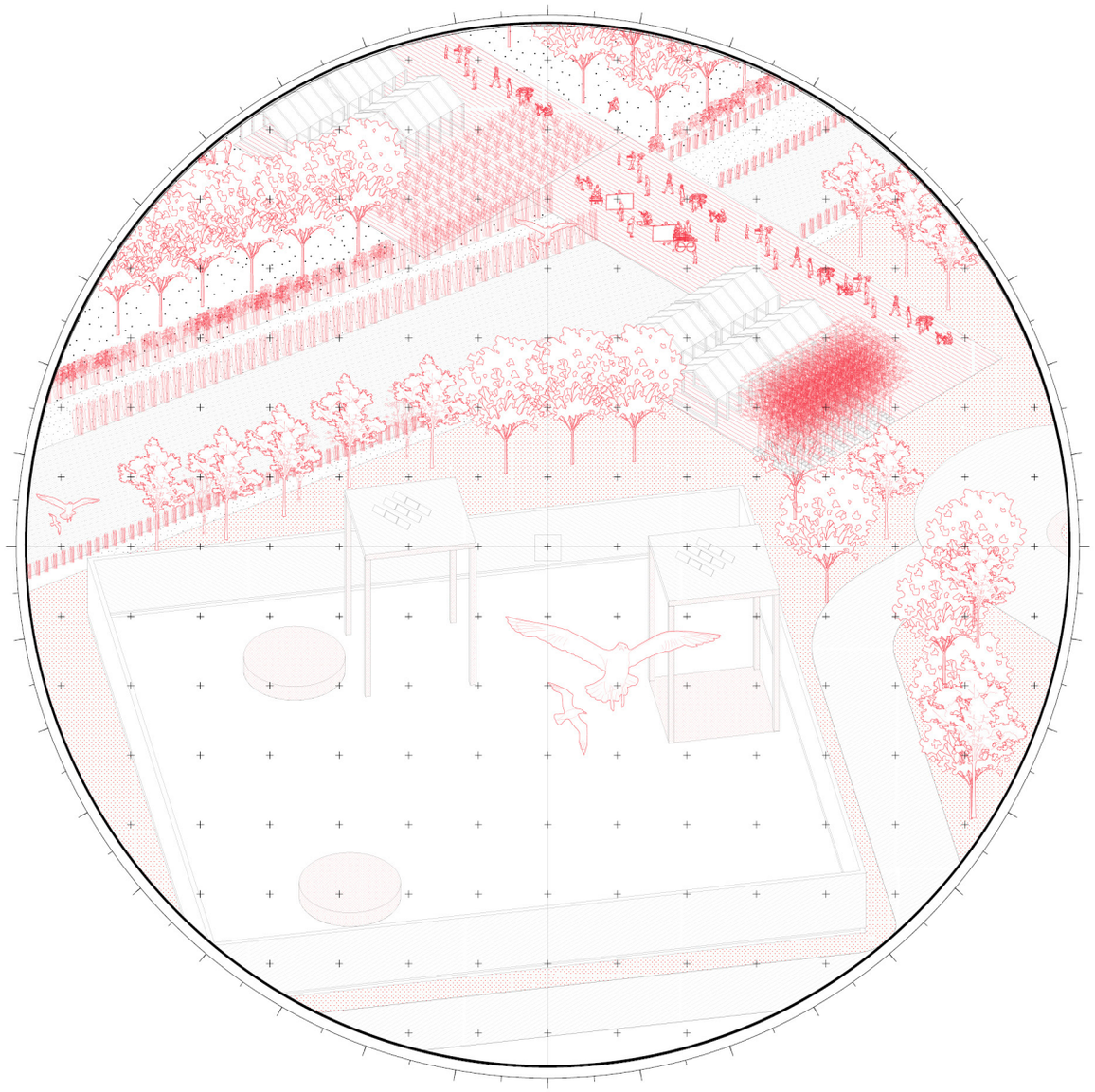


FIG. 11.66 Axonometric Detail view *(Own elaboration) the figure shows the transformation stressed by the lowest integration scenario*

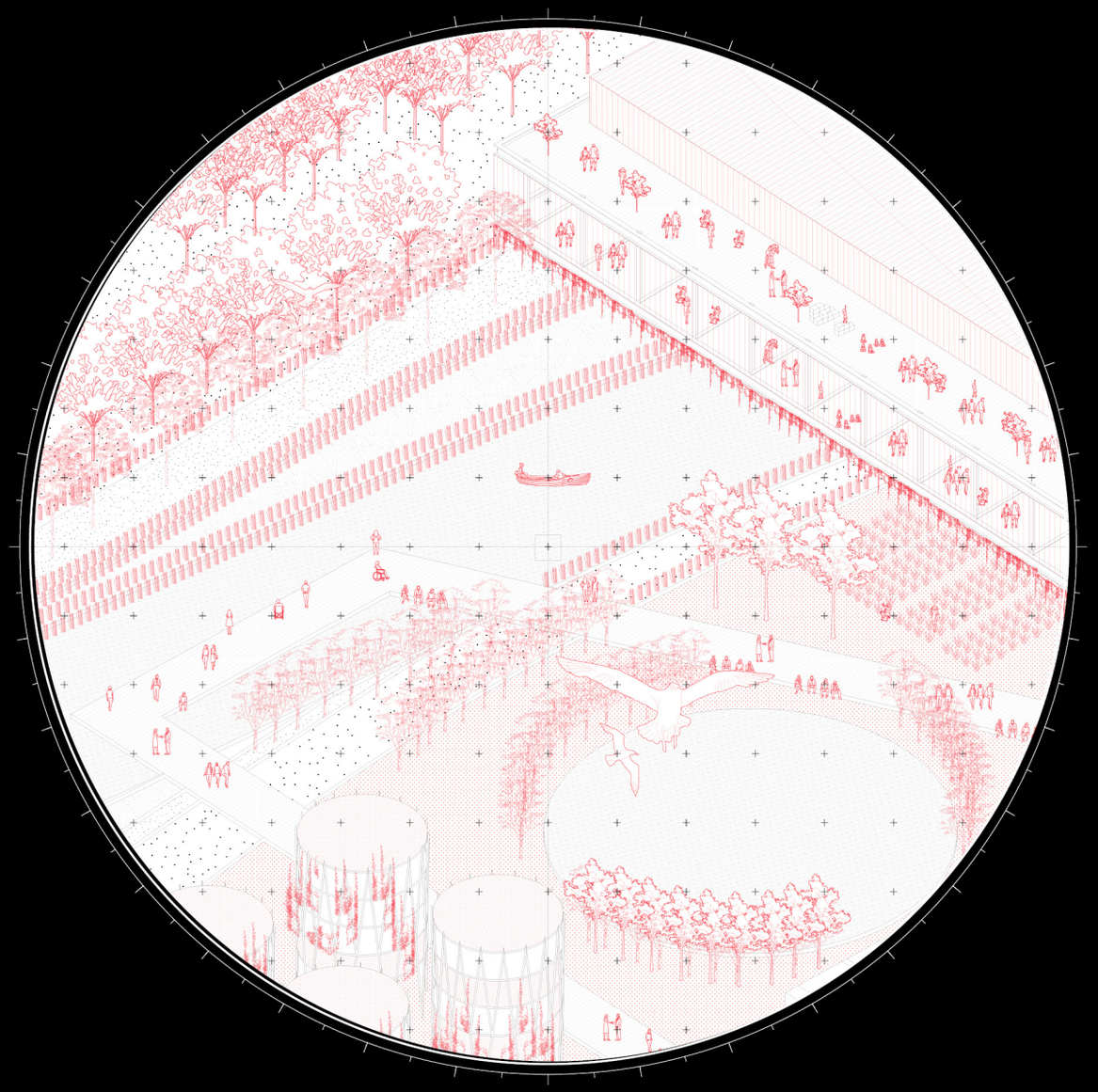


FIG. 11.67 Axonometric Detail view *(Own elaboration) the figure shows the transformation stressed by the highest integration scenario*

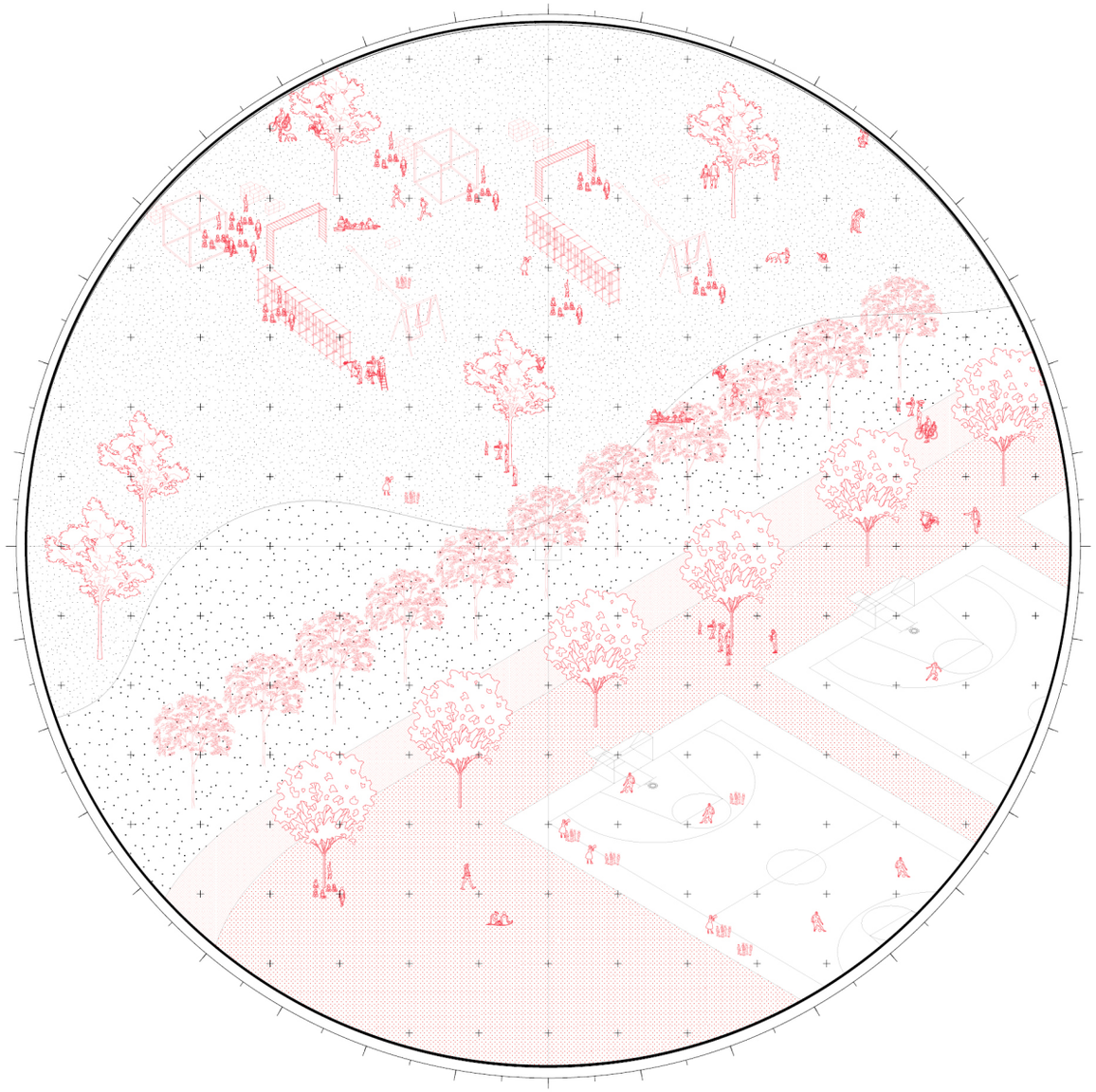


FIG. 11.68 Axonometric Detail view *(Own elaboration) the figure shows the transformation stressed by the lowest integration scenario*

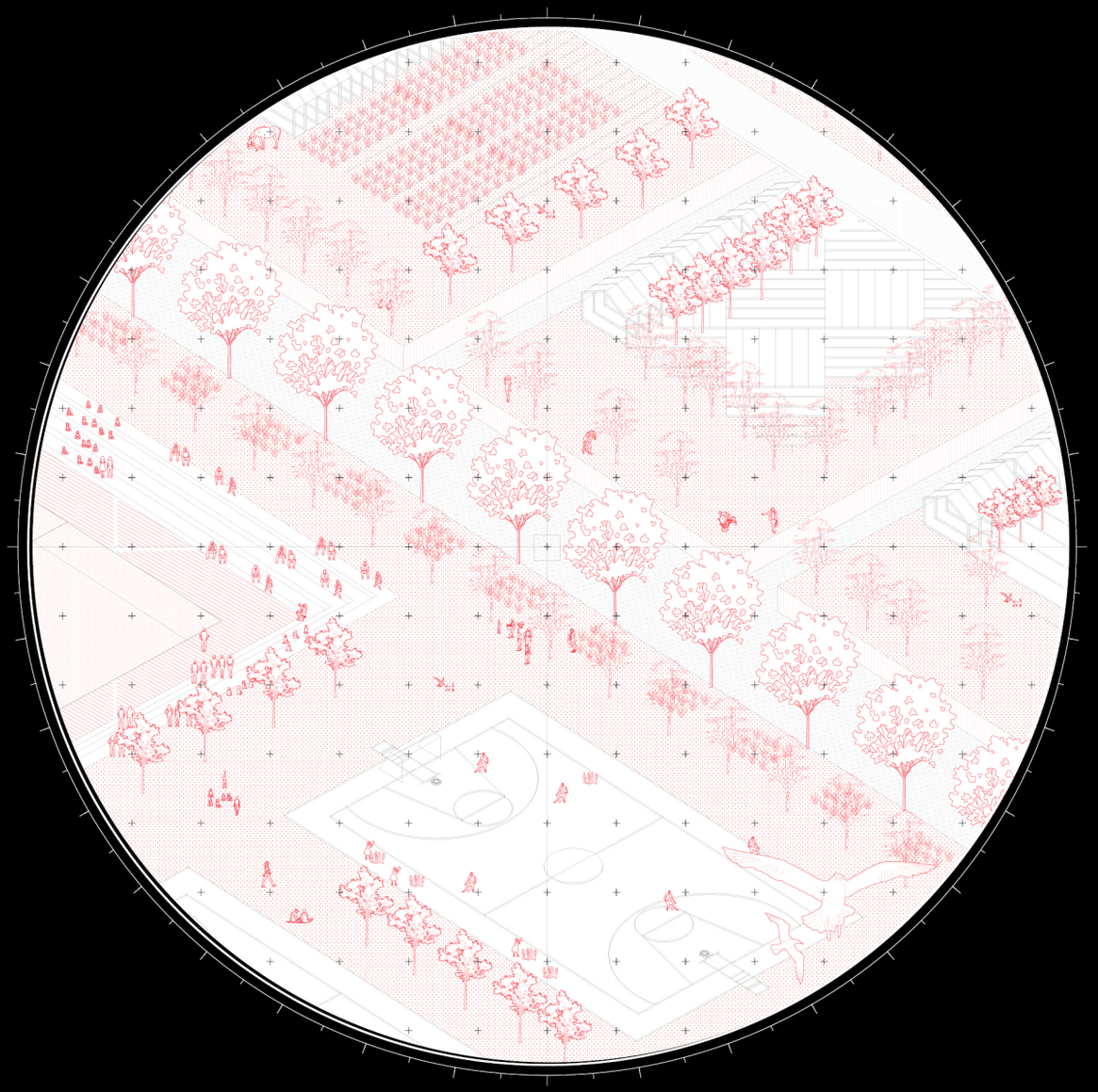


FIG. 11.69 Axonometric Detail view *(Own elaboration) the figure shows the transformation stressed by the highest integration scenario*

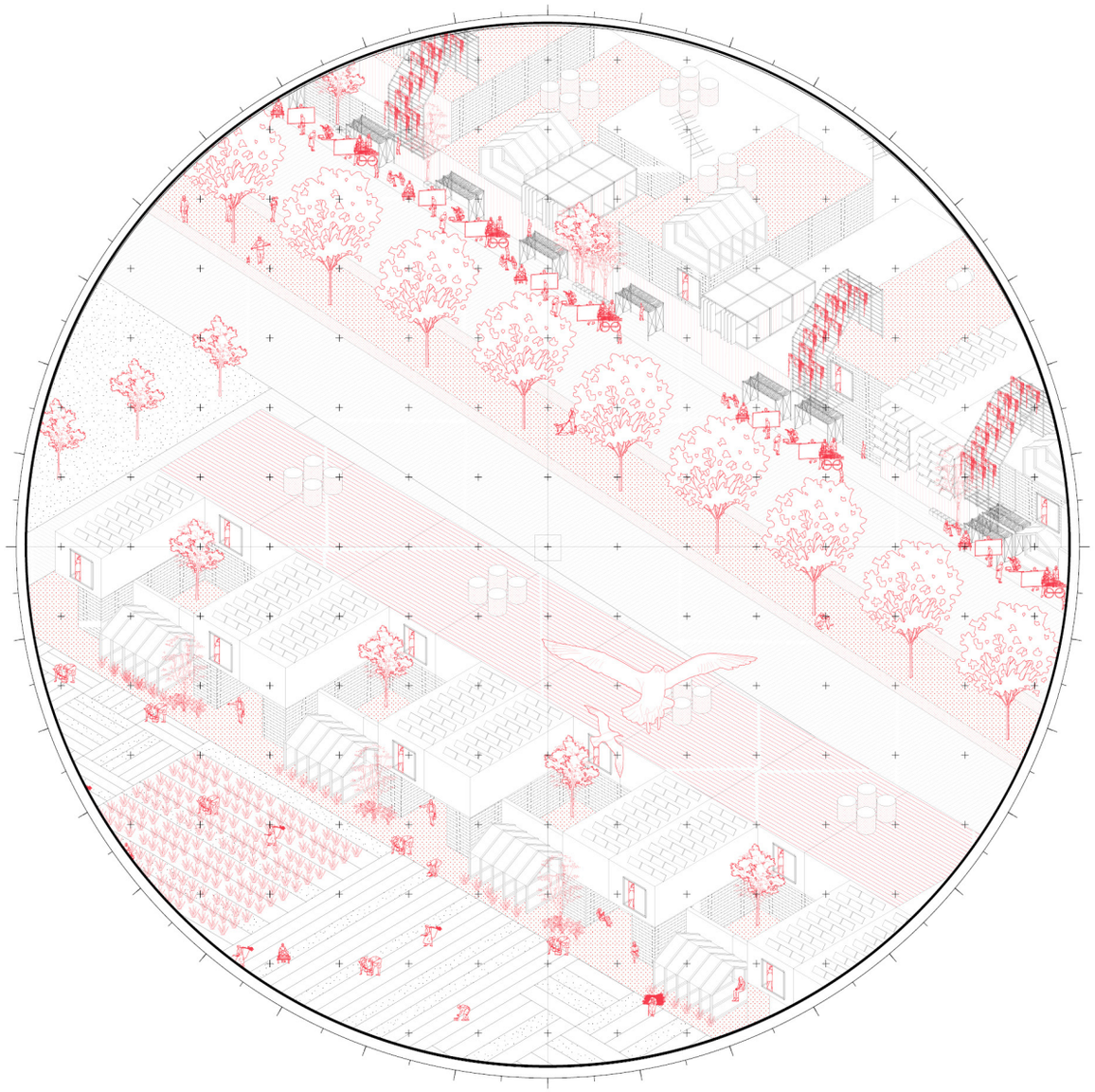


FIG. 11.70 Axonometric Detail view *(Own elaboration) the figure shows the transformation stressed by the lowest integration scenario*

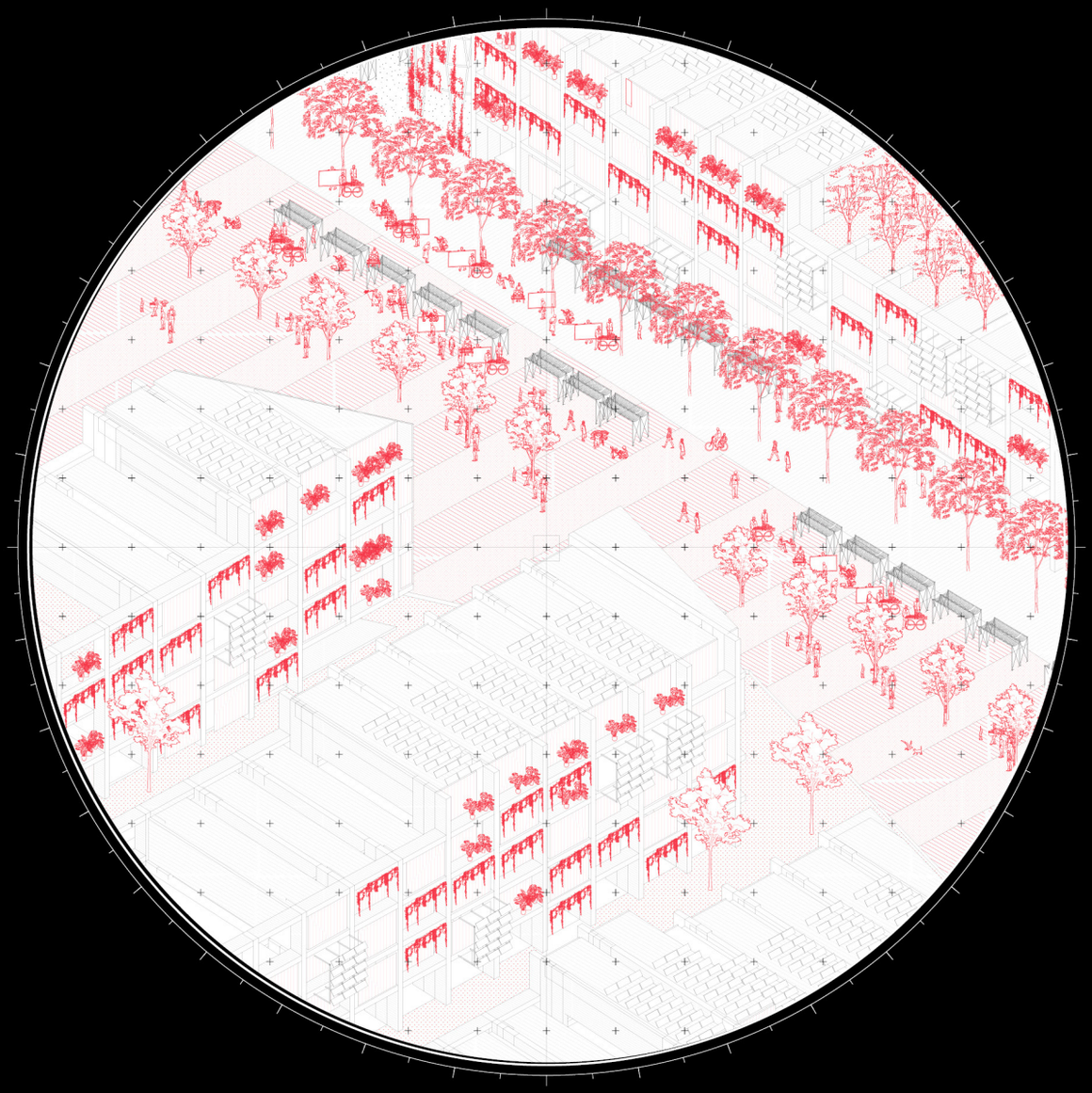


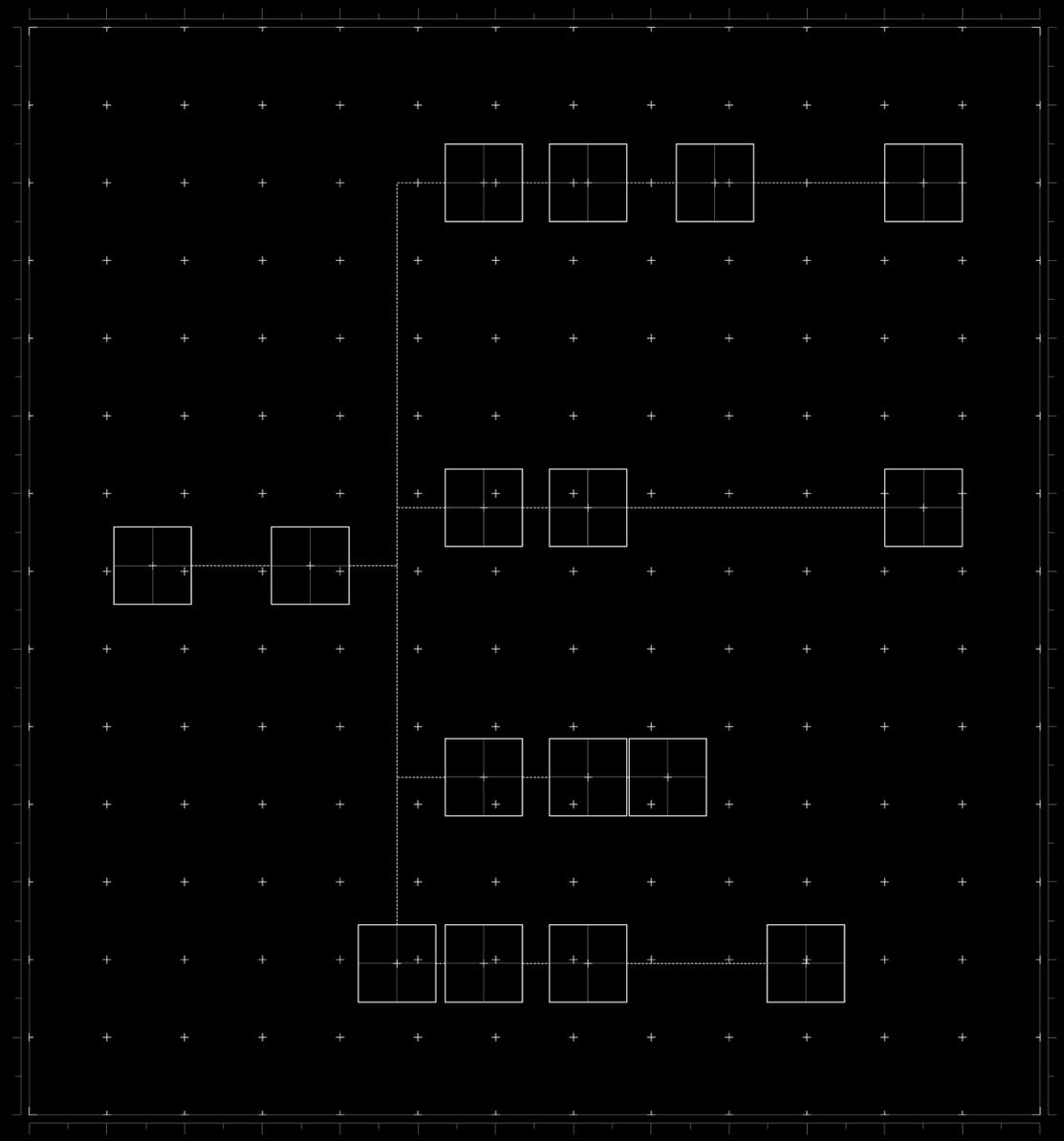
FIG. 11.71 Axonometric Detail view *(Own elaboration) the figure shows the transformation stressed by the highest integration scenario*



IMG. 11.27 Visualization of the area with its full potential achieved *(Own elaboration) The image shows the ecological corridor in the boundary area between the metropolitan park and the urban tissue.*

The selected area reveals the highest socio-ecological transformation levels among the three tested in this report. Its intrinsic value lies in its closeness to the future metropolitan park, its wasteland availability after flexible land use and the interest of the higher power levels to invest in acupuncture water sensitive strategies to reduce vulnerabilities in the metropolis. Moreover the direct influence of the access point enhances development and attracts private investment revealing new local capacities.

12 EVALUATION BY ADAPTIVE PATHWAYS



Overview

The next chapter focuses on one of the selected local areas and its evaluation through the exploration of four different adaptive pathways in order to reveal the several capacities for transformation at the local level and various moments in time when a higher actor or stakeholder is needed to speed up the process.

Evaluation Through Adaptive Pathways

This report has elaborated and explored several steps needed according to the overall adaptive strategy taken in this report (metropolitan assessment, conceptualization of the gate system and the systemic goals, and scenario making of selected areas at the local level) which links socio-ecological processes with the emergent metropolitan structure of the MAVM by the conceptualization of new subscentralities in vulnerable areas. Transformation processes developed by this approach are based on the local capacities of the selected areas, their potential for socio-ecological adaptation and the possibilities to reshape the metropolitan emergent processes towards spatial cohesion, reducing spatial fragmentation and social segregation.

The last chapter introduces the construction of 2 main scenarios per selected area (low and high integration) relying on the local level and the capacities of bottom-up initiatives to generate transformation by means of spatial actions and active participation between different levels of stakeholders. It is worth pointing out that every process of development capable of transformation in the selected areas departs from current decision-making processes, necessary for the feasibility of the proposed change. It is the 'start point' that will evolve according to the strategies, or actions at stake, which involve an integration of different systems (the 5 systemic goals) and different actors adding new layers of complexity, enabling a systemic transformation.

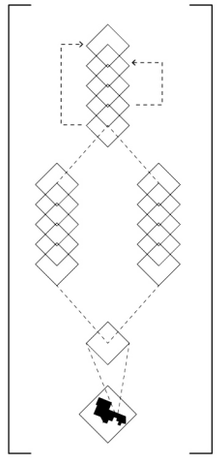


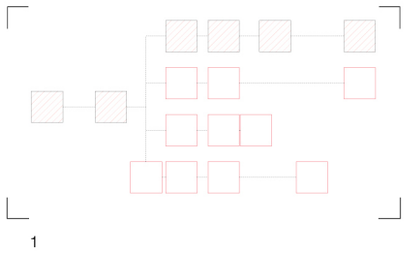
FIG. 12.10 Adaptive pathway diagram *(Own elaboration) The figure emphasizes on the selected area to be evaluated by*

The proposed strategy suggests as last step of the adaptive strategic planning the construction of multiple pathways as a way to evaluate and demonstrate the possibilities and capacities for transformation embedded at the local level which will be referred in this report as AP (adaptive pathways). The pathways allow the possibility for the stratgy to change from one action to the other in order to reach the desired goal after achieving certain bottlenecks (Adaptive tipping points which in this report will be refered as ATP's) that reveal the moment in time when adaptation is needed due to lack of stakeholder interest or power avoiding development stagnation (van Veelen et Al., 2015). The ATP's function as 'red flags' that need the integration of new stakeholders into the governance system or a new functional arrangement by linking systems or strategic objectives with the aim of speeding up the transformation, in short ATP's enable the pathway to scale up and adapt to the confronted uncertain circumstances.

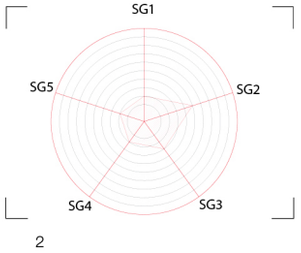
The following example corresponds to the local area in [GE7] of the municipality of Ecatepec. The construction of the AP starts from a necessary social network grounded in the local organizations and community interests. Spatial transformations at the local level depart from a bottom-up perspective that takes one single spatial action as trigger for development; MI [18.1] (increasing the street natural elements constructing a local network of interventions). This decision will not only stress the capacity of that action to change its immediate environment but also its capacity to engage a higher integration between stakeholders during the process. From this point forward 4 pathways are described with different levels of integration stressing their own capacities, thus revealing adaptation towards different actions reacting also to a different engagement of governance levels. However as will be shown later, limitations are present and directly dependent of time, scale and level of participation which affect in the end result or completion of the goal. Moreover as will be shown in the same example, synergies between different systemic goals may affect the speed or scaling up of the objectives formulated by the strategy.

The following diagrams are used to illustrate the different adaptive pathways:

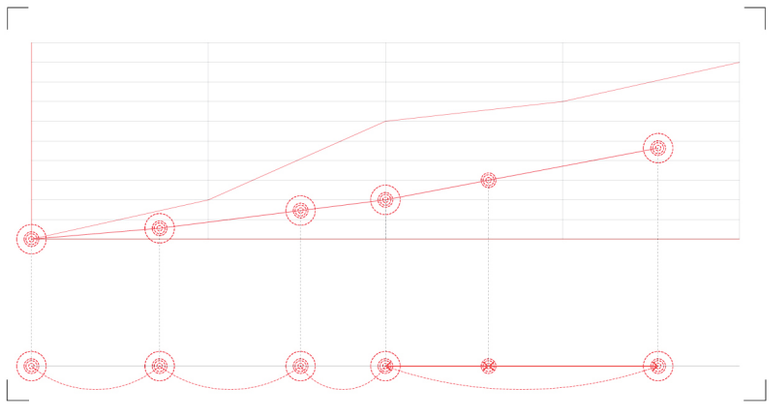
1- Adaptive route
2- Systemic goal achievements
3- Evolution through time and Adaptive tipping points ATP's
4- Stakeholder levels of participation regarding the actions involved



1



2



3



4

FIG. 12.11 Complementary diagrams to construct the Adaptive pathway *(Own elaboration)*

ASYMMETRIES OF POWER

Adaptive Pathways AP's

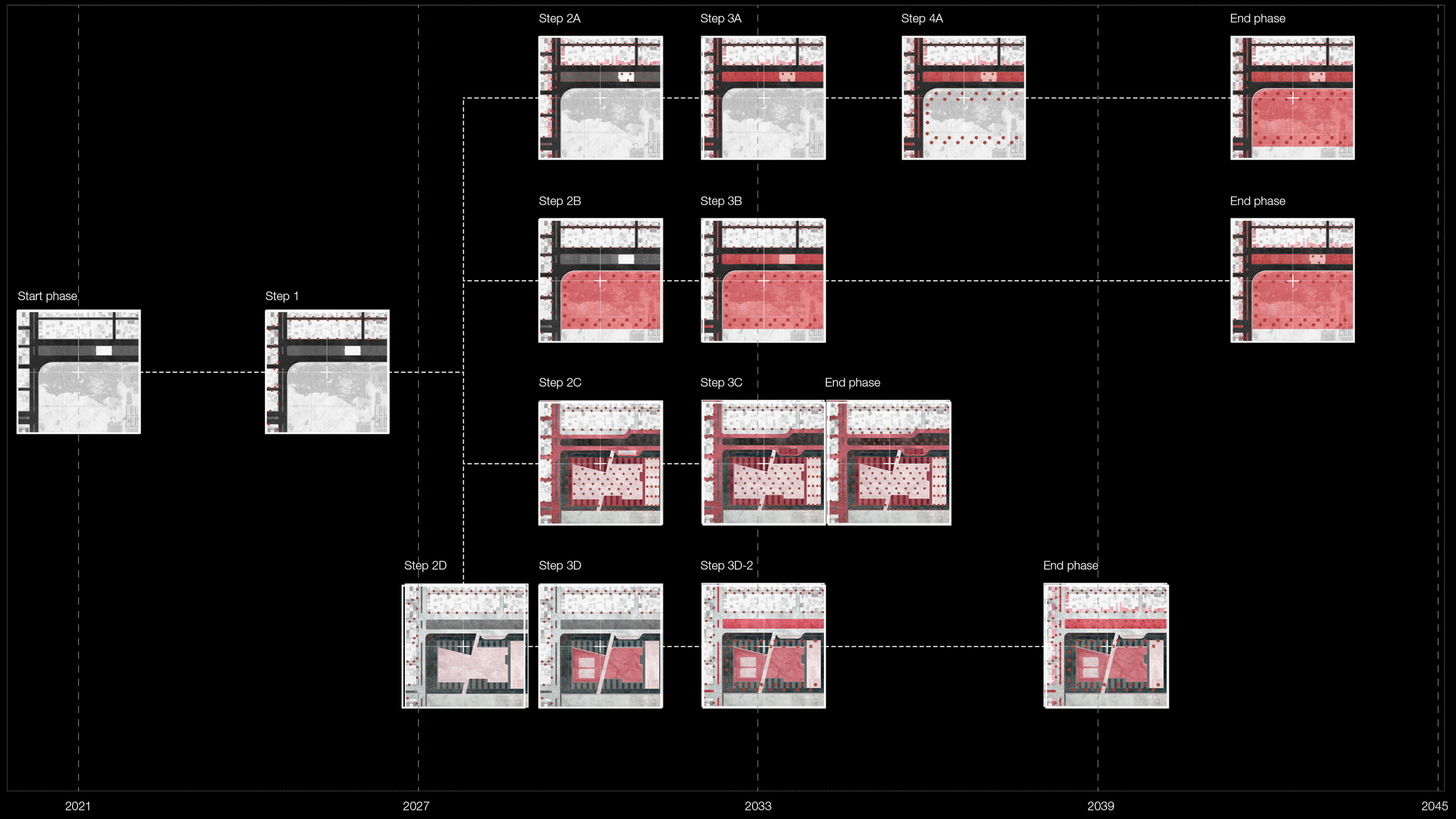


FIG. 12.12 Adaptive pathway of [GE7] area *(Own elaboration)*

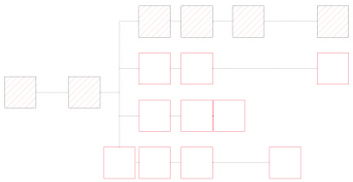
ASYMMETRIES OF POWER

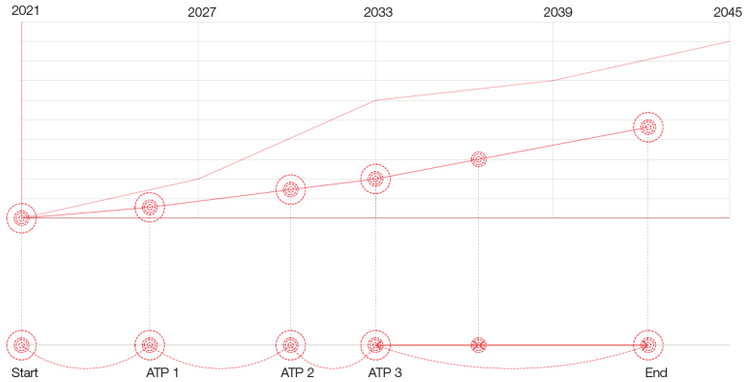


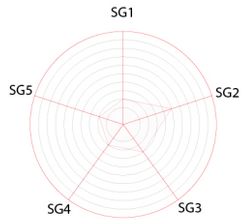
IMG. 12.10 The first collective spatial action starts *(Photography by the author)*

AP 1

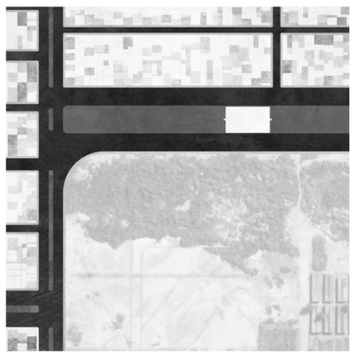
This pathway works firstly under a local perspective with no higher participation of actors, it simulates the maximum capacity for development regarding the objective of increasing the green natural structure. With aid of NGO'S a dialog with municipalities and higher hierarchy powers allow a flexibility of land to continue with transformation by means of local participation.

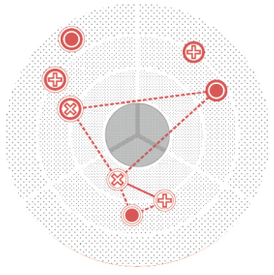






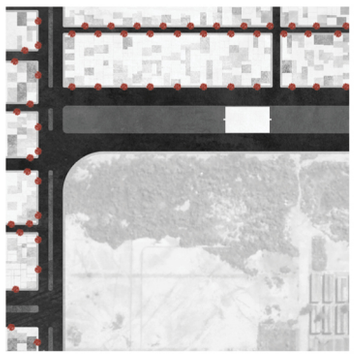
Start phase

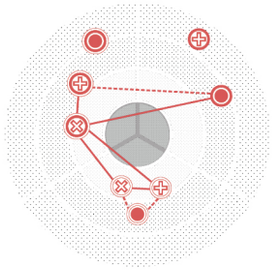




Local participants initiate with the action MI[18.1] (Micro scale action) following the objective renaturalizing the urban fabric of the systemic goal 2. The action stresses local collaboration to increase green elements in the streets.

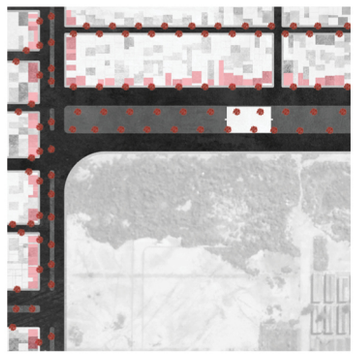
Step 1

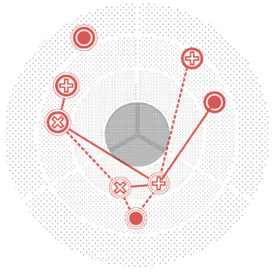




Implement M[20.1] Medium scale action - NGO's together with community groups reach the municipality thus municipal efforts help to increase the impact of the green network by implementing new species in the already existing open spaces such as streets.

Step 2A

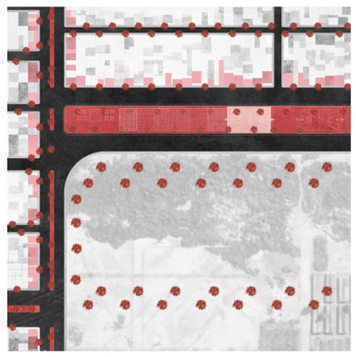


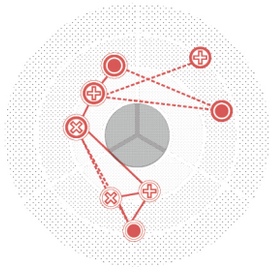


Implement M[31.1] + MI[18.1] Medium and Micro scale actions - due to the new development caused by the attraction of the gate new commercial spaces appeared in the area by reprogramming the urban fabric (action that belongs to the systemic goal 3 objective 1) the new benefited users are requested to participate by a new policy agreement, including them in the intensification of local green elements.

FIG. 12.13 Adaptive pathway 1 *(Own elaboration) The figure shows the steps taken to accomplish the objective set by the starting action, its level of completion towards the general goal and stakeholder relationships are revealed*

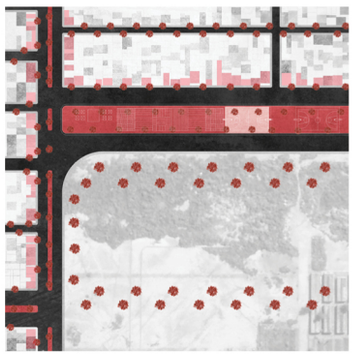
Step 3A

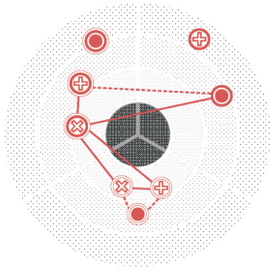




Implement L[30.3] Large scale action - the municipality arranges land use flexibility with the state in order to open up space to increase the green structure.

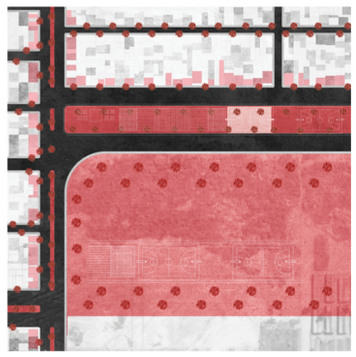
Step 4A

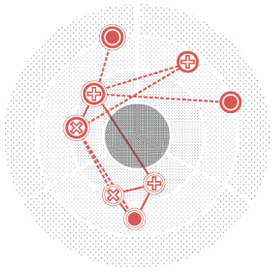




Implement M[20.1] Medium scale action - the municipality increases the level of green in the new space which will add to the green patch network that connects the area with the metropolitan park.

End phase





Implement L[25.2] Large scale action - Federal initiatives and new planning regulation/policies open a flexibility threshold in land use, allowing the municipality to activate new land use arrangements in the cemetery thus opening up unused space for new public facilities.

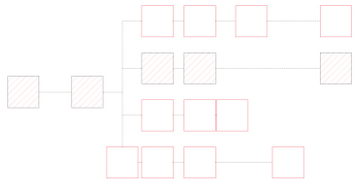
ASYMMETRIES OF POWER



IMG. 12.11 Adaptive pathway 1 *(Own elaboration)*

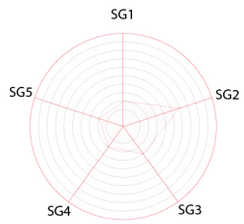
AP 2

The second pathway goes one step further with engaged actors. As the gate attracts investment and economic development some participants are taking benefit from the situation, as a countermeasure that ensures accountability some policies are evaluated to increase the quantity, quality and speed of local transformations.





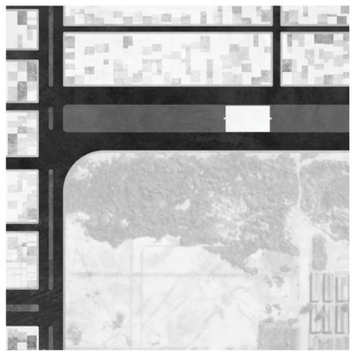
ASYMMETRIES OF POWER

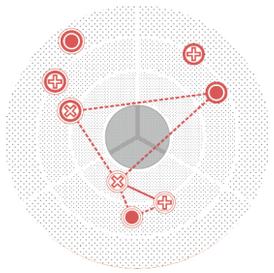


Legend

- Adaptive pathway AP
- High integration pathway
- ATP threshold
- Joint actions
- Adaptive tipping point ATP
- Complementary action

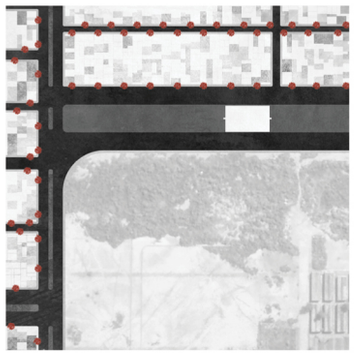
Start phase

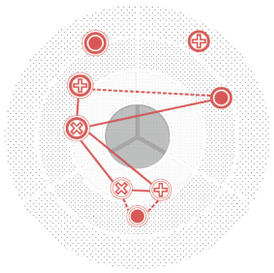




Local participants initiate with the action MI[18.1] (Micro scale action) following the objective renaturalizing the urban fabric of the systemic goal 2. The action stresses local collaboration to increase green elements in the streets.

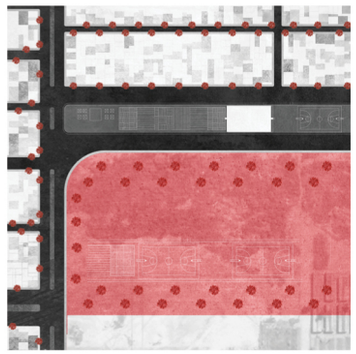
Step 1

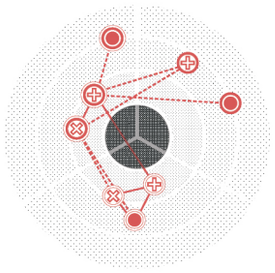




Implement M[20.1] Medium scale action - NGO's together with community groups reach the municipality thus municipal efforts help to increase the impact of the green network by implementing new species in the already existing open spaces of streets.

Step 2B

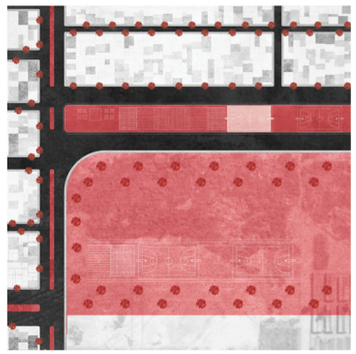


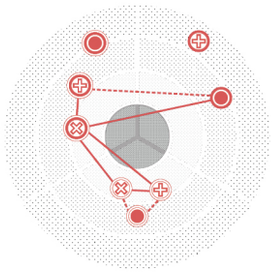


Implement L[25.2] Large scale action - Federal initiatives and new planning regulation/policies open a flexibility threshold in land use, allowing the municipality to activate new land use arrangements in the cemetery thus opening up unused space for new public facilities.

FIG. 12.14 **Adaptive pathway 2** *(Own elaboration) The figure shows the steps taken to accomplish the objective set by the starting action, its level of completion towards the general goal and stakeholder relationships are revealed*

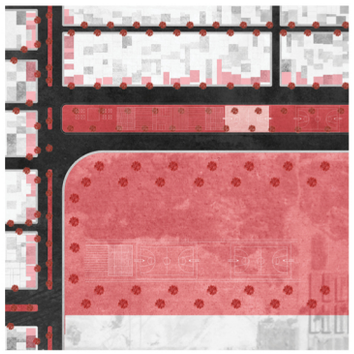
Step 3B

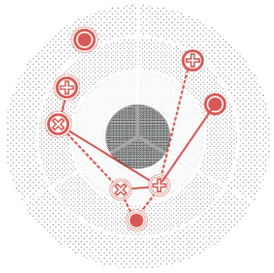




Implement M[20.1] Medium scale action - the municipality increases the level of green in the new space which will add to the green patch network that connects the area with the metropolitan park.

End phase





Implement M[31.1] + MI[18.1] Medium and micro scale actions - due to the new development caused by the attraction of the gate new commercial spaces appeared in the area by reprogramming the urban fabric (action that belongs to the systemic goal 3 objective 1) the new benefited users are requested to participate by a new policy agreement, including them in the intensification of local green elements.

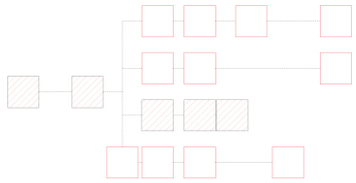
ASYMMETRIES OF POWER



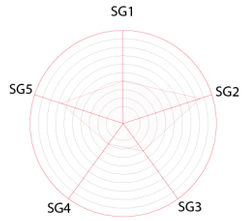
IMG. 12.12 Adaptive pathway 2 *(Own elaboration)*

AP 3

Pathway number 3 pairs the initial systemic goal (SG1 public infrastructure) with the SG5 which deals with transport and mobility strategies. By doing so transformation levels increase rapidly changing the morphological configuration of the area. Due to the large investment required for transport and mobility municipalities paired their interests with those of private developers and previous community efforts.



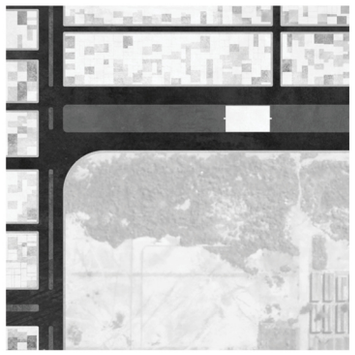


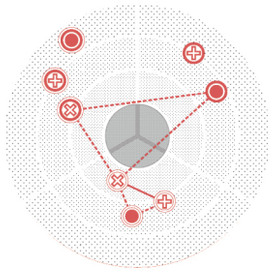


Legend

- Adaptive pathway AP
- High integration pathway
- ATP threshold
- Joint actions
- Adaptive tipping point ATP
- Complementary action

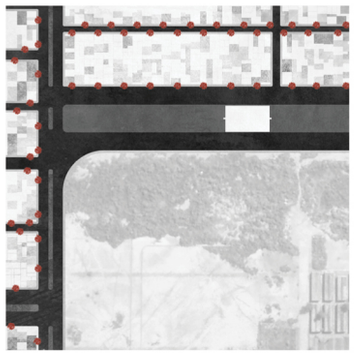
Start phase

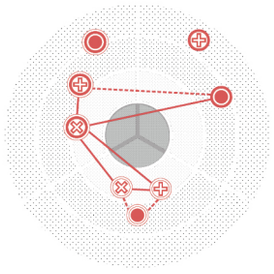




Local participants initiate with the action MI[18.1] (Micro scale action) following the objective renaturalizing the urban fabric of the systemic goal 2. The action stresses local collaboration to increase green elements in the streets.

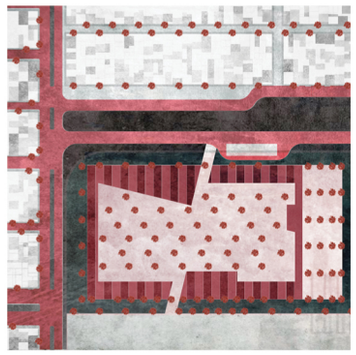
Step 1

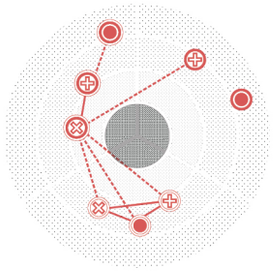




Implement M[20.1] Medium scale action - NGO's together with community groups reach the municipality thus municipal efforts help to increase the impact of the green network by implementing new species in the already existing open spaces of streets.

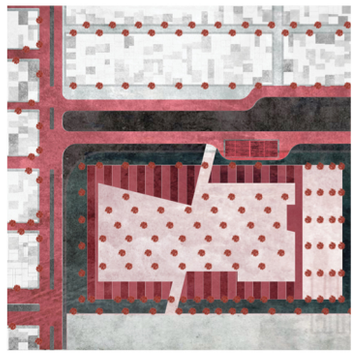
Step 2C

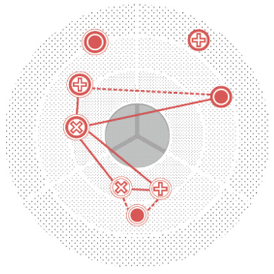




Implement M[57.3] + L[51.1] Medium and Large scale actions - public transport need to be intensified in the area, due to this reason a new public transport stop capable of reorganization internal flows is needed thus requiring a reconfiguration of the street pattern.

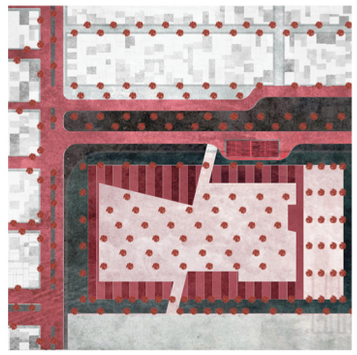
Step 3C

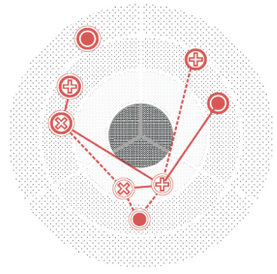




Implement M[20.1] Medium scale action - the municipality increases the level of green in the new space which will add to the green patch network that connects the area with the metropolitan park.

End phase





Implement M[31.1] + MI[18.1] Medium and Micro scale actions - due to the new development caused by the attraction of the gate new commercial spaces appeared in the area by reprogramming the urban fabric (action that belongs to the systemic goal 3 objective 1) the new benefited users are requested to participate by a new policy agreement, including them in the intensification of local green elements.

FIG. 12.15 Adaptive pathway 3 *(Own elaboration) The figure shows the steps taken to accomplish the objective set by the starting action, its level of completion towards the general goal and stakeholder relationships are revealed*

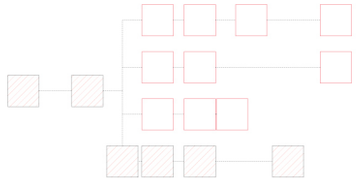
ASYMMETRIES OF POWER



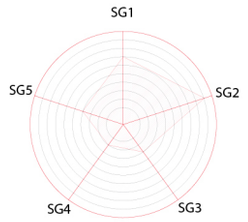
IMG. 12.13 Adaptive pathway 3 *(Own elaboration)*

AP 4

The last pathway also stresses different goals, in this case SG1 and SG2 (water infrastructure). It is a pathway that does take longer than AP3 but transformation is paired with socio-ecological interests rather than mainly economic and morphological. The public sector in this regard has to act first while engaging with local participants so to reach agreements of land flexibility for large interventions. Water infrastructure takes longer to be implemented and one of the reasons is that the private sector does not participate with investment in the first phases of development. However attraction increases and new policies are developed to increase collaboration.



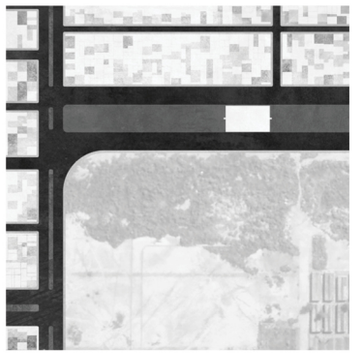


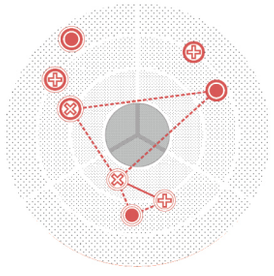


Legend

- Adaptive pathway AP
- High integration pathway
- ATP threshold
- Joint actions
- Adaptive tipping point ATP
- Complementary action

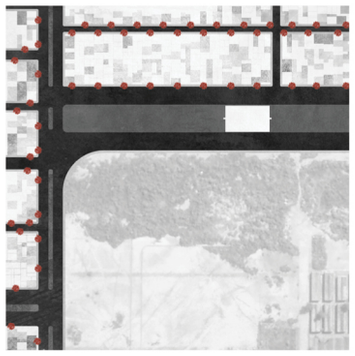
Start phase

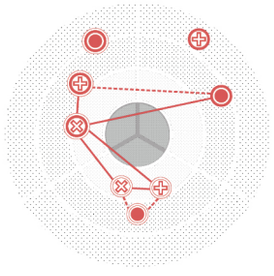




Local participants initiate with the action MI[18.1] (Micro scale action) following the objective renaturalizing the urban fabric of the systemic goal 2. The action stresses local collaboration to increase green elements in the streets.

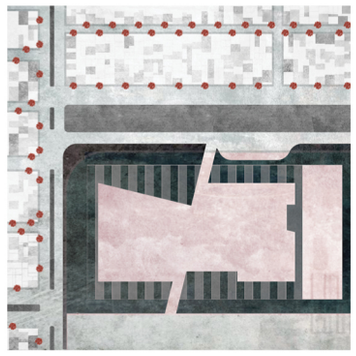
Step 1

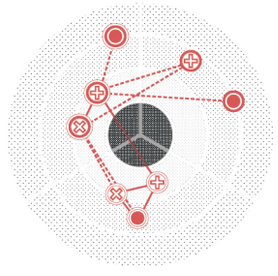




Implement M[20.1] Medium scale action - NGO's together with community groups reach the municipality thus municipal efforts help to increase the impact of the green network by implementing new species in the already existing open spaces of streets.

Step 2D

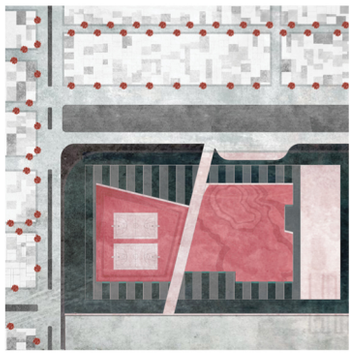


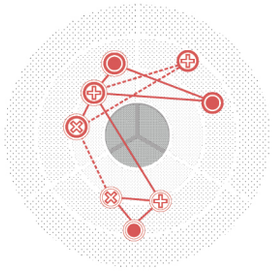


Implement L[25.2] Large scale action - the municipality arranges land use flexibility with the state in order to open up space for the new explorations, as a result a new area is opened in the cemetery, transforming it into public space thus increasing the green elements of the area.

FIG. 12.16 Adaptive pathway 4 *(Own elaboration) The figure shows the steps taken to accomplish the objective set by the starting action, its level of completion towards the general goal and stakeholder relationships are revealed*

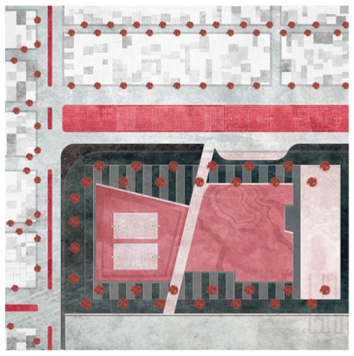
Step 3D

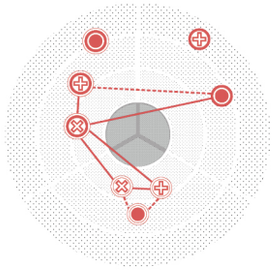




Implement L [9.2] + L [14.3] Large scale action - The municipality evaluates the area as priority for water sensitive strategies to reduce flood risks and lack of water in draught seasons.

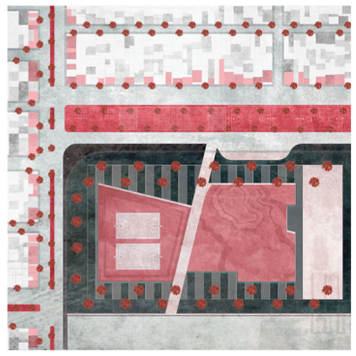
Step 3D-2

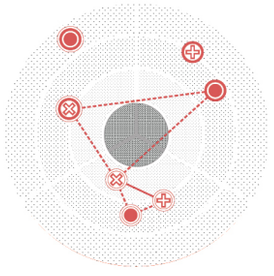




Implement M[20.1] Medium scale action - NGO's together with community groups reach the municipality thus municipal efforts help to increase the impact of the green network by implementing new species in the already existing open spaces of streets.

End phase





Implement M[31.1] + MI[18.1] Medium and Micro scale actions - due to the new development caused by the attraction of the gate new commercial spaces appeared in the area by reprogramming the urban fabric (action that belongs to the systemic goal 3 objective 1) the new benefited users are requested to participate by a new policy agreement, including them in the intensification of local green elements.

ASYMMETRIES OF POWER



IMG. 12.14 Adaptive pathway 4 *(Own elaboration)*

Conclusions

AP1- The first pathway shows an incremental participation of stakeholders through time, however the inclusion of new power forces takes time while the actions are being implemented. This characteristic reduces the immediate impact of the actions due to their longer timeframe of implementation. It is revealed that after the involvement of the municipality, transformation can increase rapidly until reaching the interest of the highest level of power (federal government) nevertheless the time stablished by the scenario has been reached thus achieving a completion level of 7.

AP2- The second pathway starts with a federal government initiative on planning regulations, giving power to the municipality to arrange new land use. This decision proves to be effective in a short term since transformation can be done faster. This particular pathway also introduces new policies such as cooperation from private businesses that where directly benefited from the development. Regarding the objective which aims to increase the natural elements in the urban fabric, this pathways proves to be efficient in that regard, achieving certain level of cohesion rapidly.

AP3- This pathway is the first to introduce actions and objectives from another systemic goal, in this case; transport and mobility. It reveals the capacity of both systemic goals to work together in order to achieve greater transformation in the area. Municipal efforts are key to complete the first stage of this pathway. After reaching its ATP, the participation of local businesses that where directly benefited from the development is needed to complete the objective. The pathway demonstrates that synergies with different objectives stressed by another systemic goal can foster faster and greater transformation levels.

AP4- This pathway also seeks to combine another systemic goal, however this goal aims to favour water management combining it with public space. Both systemic goals are complementary in this regard. Municipal efforts are also key for the development of this pathway since higher levels of investment are required. To complement the higher power levels, local community and NGO's work together with local businesses to increment the green elements of the new explored action. The pathway demonstrates that the direct synergy with compatible objectives from another systemic coupled with local participation can achieve a cohesive transformation.

The best pathway

AP4 achieves the highest transformation level in the area, moreover its synergies with other systemic goals enhance the impact at a local level, revealing the capacity of local actors to arrange agreements with higher level actors thus activating new potentials such as water sensitive actions couple with public space. It is the second fastest pathway, however its actions towards socio-ecological goals are able to reduce segregation and fragmentation more effectively.

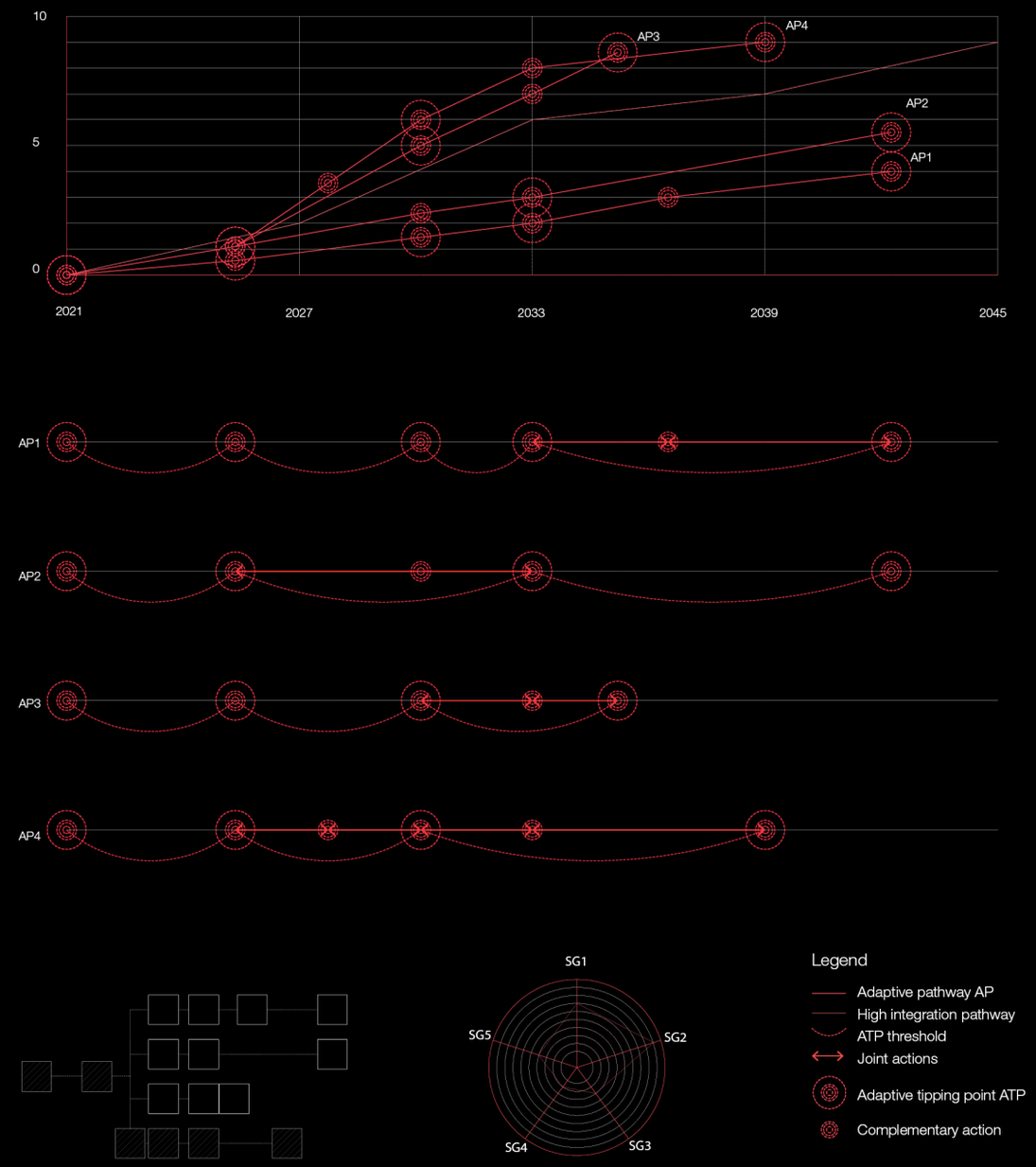


FIG. 12.17 Conclusion of Adaptive pathway *(Own elaboration)*

ASYMMETRIES OF POWER



01
Current condition



02
Micro action / local initiative



03
Repetition / local participation



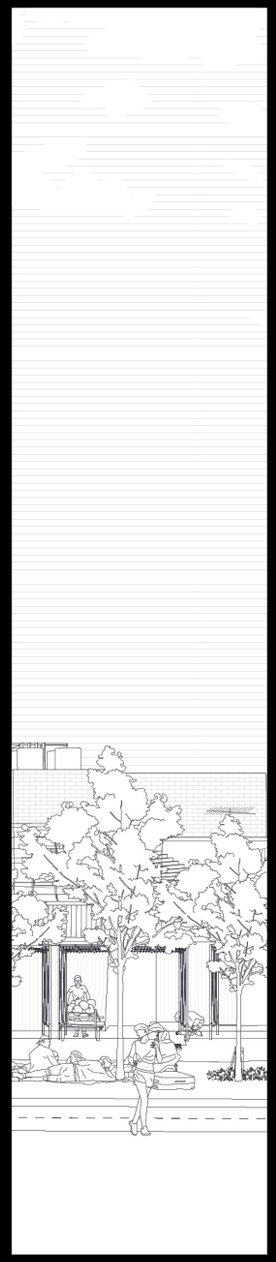
04
Flexibility with the state in order to open up space



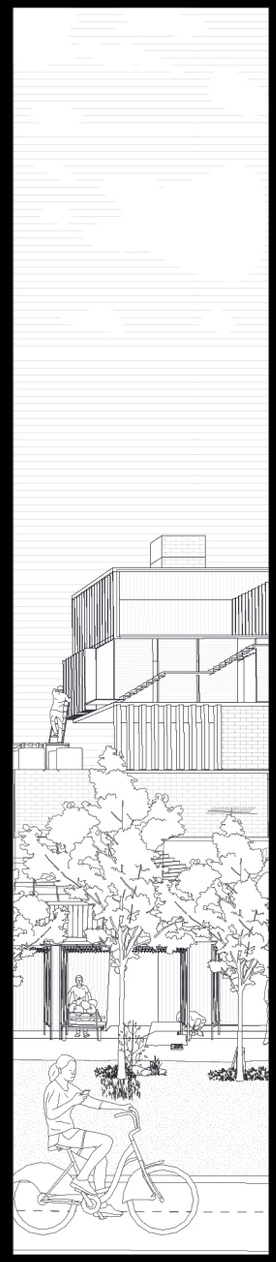
05
Flexibility with the state in order to arrange new land uses in order to introduce mix functions in the area



06
New commercial spaces appeared including their participation with increasing the green structure



07
The municipality evaluates the area as priority for water sensitive strategies / The local residents implement new densification strategies



08
The urban fabric starts a reprogramming phase changing towards a more flexible morphology paired with public space and water sensitivity strategies

FIG. 12.18 Adaptive pathway , evolution process *(Own elaboration) The figure shows the steps taken to accomplish the objective set by the starting action.*

CONCLUSIONS AND REFLECTION

Conclusions

The Metropolitan Area of the Valley of Mexico functions under a neoliberal top-down approach towards decision making processes. Regarding urban development this approach has several downsides reflecting the current unjust emergent metropolitan process that worsens the conditions of the most vulnerable population. Lack of accessibility to metropolitan functions such as public transport, job sources, public space, and socio-ecological vulnerabilities such as environmental decay, pollution and water scarcity which are just a fraction of a problem that constrains local development but that can be shifted with new arrangements in the governance system.

This report grounds its conceptualization on the potentials and capacities that local communities can have against the general metropolitan problematisation of social segregation and spatial fragmentation. From that point forward, the adaptive strategic planning suggest a balanced relationship between bottom-up and top-down approaches. However this might become the most difficult challenge of the approach since it necessarily needs of high power level stakeholders to engage agreements and open collaboration not only with each other but with local communities as well.

The decision making system

Redefining the role of the different actors that can be potentially affected or involved by any of the spatial configurations framed by the approach of this report is a ‘must’ in order to successfully achieve spatial cohesion.
As a way to practice a more just decision making in the emergent metropolis (MAVM), the bottom-up perspective thus the role of the local actors (civil society) has to change from a being mainly reactors of change to active participants of decisions for change, as for the normative role of public actors (top-down perspective) needs to change to higher interest levels and flexible capacities. Selection and definition of strategies and actions has to be a participatory process that strengths internal and external connections between them, mediating and regulating the multiple interests at stake. This process can be arranged by civil society, NGO’s or the public sector. However the proposed actions need to be evaluated by a multidisciplinary team depending of the urban spatial, functional and environmental conditions of the area. This process certainly enables a platform for collaboration to stress the highest possibilities.
Nevertheless there are fundamental tasks that different actors have to address and agree before implementation phases as a way to achieve the settled goals, this process can be long, and interests might change over time, thus limiting transformation. Therefore the proposed framework enables the exploration of scenarios through different pathways as a way to increase options (social and spatial) and reduce bottlenecks during the process.

To conclude the governance system does not need a radical change regarding power levels, but rather a change in interests and operability towards spatial cohesion. Constant participation and collaboration across boundaries is required for the development of new planning tools and policies capable of dealing with uncertainty, resilient responses and adaptation.

The role of Design on adaptation

Design in this report is the core of the adaptation process, it supports, translates and integrates its different parts acting as a mediator of the planning framework and governance capacities; strategies and objectives; users/participants, and making processes, enabling a coherent process of participation. In this regard, Design acts across different scales and time adding to its capacity of evolutionary change.

The value of the main principles (systemic goals)

For a coherent transformation and adaptation the socio-ecological dimension was included in the framework as being essential part of the complex nature of the thesis. The combination of governance, formal and functional structures in the urban fabric with socio-ecological systems allowed the formulation of 5 systemic goals that through connectedness and potentials determine spatial strategies (actions), first at the local level with the capacity to influence a cross border activation. These 5 main principles stress different dimensions of actors, scales and time, thus their capacity for transformation is directly dependent of how those factors generate synergies between them so to increase, accelerate or stagnate adaptation.

During the last chapter of the report, ‘adaptive change’ was mostly affected by the interests at stake. Different Interest levels regarding the specific goals (main principles) increased at the local level, thus attracting from a bottom-up perspective higher levels of power, until pairing their interests towards an effective adaptive transformation. However since interests are directly proportional to the transformation capacities without them change will not be possible.

The value of the sub-centre

The gates, or sub-centres aim for a policentricity in the selected vulnerable area as a way to stablish new local connections at the municipal level to a cross municipal perspective enhancing endougenous capacities to counteract the monofunctional character that currently defines them.

It has to be acknowledge that several studies define centres and sub-centers as monofunctional spatial configurations mainly related with employment capacities (Krehl, A., Siedentop, S. 2019). However due to the multidimensional exploration in this report, defining the gates as mainly job sources seemed to be a short definition under the proposed framework.

The approach presented in the report, ‘the system of gates’ enables a new contextualized definition of what a sub-centre can be, an agglomeration capable of reducing the segregated conditions in the selected context. It is not about jobs or density as isolated variables, but about other dimensions as well, such as public space accessibility, enhanced urban lifestyles, accessibility to public transport, resilient capacities and connectedness to other urban functions across borders, in short, more variables need to be added to be considered a sub-centre. By means of design explorations of different gates it was revealed that the aforementioned dimensions can be stress differently among them.

To conclude, the gates stablish a connectivity with the overall metropolitan structure, creating opportunities for local development capable of overcoming segregation and fragmentation by means of enhanced economic and community activities that together define a new system of sub-centralities increasing local competitiveness while becoming more attractive to local residents until reaching a higher hierarchy within the metropolitan structure, a metropolitan sub-centre with higher value towards the main centralities.

Contributions

Adding to the literature of the potential that sub-centralities and polycentric urban structures have in complex metropolitan emergent systems.

A new planning framework for urban adaptation and governance capacities in the context of the Global South.

Adding to the empirical knowledge of the MAVM, analysis and assessments at different scales of the territory.

An insightful critique to current large urban projects in the MAVM changing their current paradigm based on neoliberal urban strategies towards a more just planning process.

Next steps and future research

Further research is needed to advance the method and to fully explore potential applications to guarantee a continuous operability of the proposed framework.

A clear engagement with several stakeholders is needed to complement the power and interest matrix thus pairing their interests with the proposed strategic actions.

Several workshops need to be arranged with the participation of the three sectors (public, private and civil society) to make agreements and coordinate interests across municipal borders.



IMG. 12.15 Gate [GE7] MI [18.1] Local collaboration initiative to increase natural elements in underused open spaces *(Image taken by the author) The image shows an example of local practices regarding appropriation of open space by attempting to increase the green natural elements in the area.*

Research Questions

_Main question:
How can adaptive spatial planning facilitate endogenous urban development capable of reducing social segregation and spatial fragmentation towards a cohesive-just Metropolitan Area of the Valley of Mexico?

In order for the adaptive planning to facilitate development it needs a refinement, consideration and activation of the local capacities for transformation embedded in vulnerable communities currently shaping the process through which the metropolitan structure is evolving by directing their potentials towards spatial cohesion. The goal is to achieve a long-term plan balancing top-down and bottom-down approaches, combining local adaptation to socio-ecological concerns and local development in areas that can potentially create certain levels of concentration for transformation, facilitating flows and urban dynamics towards the metropolis, reinforcing and integrating them rather than exile them worsening the problematics currently at stake. The approach enables stakeholders with a portfolio of actions following the objectives of 5 systemic goals that take into consideration socio-ecological concerns in the metropolis by stressing local capacities for transformation in the territory. Actions are different in scale, and different in the level of engagement needed for their development. Therefore they can be changed trough time, allowing new synergies with different strategies, complementing or completely changing the pathway of transformation.

_Subresearch question 1:
What are the social and spatial conditions in the MAVM, result of the emergent metropolisation process?

Social
Current conditions in the metropolis worsen the lives of the most vulnerable inhabitants. The fast growth has led to unequal developments in the outskirts of the urban agglomeration where informal arrangements of land development, appropriation and housing are a regular practice. Conditions that influence in the way society performs, as a result violence and discomfort towards power interests are common.

Spatial
The metropolis is a reflection of a segregated society. Its fast growth and unequal urban development has labeled its expansion into center and periphery, where vulnerabilities worsen the further urban agglomerations are from the metropolitan functions. A condition that clearly fragments spatial development. Moreover within the local level fragmentation worsens with closed housing developments, a pattern that neglects the urban surroundings by means of a wall and a careful controlled access.

Subresearch question 2:
How does urban planning and its instruments/tools affect the emergent metropolisation phenomenon in terms of policies, and project implementation?

The MAVM lacks of a planning vision capable of directing strategies towards completing cohesive goals of urban development reducing its capacity to react against climate change measures, or unequal development speculation which often is supported by high power interests. Planning has not been able to couple with the

fast growth process suffered by the metropolitan area, and strategic projects answer to neoliberal practices where profit has blind urban planning worsening the condition of the metropolis

_Subresearch question 3:
How and where can adaptive spatial planning be implemented in order to reduce social segregation and spatial fragmentation?

Where
The metropolitan assessment made in this report depicts several areas where the vulnerabilities are worse. The selected area to be tested by design is one of this cases located in Mexico State (Estado de Mexico), a place that is no stranger to speculation practices. Being the void of the metropolis (the only not urbanized area of the MAVM), a former lake in the past (Texcoco lake) and nowadays the location of the leftovers of a new international airport that was canceled at the end of 2018 (NAIM), is now the desire host of a new large urban project, the ecological park of Texcoco.

How
The selected area will suffer spatial changes that can worsen or improve the vulnerable condition of its inhabitants. In order to guarantee an improvement the adaptive planning takes takes the metropolitan park as a trigger for change, complementing its focalized aim into an open ended project that takes local capacities of transformation from the peripheral municipalities, enabling the development of a system of strategic actions with collaborative efforts, connecting and activating subcentralities around the metropolitan park capable of connecting the urban tissue with higher socio-ecological systems thus changing current conditions.

_Subresearch question 4:
What are the governance limitations and possibilities for endogenous development in vulnerable areas under a collaborative spatial planning framework?

The governance challenge lies in the process and its capacity of adaptability, on how different stakeholders involved can collaborate, and find agreements, where the decision making process is balanced, integrating local development and local adaptation, a consolidated process of activation able to diminish the segregated conditions of the area as an alternative to the imposed normative process.

_Subresearch question 5:
What are the spatial strategies, design principles and tools required for endogenous development capable of reducing social segregation and spatial fragmentation?

The gates are the strategic concept used in this thesis, new defined subcentralities embedded in the territory capable of reducing the segregated conditions of the surrounding settlements by linking local development with the adaptation capacities to social-ecological changes. Its adaptive character envisions a long term scope activating vulnerable areas through time with actions that can change and upgrade the area. Depending on their scale, and level of participation of the actors involved.
The thematic framework, identified in the field-based analysis is led to 5 strategic systemic goals:
_water landscape integration and management,
_green infrastructure system and quality of public and open space,
_densification of the built system,
_productive landscapes and means of production' and
_transport and mobility system.

Reflection

Asymmetries of power started as a thesis project that in preliminary discussions embrace the fact that urban planning needed a reformulation in its entirety. However the process led by the research and design explorations made at several scale levels of the territory revealed an alternative to produce greater transformation impact in the metropolitan area capable of reducing the vulnerabilities at stake; the value of the local level for adaptation regarding urban development.
The value of the adaptation lies in the local capacities of communities and organizations to lead their development paired with higher power interests under a collaborative practice. There is a need for alignment of regional planning and policy making with the intrinsic local capacities in order for an effective transformation to take place. However in order to align interests, power levels and goals the awareness of the local actors (civil society) and higher power stakeholders (public and private sectors) of the capacities stressed by local adaptation towards the general metropolitan structure is key.

The challenge of complexity

Complexity in urban systems requires multidisciplinary and interdisciplinary approaches to arrange feasible strategies. This is one of the main challenges, since actors in this regard work at multidimensional levels (e.g. time, scale), particularly in the MAVM and its most vulnerable areas self-governance arrangements (informal practices of land development) paired with high power interests (mainly political) blur the possibility of understanding how certain areas are developed weakening their potential for change and operability forecasted by planning strategies.

Moreover emergent metropolis systems are composed by dynamic networks constantly interacting with each other, relationships of the whole system that affect the smallest pieces that conform it. However, the study of its parts does not guarantee a complete understanding of the whole since uncertainty can emerge at any given point of an evolutionary process changing the system dynamics from different angles in unexpected ways. Such is the case of climate change or unforeseen events like COVID-19 requiring a rapid adaptation of the system to be able to surpass externalities.

Method and approach of the graduation project

The studio Complex Cities grounds its focus on the most vulnerable urban environments, which require strategic spatial planning in order to overcome their current and future urban challenges. From this point forward, the selected metropolitan area became an ideal testing ground for strategic adaptability.
The research approach for this thesis is a combination of the deductive and inductive approaches with several scales of study. The project departs from a Deductive approach implementing the method of literature review, the necessary knowledge regarding strategic planning, adaptive ways to implemented and spatial fragmentation and social segregation cause and effects in developing countries such as Mexico.
The multidimensional and multiscalar nature of the research enabled the project to identified different areas where urgent change in urban strategic planning was needed, a process that was repeated across scales from the metropolitan, the specific area of interest to the defined boundaries that allow depicting neighborhood scale areas to further test by design. A process that also contributed to reveal and define the specific adaptive strategic planning required in the area its objectives, spatial actions

and stakeholders involved.
After the design phase an evaluation phase was carried out. Thus, the change from deductive to inductive approaches. The inductive part of the approach enabled the research to validate the proposed spatial transformations by assessing the strategies and effects that these will have in the general metropolitan structure.

Societal value, ethical aspects and wider scientific relevance of the graduation project

_Scientific relevance
Recently several approaches have being explored in similar contexts known for their vulnerable conditions, all of which have been proven successful in a theoretical level. This specific research seeks add to the knowledge of the global south as one of the first adaptive approaches using research by design in the Mexican context (under socio-spatial segregation) capable of adding to the discourse and contemporary depate of spatial justice.

The research project develops an adaptive approach capable of being reproduced in other contexts with its apporpiate contextualisation. It deals with 5 systemic goals (water landscape integration and management, green infrastructure system and quality of public and open space, densification of the built system, productive landscapes and means of production, transport and mobility system) that influence any urbanised territory in a multi dimensial and multiscalar way, from micro to large actions that influence the dynamics of the given urban system.

_Societal relevance.
The project seeks to understand the current socio-spatial segregation condition of the an area where fast metropolisation process overcame the urban planning agenda, unable to find solutions to its vulnerable condition. This is embedded in the core of Mexican society which is looking urgently to a urban paradigm shift, a transition that is not only the task of urbanist and planners but it is a goal to be achieved at a multidisciplinary level, institutionally, legally, and academically.
If one of the goals from PND (National development plan) is to increase and democratise the productivity of Mexican economy, then, reducing socio-spatial segregation must be within the same interests towards a more inclusive and just metropolis.

_Ethical considerations.
Mexico's urban planning has been developed under a top-down fashion and certainly has been making progress regarding this matter. The proposed approach to the probelmatisation of the thesis project suggest a better engagement between actors, it prioritises the process over the final project itself since its success depends on their fruitful collaboration. This necessary condition touches one of the most sensitive topics in the country, 'trust to the political power', which is basically low since the neoliberal economy favours the already privileged and worsens the conditions of the most vulnerable population. People do not trust their government, and the government itself is not flexible enough. Engaging the population on the process proposed by the project and make successful arrangement of collaboration between powers of governance are indeed the biggest challenges.

About the scope and limitation of the graduation project

The graduation project became an evolutionary process, constantly changing and continuously challenging its theoretical foundation. The biggest challenge of the project in terms of definition was 'scale' and the effects that different layers have

towards the vulnerable condition of the studied metropolitan area. During the research this became the biggest challenge since decisions had to be made in order to tackle the problematisation. As such the scope of the research focused on the broader general analysis in order to depict a manageable scale for intervention which had to be careful studied. From that point forward the research and design strategies became contextualised and real.

The second challenge of the project was the level of specificity required in the systemic goals which are used to develop the adaptive approach since each of them require an extensive metropolitan evaluation. The graduation project focuses on a manageable scale for the assessment and evaluation processes, thus leaving the overall metropolitan evaluation in a future stage of the research.

The third challenge of the thesis and the biggest procedural one has to deal with the stakeholders and the governance system of the area. During the fieldtrip several interviews were cancelled or postponed due to private interests involved. Information in this regard was gathered by interviewing professionals that had been in contact with the greater governance forces in the country. When studying the specific areas of the project security measures made harder to get in touch with local people involved in irregular land arrangements. Information that was learned from a last minute interview with a local architect whose work is embedded in vulnerable contexts.

Overall the access to the factual and relevant information of current strategic projects and actors required for the graduation project became one of its greatest limitations. The country develops most of the projects in a top-down fashion and information remains in secrecy.

The last limitation is data collection since the country develops a census every 10 years meaning that the data is outdated and will have to be revised once the new census is out. Moreover theoretical papers, and essays regarding the development of the metropolis are not up to date, and the newest publications also use outdated information. This particular condition will limit the final results in a particular level.

About the transferability of the project results

The research project is carried out in a specific area of the Metropolitan Area of the Valley of Mexico, taking a specific large urban project as a trigger for the adaptive approach. It has to be pointed out that the goal of the research is to develop a strategic approach towards socio-spatial cohesion, an objective that can be transferred to any other metropolitan area.

The adaptation is embedded in the multidimensional decision making process that fosters collaboration between different actors from private, public to civil society, strengthening social alliances, looking for aligned objectives and possibilities in the urban system.

The research tests 5 systemic goals, flexible enough to be transferable to other contexts. However the actions and objectives that the adaptive strategy suggests must be re-evaluated in the given territory, understanding that the social, economic and political dimensions are different across boundaries with particular vulnerabilities. Nevertheless segregation and fragmentation are both global concerns that can be improved by the use the proposed strategic adaptation of the project.

About the relationship between research and design

The graduation project is developed under a research by design approach. A thorough theoretical background is carried out in order to develop the methodological approach which guide the entire process of the project. However it has to be clear that design and particularly the design of a complex metropolitan area such as the MAVM requires a constant adaptation even in the process itself. The complexity and scale of the metropolitan functions and their impact in the vulnerabilities are such that a complete research on every single one is beyond the scope of the graduation thesis. It is because of this reason that the process changed while the research was carried out, narrowing the general problematisation until a manageable scale through which the design can be handled. As such the multiscalar nature of the project is essential to understand the final design. The constant research envelopes the different scales and dimensions of the project from morphological and functional relations to governance processes that influence decision making process where urban design and policy making directly influence the impact that urban planning has in the general urban structure. Understanding the overall metropolitan structure by means of assessing its different layers at different scales allows the design strategies to become more than just ideals but instead they transform into feasible possibilities that if implemented can positively contribute to the problematisation.

About the relation between the (a) graduation project topic with (b) the studio topic, (c) master track and (d) master programme

a. Graduation project topic: Asymmetries of Power: Adaptive spatial planning as a process to reduce social segregation and spatial fragmentation in the Metropolitan Area of the Valley of Mexico
b. Complex Cities of the Global South
c. Urbanism
d. Msc4

_a and b
The research is part of the Complex Cities studio which has as part of its focus the ‘global south’ and their socio-spatial problematisations that have a specific urgency due to the fast growing population and urbanisation processes of their cities. In this regard the studio’s strategy helps to the understanding of this issues under the framework of spatial planning and strategy which is of the most importance when dealing with complex metropolises such as the Metropolitan Area of the Valley of Mexico. Therefore the studio’s goals and the research proposed by this thesis are aligned, while the later seeks to contribute to the knowledge carried out at the studio.

_a and c
The graduation project relates directly to the field not just because of dealing with an urban area but because of the adaptive approach taken which lies in the contemporary concerns of the biggest and most vulnerable metropolises in the world. A strategic pathway that enables socio-spatial cohesion.

_a and d
The graduation project tests the knowledge acquired in the previous courses, since the adaptive strategy suggests 5 systemic goals, each one deals with a different system of the urban realm, public space, water, transport and mobility, densification and productive landscapes. It is certainly a way to adapt the previous knowledge in one synthetic strategy, capable of achieving the aim proposed by the research project.

APPENDIX

Delft University of Technology
MSc3 Urbanism

AR3U023 Theories of Urban Planning and Design

Theory advisor: Dr.ir. G. Bracken MPhil

Student: Raúl Alejandro Martínez Medina

Student N°: 4859197

Email: ramartinezmedina@gmail.com

Submited: 27-11-2019

Adaptive strategic spatial planning:

Re-conceptualization of the emergent metropolisation model in the Metropolitan Area of the Valley of Mexico.

Abstract

Under a globalised world, the phenomenon of metropolisation in Mexico has been strongly influenced by market driven neoliberalism policies, where political, social and economic asymmetries seem to be growing non-stop affecting urban development. As many Latin American countries, Mexico and its emergent metropolisation characterised by uncontrolled growth has been influenced by outdated planning methods (land use planning/zoning, master plans and strategic plans) in a clear top down operability with a non-clear planning vision and reinforced by the private actors investment. This had affected the urban metropolitan structure reinforcing spatial fragmentation and social segregation.
As a case study the MAVM (metropolitan area of the valley of Mexico) reflects and depicts the weakness of current planning strategies in Mexico which have not significantly changed since its first implementation. Moreover the paper discusses the lessons learned from master planning and strategic planning to later elaborate in what has been defined as an alternative for adaptive strategic spatial planning (Friedmann, 2004; Albrechts, 2009; Sepulveda, 2019) as a paradigm shift that can be implemented in Mexican urban planning. Furthermore, it is argued in the paper that current urban projects under development, regardless of their top-down nature, can be strategic opportunities for the adaptive approach if then considered a broader set of actors and their diverse demands. The aim of the paper is not to impose a new planning method but to embrace the possibility of change and inclusion towards a cohesive transition, capable of dealing with the complexity of contemporary developing metropolis such as the MAVM.

Key words: Urban planning, Metropolisation, Globalization, Master planning, Strategic planning.

Introduction: Globalization and Neoliberalism in Latin America

In an era of fast globalization and capitalism, cities have been caught up under significant changes in urbanization processes, positioning them as powerful engines of growth (Cohen, 2001). Although for Latin American countries still under “development status” growth has not been only economic, but assimilated and translated into increase levels of poverty, social inequalities, fragmentation, segregation, decentralization and unemployment, all of which were effects of globalization practices and continuous municipal competition and investment attraction. Furthermore, unable to cope with global trends and subjugated by economic growth and strong competition, Latin American countries still under debt crisis (intensified by globalization trends) followed structural reforms in form of readjustment policies as a recommended strategy by global institutions such as the World Bank and the IMF in order to get further loans (Carmona, Burgess, and Badenhorst, 2009, and de Mattos, 2002). This reforms initiated an economic trend characterised by the liberation of the market through subsidies, privatization and international participation, currently what we know as Neoliberalism (de Mattos, 2002). Soon, Neoliberalism started to modify urbanization processes, organization, structure and functionality within Latin American countries. Moreover planning overall changed drastically to cope with neoliberal ideals, fundamentally planning policies were adapted to improve the conditions and productivity of cities enabling the development of markets, privatization, investment, and the decentralization of political administrations (Carmona, Burgess, and Badenhorst, 2009).
The structural transformation of the global economy accelerated the globalization process affecting developing countries. Fast urbanization and expansion, speculation with land value and tenure, unequal development, segregated societies, informal human settlements due to unaffordability of land, and asymmetries between government institutions are some of the radical changes result of this new economic liberation in the developing world. Although changes may seem similar across countries (in Latin America) it is important to mention that there is an undeniable contextualization of the neoliberal movement that revealed endogenous and unique responses on urban developments in each one of them. Hence, beyond globalization, identity and idiosyncrasy within inhabitants of cities triggered different manifestations of urban morphology, urban landscapes, and architecture trends (de Mattos, 2002). Until today a holistic strategy capable of dealing with urban asymmetries due to neoliberal and globalization processes has not been reached and probably will never be accomplished. The complexity behind each context makes it impossible to be handled the same way across boundaries, flexibility and adaptability must be critical goals for future urban planning strategies.

As many countries in Latin America, Mexico has been heavily affected by globalization, manifesting new economic, social and political configurations that have been transforming the territory at different dimensions and scales. The complexity of the territory was then challenged and increased by the introduction of neoliberalism, ´the central guiding principle of economic thought and management´ (Harvey, 2005) which had an important impact in the urbanization process in the 80´s, leaving behind industrialization as the main economic driver of development towards a new post-industrial era dominated by a market driven economy focused on services, and characterised by international investment and municipal competition, privatization of space, stronger migration and decentralization, and inadequate land management. These processes soon started changing the urban development of the country, shaping Mexican cities (and many others) to what we know today (2019), strongly social-segregated and spatial fragmented.

Under this context the following paragraphs will tackle Mexico as case study, particularly the conditions reflected in the main metropolitan area in the country; MAVM (Metropolitan Area of the Valley of Mexico). Firstly by introducing a brief history of urban planning evolution in Mexico until today to understand its process and limitations. Secondly the paper will describe

the emergent metropolisation process in the MAVM from its growth and consolidation, its current segregated condition, and the current planning challenges faced by the metropolis due to its top-down planning approach. Thirdly the paper will argue the possibility of change regarding the planning approach by depicting the lessons learned from master planning (the modernist approach), land use planning and strategic planning (the neoliberal approach) and elaborating an argument towards an adaptive strategic planning as the next step for the inherited metropolis. Finally some recommendations will be suggested in order to achieve the adaptive strategic planning.

Urban planning in Mexico

Urban planning in Mexico has been a process of constant evolution since the beginning of prehispanic civilization. However, under the influence of the Spanish conquest similar patterns of urbanization with other Latin American cities are recognised by the XVI century. According to several studies a historic uniformity is identified in the urban centers in Latin America during the colony after the Spanish conquest (Chaparro, 2009). During this time the European influence in the design of the emergent settlements is clear, most of the patterns recognised are known from its response to Felipe II ´ordenanzas´, an ordering system similar to zoning from characterised by having all the streets joint to a center plaza (with the most important buildings such as churches or royalty and other civil buildings) in a grid system of order (Chaparro, 2009). In this regard ´ordenanzas´ shaped the centers of the Spanish cities in America which were growing and slowly urbanizing following a specific architectural and urbanistic style incorporated in Europe during the first half of XIX century and the beginning of XX century (Chaparro, 2009). During this period u}banism in Latin America followed specific French tendencies initiated by Houssmann as the brain behind the urbanization process in Paris, better known for its long and wide avenues that created perspectives with an icon building at the end.

However, modern urbanism starts in Mexico since the introduction of “Plano Regulador de México” (Regulation plan of Mexico) at the end of the XVIII century with Ignacio Castera (See figure 1) as the author influenced by neoclassic urbanism characterised by symmetry and order (McMichael, 2002).

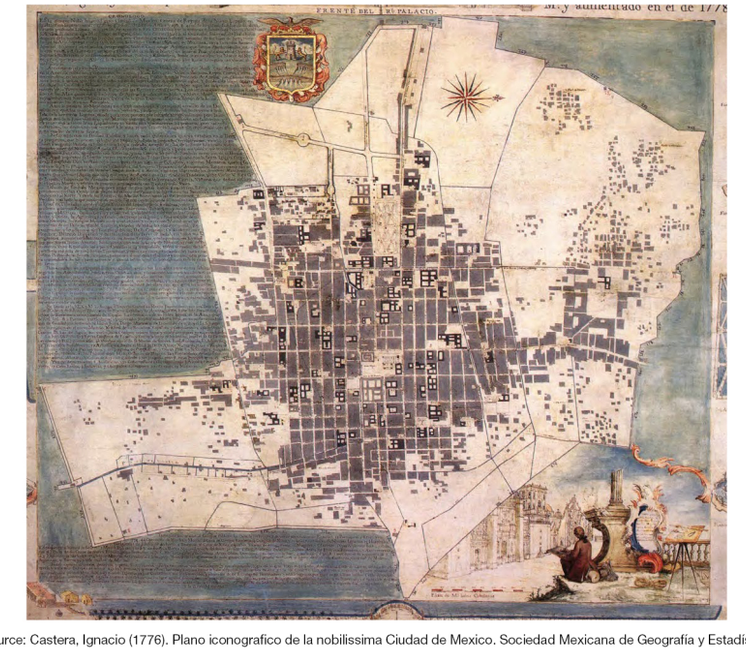


Figure 1. Source: Castera, Ignacio (1776). Plano iconografico de la nobilissima Ciudad de Mexico. Sociedad Mexicana de Geografía y Estadística (SMGE).

During the last two decades of the XIX century and under the dictatorship of Porfirio Diaz, Mexico experienced the first steps towards globalization (Suarez, 2009). Mexico was open for investment and with the railway system underway, industrialization was slowly settling as the main economic activity, influencing not only the economy but the growth of its cities as well. It is in this period of time and the first decade of the XX century when modernity was on the rise. Large-scale public buildings, public transport infrastructure, basic urban services and social equipment were built. The city was growing at a fast rate. Nevertheless, this tendency of new buildings and constant urbanization stopped suddenly after 1910 and between 1920 due to the Mexican Revolution. But it was the post-revolutionary period the one triggering a substantial change for urban planning in Mexico. The reason is because of the process of national reconstruction helped developing a theoretical framework based on modernism practices for urban planning, giving it the impulse in a later state to act as an institutional tool for urban interventions (Chaparro, 2009).
Moreover, urbanism influenced by the ideas of the last century had led to the formulation of a large number of urban plans and masterplans/blue prints based on zoning regulations and the control of the urban expansion and building density (Chaparro, 2009). The first regulatory plan used as tool and graphic instrument that illustrated social and economic activities and its spatial manifestation was introduced by architect Carlos Contreras in the 1920´s (Chaparro, 2009, Sanchez, 2002 and Gortary and Hernandez, 1988). This regulatory plan used ´zoning´ as the control measure and guide for the ordered development and growth of the city based in their specific activities (Sanchez, 2002). From this regulatory plan that was based in functional principles the evolution of planning in Mexico has not changed drastically. The approach is still similar, with new complexity due to the expansion of the city, but the improvements have been methodologically speaking; ´poor´.
The first national plan for urban development (Plan Nacional de Desarrollo Urbano) was made in 1978, as an attempt to cope with the rapid urbanization in the country due to industrialization processes, which modified the approach of urban planning towards improving the territorial conditions for better and more effective industrialization processes. The focus was merely economic. Investments and development of infrastructure was only focused to make industries as effective as possible, as a result the evident concertation of population and resources was focalised in a few places within the national territory (Chaparro, 2009). It is because of the conquest that the tradition of urban planning in Mexico and other Latin American cities act as mirror effect of European urbanization processes. The evolution of the urbanization specifically in Mexico has been that of a constant try and error imitation of several trends of urban theory. The garden city by E. Howard, Le Corbousier and its gigantic lifeless buildings (implemented by Alberto J. Pani in Mexico City), the suburban movement in the USA not to mention architectural specific trends that shaped Mexico´s urban image. Mexico is a half-blood country with a half blood urbanization process. Thus, the tradition of urban planning in Mexico has been focusing in land use and zoning solely denoting its spatial-functional approach, a method proven to be unsuccessful in the contemporary urbanizing-globalizing world due to the fact that it encourage competition fostering economic investment through hard infrastructure projects that cause a segregated condition in the city as will be explained in the next section. Its rigid and prohibitive modernist nature are the reason why Mexican urbanistic plans for development have failed to cope with the challenges and the reality faced until today (Chaparro, 2009).

Challenges in Mexico as in other parts of the world have changed and became more complex than a century ago. Economic and social conditions in a developing country like Mexico are radically different than those in the developed world, it is not feasible to base urban planning principles of countries that faced other realities (Carmona, M., Burgess, R. and Badenhorst, M., 2009). What the administrations, organizations and the government in general has yet to understand is that with a growing complexity there is an urgent need for improvement regarding planning methods and an approach that deals with an inter and intra municipal

perspective. The country cannot continue growing with the same planning background which as mention earlier was developed under other circumstances. The clearest example of this complexity and lack of successful planning is the Metropolitan Area of the Valley of Mexico (MAVM), the biggest and most influential metropolis in the country, a metropolitan system that has grown unpredictably at a fast speed under globalization and neoliberalism policies.

The Emergent Urban Metropolisation Process in Mexico

The metropolisation developing model is a process whereby certain cities adapt to the emerging post-industrial economy by concentrating locally interacting high-order- information-using activities that both enable and structure global interactions (Bourdeau-Lepage and Huriot, 2005 p6).

Urban Growth and the formation of the MAVM

Urban growth in Mexico has been influenced firstly by industrialization, a process that dates since the beginning of the 1940´s where conditions favored the main cities; Mexico City, Monterrey and Guadalajara to develop as industrialised urban systems. At that time 40% of the national population lived in Mexico City, 5% in Monterrey and 6% in Guadalajara (Eibenschutz, Carrillo, 2011). Government action during these periods was focused on two priorities; first to complete the distribution of land and regulate production in the Mexican countryside, pending from the Mexican revolution, and the second was industrial development (Eibenschutz, Carrillo, 2011).
During the 1950 and 1960 population in Mexico City grew at a fast rate as the effect of massive migration from rural countryside to urban and industrialised cities where job opportunities were on the rise. It is in the 1960 when a deconcentration phenomenon started in the capital city passing the population growth “torch” to its nearest neighbor Estado de Mexico, originating the first conurbation between them, hence initiating the process of metropilisation in Mexico City (Unikel et al. 1978). This central urbanization dynamic led to the formation of the MAVM or Metropolitan Area of the Valley of Mexico (See figure 2), a massive expansion of the urban fabric from a central point (Mexico City and its 16 municipalities) towards its periphery, influencing 2 other political-administrative entities; Estado de Mexico and Hidalgo, affecting 58 municipalities and 1 municipality respectively. Together they have a population of more than 20 million inhabitants (INEGI, 2015).

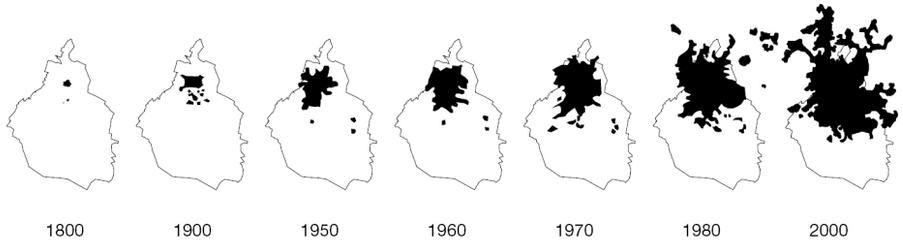


Figure 2. Source: Own elaboration. the drawing shows the expansion of the metropolitan area through time.

But before achieving such huge population numbers, growth accompanied with a high concentration of services in the center and the rise of land affordability, obligated the poorest population generally the working class to settle in the periphery; a growth pattern soon to be recognised as a ´ring growth model´ of development (Unikel et al. 1978). A typical relation center-periphery was then enhanced by lack of land management from government

institutions impotent to control the massive overpopulation and growth towards the periphery, an expansion mostly made without regulating tools or appropriate adaptive models, meaning that people settled in land illegally (see figure 3) and land was sold to developers focused on building housing for the low income, gated communities fragmented from the urban tissue. In short, a new informal urbanization contrasted from the regulated formality in the center. Therefore two processes of settlement on urban soil where then recognised in Mexico: the ´formal´ although arguably characterised for compiling with regulations stablished by the government, and the ´informal´ which did not followed the regulatory framework of planning regulations (Eibenschutz, Carrillo, 2011).



Figure 3. Source: Photography by Pablo López Luz. The image shows informal settlements at the periphery in Mexico City.

Social segregation and spatial fragmentation

The conditions of social segregation and spatial fragmentation in the metropolis were enhanced due to globalization influence regarding urban planning strategies and methods applied to the metropolis (Kozak, 2018). Neoliberal policies and the liberation of the market intensified the competition among municipalities which were mostly interested in finding investments. Responsibilities were not clearly defined across them and the dominating planning approach normative regarding land uses was not flexible to the expansion and competitive conditions that the metropolis was facing. Municipalities began losing power regarding decision making, even when the autonomy of decisions was at their disposal. Developers played an important role in decisions due to the fact that without them, municipalities alone did not have enough resources to cope with expansion needs, finding the answer in the privatization of spatial developments. As such, the metropolis was growing with privatised spatial services, transport infrastructure and other public facilities which were following a project-based planning approach where responsabilities concerning local immediate surroundings where overlooked not having an appropriate response towards a functional cohesion in the metropolis.

Globalization intensified the fragmented and segregated urban condition of the metropolis, the dynamics of the market increased competition between municipalities across regions that at the same time worsened the space consumption in the territory where municipalities lack of successful instruments to regulate it. Informal settlements were developed in protected areas, and protected communal land was sold to the highest biter in a competitive market often ruled by developers looking for the cheapest land price to build-in (Eibenschutz, Carrillo, 2011), an economy where demand surpassed offer potentials; the perfect scenario for development and investment. Because of that reason urban planning shifted to that of only project-led rather than process-led approach. Developers had a strong influence in the development of projects, which were strategic for economic goals, mostly attracting investment, new businesses and most recently tourist attractions and an increase housing stock completely segregated from basic services, decent quality of life, transport facilities, and work centralities to name a few (Garcia, 2011).

In this regard, the unbalanced conditions of planning in the MAVM focalised projects concerned in the enhancement of infrastructure and spatial conditions in privilege areas (e.g business districts) that belong to the strongest municipalities (Mexico City). The MAVM has been growing with this ideology of stronger powerful players that has only worsen the segregated condition of the metropolis were vulnerable areas with weak power-municipalities are not taken into consideration, completely subjugated to decisions taken above them.

The effects of Housing

Regardless of economic prosperity cities were not prepared for the massive population growth, increasing the demand for urban land, basic urban services, infrastructure and housing (Garcia, 2011). Moreover housing in informal human settlements (HIS) took place in places far from the aforementioned services and main centralities, increasing the risk to vulnerabilities such as hazards and health concern issues. As a response to the increase in housing demand, complementary programmes for finance were put in motion, the housing finance programme (PFV) and the Housing Fond (Fovi) in 1963, and with them ´the emergence of a new agent for housing production: the real estate promotion sector´ (Garcia, 2011), thus the beginning of the social housing market.

Social Housing was later controlled and managed by public institutions whose funds were taken from solidary savings made by obligated workers contributions. Of this institutions the largest financing agency was Infonavit; the national funding institute for workers´ housing, which intentionally would've taken contributions from the high income workers to facilitate credit to the lower income workers. Nevertheless it failed due to internal mechanisms of corruption, enabling the private sector who was in control of the distribution of housing loans to develop their own construction companies, thus taking the commissions of housing development projects. Furthermore in addition to the conditions relating housing construction, the free land market economic model that took place in the 80´s led to the intensification in the speculation of the housing value. The open market allowed investors to buy land at lower prices at the outskirts of the city, fostering periphery developments segregated from basic services and commodities located at the centre. Planning mechanisms at the time were unable to control and regulate the expansion phenomenon due to the new economic model, transforming the aim of Social Housing; from being a political concern towards a mare business strategy able to profit the big winners; the housing developers (See Figure 4). The city was then under high pressure and massive expansion, a fragmented structure was dominating housing developments, which were walled gated communities of thousands of houses one after the other as an homogeneous organism alienated from the general city structure; openness and livability were contested by insecurity, and insecurity was aggravated by the segregation of such developments.

A segregated model of long commutes to job centralities, high costs of infrastructure and living expenses due to long distances and loss of protected land against informality. These are only part of the problem in an asymmetric urban metropolis recognised by a small high income west with a massive poverty east uncapable of affording a different lifestyle under a neoliberal high competitive regime. The housing market has shown that the challenge is to build houses, rather than creating suitable environments with the necessary networks for promoting productive inclusion (Hausmann, 2016), it has become the most successful business in developing countries.

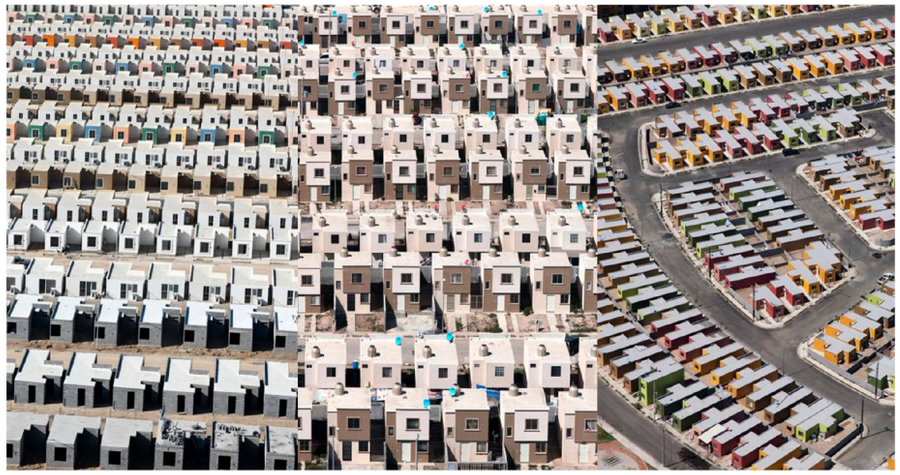


Figure 4. Source: Photography by Jorge Tabaoda. The image depicts the current models of urbanization, repetitive low cost housing.

Current Urban Challenges

The emergent metropolisation process through which the MAVM has being developed is that of a segregated society in a fragmented space. The current situation in the country lacks of planning instruments and mechanisms capable of dealing with the different asymmetries that are constantly shaping the urban life of its citizens (See figure 5 and 6). Moreover, the constant competition among municipalities, private companies creates an unjust market that favors those with the highest incomes and worsens the possibilities of the low income society to enter the formal economy; residents are unable to migrate to areas close to job centralities nor areas close to efficient public transport and public space facilities. This results in an uneven growth that has dominated over the past century.

One of the main causes of this unhealthy urbanization is attributed to neoliberal policies that enabled the territory to be used speculatively where the only actors involved are developers and community land owners whom dictate conditions and terms - the game is simple, as long as the future outcome fills their pockets following their private interests and benefits, the city can continue growing non-stop-, leaving the state powerless to control the situation acting as a mere expectator besides, in some cases it also acts as a player due to its own interest in attracting investment.
Mexico City has been the main attractor for economic development and investment for large urban projects under the last decades in the country, most of which are attributed to its radical expansion, mainly focusing on regional-logistic infrastructures and the urgency to find solutions for its condition, a known practice of re-action rather than action. This projects however, are develop under a top-down approach with no consideration of local vulnerable actors for a fair decision-making process. They are indeed strategic for economic development; some will argue that they are even necessary for the better good of the economy international investment and better positioning of the country globally. But what all of this projects lack of



Figure 5. Source: UNEQUAL SCENES, 2019. The image depicts Spatial Fragmentation, high income and low income developments in the same place



Figure 6. Source: UNEQUAL SCENES, 2019. The image shows Santa Fe buisness district close to housing developments of vulnerable groups

is a strategic approach that not only focuses on the evident economic benefits but rather in the people that will be locally affected by their further development and implementation - the losers-. A society that has grown socially segregated and spatially fragmented under a weak democracy.

Some of the urban projects and attractors of investment are housing developments, new public transport infrastructure, a new international airport, metropolitan open spaces (See figure 6), business areas, and some renovation projects of vulnerable places and city center. Projects that without a doubt have an impact at a multidimensional and multi-scalar levels but have not been appropriately formulated since municipalities despite their power and autonomy regarding their own planning-future lack of collaboration and coordination among them (inter-municipal level), thus, they are unable to develop a vision(s) that frame adaptive strategies.

An adaptive strategic planning in the MAVM

Until this point the paper has covered the evolution of urban planning in Mexico to what it is today and addressed the emergent metropolitan model which portraits the biggest challenges of the metropolis. Departing from them as an initial statement of the current metropolitan condition in the MAMV this section of the paper will address a necessary paradigm shift, in order to change the current urban planning system that has been stagnated for a long time with a traditional planning can only be described as an old and outdated process that instrumentalise land use through zoning and masterplans through rigid blueprints. It has also been pointed out that no essential improvements towards a just decision making process have been made. This is because until now the power of decision in Mexico belongs to the developers and municipalities which have specific uncoordinated goals, moreover, the general public (especially vulnerable actors) is not involve in decision-making processes because it would mean giving up some of the control in the process, and those who have it are not ready to share it (Friedmann, 1992; Albrechts, 2009).

Master planning

Modernism guided architecture and planning professionals towards urban growth and redevelopment and Mexico is not an exception. Under this interpretation the urban function and form (structure and the built environment) needed to be adjusted to pursuit the economic, social and demographic demands fostering industrialization. In this regard, modernism influenced urban planning principles towards this goal, putting it up front and guiding it with a functional rational, characteristic of the movement.

In developing countries functional urbanism and planning fostered the introduction of a new urban order which socio-economic goals were to increase the efficiency of the city through strict, functional segregation of land uses, improvements to transport systems and the subsidization of services (Carmona, Burgess, and Badenhorst, 2009). Moreover urban policies under the functional regime had the goal to transform developing countries into modern cities using zoning and masterplans as the main instruments for implementation and control of land use (Carmona, Burgess, and Badenhorst, 2009).

Regardless of its ideals, master plans required strong state power of intervention, regulation and control (Carmona, Burgess, and Badenhorst, 2009), but it was noticed that this rigid plans were in charge of inflexible governments with weak institutions and lack of co-ordination among them and across municipalities. In this regard planning had a predominant top-down approach that excluded local interests from decision making processes, thus a more flexible planning was needed in order to make a change that enable competition and the development of markets in fast globalizing world (Carmona, Burgess, and Badenhorst, 2009).

Strategic planning

After the modernization and industrialization period, Neoliberal thinking and policies changed urban planning conditions enabling markets and privatization for a more productive and efficient development. As a response to search global competitiveness the private sector implemented strategic planning, a strategy used firstly by companies to plan their futures effectively while dealing with uncertainty (Albrechts, 2009; Carmona, Burgess, and Badenhorst, 2009; Kaufman and Jacobs 1987).

"The strategic plan aims to improve traditional planning by being closer to reality, resources and social actors. It recognises the need to define urban objectives in terms of the existing economy, social and cultural dynamic. It develops a permanent relationship between objectives, strategies projects and impacts. It recognises the need for the convergence of interests between public and private actors in all the phases of plan making and implementation" (Burgess and Carmona, 2009, p25).

Objectives regarding strategic planning may vary but according to Albrechts (2009) constructing coordinated visions, framing an integrated long-term strategic logic capable of enhancing action-orientation beyond control and multi-level governance were among them. Although it seemed to be implemented mainly for economic development a strategic planning approach was implemented by some governments like USA (Albrechts, 2009).

Towards an Adaptive Strategic Spatial Planning in the MAVM

But what can be learned from a masterplan land use based approach and a strategic plan based on economic improvement? And is either one enough for a metropolis such as the MAVM?

Master plans are oriented towards results instrumentalised by rigid blueprints and inflexible land uses, while the strategic plans are instrumentalised through objectives towards economic interests to cope with globalization. Both limit urban growth in contexts similar to the one developed in Mexico (developing countries) where the dynamics of urbanization and the processes of development are complex by nature responding to inequalities, social segregation and spatial fragmentation. Moreover both still have a dominant top-down approach, not flexible to further adaptation regarding urban planning.

It has been clear that top-down planning is not working in the MAVM, which suffers the constant competition between municipalities and robust influence of governmental institutions, the power belongs to investors and politicians; the current condition of the emergent metropolis shows serious social segregation and lack of interest from power positions to share it with its citizens. A change that seeks for a balance between top-down and bottom-up initiatives is needed, brought from negotiation collaboration and constant participation towards a better and sustainable future. In short, there is a need for an adaptive strategic approach that takes into account the intra-municipal development through inter-municipal collaboration and coordination that facilitate local endogenous developments for the most vulnerable actors which are heavily influenced by planning actions.

In Mexico transparency and accountability regarding political actions has recently manifested some achievements -baby-steps yet for a massively asymmetric metropolis- but nevertheless the possibility of substantial change. There are many examples in the metropolis to illustrate top-down approaches and the lack of interest regarding decision-making (between developers and local communities), but the most relevant due to its impact and consequent response of society was the “Corredor Verde Chapultepec” (green corridor of Chapultepec); a large strategic urban project, formulated as a second floor (portrayed as public space) in one of the most important avenues in Mexico City (Chapultepec, 10 lines of vehicule-traffic). The project got a complete rejection from the society and professionals all over the metropolis (see figure 7 and 8). The main reasons were; lack of accountability, the negative impacts regarding local economies and the enhancement of segregation in an area which already suffers from it. The project was revealed as a finished design ready for implementation. Later on, the project was submitted to “public consultation”, and as expected the very nature of the project (private investment for commercial purposes) turn the citizens against it, making use of public media to organise themselves in a public manifestation that later put a definite end to the project.



Figure 7 and 8. Source: above, render by FREE 2015, magis.iteso.mx; below, maspormas.com 2015. The image shows a render of the proposal (above) and the resulting protest (below)

Such an event reflects a society tired of not been taken into consideration when important decisions are to be made. As an alternative, an adaptive strategic planning is needed and some efforts to formulate it have been done in European contexts (see Healey, 1997; Albrechts, 2004; 2006; Albrechts et al, 2001, Albrechts et al, 2003; Motte, 2006; Healey, 2007), relevant and important inputs that nevertheless need to be taken into consideration in a contextualised way (Latin America and developing countries). Louis Albrechts describes strategic spatial planning as follows:

"spatial strategic planning is a transformative and integrative, public sector led socio-spatial process through which visions/frames of reference, justification for coherent actions and means for implementation are produced that shape and frame what a place is and what it might become (Albrechts, 2001; 2004; 2006; Motte, 2006)"

From his own definition it can be understood the need for integration in a continuous process of collaboration and coordination are a strong asset of this new way of planning because it allows a multilevel-governance, involving a diverse series of actors, from public to private into the decision-making and implementation process, creating long term visions with strategies a at different levels of power structures rather than rigid unilateral blueprints (Albrechts, 2009). In this regard the MAVM and Mexico as a Nation needs urgently to formalise and put in motion an adaptive strategic planning, formulated and fitted to its own challenges with the implementation of a new governance system that takes public in consideration regarding decision-making processes. Thus, stressing collaboration and coordination among public and private actors (See figure 9). The goal is to achieve better results in a long-term basis finding an appropriate balance between top-down and bottom-down approaches, a vision that considers existing issues, problems and future opportunities (Albrechts, 2009).

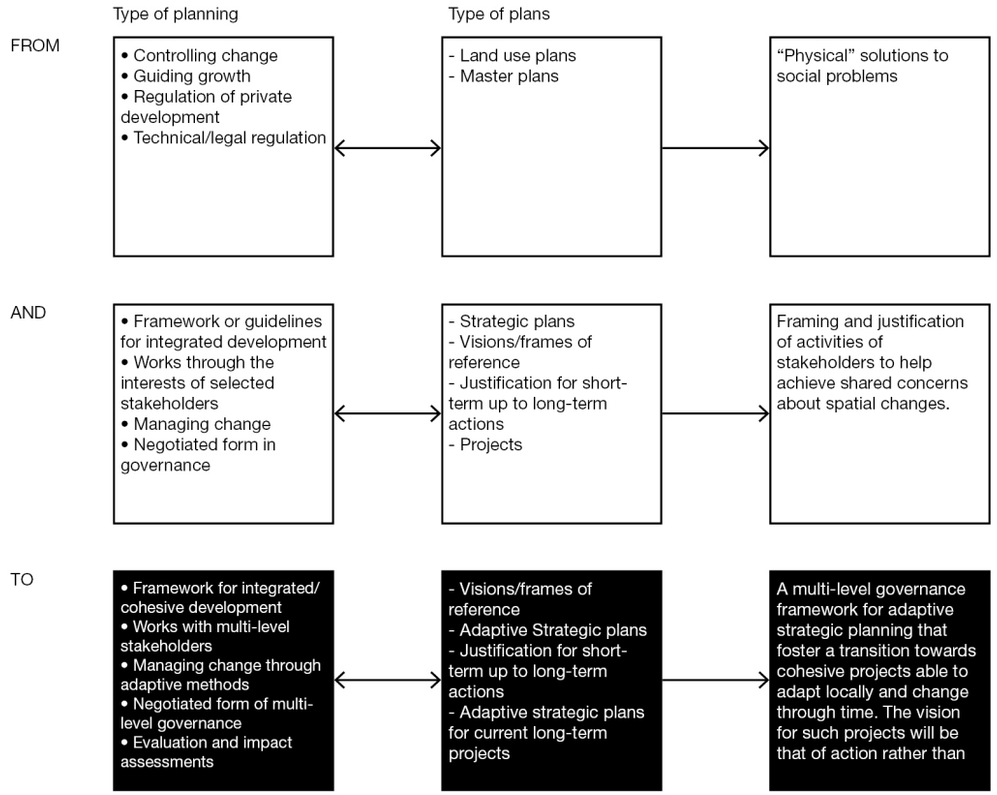


Figure 9. Modified diagram based in Louis Albrechts (2009). From traditional land use planning and strategic planning to an adaptive spatial strategic planning

The role of current large urban projects and municipal power

Current projects that originated in a top-down approach and are difficult to change at this stage of development are some of the challenges faced the Metropolis, but that can be opportunities to startup the adaptive change due to its large scale of impact and multidimensional levels of interest and actors. Ongoing projects are:

- The development of the expansion of the international airport AISL (a project 50km away from the original airport which will include further transport development to connect them)
- The metropolitan eco-park in the former lake of Texcoco (the biggest void in the metropolis)
- Infrastructure projects regarding transportation, e.g. the expansion of Metro lines
- Reconstruction of vulnerable areas after the 2017 Earthquake (an area known as "Zona Cero" highly vulnerable to seismic events)

These projects are strategic and respond to specific metropolitan needs, nevertheless, the power of decision-making process is still unbalanced. Current municipal urban plans (PDU´s) are not coordinated reflecting the lack of interests in this regard with the planned projects. It is important to mention that each municipality has its own interests and stress the fact that such interests are competing with each other weakening the possibility to reach agreements with the current planning framework. For this reason municipalities must engage a different approach, one that recognises their own interests and common ones, economically and functionally enabling the development of shared visions for a better inclusive and cohesive metropolis, thus reducing the asymmetries that characterise it until now.

Moreover, if local areas are taken into consideration (primarily vulnerable low-power communities), new developments can be planned regarding the interests of local people combined with those of developers and the own municipalities from a cohesive and inclusive approach. In order to make this possible a multilevel-governance most be implemented, approaching the main actors that want to get benefited from the project, those that will take most of the responsibilities and the negatively affected ones that are always diverted by the process, lifting most of the burdens (in current planning strategies). The possibilities could benefit all levels of power, from local and municipal to state level. Moreover, endogenous developments which people relate with, are important to start with the reduction of social segregation and the spatial fragmentation, characteristics and challenges of the MAVM.
Strengthening local actors will benefit the metropolis system, because of several factors:

- With endogenous development, identity regarding the locality might rise, thus reducing segregation
- Stressing endogenous developments will enable new economic manifestations, enhancing local sub-centralities
- The endogenous development will make possible innovations at a local level, giving vulnerable places the ability/opportunity to adapt and react to outside challenges (Garofolio, 1993)
- New sub-centralities specific to the needs of local residents will help to mitigate the monocentric functions towards the center (Mexico City), by decentralizing them but acknowledging that the network cannot be overlooked.
- By reducing the monocentric functions, more sustainable goals and practices regarding transport (reducing excessive transport commutes) and health-issues (less pollution, more walkable distances) can be achieved locally.

Conclusions

Planning in Mexico has been contextualised in this paper as a technical instrument without flexibility; an administrative tool dedicated to “control” urban expansion, mobility and land use, inadequate to answer to contemporary conflicts just as socio-spatial fragmentation, leaving vulnerable communities behind, increasing their precarious living standards. Moreover planning has a Top-Down approach in the country, municipal and federal authorities have shown a serious inefficiency when approaching towards a more just planning process excluding the communities, influenced by historical traditions and competitiveness in a neoliberal, globalised reality. It has a lot of discrepancies regarding decision making processes where political interests and corruption are part of the daily system. As such, governance in Mexico seems to be out of the question in current urban plans, an approach has not been appropriately implemented. Furthermore, most of the decision making that has taken place under the neoliberal umbrella protects and improves the quality of life of high-income societies, leaving the low income wet and vulnerable, segregating them not only from the process but from basic urban benefits.

The recommendation for a change regarding urban planning in Mexico is that of an adaptive model of strategic planning, through which tasks and burdens are shared in a balanced way and where large urban projects consider their local immediate surroundings before landing, searching for potentialities within the area in order to facilitate their integration thus reducing the fragmented condition, currently increasing do to the lack of a defined and clear perspective towards their response to the overall metropolitan functionality.

It also has been stressed that Mexico and the MAVM are continuously growing, facing big procedural and morphological challenges such as the current metropolitan strategic projects that regardless of their nature (top-down), there is an important opportunity for change by adapting the proposals to answer local-vulnerable needs, responding to new visions that integrate them in the development rather than exclude them.

In order to develop those visions, intra-municipal goals need to be re-defined and enhance through inter-municipal collaboration and coordination by defining new instruments for adaptive planning such as policies and specific projects in determined time frames for implementation (from short-term to long-term) defining priorities among them, thus recognizing the actors involved in a multi-level governance approach (from strong powers of interest and action to vulnerable local communities with low power) in a co-participatory process able to foster not only new developments but to actually guarantee that the metropolitan interests and functions (e.g. connectivity, accessibility, job concentration, housing etc) will enable rather than block local actions (from the bottom to the whole) and the possibility for endogenous developments particular to the needs of localities.

Future steps for research and implementation

Finally it is relevant to take into consideration other successful cases for urban planning, practices that have been proven successful in other (similar) contexts but that nevertheless can be evaluated for further implementation in the MAVM such as Surplus Value Capture (Colombia) The Urban Operation and Interlinked Operation (Brazil), Transferable Development Rights (Tokyo, Toronto), or Zoning incentives which have been practiced in Mexico to maintain the Historic city center. Policies and initiatives capable of changing developing countries urban planning history towards more adaptive models of strategic planning.

References

Albrechts, L. (2002): The planning community reflects on enhancing public involvement. Views from Academics and Reflective Practitioners, Planning Theory & Practice, 3 (3) 331-347.

Albrechts, L. (2003): Planning versus Politics. Planning Theory Vol.2 (3) 249-268, 2003.

Albrechts, L. (2004): Strategic (Spatial) Planning Reexamined Environment and Planning B. 31 743-758.

Albrechts, L. (2006): Shifts in Strategic Spatial Planning? Some evidence from Europe and Australia. Environment and Planning A 38(6) 1149-1170.

Albrechts, L. (2009). Strategic spatial planning revisited experiences from Europe. 3. BÖLGESEL KALKINMA VE YÖNET□□□M SEMPOZYUMU, 61.

Albrechts, L. Alden, J., Da Rosa Pires, A. (2001) (eds.). The Changing Institutional Landscape of Planning (Ashgate, Aldershot).

Albrechts, L. Lievois, G. (2004). The Flemish Diamond: urban network in the making, European Planning Studies, 12 (3) 351-370.

Albrechts, L., Healey, P., & Kunzmann, K. R. (2003). Strategic spatial planning and regional governance in Europe. Journal of the American Planning Association, 69(2), 113-129.

Bache, I., & Flinders, M. (2004). Multi-level governance and the study of the British state. Public policy and administration, 19(1), 31-51.

Bache, I., Bartle, I., & Flinders, M. (2016). Multi-level governance. In Handbook on theories of governance. Edward Elgar Publishing.

Bobbette, A. W. (2014). Scapegoat: Architecture, Landscape, Political Economy.
Bourdeau-Lepage, L., Huriot, J. M., & et Gestion, P. D. E. (2002). Metropolisation in Warsaw: economic change and urban growth. Canadian Journal of Regional Science, 25(3), 423-446.

Burgess, R. and Carmona, M. (2009). The shift from master planning to strategic planning. Carmona, M., Burgess, R., Badenhorst, M. (2009). In Planning through projects: Moving from master planning to strategic planning: 30 cities. Techne Press. 12-42.

Burgess, R., Carmona, M., & Kolstee, T. (1997). The challenge of sustainable cities : neoliberalism and urban strategies in developing countries. London ; Atlantic Highlands, N.J.: Zed Books.

CAF and UN-Habitat (United Nations Human Settlements Programme) (2014). Construction of more equitable cities. Nairobi.

Carmona, M., Burgess, R., Badenhorst, M. (2009). Planning through projects: Moving from master planning to strategic planning: 30 cities. Techne Press.

Cervero, R. (2004). Transit-oriented development in the United States: Experiences, challenges, and prospects (Vol. 102). Transportation Research Board.

Chaparro, J. (2009). Planeación urbana en México: un análisis crítico sobre su proceso de evolución. Urbano, 47-63.

Cohen, M. (2001). The impact of the global economy on cities; Freire, M., & Stren, R. (2001). In The challenge of urban government: policies and practices, 5-17. The World Bank.

Daniell, K. A., & Kay, A. (2017). Multi-level Governance: An Introduction. MULTI-LEVEL GOVERNANCE, 3.

De Gortari, H., de Gortari Rabiela, H., & Hernández, R. (1988). La ciudad de México y el Distrito Federal: una historia compartida. Departamento del Distrito Federal.

De Mattos, C. (2002), Transformación de las ciudades latinoamericanas: ¿Impactos de la globalización?, EURE, vol. XXVIII, núm. 85, Pontificia Universidad Católica de Chile, Santiago, Chile .

De Mattos, C. (2010) 'Globalización y metamorfosis metropolitana en América Latina. De la ciudad a lo urbano generalizado', Revista de Geografia Norte Grande. n.47.

De Mattos, C. A. D. (2007). Globalización, negocios inmobiliarios y transformación urbana. Nueva Sociedad, 212, 82-96. Available at: http://nuso.org/media/articles/downloads/3481_1.pdf (Accessed: 28 October 2019).

DE URBANISTEN (2016). Towards a water sensitive Mexico City Report. Available from http://www.urbanisten.nl/wp/wp-content/uploads/2016.07.21_Reporte_CAF_Urb-AEP_lr-2.pdf, accessed 18-11-2019

Durance, P., & Godet, M. (2010). Scenario building: Uses and abuses. Technological forecasting and social change, 77(9), 1488-1492.

ECLAC (Economic Commission for Latin America and the Caribbean), FAL (2014). "The economic infrastructure gap and investment in Latin America". Available from http://repositorio.cepal.org/bitstream/ handle/11362/37381/7/S1500152_en.pdf
-
Eibenschutz, R., & Carrillo, L. O. (2011). The growth of cities in Mexico. Urban Asymmetries. Studies and Projects on Neoliberal Urbanization, 84-97.

Fainstein, S. S. (2014). The just city. International Journal of Urban Sciences, 18(1), 1-18.

Friedmann, J. (1992). Empowerment: the politics of alternative development. Oxford: Blackwell.

Friedmann, J. (2001). Regional development and planning: The story of a collaboration. International Regional Science Review, 24(3), 386-395.

Friedmann, J. (2004). Strategic spatial planning and the longer range. Planning Theory & Practice, 5(1), 49-67.

García, B. (2011). Social housing in Mexico: The commodification and peripheral growth of the city. Urban Asymmetries. Studies and Projects on Neoliberal Urbanization ,98-111.

Garofoli, G. (1993) 'Economic development, organization of production and territory', Revue d'économie industrielle. doi: 10.3406/rei.1993.1475.

Graham, S., & Marvin, S. (2002). Splintering urbanism: networked infrastructures, technological mobilities and the urban condition. Routledge.

Harvey, D. (2005). A brief history of neoliberalism. Oxford ; New York: Oxford University Press.

Harvey, D. (2010). Social justice and the city (Vol. 1). University of Georgia Press.

Hausmann, R., Cheston, T., Santos, M., & Pietrobelli, C. (2016). Towards a Prosperous and Productive Chiapas: Institutions, Policies, and Public-Private Dialog to Promote Inclusive Growth.

Healey, P. (1997). Collaborative planning: Shaping places in fragmented societies. Macmillan International Higher Education.

Healey, P. (2007). Urban Complexity and Spatial Strategies. Towards a relational planning for our times, London, Routledge.

INEGI, C. (2015). Encuesta nacional de la dinámica demográfica ENADID 2014: Principales resultados. Mexico: Instituto Nacional de Estadística y Geografía y Consejo Nacional de Población.

__ Censos y Conteos de Poblacion y Vivienda 1950-2010. Consulted October 2019, Available from https://www.inegi.org.mx/datos/

__ Marco Conceptual del Censo de Poblacion y Vivienda 2010. Consulted October 2019, Available from https://www.inegi.org.mx/est/contenidos/espanol/metodologias/censos/ marco_conceptual_cpv210.pdf

__ Directorio Estadistico Nacional de Unidades Económicas DENUE. Consulted October 2019, Available from https://www.beta.inegi.org.mx/app/mapa/denue/

__ Inventario Nacional de Vivienda 2015. Consulted October 2019, Available from https://www.beta.inegi.org.mx/app/mapa/inv/

Kaminer, T. et. Al. (2011). Urban asymmetries : Studies and projects on neoliberal urbanization. Rotterdam: 010. Netherlands.

Kozak, D. (2018). Revisitando el debate sobre la fragmentación urbana: una década y media después de "Splintering Urbanism". Revista Iberoamericana de Urbanismo, (14), 15-22.

Kozlowski, G. (2015). Framing dispersal: urban strategies for Mexico City's sprawl (Doctoral dissertation, Massachusetts Institute of Technology).

Leibenath, M., Korcelli-Olejniczak, E., & Knippschild, R. (2008). Cross-border governance and sustainable spatial development. Berlin, Germany: Springer.

Marcus, L., & Colding, J. (2011). Towards a spatial morphology of urban social-ecological systems. In 18th International Seminar on Urban Form'Urban morphology and the post-carbon city', 26-29 August 2011, Montreal, Canada.

Martens, K. (2016). Transport justice: Designing fair transportation systems. Routledge.

McMichael, C. (2002). The Urban Development of Mexico City, 1850,1930, from Almandoz A. (2002) Planning Latin America's Cities. 19850-1950. Routledge. London, UK.

Meijers, E. J., & Burger, M. J. (2017). Stretching the concept of 'borrowed size'. Urban Studies, 54(1), 269-291.

Motte, A. (2006): La notion de planification stratégique spatialisée en Europe (1995-2005), Lyon, Puca.

Murata, M., Campos, J. D., & Lastra, M. S. (2017). ¿ Por qué la gente no usa el Metro? Efectos del transporte en la Zona Metropolitana de la Ciudad de México. Investigaciones Geográficas, Boletín del Instituto de Geografía, 2017(93), 158-176.

Sabatini, F. (2003). The Social Spatial Segregation in the Cities of Latin America. Inter-American Development Bank.

Sánchez, G. (2002). Planificación y urbanismo de la Revolución mexicana. México, Asamblea Legislativa-Universidad Autónoma Metropolitana, Azcapotzalco, México.

Santana, D. and De Mattos, C. (2012). Globalización y metamorfosis urbana en América Latina. Cuadernos de Geografía: Revista Colombiana de Geografía, 21(1), 163 - 167. doi:https://doi.org/10.15446/rcdg.v21n1.30699.

Sepulveda D. (2019). Perspectivas de planificación en la implementación de estrategias adaptivas. In Janches F. et. Al. (2019) Hacia una Estrategia Co-transferible de conocimientos, Editorial Universidad de Buenos Aires, Buenos Aires, Argentina.

Shucksmith, M. (2000). Endogenous development, social capital and social inclusion: Perspectives from LEADER in the UK. Sociologia ruralis, 40(2), 208-218.

Sohn, C., Reitel, B., & Walther, O. (2009). Cross-border metropolitan integration in Europe: the case of Luxembourg, Basel, and Geneva. Environment and Planning C: Government and Policy, 27(5), 922-939.

Stilwell, F. (2017). Social justice and the city.

Suárez Pareyón, A. (2002). Mexico City. Carmona, M., Burgess, R., & Badenhorst, M. S. (2009). Planning through projects: Moving from master planning to strategic planning: 30 cities. Techne Press. 103-111.

Torres, A. D. M. (2015). El clientelismo una forma legal de adquirir suelo. Accessed February 2020. Available from http://2wcavi.com/ciudad/clientelismo.pdf

UN-Habitat (2016). Habitat III REGIONAL REPORT LATIN AMERICA AND THE CARIBBEAN. Available from http://habitat3.org/wp-content/uploads/HabitatIII-Regional-Report-LAC.pdf, accessed 12-10-2019

Unikel, L., Ruiz-Chiapetto, C., & Garza, G. (1978). México: Desarrollo urbano e implicaciones futuras. México, El Colegio de México. Ciudad de México, México.

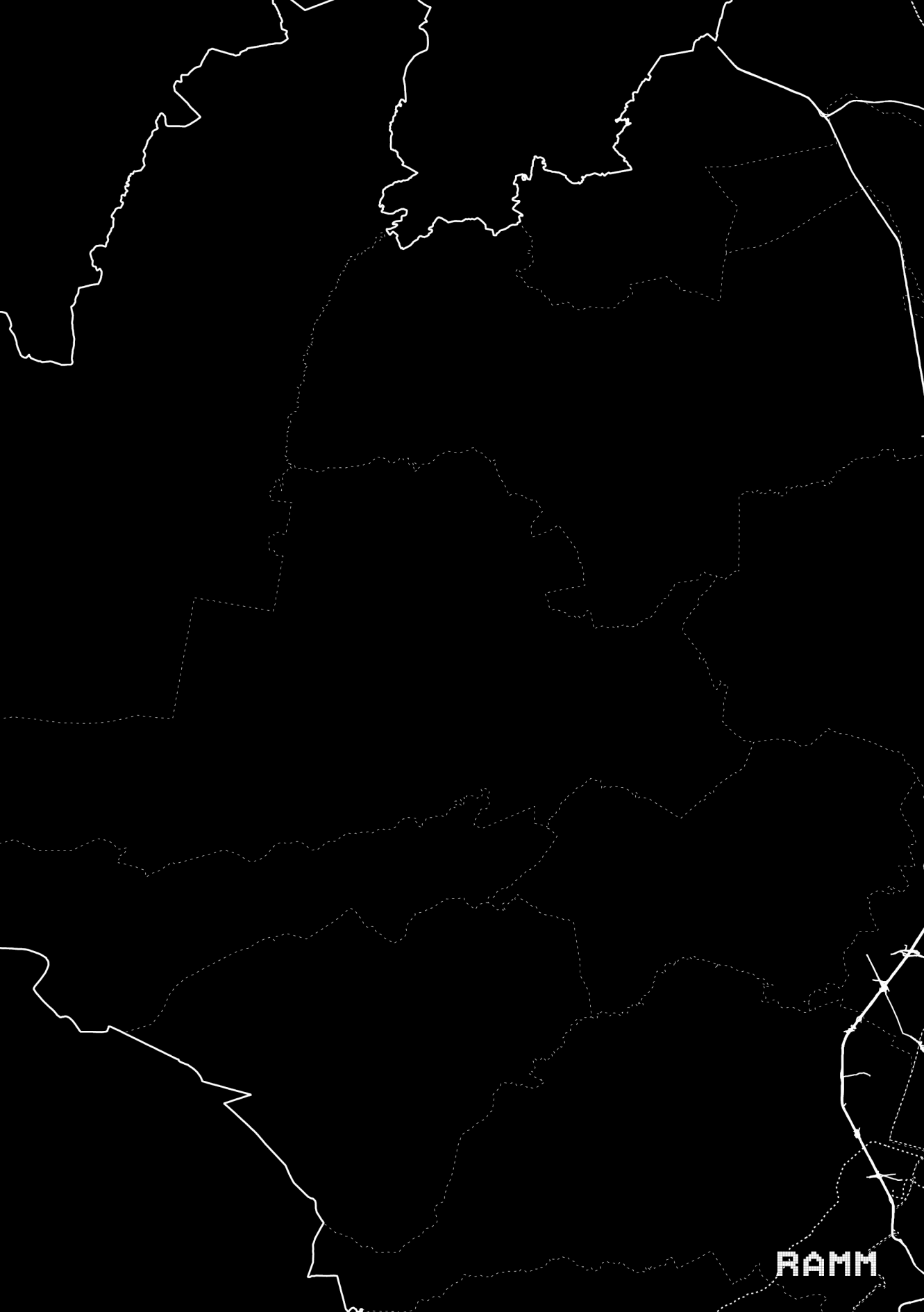
Ünlü, A. D. (2018). Global Governance vs. Regional Governance in Social Policy: The Social Policy of the EU. In Technology Adoption and Social Issues: Concepts, Methodologies, Tools, and Applications (pp. 1181-1201). IGI Global.

van Veelen, P. C., Stone, K., & Jeuken, A. (2015, February). Planning resilient urban waterfronts using adaptive pathways. In Proceedings of the institution of civil engineers-water management (Vol. 168, No. 2, pp. 49-56). Thomas Telford Ltd.

Weaver, T., Greenberg, J. B., Alexander, W. L., & Browning-Aiken, A. (Eds.). (2012). Neoliberalism and commodity production in Mexico. University Press of Colorado.

World Bank (2018) GDP per capita (current US$) | https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=ZJ-MX (Accessed: 12 December 2019).

Zagare, V. (2018). Towards a Method of Participatory Planning in an Emerging Metropolitan Delta in the Context of Climate Change. A+ BE| Architecture and the Built Environment, (25), 1-234.


RAMM