



MEXICO CITY



MEXICAN REPUBLIC - POPULATION DENSITY BY CITY

SOURCE: INEGI, 2000



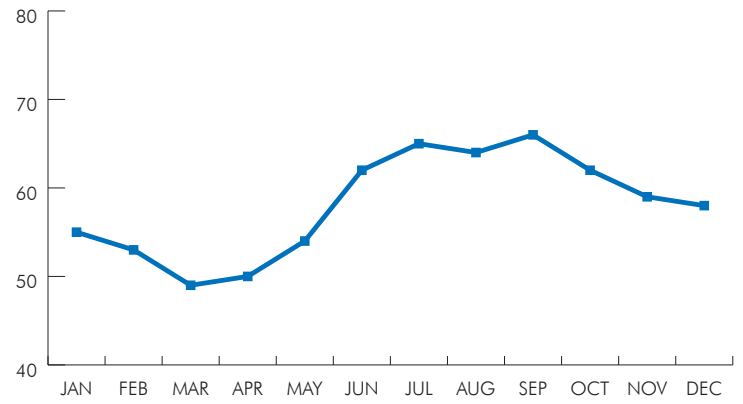
POPULATION (HAB/KM²)



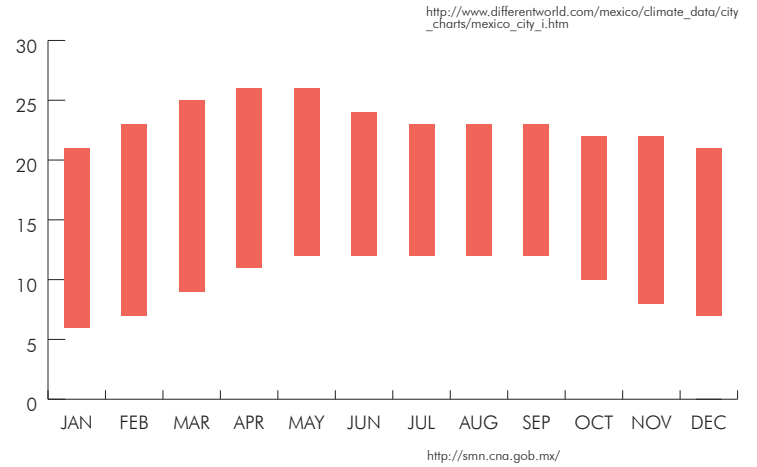
MEXICAN REPUBLIC. POPULATION DENSITY BY STATE.

SOURCE: INEGI, 2000.

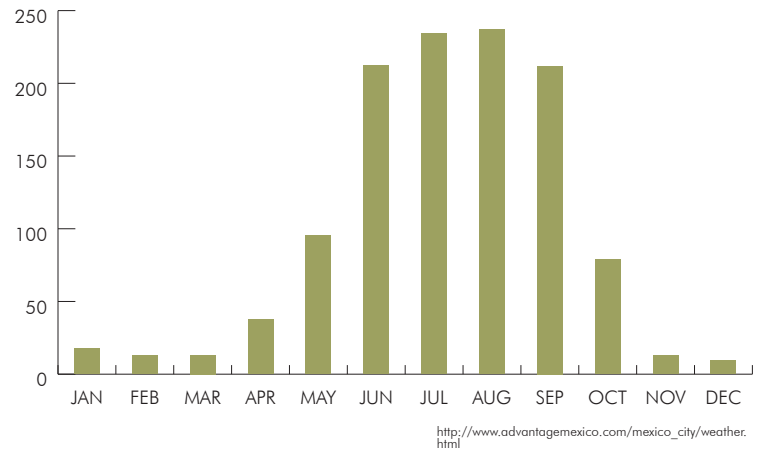
D.F. AVERAGE MONTHLY HUMIDITY (%)



D.F. AVERAGE MONTHLY TEMPERATURE (°C)



D.F. AVERAGE MONTHLY PRECIPITATION (mm)



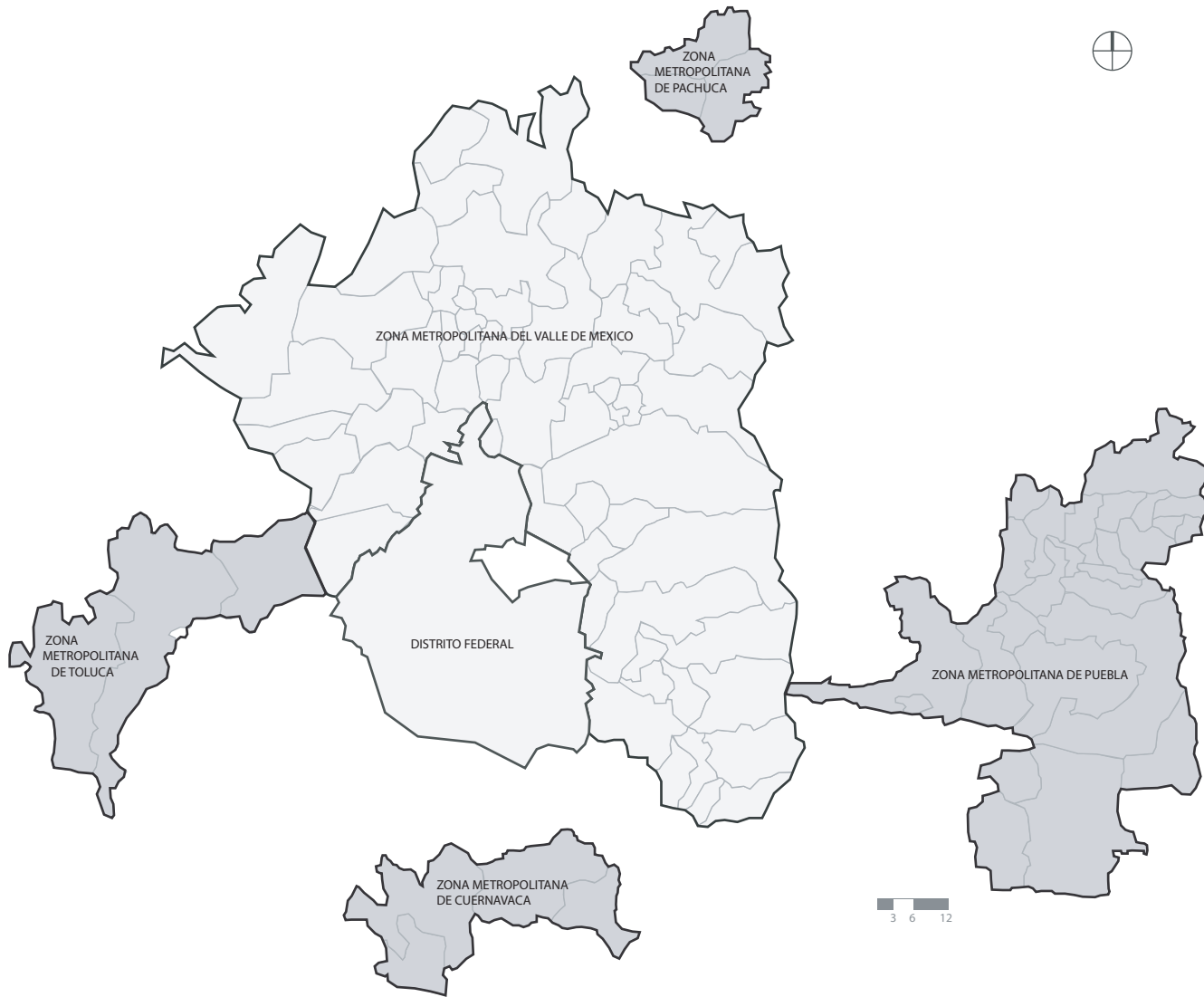


DELGACIONES

1. BENITO JUÁREZ
2. MIGUEL HIDALGO
3. MILPA ALTA
4. CUAJMALPA
5. ALVARO OBREGÓN
6. TLALPAN
7. COYOACAN
8. VONUSTLANO CARRANZA
9. MAGDALENA CONTRERAS
10. XOCHIMILCO
11. ATZCAPOTZALCO
12. CUAHTÓMOC
13. GUSTAVO A. MADERO
14. TLAHUAC
15. IZTAPALAPA
16. IZTACALCO

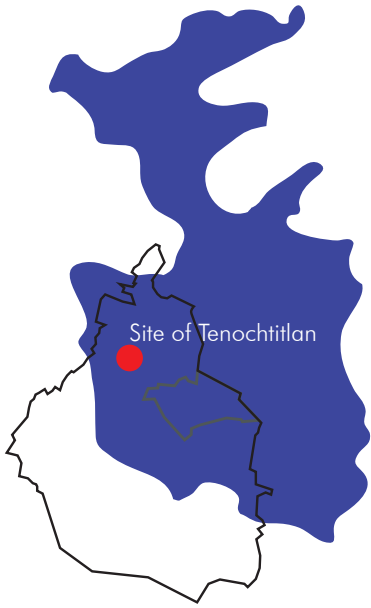


POLITICAL DIVISIONS

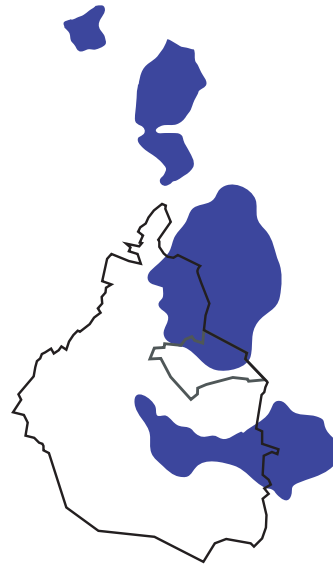


METROPOLITAN AREAS SURROUNDING THE ZMVM

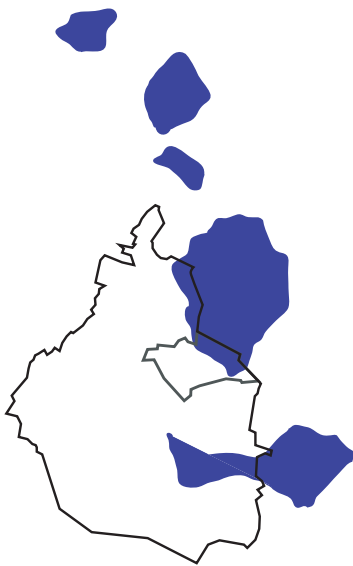




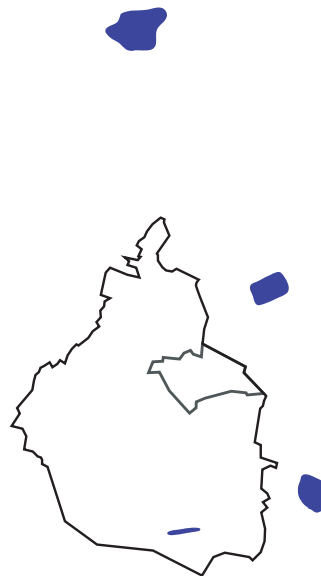
1500



1600

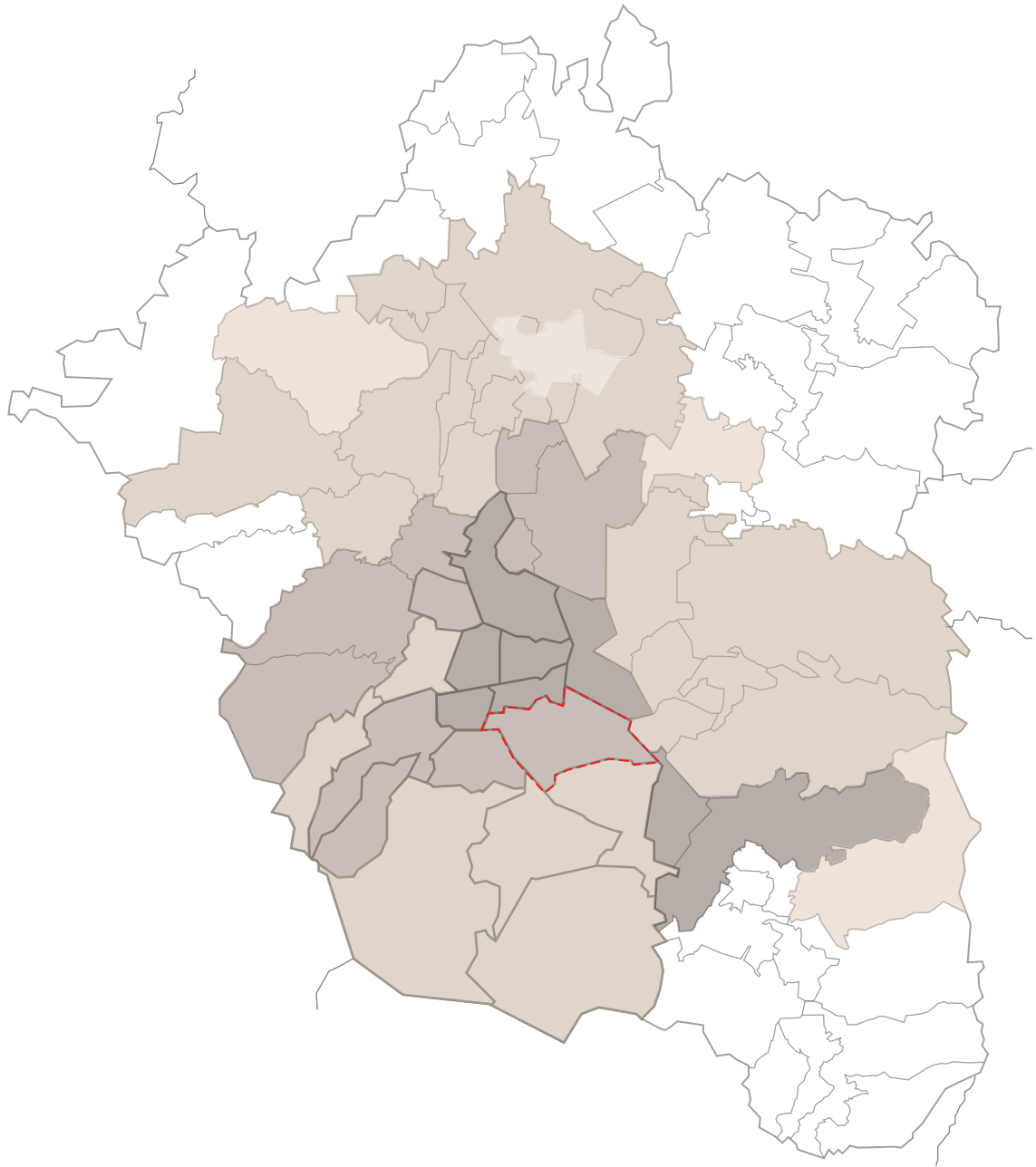


1700



2000

SHRINKAGE OF THE LAKE SYSTEM IN THE VALLEY OF MEXICO
ZMVM 1er edicion, 2000. LCM Rennando Romero

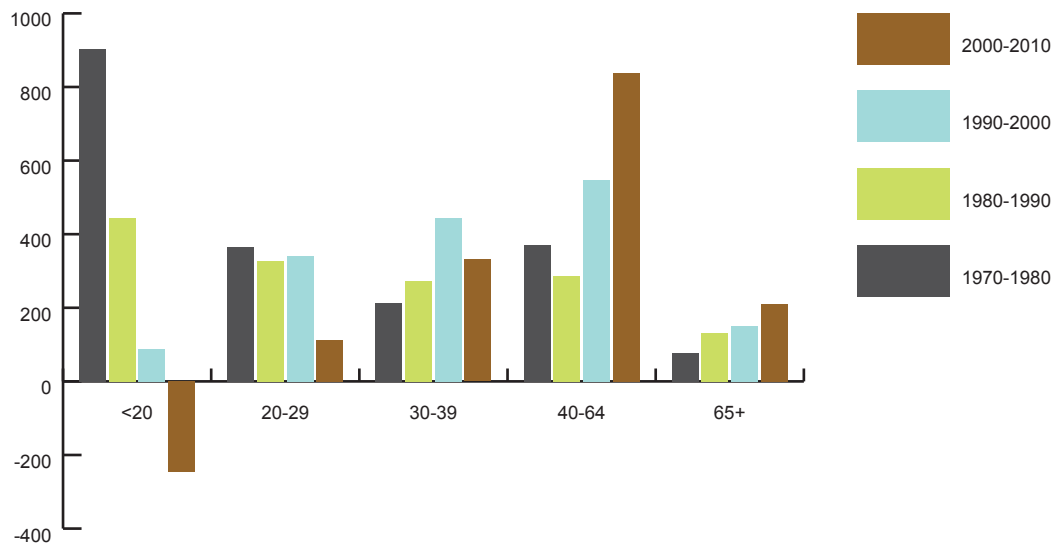


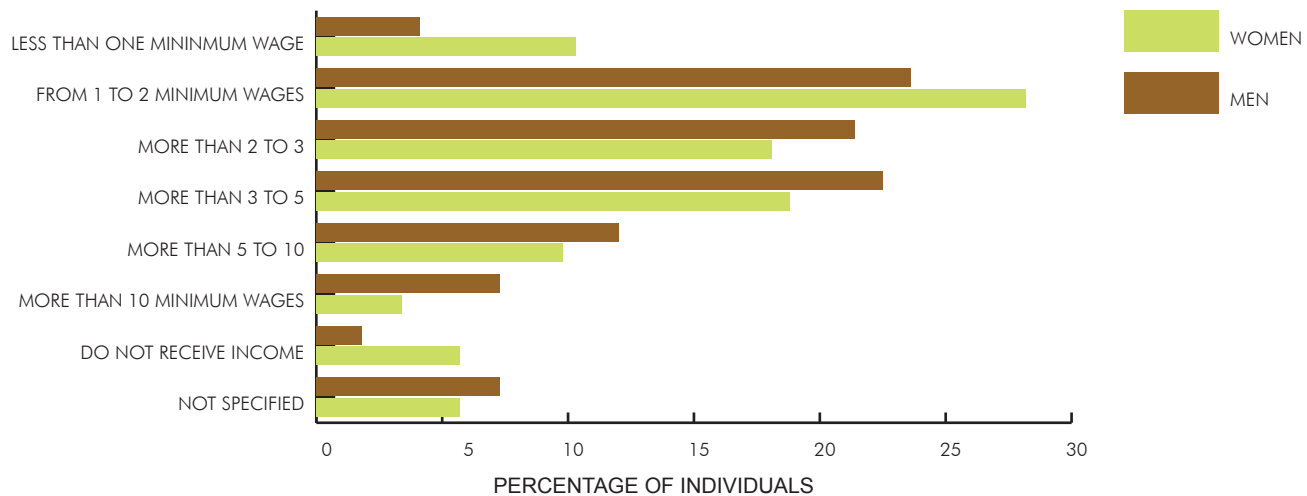
- 1 to 60 inhabitants/hectare
- 50 to 100 inhabitants/hectare
- 100 to 150 inhabitants/hectare
- 150 to 300 inhabitants/hectare

DENSITY ZMCM

La Ciudad de Mexico Hoy. Bases para un diagnostico. 1990

AVERAGE ANNUAL POPULATION GROWTH BY AGE GROUP (THOUSANDS)

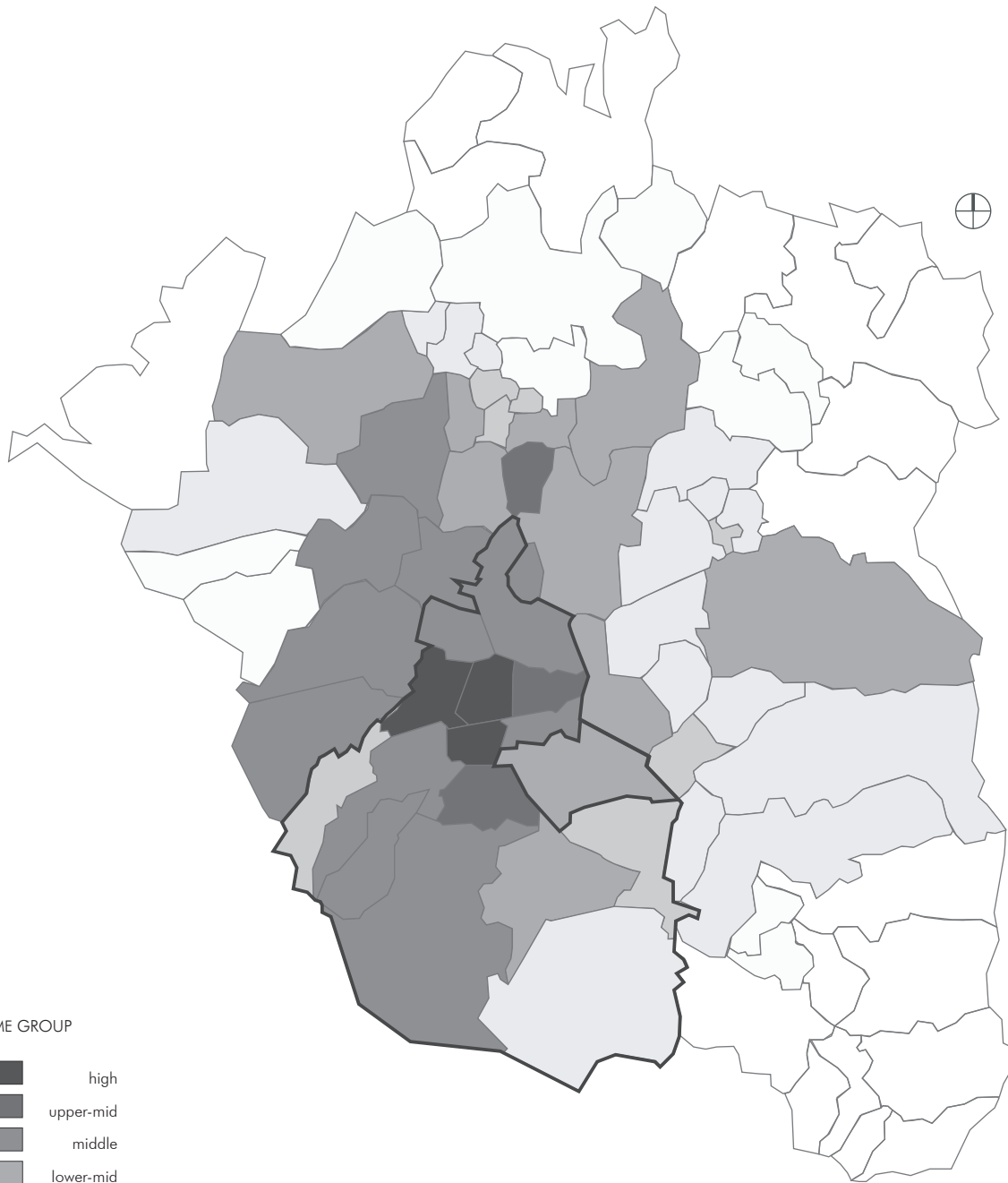




SOURCE: SERVICIO DE ADMINISTRACIÓN TRIBUTARIA (MÉXICO, 2005)

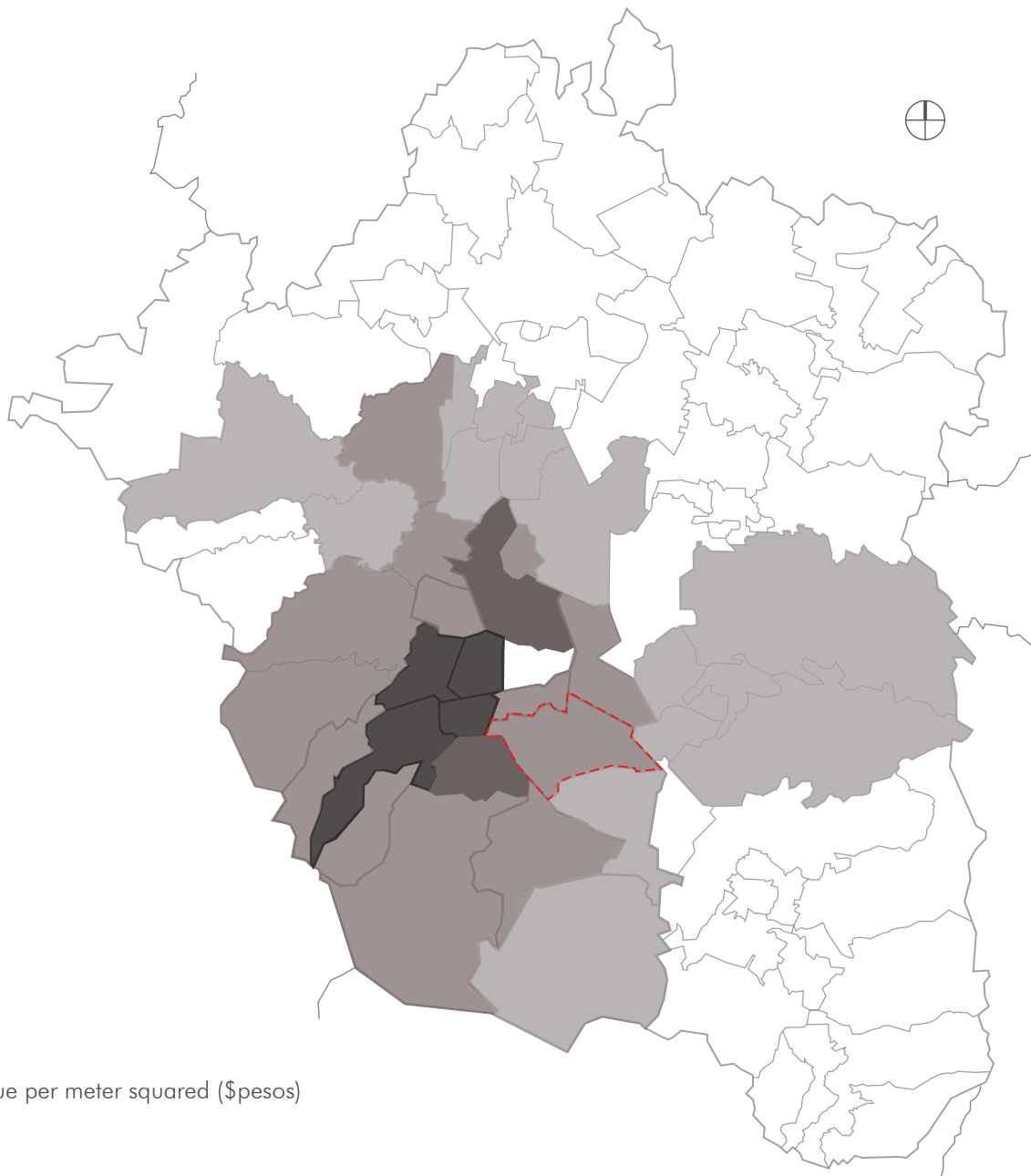
POPULATION DEMOGRAPHICS. LEVEL OF PERSONAL INCOME
 MINIMUM WAGE/SALARY PER DAY FOR 2005: 46.80 NP/ 4.32 USD

INCOME GROUP



POPULATION DEMOGRAPHICS.
SOCIOECONOMIC DISTRIBUTION

SOURCE: Urban Transportation, Land Use, and the Environment in Latin America: A Case Study Approach. Sussman, Joseph and Christopher Zegras. Massachusetts Institute of Technology, 2002.



Average commercial value per meter squared (\$pesos)

- From \$1 to \$1000
- From \$1001 to \$2000
- From \$2001 to \$3000
- From \$3001 to \$4000
- Value unknown

COMMERCIAL VALUE ZMCM

La Ciudad de Mexico Hoy. Bases para un diagnostico. 1990

TRANSPORTATION

29.1 million daily passenger trips

Among top five cities with the worst congestion/contamination combination

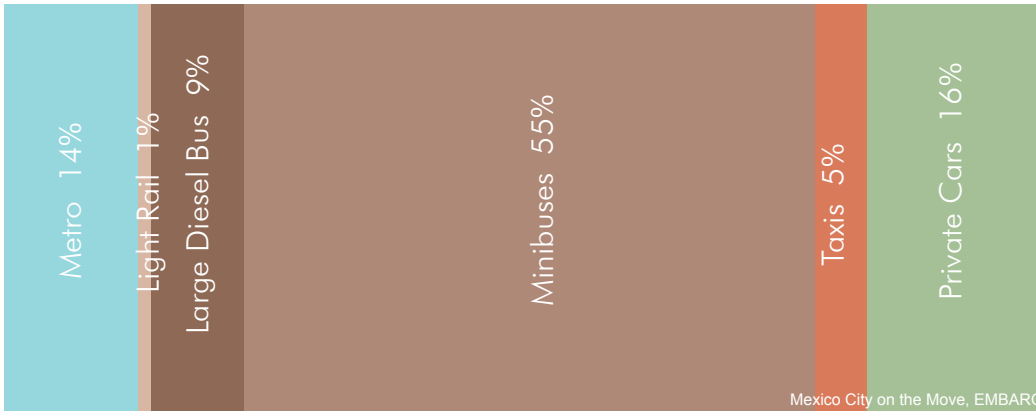
4,000 premature annual deaths attributed to air pollution

Close to 4 million registered private vehicles (including 100,000 taxis) transport 17.6% of daily trips, and contribute to 90% of street congestion and 50% of all transport-related emissions

Mexico City's Subway system is the second busiest in the world and includes:
180 km of track
10 lines
167 stations

(World Bank, 2001)

Shares of Daily Trips by Mode of Transport

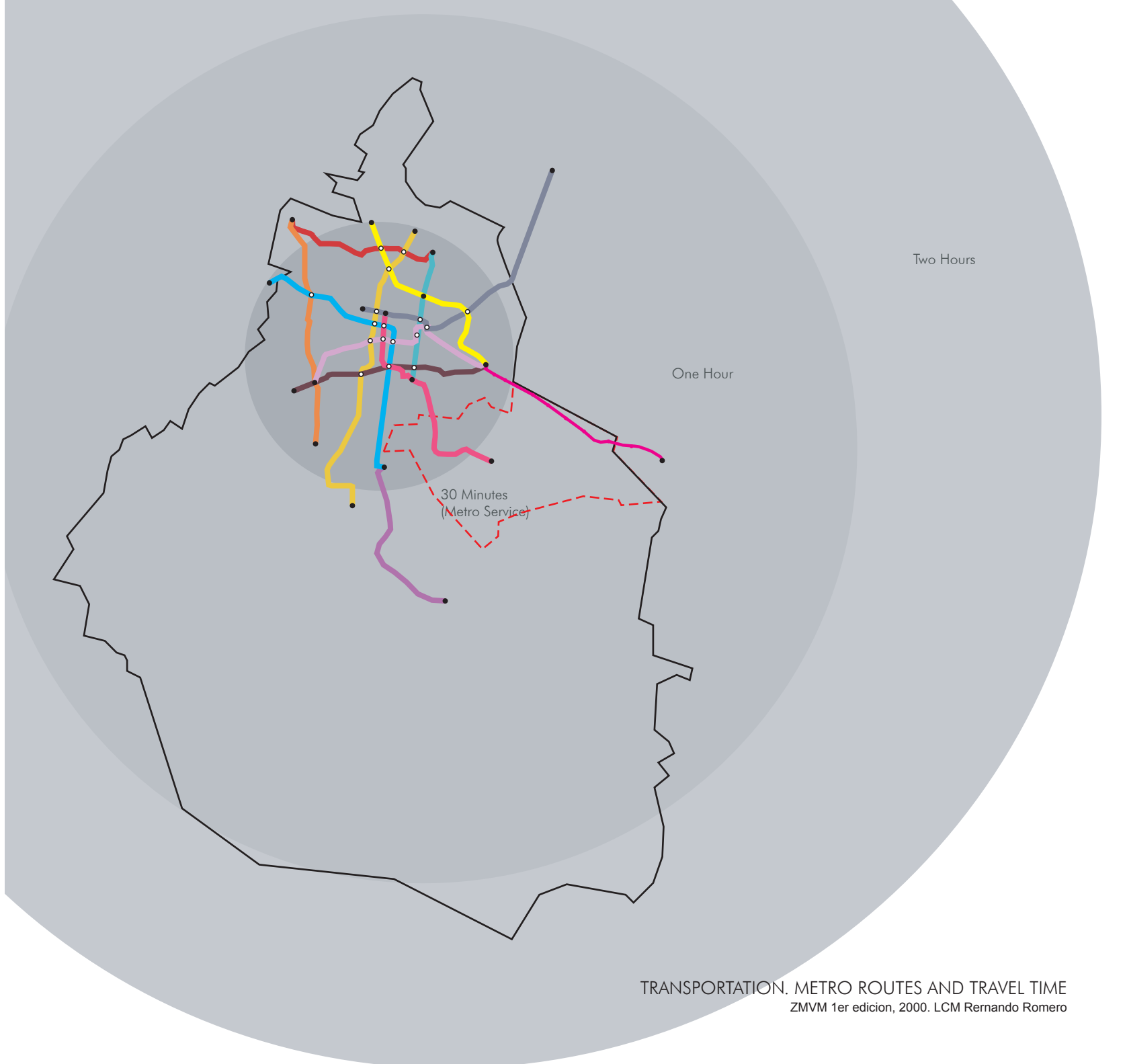


Transportation Costs (\$pesos)

Metro	\$2.00
Bus	\$3.50
Microbus	\$2.50
Taxi	\$5.80 + \$0.78/250m

http://www.setravi.df.gob.mx/noticias/tarifas_del_transporte_2004.html

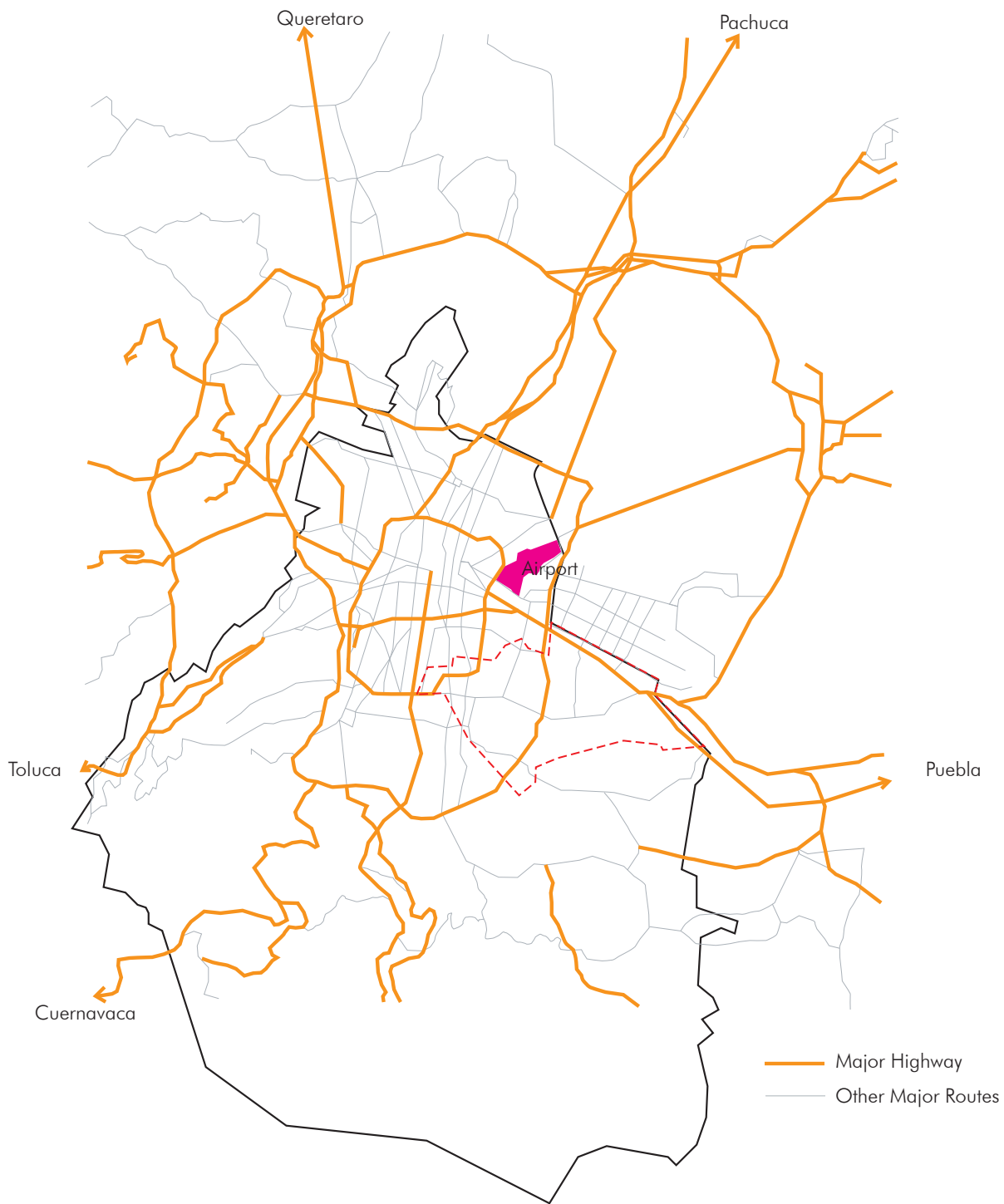




Two Hours

One Hour

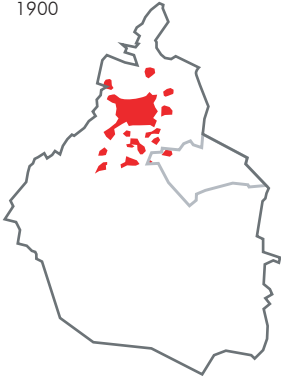
30 Minutes
(Metro Service)



MAJOR ROUTES

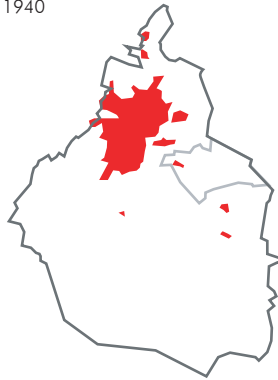
Guia Roji, Ciudad de Mexico, 2005

1900



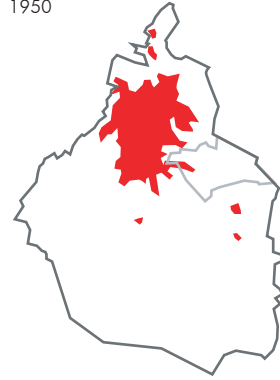
pop. 344,721
27 km²

1940



pop. 3,100,000
229 km²

1950



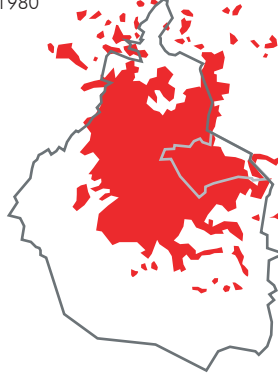
pop. 5,400,000
470 km²

1970



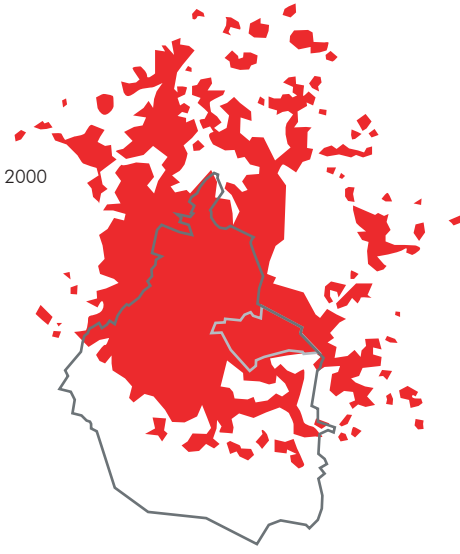
pop. 9,200,000
682 km²

1980

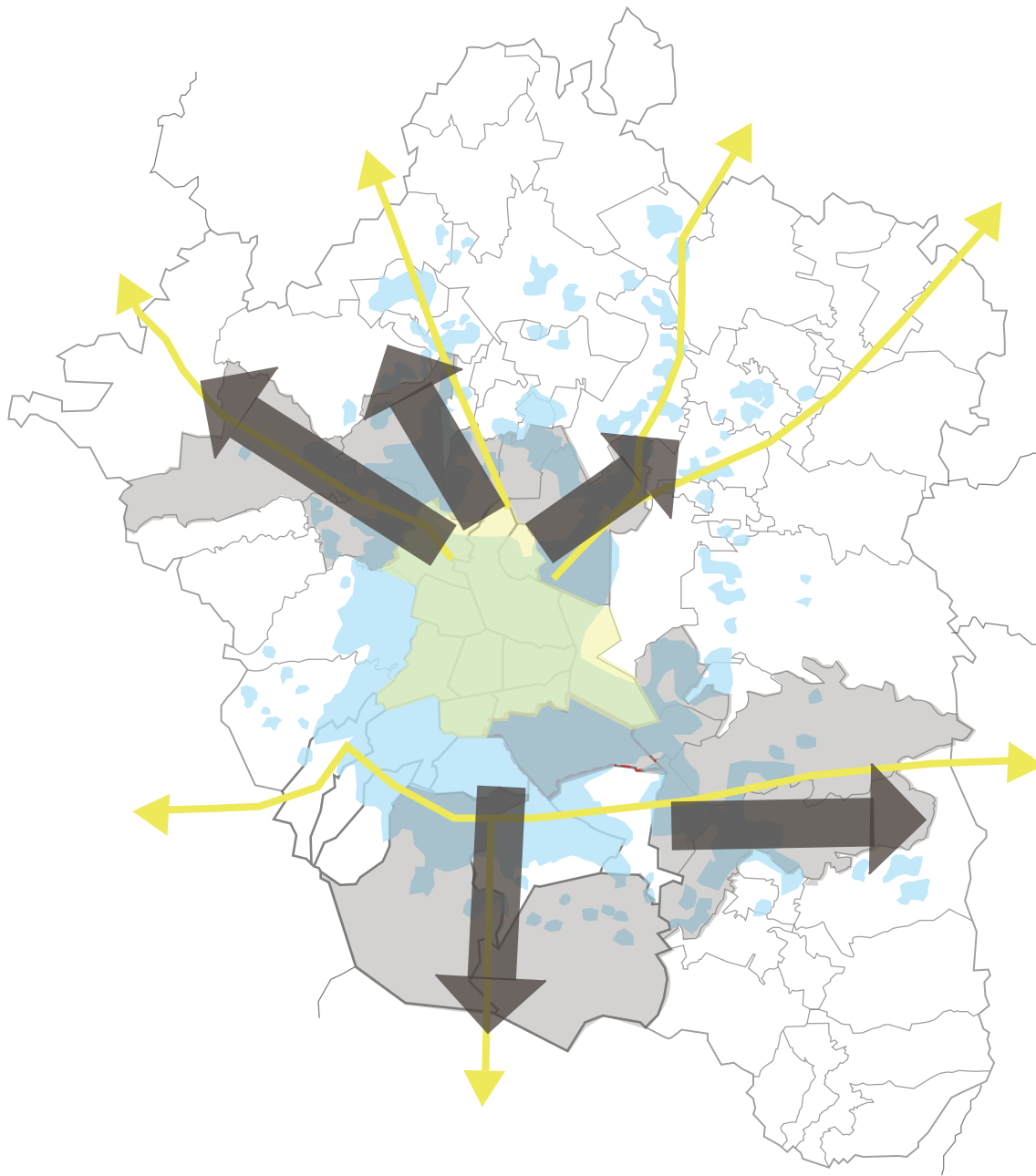


pop. 12,900,000
1056 km²

2000



pop. 18,100,000
1,325 km²

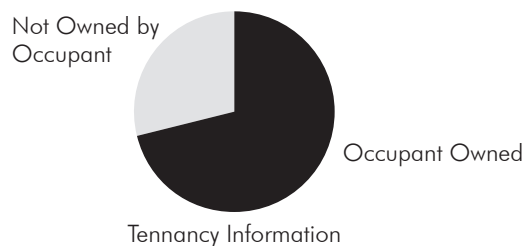
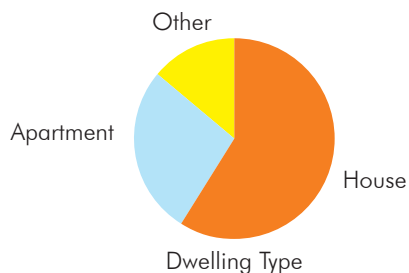


- Entities expulsing population
- Entities with major population increase
- Urban area
- Major roadways out of the city
- Axes of growth



ZMVM: PREDICTED URBAN GROWTH 2000-2010

*Unidad de Estudios Territoriales y Ambientales Marzo 2000
Censo de Poblacion y Vivienda 1990 y Conteo 1995, INEGI*



Características seleccionadas de las viviendas particulares habitadas, 2000, INEGI

Minimum and Maximum Rents for D.F (As advertised in Newspaper El Universal)

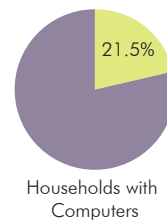
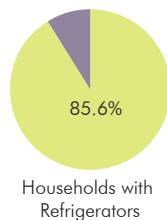
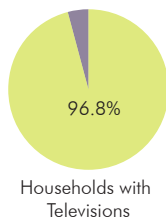
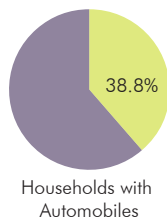
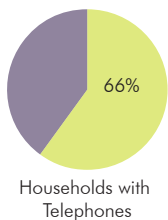
Year	Minimum Rent	Maximum Rent
1990	\$107	\$1,960
1991	\$100	\$2,690
1992	\$100	\$1,670
1993	\$166	\$1,670
1994	\$122	\$2,600
1995	\$83	\$3,300
1996	\$74	\$2,290
1997	\$75	\$2,530
1998	\$108	\$2,290

ZMMV 1er edicion, 2000. LCM Rernando Romero

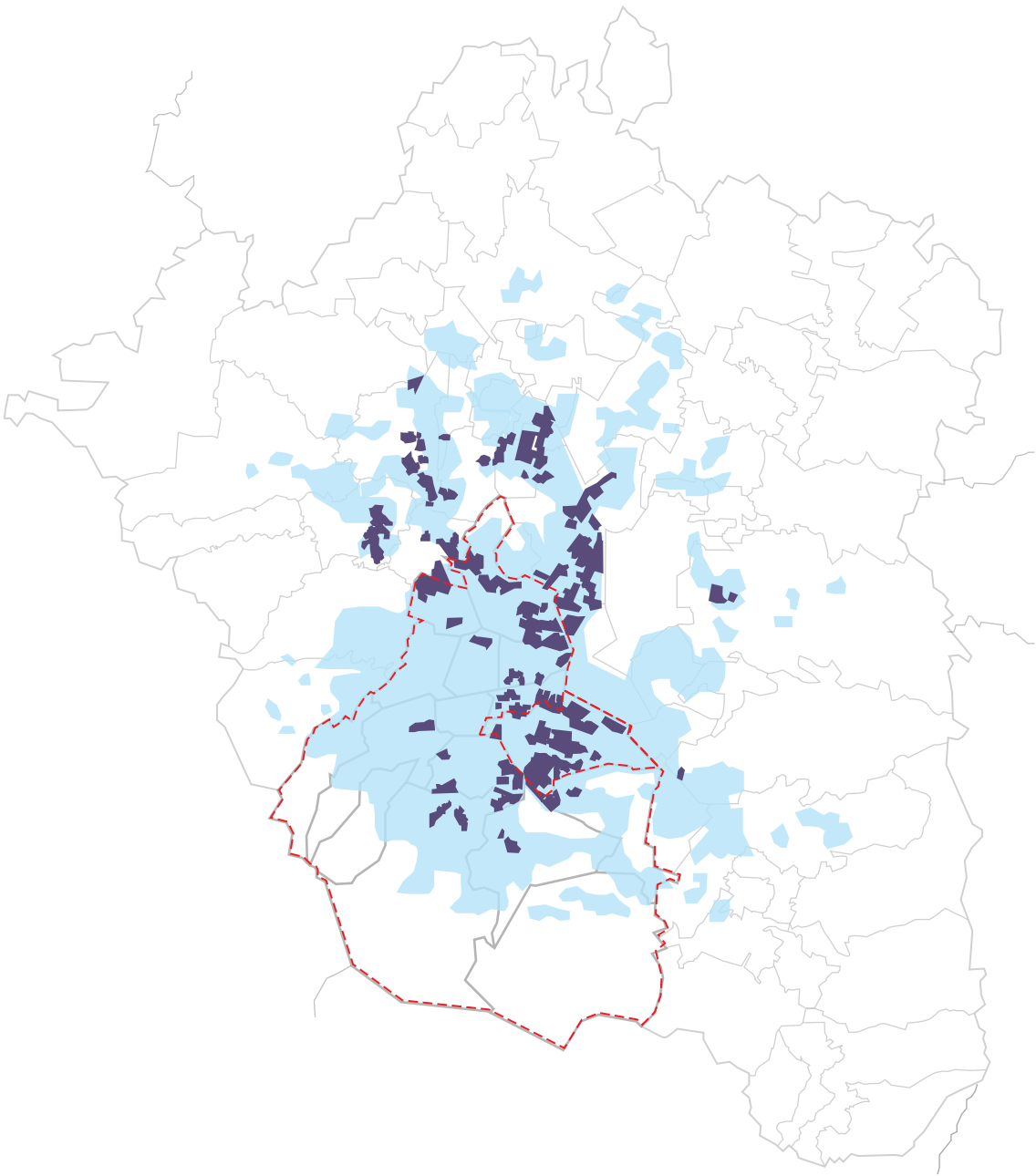
Access to Services



	Running Water		Sewage		Electricity	
	1990	2000	1990	2000	1990	2000
Mexico (Country)	77.1%	85.2%	62.0%	75.4%	87.5	95.4%
Federal District	95.7%	97.6%	93.3%	97.7%	99.3	99.8%

VIENDAS PARTICULARES PROPIAS POR DELEGACIÓN, INEGI



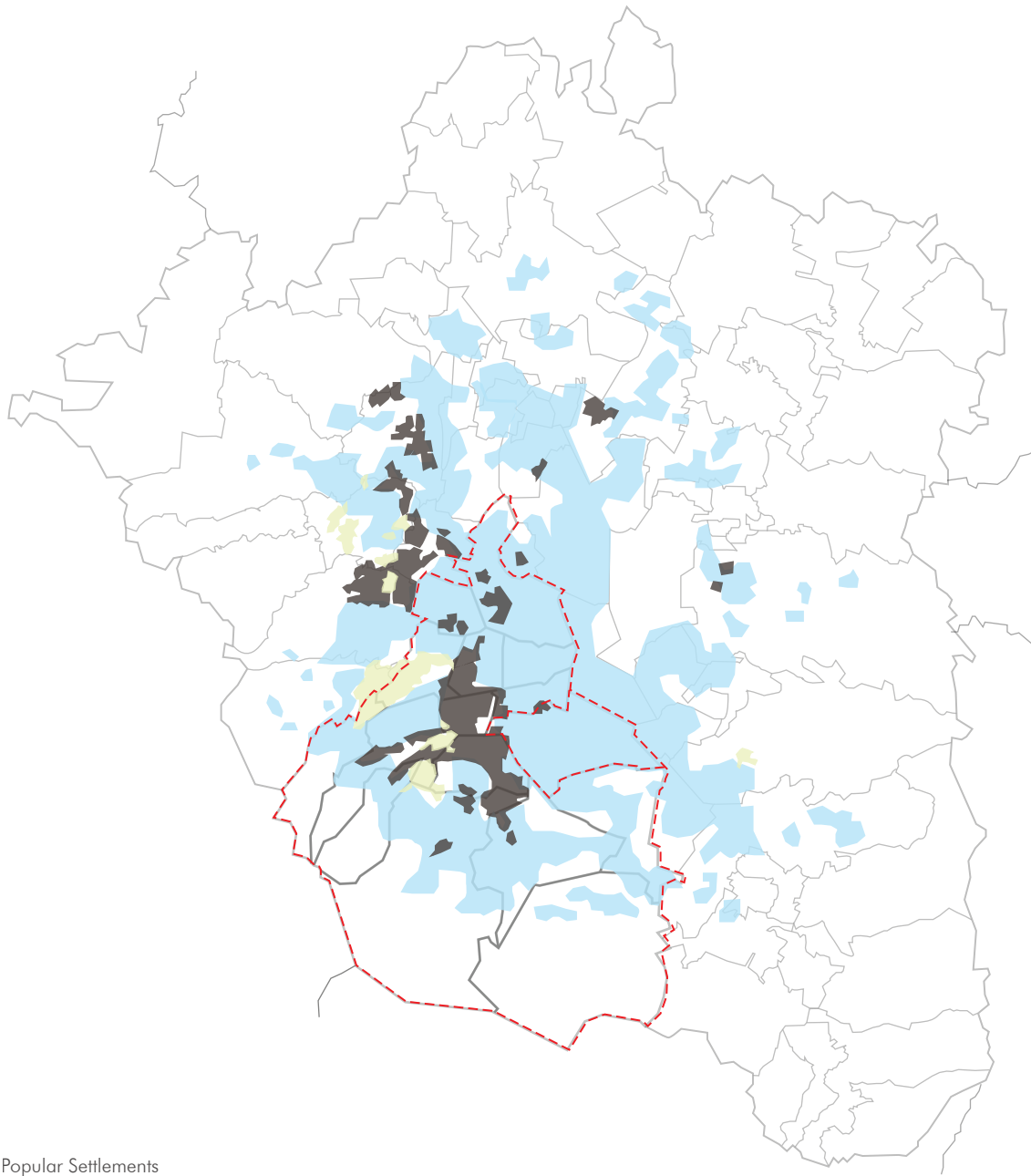
Características seleccionadas de las viviendas particulares habitadas, 2000, INEGI



-  Popular Housing
-  Collective Housing



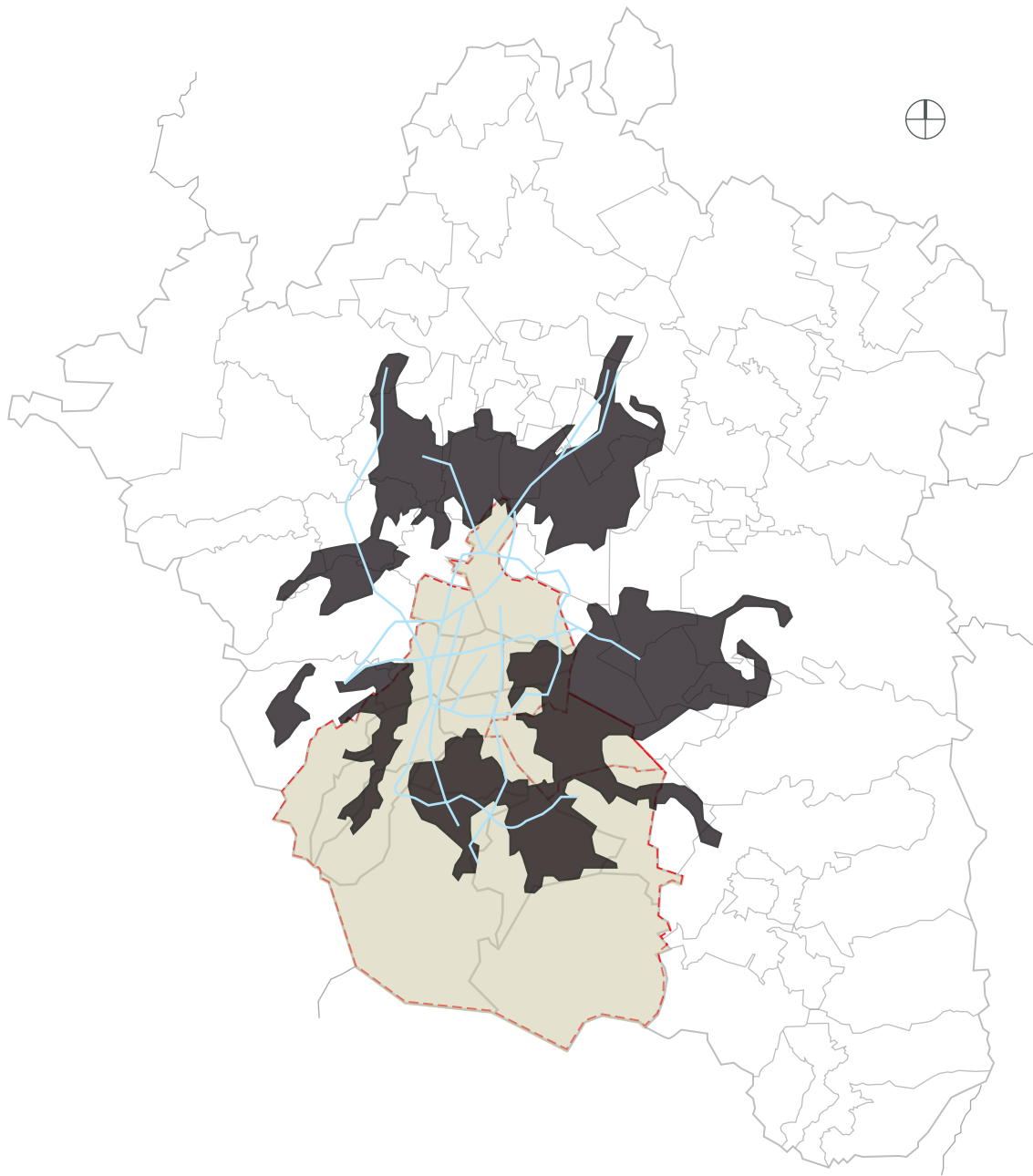
HOUSING DISTRIBUTION: COLLECTIVE HOUSING
[Conapo, 1998]



- Popular Settlements
- Middle Residential
- High Residential



HOUSING DISTRIBUTION: RESIDENTIAL ZONES
(CONANPO)



- Low-income settlements
- Principal roadways

3 6 12

IRREGULAR SETTLEMENTS AND AUTO-CONSTRUCTION

Ward, 1991 in ZMMV by LCM 2000



The following information was gathered from class lectures and discussions

In Mexico City there are 3 types of poverty:

- 1) 20% are the “supervivientes” (survivors) - the poorest, they are barely getting by, they have little or no food, and often have an accompanying health condition either mental or physical.
- 2) 20% have food, but not a great place to live, societal problems, and often they cannot work.
- 3) 20% are the “patrimonios” (wealthy poor) - the richest of the poor. They have a job, a few assets, and some capacity to society.

For each of these groups there are different social problems, different needs, and different social policies in place as aid.

Mexico City is a mix, geographically, of the poor and the middle classes. Cultural and economic conceptions cross in this mix. Social ideas of “betterment”, and “everyone should be given a house” are not always appropriate solutions to the housing crisis.

Housing is not mainly an architectural problem, but a social one. Inhabitation varies depending on culture and values within a society. There are therefore many levels to understanding social housing: urban, tectonic, anthropological, and psychological to name a few, but this means that contradictions in building are not always a result of the architecture (which is often what the architect assumes), but a result of culture and the particularities of a community.

There have been many generalizations made about housing over the years, particularly in the modern era where the concept of the nuclear family and the middle-class dictated the designs and attitudes of architects of that generation. This way of seeing things couldn't have been further from reality for most of the world. The market as well, often dictates the kind of housing that gets built, but again is far from what the majority can afford or feel comfortable living in. Architects often make assumptions and this is fundamentally opposed to the way of thinking involved in a participatory design process, which will be looked in more detail in the following pages.

To understand the housing problem, it is important to understand what presently exists in Mexico City. Five percent of citizens' salaries go towards housing finance programs and institutions for social housing. Financial aid institutions such as Infonavit, Fovissste, and Fovin, give credit to families in need, up to 130,000 pesos, but those families are then expected to buy from within the market.

Mexico City has learned to thrive on an informal economy and not surprisingly, informal housing settlements have been a natural result of this. In the country as a whole, there are 25,000,000 dwellings, 4,000,000 are social housing projects built over the last 50 years and 16,000,000 are auto-produced by home owners, of which 1,000,000 are rich owners and 15,000,000 are poor owners.

It is very difficult to legally build a house in Mexico City if you are part of 80% of the population. In order to obtain credits from the government you must first own the land on which you wish to build, and in order to do this you must make at least \$600 per month in order to qualify for financial assistance. This means that lower-income families are in fact supporting higher-income families with their 5% salary contribution, but do not have the right to obtain credits because they don't earn the minimum.

In regulated areas of the city, plots are very small and undesirable. Land is very expensive and because of this people look elsewhere for ways of building – the illegal market and illegal land acquisition – as the popular Mexican saying goes, “better to ask forgiveness than to ask permission”.



Informal Settlements

Possession of land is very important, and initially often people illegally acquire it in order to build. Once living on the property, it becomes very difficult by Mexican law and authority to evict dwellers. Most land becomes regulated over 10-20 years, by which time people are already well established within their communities. These informal settlements make up to about 40-65% of the city.

The realities of the law and the realities of the people contradict one another. Mexico City has a big problem with poverty, with the majority (up to 80%) of inhabitants unable to afford houses with a minimum cost of 150,000 pesos, yet the rules are made for the ruling class. The United Nations Charter of Rights from 1996 states that all people have the right to housing and all people have the right to property. In Mexico, there are too many contradictions within the law to make this true unfortunately.

Because there is public money involved, social housing requires there to be a dialogue between all people with an interest in the outcome. This means connections must be made between disciplines. The poor are the majority and many times professionals cannot understand that the decisions that are being made -often *for* the poor and not *by* them- can mean life or death.

Often people, professionals, and governments don't want to accept the reality of the housing crisis and will instead build new houses to suit the needs of a middle-class consumer. Even the more left-wing politicians have stated that by designing for the poor, we are accepting poverty, developing poverty, and designing for poverty.

The participatory design process presents an alternative method for making decisions when it comes to social housing. It gives people more control over their own situation by asking what it is they need and want, all the while dealing with the realities of the particular environment.



The Participatory Design Process in Social Housing

The following information was collected from class lectures in Gustavo Romero's Diseno Participativo , and Taller de Investigacion 2005-6

What is Participatory Design?

Participatory Design is a fundamentally democratic, open process and a critical vision; it is about the flow of information and understanding between people and it is about asking the right questions; it is about designing within contradictions, by accepting that they exist; it is about the dweller as creator of his or her own habitat, and as creator of meaning in his or her environment; it is about creating sustainable dwellings, rather than throwaway architecture; it is about involving people, involving creativity, and thinking specifically and globally, simultaneously.

Primarily, Participatory Design has as its foundation an adherence to reality. That is to say, the participants in a participatory design process respect the social, political, and popular circumstances in which an architectural resolution is sought. Among low-income housing projects, there are many contenders looking to be satisfied. This undoubtedly has an effect on the outcome of a given design problem, and in the end all too often it is the users who suffer. The needs of people, of government, and of architects are, to some degree, in conflict when looking at traditional methods of designing for low-income housing. In a participatory design project, the architect becomes the choreographer whose goal it is to enable communication among all parties involved in a manner reflective of the realities of the given political, social, cultural, and geographic environment. Despite often working idealistically in opposition to ruling agents, architects cannot hope to change the political and social situations they may be working within by creating an architecture that is from outside of that reality.

What is the role of the architect?

Participatory design calls into question the role of the architect. The architect looks for possibilities rather than solutions and must demonstrate and draw out the so-called "obvious" alternatives in order to be able to discuss options with people. The architect's duty is to be explicit throughout the entire participatory design process, and in doing so, is able to cover all ground before making assumptions on an individual basis. The architect's role is to enable communication. Options must be realistic and must be responsive to the way the client group will be using their home and surrounding space.

More discussion means more of a consensus, and more consensus among group members means more investment in the end result. With more invested in the dwelling, an owner takes more pride in his or her place and wants to live there and create a positive surrounding community. It is an integral approach, thinking at the micro and macro scale. Throughout this process, the architect is able to manage contradictions because he or she is in a dialogue with people, but if the right questions aren't asked, there can be no true understanding between participants.

In the book entitled *La Participacion en el Diseno Urbano y Arquitectonico en la Produccion Social del Habitat*, coordinated by Gustavo Romero and Rosendo Mesias, Participatory Design is defined as: the collective vision among actors directly or indirectly implicated in the architectonic resolution of the project, to make appropriate decisions for a physical configuration by taking into account the values, needs, aspirations, and context in which the project will be realized. The following 5 main points have been translated from the above mentioned text.

Collective Construction:

Based in a dialectical methodology, directed towards resolving problems within a collective action. Development of the “interdisciplinary” concept.

Diverse Actors:

Based in mutual respect, it is understood that every participant is capable of enriching the project with his/her input.

The Right to Make Consensual Decisions:

This is fundamental to participatory design and is the basis of any democratic project.

Appropriate and Appropriable Physical Configuration:

This refers to an integral solution for the inhabitable spaces, not only their aesthetic, or functional manifestation. They should respond the needs, values and culture of its inhabitants, and be appropriable, taking into account the inhabitant’s history, present and future.

Needs, Values, and Aspirations:

By speaking openly with the client group, the complexity of the way people live becomes more clear, and by respecting differences, only then can one understand the particularities of people’s needs, values, and aspirations.

Adequate to the Resources Available:

From the beginning the design should understand the limits to the project and learn to manage conflicts, as well as understand the advantages and disadvantages within a complex reality.



What are the main issues to be discussed and decided in a Participatory Design process?

The desires of the client don't necessarily say anything about the architecture, so what then must be asked?

The intention of discussion in a participatory design process is to open up the minds of the clients to all the possibilities for a given housing settlement.

Decisions that need to be made through discussion in the participatory design process are:

- Property - Shared lot type or individually owned properties
- Housing typology - Progressive/not, row house, duplex, triplex, multiplex or apartment
- Circulation - car or pedestrian or both, specifically where and how
- Parking - options for none, for 1/4 of the dwellings, 1/3, 1/2, or all dwellings
- Groupings - building and lot configuration including adjacency, negative space and frontage
- Materials and structure- traditional local technologies, or not
- Public gathering space - garden, non-circulatory space
- Image – of the overall housing project, or more specifically the façade

All of the elements that go into making up a housing settlement are open to discussion among all participants and the way of getting to these discussions can vary from group to group.

What are some of the deciding factors involved in the Participatory Design process?

There are likely pre-existing parameters to a given social housing project. The client group's financial situation often dictates the type of housing or the amount of focus on certain areas of the construction (finishings and designed details take a back seat most times), the group may even come into the process with many decisions already made based on their needs and wants.

Other decisions that need to be investigated regarding the given site and the participating group include:

- Financial information for the client group
- Work/live situation, family network, space relationships, concepts of privacy, urban rules for the area
- Transportation and infrastructure, services, land
- Zoning, and minimum building size requirements
- Transience vs. permanence
- Imposed structure vs. self-determined or evolutionary structure
- Gated community vs. open to public



What methods and tools are there in the participatory design process?

Discussion needs to be extremely clear and well understood by all of those involved. Because of this, it is important that the architect use tools that best convey the information to be discussed. Often this means using simple typological drawings, matrices of options, and sometimes models and renderings. It is critical that the tools be simple and objective enough to convey the possibilities without pre-determining or guiding the participants in a certain direction, yet complex enough to enable discussion. Interviews and sometimes role-playing scenarios are used to get imaginations working.

In the past there have been varying methods of enabling discussion and following through on a design. Among them are Hano Webber and Michael Pyatock's Matrix method, Livingston's interview method used in Cuba, Christopher Alexander's "Pattern Language", and John Habraken's "Supports", all of which propose more than one option for resolving a project, rather than the traditional singular solution.

Generally the process follows these main steps:

Translated from: La Participacion en el Diseno Urbano y Arquitectonico en la Produccion Social del Habitat

Approximation of the Problem:

This first step is the most important, because if the problem isn't framed in the right way, the possible solution can never be found. The problem, or framework of the situation must be examined by the group of clients (community), as well as the technical group of assessors. At this point the collective is formed to work together towards the goal of an architectonic and/or urban resolution.

Investigation and Understanding:

Once the collective team has been formed, all information must be examined – urban, social, economic, cultural –in order to begin organizing the steps that need to be taken in order to follow through with the project. The objective is to gather the information necessary to make appropriate decisions throughout the design development phase.

Generation of Design Ideas:

The information is collected, analyzed, and systematized in this phase from which a dialogue can occur. The use of visual aids such as drawings, sketches, photos, and models are key to enabling the discussion among participants. The objective of this phase is to generate collective ideas and criteria for the design.

Realization and Evaluation:

Once the generation of ideas is complete from the workshops, the assessor team works to elaborate those ideas and proposals and make them concrete. The objective at this phase is to have a final project collectively created through the participative process.

This participatory design project will consider the precedents and will use a combination of Webber and Pyatock's matrix method of discussion along with a variation on Habraken's Supports.

Requirements for the Mazahuas Group Housing Project:

- To provide housing for at least 30 families on a communal lot of either 1483.26m² or 2146.53m² of usable space
- To maximize density while providing possibility for growth over time
- To provide parking and circulation for at least 1/3rd of the dwellings
- To provide services to all families
- To maintain privacy of each family

There is a need to place certain parameters around this social housing project since this is an academic exercise and there will be no actual discussion among members of the Mazahuas group. Under normal circumstances all decisions would be up for open discussion and debate.

Rules for Housing Development

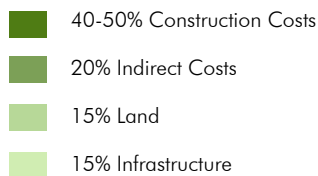
- 1) Private entrance
- 2) Personal outdoor space (patio, open to sky, 10m² min)
- 3) Vista out of at least two exterior walls – main rooms should have vista
- 4) Communal outdoor space for every 16 families, or 672m² (semi-private)
- 5) Variety of space, variety of lot form/size/housing type
- 6) Natural light for every inhabitable room
- 7) Minimum exterior pedestrian circulation: 2.5m
- 8) Progressive building possibilities in at least one direction
- 9) Possibility for work space /commercial main floor
- 10) Must be flexible

There are two sites being considered for the housing project, both of which are in an area called Barrio San Ignacio. The first step of is to determine which site will be most suitable to the needs of the users. In order to make that decision, finances must be looked at along with a series of housing typology and lot arrangement options. Initially discussions will be more general, gradually moving towards more specific discussions.

Although there must be a logical method of procedure in participatory design, it is often an iterative process, and not always linear in nature.



Peso Vivienda

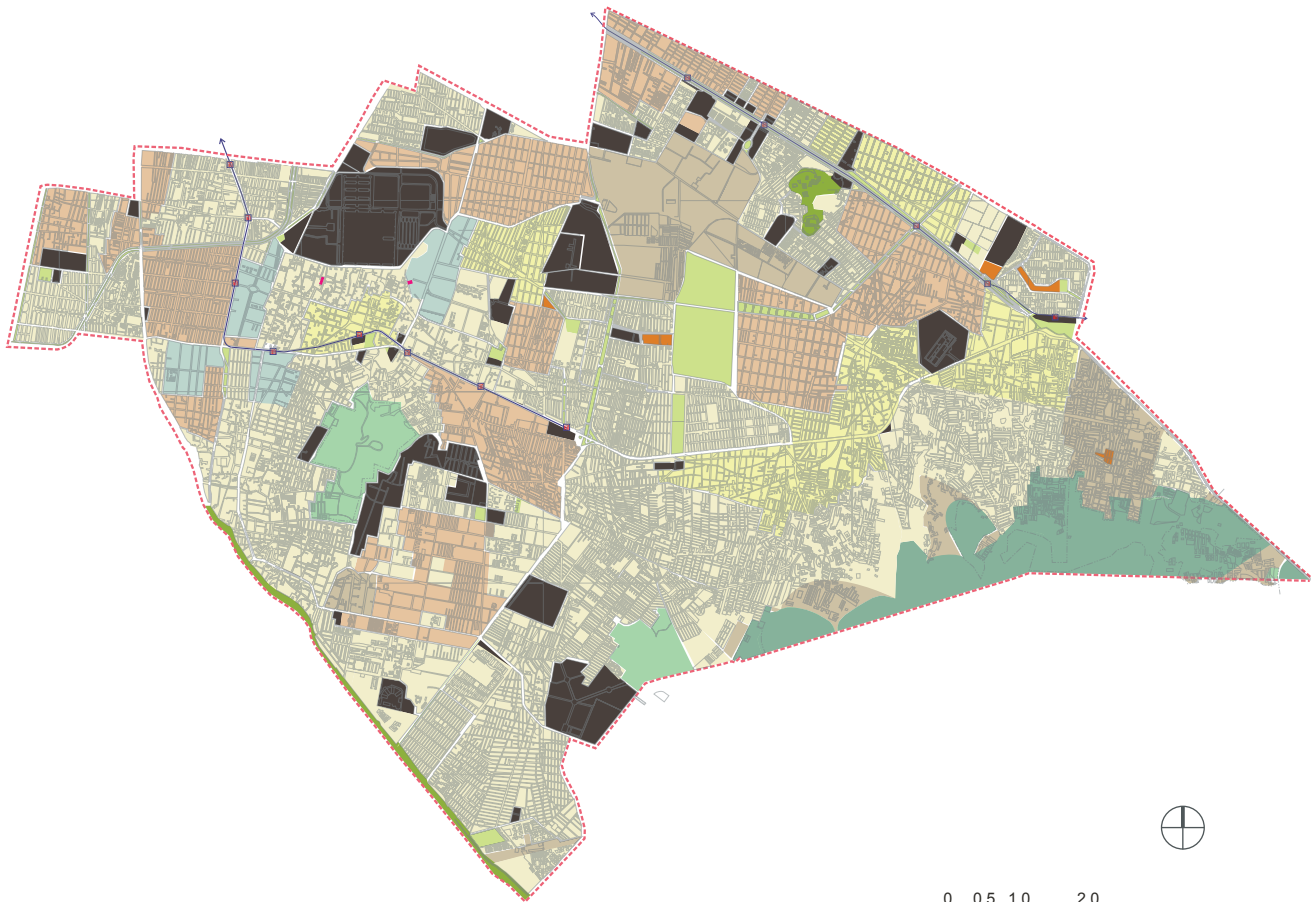


The National Indigenous Institute of Mexico will be purchasing the land for the Mazahuas group and the Instituto de Vivienda del Distrito Federal (IVDF) will be providing each family with a credit of \$70,000 - \$130,000 (pesos).

The minimum cost of a simple house without finishings is approximately \$3000 per meter squared. A normal house runs between \$5000 - \$10,000 per meter squared. The minimum size of a starter house on a communal plot is usually around 42 meters squared. Estimated minimum total cost = \$126,000.

The costs not covered by the credit from IVDF must be supplemented by the home owner. This is usually around 10-20% of the total cost. The minimum salary of the Mazahua group is \$120-\$300 per month.

The Peso vivienda is a general breakdown of the costs involved in building a house in Mexico City. 40-50% of the money goes towards construction costs, 20% goes towards indirect costs such as the license to build, the service license, and the financing, 15% goes towards the land purchase, which in this case will be covered by the Indigenous Institute, and 15% goes towards infrastructure, which in the city does not need to be paid since it already exists.



Urban Land Use

- Residential
- Residential and Commercial
- Residential and Offices
- Mixed Residential (Residential, Commercial and Offices)
- Town Center (Commercial, Services, Schools, Health and Markets)
- Infrastructure (Public and private services, Health, Schools, Cultural, Sports, Cemeteries)
- Industrial
- Public Space (Parks, Plazas, Gardens, Sports Fields)
- Green Space (Forest, Hillside)

Conservation Land Use

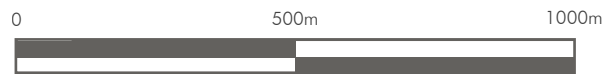
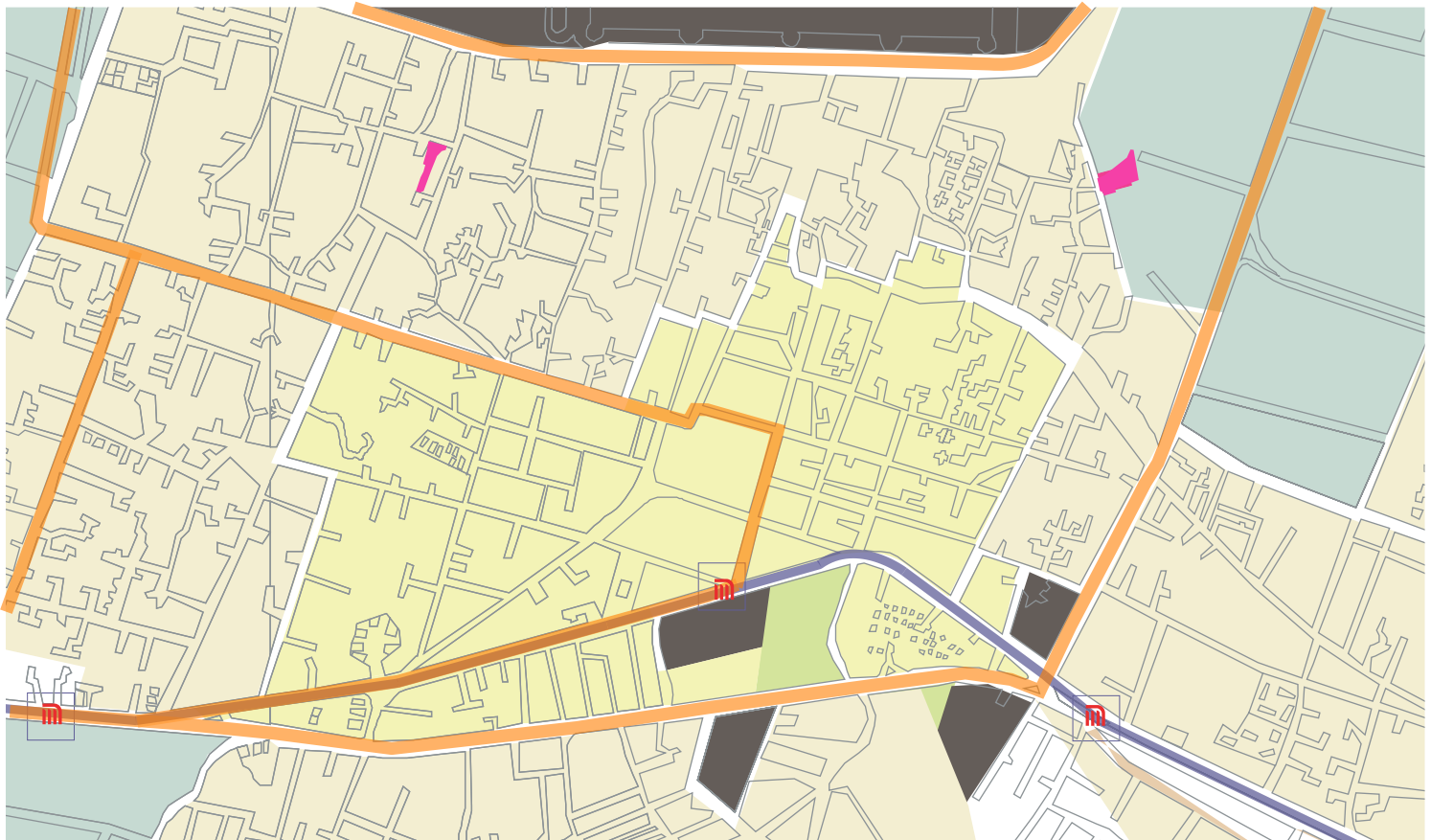
- Ecological Reserve (Have lost some original characteristics but are being recovered)
- Protected Agricultural
- Ecological Preserve

Site










IZTAPALAPA

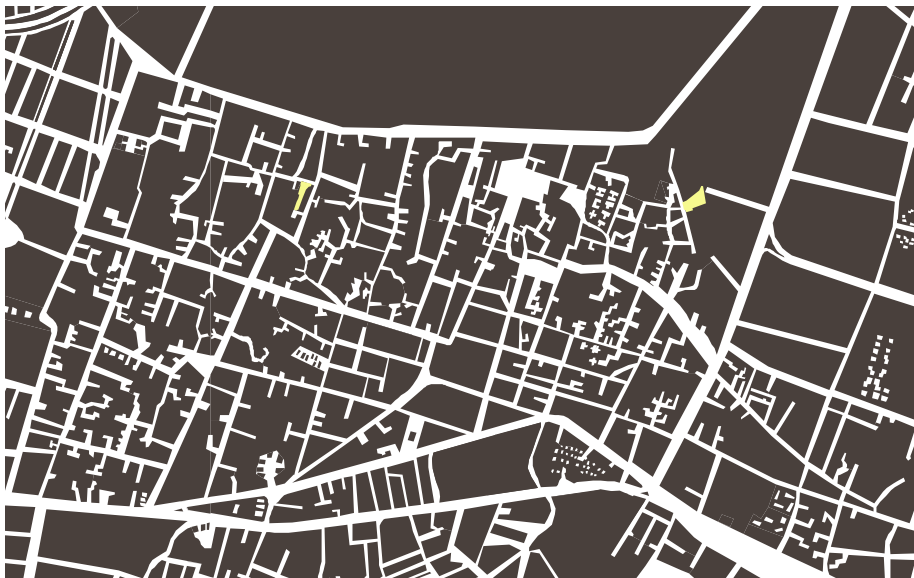
Secretaría de Desarrollo Urbano y Vivienda, Cartas de Divulgación de Programas de Desarrollo Urbano Publicados en la Gaceta Oficial del GDF en el año 1997



Urban Land Use

-  Residential
-  Residential and Commercial
-  Infrastructure (Public and private services, Health, Schools, Cultural, Sports, Cemeteries)
-  Industrial
-  Public Space (Parks, Plazas, Gardens, Sports Fields)
-  Site
-  Major Roadways

Barrio San Ignacio



Barrio San Ignacio

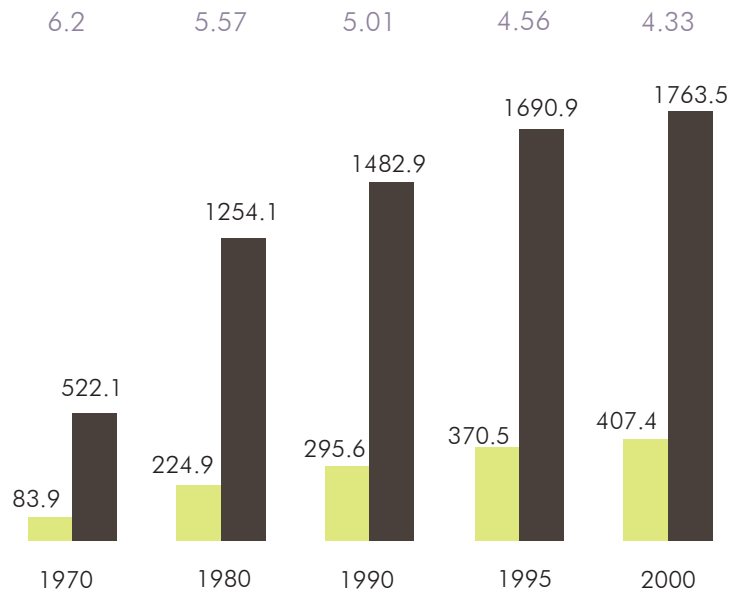


Ticomac
1483.26m²



Tecorales
2146.53m²

Occupants per Dwelling - Iztapalapa

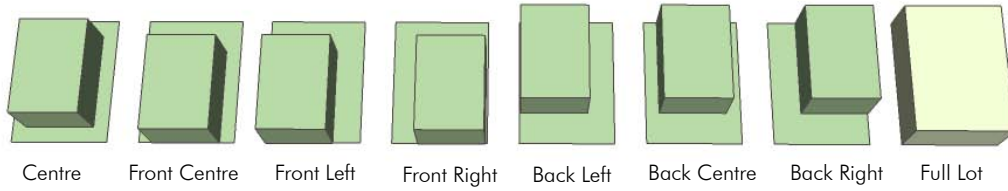


Dwellings
Occupants

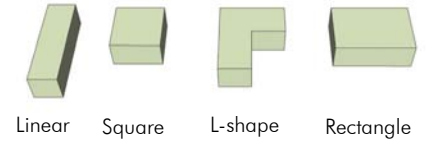
Initially in the process of Participatory Design, it is important to establish dwelling typology. All typologies must be drawn out in order to understand which is the most appropriate for the given site and how it makes sense according to the financial situation of the group. What follows are a series of basic drawings of typological configurations to be discussed.

In this case, as an academic project, I have decided that one of my goals as a housing development will be to create a high density proposal without overcrowding or monotonous repetition of dwellings. This has several benefits: higher density, means more dwellings and less financial burden on each member of the group. Also, it creates the potential for the community to expand over time, whether as extended family or newly migrated members of the Mazahua group.

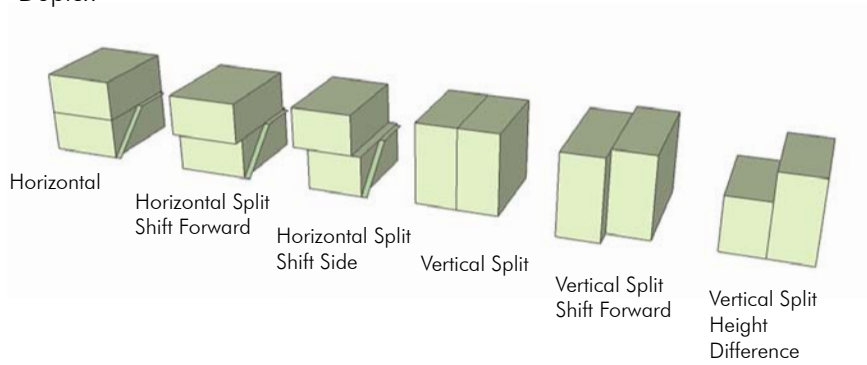
Placement of Single Family Home on Individual Lot



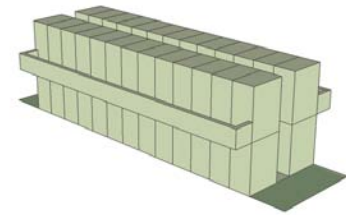
Form



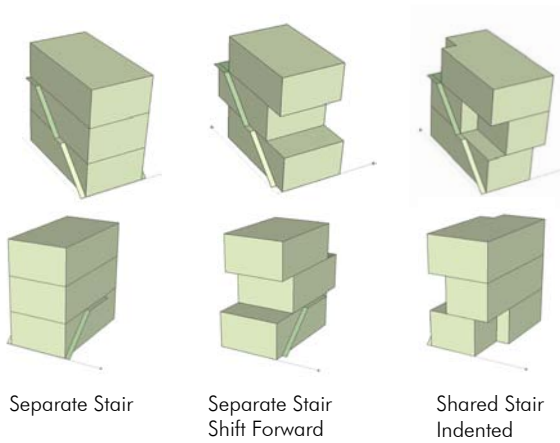
Duplex



Multiplex



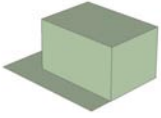
Triplex



Density

Potential for Growth

Privacy

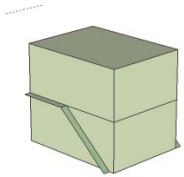


Single Family Progressive House

To maximize the density of the SFH, smaller dwellings are required on smaller lots, this in the end affects the potential for growth

The potential for growth of a SFH is optimal in comparison to other dwelling types because, depending on adjacencies, it can grow in almost every direction including up (z-axis)

The SFH provides the most privacy in comparison to other typologies

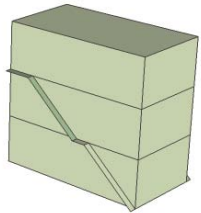


Duplex

Density for duplex dwellings can be medium to high depending on the lot size

Duplex growth can occur in two ways: the ground floor can spread out along the x,y axis, and the second level unit can spread out along x,y and z axis, or the two units can have access to ground floor and grow up along z axis

The duplex is second in providing privacy, and can be organized in such a way as to provide a private entrance and personal outdoor space (patio)

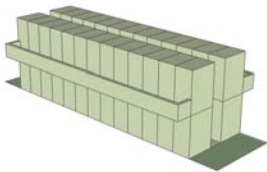


Triplex

Density for triplex dwellings is high depending on the lot size. It offers density without overcrowding in comparison to the multiplex

The triplex can be seen as one part bungalow (ground level) and one part elevated duplex (top two levels). Growth for the ground floor unit occurring along the x,y plane, and growth for the upper two units occurring similar to the duplex (see above)

Although the triplex has one more dwelling than the duplex, the privacy can be equal to the duplex. Again, it can be organized in such a way as to provide a private entrance and personal outdoor space (patio) for each dwelling



Multiplex

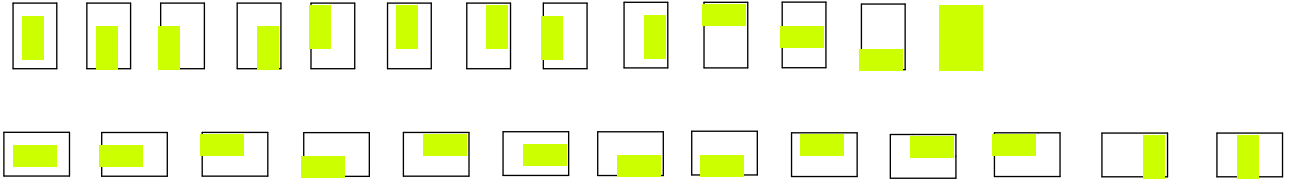
Density for multiplex or apartment dwelling is high because it is often stacked

The multiplex has limited growth potential, but if the units are open to the exterior, the upper-most floors can grow upwards. Interlocking of spaces may allow growth on lower floors, but these are expensive to accomplish structurally

The multiplex provides the least amount of privacy since it often shares a common entrance and patio space. It can be organized to have dwellings facing outwards rather than inwards, but the overall structure shares the same lot

Lot

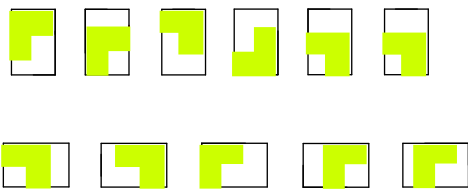
Rectangle



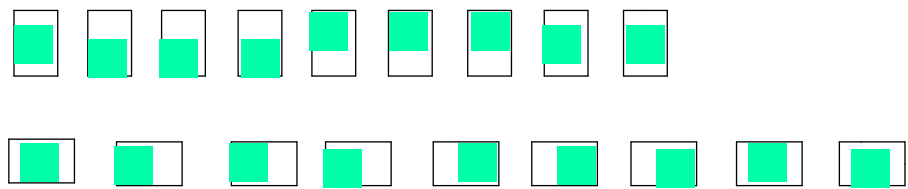
Linear



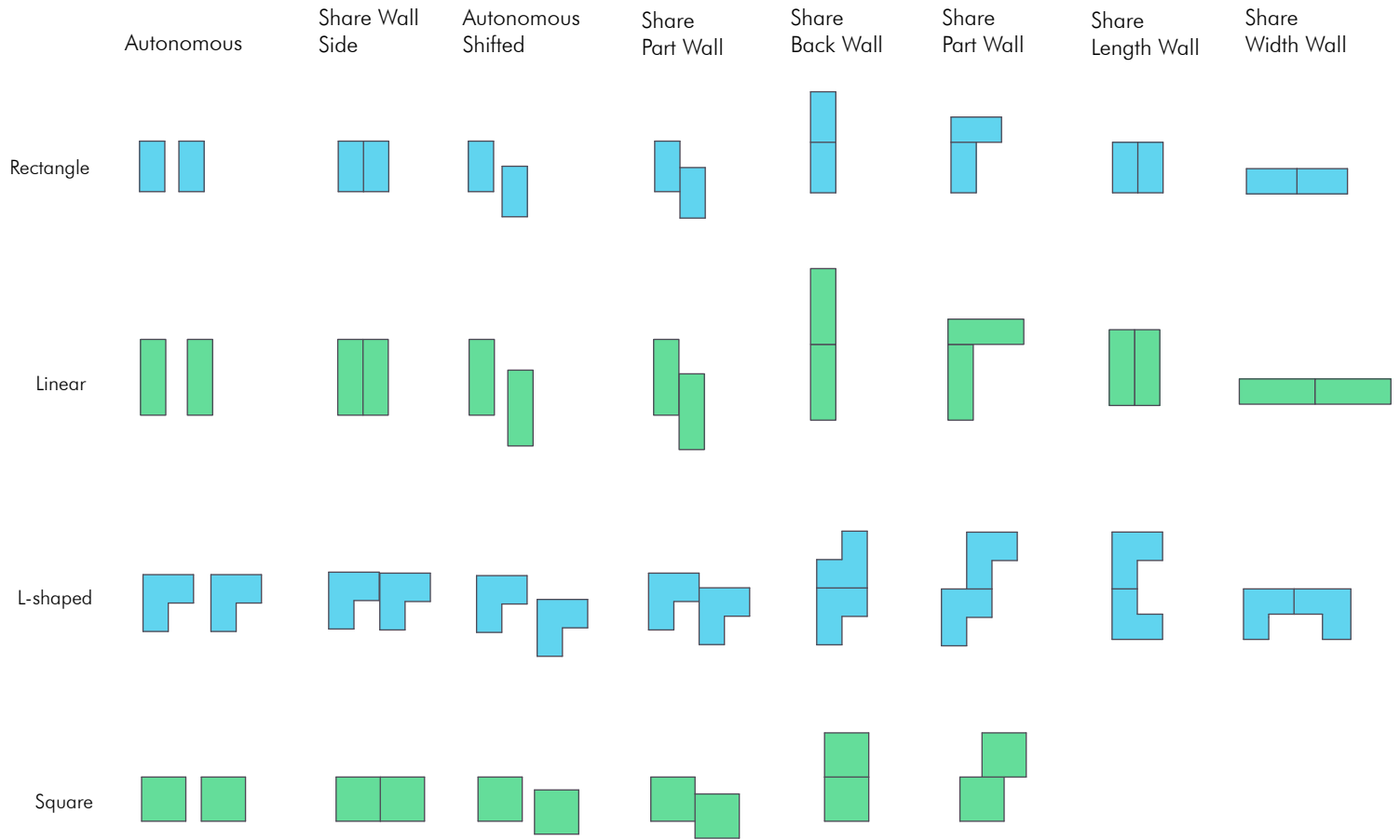
L-shaped



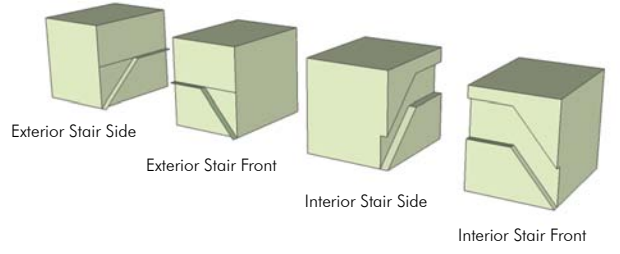
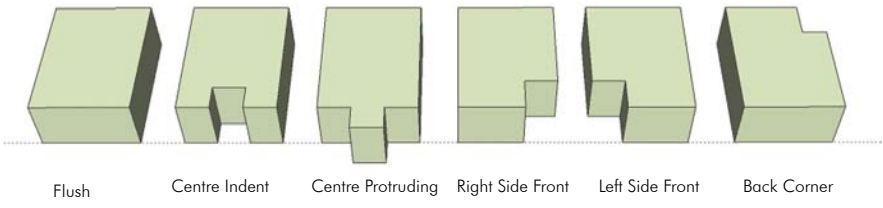
Square



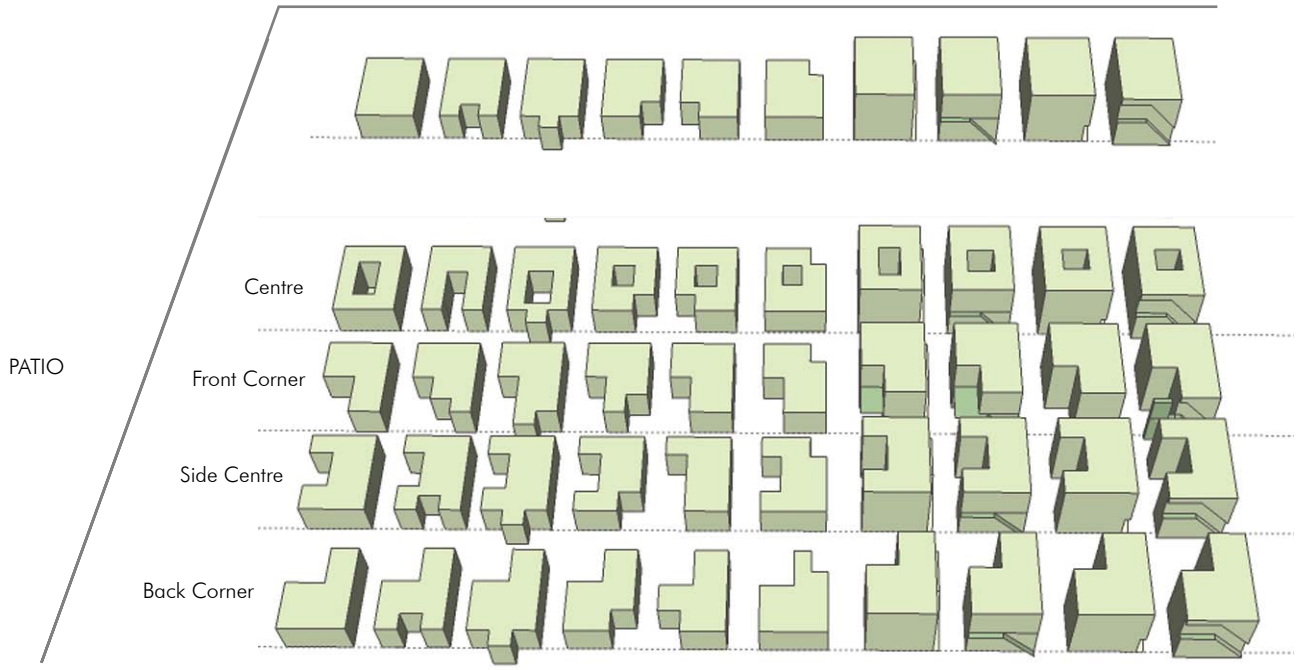
Options
Single Family Progressive Home
Initial Stage Form
Placement on Lot



Options
Adjacency



ENTRANCE



Options
Entrance/Patio

Entrance into Multipurpose Room

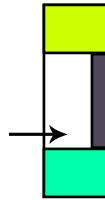
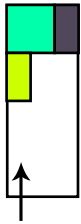
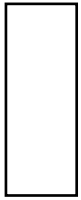
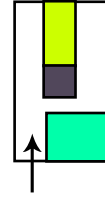
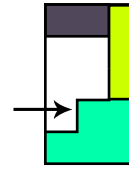
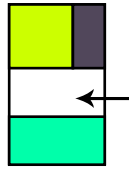
Entrance into Hallway

Rooms on Ends

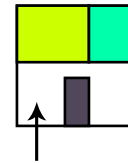
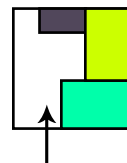
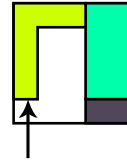
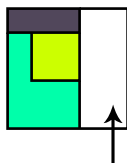
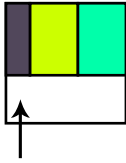
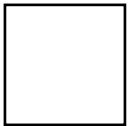
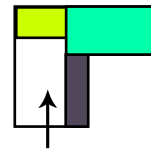
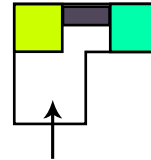
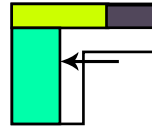
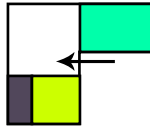
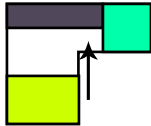
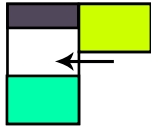
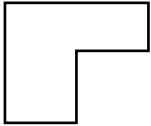
Rooms Perimeter

Rooms Along One Side

Rooms T-shape

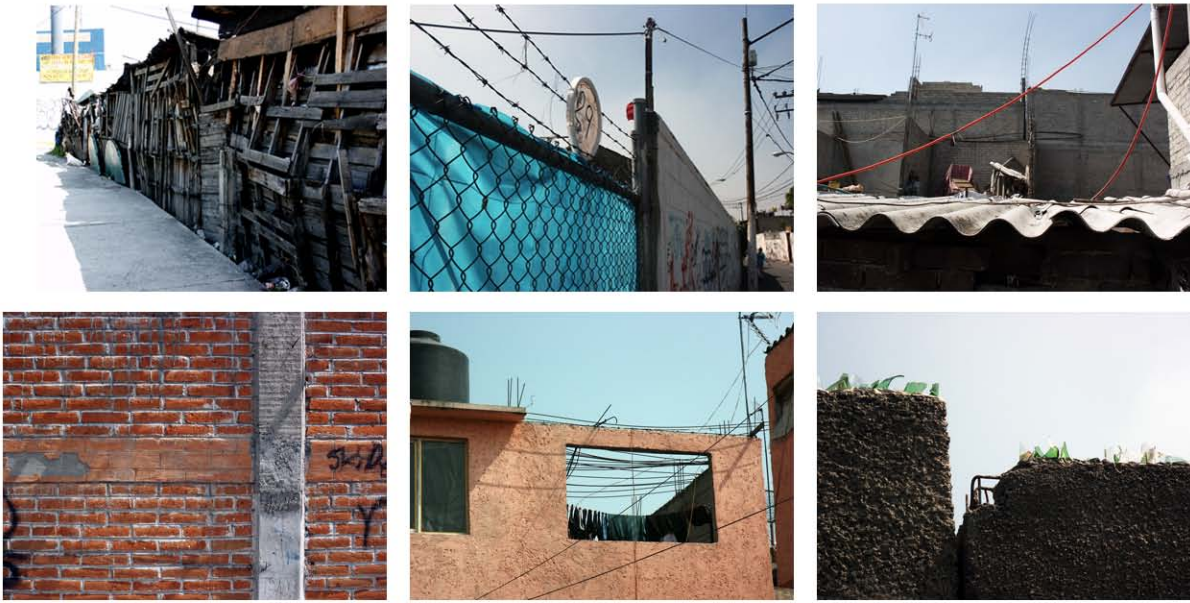


Form



-  Bedroom
-  Kitchen
-  Bathroom
-  Multipurpose room

Options
Layout
Main Floor



Notes translated from lectures and *Habitat Social Progresivo, Vivienda y Urbanizacion*

The housing problem is a problem of poverty. Poverty cannot be separated from the social, political, and economic context in which it is produced. One response to the housing shortage among low-income families is a concept founded in the ideas of evolution.

Evolution in nature is a slow and methodical process, broken down into small steps over time. In an evolutionary process there are no sudden leaps forward, there is no turning back, and there can be many ways to solve the same problem .

Architects cannot predict the future despite their efforts to do so. Buildings evolve and transform over time no matter what. What then is the role of the architect in helping shape social progressive housing? Within the complex and integral concept of evolutionary design, the future still cannot be known, but embedded in evolutionary design is the idea that there be 'potential' built into everything that is designed in the present.

Conceptual Framework for an Evolutionary Habitat:

It is a process of transformation giving rise to a relationship with adaptable technologies that interact synergetically in an incremental logic. It is based in the participation of people, with the goal of strengthening social and symbolic investment, and improving housing conditions within the framework of sustainable development.

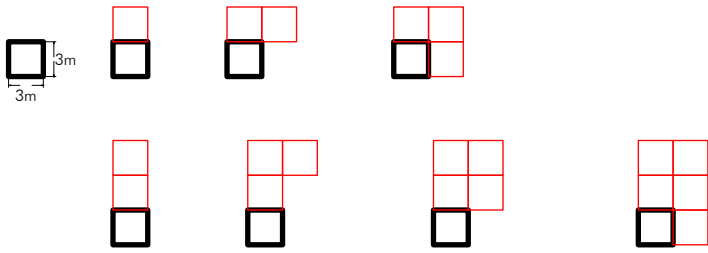
Methodological Framework:

The methodological framework is Participative, Systematic, Foresighted, Strategic, and Sustainable.

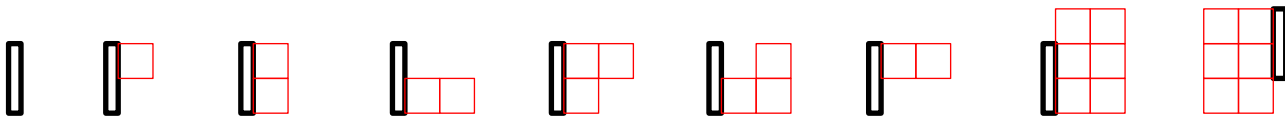
The following are possible options for ways a building can grow over time.



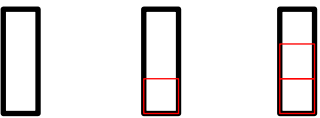
Evolutionary Housing



Option 1 - 3m bay multiplied



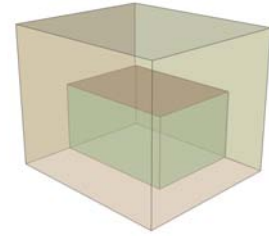
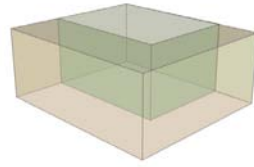
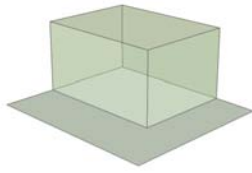
Option 2 - Service Core/Utility Wall



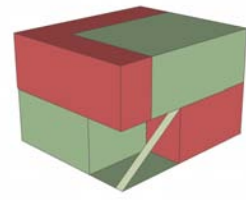
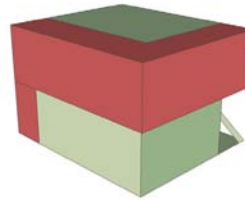
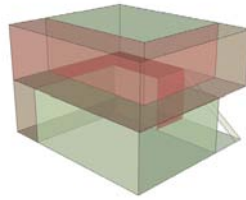
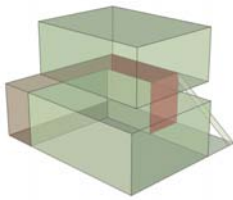
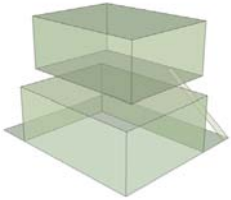
Option 3 - Hollow shell with growth inside

Options
Growth along xy plane

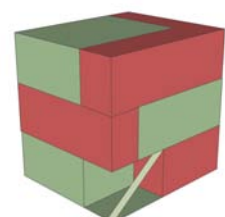
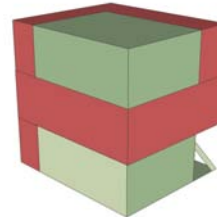
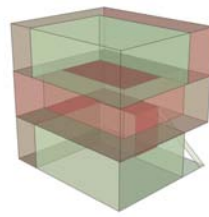
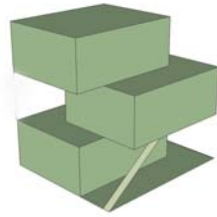
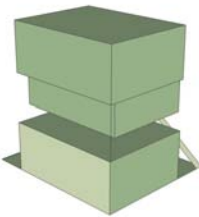
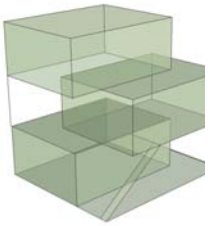
Single Family Home



Duplex

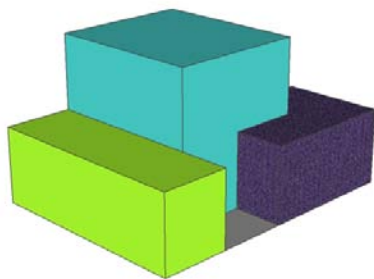
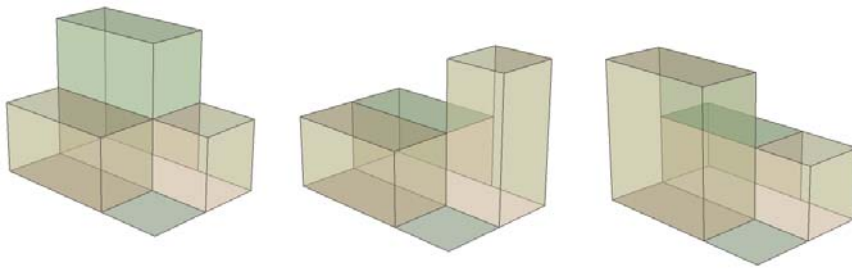
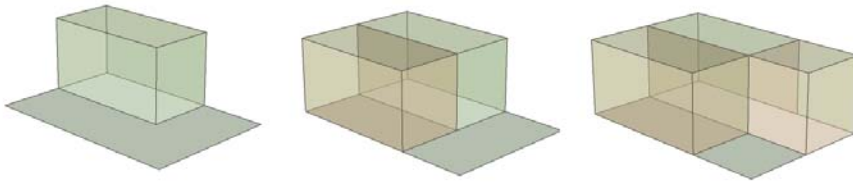


Triplex



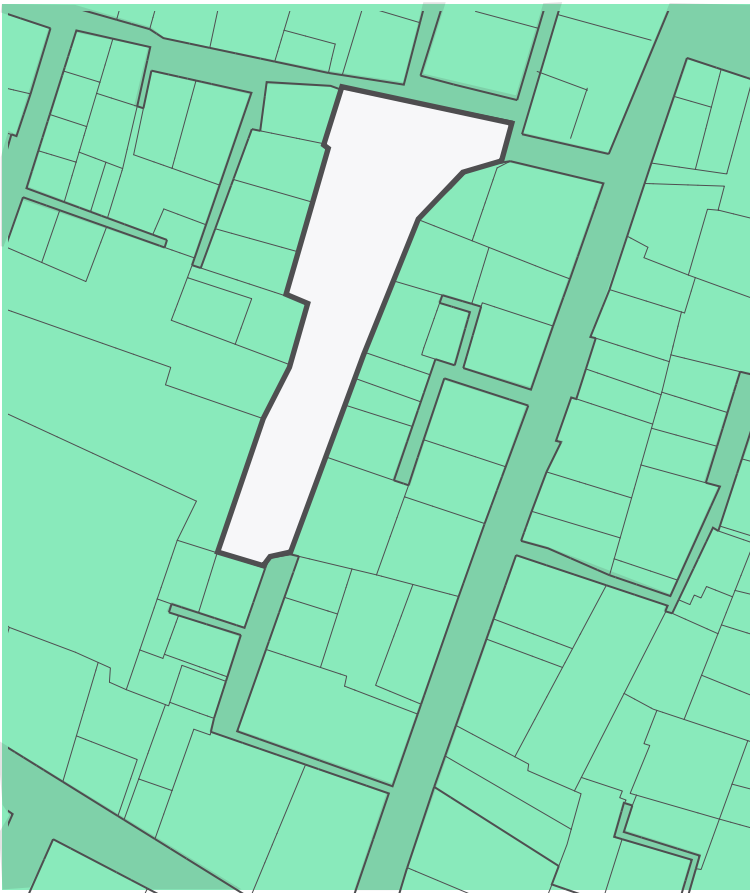
- Initial Building
- Potential Growth

3-d Growth Possibilities



Conclusion:

Each typology provides its own potential for growth, but what if typologies were mixed on the site? The mixing of dwelling typologies would allow for different types of growth, possibly even interactive growth that interlocks over time, much the same way trees and nature grow around what already exists.



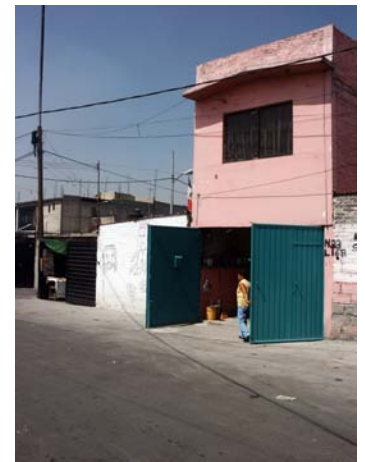
5 10 50



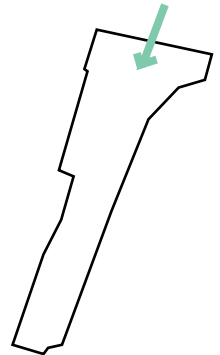
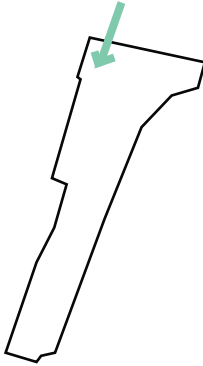
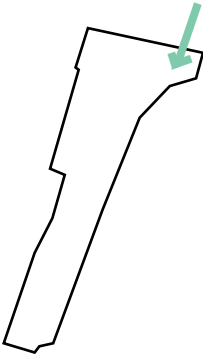
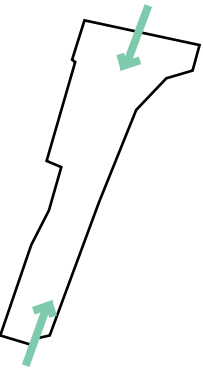
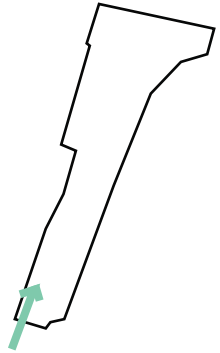
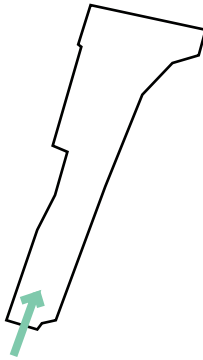
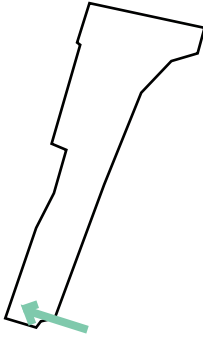
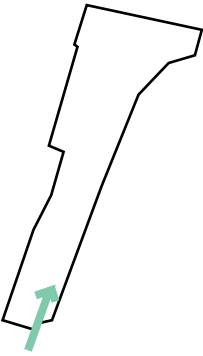
Site
Ticomac



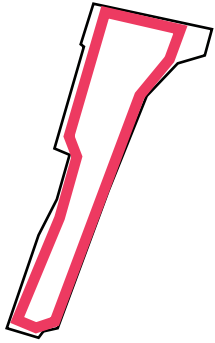
The following options have been broken down into entrance, circulation, parking, public space, and housing groupings. By breaking down the components into manageable steps, it is easier to discuss all the possibilities



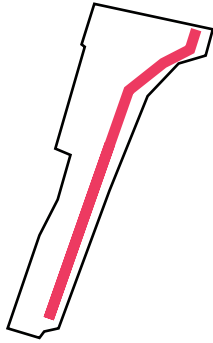
Ticomac



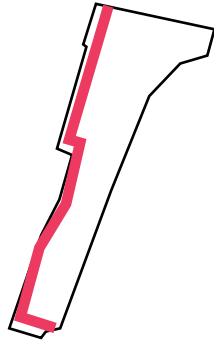
Ticomac Options
Entrance



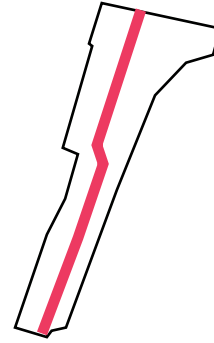
Circular



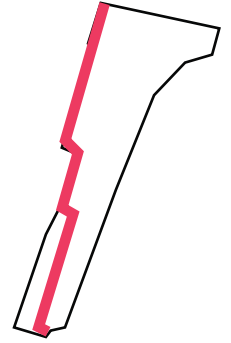
Linear East



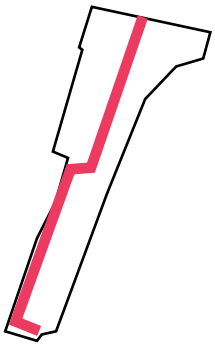
Linear West



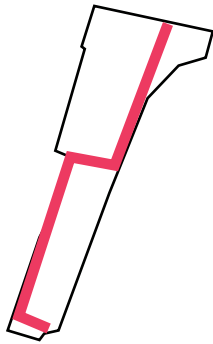
Linear Central



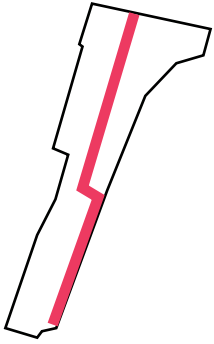
Linear West-Central



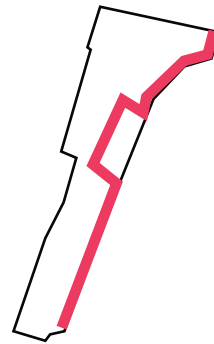
Linear Central-West



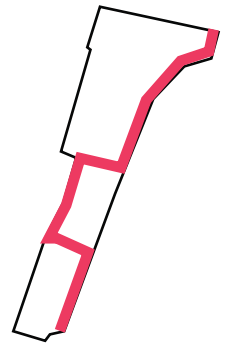
Linear East to West



Linear Central-East



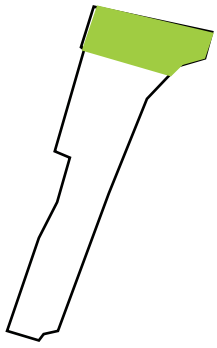
Linear with a jog



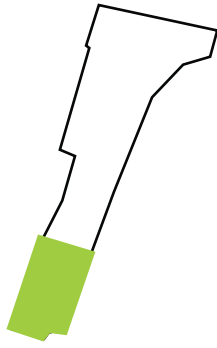
Linear with a jog

 Circulation

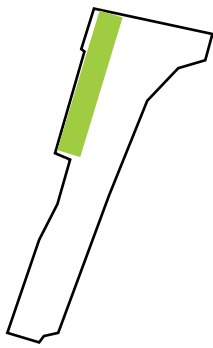
Ticomac Options
Circulation



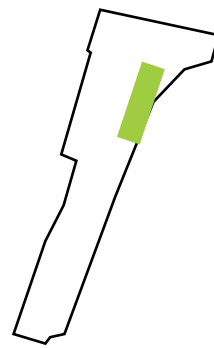
North



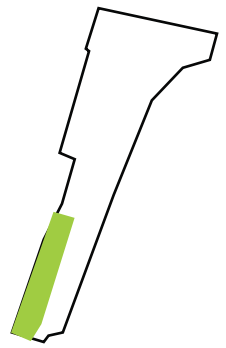
South



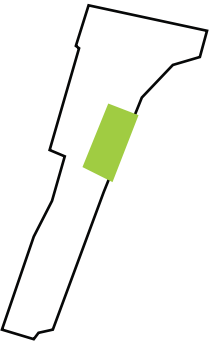
North-West



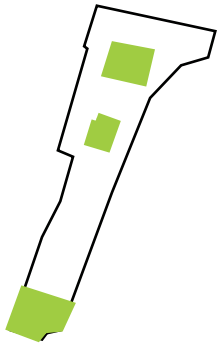
North-East



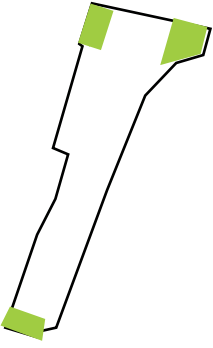
South-West



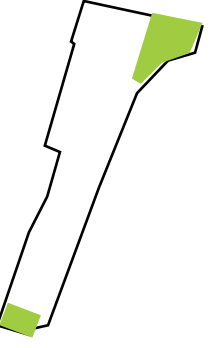
Central



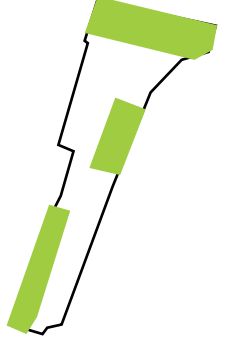
Divided Central



Divided Corners



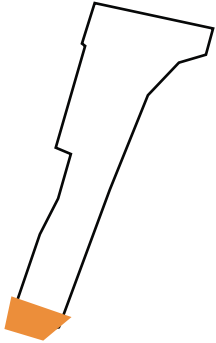
Divided North & South



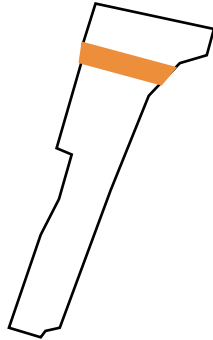
Divided Sides

 Parking

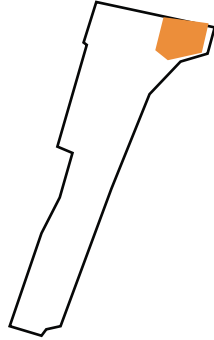
Ticomac Options
Parking



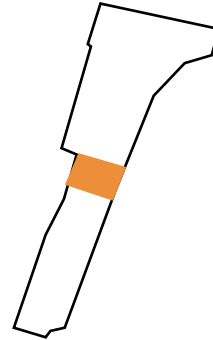
South



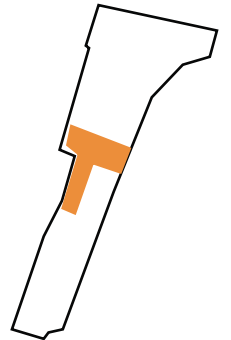
North



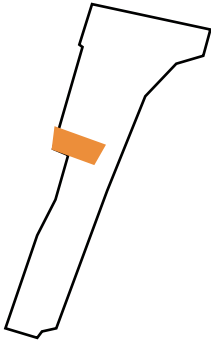
North Corner



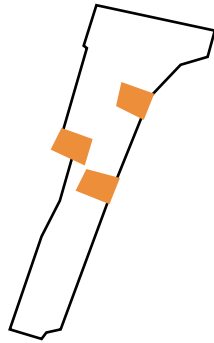
Centre



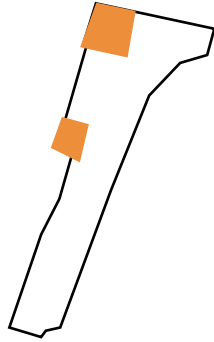
Centre



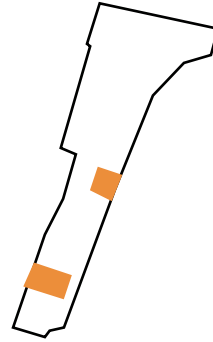
Centre West



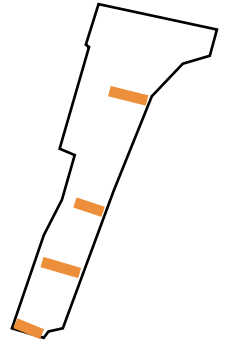
Divided Centre



Divided West



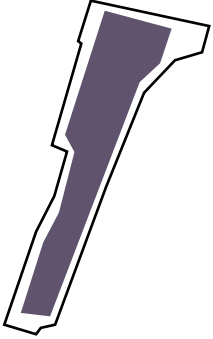
Divided South



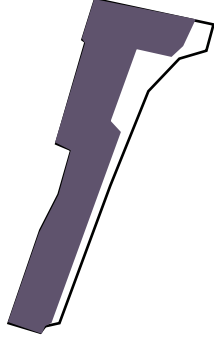
Divided Linear

 Non-circulation public space

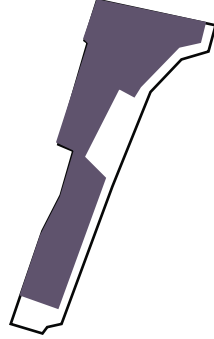
Ticomac Options
Non-circulation public space



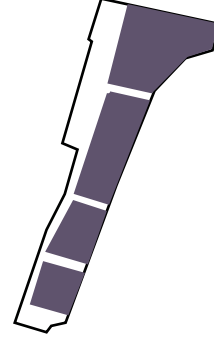
Linear Central



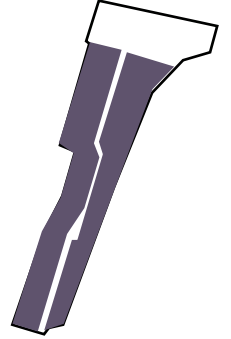
Linear West



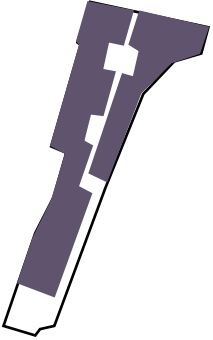
West



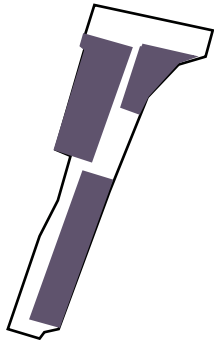
East with pathways



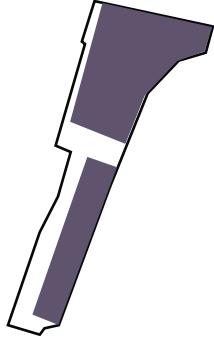
Divided Sides



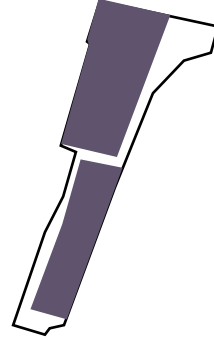
Divided



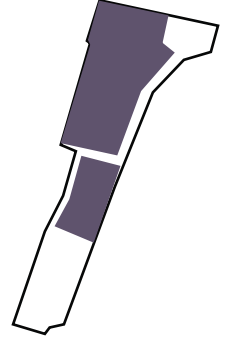
Divided Sides



Divided East



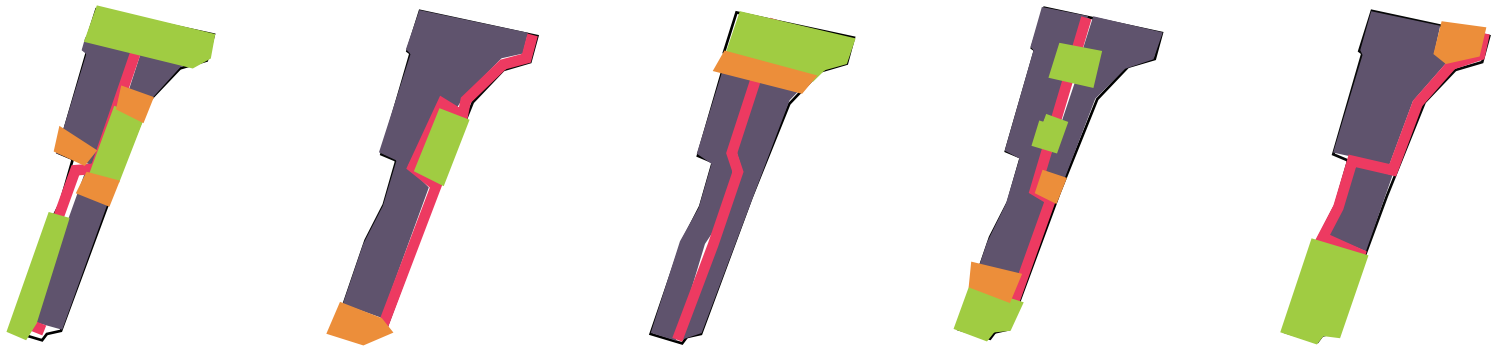
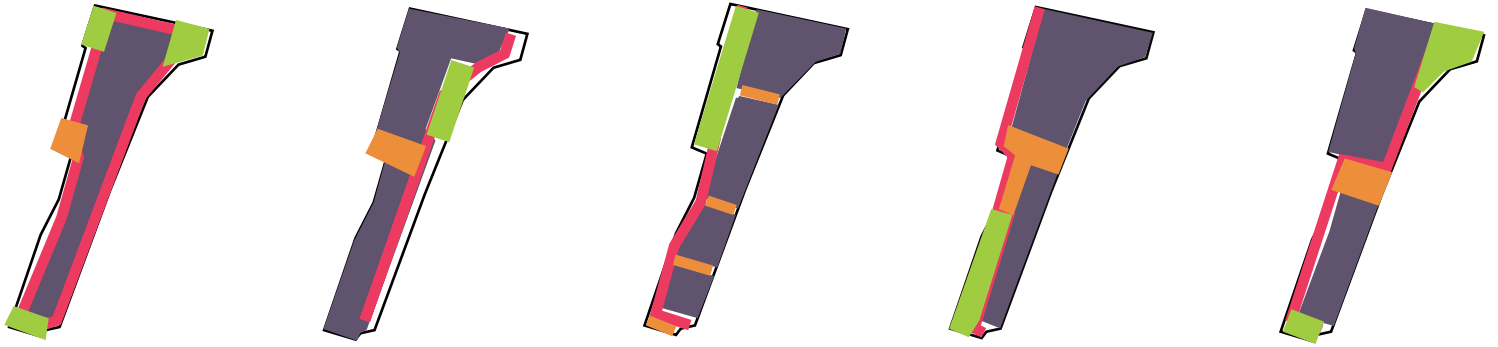
East & West Blocks







East & West Blocks

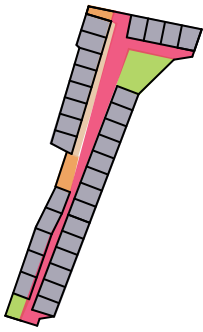
■ Housing

Ticomac Options
Housing

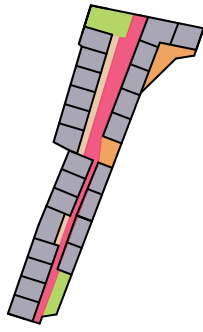


-  Housing
-  Circulation
-  Parking
-  Non-circulation public space

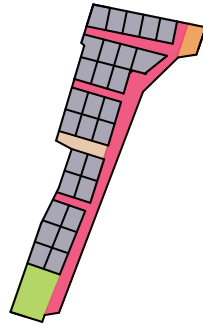
Ticomac Options



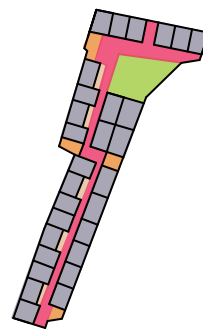
31 @ 6x8 - individual lots



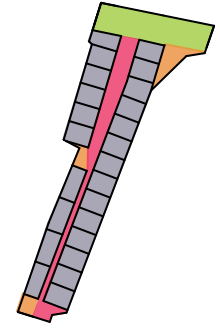
23 @ 7x9 - individual lots



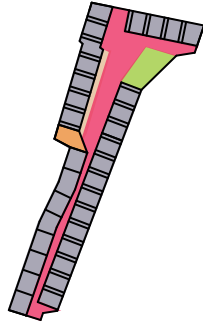
27 @ 6x8 - individual lots



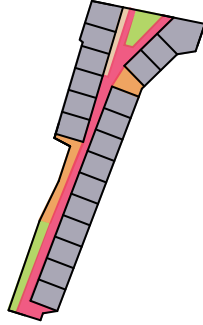
29 @ 6x8 - individual lots



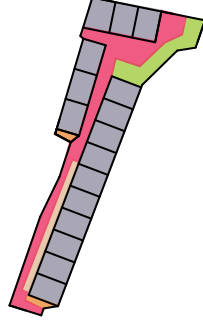
23 @ 7x9 - individual lots



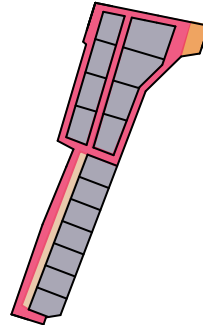
32 @ 5x7.5 - individual lots



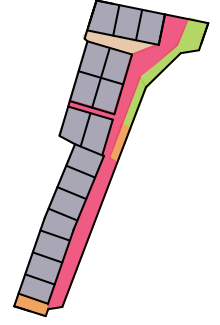
19 @ 8.5x10 - duplex lots



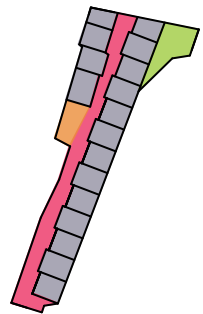
16 @ 8.2x11 - triplex lots



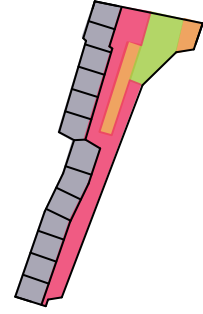
15 @ 8.2x11 - Triplex Lots



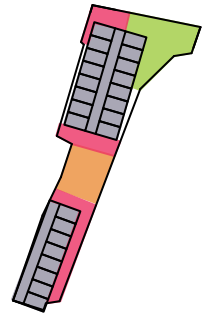
16 @ 8.2x11 - Triplex Lots



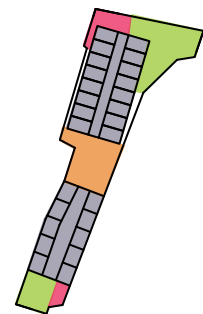
16 @ 8.5x10 - duplex lots



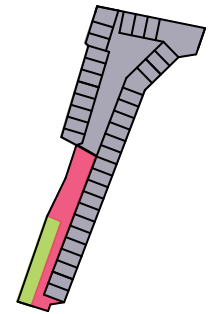
13 @ 8.5x10 - duplex lots








2 multiplex lot



2 multiplex lot



1 multiplex lot

-  Commercial
-  Housing
-  Circulation
-  Parking
-  Non-circulation public space

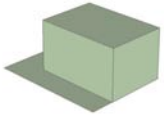
Ticomac Options
Lot Divisions

Most Dense Grouping

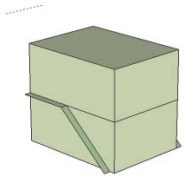
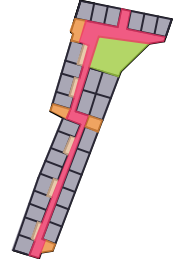
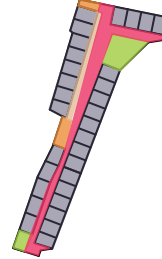
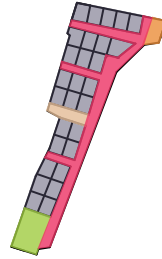
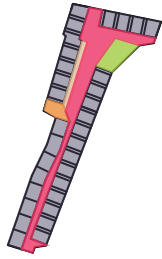
Most Circulation Space

Most Open Space

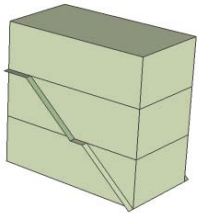
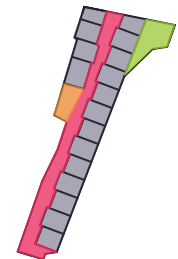
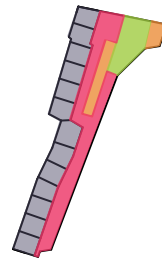
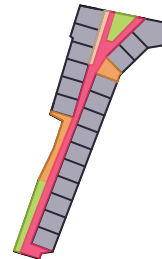
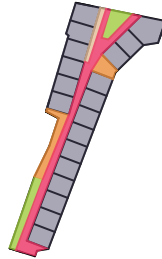
Most Private Space



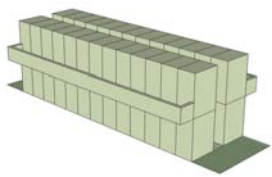
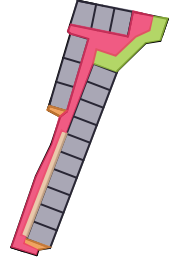
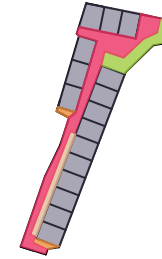
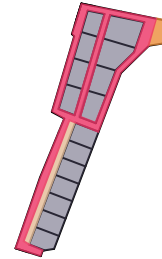
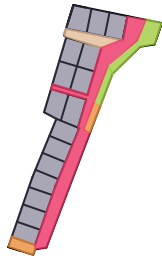
Single Family Progressive House



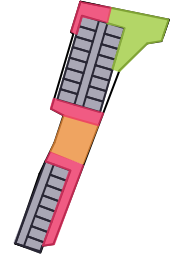
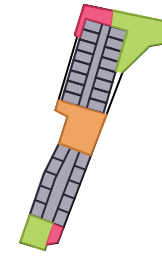
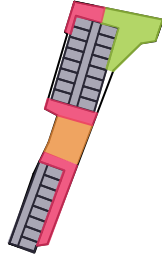
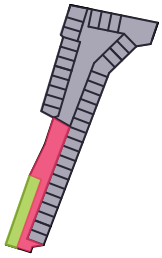
Duplex



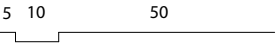
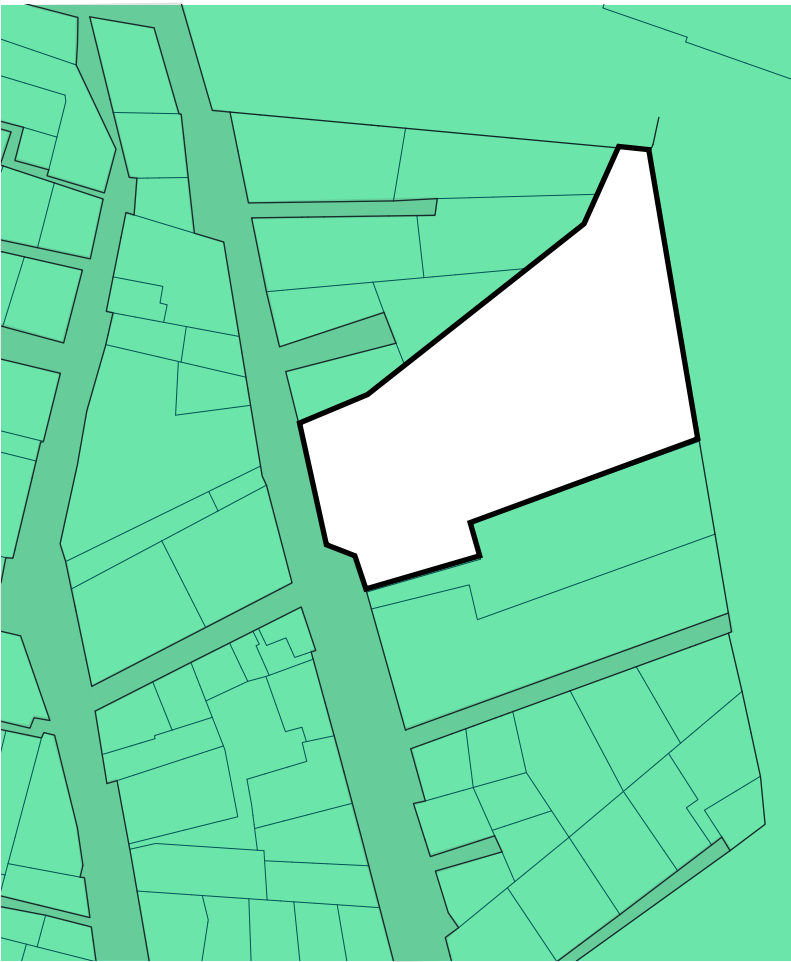
Triplex



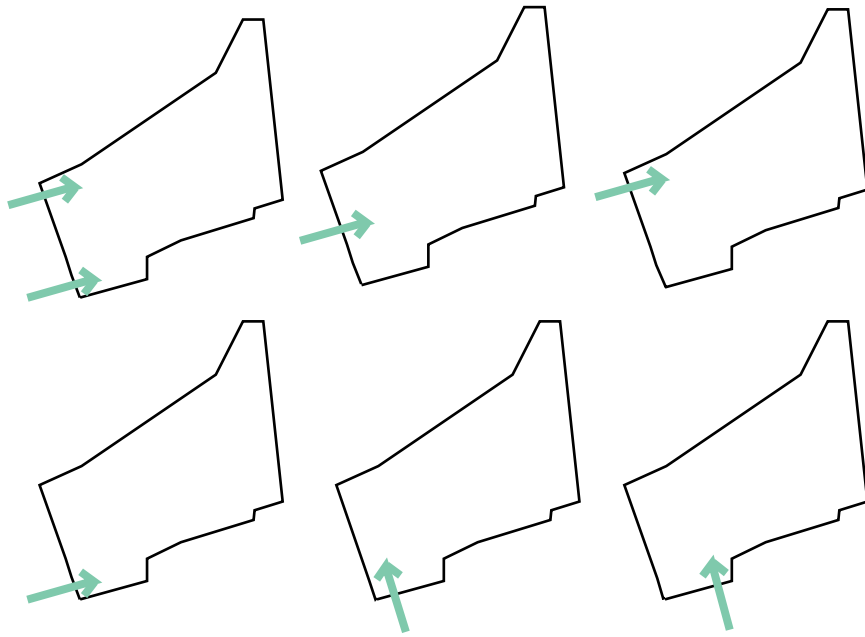
Multiplex



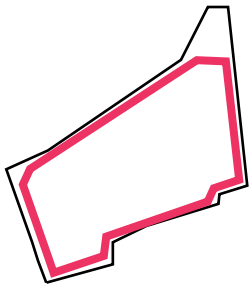
Priorities



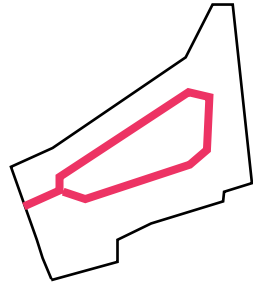
Site
Tecorales



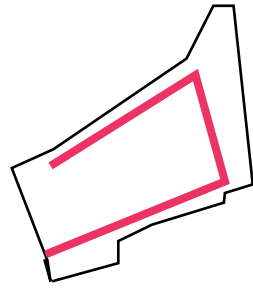
Tecorales Options
Entrance



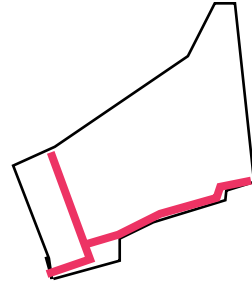
Circular



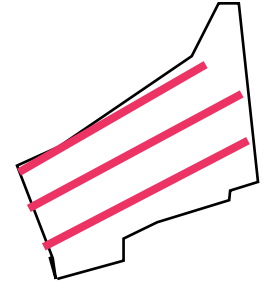
Circular



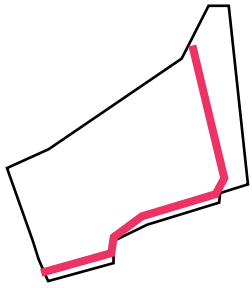
Circular



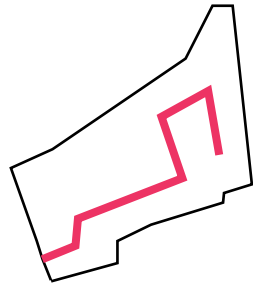
Linear



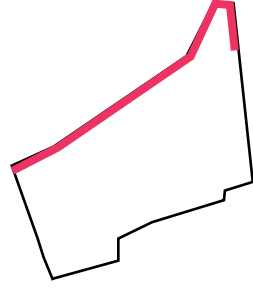
Linear



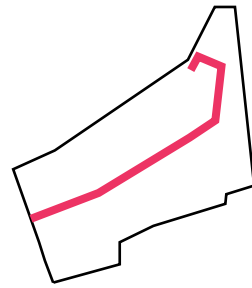
Linear



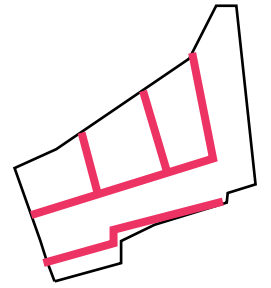
Cul de Sac



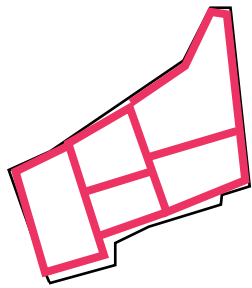
Cul de Sac



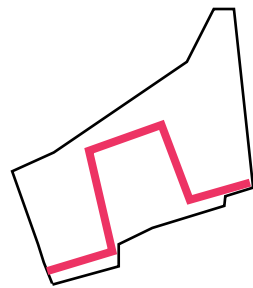
Cul de Sac



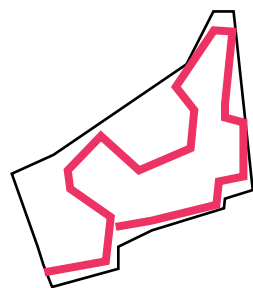
Grid



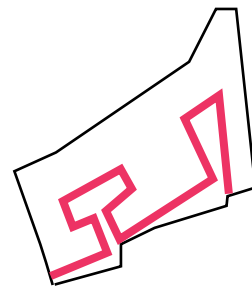
Grid



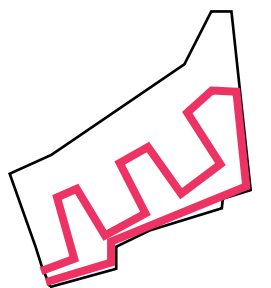
Grid



Meandering



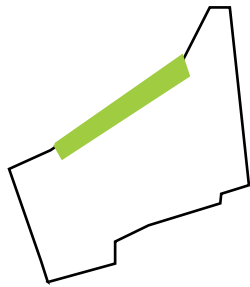
Meandering



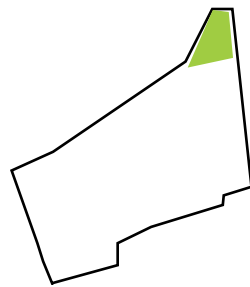
Meandering

■ Circulation

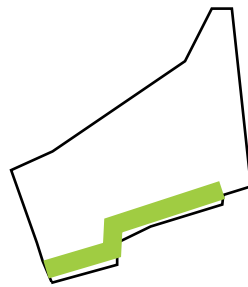
Tecorales Options
Circulation



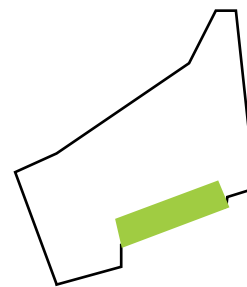
North Centre



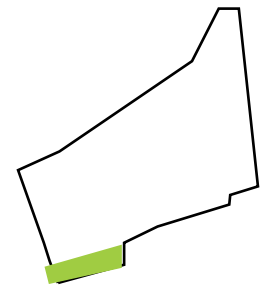
North Corner



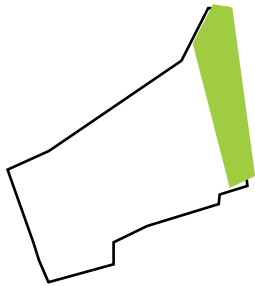
South Long Linear



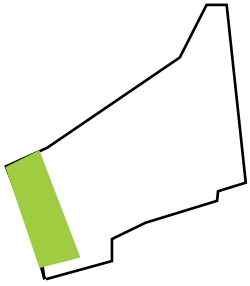
South Block



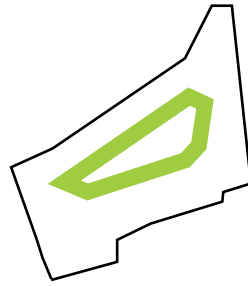
South



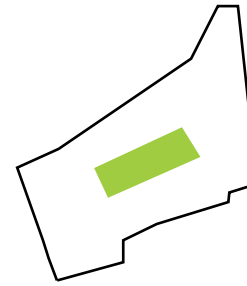
East



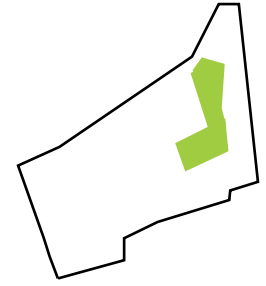
West



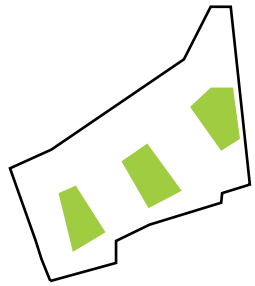
Loop



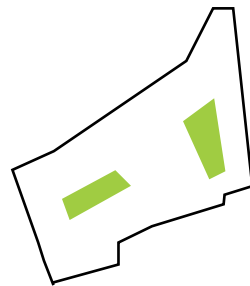
Centre



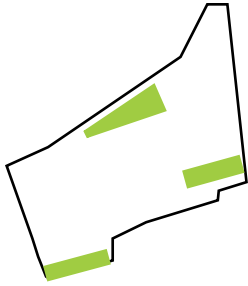
Centre



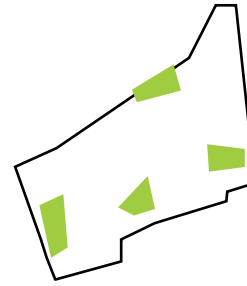
Centre Divided



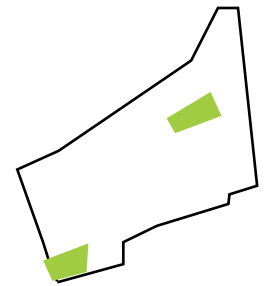
Divided



Divided



Divided

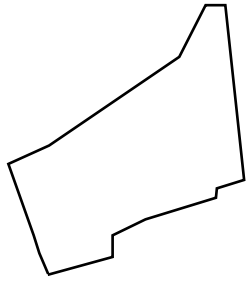


Divided

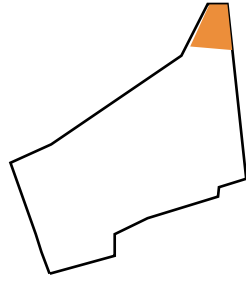


Parking

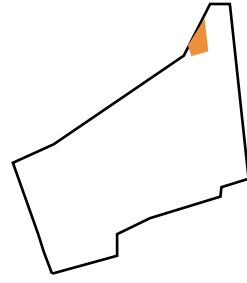
Tecorales Options
Parking



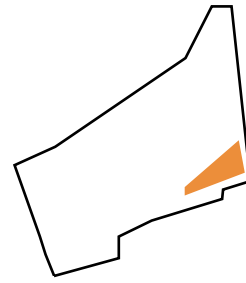
None



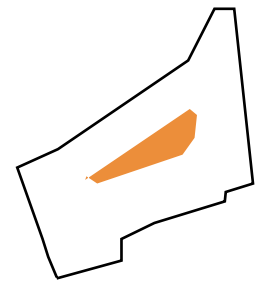
North Corner



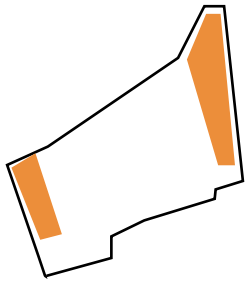
North Corner



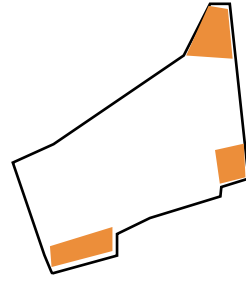
South-east Corner



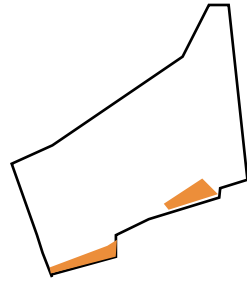
Centre



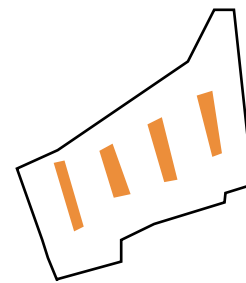
East and West Ends



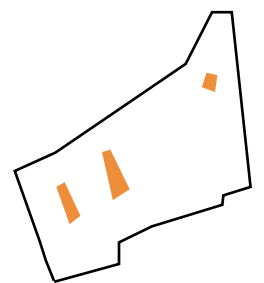
Corners



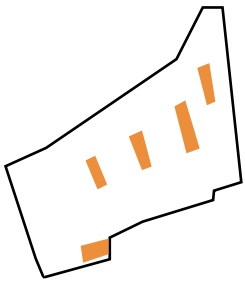
South Linear



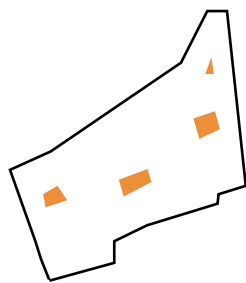
Centre Linear



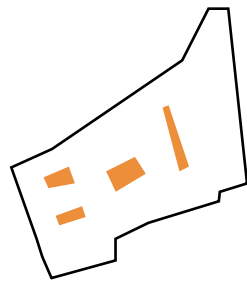
Divided Centre



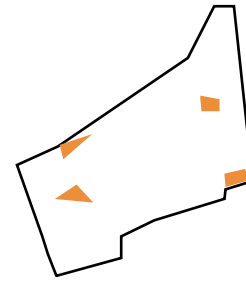
Divided Centre



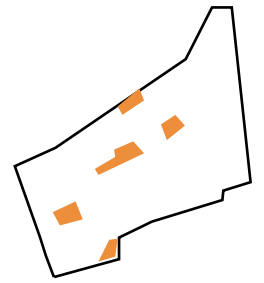
Divided Centre



Divided Centre



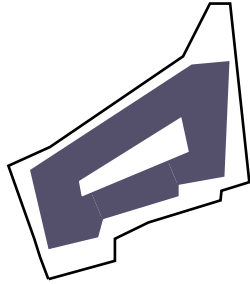
Divided Scattered



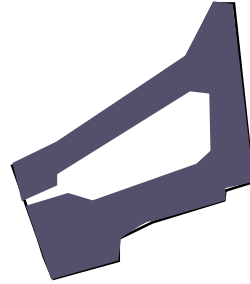
Divided Scattered

■ Non-circulation public space

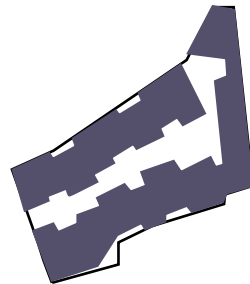
Tecorales Options
Non-circulation public space



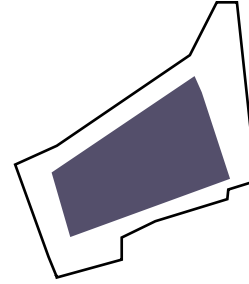
Loop Centre



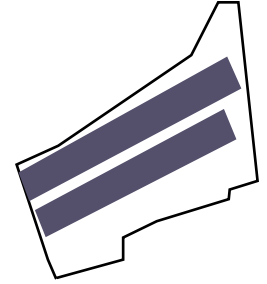
Loop Perimeter Flush



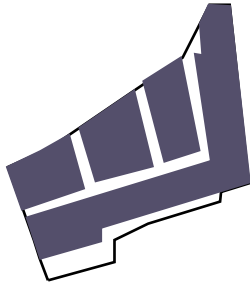
Loop Perimeter non-flush



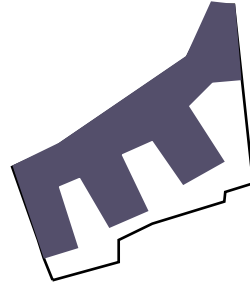
Large Block Centre



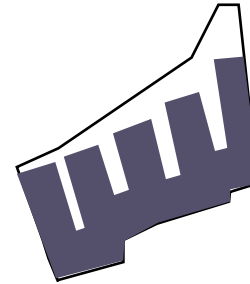
Linear



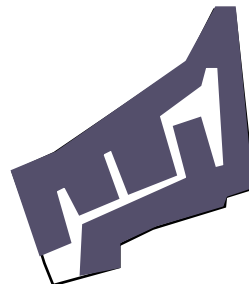
Linear



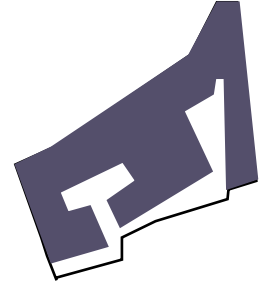
Forking North



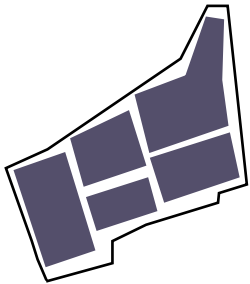
Forking South



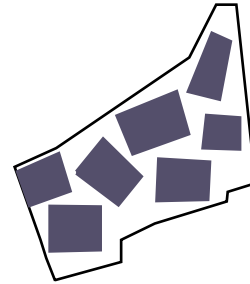
Meandering



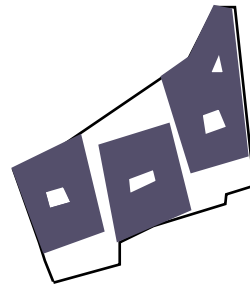
Meandering with Cul de Sacs



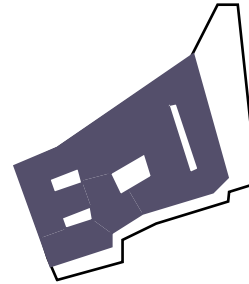
Blocks Grid



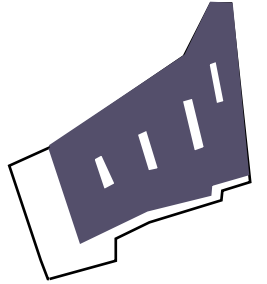
Blocks Random



Blocks with Atriums



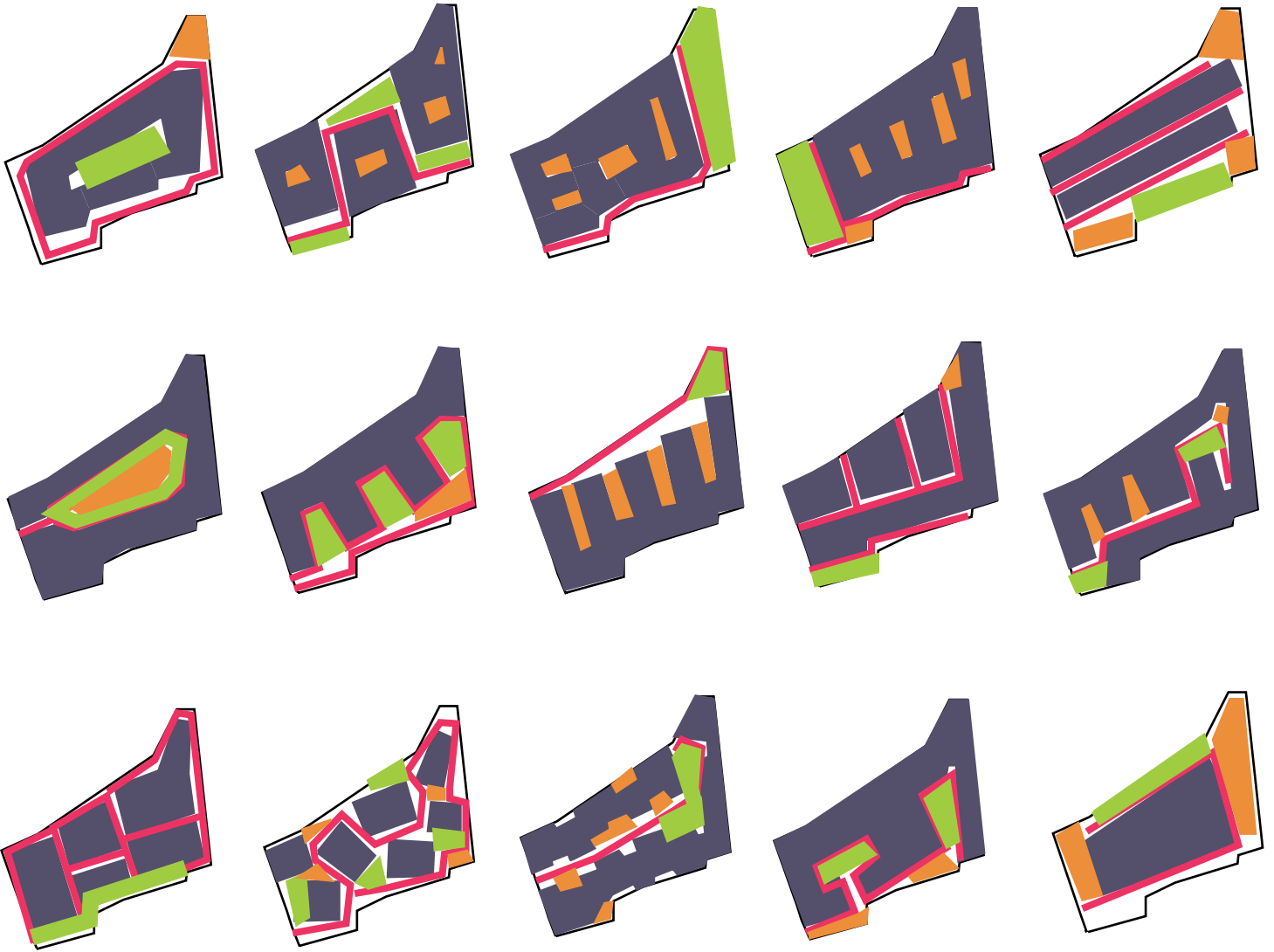
Large Block Communal



Large Block Communal

■ Housing

Tecorales Options
Housing



- Housing
- Circulation
- Parking
- Non-circulation public space

Tecorales Options

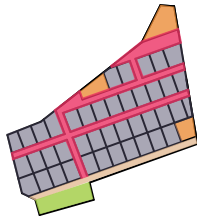
Linear

Clustered/Circular

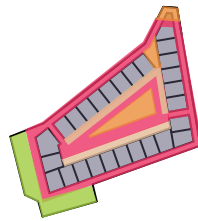
Mixed Layout

Mixed Typology

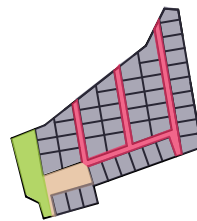
Single lots



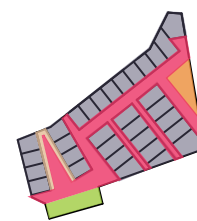
44 @ 6x8.5 - Individual lots



27 @ 6x 8.5 - Individual lots

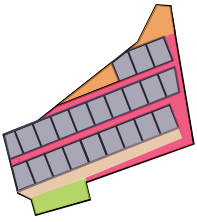


45 @ 6x8.5 - Individual lot

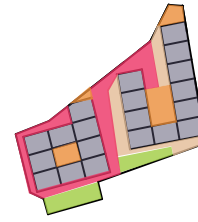


32 @ 6x8.5 - Majority Individual lots

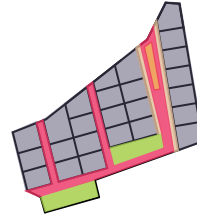
Duplex Lots



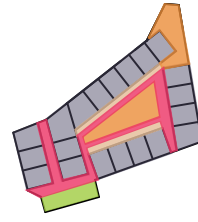
22 @ 8x10.5 - Duplex lots



23 @ 10.5x8 - Duplex lots

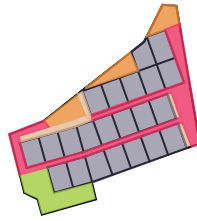


23 @ 10.5x8 - Duplex lots

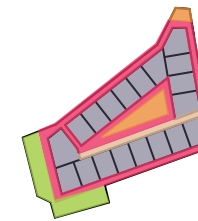


20 @ 8x10.5 - Majority Duplex lots

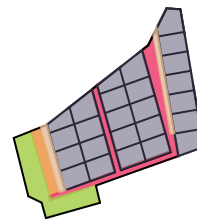
Triplex Lots



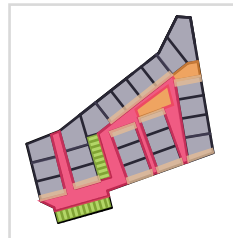
22 @ 8.2x11 - Triplex lots



19 @ 8.2x11 - Triplex lots

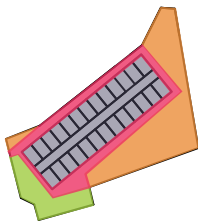


23 @ 8.2x11 - Triplex lots

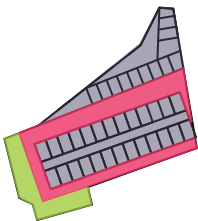


23 @ 8.2x11 - Majority Triplex lots

Multiplex Lots



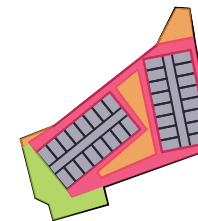
1 Multiplex Lot



2 Multiplex Lots



1 Multiplex Lot



2 Multiplex Lots

- Commercial
- Housing
- Circulation
- Parking
- Non-circulation public space

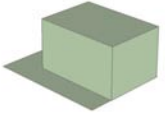
Tecorales Options
Lot Divisions

Most Dense Grouping

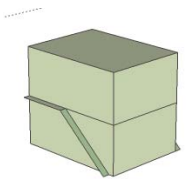
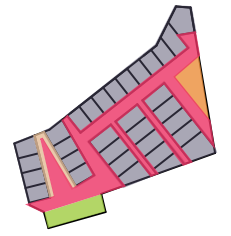
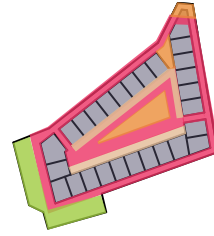
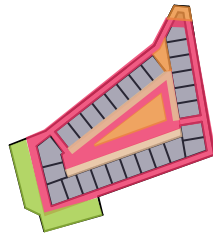
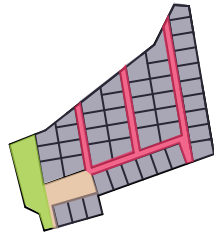
Most Circulation Space

Most Open Space

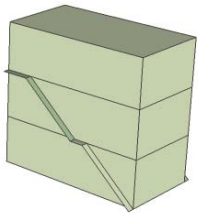
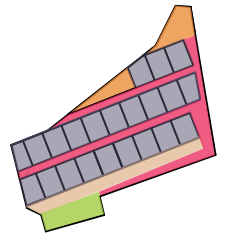
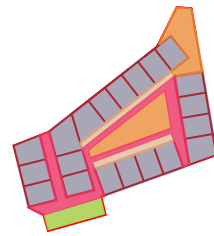
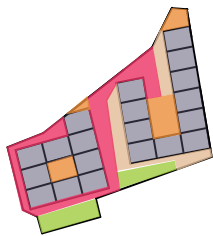
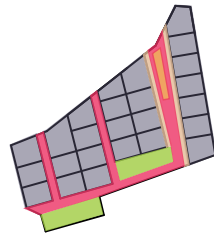
Most Independent Lots



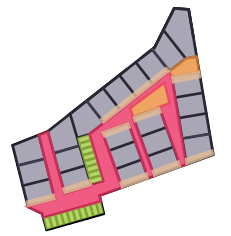
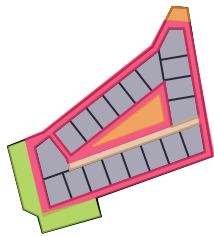
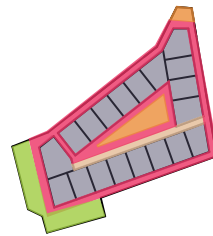
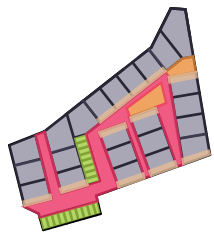
Single Family Progressive House



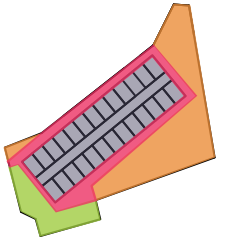
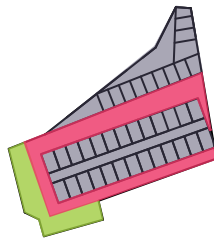
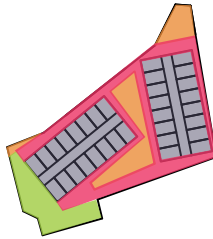
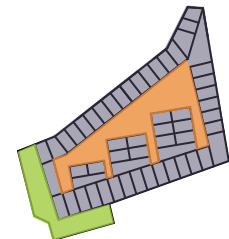
Duplex



Triplex



Multiplex



Priorities

Site Option Selection

It was found that the Tecorales mixed option with a majority of triplex dwellings, offered not only high density, but also more flexibility and possibility as a site, both in shape and in space. This site has more potential to meet the criteria which were set out from the beginning (see rules), and although it is a less developed neighbourhood, it has more potential to grow and develop over time. It has equivalent access to public transportation and public schools.

Conclusions for Configuration of Lots on Site:

Using a mix of 3 dwelling typologies - single family progressive, duplex, and triplex lots

- Creates more interesting in-between space
- Varies the heights of buildings allowing in more light
- Allows for different forms of building evolution
- Gives the client group more choice, allowing them to personalize their more unique dwelling
- Overall, variety makes for a more uniquely characterized development

Using a mix of lot layout and shape - perimeter and grouped

- Creates more interesting negative space
- Corner lots are zoned single family residential, alleviating facade monotony and letting in more light
- Allows for density, but not over crowding

Using a mix of commercial and residential lots

- Allows for potential income for the residents
- Brings in outside patrons
- Options facing both inward and onto the street, help develop the surrounding neighbourhood's economy as well

Easy access to all buildings on site

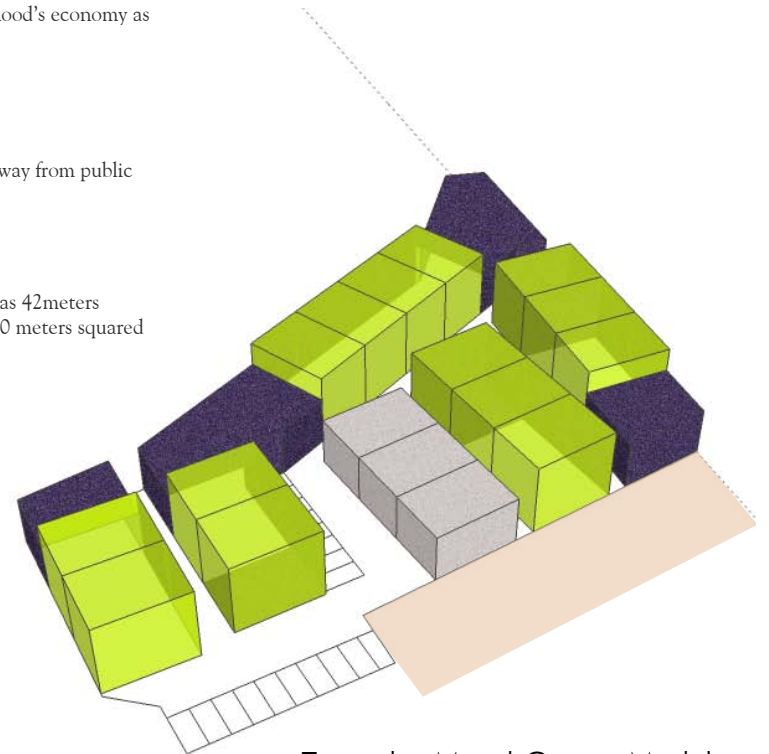
- U-shaped driveway into lot (2 connected vehicular entrances)
- Parking split up into two lots allows for more flexibility of space and easier movement
- Two minor pedestrian entrances ensure that access to all buildings is less than 42 meters away from public street.

Potential for growth

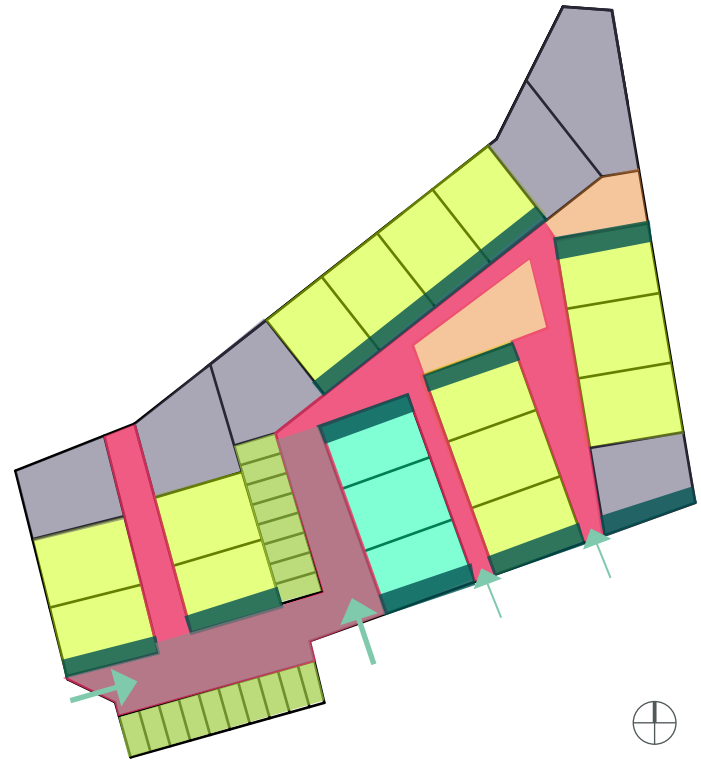
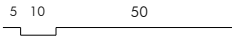
- Possibility to use the adjacent dead-end street as a market area on weekends
- All lots are intended to be used for progressive dwellings with initial dwelling area as small as 42 meters squared, growing to as much as 90 meters squared for duplex and triplex dwellings, and 180 meters squared for the single family home

Maximum Volume on Lot

- Single Family Progressive
- Duplex
- Triplex
- Possible market



Tecorales Mixed Option Model



- Vehicular Circulation
 - Pedestrian Circulation
 - Non-Circulation Public Space
 - Commercial Frontage
 - 6 Lg. Irregular Individual Lots = 6 Families (1 commercial unit + 5 residential units)
 - 3 Duplex Lots = 6 Families (2 commercial units+ 4 residential units)
 - 14 Triplex Lots = 42 Families (9 commercial units +33 residential units)
 - 18 Parking Spaces
- Total= 23 lots, 18 parking spaces, 54 Families (12 units are mixed commercial/residential, 42 are only residential)

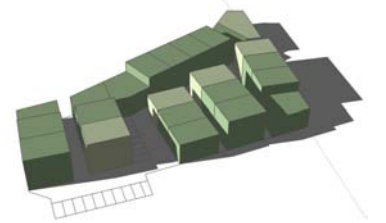
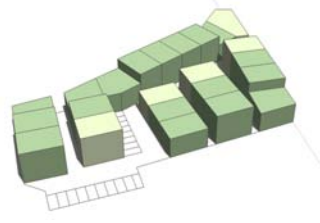
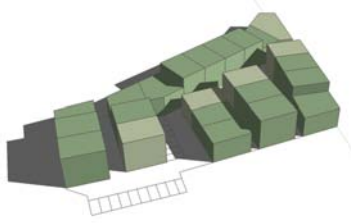
Final Lot
Configuration

9 am

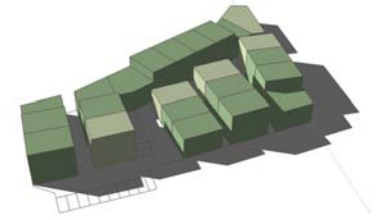
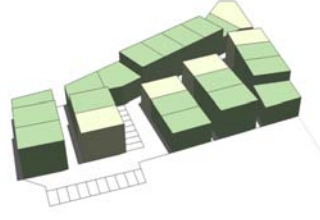
Noon

5 pm

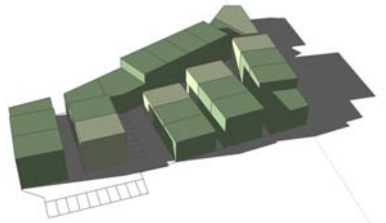
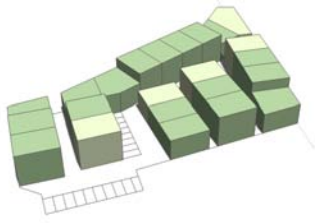
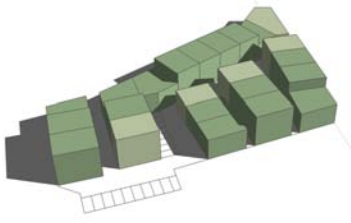
March 21 Mexico City



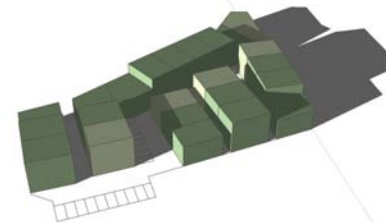
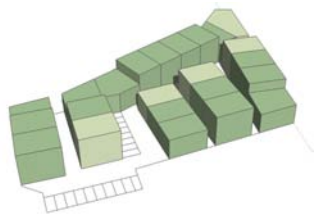
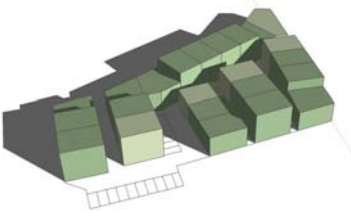
June 21 Mexico City



September 21 Mexico City



December 21 Mexico City



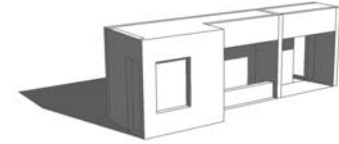
Maximum Height
Shadow Studies

Proposal: Dividing Needs and Wants

If the basic needs of each family are the same: water, electricity, and shelter, why not assign a physical space on the communal property for each dwelling before dividing the lots? In other words, what if the space that houses services for each dwelling was considered part of the overall lot? It would guarantee minimum services for each family, the cost would be absorbed collectively, and there would be more private property for each dwelling that could be used more creatively and more economically.

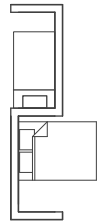
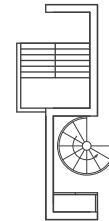
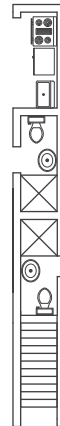
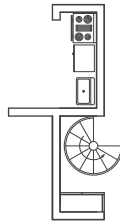
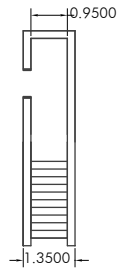
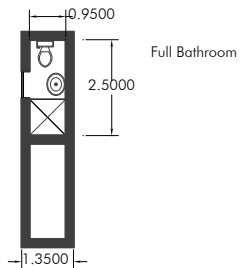
Double Duty: The idea for a utility wall for each family could be treated as public property and could be “plugged into” as needed, but could also function as structural support for future building.

Utility wall compartments, 2.5m x 0.95m, are big enough for a bedroom nook, a kitchenette, a staircase (spiral or straight), a bathroom, or a laundry nook. They can be combined in any way.



Ground Level Commercial Wall

Interior Wall Layout



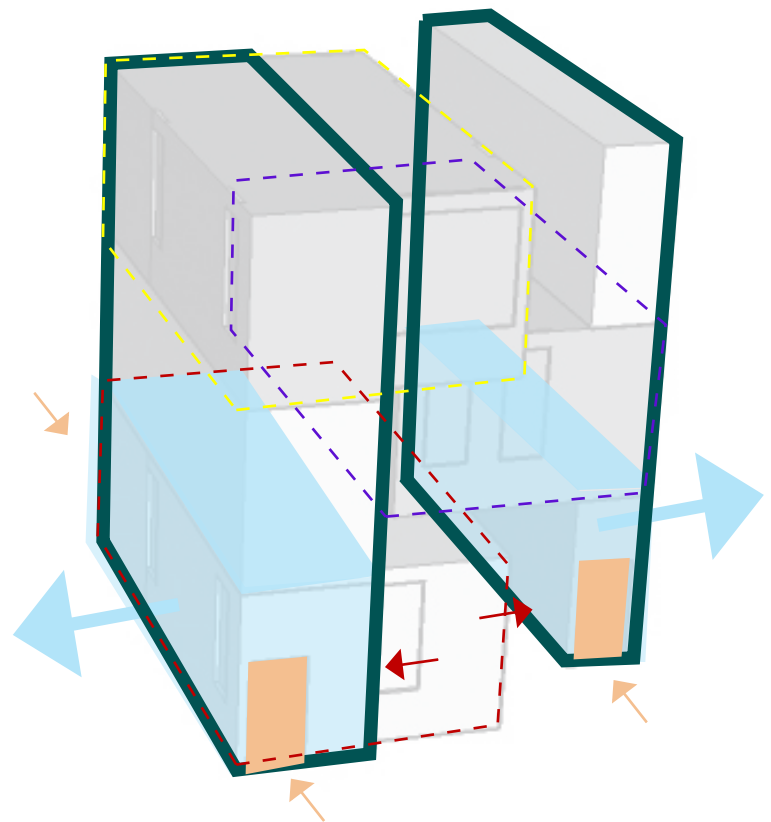
Utility Wall Concept




Ground Floor Unit

- Access to utility walls on both sides
- Possibility for mixed-use commercial/residential space
- Growth potential along the xy plane
- Private entrance option either front, side, or back
- Flexibility
- Multiplicity of configurations

Top Units

- Staircase provided within utility wall
- Possibility of two units on same floor with growth up, or one unit on second floor, third unit on third floor – both with private entrances
- Access to either double height utility wall on one side, or access to utility walls on both sides

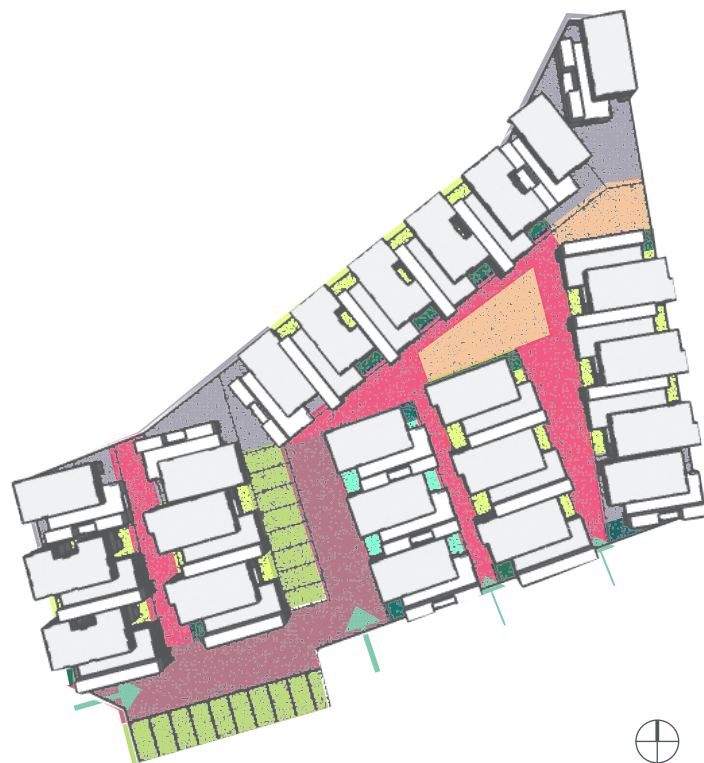


-  Third Floor Unit
-  Second Floor Unit
-  Ground Floor Unit
-  Commercial Use of Utility Wall
-  Private Entrances Front and Back
-  Utility Wall

Proposal for Use



5 10 50

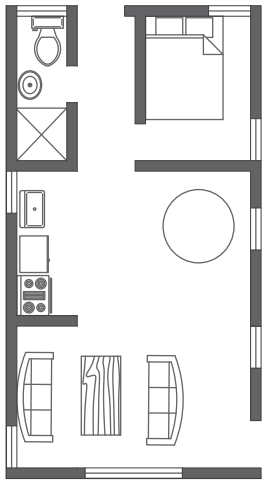


- Vehicular Circulation
- Pedestrian Circulation
- Non-Circulation Public Space
- Commercial Frontage
- 6 Lg. Irregular Individual Lots = 6 Families (1 commercial unit + 5 residential units)
- 3 Duplex Lots = 6 Families (2 commercial units+ 4 residential units)
- 14 Triplex Lots = 42 Families (9 commercial units +33 residential units)
- 18 Parking Spaces

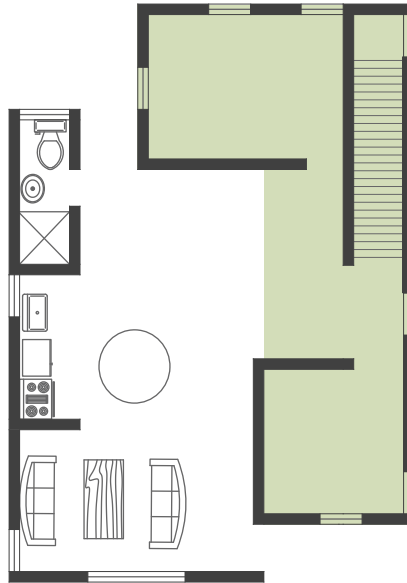
Total= 23 lots, 18 parking spaces, 54 Families (12 units are mixed commercial/residential, 42 are only residential)

Final Lot Configuration
with Housing

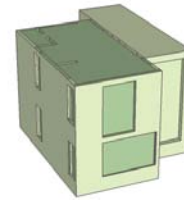
Single Family Progressive with Optional Ground Floor Commercial Space
Progressive Duplex with Optional Ground Floor Commercial Space
Progressive Triplex with Optional Ground Floor Commercial Space



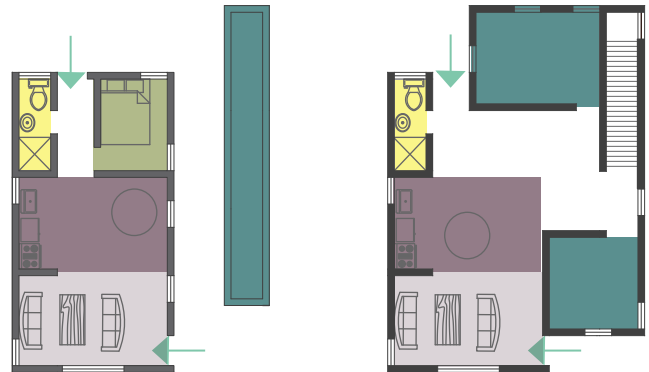
Initial Stage Single Family Home



Possible growth over time

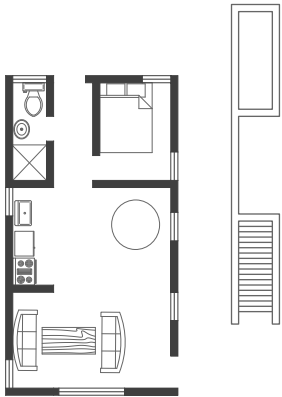


- Growth
- Kitchen
- Multipurpose Room
- Bathroom
- Bedroom
- Possible Commercial Use



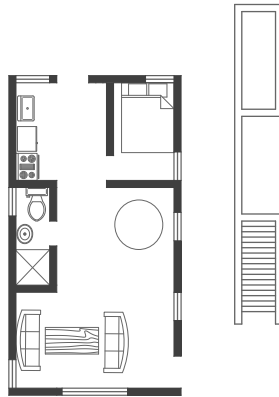
Single Family Progressive Home

Option 1



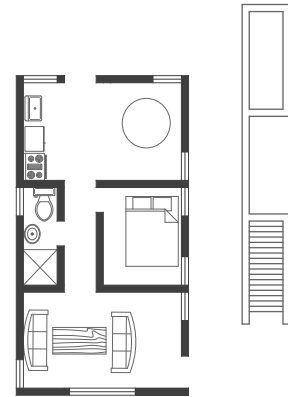
Duplex unit one ground floor initial stage
Layout with kitchen centre

Option 2

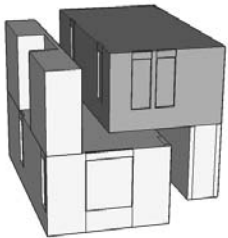


Duplex unit one ground floor initial stage
layout with kitchen and bedroom back

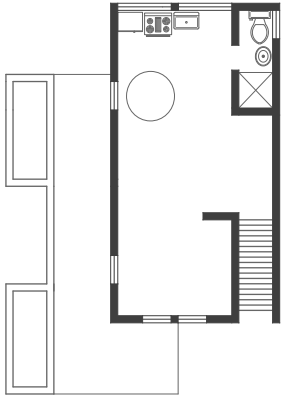
Option 3



Duplex unit one ground floor initial stage
layout with bedroom centre

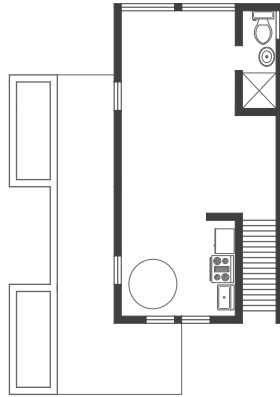


Option 1



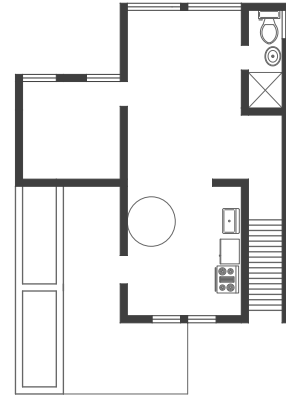
Duplex unit two second floor initial stage

Option 2

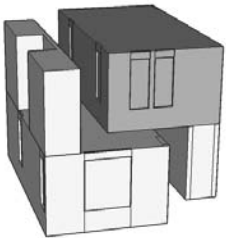


Duplex unit two second floor initial stage

Option 3

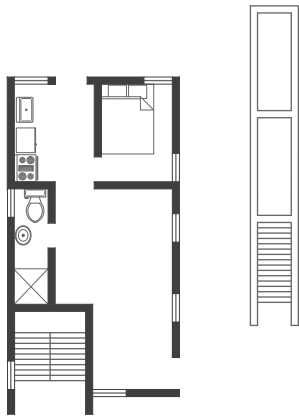


Duplex unit two second floor initial stage



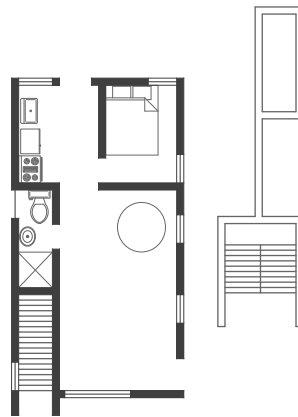
Duplex Unit Two - Second Level

Option 1



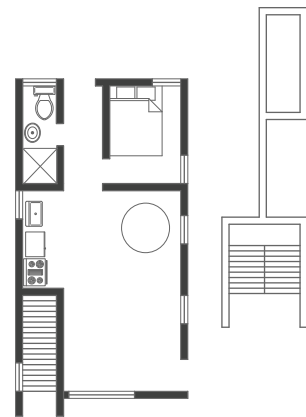
Triplex unit one ground floor initial stage

Option 2

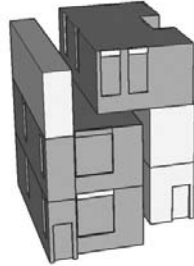
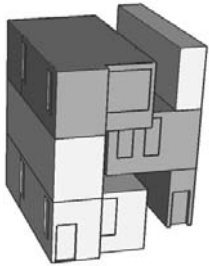


Triplex unit one ground floor initial stage

Option 3

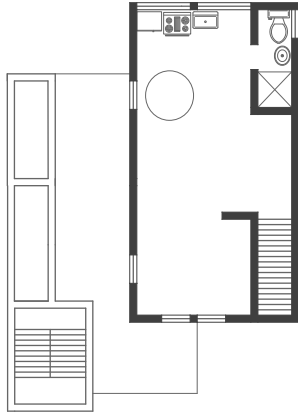


Triplex unit one ground floor initial stage



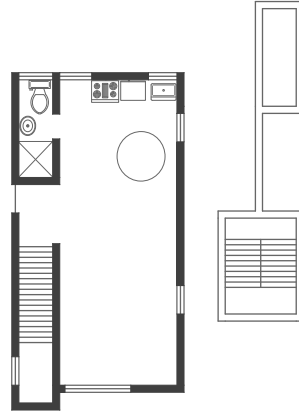
Triplex Unit One - Ground Floor

Option 1



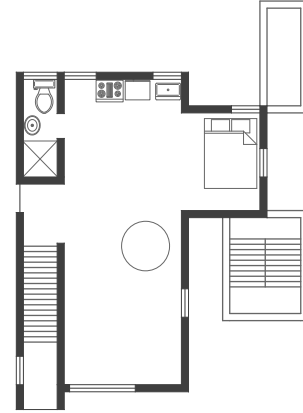
Triplex unit two second floor initial stage

Option 2

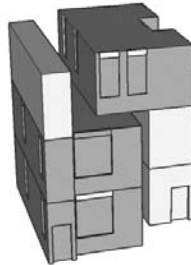
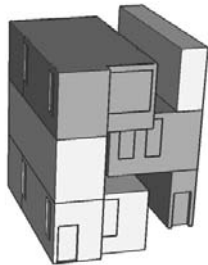


Triplex unit two second floor initial stage

Option 3

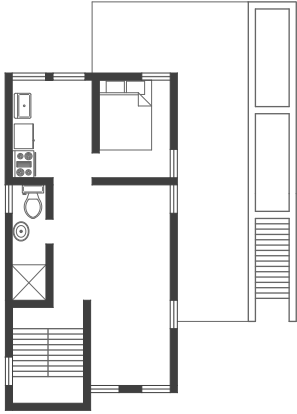


Triplex unit two second floor initial stage



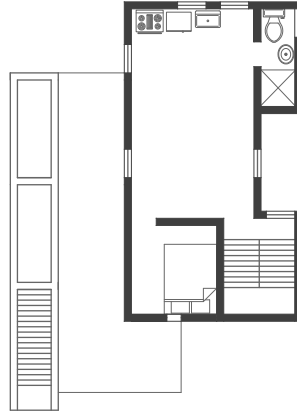
Triplex Unit Two - Second Floor

Option 1



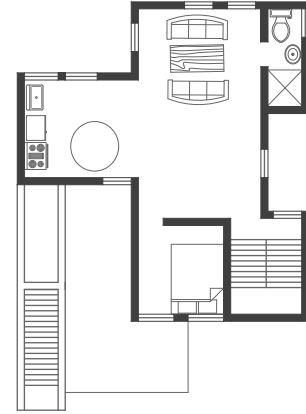
Triplex unit three third floor initial stage

Option 2

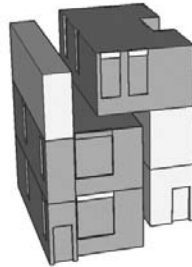
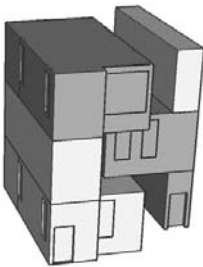


Triplex unit three third floor initial stage

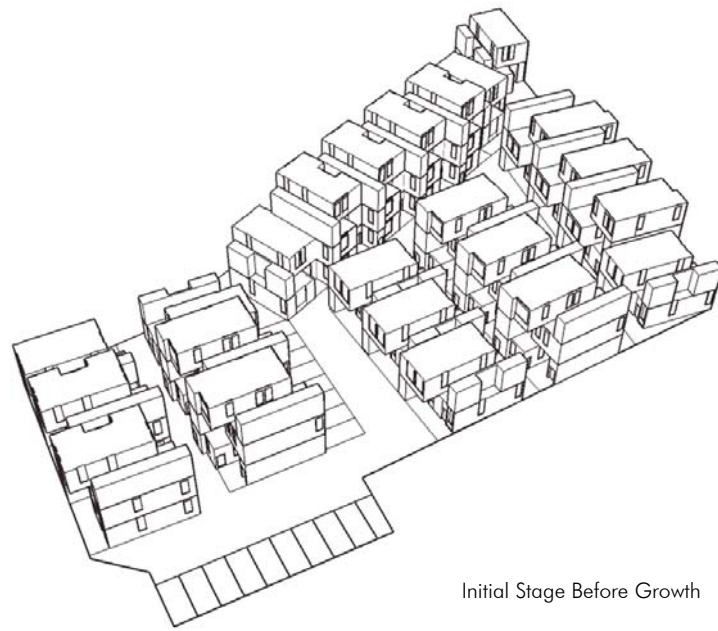
Option 3



Triplex unit three third floor initial stage



Triplex Unit Three - Third Floor



Initial Stage Before Growth



Transformation

Transformation of the Mazahua Neighbourhood Over Time



Early Stages of the Mazahua Neighbourhood



After Growth

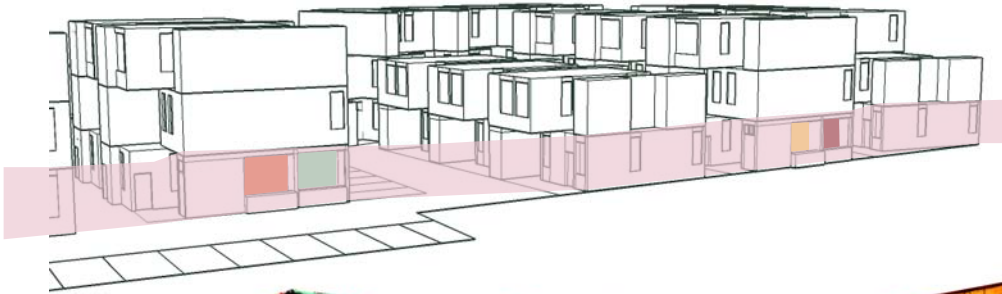
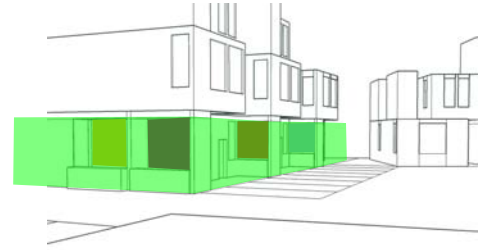
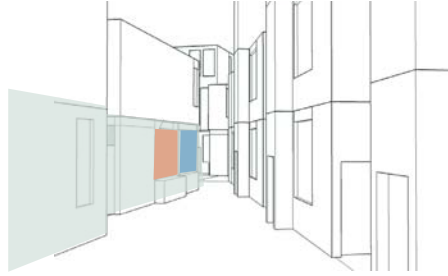


Initial Stage

Growth of the Mazahua Neighbourhood



Commercial Use of Utility Wall



Commercial Areas



Accomplishments of the final design proposal:

- the neighbourhood is made up of a mix of typologies creating variety of living, in-between space, height difference, and primarily choice for its residents, all typologies have the possibility to grow over time
- each dwelling has its own private access, and the ground floor dwelling has a front and back entrance
- the buildings have access to public space both in front and in back, yet are arranged in such a way as to provide a private patio for each dwelling, and an inside "street" of their own
- Every room in the dwellings have natural daylight, and important gathering spaces have a vista out onto the neighbourhood
- the design provides density without overcrowding - there are enough dwellings for 59 families, while the minimum size of each dwelling after full growth is 90 meters squared, maximum size 180 meters squared
- provides the possibility of having a work/live situation along the ground floor, increasing revenue for the neighbourhood
- a south-facing lot configuration allows good daylight for all buildings, all year round
- opening on to a cul-de-sac side-street to the south allows for more private access and traffic flow, yet is still open to the public
- the southern side-street has the possibility to act as a spill-out for commercial areas, and can possibly be used as a market on weekends
- this proposal considers how the housing and commercial revenue in the Mazahua development can evolve over time, while also interacting with the surrounding neighbourhood, simultaneously adding to the development of a larger community in San Ignacio

Conclusion