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# CONNECTING CANAL DE CHALCO

A Strategic Approach
to Upgrade an Informal Settlement
in Mexico City

Diplomarbeit

# Connecting Canal de Chalco
## A Strategic Approach to Upgrade an Informal Settlement in Mexico City

ausgeführt zum Zwecke der Erlangung
des akademischen Grades einer Diplom-Ingenieurin
unter der Leitung von

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Wien am 4. April 2014

*Dedicated to the residents of Colonia Chinampas de Santa María Tomatlán.*

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# INTRODUCTION

During a study mission in Mexico City, between September 2011 and May 2012, I met Professor Jorge Andrade-Narvaez who invited me to be part of a collective work between the *Universidad Autonoma Metropolitana - Xochimilco*, various faculty members and students to work on a project at *Canal de Chalco*.

My work focused on the history of Mexico City and in particular on the development of informal settlements. Part of my analysis concerned the government's policies for the management and upgrading of such areas, specifically as proposed in the community based *Programma Comunitario de Mejoramiento Barrial*

Besides the conceptual and historical perspective, my field work aimed at finding a strategy on an urban level to improve the informal neighborhood at *Canal de Chalco*.

My
Subjective Perception
of the City

## *La Ciudad de México*

Mexico City is a place that does not truly relate in size or structure to any typical European city known to us. The giant city is laid out in a chessboard pattern and even though there is certain structure, to me it seemed more like a labyrinth of streets blocked by countless cars stopped in traffic jams most of the time. Neighborhoods from different time periods, constructed on Lake *Texcoco* with the ruins of *Tenochtitlan*, the former capital of the ancient Aztec empire, are stretched out in the Valley of Mexico as far as the eye can see. Somehow, Mexico City is not only one city, it seems more like a cluster of numerous little towns, each with its own flair, its individual spirit and way of life, all huddled together to form one huge megacity.

The heart of the city is the Zócalo, one of the biggest main squares in the world with a size of 57,600 m$^2$. It is located in the *Centro Historico* surrounded by the ruins of the Aztec Temple Mayor, the cathedral C*atedral Metropolitana de la Asuncion de Maria*, the National Palace and many other buildings in colonial style [pic. 01]. Most of the time the square is crowded with activists and protesters, so one hardly ever sees the area cleared out. It also offers space for cultural events, concerts and there is even a Christmas market with an ice-skating rink in the wintertime.

It is difficult to find a place of silence wherever you go. The noise of the traffic and honking cars are a constant companion which you get used to after a while. Then you start hearing the calls of the street vendors and the recorded tapes of the *tamales* salespeople, the bells of the garbage trucks and the distinctive sounds of youngsters shouting "*hay gas*" at all hours of the day and night.

Walking through the city, I was confronted every day with old and new, rich and poor, living close together side by side, presenting a constant contrast between two worlds. The sparkling city center was later soon forgotten as I was sitting on a bus trying to find my way out of it all. Endless roads aligned with the *colonias populares* let you realize the inequalities that surround you. Still the city casts a spell on each and everyone, mesmerizing them to the point where it becomes hard to leave. There are so many things to discover – what might be hidden beyond the next corner?

[pic01] *Zócalo, Centro Historico*

Main Square in the historic center of Mexico City

# PROFILE

MEXICO CITY

# 01.1 FACTS & INFORMATION

## The Country

*Estados Unidos Mexicanos* | United Mexican States

Composition: Geographically, Mexico is part of North America, although geopolitically it belongs to Latin America [map 01]. The United Mexican States are a federation of 31 states and the Federal District, known as Mexico City [map 02]. The country has a population of more than 118 million people, of which 78% live in urban agglomerations (cia factbook).

Neighbors: To the North, Mexico shares a borderline with the United States of America and to the East with Guatemala and Belize. The remaining boarders are formed by the coastline of the Pacific Ocean to the West and South as well as the Gulf of Mexico and the Caribbean Sea to the East [map 01].

Languages: The national language is Spanish, although indigenous languages such as Mayan, Nahuatl and other regional dialects are still in use. 92.7% of the population speak only Spanish, merely 0.8% are in command of these indigenous languages, 5.7% speak both Spanish and one of these indigenous languages. The remaining 0.8% are unspecified (cia factbook).

## The City

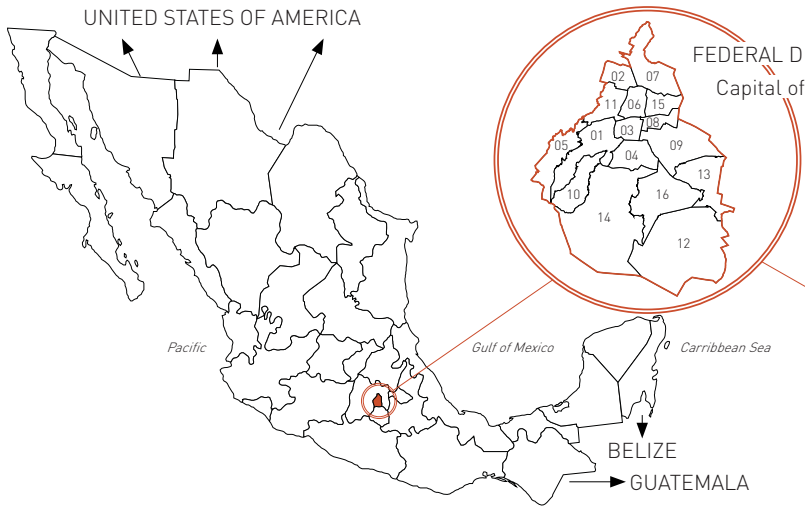
*La Ciudad de México* | Mexico City

Location: Mexico City is located in the Valley of Mexico, a high plateau in the Trans-Mexican Volcanic Belt, at an average elevation of 2,240 m. The city is surrounded by mountains and active volcanoes of which *Popocatépetel* (5,426 m) is the highest. Mexico City stretches out over an area of 7,854 km$^2$ [fig 01].

Megacity: At the beginning of the 16th century *Tenochtitlán*, the capital of the Aztec Empire, already formed the biggest urban agglomeration of the time and even today Mexico City is one of the largest megacities in the world. The city is the second-most populated urban agglomeration in the Western Hemisphere, after São Paulo (Brazil) and before New York-Newark (USA).
The metropolitan area has an estimated population of slightly over 21 million (cia factbook), with the Federal District inhabiting 8.8 million inhabitants (INEGI), [fig 01].
The metropolitan area of Mexico City is comprised of the Federal District with 16 boroughs, parts of *Estado de México* with as many as 59 districts and *Estado de Hidalgo* with only 1 district [map 03]. The city is home to roughly 19% of the total Mexican population (INEGI).

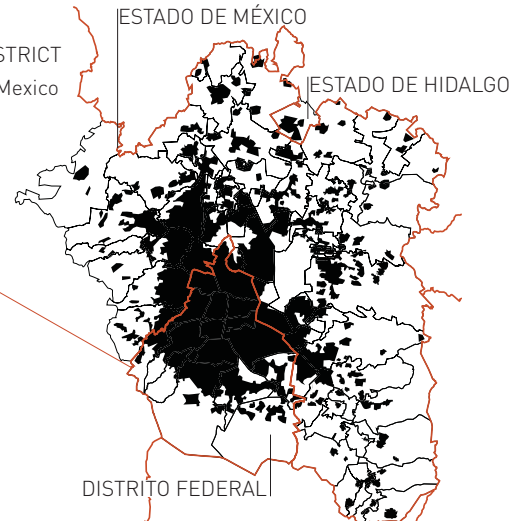
Names: The Mexicans have many names for their capital city and its inhabitants. The official appellation *La Ciudad de México* is hardly used in everyday language. Most commonly it is referred to as *el De-Efe,* an abbreviation of the *Distrito Federal* (D.F.) or simply *México*.
The inhabitants of Mexico City are either called *capitalino,-a*, *defeño,-a* or *chilango,-a*, indicating their place of birth. Originally, the *capitalinos* (capital) and the *defeños* (D.F.) were born and raised in the city, whereas the *chilango* came in from other parts of the country (Ward 1998, p. 37; Jachnow 2008, p. 47). The inhabitants of Mexico City are proud to be *chilangos* and furthermore *chilangolandia* is used to name the capital itself.

[map 01] Mexico in context to the world




[map02] United Mexican States and the Federal Districts 16 boroughs (*delegaciones*)

01 ÁLVARO OBREGÓN
02 AZCAPOTZALCO
03 BENITO JUÁREZ
04 COYOACÁN
05 CUAJIMALPA DE MORELOS
06 CUAUHTÉMOC
07 GUSTAVO A. MADERO
08 IZTACALCO
09 IZTAPALAPA
10 LA MAGDALENA CONTRERAS
11 MIGUEL HIDALGO
12 MILPA ALTA
13 TLÁHUAC
14 TLALPAN
15 VENUSTIANO CARRANZA
16 XOCHIMILCO




[map03] Metropolitan area of Mexico City 2010

URBANIZED AREA MEXICO CITY
RURAL AREA (E.G.: MOUNTAINS, CONSERVATION AREA)
STATE BORDER
MUNICIPALITIES
0 20km

**population [million]**

DF 8,851,080
ZMVM 21,081,587

**relation to national population [percent]**

DF 7.9%
ZMVM 18.8%

**population density [person/km²]**

DF 5,920
ZMVM 2,416

**surface [km²]**

1,485 DF
7,854 ZMVM

**urban area [km²]**

DF 630
ZMVM 2,249

[fig01] Mexico City in numbers

DF FEDERAL DISTRICT (*Distrito Federal*)
ZMVM METROPOLITAN AREA (*Zona Metropolitana del Valle de México*)

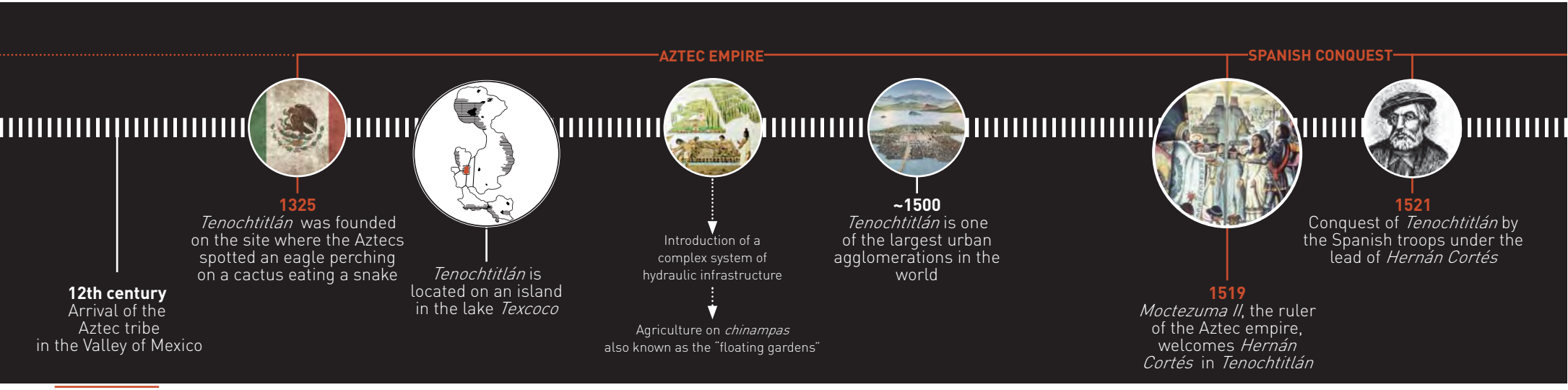
## 01.2 URBAN DEVELOPMENT

### From an Island in a Lake to one of the Largest Megacities in the World

Aztec Empire: The city *Tenochtitlán* was founded on an island in a shallow lake called *Texcoco* in the 14th century by the Aztecs. The poor, warring nomadic tribe started to migrate from the north-western region of the country to the Valley of Mexico in search for better living conditions. Legend states that the Aztecs followed the prophecy of one of their priests, whereas the journey would end as soon as they reach the place where an eagle, devouring a snake is perched on a cactus (Fernández 2011, p. 18-19). This image is still present on the green, white, and red Mexican flag.

As early as the 12th century, at the time of the Aztec arrival, the Valley of Mexico was already densely populated by various tribes even though the area was covered by a series of lakes and land was sparse. However, the fertile shores and perfect climate conditions offered an ideal living environment.
After a while the Aztec peoples settled on a swamp island in lake *Texcoco*, where the capital of the Aztec empire *Tenochtitlán*, was founded in 1325. The strategically well chosen location helped the Aztecs build a large empire in less then 200 years (Ribbeck 2002, p. 18).
The island of *Tenochtitlán* was connected to the main land by avenues constructed over dykes. These not only separated the brackish from the fresh water but also protected the city from floods. An aqueduct supplied drinking water. *Tenochtitlán* was extended by artificially created plots of land, called *chinampas* which were built into the shallow areas of the lake and provided additional land to cultivate fruits and vegetables (Suárez Pareyón 2009, p. 274). Around the year 1500 the city was one of the largest agglomerations in the world, with about 80,000 people inhabiting an area of roughly 2 km$^2$ (Ribbeck 2002, p. 18). At the same time the entire valley reached a total population of 1.5 million (Ezcurra, et al. 1999, p. 34).

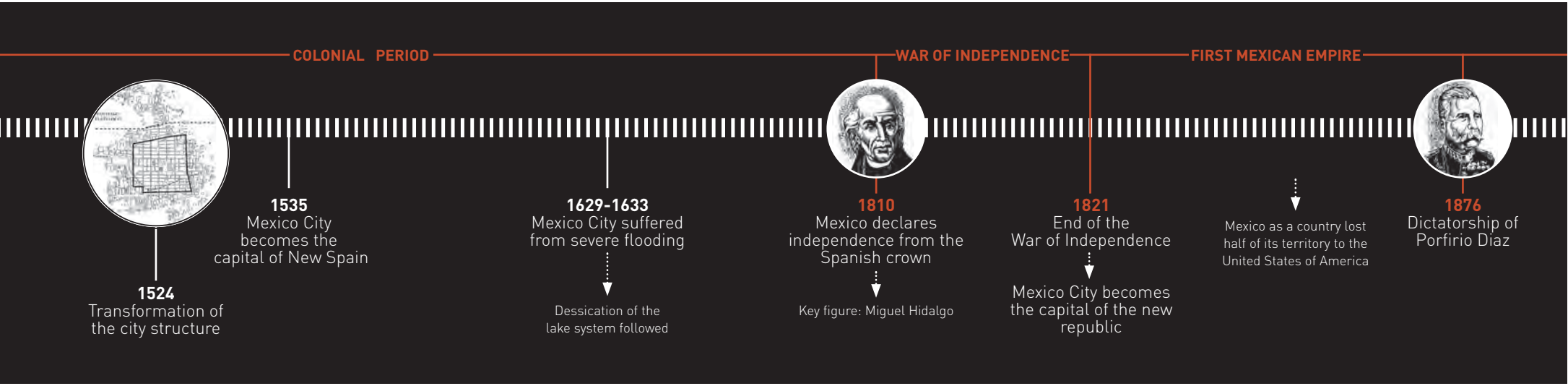
Spanish Conquest and Colonial Period: When the Spaniards arrived in 1519 under the command of *Hernán Cortes* they were immensely impressed by all the splendor *Tenochtitlán* had to offer. The strangers were falsely regarded as gods for whose return the Aztecs




[fig02] Timeline

were waiting. At the beginning the Aztecs and their ruler *Moctezuma II*, were very friendly towards the Spanish invaders and presented them with all sorts of goods and valuable gifts. In 1521 the Spaniards conquered the city with the help of several surrounding tribes who had suffered maltreatment by the Aztecs and therefore sought a way out of suppression (Fernández 2011, p. 26-28).
After the conquest the city was remodelled following the classical grid pattern of Spanish cities. The *Plaza Mayor* was located in the center from where streets ran on a north-south and an east-west axis. From there, 10-13 blocks in each direction were reserved only for the Spaniards. Outside the city center, the homogeneous grid pattern did not apply (Bailey Glasco 2010, p. 26). The Aztec temples and pyramids were replaced by churches and European architecture and the city became the capital of New Spain in 1535 (Becker, et al. 2008, p. 14).
Unfortunately, the complex system of the hydraulic infrastructure was destroyed because the Spaniards were unfamiliar with Aztecs irrigation techniques (cp. Chapter 03.2). As a result, the city was repeatedly flooded. In the 17th century the government drained the lakes which eventually led to the destruction of the existing ecosystem (Suárez Pareyón 2009, p. 274).
The population dropped significantly during the cruel conquest and more importantly as a result of new diseases having been brought in from Spain (Ezcurra, et al. 1999, p. 35). Between 1700 and the mid-19th century there was only very little growth, comprising 6 to 10 km$^2$ (Ward 1998, p. 42). During the late 18th and early 19th century the population of the city rose to approximately 180,000 people (Bailey Glasco 2010, p. 21).

Independence and First Mexican Empire: The colonial era came to an end when Mexico declared independence from Spain in 1810, leading to the War of Independence (1810-1821). Mexico City became the capital of the newly established republic in 1821 (Ribbeck 2002, p. 22).
During the following decades Mexico not only had to overcome the struggles of independence from Spanish imperialism and European and North American invasions but also internal conflicts between liberals and conservatives. Although Mexico City maintained its importance and central position throughout these conflicts Mexico as a country lost half its territory

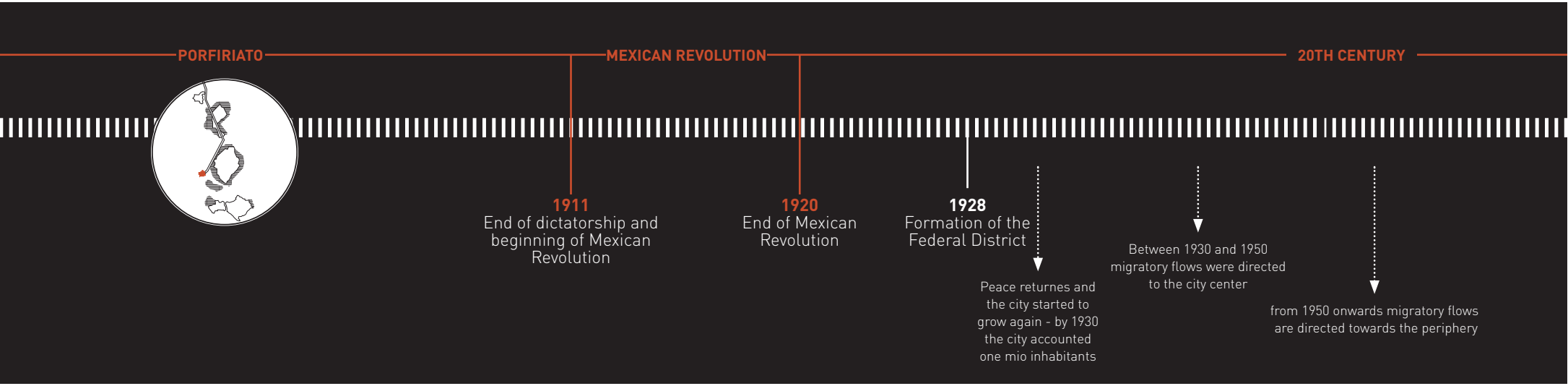


(California, Texas and New Mexico) to the United States of America (Suárez Pareyón 2009, p. 275). Vast political and economic changes took place and Mexico began to define a new future for itself. New laws were enforced and the country opened up to investments and new technologies from other countries.

Porfiriato: Under the dictatorship of General *Porfirio Díaz* who gained power in 1876 and governed until 1911 the country was led to a first period of "globalization" (Suárez Pareyón 2009, p. 275). Role model for Mexico City's development were European standards. Boulevards with magnificent buildings were constructed and smaller towns around the city center were imbedded in the urban structures. The city continued to expand when advanced basic infrastructure and electricity were introduced around 1900. Factories and railroad networks attracted people from all over the country who sought labor in the capital (Ezcurra, et al. 1999, p. 36). The first decade of the new century started off into the modern age - Mexico City found itself in full expansion mode. The down side of industrialization was, that the development of the city was achieved by an impoverished rural society (Suárez Pareyón 2009, p. 275). At that time the city boasted approximately 720,000 inhabitants (INEGI).

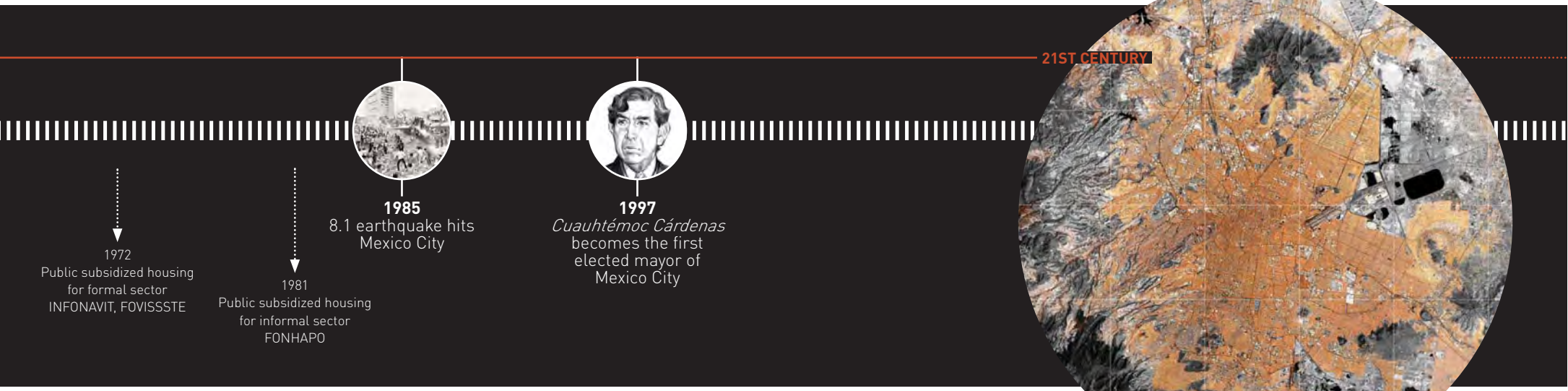
Mexican Revolution: The era of *Porfirio Díaz* came to an end when he was exiled in 1911. The Mexican Revolution began and lasted until 1920. It brought important reforms and social organization, thus becoming one of the most important sociopolitical events in Mexico (Fernández 2011, p. 123-128). The revolution brought little damage to Mexico City due to the fact that hostilities were more or less restricted to rural areas (Ezcurra, et al. 1999p. 36). However, there were only few investments made in construction and urbanization in view of the uncertain time (Suárez Pareyón 2009, p. 275 ).

20th Century: In 1928 Mexico City lost its municipal status and became the Federal District (Becker, et al. 2008, p. 15). The post-revolutionary period was a decade of uncertainty until peace returned in the 1930s. At that time Mexico City reached one million inhabitants. Between 1940 and 1960 the city grew most rapidly. Industries settled all over the city because of the Import-Substituting-Industrialization



(ISI) program which was set up to promote production inside the country. The increasing demand for labor led to more and more people seeking employment in the city. At first the migrants found shelter in the abandoned city center as well as in newly built apartment blocks at the edge of the city (Ward 1998, p.43, 55) Insufficient housing resulted in the development of illegal settlements, constructed mainly in the eastern and northern parts of the city. Suburbanization began in the 1950s (Suárez Pareyón 2009, p. 275) and construction of the metro network started in 1967 (Bataillion; Rivière D'Arc 1973, p.120)
The first publicly subsidized housing programs were launched in 1972 for lower-middle income groups employed in the formal sector. Within the following decade workers from the informal sector were also eligible for subsidized housing. (IDB 2011).
In 1985 a 8.1 magnitude earthquake destroyed many parts of Mexico City's central area. 10,000 people were killed and thousands were injured or left homeless. Although the marks of the quake could be seen decades later, the reconstruction and the development of 60,000 new houses were achieved in a combined effort of government and civil services (Suárez Pareyón 2009, p. 276).
The financial crisis of 1994 reduced real estate investments and the effects lasted on until the end of the century (Suárez Pareyón 2009, p. 276), at which time Mexico City inhabited approximately 18 million inhabitants (INEGI).

Into the 21st Century: The left wing government reformed the exiting structures of Mexico City. An urban development law was passed together with an urban development plan.
To prevent urban expansion into the nature conservation zone in the south of the Federal District, there were projects to revitalize the central boroughs that had lost population. Further, public transport and the existing road network in the city were improved. Today, Mexico City is the political and financial center of the country.
Mexico City is sill confronted with countless challenges, resulting from the rapid demographic and urban growth of the second half of the past century.




[map04] Mexico City' metropolitan area, 2010

## 01.3 DEMOGRAPHIC DEVELOPMENT

### With a Focus on Social and Spatial Fragmentation

Cities throughout the world are known to be fragmented and patterns of social and spatial segregation can often be observed. The reason for this fragmentation can generally be found in economic, religious or ethnic backgrounds of the people.
In Mexico City, as in other Latin American cities, the polarization between rich and poor quarters has become more and more tangible. The wealthier and better-educated population can thus afford to live in areas with a higher level of urban infrastructure, better social and cultural facilities as well as plenty of recreational space. Single-family homes are legally constructed on large plots of land and apartment buildings are well equipped. Lower-income groups are restricted to parts of the city with affordable housing. These areas frequently lack the most basic prerequisites, such as potable water or even electricity. They are often marked by high population densities and consequently by higher crime rates. Social and spatial segregation did not only occur in the 20th century when the city underwent the process of becoming a megacity.
The Aztecs already pursued hierarchical development structures in their capital *Tenochtitlán*. At that time temples, palaces and a market place were constructed in the city center for the more privileged population. The working class people lived and worked on the so-called *chinampas* outside the city center (Ribbeck 2002, p. 18).

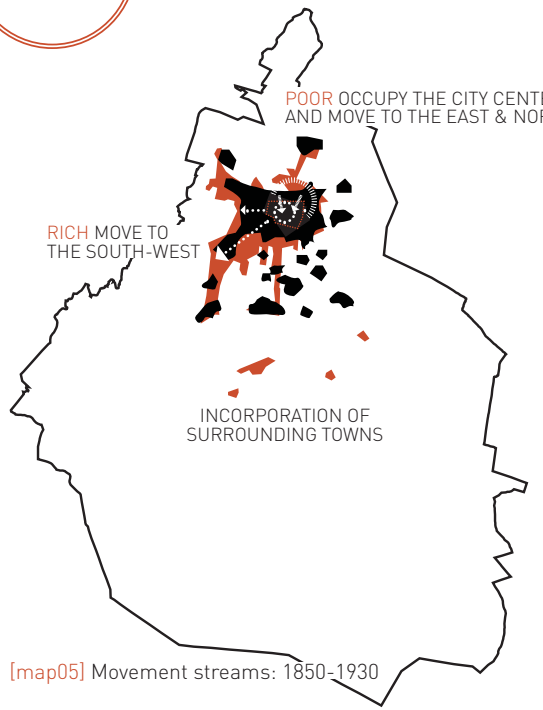
After the Spanish conquest in the 16th century, the Spaniards laid out a chessboard pattern over the ancient Aztec capital and constructed the *Plaza Mayor* (later called *Zócalo*) in the city center (Ribbeck 2002 p. 20). A colonial regime led to social and spatial fragmentation. In the beginning, only the Spaniards were allowed to reside in the magnificent homes and impressive public buildings with open recreational spaces within the city center. This part of the city was designed as European-only zone, the so-called *traza* (Bailey Glasco 2010, p. 19). The indigenous people, on the other hand, lived a hard working life in small cottages outside the city (cp.: Ribbeck 2002 p. 20).
Apart from these aforementioned alterations to the city structure after the Spanish conquest there was little expansion of the city limits until the middle of the 19th century (Ezcurra, et al. 1999, p. 46).

1850-1930 | Migration from and to the City Center [map05]: Throughout history the city center belonged to the élite, with the working class population living well away from them. In 1856 land that formally belonged to the church was nationalized and soon after the avenue *Paseo de la Reforma* was constructed to link the Executive's official residence at *Chapultepec Castle* with his place of work at the *Zócalo* (Ward, 1998, p. 55). Attractive land in the periphery was provided and eventually sold off to the upper-class citizens. (Ezcurra, et al. 1999, p. 46). Around the turn of the 19th century there was major improvement done to the road network and an electric tram was introduced.
The upper-class was no longer restricted to the relatively overcrowded city center and moved to the south-west (Ward 1998, p. 55). Residential neighborhoods (e.g. *Lomas de Chapultepec*) with modern urban improvements, such as the installation of running water and sewerage were established, summer residences in the periphery were used more frequently and new weekend homes were developed. As the city expanded some of the surrounding villages, such as *Tacuba* and *Tacubaya* were eventually integrated into the city structure (Ezcurra, et al. 1999, p. 46). Numerous mansions and residences were vacated in the city center. The traditional *vecindades* were remodeled and rented out to the urban poor, very often accommodating several families (Ward 1998, p. 55). New one- or two- storey apartment blocks, similar to the traditional *vecindades* were constructed with living quarters arranged around a now much smaller patio. The residents, who were needed in large numbers in factories and for the railroads usually had to share bathrooms and kitchens (Bredenoord, Verkoren 2010, p. 360).
Just before the Mexican Revolution started in 1911, the city was spatially and socially divided. The regions in the south-west belonged to the high income population, whereas the poor families occupied the city center and from there the laborers moved to the eastern and the northern parts in search of work (Ezcurra, et al. 1999, p.46).

1930-1950 | Rural-Urban Migration [map06]: At this time Mexico's economy focused on an inwardly development strategy. The Import-Substitution-Industralization program fostered the development of consumer goods made in Mexico. The newly established industries, many

MOVING FROM AND TO THE CITY CENTER

1850-1930




[map05] Movement streams: 1850-1930

RURAL-URBAN MIGRATION

1930-1950

[map06] Movement streams: 1930-1950

MOVEMENT FLOW RICH
MOVEMENT FLOW POOR
FEDERAL DISTRICT
CITY GROWTH
0 10km

[fig03] Population growth 1910-2010

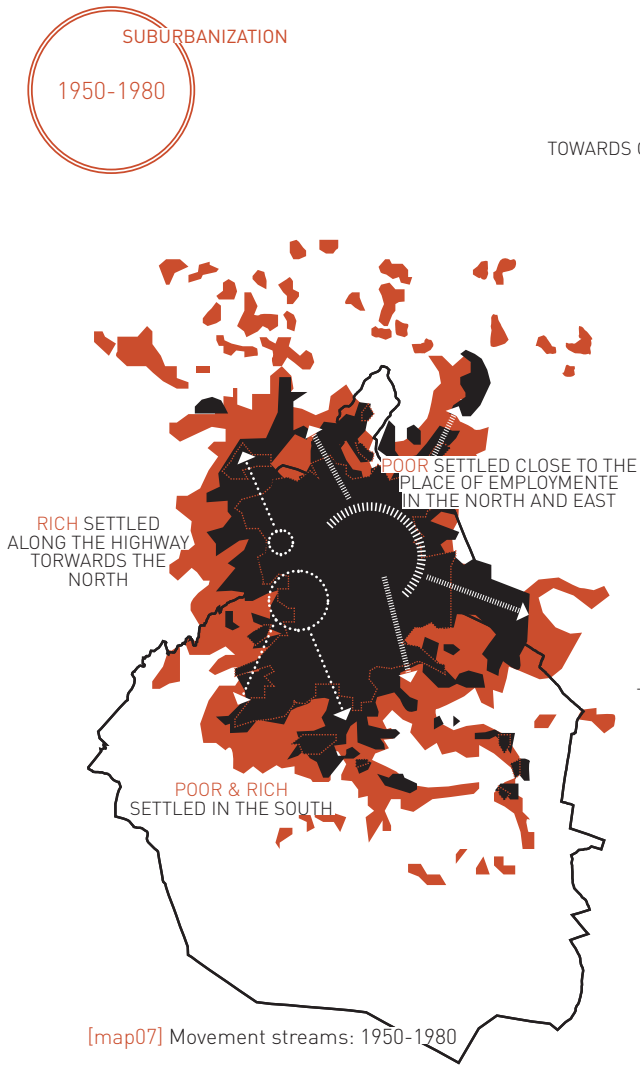
DF FEDERAL DISTRICT (*Distrito Federal*)

ZMVM METROPOLITAN AREA (*Zona Metropolitana del Valle de México*)

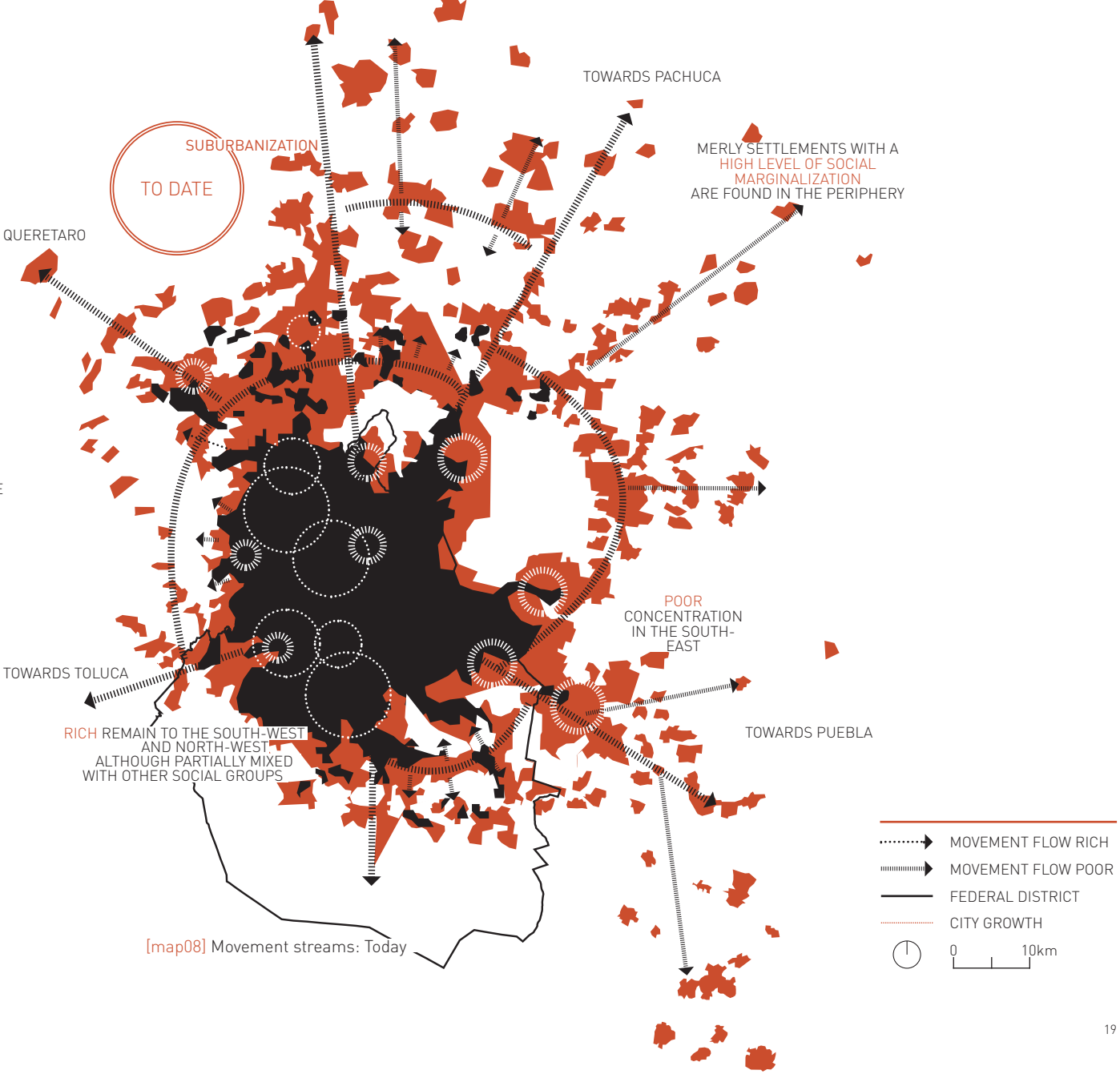
of them around Mexico City, directed toward domestic markets by imposing high protective tariffs and other restrictions on imports (Merril, Miró 1996).
The demand for labor increased and massive rural-urban migration followed. Between 1940 and 1950 the annual growth rate in the Federal District reached its highest point of 5.5%. The driving force was without doubt migration, which accounted for 73.3% of the city's growth (Ezcurra, et al. 1999, p. 40). The arriving, mostly poor rural population, settled close to their workplace, once again to the north and east of the city (Bataillion; Rivière D'Arc 1973, p. 31).
The improvement of the central traffic ways, most importantly the construction of the streets *Insurgentes* and *Calzada Tlalpan* leading southwards out of the city center, influenced a ribbon-type development (Ward 1998, p. 55). Low-density upper class neighborhoods were established along these routes.
The city expanded in all directions and affected both, the rich and the poor social groups which continued to be separated spatially and socially. The high-income class moved further to the south and west, whereas the working class settled in the eastern and northern regions (Ward 1998, p. 55).

1950-1980 | Suburbanization [map07]: Until the 1950s the city did not expand beyond the limits of the Federal District. There was a construction ban against further residential development in the Federal District which led to expansion into the neighboring state of *Estado de México*, where these restrictions did not apply and taxes were more favorable (Ward 1998, p. 56, 57). This led to annual growth rates up to 18% in some of the municipalities between 1960 and 1980, far beyond those in the Federal District (Ezcurra et al., 1999, p. 42). Therewith, the demand for housing increased.
The development of a new housing area *Ciudad Satelite* (1957, *Estado de México*) and the construction of the *México-Querétaro* highway in the north-west attracted the middle and upper classes to move towards the north (Ezcurra et al., 1999, p. 47).
The poor, on the other hand, were displaced farther and farther to the east. Industrial zones, which had been established around railheads in the Federal District, spread out farther to the north and east. Low-income neighborhoods grew in these areas, but available land in the desiccated lakebed of *Texcoco* was ill serviced and lacked basic infrastructure (Ward 1998, p.142). The renting sector for the low-income groups became insufficient and self-help housing, mostly built illegally, was the only option outside the regulated housing market. Self-help housing was the conventional form of development in rural Mexico. Since the second half of the 20th century this has been the major driving force for massive urbanization in Mexico City (Bredenoord, Verkoren 2010, p. 360, 363). The best known example for this development is *Ciudad Nezahualcóyotl* in the State of Mexico where the population rose from 65,000 in 1960 to 650,000 one decade later. This neighborhood is still growing and today it is the most densely populated part of the metropolitan area of Mexico City (Ezcurra, et al. 1999, p. 47).
In 1968 the ban of the early 1950s was repealed and the result was renewed expansion to the south of the Federal District by mixed social groups. Around this time the government started to acknowledge the problem of informal settlements and implemented a housing finance program. This resulted in the construction of massive lower-middle-income housing units in the south (c.p. chapter 02.3.2), (Suárez Pareyón 2009, p. 276).

1980 to Date | Tendencies [map08]: These last decades have been marked by a depopulation of the historical city center, the growth of the municipalities in the State of Mexico as well as the expansion of the city towards the periphery (Aguilar; Ward 2002, p.10).
The Mexican economy suffered a severe breakdown in 1982, causing the worst recession since the 1930s. The time between 1980 and 1990 were the only years of the 20th century where the population actually declined in the Federal District. This was due to the fact that the development strategy based on Import-Substituting-Industrialization program was no longer sustainable and industries were relocated farther away from the central areas of Mexico City. In addition to all this a severe earthquake shook the city in 1985 (Alba 1998, p. 1223).
This was a time of rapid growth and expansion along the fringe of the urban built-up area but mainly in the periphery along the roads to *Puebla* (east) and *Pachucha* (north-west) as well as some hot spots along the motorway towards *Querétaro* and *Tulancingo* (north-west). Reasons for this trend was not only the relocation of industries farther out from the central ares of Mexico City but also stricter land-use controls on the mountain



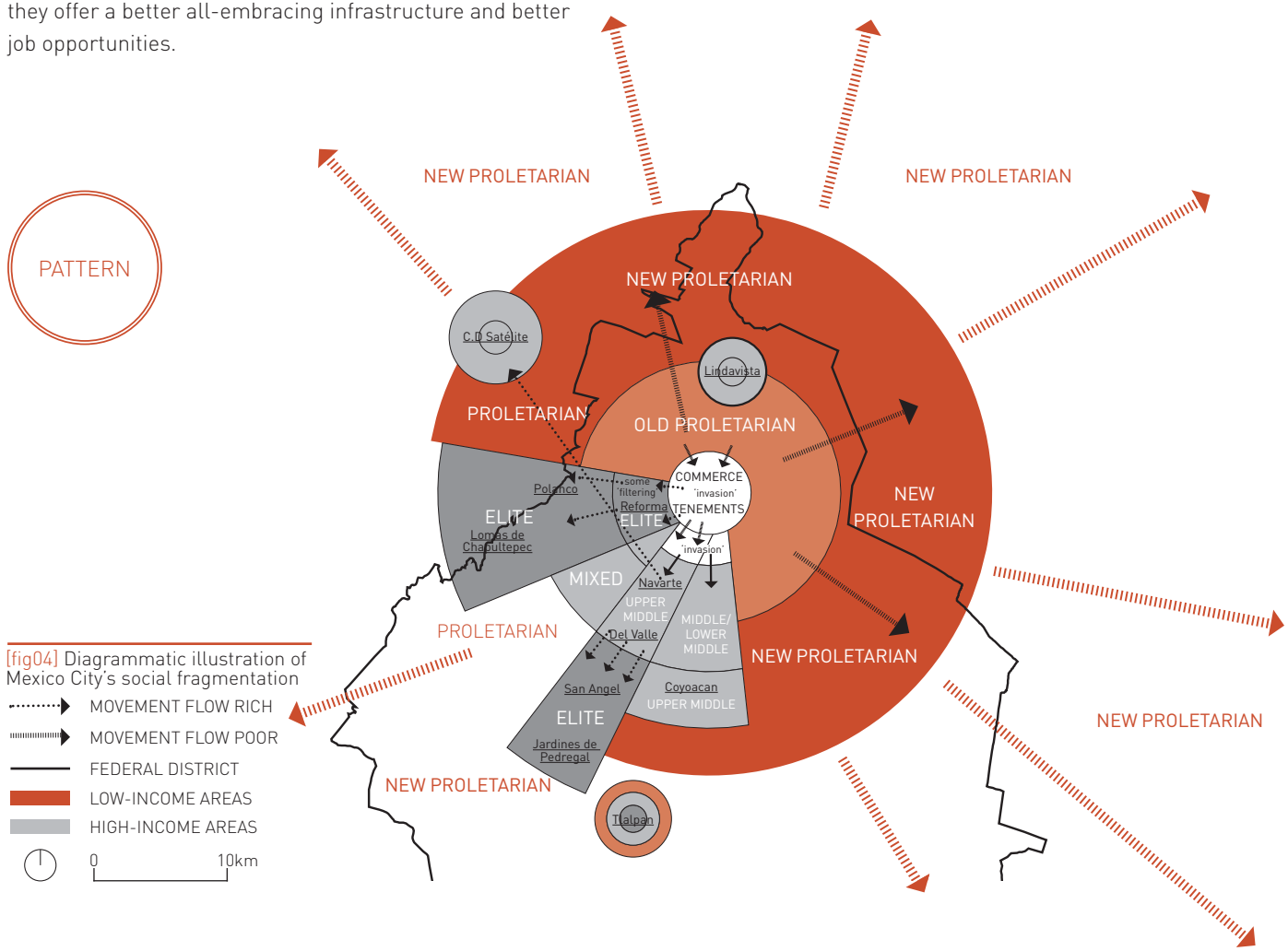

[map07] Movement streams: 1950-1980



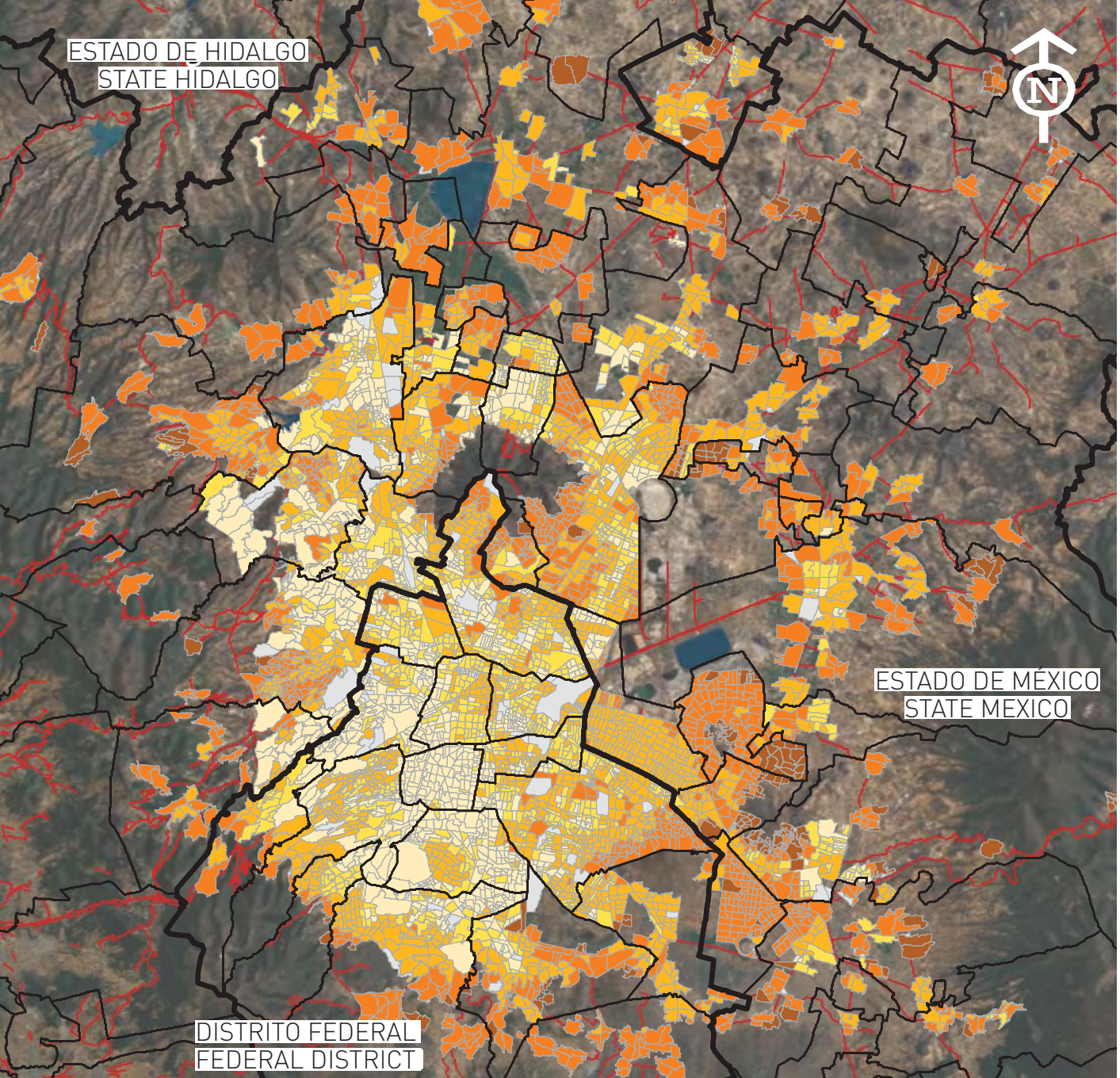

[map08] Movement streams: Today

slopes to the south of the Federal District (Aguilar; Ward 2002, p. 12).
Mexico City's economy shifted from an industrial and manufacturing market in the middle of the 20th century to an emerging role as a financial and commercial city.
As jobs became spares in the manufacturing sector the people went to work as household servants for higher income families. This resulted in neighborhoods where different income groups lived more closely together.

If we look at the social marginalization of the metropolitan area in 2010 [map09], the basic structures that evolved in the 20th century still remain. The northern, eastern and southern, as well as some of the central parts of the Federal District, are occupied by the middle and lower income groups. The western parts are reserved for the upper classes.
In the course of time, neighborhoods were "downgraded" as the middle class settled in former élite quarters such as *Polanco*. On the other hand, the rich rediscovered the historically valuable towns of *San Angel* or *Tlalpan* in the south of the city (Ward 1998). However, signs of mixture between the different social groups have become noticeable in some parts of the Federal District as well as in some areas of the surrounding State of Mexico, mainly in the west. The eastern parts of the city and the periphery of the metropolitan area remain restricted to the weakest income groups. The areas in the periphery are ill developed and continue to lack basic infrastructure. Additionally, there is the burden of having to commute long distances to and from the city. Therefore, the residents who live outside the city are often excluded and have no access to the amenities the big city has to offer. This concludes that the central areas are richer because they offer a better all-embracing infrastructure and better job opportunities.




[fig04] Diagrammatic illustration of Mexico City's social fragmentation




> *"Factors such as lowered wages, the reduction of formal sector employment, the transfer of jobs to the informal sector, and the loss of purchasing power, combined with a service sector that concentrated wealth among a professional elite, accentuated the city´s social polarization"*
> (Carmen Moreno Carranco, p.39)

[map09] Illustrates the Level of Social Marginalization in the metropolitan area in 2010 (CONAPO)

- 2,4% VERY HIGH
- 23,6% HIGH
- 37,3% MEDIUM
- 18,3% LOW
- 18,1% VERY LOW
- 0,3% N.A
- STATE
- MUNICIPALITIES/DISTRICTS
- COLONIAS
- 0 — 10km

[pic02] Informal settlement in the north of Mexico City's metropolitan area

# 06 INFORMAL SETTLEMENTS

## 02.1 DEFINITION

Informal settlements are "areas where groups of housing units have been constructed on land that the occupants have no legal claim to. These are unplanned settlements where housing is not in compliance with current planning and building regulations" (OECD Glossary).

***favelas*** brasil

***barrios*** venezuela

***villas miseria*** argentina

***COLONIAS POPULARES*** MEXICO

Informal settlements throughout the world can not be compared to each other. The term not only varies from country to country and region to region; there is also great difference in how the people live their lives and master their problems. Nevertheless, there are certain characteristics that apply to all these dwelling forms (defined by UN-Habitat, 2006/07). A group of individuals living under the same roof in an urban area which lacks one or more of the following criteria: (1) durable housing, (2) sufficient living space, (3) safe water, (4) adequate sanitation and/or (5) security of tenure [fig05].
These illegal dwellings are often characterized by poverty, high population density, social disorganisation, substandard housing, inadequate sanitation and lowly infrastructure (Acioly Jr. 2010, p. 223).

The reasons for this development and the continuance of informal settlements in urban agglomerations are not easy to define. They are often only associated with rural-urban migration attributed to people seeking employment and improvement of their living conditions. Industrialization and a large demand for labor attract workers to move to the cities. Over time the cities grow, also due to increased birth rates and the better health care systems, leading to longer life expectancy (Ward 1998, p. 43). As a result there is a bigger demand for affordable housing which the cities can not provide. As a consequence, the poor try to find solutions themselves. The UN-Habitat informed in its Global Report on Human Settlements (2003), that in most cities the formation of informal settlements will continue on – Mexico City is no exemption(UN-Habitat 2003, p. xxvi). Even though, in general, growth rates of metropolitan areas in Latin America are declining, informal settlements continue to grow rapidly (Acioly Jr. 2010, p. 227). Over time policies in dealing with slum dwellers and/or informal settlements have changed in a way that there are now fewer forced evictions and the focus lies on helping people upgrade their existing neighborhoods (UN-Habitat, 2003).
However, informal settlements are not inevitably linked to low-income households. The formal housing market in many megacities can not provide enough living opportunities and therefore, relatively high income-groups also build their homes illegally (Acioly Jr. 2010, p. 222-223).

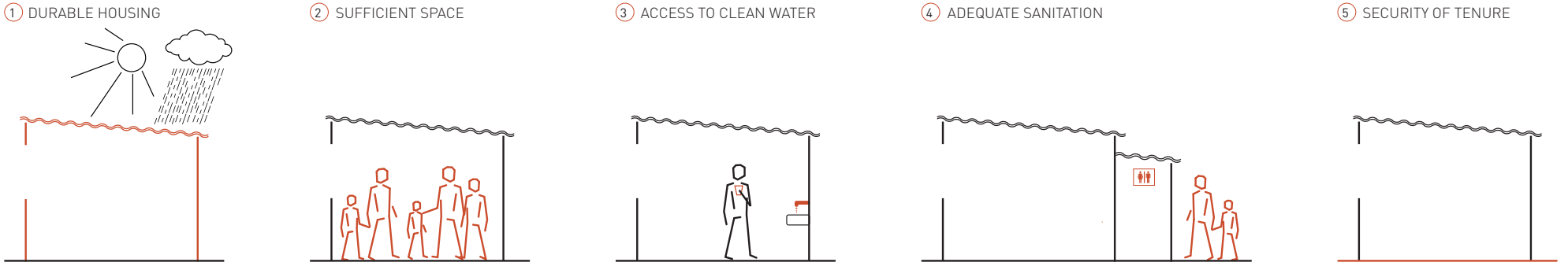
> *"Slums are a physical and spatial manifestation of urban poverty and intra-city inequality. However, slums do not accommodate all of the urban poor, nor are all slum dwellers always poor."* (UN-Habitat, 2003)

Mexico City: Most of the informal settlements were built somewhere between the mid 1950s and the 1980s (Conolly 2003, p. 13), when people moved to Mexico City because of the surging industrialization and a higher demand for labor. More than 60% of the population live in *colonias populares* as the "popular-class neighborhoods" in Mexico are called. These settlements occupy approximately half of the urbanized area of the Federal District, parts of the State of Mexico and parts of the State of Hidalgo. Due to the fact, that the Federal District and the two neighboring states are each in the hands of different political parties, people are subjected to numerous laws, housing policies and/or finance regulations. Coherent solutions in dealing with informal settlements are hard to pinpoint (Becker, et al. 2008).

*“ UN-HABITAT defines a slum household as a group of individuals living under the same roof in an urban area who lack one or more of the following:*

*1. DURABLE HOUSING: meaning a permanent structure that protects against extreme climate conditions.*
*2. SUFFICIENT LIVING SPACE: meaning not more than three people sharing the same room.*
*3. SAFE WATER: meaning easy access in a sufficient amount and to an affordable price*
*4. ADEQUATE SANITATION: meaning access in form of a private or public toilet shared by a reasonable number of people.*
*5. SECURITY OF TENURE: meaning a security that prevents forced evictions.”*

(UN-Habitat)



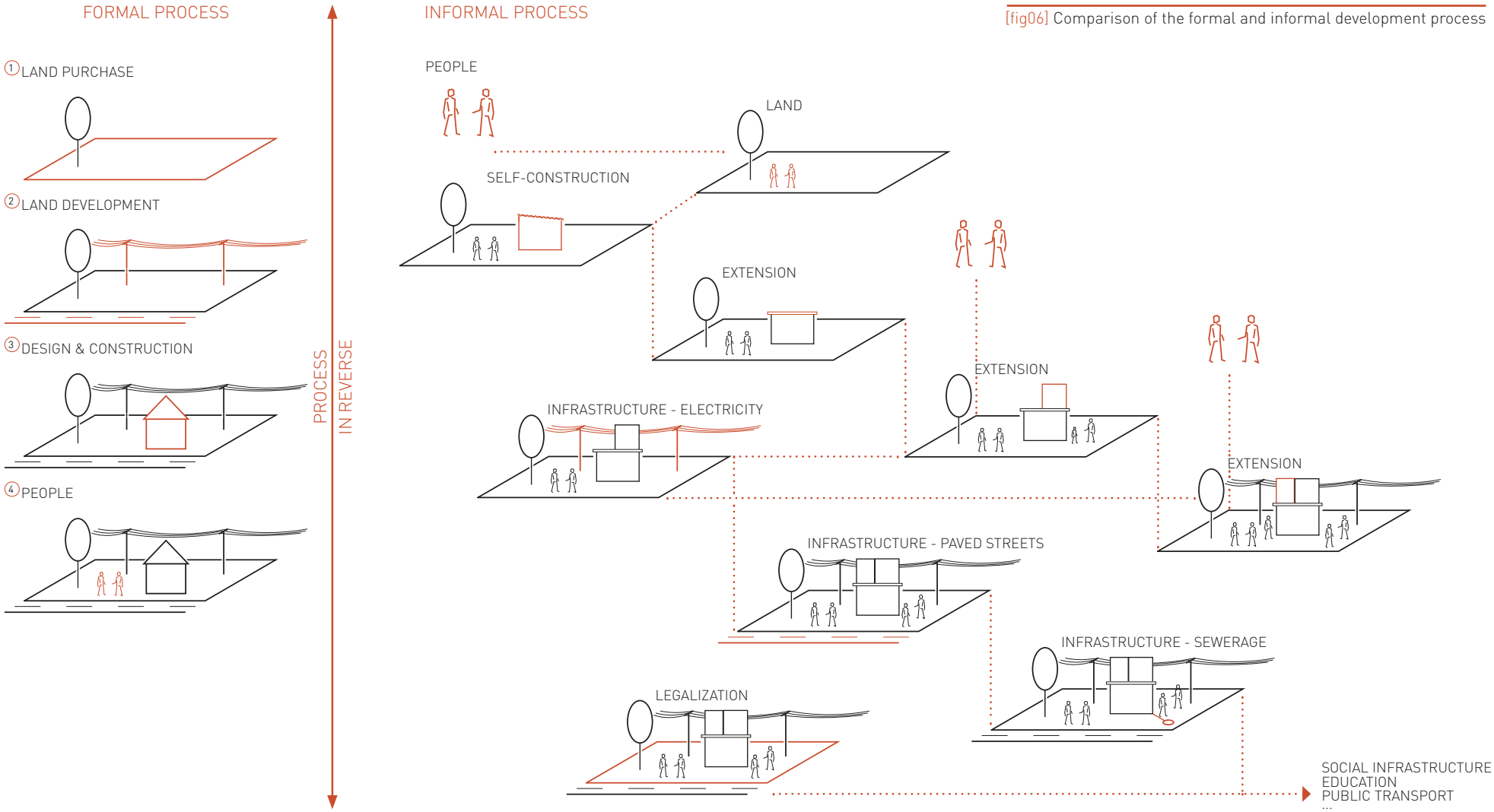

[fig05] Graphical illustration of a slum household as defined by UN Habitat

## 02.2 DEVELOPMENT PROCESSES

Generally, informal settlements come to existence in the reversed order from formal housing development projects. The process follows many different stages over an extended period of time. The emergence is always subject to numerous factors. The following description is based on the City Alliance Policy Research (Wakely; Riley 2011, p. 2-4) if there is no other reference.

Land Acquisition: Informal settlements are erected on land where perpetual housing development is not allowed. Notably in Latin America large numbers of people literally invaded large tracts of land during the 1960s and 70s. Occupied land is often unsafe or otherwise unsuitable for residential use, located either on steep slopes, near riverbanks, under power supply lines or close to highways. The plots are often vulnerable to land slides, flooding or other natural hazards.
Illegal squatting is only one form of land occupation for informal settlements. The other is the unauthorized sale of land to low income groups for an affordable price because of unclarified legal tenure.
Often peri-urban agricultural land is parcelled and vended by the owner or informal developers acquire large tracks of land which are subdivided and retailed to the poor. Sometimes these developers even offer loans, to which prospective buyers would not have access on the official money market.
The bigger issue is the un-serviced property. Basic infrastructural necessities such as paved streets, running water, electricity supply or wastewater sewerage as well as basic services such as schools, clinics or recreational areas are mostly provided years after the dwellings were founded.
Self Construction: Most of these homes are originally built as simple shelters to be extended and remodeled over time. This happens for various reasons: First, everything depends on the money available to the builder at the time of construction and the family income in the years thereafter. Non-durable and secondhand building materials need to be renewed and lastly, more space is necessary as the family grows.
Due to the lack of legal ownership and the constant risk of being evicted, permanent building structures are not a major priority. On the contrary, money is in such short supply that people are forced to invest in small businesses enterprises and set money aside for children's education. As an additional source of income it is common to share family space with strangers or landlords own more than one dwelling which they rent out to other people in need.
Land Development: In legally developed settlements communal services, such as potable water, electricity, drainage or solid waste disposal, are taken care of by city authorities. However, such infrastructure is limited in informal settlements and so people become inventive and simply hijack electricity from public lines. Private companies do step in and offer their services as long as bills are paid – in these cases no questions are asked, whether dwellers have formal or informal residential status. The more permanent these settlements become, the more likely they are to receive official recognition. This in turn encourages construction of new illegal dwellings in view of pending consolidation.
Main focus at this point is the step-by-step development of physical infrastructure, such as water lines, drainage, electrical power, paved roads and streetlights. Community based infrastructure, such as children's education, health care facilities and public recreational areas are secondary. These institutions are much too costly and disruptive to the community, due to the fact that they require space which is simply unavailable.
Legalization: Land ownership is by all intents and purposes desired by both dwellers and authorities. Land titles are assets and can be used as collateral for loans. On the other hand legalization alone does not implicate better living conditions. Many dwellers can not afford the additional costs of legalization and rather stay illegal or prefer to move on to create new informal settlements.
Unfortunately, urban policy makers have been "forced to "accommodate" a large number of poor inhabitants in the urban space. This "accommodation" was not only expressed in the form of great tolerance", it also facilitated the occupation of more urban land illegally and as a result the number of informal dwellings increased. Policy makers have been accused of focusing too much on the consequences rather than the causes of informality. Legalization is largely considered "too easy a way out" and represents only a relatively inexpensive short-term solution to the situation (Aguilar; Santos 2001, p.650, 652).

[fig06] Comparison of the formal and informal development process



## 02.3 IN THE CASE OF MEXICO CITY

### 02.3.1 Types of Low-Income Housing

There are many different types of low-income neighborhoods in Mexico City. Some were developed legally; some were legalized over time; others remained illegal. Some of these dwellings are substandard, others offer decent living conditions. It is important to note that these settlements give shelter to a wide range of social classes and are not explicitly for the poor.
The following types of housing illustrate the living situation of 60% of Mexico City's population and cover roughly half of the urbanized area. The following description is based on the work of Priscilla Connolly (p.12-21) if not otherwise indicated.

*Colonias Populares* | Popular Class Neighborhoods or *Asentamientos Irregulares* | Irregular Settlements [pic03]: These dwellings are categorized by critical housing conditions. Self-help housing was the conventional form of construction and traditional in rural Mexico. It was not until the second half of the 20th century that this practice "went urban". Since then, self-help housing has been the driving force for massive urbanization in Mexico City (Bredenoord, Verkoren 2010, p. 363).
Most of the *colonias populares* were constructed between 1950 and 1980 and they still continue to evolve. Many are being developed illegally on unauthorized land without any building permits whatsoever. They lack urban infrastructure and services and are often consequential to natural disaster. Living conditions vary in these *colonias populares*. Over decades some have become legalized – infrastructures developed and land titles were granted. It is noteworthy that decent neighborhoods can develop out of informal settlements over time and are fully integrated in the urban city structure. However, most of the dwellings are without the most basic human requirements and offer only precarious living conditions.

*Vecindades* | Inner City Tenements [pic04]: The first of these were located around the *Zócalo*, the central square in Mexico City. Originally, the houses in the inner city were modeled after the Spanish courtyard buildings with rooms arranged around a central patio. They were built by the Spaniards before the nineteenth century and served as grand houses or palaces for the upper-class citizens. At the end of the nineteenth century, the rich moved to newly urbanized areas and abandoned their homes in the city. These became vacant to the poor and were transformed into low-class tenements. From that time forward, these dwellings have become more and more crowded with several families living together on limited space.
More accommodation was needed as the city started to grow under *Porfirio Diaz'* dictatorship. New *vecindades* were built in and around the eastern part of Mexico City and continued to be built at the beginning of the 20th century. The traditional inner city *vecindades* served as a prototype, however modified. From now on the central patio was minimized to a narrow passageway that gave access to the apartments, it provided lighting and ventilation and served as "semi-public" space for the tenants. They were cheaply built of cement and concrete bricks with cardboard roofs. During the first half of the 20th century communal tap water and flush lavatories were installed in some of the *vecindades*.
In 1941 rents were frozen and landlords ceased to invest and tenements deteriorated (Ward 1998, p. 64). In 2000, 10% of Mexico City's dwellings were *vecindades*.

*Cuartos de Azotea* | Rooftop Homes [pic05]: These frequently accommodate concierges, students or domestic servants who are invariably restricted to the central areas. As a result, a total of 17,500 rooftop homes are located in the metropolitan area, of which 14,500 are in the Federal District (census 2000). Rooftops are often overcrowded and services are shared. Some of the inhabitants are live-in workers who are registered as part of the household they work for.

*Ciudades Perdidas* | Lost Cities [pic06]: These are small shacks that were built on undesirable urban locations along railway lines, near heavily frequented roads, under bridges or on vacant plots in and around built-up neighborhoods. Many have been eliminated to make room for urban development or closed down for safety reasons. Inhabitants were offered cheap credits to buy alternative dwellings or were compensated. In the 1970s only 1.5% of Mexico City's population lived there. Only very view people live in these shantytowns today.

Social Interest Housing: These are government-financed houses that were mostly built in the 1970s and are located in the outskirts of Mexico City. These dwellings were cheaply built and accommodate many families in small apartments. These neighborhoods are in danger of becoming irregular settlements. They lack maintenance as well as public spaces and are often enlarged illegally by the inhabitants themselves. Over time, an impoverished working class settled in these dwellings, and are often characterized by unemployment, alcohol and drug abuse as well as criminal actions (cp. Chapter 02.3.2).

> "Governments and the international community face an extraordinary challenge. They must not only improve existing settlements, but also slow the growth of new informal settlements. Improvement must therefore coexist with slum prevention strategies capable of providing affordable housing opportunities on a scale sufficient to cope with the growing demand for housing and infrastructure." (Acioly Jr. 2010, p. 222)

*Colonias Populares* [pic03]
*Vecindades* [pic04]

[pic05] *Cuartos de azotea*
[pic06] *Ciudades perdidas*

## 02.3 IN THE CASE OF MEXICO CITY

### 02.3.2 Public Subsidized Housing Programs

The government became active in finding public housing solutions for the urban population in the 1930s. The first organized construction was undertaken in the late 1940s. In the 1960s international loans, e.g. from the Intra-American Development Bank became available and housing was developed on a larger scale, mostly for rent (Bredenoord, Verkoren 2010, p. 361). As this did not serve the low income-groups, social interest housing was initiated. Nevertheless, it continued to supply predominately the lower-middle-income groups due to the fact that mortgage payments were not affordable. Only the minimalist dwellings, insufficiently attractive to middle-income groups became available to the poor population. These groups were mostly relocated from the *vecindades* or inner-city shantytowns (Ward 1998, p. 61, 62). Between 1947 and 1970 some 250,000 public housing units were produced, but compensated only for 35% of the total housing production (Bredenoord, Verkoren 2010, p. 361).

In the 1970s semi-public housing agencies were created. It was a tripartite cooperation between the state, the private sector and labor unions. INFONAVIT (National Housing Fund for Private Sector Workers) and FOVISSSTE (Housing Fund for Public Sector Workers) were first established in 1972. They were responsible for planning, developing and financing housing units for the medium and low-income groups in metropolitan areas of the entire country, but especially in Mexico City (Bredenoord, Verkoren 2010, p. 362). INFONAVIT, "generated in its first three years as many dwellings as the entire state sector had achieved during the previous four decades" (Ward 1998, p. 62). Problematic was, that it was only accessible to people who had a formal job, therefore, people employed in the informal sector and those who earned less than two to four times the minimum wage were once again excluded (Bredenoord, Verkoren 2010, p. 362).

FONHAPO (National Fund for Popular Housing) was established in 1981 and operated for those with an income below 2.5 times minimum wage and were thus not eligible under other agencies. More importantly, workers from the informal sector were addressed. The agency, "in contrast to other housing institutions, progressively favoured financing partial housing solutions [...] five types of housing projects were financed: site and service; incremental housing; home improvements; finished dwellings; and production and distribution of building materials" (UN-Habitat 2005, p. 123). "Fiscal revenues and funds from the World Bank were used at that time to grant loans to social organisations (group loans) and public agencies for upgrading or self-building of houses in progressive developments. Even subsidies of up to 50 per cent had been possible" (UN-Habitat, Mexico 2005, p. 64).

Over time, the agencies were restructured and their responsibilities shifted from being "building institutions" to "housing finance institutions" (Bredenoord, Verkoren 2010, p. 363). As the private building sector was able to develop large scale projects, the agencies could focus merely on mortgage issuance. In 1987 the loan system was overhauled and linked to "times the minimum wage" (IDB 2011, p. 17,18). The minimum wage (2014) in zone A which comprises all of Mexico's major cities and entry ports increased to $67.29 Mexican pesos per day, approximately $5.18 USD (SHRM, 2014).
With the change of the PRI government to PAN, housing policies were modified in the 2000s. INFONAVIT for example introduced a lottery system for the applicants in 2001 to prevent corruption. In recent times FOVISSTE and INVONAVIT provide eight out of ten mortgage loans in the country (IDB 2011, p.13), currently for housing purchase, upgrading, construction (on a property of the borrower) and lender substitution (IDB 2001, p. 20, 21). However, unalterably to those with higher incomes. Three times the minimum wage is still not affordable to the households at the bottom of Mexico's income pyramid (UN-Habitat 2005, p. 74).

A housing law was passed in 2006, concentrating on "social production of habitat". This means supporting the

self-producers and self-builders who construct for their own needs and not for the purpose of making profits. Several sub-programs were implemented to reduce poverty in the housing segment (Bredenoord, Verkoren 2010, p. 362). "Despite the impressive growth of Mexico's subsidized housing delivery system over time, the poorest socio-economic groups have been virtually excluded, during the heydays of the public housing agencies, as well as in the 21st century [...]. Another unsolved problem relates to the demand for low-income rental facilities. [...] Looking for possibilities to stimulate the rental housing market, especially for those who cannot find ways for the (subsidized) purchase of a house " (Bredenoord, Verkoren 2010, p. 364).

Nevertheless the development of self help housing continues in Mexico as it seems to be the only solution outside the regulated housing market.

> "Slums and urban poverty are not just a manifestation of a population explosion and demographic change, or even of the vast impersonal forces of globalization. Slums must be seen as the result of a failure of housing policies, laws and delivery systems, as well as of national and urban policies." (UN-Habitat, Slums, 2003, p.5)

[pic07] Settlement by INVONAVIT

## 02.3 IN THE CASE OF MEXICO CITY

### Elaboration of a Participatory Community Program for Neighborhood Improvement

Mexico City offers several programs to improve the urban poor's living conditions, mostly with the focus on housing solutions. In this thesis the *Programa Comunitario de Mejoramiento Barrial* | Community Program for Neighborhood Improvement will be elaborated in more detail as it is in coherence with the upcoming project.

The community-based neighborhood improvement program was established in 2007 by the Social Development Secretariat of Mexico City, as a response to the increasing demand for urban social movement for decent and safe neighborhoods. It is a collaboration between the government of Mexico City, the local districts (*delegaciones*), and civil society organisations.
In 2011 the program won the World Habitat Award, an annual international competition that honors innovative and sustainable solutions to key housing challenges in the global South as well as the North.

Aims: The program aims to improve the urban living conditions in informal settlements and low-income neighborhoods. The focus directed towards the creation and/or recovery of public spaces in the city's most marginal areas to minimize socio-spatial segregation.

Areas: The main beneficiaries of the program are the inhabitants of informal settlements and low-income neighborhoods in Mexico City. Areas with a high level of social conflict, marginalization and/or urban decay are favored. Although, it is also possible to include neighborhoods of the non-marginalized areas, who nonetheless experience the decay of the social or urban infrastructure.

Projects: The program involves the upgrading of public spaces, urban infrastructure and community facilities [pic07-10].

• paving of streets • illumination of streets • drainage systems • sanitation • rainwater collection • secure steep areas (i.e. safety walls, stairs, handrails)
• recreational space • parks • plazas • playgrounds • sports facilities • cycle tracks • reforestation
• community centers • theaters • museums • libraries
• multi-purpose rooms • community gardens

Funding: The projects are entirely funded by the government of Mexico City, but also open to donations from private enterprises, international organizations or other local and federal government funds. The resources range from US$ 40,000 to US$ 400,000, depending on the type of project and on the needs of the community. The peak was in 2009 as US$ 14.5 million were available, although the budget was reduced in the following years, due to economic crisis and the fact that policy makers wished to give local direct control over public funding to the districts rather than to the communities.

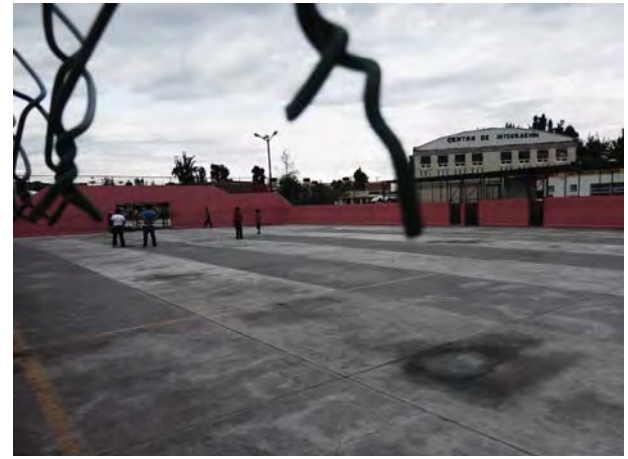
Process: Residents, civil society organisations, communities and academic institutions have the opportunity to promote/recommend projects to the Social Development Secretariat of Mexico City each year in January. *Programa Comunitario de Mejoramiento Barrial* does not design or propose any kind of initiative.

1 To submit a project, communities have to define the social and spatial boundaries of their neighborhoods, identify the problems and challenges and prepare a proposal. The projects need to be designed by the communities themselves, although technical support from outside advisors may be obtained. These can be the governments, a range of academic institutions, NGOs and other civil or social organisations, that provide the

required technical and social assistance for the community projects.
2 A community assembly needs to approve these projects before a proposal can be presented to the judging panel.
3 A joint technical committee, comprising representatives of civil societies and representatives of various branches of the government, decides which projects will be funded in a particular year.
4 The funds are distributed directly to the communities, after being trained in financial and project management.
5 Communities select their own administration, supervision and community development committees.
6 The committees are responsible for the public funds. They also oversee the ensuing construction processes make sure that the proposed works are executed properly. Further, follow-up work and post implementation is within their competence.

Community center and library, *Iztapalapa* [pic08]
Playground, *Iztapalapa* [pic09]

[pic10] Public space, *Álvaro Obregón*
[pic11] Sports field, *Iztapalapa*



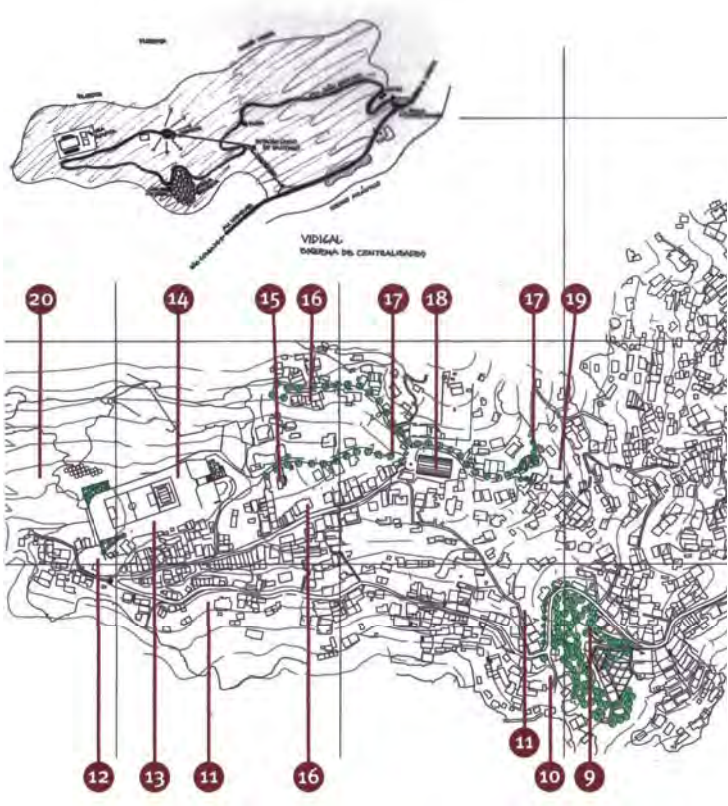
## 02.4 BEST PRACTICE
*Favela Bairro* - Rio de Janeiro, Brazil

Like in many other Latin America cities, rural-urban migration during the 20th century led to rapid growth of urban agglomerations. Housing policies were mostly inexistent and housing finance programs could not fulfill the growing demand for residential space. People settled in areas lacking basic infrastructure, decent houses, public areas, basic welfare as well as educational services. These neighborhoods are located in the outskirts of the cities or in the deteriorated historic city centers. This is also the case in Brazil where about 40% of Rio de Janeiro's population live in ill developed areas, in the so-called favelas.

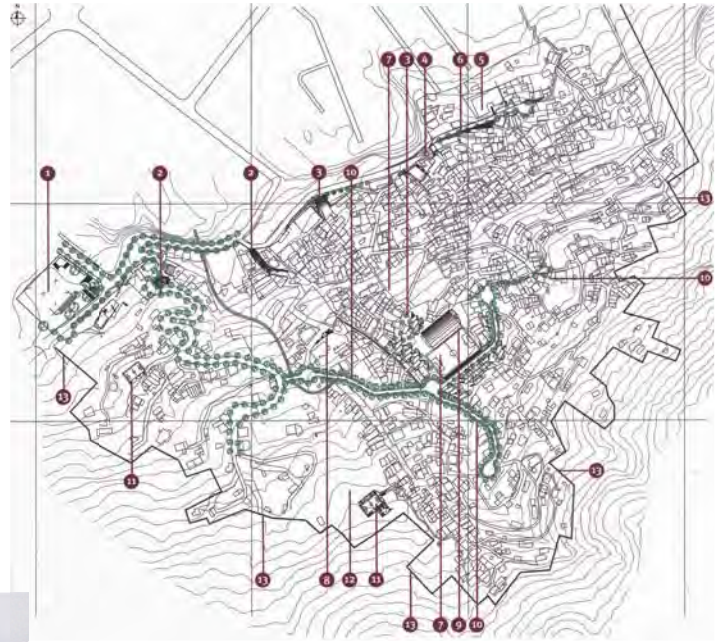
Favela Bairro: During the 1990s a new strategy in dealing with informal settlements in Rio de Janeiro was developed and is now in its third phase. The successful program serves as a prototype for many other programs. Through selective projects within the favela areas the living conditions have been improved and the neighborhoods have been incorporated in the formal structure of city.

Aims: The focus is on future orientated projects and not only on providing new and decent housing for the inhabitants of the favela areas. Efforts are concentrated on the creation of infrastructure, accessibility, public facilities and services. Through these measures the neighborhoods are to offer the most basic prerequisites to the inhabitants and to include these quarters within the formal city structures. This means a physical improvement of the area but more importantly a social integration of the its people

Project development: The foundation for each project is urban integration through social development and the amelioration of the conditions in the neighborhoods. Project planning is a process of constant consolidation. It is important to differentiate each dwelling from the other as the initial situation is very different. The topography varies from neighborhoods in the flatlands or on hills, along the banks of streams or on the seaside. Also communities vary in terms of cultural diversity and therefore it is of great importance to solicit the participation of the inhabitants (Brasil Favelas Upgrading,2002).



COMMUNITY
&
PARTICIPATION



[fig07] Projects in the *favelas* of Rio de Janeiro

## 02.4 BEST PRACTICE

Informal Toolbox S.L.U.M. Lab *Paraisópolis* - São Paulo, Brazil

Sustainable
Living
Urban
Model
LAB

S.L.U.M. Lab: Columbia University, New York.
"The Lab consists of planners, architects, and students from all areas of the globe to work towards an understanding of the link between architecture, urban design, planning and poverty alleviation" (Urban Think Tank).

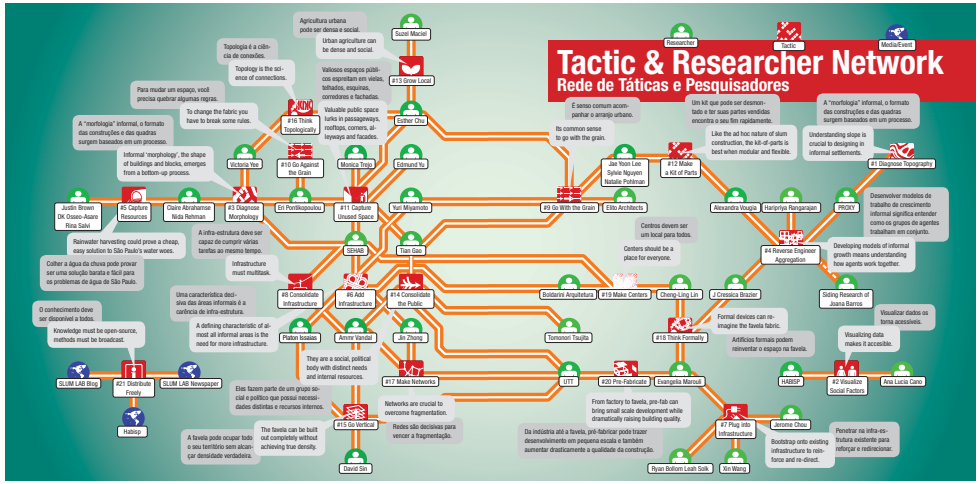
Aims: "The Sustainable Living Urban Model "toolbox" aims at suggesting a working method for supportive, new architecture with the capacity to empower people at the crossroads of colliding realities - all within the global south's emerging cities [...] to focus on the informal developments of the Latin American cities and to shift the focus of contemporary form-driven architecture towards reducing the gap between buildings' designs and their social impact." (Slum Lab 2008, p. 52)

Case Study: It is a collaboration between São Paulo's social housing agency and the S.L.U.M. Lab that developed an urban concept for the São Paulo's second largest favela, the so-called *Paraisópolis*.

Paraisópolis:
*Paraisópolis* is a sprawling hillside settlement or "*favela*" in *Morumi*, one of the wealthiest areas of São Paulo. A gridded road system, planned in 1921 was laid over the area, although only partially developed as it was incompatible with the topography of the region. Nevertheless, workers attracted by employment to build the upscale homes settled on the steep slopes in the second half of the 20th century. Today, the area is full of houses, leaving little space available. Many parts of the neighborhood are constantly threatened by land slides and flooding.
With 60,000 people living on 90,000 square meters, it is the second largest *favela* in São Paulo. It differs from others as it is well connected to a robust job market with privileged accessibility. The residents are mainly employed in construction and domestic work throughout the district. Not only is there a huge contrast between the *favela* and the surrounding built-up area, there is also a great contrast within the favela itself. On one hand there are highly consolidated areas, on the other hand the houses are in an extremely precarious condition.

Tactics:S.L.U.M. Lab developed 21 tactics, whereas each focuses on a specific topic. Each part consists of an analysis of the challenges and potentials as well as proposals of how to change and improve the neighborhood [fig07-10].

TACTIC#1 Diagnose Topography; TACTIC#2 Visualize Social Factors; TACTIC#3 Diagnose Morphology; TACTIC#4 Reverse Engineer Aggregation; TACTIC#5 Capture Resources; TACTIC#6 Add Infrastructure; TACTIC#7 Plug into Infrastructure; TACTIC#8 Consolidate Infrastructure; TACTIC#9 Go with the Grain TACTIC#10 Go Against the Grain; TACTIC#11 Capture Unused Spaces; TACTIC#12 Make a Kit of Parts; TACTIC#13: Grow Local; TACTIC#14 Consolidate the Public; TACTIC#15 Go Vertical; TACTIC#16 Think Topological; TACTIC#17 Make Networks; TACTIC#18 Think Formally TACTIC#19 Make Centers; TACTIC#20 Pre-Fabricate; TACTIC#21 Distribute Freely.



[fig08] Tactics and researcher network

[pic12] Informal Settlement: *Colonia Chinampas de Santa Maria Tomatlán* aligned to the street *Avenida Canal de Chalco* and the wall that hides the historically meaningful *Canal de Chalco*.

# 03 ANALYSIS

## COLONIA CHINAMPAS DE SANTA MARÍA TOMATLÁN

# OUTLINE

On the following pages we are confronted with *Colonia Chinampas de Santa María Tomatlán*, an informal settlement which was constructed between several formal settlements and a fairly large nature area. A busy street and a historically meaningful canal separate urbanity from nature.

[map10] Aerial view, *Colonia Chinampas de Santa María Tomatlán*

[pic13] Street view, *Colonia Chinampas de Santa María Tomatlán*

[pic14] *Avenida Canal de Chalco*

STREET

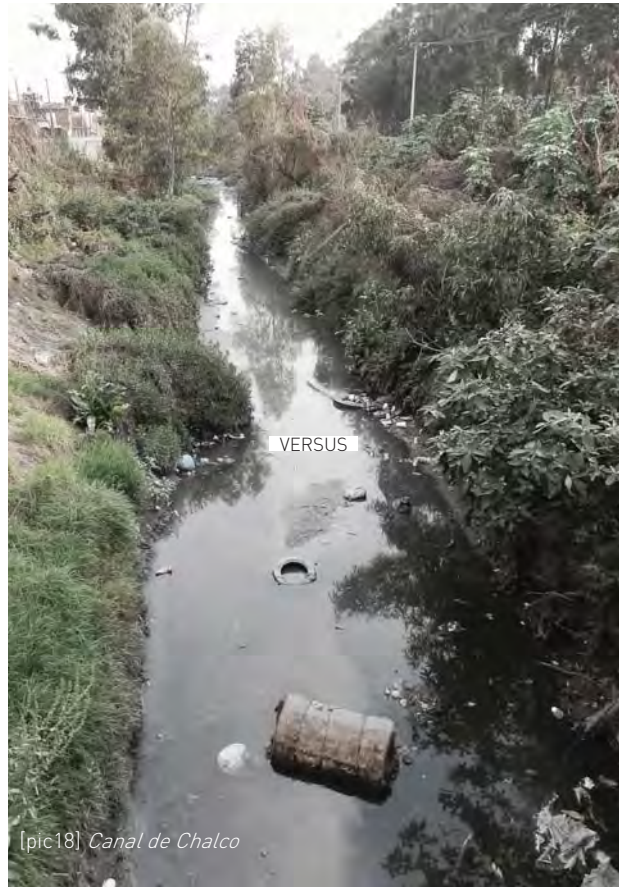
[pic15] *Avenida Canal de Chalco*

URBANITY

[pic16] *Avenida Canal de Chalco*

[pic17] *Canal de Chalco*

CANAL


[pic18] *Canal de Chalco*

VERSUS

[pic19] *Parque Ecológico Cuemanco*

PARK

[pic20] *Parque Ecológico Cuemanco*

NATURE

[pic21] *Parque Ecológico Cuemanco*

# STRUCTURE ANALYSIS

Content: The following analysis will describe the area around the informal settlement and give insight into the location, history, the physical development as well as challenges and potentials and more importantly the opinions of the people who live there.

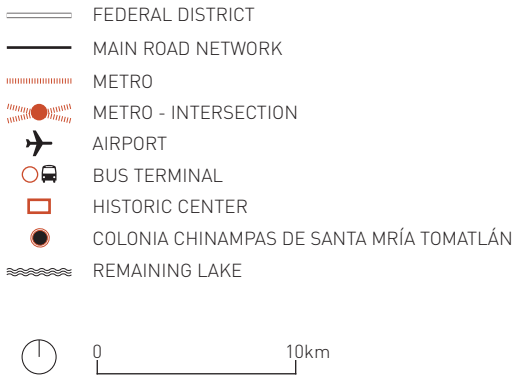
[pic22] Metropolitan area

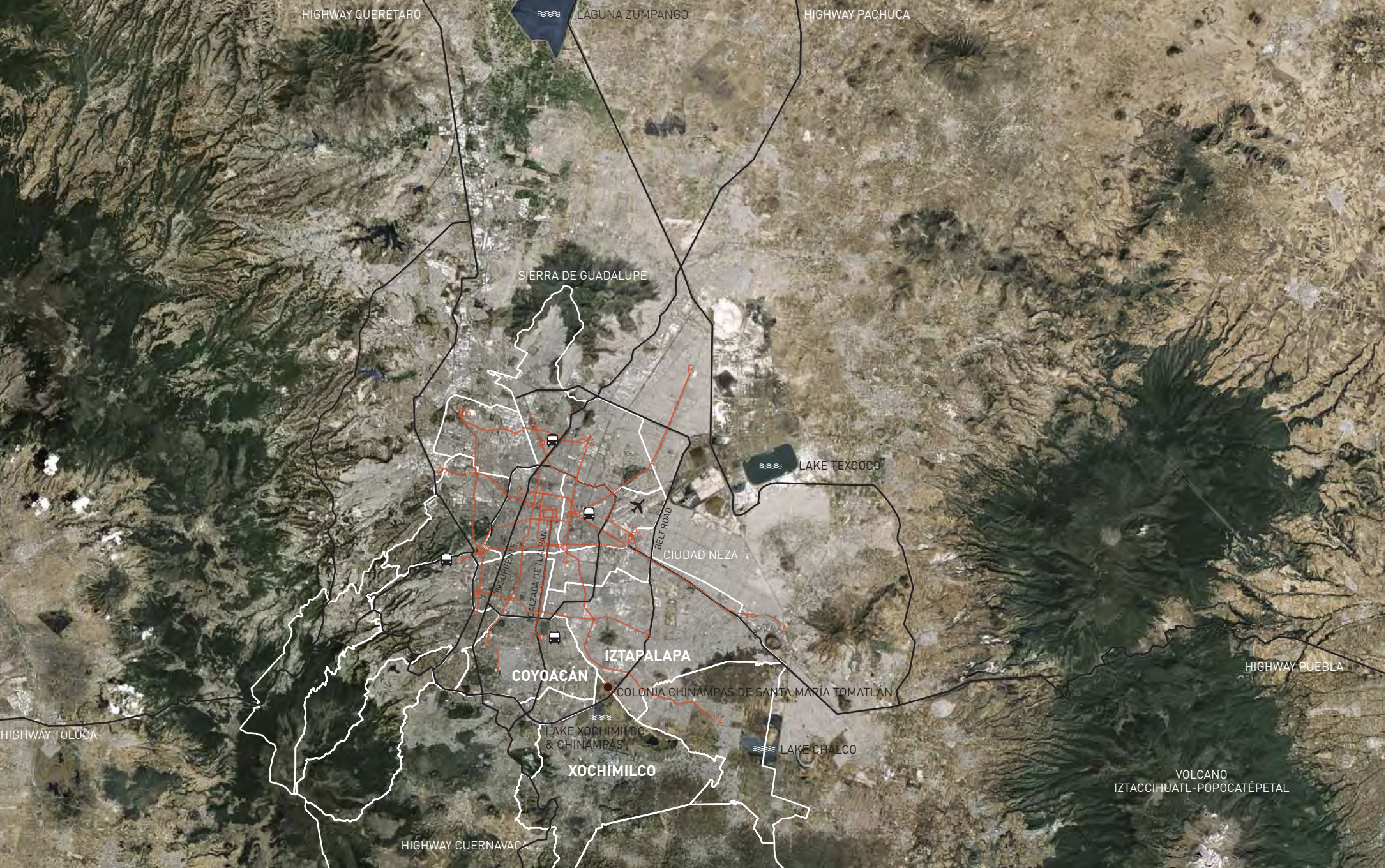
# 03/1
LOCATION

## 03.1.1 METROPOLITAN AREA

Metropolitan Area: The informal settlement *Colonia Chinampas de Santa María Tomatlán* is located in the south-east of the Federal District. More precisely, the neighborhood is right on the edge of the district *Iztapalapa*, where it borders with the district *Xochimilco. Colonia Chinampas de Santa María Tomatlán* is in the close proximity of the floating gardens - *chinampas* of *Xochimilco* and approximately 18 km from the historic city center - *Centro Histórico.* Both areas are under UNESCO World Heritage protection [map11].

[map11] Location of *Colonia Chinampas de Santa María Tomatlán* within the metropolitan area of Mexico City

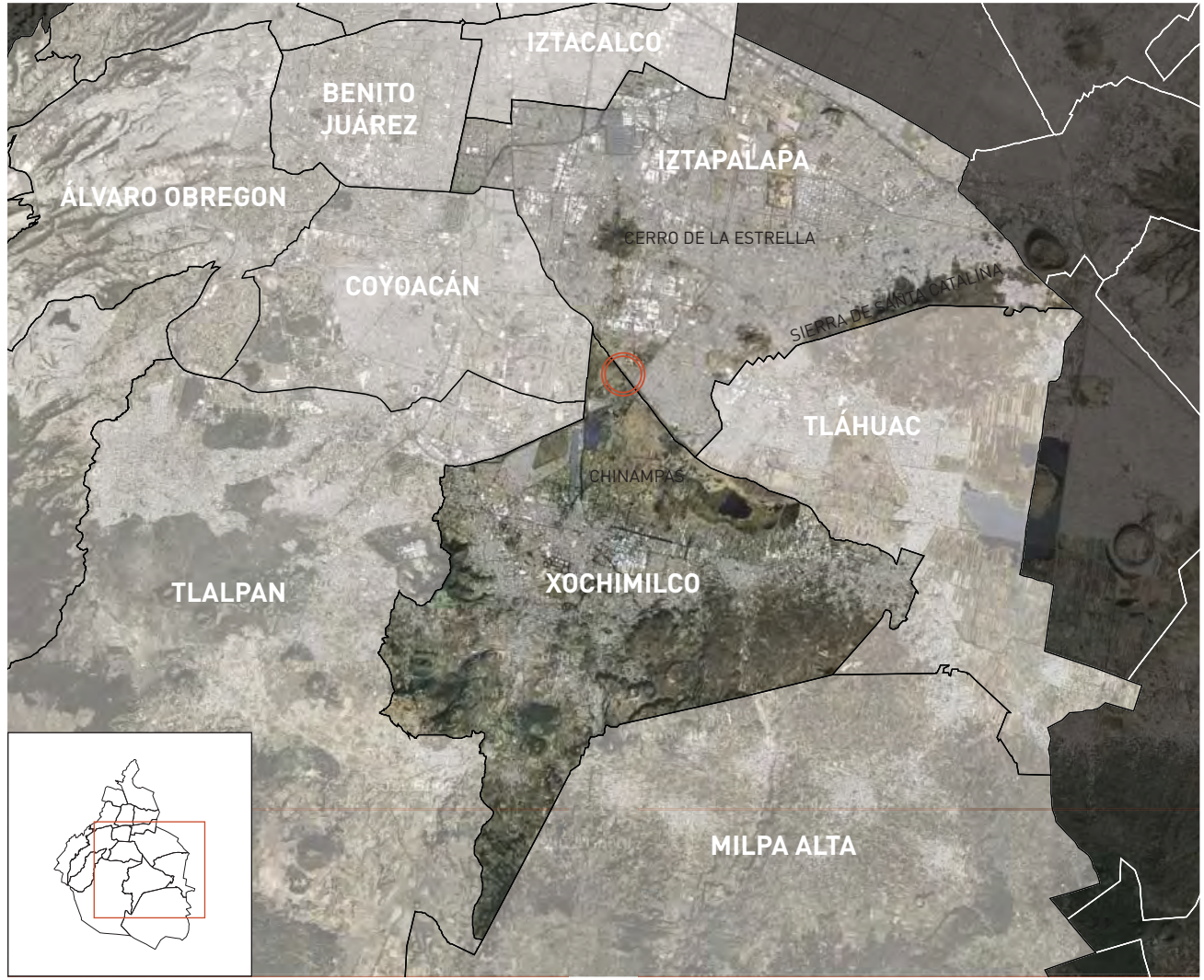



HIGHWAY QUERÉTARO
LAGUNA ZUMPANGO
HIGHWAY PACHUCA
SIERRA DE GUADALUPE
LAKE TEXCOCO
BELT ROAD
CIUDAD NEZA
INSURGENTES
CALZADA DE TLALPAN
IZTAPALAPA
COYOACÁN
COLONIA CHINAMPAS DE SANTA MARÍA TOMATLÁN
HIGHWAY PUEBLA
HIGHWAY TOLUCA
LAKE XOCHIMILCO & CHINAMPAS
LAKE CHALCO
XOCHIMILCO
VOLCANO IZTACCIHUATL-POPOCATÉPETAL
HIGHWAY CUERNAVACA

## 03.1.2 GENERAL REPUTATION
### Districts Iztapalapa and Xochimilco

Districts: Seen from an aerial view it becomes clear that the two districts *Iztapalapa* and *Xochimilco* are in contrast to each other. On the one side we have the urbanized built-up area and on the other what is left of the original natural state of the valley.

- *Iztapalapa* shows a very high level of urbanization with hardly any vegetation. The only remaining exceptions are the hill of *Cerro de la Estrella* and the mountain range of *Sierra de Santa Catalina*.
- *Xochimilco*, in contrast, consists of rural land with the ancient *chinampas*, pastures, wetlands and wooded areas spotted with only small built up areas [map12].




[map12] Surrounding districts of *Colonia Chinampas de Santa María Tomatlán*

- DISTRICTS OF THE FEDERAL DISTRICT
- FEDERAL DISTRICT
- STATE MEXICO
- MUNICIPALITIES OF THE STATE MEXICO
- INFLUENTIAL DISTRICTS
- COLONIA CHINAMPAS DE SANTA MRÍA TOMATLÁN

0 5km

• *Iztapalapa* is described by high density, low income housing, few recreational areas, crime, drugs and poverty. There is little that calls to the people from other districts of Mexico City and there are hardly any tourist attractions [pic22].

"...I honestly don't know, I can't remember ever being there..."

"...it is mostly a residential area for the low income population, similar to Ciudad Neza..."

[pic23] District: *Iztapalapa*

Stereotypes: When I talked to the people it became very obvious that these two districts are characterized by contrast. Some of the things the people said were recurring [fig13].

IZTAPALAPA

- high density
- low income housing
- crime

XOCHIMILCO

- nature & water
- tourism
- chinampas (floating gardens)
- trajineras (boats)

[fig09] Stereotypes: *Iztapalapa* and *Xochimilco*

• *Xochimilco* on the other hand is associated with weekend breaks and spare time, culture and tourism. It is called the "Venice of Mexico" because boats take visitors through the ancient *chinampas*. People spend their days on the *trajineras*, as the boats are called, having celebrations, or simply taking time off to enjoy the natural beauty which is hard to find elsewhere in the city. The residents of Mexico City appreciate it as much as the tourists [pic23].

"...little flamboyant Venice..."

"...a historically valuable area with outstanding landscapes because of the ancient canals and chinampas..."

[pic24] District: *Xochimilco*

## 03.1.3 DELEGACION IZTAPALAPA

### Development and Characteristics of the District

- Inhabitants: 1.8 million
20,5% of the Federal District
- Surface: 116.67 km$^2$
7,5% of the Federal District
- Altitude: 2,100 m

*"En el agua de las lajas"*

"In the water of the banks "

"Sobre las losas del agua"

*"On the stones of the water"*

*Iztapalapa* is one of the 16 *delegaciones* of the Federal District and is located on the eastern side of the city. It is the most densely populated district within the D.F., with a high level of socioeconomic marginalization.

The pre-hispanic village of *Iztapalapa de Cuitláhuac* was originally founded on the shore of lake *Texcoco*, partly on dry land and partly over water. The name of the former peninsula originates from the *náhuatl* tongue (-*iztapalli* "slab, banks"; -*atl* "water"; -*pan* "on"), meaning "in the water of the banks" or "on the stone of the water".
Due to the fact that the soil was very fertile, *Iztapalapa* was dedicated to agriculture all throughout history. Numerous vegetables such as corn and beans as well as flowers were grown in this area, mainly cultivated on *chinampas*. The village became one of the main suppliers of the former Aztec capital *Tenochtitlán* in the 14th century. In the late 16th century *Iztapalapa* was destroyed by the Spaniards and became crown property. Pre-hispanic temples were replaced by churches and colonial architecture. Even though the lakes were drained, the canal-system and agricultural activities on the *chinampas* persisted until the middle of the 20th century.

Over time, *Iztapalapa* has undergone many changes and modifications. The most severe took place in the last 40 years and are still ongoing. The district was transformed from a rural landscape [pic25] to an urbanized part of the city with hardly any vegetation left [map13].
The transformation began in the 1940s when the *Canal de la Viga*, one of the most important former trade ways in the valley, was drained. The *chinampa*-agriculture came to an end as a result of the dessication because the system lived on a constant flow of water.
Urbanization started in the 1970s when industries settled in *Iztapalapa*. Before that, the territory presented itself in a diverse geographical landscape with hills, woodlands and swamps dotted with lakes and grassland plains. Today, only a very small area is still reserved for agricultural purposes. Currently, approximately 10% of the district's population remains to be engaged in farming. Most of the inhabitants are employed in commerce, services and industry. Between 1970 and 1980 the population growth in *Iztapalapa* corresponded to 54.3% of the entire Federal District. Since then, *Iztapalapa* has been the main land reserve for the Federal District's urban expansion and has played an important role in the redistribution of the population. The influx of so many people on the one side with hardly any housing for the urban poor on the other led to the development of numerous illegal settlements in the area. Heavy rainfalls and floods have since then been an ongoing problem in the district.
Today, *Iztapalapa* has almost depleted it's reserves of land available for further development. Over 90% of the district has been urbanized and it's rural history is almost forgotten (cp. http://www.iztapalapa.df.gob.mx).

[map13] *Iztapalapa* 2014 (top)
Aerial view, shows the transformation of the former rural area of *Iztapalapa* to a densely urbanized part of Mexico City.

◎ COLONIA CHINAMPAS DE SANTA MARÍA TOMATLÁN

[pic25] *Iztapalapa* 1941(left)
Aerial photograph, view towards the south; in the foreground the original town of *Iztapalapa de Cuitláhuac* and the *Cerro de la Estrella*; in the background *Canal de Chalco* and *Canal Nacional* which connected several towns with the *chinampas* and the city center.

## 03.1.4 DELEGACION XOCHIMILCO
### Development and Characteristics of the District

- inhabitants: 404,458
- surface: 125.2 km²

8,4% of the Federal Districts area

- altitude: 2,240 m

> *"Lugar en la sementera de las flores"*
> "the place in the showing of flowers"

> *"Milpa de flores"*
> "flower field"

*Xochimilco* is one of the 16 *delegaciones* of the Federal District and is located to the south of the city. Most of the area is reserved for rural purposes with only small built-up areas. The ancient remains of the unique system of canals and the floating gardens (*chinampas*) in combination with well preserved colonial architecture was declared a UNESCO World Heritage site in 1987.

The formally independent city of *Xochimilco* was originally established on the southern shore of Lake *Xochimilco*. The first settlers, the *Xochimilcas*, a *Nahua* tribe arrived in the 10th century and invented the chinampa agriculture. They started to build artificial fields into the lake where they cultivated corn, beans, chili peppers, pumpkins and various flowers. The name of the former town has it's origins in the *náhuatl* tongue (*xochi(tl)* „flower", *mil(li)* „field", *–co* the suffix for place), meaning "flower field".
In 1352, during the Aztec rule, the old city on the mainland was abandoned and rebuilt on an island in the lake. The consequent rivalry between the Aztecs and the *Xochimilcas* led to a first warlike conflict in 1376.
In 1430 the city was defeated and had to pay tribute to the Aztec empire in form of materials and labor. For their services they were granted autonomy which remained unchanged into modern times.

Throughout the colonial period *Xochimilco* was an important agricultural area that supplied the city with produce. Due to numerous severe floods the lake had to be drained around 1600. As a consequence the canals and chinampas started to disappear (cp. http://www.xochimilco.df.gob.mx/historia.html). Continuous exploitation of existing water reserves to supply the city with potable water damaged the landscape of Xochimilco.

Urbanization began in the late 1950s. Mexico City hosted the Olympic Games in 1968 which further stimulated the urbanization processes because infrastructure was needed in the southern part of the city. Agricultural activities became less important as productivity declined and the demand for housing increased. This animated locals to sell and/or settle on their chinampa land. Although approximately 80% of the district is located within the so-called *suelo de concervación* (conservation land), where residential housing is prohibited many informal settlements were established illegally. This constitutes a growing threat to the natural water supply of the city and its biodiversity and ill developed infrastructure of individual dwellings are leading to high levels of contamination of rivers and canals.
There have been numerous programs in recent years to protect and maintain the remaining *chinampas* (Wigle 2010, p. 341). However, their further existence is in great danger as long as the ongoing urbanizational activities continue to prevail.

[map14] *Xochimilco* 2014
Aerial view, shows the transformation of *Xochimilco*. It is one of the last remaining nature reserves in the urbanized area of Mexico City.

COLONIA CHINAMPAS DE SANTA MARÍA TOMATLÁN

[pic26] *Xochimilco* 1933
Aerial photograph; View towards the north; in the foreground the original town of *Xochimilco* surrounded by canals and *chinampas*; in the background *Canal de Chalco* and *Canal Nacional*.

[pic27] *Chinampas*, floating gardens

03/2
HISTORY

## 03.2 HISTORY

The significance of the former lakes is still present in *Xochimilco* in form of a network of canals and *chinampas*. The remains can be found in the immediate surroundings of *Colonia Chinampas de Santa María Tomatlán*, which was built over the ancient *chinampas*.

Context: In ancient times the Valley of Mexico was filled with a series of lakes. In the north there were the *Zumpango* and *Xaltocan* lakes, more in the middle there was lake *Texcoco* and in the south there were the lakes *Xochimilco* and *Chalco*. During the Aztec empire, Mexico City, formerly known as *Tenochtilán*, was an island in the western part of lake *Texcoco*; the largest in size and the lowest in altitude of the five shallow lakes (Ezcurra et al. 1999, p. 10). Dykes and aqueducts not only divided brackish from fresh water and created bridges to the main land but prevented the city from being flooded and provided drinking water for it's inhabitants (Ribbeck 2002, p. 18). Fruits and vegetables were produced on the *chinampas* around *Tenochtitlán* and on the banks of the lakes to supply the inhabitants of the valley with fresh produce. *Chinampas* are artificial plots built into the shallow areas of the lakes creating a network of canals. Boats and canoes were used to cultivate the plots. Waterways were vital at this time because the Aztecs were not familiar with the use of animals to transport merchandise (Arte de México p.96).

After the arrival of the Spaniards and the conquest of *Tenochtitlán* in 1521 the city structure was modified significantly. The new city plan did not account for the lacustrine landscape. It was only a question of time before the sophisticated water system would be destroyed. Transportation modes and agriculture were reformed, mainly through the introduction of horse and cattle. Canals were transformed into roads where horses and cattle with carriages were able to operate. Filling up the canals not only destroyed large parts of the *chinampa* culture but also injured the drainage system created by the Aztecs. Floods were the result. After three severe floods in the second half of the 16th century the colonial government started to dewater the entire basin in 1608 (Ezcurra et al., 1999, p. 35). In spite of the drainage the canals remained active throughout the colonial period and represented an important trading route for agricultural products between the *cinampas* of *Xochimilco* and the city center (Ezcurra et al., 1999, p. 36).

By the end of the 19th century, *chinampas* had already disappeared in many areas of the city and new forms of agriculture were established. *Xochimilco*, however remained more or less the same until *Porfirio Diaz* discovered the potential for tourism in this area. The floating gardens became one of the typical landmarks of Mexico City. As much as the landscape was admired, drinking water was in short supply. Therefore, an aqueduct of 27 km length was constructed to bring water to *La Condessa*, a newly built neighborhood for the rich. The water was returned to *Xochimilco* as treated sewage. This secondhand water from the city and the industries was inadequately cleaned and never came back in sufficient quantity.

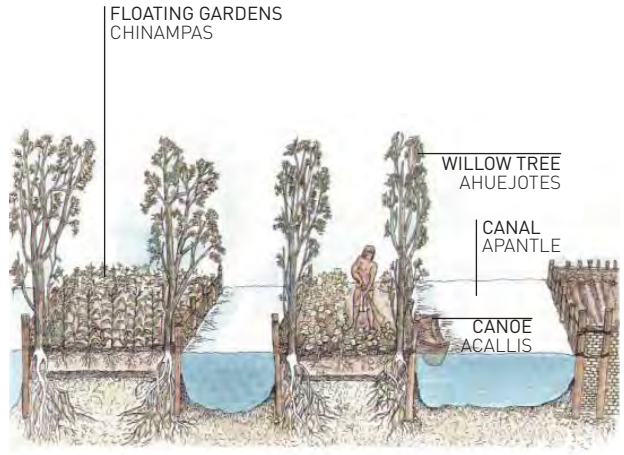
Even though the *chinampas* have been a UNESCO World Heritage site since 1987, they are in great danger of being destroyed. Contamination and the ongoing urbanization in form of illegal settlements in *Xochimilco* represent a big burden and in addition the inadequate infrastructure and especially the discharge of sewage to the last remaining canals are life-threatening to the few remaining *chinampas* in Mexico City.

In 1992, the Federal Government established a Natural Protected Area covering most of the remaining *chinampa* zone and is under stricter environmental controls than other areas of conservation land. Various programs and measures have slowed but not prevented the denigration of the remaining chinampas (Wigle 2010, p. 341).

Today, almost all the canals and *chinampas* have disappeared from the valley of Mexico. Only a small area in *Xochimilco* has survived as illustrated on the. The demands for further urbanization have prevailed over the entire concept of the ancient city. Therefore, the value and importance of this area is incalculable to the city.

[map15] Valley of Mexico during the Aztec Empire (left)
[map16] Valley of Mexico around 1900, Canal of Xochimilco is also known as Canal de Chalco (right)

## 03.2.1 CHINAMPAS AND CANAL DE CHALCO




*Chinampas:*
nahuatl: "chinamitl"
meaning: " hedge of reeds"
"plot of land enclosed by interwoven poles"

*Chinampas* are an advanced and sophisticated form of agriculture. Mexico has long dry seasons (October to May), where most crops allow only one harvest. The lake in the basin of Mexico was the solution. Even though the muddy grounds were unsuitable for settlement, the tribes managed to extend the land by building *chinampas*. This form of agriculture was extremely fertile and supplied the inhabitants with two or three annual harvests of fruits and vegetables (Arte de Mexico p. 33, 38).

Construction of a chinampa, an artificial island joined by a network of canals, was extremely hard work for the populace. First the lush aquatic vegetation in the lake was gathered together to form a base. This green bed of water plants was then covered with mud to secure the soil from eroding and willow trees called *aheujotes* were planted around the edges to serve as fences. The roots eventually took hold and secured the chinampa in the lake (Arte de México p. 96). As the crops grew and fertility was reduced the silt was replaced by new layers of rich lake-bottom sediment. A further advantage of this form of agriculture was that water was in constant supply throughout the year and absorbed directly by the soil of the artificial field.

*Canal de Chalco* :
The "*Hue Apantli*" which means the "Great Canal" was once the most important water way in the ancient basin of Mexico. It was a man-made canal that connected the city center with lake *Xochimilco-Chalco* (González, 2013). Originally it was used for two purposes. For one, the canal was used to regulate the flow of water from the lakes *Xochimilco* and *Chalco* in the rainy season, for the other it was used to flood passage ways to safeguard against enemy invasion.
From the colonial period until the middle of the 19th century the inhabitants had three different names for the canal, referring to three different sections along its path. The part located in the city center was referred to as "*Acequia Real dentro de la Ciudad de México*" the second part "*Acequia Real a Mexicaltzingo*" and the southern-most part "*Acequia Real a Chalco*". In 1856 it was finally renamed and has since then been known as *Canal Nacional* and *Canal de Chalco* (González, 2013).
The water originally stemmed from two tributaries, *Canal Cuemanco* and *Canal de Chalco* , which connected into one water at the *Ciénega Grande* (water regulation pool). Over centuries, the canal was an important transportation trade way that served to supply the city center with agricultural goods produced on the chinampas.
Towards the end of the 20th century the appearance of the great canal deteriorated noticeably. In the north the canal no longer carries water and has been turned into a automobile motorway. In the south it is haphazardly used as an open gray water receptacle. Efforts have been made to revive sections of the canal or/and to transform them into recreational areas (ciudadanosenred).

[pic28] *Chinampas*
[fig10] *Chinampa*-buildup
[pic29] Life at the canal, Canal de la Viga 1890
[pic30] Panorama of the valley of Mexico, 1890

## 03.2.2 WHAT IS LEFT FROM THE PAST

What was once a life-giving world of natural beauty and the foundation of ancient culture has been transformed throughout the centuries into a landscape of concrete and pollution.
Most of the former canals have been dewatered, dried out and converted to streets. The few that are still carrying water are often heavily contaminated.
As a result of technological advancement in agriculture the former chinampas were forced to give way to greenhouse-farming system.
If this tendency of urbanization continues, history will soon disappear from the landscape.

[map17] *Chinampas of Xochimilco*

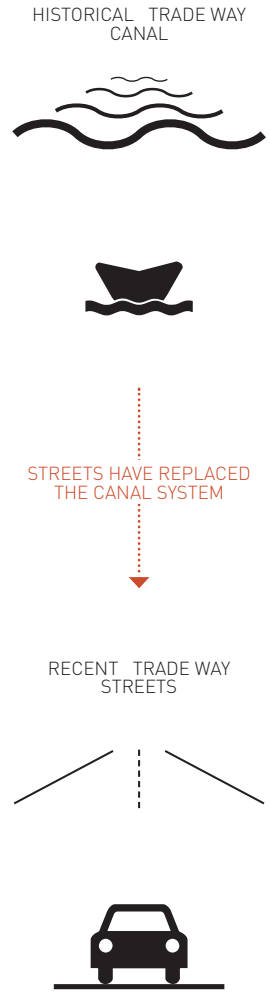
(1) ORIGINAL STRUCTURE

(2) TRADITIONAL WAY OF AGRICULTURE IS CHANGED BY NEW WAYS

(3) CANALS ARE REPLACED BY STREETS

(4) URBANIZATION OF CHINAMPAS

[fig11] History - Today




[fig12] Transformation of the canals into streets

[pic31] Informal Settlement: *Colonia Chinampas de Santa Maria Tomatlán* alligned to the street *Avenida Canal de Chalco* and the wall that hides the historically important *Canal de Chalco*.

# 03/3
# PHYSICAL DEVELOPMENT

## 03.3.1 SURROUNDINGS

(5) CANAL NACIONAL
HISTORICAL WATER TRADE WAY

(5) CANAL DE CHALCO
HISTORICAL WATER TRADE WAY

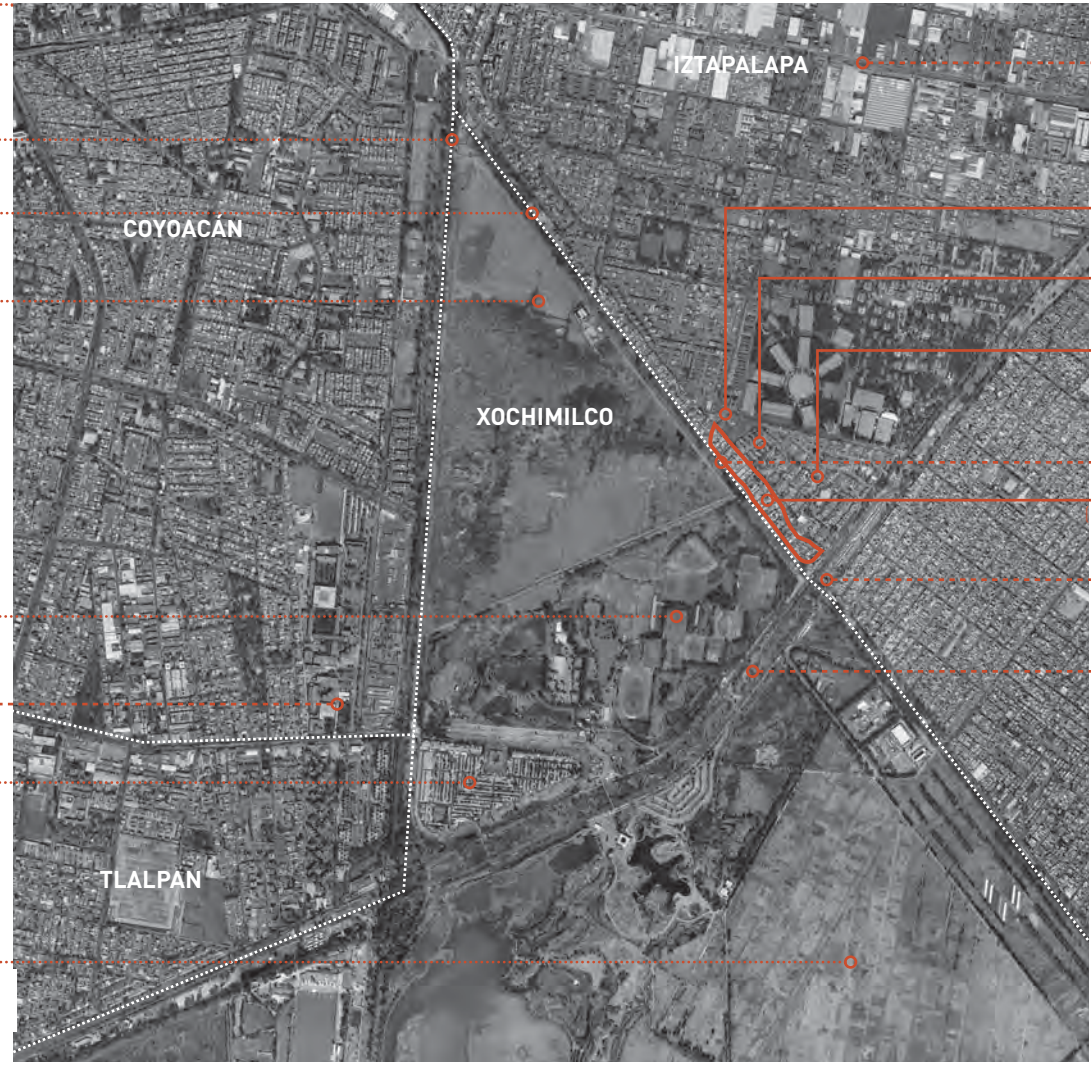
(8) LA CIÉNEGA GRANDE
ARTIFICIAL REGULATION POOL

(6) PARQUE ECÓLOGICO CUEMANCO
PARK

(14) UNIVERSIDAD AUTÓNOMA METROPOLITANA-XOCHIMILCO
UNIVERSITY

(7) MERCADO DE LAS FLORES
FLOWER MARKET OF XOCHIMILCO

(9) EJIDOS DE XOCHIMILCO Y SAN GREGORIO ATLAPULCO
UNDER UNESCO-WORLD HERITAGE PROTECTION




(12) METRO CALLE 11
PUBLIC TRANSPORTATION TERMINAL

(4) LOMAS ESTRELLA
FORMAL SETTLEMENTS

(3) FARRAC. XACALLI
FORMAL SETTLEMENT

(2) TRIÁNGULO DE LAS AGUJAS I Y II
FORMAL SETTLEMENT

(10) AVENIDA CANAL DE CHALCO

(1) COLONIA CHINAMPAS DE SANTA MARIA TOMATLAN
INFORMAL SETTLEMENT

(13) MICROBUS
PUBLIC TRANSPORTATION TERMINAL

(11) ANILLO PERIFÉRICO ORIENTE (CANAL DE GARAY)
OUTER RING ROAD OF MEXICO CITY

HOUSING
NATURE
INFRASTRUCTURE I FACILITIES

0 500m

## HOUSING

(1) *Colonia Chinampas de Santa Mará Tomatlán* is an informal settlement which is the center of attention in this thesis. Its development, structure and conditions will be described in more detail later.

(2) *Conjunto Habitacional Triangulo de las Agujas I y II, Iztapalapa* is an formal settlement that was constructed in 1991. There are approximately 4,000 inhabitants residing in 800 apartments which corresponds to an average of 5 persons per unit. If you take a closer look it is obvious that these tenements have been modified and extended over time. The open spaces between the apartment buildings are reserved for streets and parking lots. A school as well as two sporting areas are located within the neighborhood.

(3) *Fracc. Xacalli* consists of 50 housing units for approximately 250 inhabitants. The areas between the houses are vegetated and offer the much needed recreational space. The houses were built in 1997 as a community based project for residents who came from various social groups. Artists in this neighborhood host monthly events in an endeavor to bring together the inhabitants of the surrounding neighborhoods.

(4) *Lomas Estrella* is the name of a larger area in which several small neighborhoods are clustered together in gated communities.

## NATURE

(5) *Canal de Chalco* forms the boarder between the district *Xochimilco* and *Iztapalapa*. The canal used to be part of an important trade way network connecting *Xochimilco* and the inner city center.

(6) *Parque Deportivo Ecólogico Cuemanco* is the largest recreational area within reach for the people of *Iztapalapa*. The park highlights several ponds and offers various sports fields. It is a popular place for people to exercise and for families to escape the hustle and bustle of the big city at weekends.

(7) *Mercado de las Flores de Xochimilco* is one of the largest flower markets in Mexico City. This is where products, especially those produced in the remaining *chinampas*, are sold. The big variety of flowers and trees is appreciated by the inhabitants of the city.

(8) *La Ciénega grande* is an artificial reservoir covering an area of approximately one square kilometerto control water overflow and to prevent the area from flooding.

(9) *Ejidos de Xochimilco y San Gregorio Atlapulco* has been on the UNESCO World Heritage list since 1987. It is a cultural landscape which includes the *chinampas* of *Xochimilco*, the last remains of the lacustrine landscape of Mexico City.

## INFRASTRUCTURE

(10) *Avenida Canal de Chalco* is the street that runs directly alongside the *Colonia Chinampas de Santa María Tomatlán*. In previous urban development plans the street was supposed to be converted to a wide *eje vial*, to improve the road network running east to west.

(11) *Anillo Periferico Oriente (Canal de Garay)* is part of the heavily frequented outer ring road of Mexico City. In several parts it is trafficked on two levels.

(12) *Metro Linea 12* has been open to the public since the end of 2012 and connects the centralized metro-network with the south-eastern parts of the Federal District. The stations *Calle11* and *Periférico Oriente* are the closest links to the city's metro system.

(13) The *Microbus* terminal is located at the junction of *Anillo Periferico* and the *Avenida Canal de Chalco,* from where the buses leave in various directions.

(14) *Universidad Autonoma Metropolitana - Xochimilco* (UAM-X) is a public university located in the district of *Coyoacán* where I started my research project.

[fig13] Morphology of the surrounding area (top)
[map18] Surrounding area of the informal settlement (left)

Road Network: The neighborhood *Colonia Chinampas de Santa María Tomatlán* is well served by the city's road network. The *Anillo Periférico*, the outer ring road of Mexico City, has an exit to *Avenida Canal de Chalco* to which the informal settlement is aligned. This leads to heavy traffic as the street is often used as shortcut to reach other main roads within the Federal District.

Public Transportation: Within the immediate vicinity of the neighborhood there are two metro stations of the newly built *Linea 12* connecting the south-eastern parts with the city center. Before that the informal settlement as well as the university could only be reached by microbuses which were subjected to the traffic situation and therefore travel time is unpredictable.

Housing: In the larger area there are various housing options. In *Iztapalapa,* housing is provided by both the formal and informal housing market. The former offers apartment buildings mostly in gated communities, for security reasons. The informal settlements are located somewhere in between on available voids or cover many blocks with little or no public green space. In the district *Coyoacán* the built-up area is a commensurate mix of housing and recreational areas.

[map19], [map20] Public transportation

(1) PARK (2) FLOWER MARKET (3) UNIVERSITY

COLONIA CHINAMPAS DE SANTA MARÍA TOMATLÁN

METRO

MICROBUS

STREET TRAIN

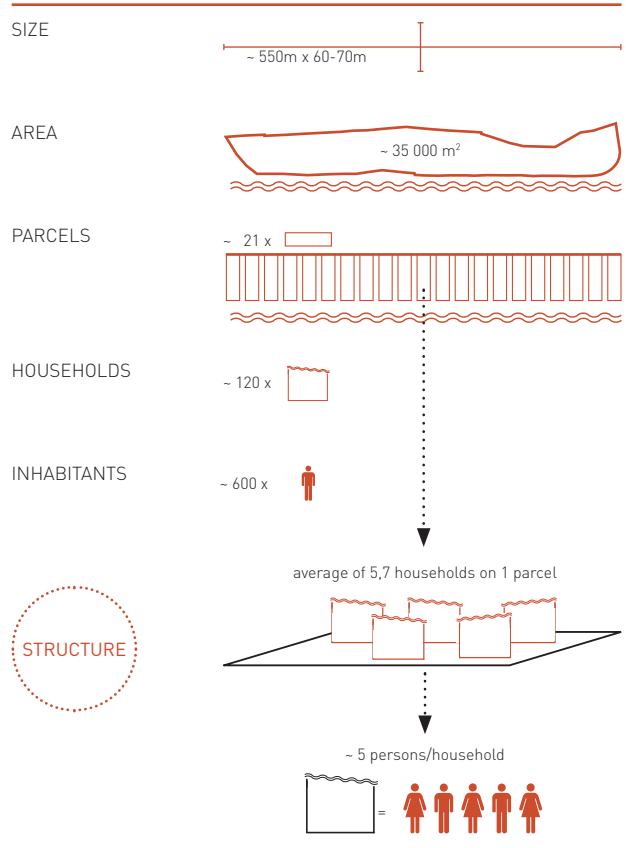
## 03.3.2 FACTS & FIGURES
on *Colonia Chinampas de Santa María Tomatlán*

The following is based on personal interviews as there was no written literature available. My special thanks goes to Profesor Jorge Andrade Narváez who lives in *Faracc Xacalli*, one of the neighboring formal settlements which he actively helped to design. He has been very helpful with fund raising activities, collaborating with authorities and initiating neighborhood activities in an effort to improve the living situation of the populace in the *Colonia Chinampas de Santa María Tomatlán*.

Location: *Colonia Chinampas de Santa María Tomatlán*, an informal settlement in the south-east of the Federal District, is located at the edge of the district *Iztapalapa*, bordering with the district of *Xochimilco*. More precisely, the section is situated along *Avenida Canal de Chalco*, between the outer ring road of Mexico City's *Anillo Periferico (Canal de Garay)* to the east and the street *Técnicos y Manuales* to the west [map21].

Size & Structure: *Colonia Chinampas de Santa María Tomatlán* is a linear settlement, stretched out alongside a street which is named after the adjacent and historically meaningful waterway *Canal de Chalco*. The area is roughly 550 meters long and 70 meters wide. The informal settlement is home to an estimated 600 inhabitants in approximately 120 households. The area is divided by small alleyways generating 21 plots. Each plot is again subdivided and shared by several families. The layout of the plots originates from the former *chinampa*-agriculture which was predominant in this area along the canal. Most residents of *Colonia Chinampas de Santa María Tomatlán* are descendents of former *chinamperos*. When the area was urbanized they were forced to move to the neighboring town of *San Antonio Tomatlán*, where they continue to till the *chinampa* fields even today.

Development: Until the early 1990s the entire area including *Colonia Chinampas de Santa María Tomatlán* was dedicated to the *chinampa*-agriculture. Before that it was under national agricultural law, which granted right of exploitation of the so-called *ejidos* only to the *ejidadores*. They were allowed to till the land and live on it but they did not own it and were therefore not allowed to sell it or otherwise dispose of it except through inheritance. In the 1980s and 90s the land underwent several neo-liberal reforms which were intended to simplify legal complexities and to individualize titel. Consequently, the area was made available on the legal housing market, whereupon formal settlements arose in the form of gated communities. INFONAVIT and FONHOPA developed most of the neighborhood settlements in the district. Nevertheless, the entire *Colonia Chinampas de Santa María Tomatlán* remained informal due to the fact that this particular strip of land was reserved for pending road building projects, which, until today, have not been built and most likely never will. The residents of *Colonia de Santa Mará Tomatlán* have been trying to gain legal title to the land as the neighborhood continued to develop. Most of the buildings are meanwhile made of durable materials, the settlement provides basic infrastructure but lacks social facilities and public recreational spaces.



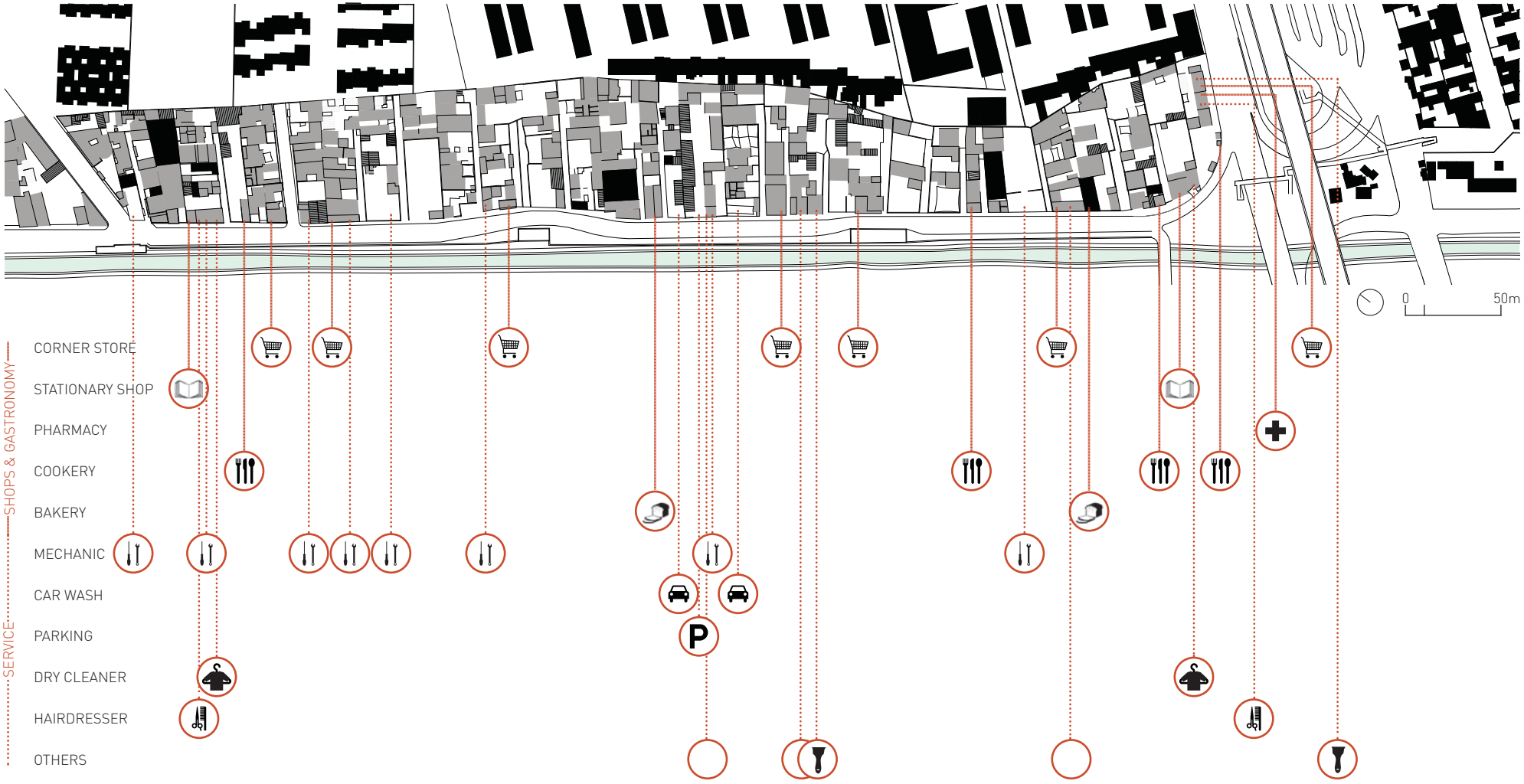

[fig14] Structure informal settlement

[map21] Aerial View Colonia Chinampas de Santa María Tomatlán

## 03.3.3 LOCAL SUPPLY

Local Supply consits of service as well as shops and gastronomy. By mapping the individual facilities it became clear that mostly mechanics are located along *Avenida Canal de Chalco*. These business are not very clean as well as use up valuable space on the sidewalks to repair the cars. Several small corner shops are located along the street.

[fig15] Local Supply


SHOPS & GASTRONOMY
SERVICE
CORNER STORE
STATIONARY SHOP
PHARMACY
COOKERY
BAKERY
MECHANIC
CAR WASH
PARKING
DRY CLEANER
HAIRDRESSER
OTHERS
P
0
50m

[pic32] Interview at *Colonia Chinampas de Santa Maria Tomatlán*

**03/4**
INTERVIEWS

# STRUCTURE INTERVIEWS

Objective: The purpose of the following interviews was to obtain insight into the daily lives and the living situation of the residents. The interviews were composed to identify the likes and dislikes of the people and to learn about their dreams and visions. It was not my intention to collect facts and figures and to set up numerical statistics.
Moreover, the results of the interviews were to serve as an additional tool to confirm or correct my personal observations. Furthermore, the requests will be respected in the project for *Colonia Chinampas de Santa María Tomatlán*.

Approach: The area is divided into three groups: the (1) informal settlement, the (2) formal settlements and the (3) park [compare map1].
It was important to interview not only the grownups but to give also the children the opportunity to express their thoughts in form of drawings. To this end four types of questionnaires were elaborated to address the individual groups.

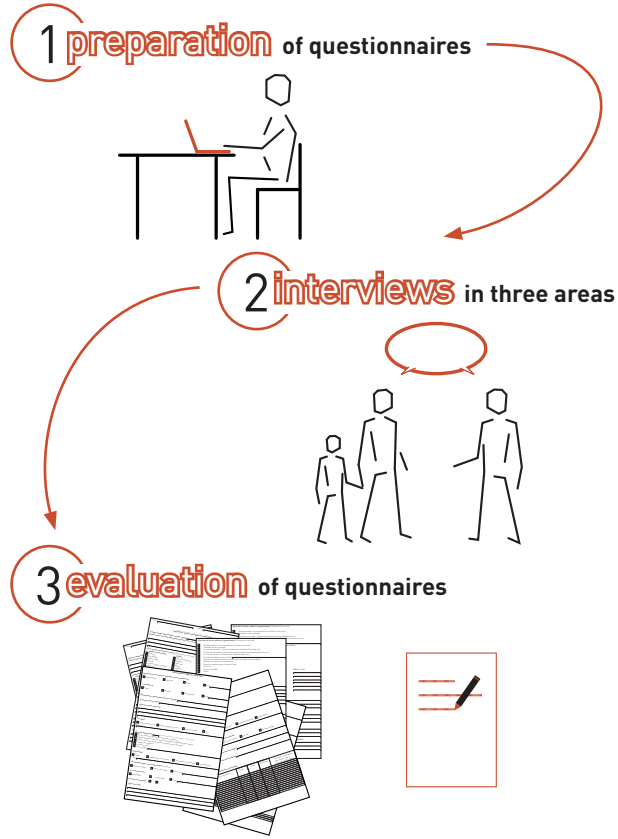
Questionnaire 1: addresses the residents of the informal settlements *Colonia Chinampas de Santa María Tomatlán*
Questionnaire 2: addresses the residents of the formal settlements
Questionnaire 3: addresses the visitors of the park *Parque Ecológico Cuemanco*
Questionnaire 4: addresses the children

In collaboration with a group of students from *UAM-Xochimilco* we interviewed approximately 35 to 40 people from each of the three sections. The interviews were conducted in the time between February and March of 2012.
There were two different types of questions. First the interviewee was allowed to respond freely without being led in a certain direction. The second group of questions was multiple choice and opened up several opportunities the interviewees might not have thought of themselves. In addition, answers could be extended by ideas of their own.

Result: Comparisons can be made and coherences between the outcome of the analysis and the results of the interviews can be drawn.
Interviewees live in different neighborhoods and under various life situations. Some are merely visitors, especially to the park, in their spare time. They all share the same space but their requirements and whishes for the future are very different.

Conclusion: The results of the interviews were evaluated to define the issues in the area. Contamination of the Canal de Chalco, heavy traffic and crime were the most frequently mentioned problems. It is worthy of mention that recreational space is desired by almost every resident of both the informal and formal settlements. Although the park is located immediately across the road from their houses and there seems to be a direct access, in reality there is neither a visual nor a physical connection. The park is only of theoretical value to the people because of a separating wall and an admission fee many can not afford to pay.
It was also observed that residents of the formal settlements speak rather lowly of their neighbors in the informal settlements. The reason being that one blames the other for the partly deplorable state of the neighborhood which is lacking public and social infrastructure.

[fig16] Illustration of the interviewing process

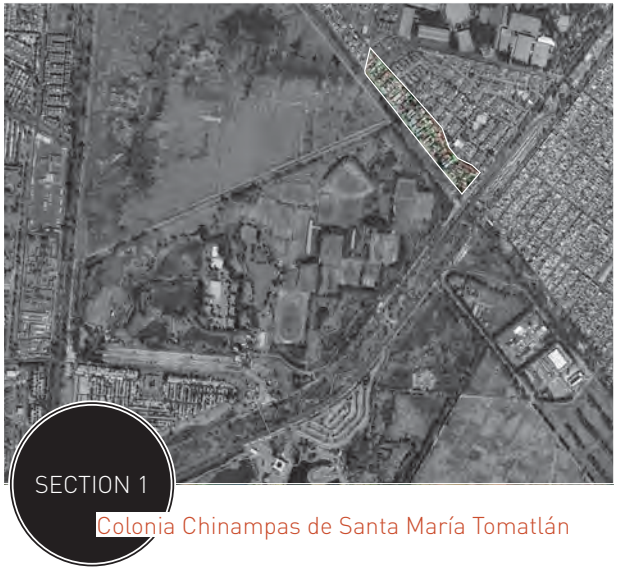



[map22] Sections for the three interviewing groups

BOUNDARIES OF EACH SECTION

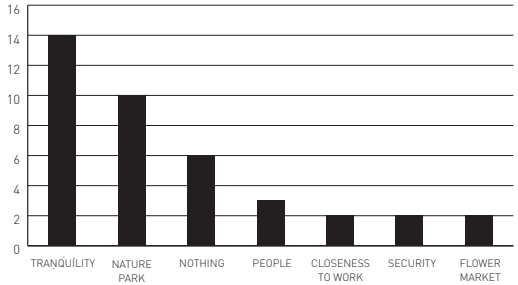
0 100m

# 03.4.1 INTERVIEWS - INFORMAL SETTLEMENT




Outline: This group represents people who live and/or work at *Colonia Chinampas de Santa María Tomatlán*. Information was obtained by knocking on the doors of several houses, walking into small businesses and simply approaching people in the streets. 34 individuals were interviewed in the time between February 19, 2012 and March 16, 2012 on five different weekdays at varying times during these days.

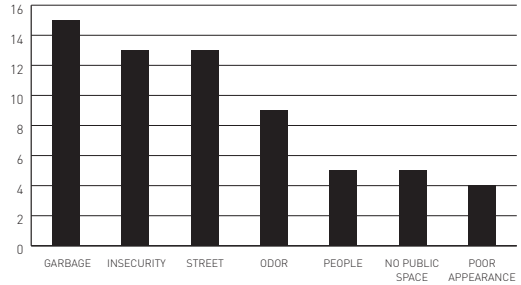
## What do you like most in this colonia/neighborhood?




> *"...to be honest, I don´t like much about this colonia, but I do like the park..."*
> *n.a, mother, 32*

The majority of people described the neighborhood as quite and many showed appreciation for the closeness to nature. The park (*Parque Ecológico Cuemanco*) was mentioned as the biggest asset in the area. Some people said that they treasured the view of the fairly large green space from their windows. Many businesses, most of which are run by the inhabitants themselves, settled along *Avenida Canal de Chalco* and proprietors pointed out the closeness to their place of work. All in all, there were things that the people appreciated, unfortunately however, many interviewees were unable to name even one positive aspect of their neighborhood.

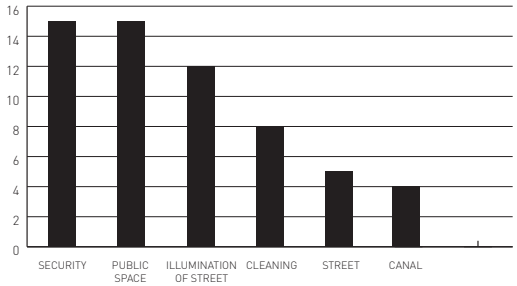
## What bothers you most in this colonia/neighborhood?




> *"...during the day everything is "normal", at nights, however, the streets become unsafe..."*
> *Maria, 39*

There were numerous complaints concerning the high level of contamination in the streets in general and in the canal in particular. The neighborhood was described by many as "normal" during the day but too dangerous to walk the streets alone at night. There are no streetlights whatsoever to give some semblance of security. People were also bothered by drunkenness in the streets and occasional drug abuse. There were remarks concerning the large number of mechanics working on cars and blocking the narrow sidewalks. People complained that parking spaces were rated higher then playgrounds for kids and that the facades of the houses were unsightly.

## What would you like to change in this colonia?

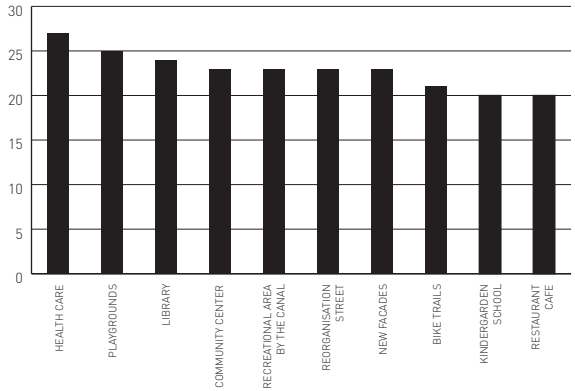



*"...I would like to change everything, from the appearance of the neighborhood and the canal to security and lights in the streets..."*

*n.a, 67*

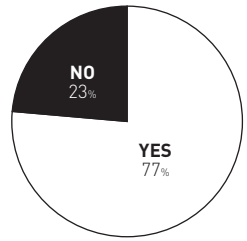
People felt that street lights would make a big difference; this would increase safety and open opportunities for social activities. Families with kids expressed their whish for playgrounds and recreational space. Many thought it would be a good idea to take down the wall and develop the area around the canal, which would have to be cleaned up or redirected underground. Some suggested reorganizing the auto mechanical activities to give the neighborhood a nicer appearance. Residents also thought about finding a solution for the excessive traffic and the water pumping stations that are in everybody's way.

## What do you think your colonia should offer its residents?




Priorities ranged from social facilities on the one hand to restaurants and sidewalk cafés on the other. Health care centres as well as playgrounds, a library and a community center where language courses and computer or cooking classes could be held were at the top of the list. Second in line were nicer streets, not only with color to the facades of the houses but walkways and bike trails on either side of the road. In general people said that they were in need of the most basic features for a more pleasant life in the community. Space and facilities for simple leisure time activities would improve life in the neighborhood considerably.

## Would you like to take part in the planning process?



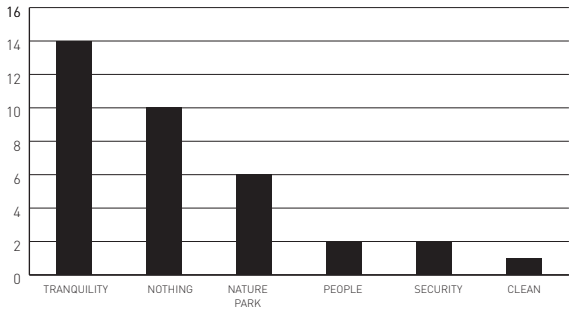

A bigger part of the residents showed active interest in their communal live. The majority wanted to take part in the planning processes and participate in decision-making. Many wanted to bring in their own ideas; some preferred to help clean the canal and others offered to contribute their time and skills to get the work done. A few were willing to take responsibility in organizing and coordinating joint activities.
On the other hand there were also interviewees who did not have enough time for community projects and said that they did not think it was worth their effort.
All in all people showed an open mind towards change and said they were ready to get started.

## 03.4.2 INTERVIEWS - FORMAL SETTLEMENT

SECTION 2

Triangulo de las Agujas, Lomas Estrella

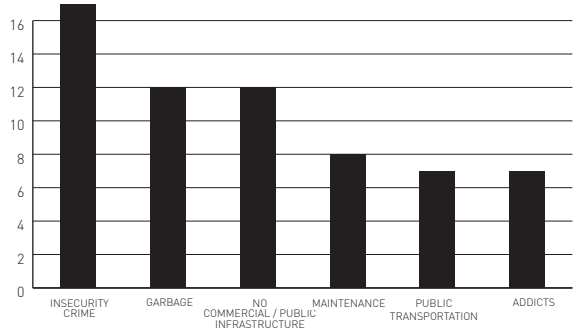
What do you like most in this colonia/neighborhood?




*"...it is very quiet, in spite of all the crime..."*

Josefina, 50

What bothers you most in this colonia/neighborhood?




*"...I would like to change the way people think of each other..."*

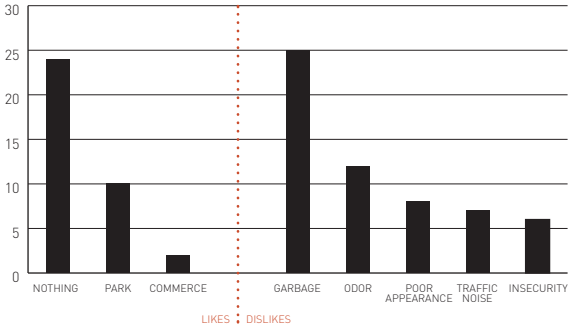
Carlos, 45

Outline: This group of interviewees represents the residents of the formal settlements, adjacent to *Colonia Chinampas de Santa María Tomatlán.* All of the neighborhoods are gated communities; therefore it was more difficult to approach the people for questioning. On several occasions we were allowed to pass through the gates and enter into the communities, at other times we had to wait outside the gates. In total, 35 individuals were interviewed between March 16 and 18, 2012 at various times of the day.

The answers were very similar to those we received from the residents of the informal settlement. When the people spoke about the surrounding area many said there was very little that they liked. Compared with the noise of the big city many appreciated the tranquility in their neighborhoods. They mentioned *Parque Ecológico Cuemanco* as the most valuable facility. Some were even content to have the park within view of their homes. The inhabitants were grateful for their apartments and the gated community gave them a certain feeling of security.

The residents repeatedly mentioned crime and the precarious environment as the biggest downside of living in this area and some blamed the people of the informal settlement. They felt they were unable to move around freely. On several occasions people expressed their regret concerning the massive pollution of their surroundings. In addition they criticized the inexistence of commercial and public infrastructure. They said that they wanted grocery stores within walking distance as well as better public transportation and recreational areas.

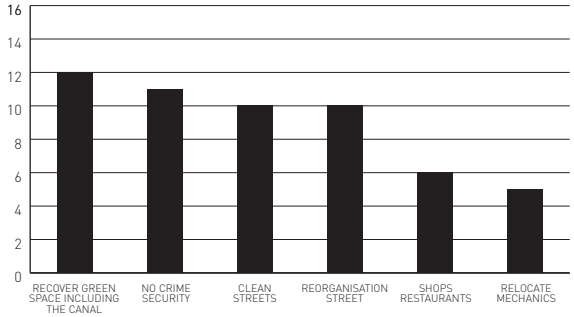
## What do and what don't you like about Canal de Chalco?




> *"...people should be more careful about where they leave their garbage, we all want to live in a clean environment..."*
>
> n.a

The *Canal de Chalco* was a bit of a problem for residents because it did not necessarily up value the area. The appearance of the highly contaminated canal was unpleasant and people complained that the water was smelly at times, although the idea of a clean body of water nearby in combination with playgrounds and recreational areas was considered to be desirable. A sitting area as well as a taco stand by the water would be fun to have. One man even mentioned how sorry he felt that people had forgotten how vital the canal used to be and the role it had played in the past.

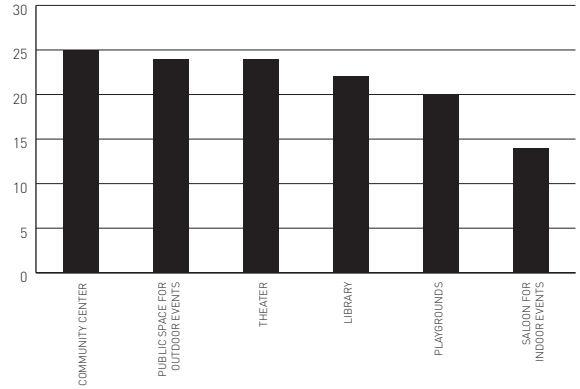
## What would you like to change in your surroundings?




> *"...I would like cleaner streets and more lights..."*
>
> Diana Maria, 37

Although there is a park in the vicinity the call for more recreational space was predominant. The reason being that families with kids could not afford to pay the entrance fee of three pesos per person every day. A few privileged residents had access to patios that they shared with others but this did not fulfill the longing for public space. Security was also a problem that could easily be solved with streetlights. Further, the streets should be cleaned and shops and sidewalk cafés should replace the auto repair shops.

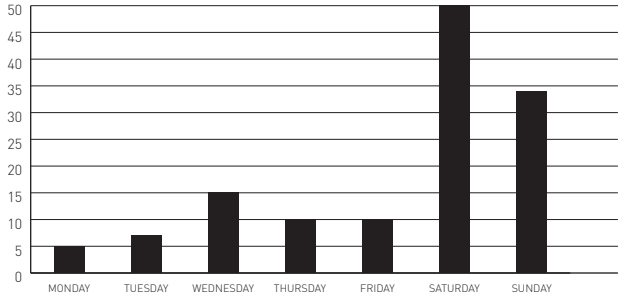
## What offers should be implemented in your colonia?




Interviewees were given options that addressed the implementation of public facilities and open spaces for outdoor family "fiestas" and neighborhood activities. A community center containing a library with access to computers as well as space and multi-purpose rooms for theater performances and other indoor events were desired. Many expressed their interest in taking language-, computer- or sports classes. Playgrounds were urgently needed.

## 03.4.3 INTERVIEWS - PARK

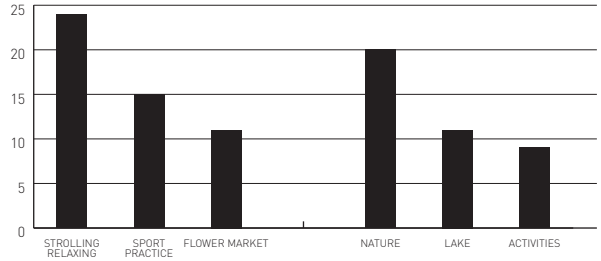
Frequency




*"...It is quiet with a little bit of nature in the city..."*

Andres, 35

What are the reasons for your visit and what do you like most about the park?




*"...My favorite place is the lake. It is nice to walk around and watch the ducks..."*

María, 43

*...I come here with my kids for soccer practice...*

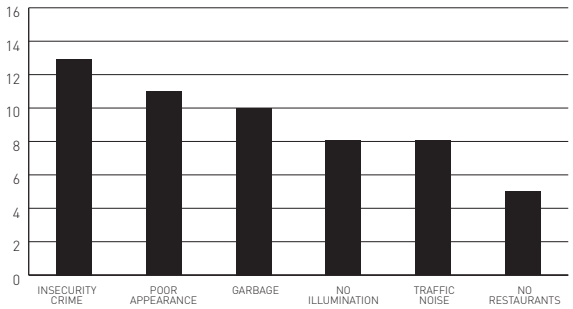
Ana, 35

Outline: *Parque Ecológico Cuemanco* is the closest and largest park for the inhabitants of *Iztapalapa*, a district with hardly any recreational areas. A total of 41 individuals were interviewed between February 18 and 26, 2012 on four different weekdays at varying times during the day. Some interviewees lived within less than 30 minutes from the park, others said it took them an hour or more to escape the city noise and spend time in nature.

The park is very popular among joggers in the mornings and late afternoons during the week, at the weekends families rent boats on the lake or spend time doing sports with their kids. Shoppers at the flower markets nearby and people who work in the area are the most frequent visitors.

Visitors treasured the park as a large natural oasis that is otherwise difficult to find in Mexico City. They liked spending their time sitting by the lake, going on boat rides, renting bikes, exercising and simply enjoying the offers nature provided them.
The air in the city was getting thicker and the park was a good place for them to get away for a while from the city smog and the summer heat.

## What bothers you most in this area?

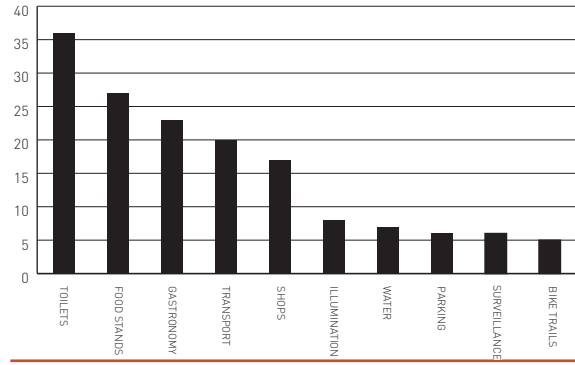



Visitors to the park were asked questions about the surrounding neighborhoods. Most of them did not like the area because of the unsightly appearance of the houses. Further, there was not much to do and the area seemed to them a little dangerous. For those who live farther away the *Parque Ecológico Cuemanco* was the only reason to visit.
Interviewees complained about too much garbage around the park and unpleasant smells from the contaminated water next to the recreational area.

> *...I don´t really know the neighborhoods around here. I arrive by car and the neigborhoods are not really in any contact with the park...*
>
> na, 25

Security was also an issue. Robberies were reported and visitors felt unsafe because there were no lights along the paths through the park and the few sanitary facilities were unkept and unclean.
Visitors also complained about noise from the traffic on Mexico City's outer ring road *Anillo Periferico* and public transportation to both entrances to the park was not very well serviced. Unpleasant smells from the contaminated water next to the recreational area.

## What offers should be included in and around the park?



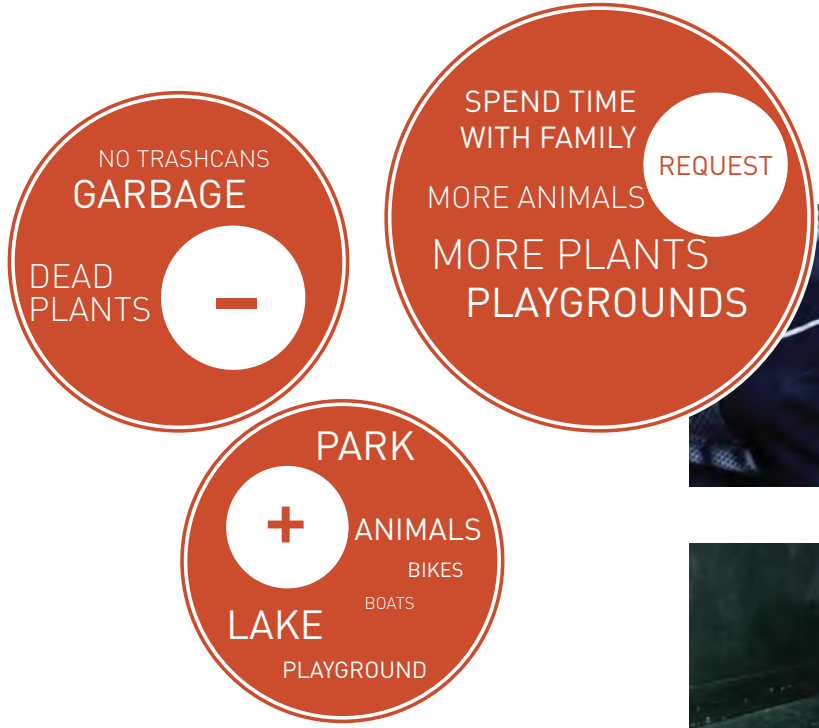

> *...There are hardly any toilets in this park...*
>
> Manola, 38

Cafés and eateries would induce people to spend more time in the park and shops and sports equipment stores were requested but nowhere to be found.
Better surveillance would be appreciated as crime is an issue. Also, parking spaces in the area around *Canal de Chalco* were limited and better public transportation was desired.
Thirty-six of forty people questioned said that restrooms were urgently needed in the park.

## 03.4.4 INTERVIEWS - CHILDREN

ADDITION
Drawings

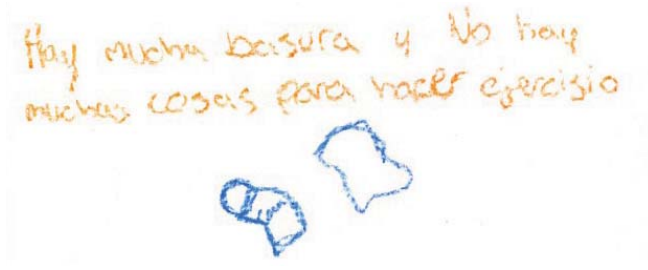
Outline: Children are important in every community. In this interview the kids were asked three different questions concerning their environment and prompted to draw pictures of what they saw. We wanted to find out what they liked and did not like about their neighborhoods and how they would improve them. It was amazing to see the details with which the kids observed their surroundings.




The park was of course their favorite because it offered so many opportunities to play. Their drawings were about riding bikes, jumping on trampolines, paddling out on the lake in a boat or simply watching the animals or climbing on big trees.
It became clear that the kids were well aware of the environmental pollution. The pictures showed people dropping trash everywhere and plants dying or rotting away.
What the kids wanted most were playgrounds so they could spend time with their parents and siblings.

What do you like most in your neighborhood?

What don't you like in your neighborhood?



What would you like to change in your neighborhood?

## INFORMAL SETTLEMENT

**+**
PARK
TRANQUILLITY

**−**
RELATIONS BETWEEN PEOPLE
INSECURITY
NO STORES
TRAFFIC
ODOR
POOR APPEREANCE
NO PUBLIC SPACE
GARBAGE

**REQUEST**
RECREATION AREAS
WASTE REMOVAL
TRAFFIC REDUCTION
STREET LIGHTNING
FACADES RESTYLING
SECURITY

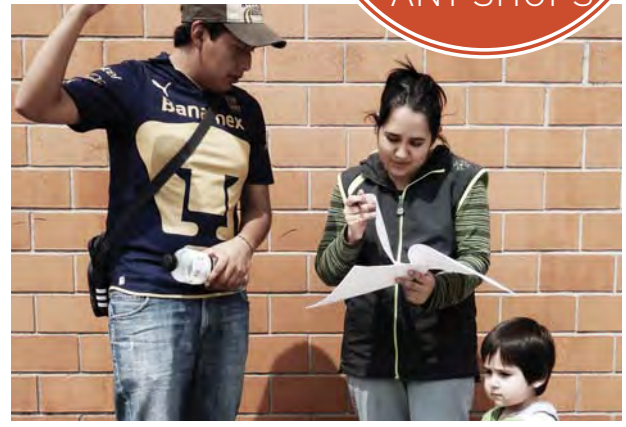
**PARTICIPATE**
PLANNING
COORDINATION OF COMMUNITY
PARTICIPATE
NO TIME
NO INTEREST

**PUBLIC INFRASTRUCTURE**
ACCESS TO CANAL
LIBRARY
COURSES
LANGUAGES, DANCING, COOKING
DOCTORS & HEALTH CARE
BIKE TRAIL
SCHOOL
KINDERGARTEN

## FORMAL SETTLEMENTS

**+**
SILENCE
PARK
NOTHING
NATURE VIEW

**−**
APPEARANCE OF INFORMAL SETTLEMENT
SMELL
GARBAGE
CRIME
HARDLY ANY SHOPS



[fig18] Results of the three interviewing groups

REQUESTS

SEWAGE SYSTEM
RECREATION AREAS
INFRASTRUCTURE
STREET-LIGHTNING
GREEN SPACE
SCHOOL

PUBLIC INFRASTRUCTURE

PLAYGROUND
COMMUNITY CENTER
THEATER
COURSES
LANGUAGES, COOKING,DANCING
OUTDOOR SPACES
LIBRARY

PARK

+

PARK
ANIMALS
SILENCE
SPORTS FIELDS
BOATS
LAKE
PLAYGROUND

−

SMELL
CRIME
TRAFFIC
GARBAGE

FREQUENCY

WEDNESDAY
MONDAY
THURSDAY
TUESDAY
SUNDAY
SATURDAY
FRIDAY

WHISHES

TRANSPORT
GASTRONOMY
LEISURE FACILITY
SHOPS
GROCERIES, SPORT CLOTHS
TOILETS

REASON

TRAINING
SPORTS
RELAX
STROLLING
FLOWER MARKET

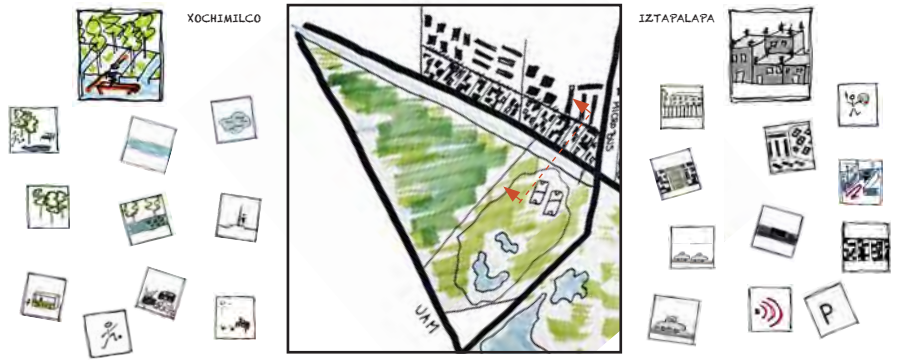
AFTER

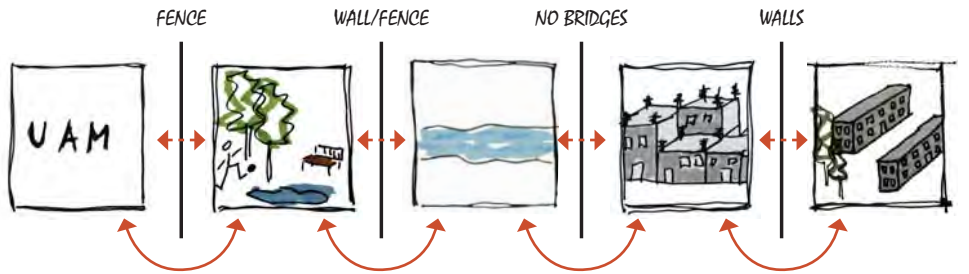
EATING
TRAINING
MEETING FRIENDS
NO OFFERS
GOING HOME

[pic33] Parque Ecológico Cuemanco

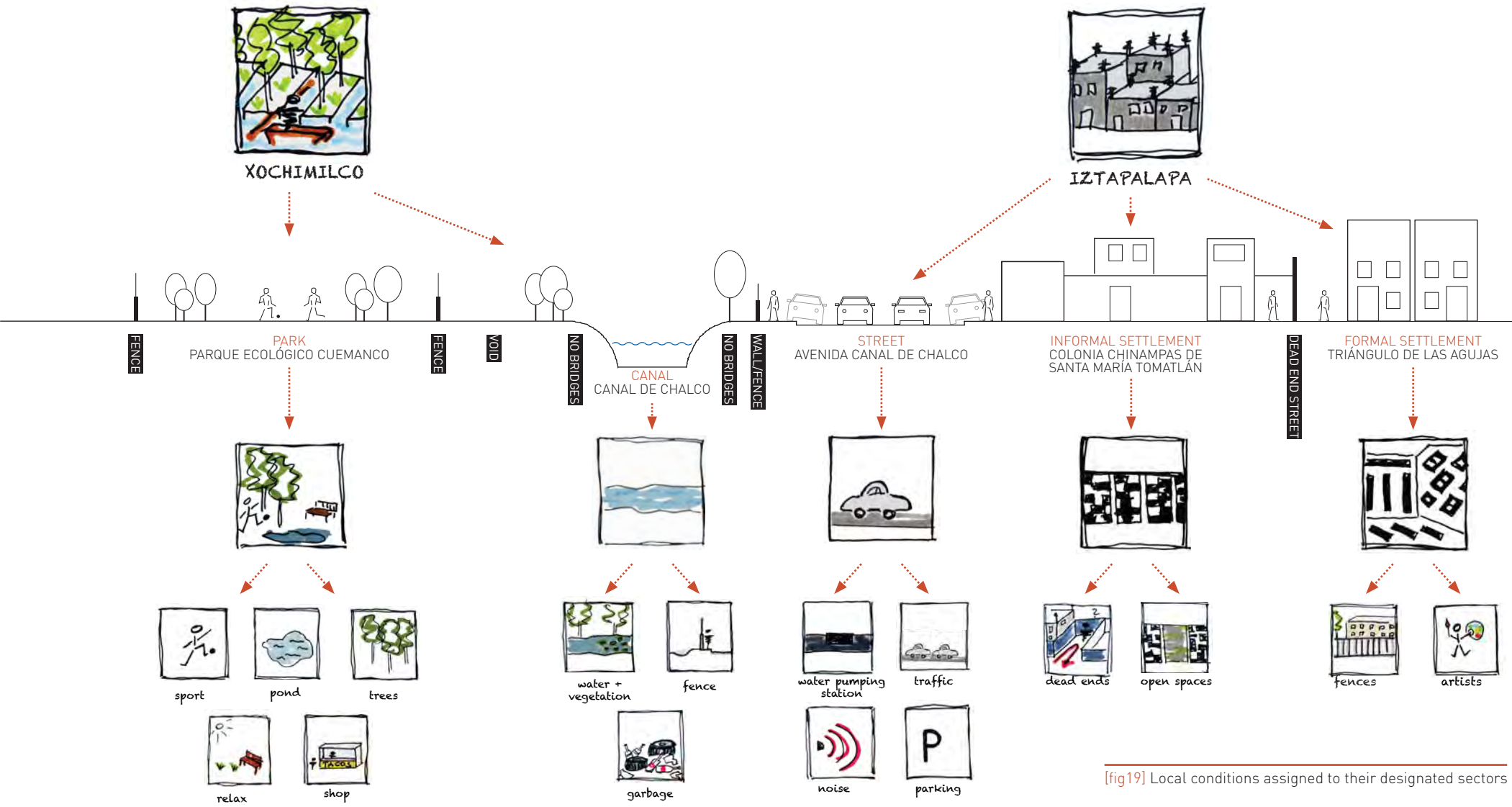
# 03/5
# CHALLENGES & POTENTIALS

## 03.5.1 LOCAL CONDITIONS






Observations were documented with photographs and sketches while walking through the neighborhoods. The collected data was later put into context and drawings of the area were assigned to their designated sectors.
A disconnection between the two bordering districts became visible where urban built-up areas are in contrast to valuable natural space. Additionally, there is a distinct separation between the individual neighborhoods.

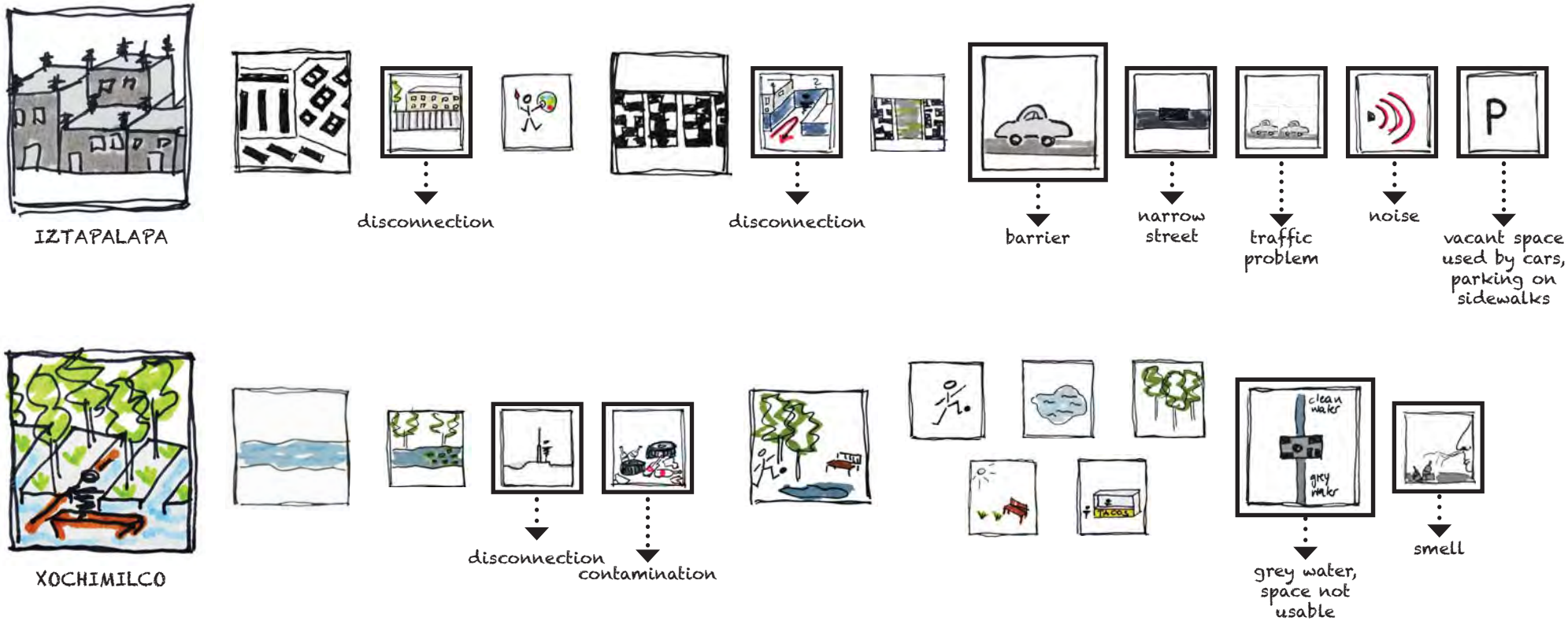



[fig19] Local conditions assigned to their designated sectors

## 03.5.2 CHALLENGES

*Iztapalapa*: The formal settlements around the *Colonia Chinampa de Santa María Tomatlán* are gated communities with surrounding walls for security reasons. The informal settlement is laid out alongside these protective walls and small alleys lead to dead ends. There is only one throughway over a length of 500 m.
Before *Avenida Canal de Chalco* reaches *Colonia Chinampas de Santa María Tomatlán* it serves as a heavily trafficked four lane road connecting the eastern urbanized areas of the Federal District with the outer ring road *Anillo Periférico*. Alongside the informal settlement it is reduced to a two-lane street with several obstacles obstructing the flow of traffic. For example, there are three water-pumping stations taking up half the width of the street, mechanics use parts of the street as well as the narrow sidewalks as extended workshops and cars are parked without orderliness on every available spot. This leads to congestion and frequent traffic jams with hardly any space left for pedestrians.

*Xochimilco:* Unfortunately, a wall separates the housing areas from the adjacent nature resort. There is only one bridge over the canal that offers access to the park. There is an admission fee of three *pesos* to the park.
Even though the area is nature protected the canal is heavenly contaminated and the smells are most unpleasant.




[fig20] Local conditions - challenges

## 03.5.3 POTENTIALS

*Iztapalapa*: There are vacant spaces and dead end streets within the urbanized area which are potentially valuable and could be used for the project at hand. Also, there have been efforts in recant years by a group of local artists to bring the people of the various neighborhoods closer together and reduce social tension.

*Xochimilco:* The greatest potential of this area is *Parque Ecológico Cuemanco*, a sizable green space adjacent to *Colonia Chinampas de Santa María Tomatlán*. The park offers racetracks and soccer sports grounds, tennis courts, playgrounds and ponds where visitors can rent boats to paddle around in. Also, there is an empty stretch of land behind a separating wall, between the street and the canal, which can be transformed into public recreational space for residents who are unwilling or unable to pay the park admission fee.

large recreational area

living by the canal

canal de chalco
historically important

POTENTIALS

combining nature and housing

reorganisation of street
to create public space

reducing divides between
communities and
the park

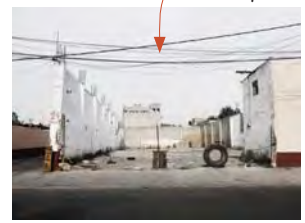
living by the park

pond

reorganisation of dead-end streets
creation of shortcuts

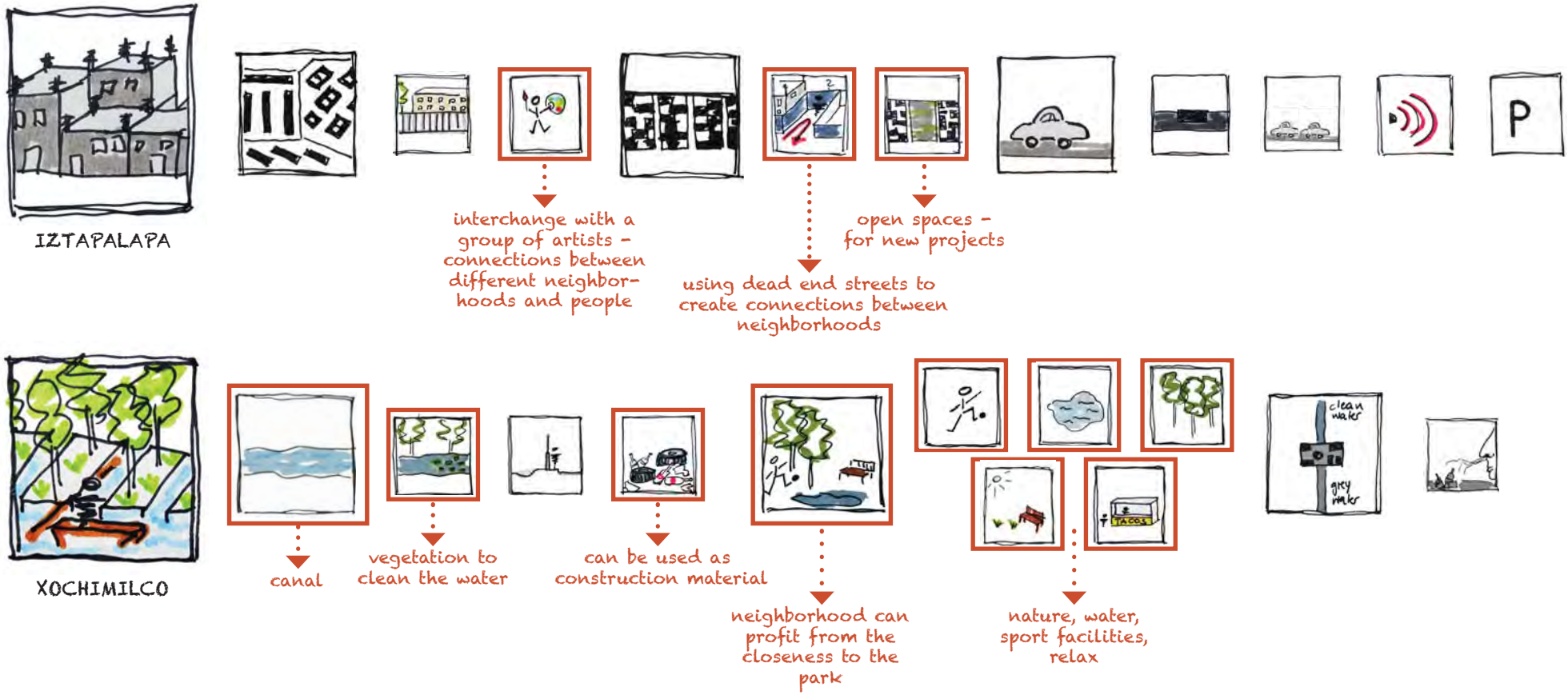
voids

space for
new projects



the park offers several sport facilities

closeness to nature




[fig21] Local conditions - potentials

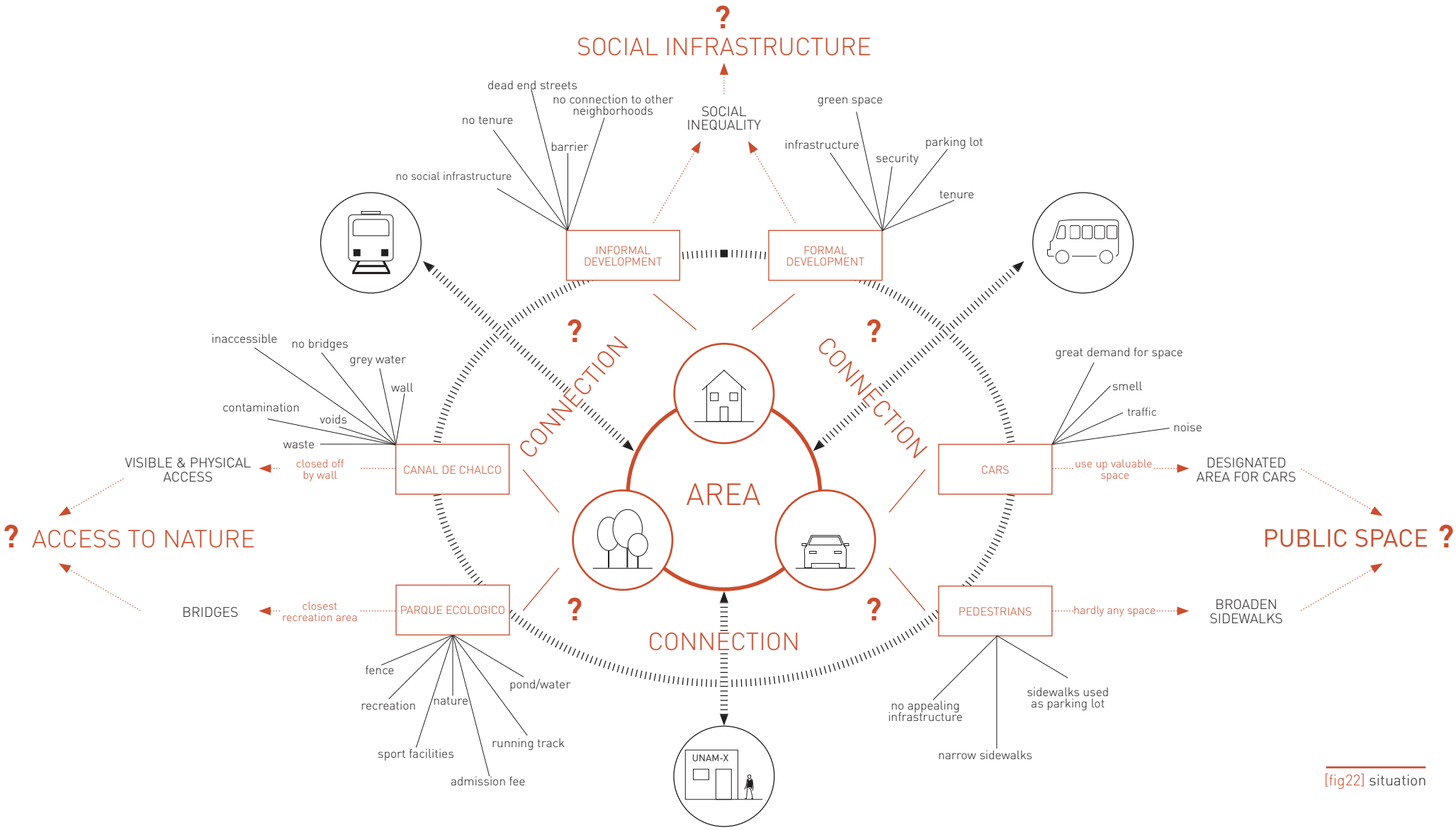
[pic34] *Canal de Chalco*, separated by a walls and fences

# 04 PROJECT

## CONNECTING CANAL DE CHALCO

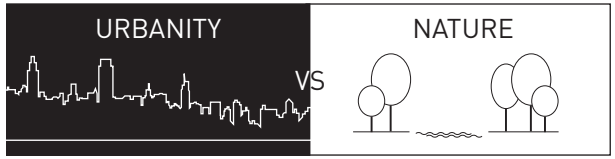
# INTEGRATED PROJECT DEVELOPMENT

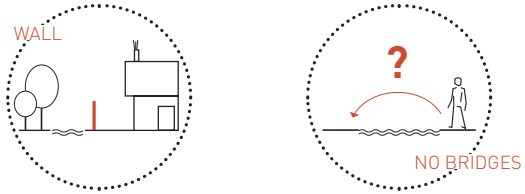
Situation: The current state of the informal settlement *Colonia Chinampas de Santa María Tomatlán* and the surrounding area was analyzed and described from various angles in the previous chapter. Subsuming we have three opposing factors that need to be brought together - nature, housing and traffic.
These three components are again contrasted. Within the housing area we have the formal next to the informal settlements; nature is closed off by walls and fences as well as by a canal with only one bridge; the street is characterized by cars parked everywhere leaving little space for pedestrians [fig22].

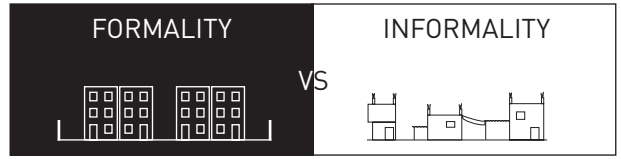


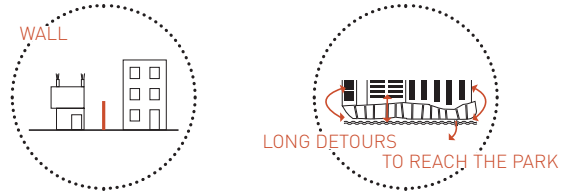

[fig22] situation

# INTEGRATED PROJECT DEVELOPMENT



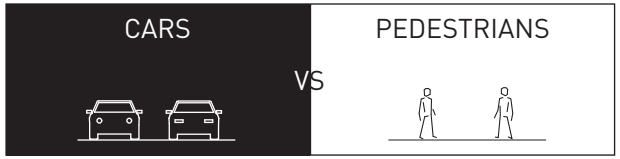



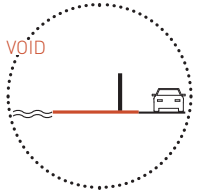

Challenges: The area is a place of diversity where urbanity meets nature, formality conflicts with informality and motorized traffic collides with pedestrians. Recurrent in the analysis is spatial disconnection, one of the biggest challenges of the area. Each area is isolated from the other by walls, which prevent residents from interacting socially with one another.

Urbanity vs. Nature: This is a place within the Federal District where literally two worlds are lying immediately next to each other - urbanity and nature. The only thing keeping them apart is the dividing wall. Also there is only one bridge that crosses the canal. It is originally built for motorized traffic, but it is also frequented by pedestrians as there is no other option.

Formality vs. Informality: There is only one passage way connecting one of the formal settlements with the informal neighborhood the others are not accessible from *Avenida Canal de Chalco*.
This leads to long detours when residents want to visit the park. The walls of the gated communities not only separate the neighborhoods spatially but also keep the people from interacting socially.

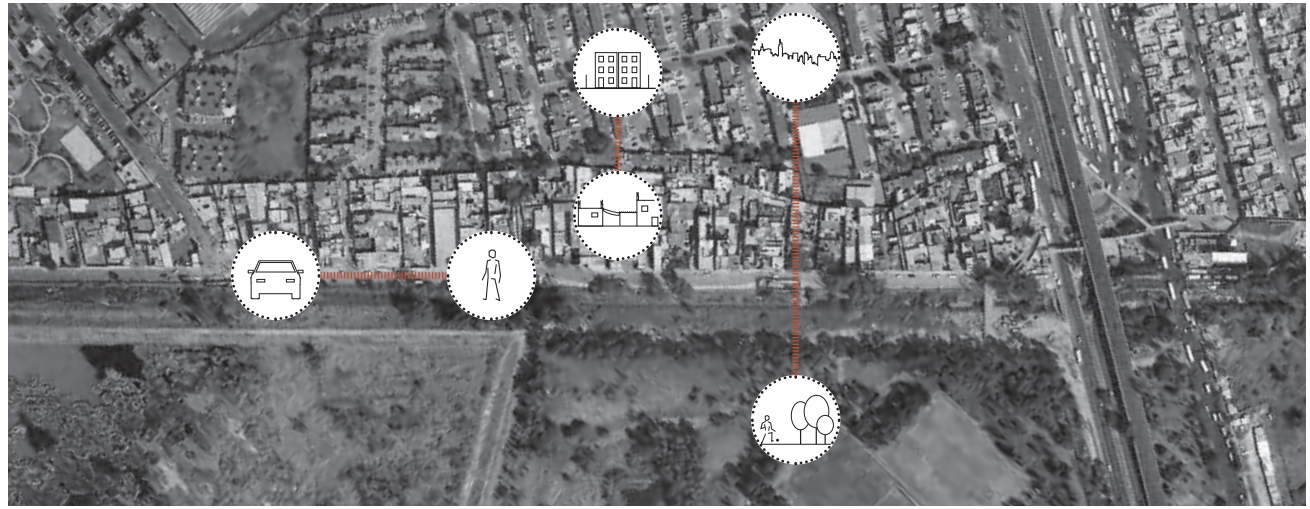
[fig23] challenges and possible solutions





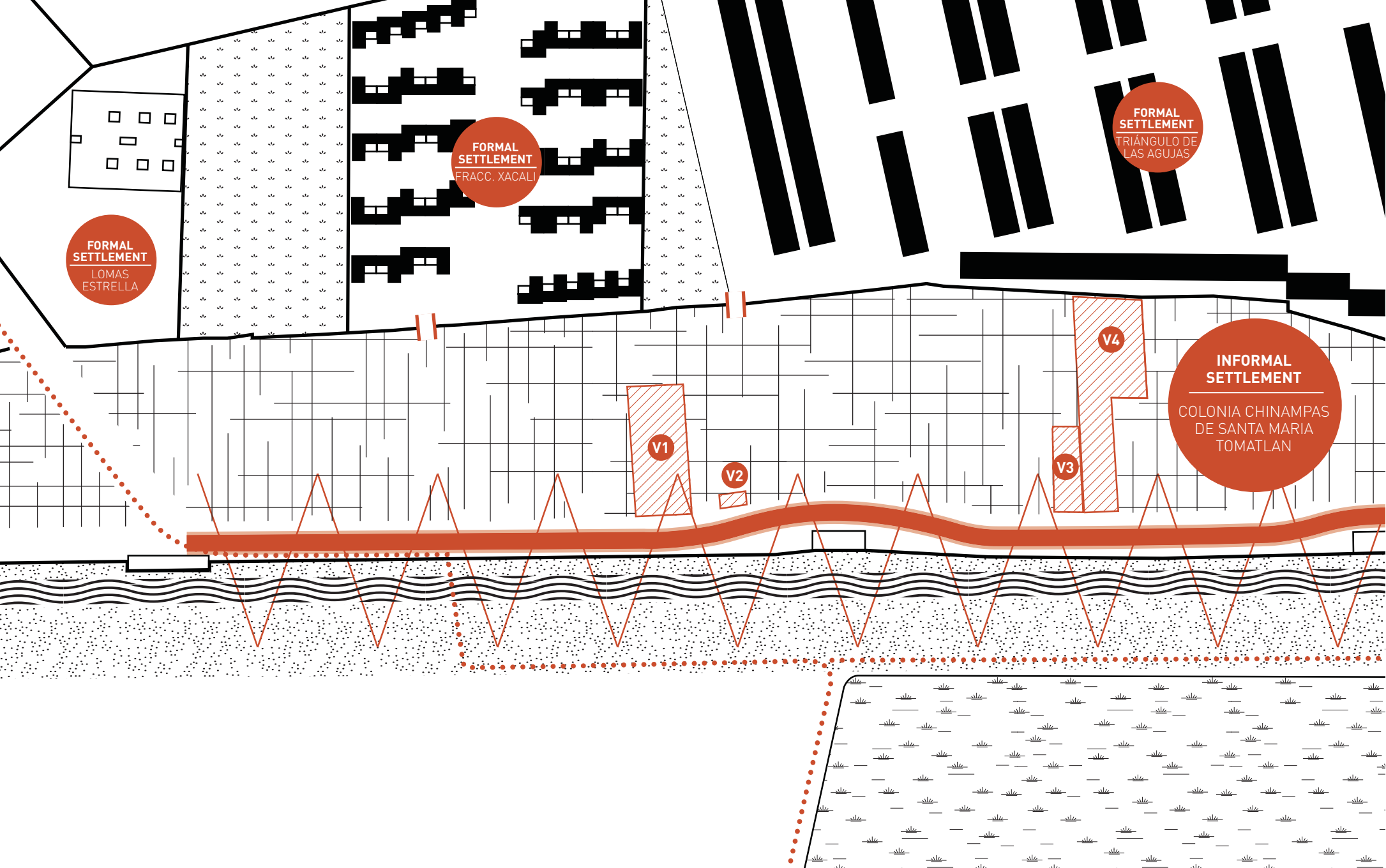

Cars vs. Pedestrians: The street *Avenida Canal de Chalco* is often used to shorten travel time during daily rush hours. There are narrow walkways for pedestrians on both sides. These, however, are obstructed by cars parked on both sides occupying the entire width of the sidewalks with hardly any space left for pedestrians.
Additionally, the wall alongside the canal makes it impossible to use the open space, which would actually be available for redevelopment along the banks of the canal.

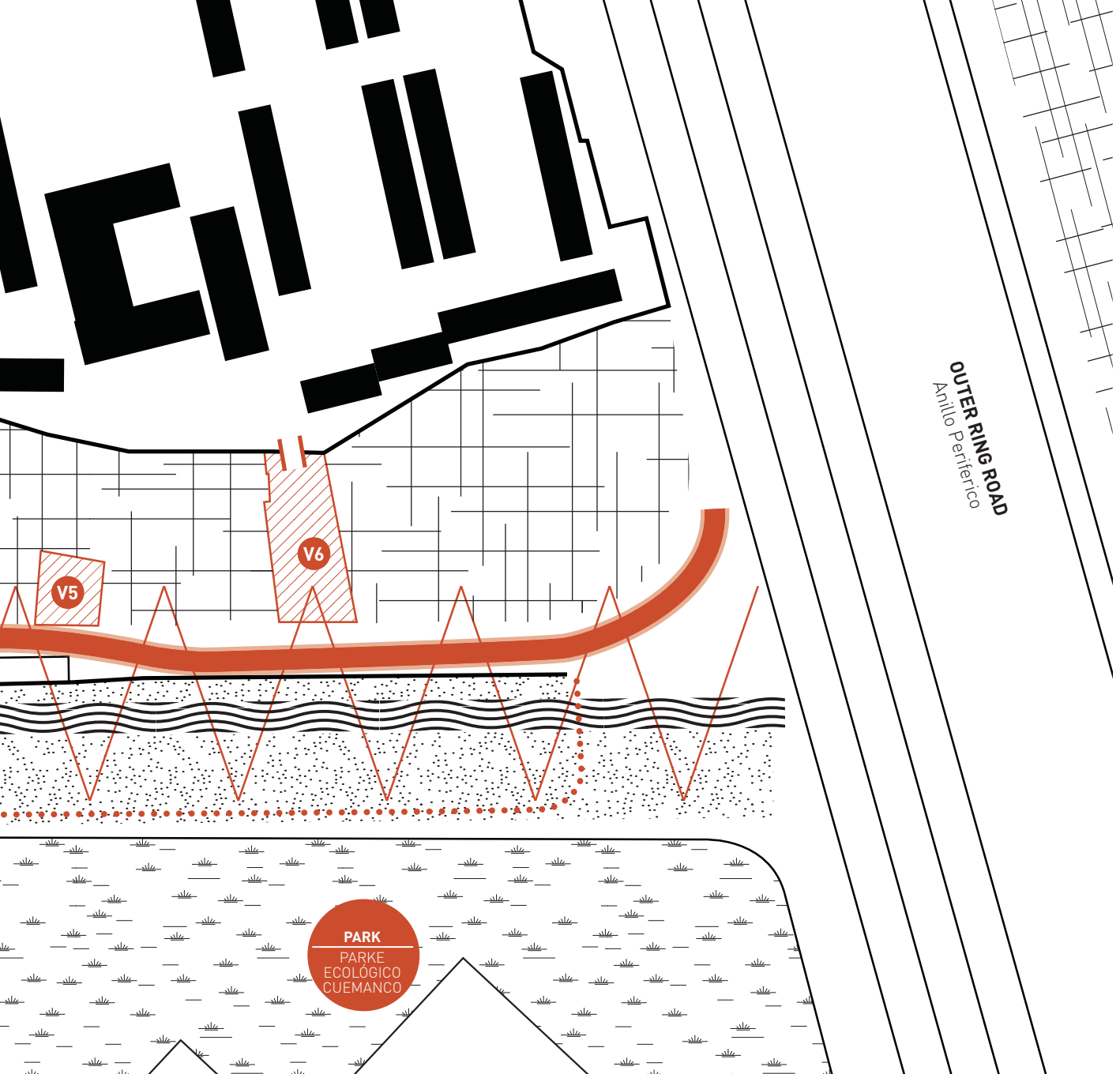
# CONNECTING A PLACE OF CONTRASTS



# STRUCTURE PROJECT

Objective: The goal of this project is to find a way of embedding the informal settlement *Colonia Chinampas de Santa María Tomatlán* within its surroundings. A number of activities will be required to improve living conditions. The overriding objectives are to find a connection spatially and socially.
Before the approach can be explained, it is noteworthy that residents of low-income neighborhoods often require short-term solutions because of major deficiencies in their immediate surrounding. In conversations with the residents it became very clear that long-term projects are likely to be rejected unless there is an immediate impact. Nevertheless, the ensuing project will be future-orientated. To guarantee short-term solutions the approach will be in form of TOOLBOXES. This ensures smaller modifications to the neighborhood in a shorter period of time.


FORMAL SETTLEMENT
LOMAS ESTRELLA
FORMAL SETTLEMENT
FRACC. XACALI
FORMAL SETTLEMENT
TRIÁNGULO DE LAS AGUJAS
INFORMAL SETTLEMENT
COLONIA CHINAMPAS DE SANTA MARIA TOMATLAN
V1
V2
V3
V4




[fig24] Implementation of the toolboxes

[pic35] Participation

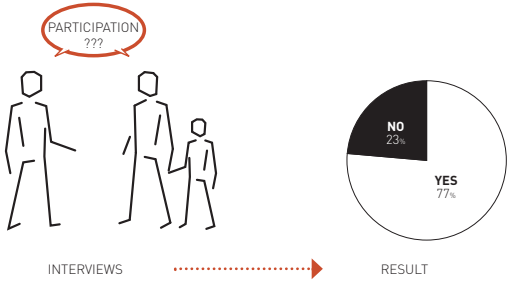
TOOLBOX

# 04/1
# PARTICIPATION

# 04.1 TOOLBOX PARTICIPATION

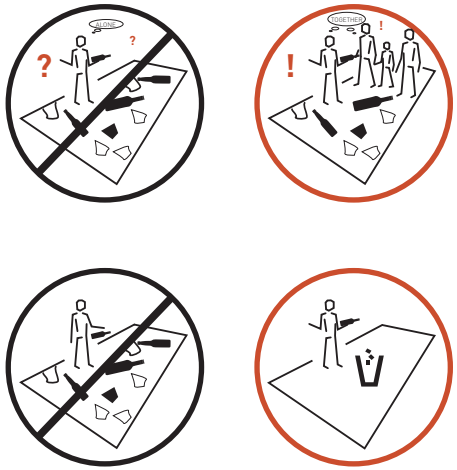
*"Cities have the capability of providing something for everybody, only because, and only when, they are created by everybody"* (Jane Jacobs)

## challenges




**Challenges:** Planners vs. Final Users

As planners we create ideas and design concepts and ultimately we produce the desired solutions. Before we can do so, however, it is essential to know the daily routines of the people who will be responsible for accepting, enlivening and lastly maintaining the public space. It is unacceptable to force such improvement upon them without preparation.  As planers we can not spend enough time documenting the input and analyzing the opinions of those who actually live in the vicinity.



**Desired Outcome:** Contribution and Participation to Guarantee Project Acceptance

In our case, residents were questioned concerning personal requests so that their most urgent needs can be incorporated into the master plan. Interviewees pointed to their personal requirements and contributed ideas as to what might realistically improve their neighborhood. This will lead to closer contacts and form the groundwork for future cooperation and further dialog.

Considering the individual skills of the people not only provides new job opportunities but also helps in building a neighborhood the residents themselves created. Involving them in the decision-making leads to greater appreciation for a project they might otherwise have opposed to or even rejected. This direct approach guarantees increased sustainability in terms of use and further development.

# impulse

**Are you interested in converting Avenida Canal de Chalco to a public space?**

[ ] YES, I would like the transformation

[ ] NO, I would not like the transformation

[ ] Why.....
.....

**Mark in the map where you wish to have a connection through you neigbourhood.**

[ ] i do not like to have shortcuts through the neigbourhood

[ ] Why.....
.....

**Which qualities do the newly created areas need to offer?**

**sidewalk**
[ ] walking
[ ] parking spots
[ ] extending business area
[ ] cafe/restaurant
[ ] street lighting
[ ] trash cans
[ ] bench
[ ] ramps for barrier-free use
[ ] .....
[ ] .....
[ ] .....

**street**
[ ] keep street as it is
[ ] no street
[ ] two-lane-street
[ ] relocate street
[ ] reduce car speed
[ ] .....
[ ] .....
[ ] .....

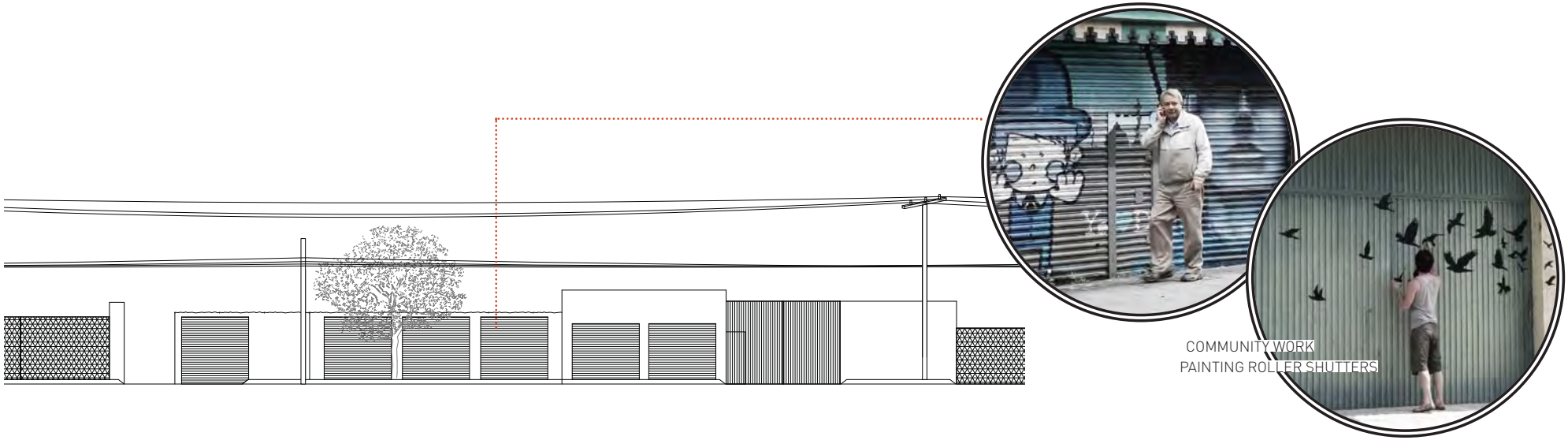
**nature**
[ ] demolishing wall
[ ] visibility of water
[ ] cleaning Canal de Chalco
[ ] bridges over the canal
[ ] playgrounds
[ ] work out areas
[ ] stage
[ ] sitting option by the canal
[ ] .....
[ ] .....
[ ] .....

**How can you contribute?**
[ ] help to clean the canal
[ ] constructor
[ ] artist
[ ] organising
[ ] .....
[ ] .....
[ ] .....

COMMUNITY WORK
CLEANING THE CANAL

**Impulse:** Including the Residents in the Development Process

▪ The residents of *Colonia Chinampas de Santa María Tomatlán* will be presented with blueprints showing the conversion of *Avenida Canal de Chalco* into public space. Posters will be placed on walls and buildings in the neighborhood to attract attention and invite residents to share ideas. The blueprint will show *Avenida Canal de Chalco* as a two-lane street with a wider sidewalk along the front of the homes as well as public space and better access to the park on the other side of the street. The residents themselves will determine how the newly




acquired space shall be used in future.

• At the same time, letters including two sets of questions will be sent out to the households soliciting peoples' opinions. The first set will allow residents to express personal wishes and indicate where they want newly created services to be located; the other holds options for facilities such as parking lots, cafes, extended workplaces, playgrounds, etc. to be added at a later date. Icons with numbers will illustrate the general direction in which activities are heading. The completed forms will be returned to the planers in mailboxes set up throughout the vicinity.

**Impulse:** Events and Participation

• Once the wall along the *Canal de Chalco* has been removed the main task of purifying the water will commence. During the analysis residents were asked if they were willing to participate in clearing and grubbing the banks. Many said they would like to collect garbage or organize groups of helpers at the weekends.
• A major issues of concern were the numerous automobile repair shops along *Avenida Canal de Chalco*. Mechanics must be provided with proper workspace and the appearance of the street might be improved with color on the walls and with paintings on the unsightly roller shutters. This could also be part of a community event as families contribute their particular skills.

[pic36] Metro, Mexico City

TOOLBOX

# 04/2
# CONNECTION

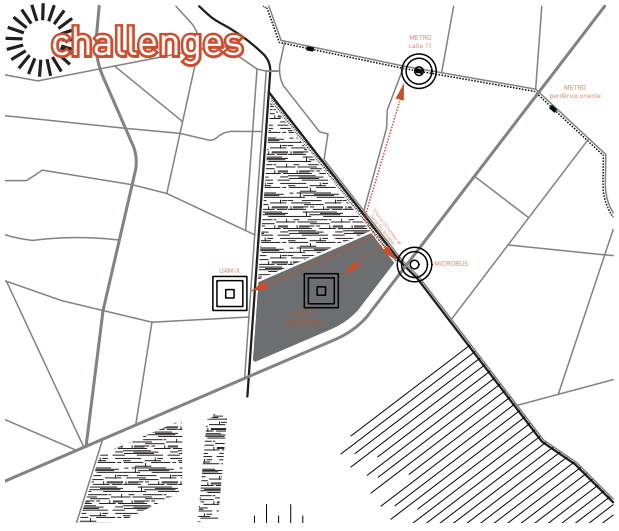
# 04.2 TOOLBOX CONNECTION
## 04.2.1 Opening up Transport Links

### ON THE REGIONAL LEVEL

Mexico City offers an extensive network of public transport that includes metro lines and metro buses in the central parts of the city with microbuses filling the gaps in the outer metropolitan area. Unfortunately, each of these transport modes has its own charging and ticketing regime for single fare, which means that passengers travelling beyond the city zones are forced to use a series of buses and buy new tickets for every section of the way. The fare for a metro or local bus ride in Mexico City is relatively inexpensive for someone with a regular job, the poorer population, however, usually the ones who commute the farthest, often find it difficult to come up with the fare required. Especially when more than one mode is necessary to travel to work in the morning and back home again in the evening.
Taxis are a convenient means of travel and private transport is considered prestigious. Both are something people would like to have but can not always afford to use. Although traffic in Mexico City is among the worst in the world and drivers spend hours in congested city streets, private cars are the preferential way of getting around. Parking is almost impossible to find and people leave their vehicles wherever they find a spot, on the streets, on sidewalks and on most vacant spaces.

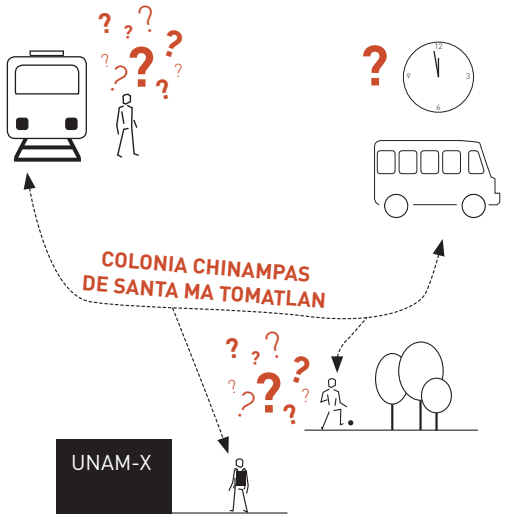
> *"ECOBICI is the new system of individual urban transport, which can be used to supplement the public transport of Mexico City. It is a comfortable and evironmentaly friendly way of transportation for short distances."*
> (https://www.ecobici.df.gob.mx/home/home.php)

The objective is to provide spatial connection on a regional level which will create a greener, healthier and faster way of transportation. This will not only improve traffic in the area, but it will also have a positive effect on the informal settlement.




**Challenges:** Connectivity

At the end of 2012 a new metro line, the *Linea 12* was added, which now connects the central metro network with the south-east of the Federal District.
The stations *Calle 11* and *Periférico Oriente* are within walking distance of 15 to 20 minutes from *Colonia Chinampas de Santa María Tomatán*, which, in Mexico City, is considered to be "right next to the station". These are not only the stops closest to the informal settlement but also to the university *UAM-X*. There is a microbus station at the junction of *Anillo Periférico* and *Avenida Canal de Chalco*, from where buses operate in

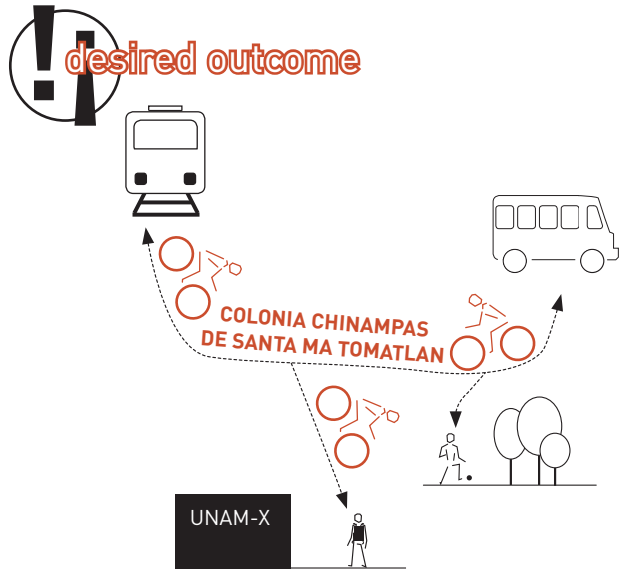



various directions.
The new metro line is a great improvement and the stops are not really very far away, however, in order to reach the university, one would have to cross through the park. Unfortunately, this is not possible because of the dividing walls along the road and fences around the park.

**Impulse:** Ecobici Terminals & Bike Lanes

• Ecobici terminals need to be implemented close to the most important facilities, at the metro station and the microbus terminal as well as near the two entrances to the park and around the university.

• To ensure a safe and fast connection bike paths and bike lanes on the streets *Techinicos y Manuales* and *Avenida Canal de Chalco* need to be created. More importantly, the path between the water regulation pool and the park needs to be opened for public use so students can cross over to *UAM-X*.




**Desired Outcome:** Improvement of Public Transportation

To complement the existing public transportation network the extension of Mexico City's ecobici network would not only improve public transport and shorten travel times but offer a greener and healthier alternative to the dense traffic and slow moving public transport by bus.
The informal settlement would have to be included to benefit both the commuters and the residents. Bikers would vitalize the settlement and open up new business opportunities for residents of the *Colonia Chinampas de Santa María Tomatlán*, who would subsequently cater to their needs.

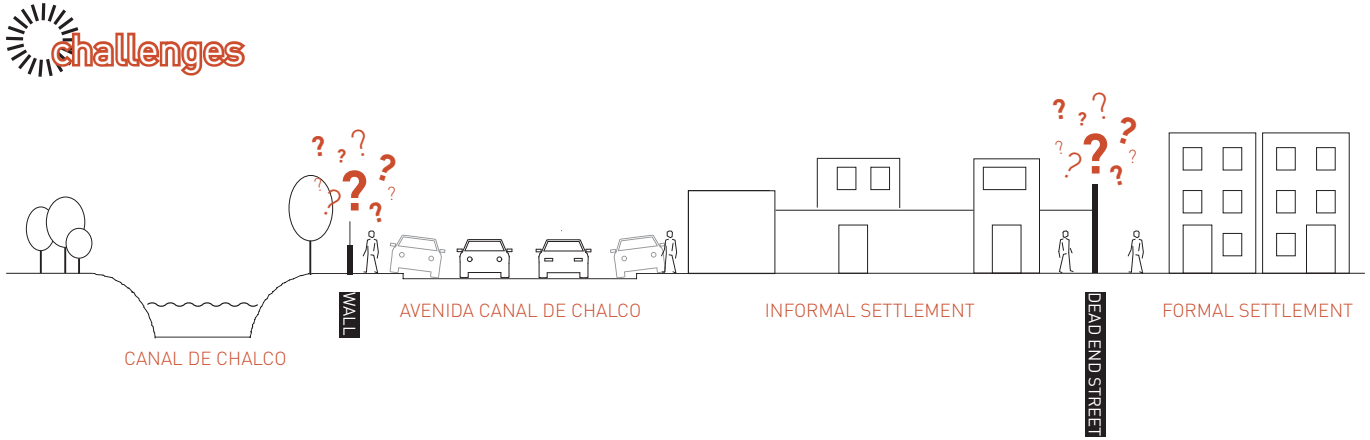
# 04.2 TOOLBOX CONNECTION
## 04.2.2 Reducing Divides between Communities and the Park

> *"The more successfully a city mingles everyday diversity of uses and users in its everyday streets, the more successfully, casually (and economically) its people thereby enliven and support well-located parks that can thus give back grace and delight to their neighborhoods instead of vacuity."* (Jane Jacobs)

## ON THE IMMEDIATE LEVEL

Parks and recreational areas are a privilege in Mexico City which are not sufficiently accessible to every resident. The people of *Colonia Chinampa de Santa María Tomatlán* have such a highly desired green space immediately in front of their doorsteps, however, they are unable to take full advantage of it.

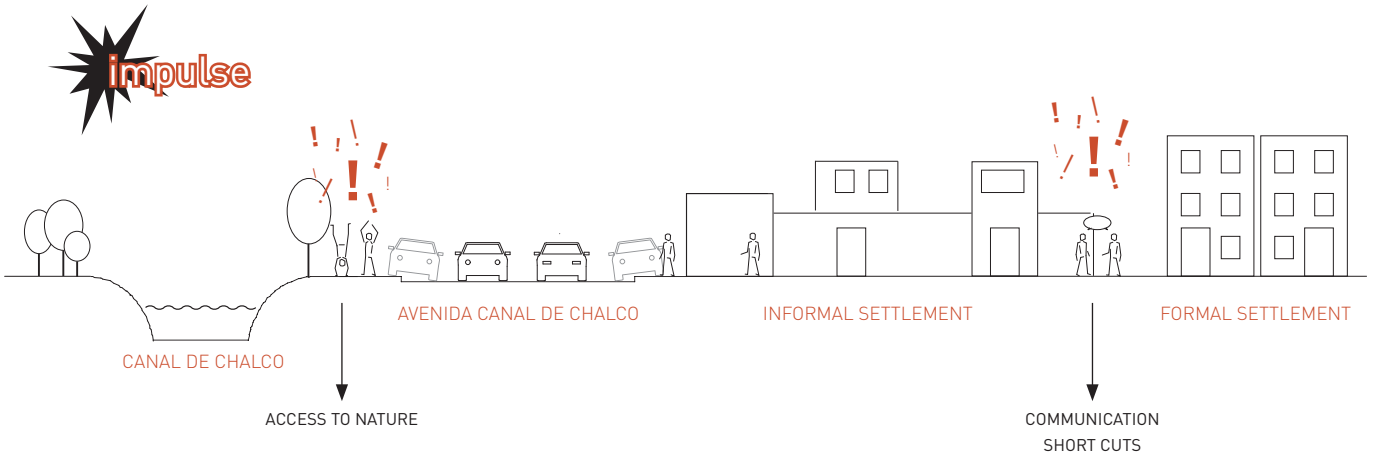
**focus**two of the **TOOLBOX**CONNECTION focuses on connecting *Colonia Chinampa de Santa María Tomatlán* with its immediate surroundings. It points out the main obstacles that cause disconnection between the different areas. A challenge that seems to be solved easily (on paper) but does not work, if the social circumstances are not respected. Therefore, this step is partially a deliberation of options which will be implemented later in the project as the implementation of social infrastructure is discussed.

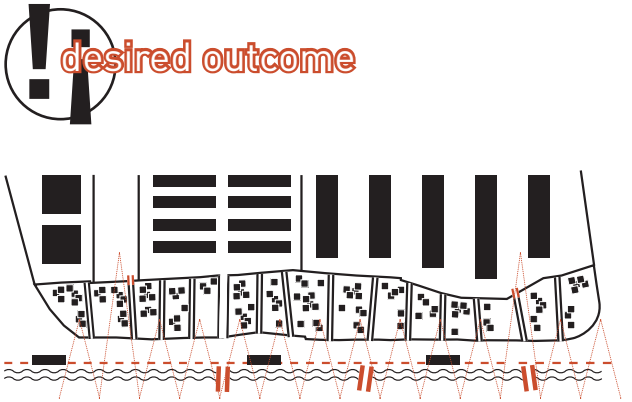



**Challenges:** Connectivity between Communities and Park

*Parque Ecológico Cuemanco* appears on the map to be within reach of the settlement but in reality it is closed off by a wall running along *Avenida Canal de Chalco*. The wall not only hinders the beautiful view over nature but more importantly denies access to the canal and the park. Additionally, it prevents the space between the road and the canal from being used.

*Colonia Chinampa de Santa María Tomatlán* is a linear settlement built along the walls of the gated communities so that side alleys run into dead ends. Only one path leads through the informal settlement that is used as entrance to one of the adjacent formal neighborhoods. Nevertheless, most of the residents must walk long ways around the informal settlement to reach the canal and the park.
The dead end streets can only be opened in combination with the newly planed social, recreational and health care facilities.




**Impulse:** Remove and Create Openings in Walls

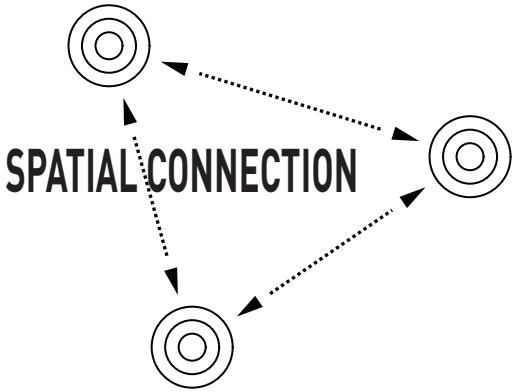
- The wall along *Avenida Canal de Chalco* needs to be removed for nature to become visible and more easily accessible. This will open the banks alongside the canal for people to "hang out", relax and spend their leisure time by the water.

- Some of the side alleys need to be transformed into throughways. This allows shortcuts for the people who live in the gated communities to reach the canal and the park. More importantly, it creates opportunities for interaction between the different social groups.

**Desired Outcome:** Reducing Divides

The purpose of this TOOLBOX is to create passageways in the safeguarding walls without breaking the security of the gated communities. The project intents to open the newly implement infrastructure in the informal settlement to all the residents of the surrounding neighborhoods and melt together and intermingle the different social groups.
The streets of the informal settlement were built on the dewatered canals of the former *chinampas* and the basic structure of the township reminds of the original *chinampa*-fields. The revival of the historically meaningful *Canal de Chalco*, will give new meaning to the neighborhood and attract visitors from other parts of the city.

# impulse




PUBLIC TRANSPORT

**INFORMAL SETTLEMENT**

**as a connective link**

MAIN FACILITIES

## focusone

**opening up transport links**

# TERMINALS

**ECOBICI**

**as an efficient form of transportation**

TIME-SAVING

ECO-FRIENDLY

NO TRAFFIC-JAM

# BIKETRAILS

IMPROVING THE PUBLIC TRANSPORTATION NETWORK

## focustwo

**reducing divides between communities and the park**

# NO WALLS

HOUSING ◄····► NATURE

**CONNECTIVITY**

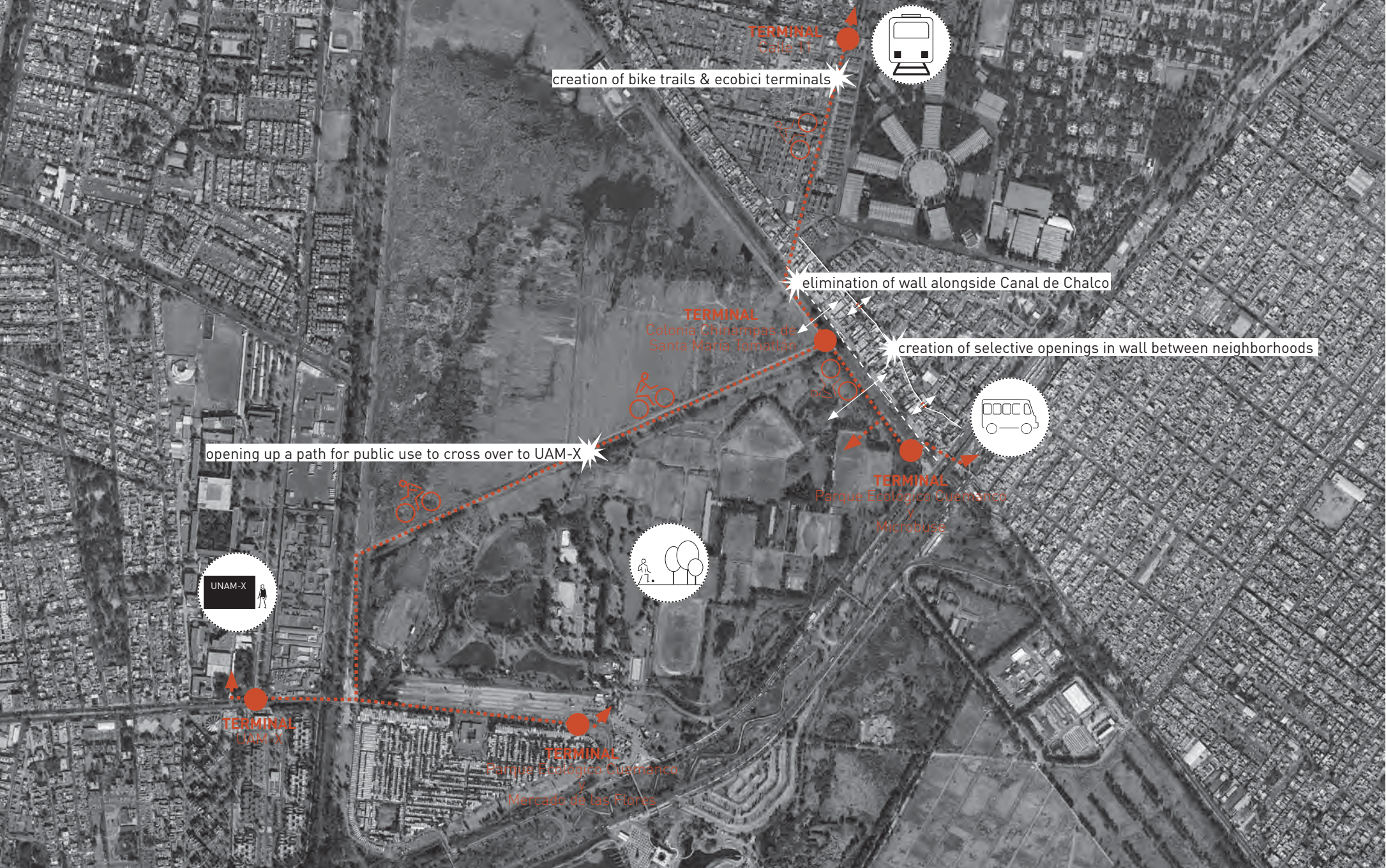
**between different areas**

INFORMAL SETTLEMENT

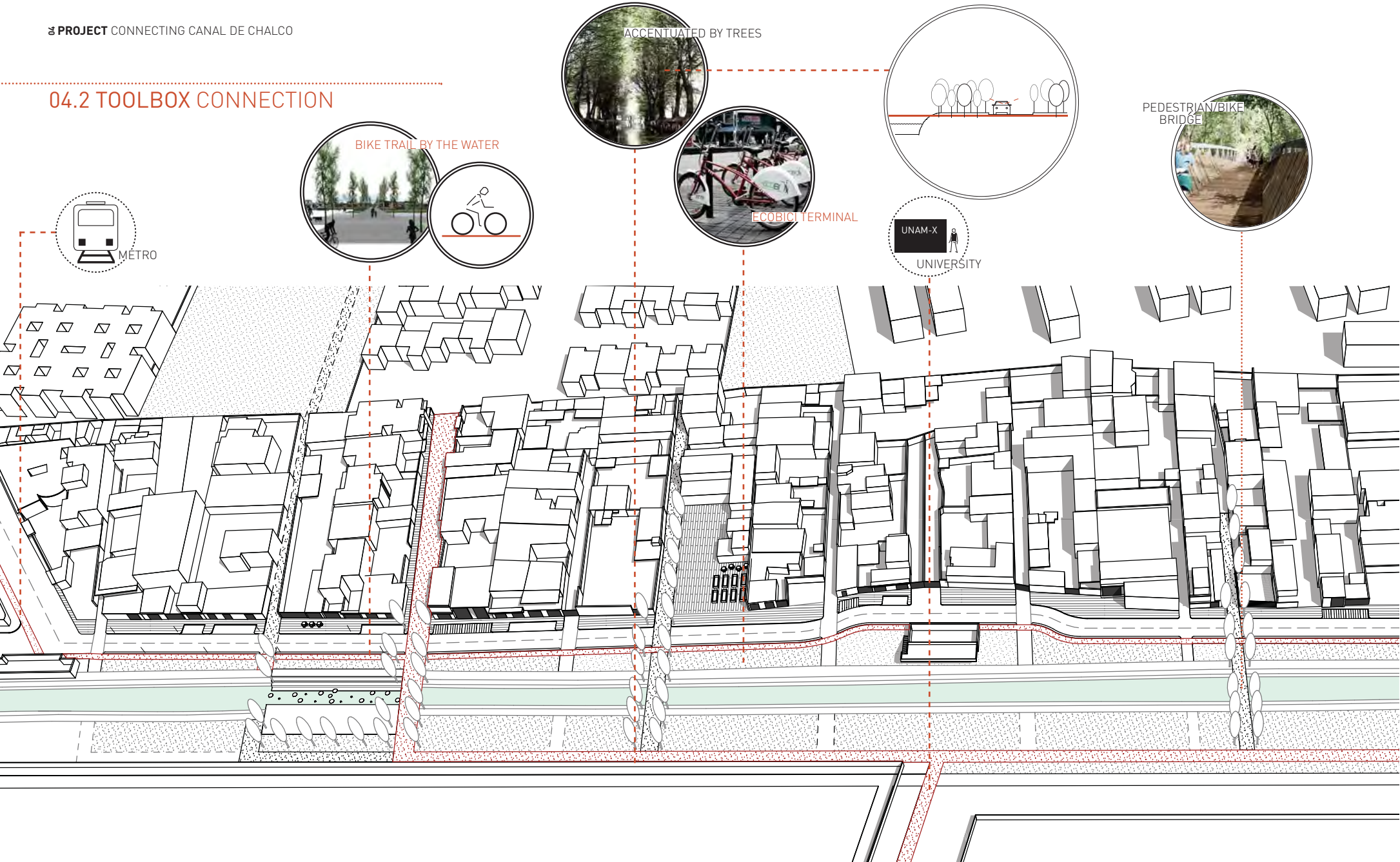
FORMAL SETTLEMENT

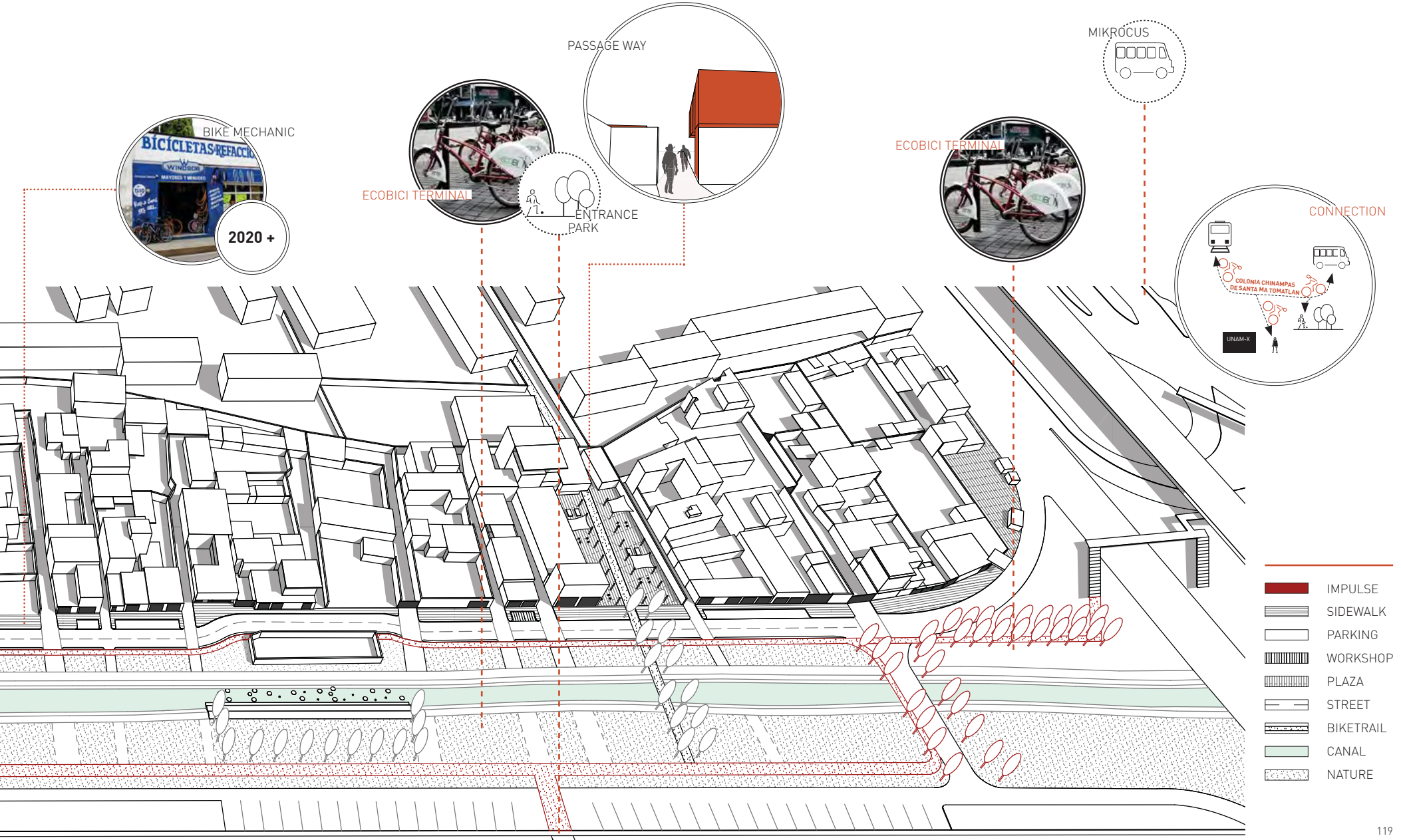
# OPENINGS

ACESS TO NATURE


TERMINAL
Cane 11
creation of bike trails & ecobici terminals
elimination of wall alongside Canal de Chalco
TERMINAL
Colonia Chinampas de
Santa Maria Tomatlán
creation of selective openings in wall between neighborhoods
opening up a path for public use to cross over to UAM-X
TERMINAL
Parque Ecologico Cuemanco
/
Microbuse
UNAM-X
TERMINAL
UAM-X
TERMINAL
Parque Ecologico Cuemanco
/
Mercado de las Flores

## 04.2 TOOLBOX CONNECTION




BIKE MECHANIC
BICICLETAS REFACCIO
WINDSOR
2020 +
ECOBICI TERMINAL
ENTRANCE
PARK
PASSAGE WAY
MIKROCUS
ECOBICI TERMINAL
CONNECTION
COLONIA CHINAMPAS
DE SANTA MA TOMATLAN
UNAM-X
IMPULSE
SIDEWALK
PARKING
WORKSHOP
PLAZA
STREET
BIKETRAIL
CANAL
NATURE

[pic37] Public Space, Mexico City

TOOLBOX

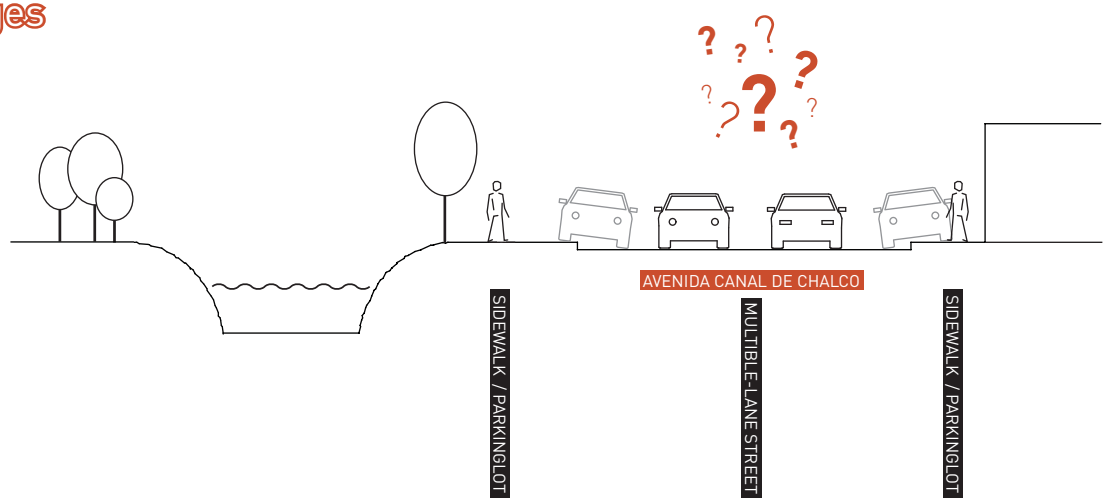
# 04/3
# PUBLIC SPACE

# 04.3 TOOLBOX PUBLIC SPACE

## 04.3.1 Converting the Street into a Public Space

> *"When public spaces are successful [...] they will increase opportunities to participate in communal activity. This fellowship in the open nurtures the growth of public life, which is stunted by the social isolation of ghettos and suburbs. In the parks, plazas, markets, waterfronts, and natural areas of our cities, people from different cultural groups can come together in a supportive context of mutual enjoyment. As these experiences are repeated, public spaces become vessels to carry positive communal meanings."* (Carr, Francis, Rivlin and Stone, 1993, p. 344)

challenges

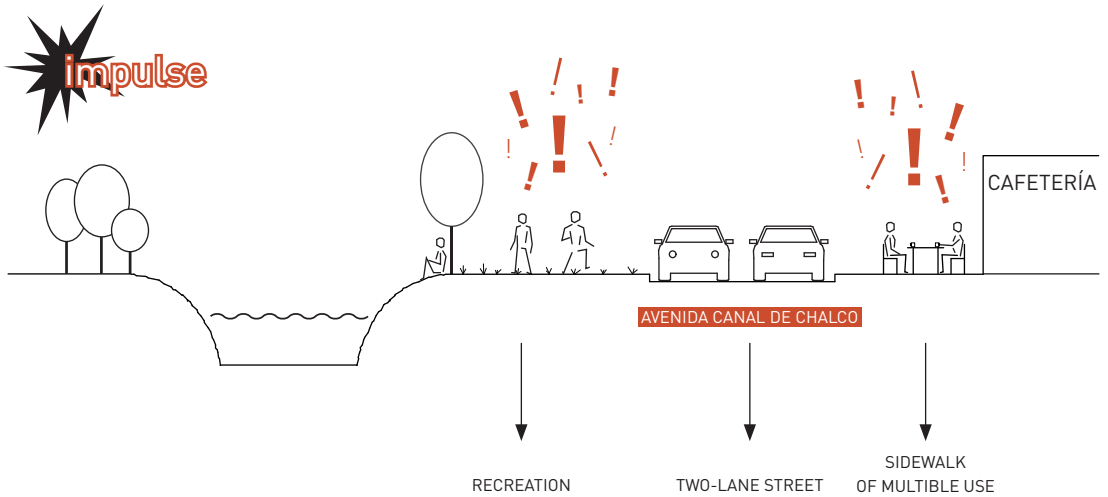


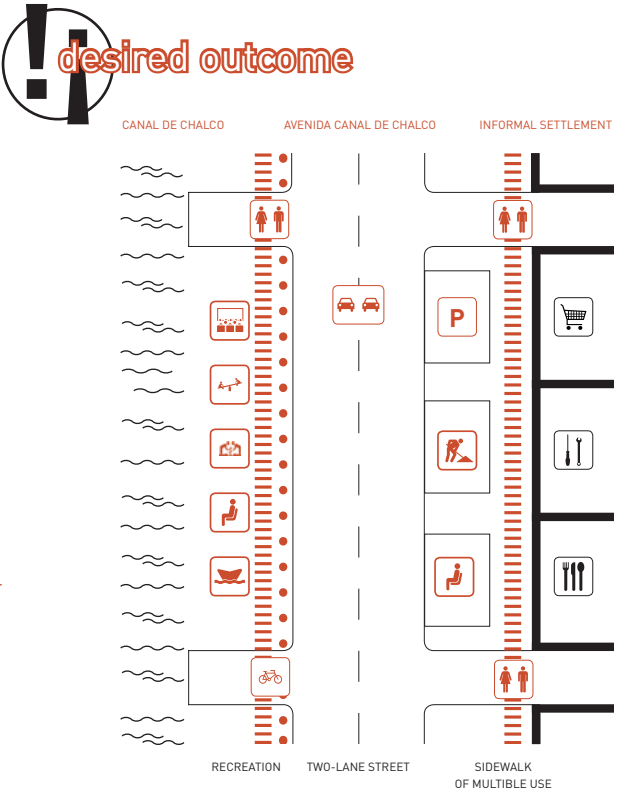

## PUBLIC SPACE

Interviews made clear, that public spaces were urgently needed. Even though *Parque Ecológico Cuemanco* is just across the canal it does not fulfill its requirements because of the entrance fee that many can not afford to pay.

**Challenges:** Cars Use Up Valuable Space

*Avenida Canal de Chalco* is a busy city throughway between 7 and 18 meters wide. Despite the width of the street only two lanes are of use to moving traffic because there are so many auto repair shops in the neighborhood with too many cars in various state of repair occupying every available spot on both sides of the street. This makes the street uninviting for pedestrians and too detached from residents everyday lives.




**Impulse:** Dividing the Street into Three Areas

*Avenida Canal de Chalco* will be divided in three different zones: A two-lane road for the traffic between a sidewalk in front of the houses on one side and green land with recreational space and the *Canal de Chalco* on the other.

- Sidewalks will be widened and transformed into pedestrians zones. Food stands and sidewalk cookeries can develop into cafés and restaurants with outdoor seating. Mechanics will receive designated work space and shops will have parking lots directly in front of the businesses for shoppers convenience.

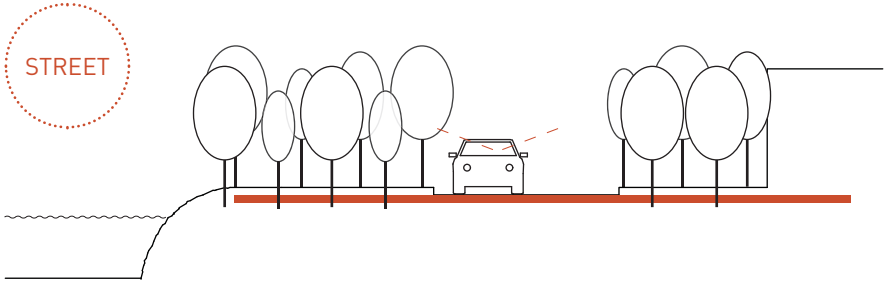
- The street will be two lanes only, which will lead to less traffic and reduced speed.

- The vacant space between the street and the canal will open avenues for landscaping and social dialogue. Sitting areas by the canal, a stage for theater performances, playgrounds and community gardens will invite people to meet and socialize.

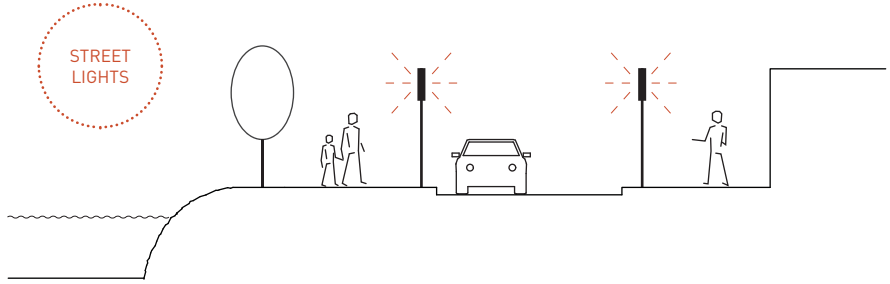
**Desired Outcome:** Street As A Public Space

With less traffic and more pedestrian space *Avenida Canal de Chalco* will become a more enlivened urban meeting area. In combination with the new bike lanes between the university and the nearby metro stations visitors will be induced to stop over and spend time in the newly created public spaces.

# 04.3 TOOLBOX PUBLIC SPACE

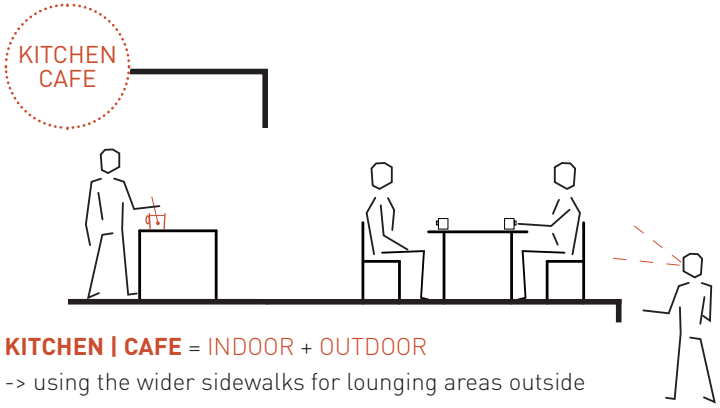



**STREET** = FLOORING + TREES
-> to call attention and slowing down traffic

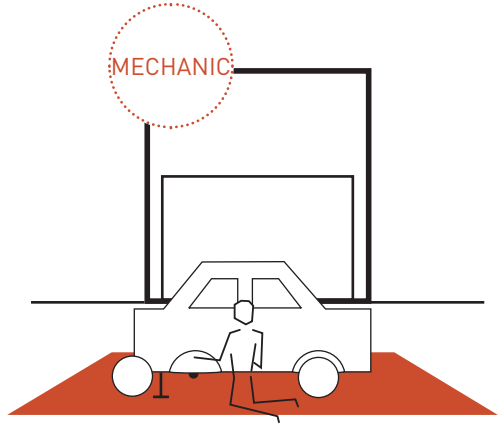



**STREET LIGHTS** = SAFE STREETS

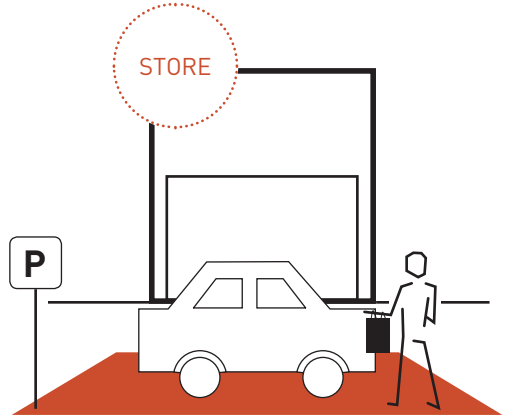
**SIDEWALK** = WALKWAY + LOUNGING AREA + WORKSHOP + PARKING SPOTS



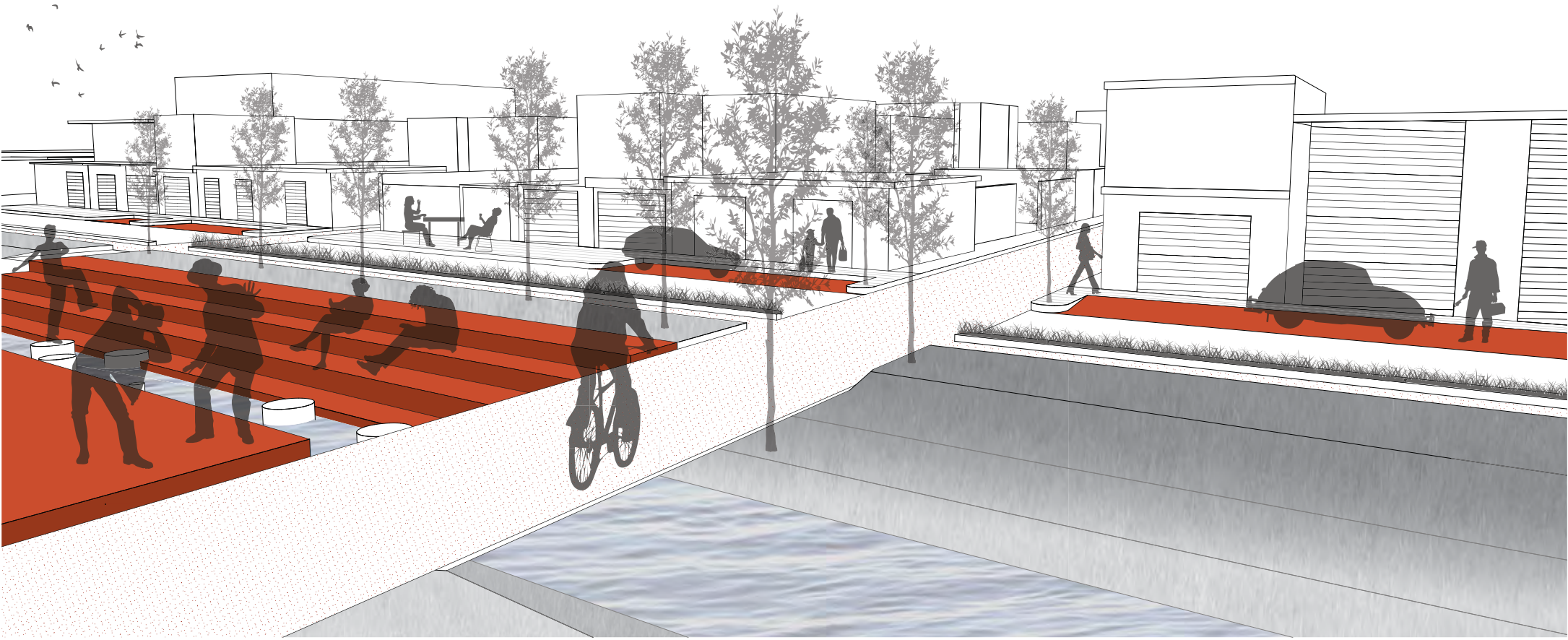

**KITCHEN | CAFE** = INDOOR + OUTDOOR
-> using the wider sidewalks for lounging areas outside



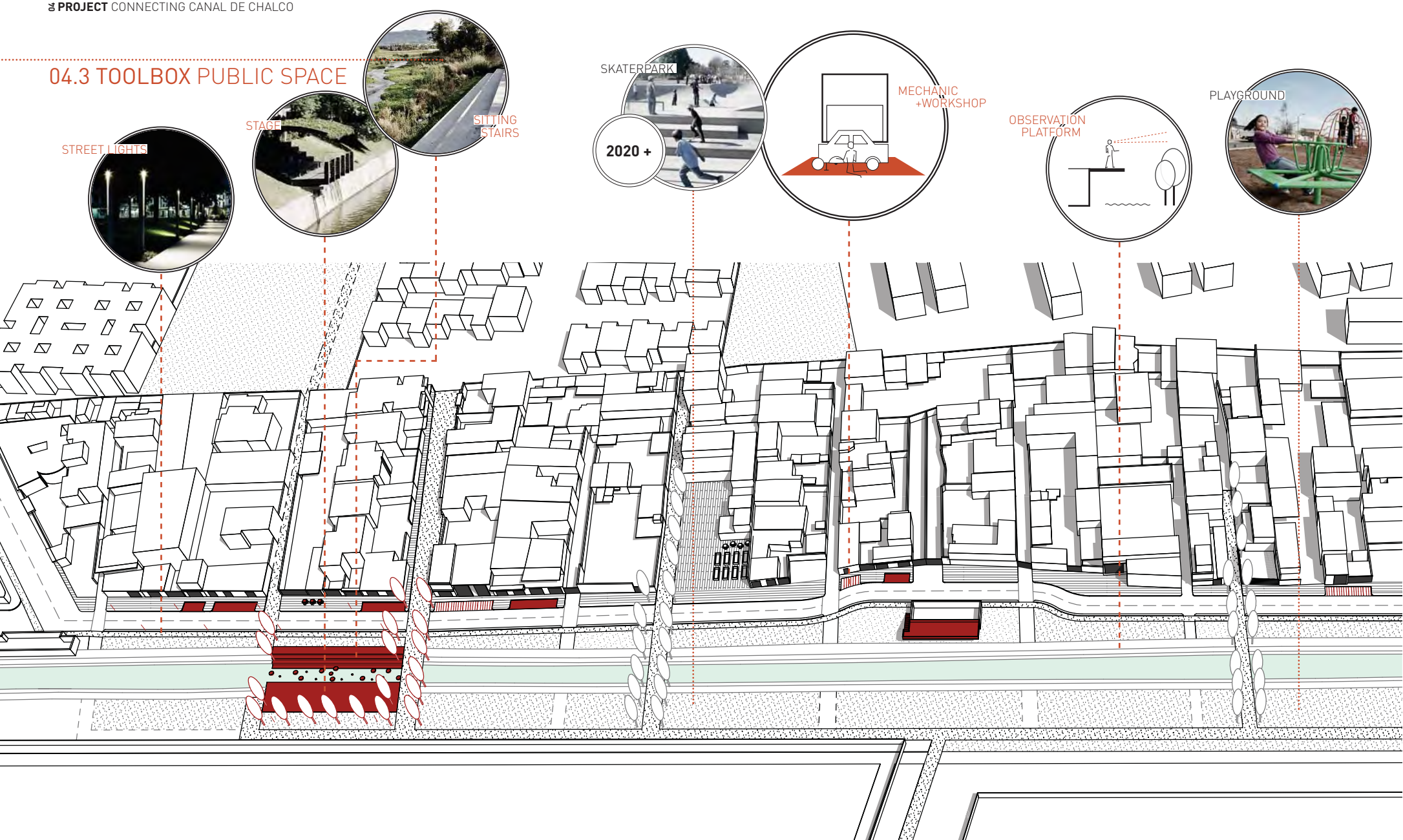

**MECHANIC** + EXTENDED WORKSHOP
-> using the wider sidewalks for extended workshops and parking lots without inter

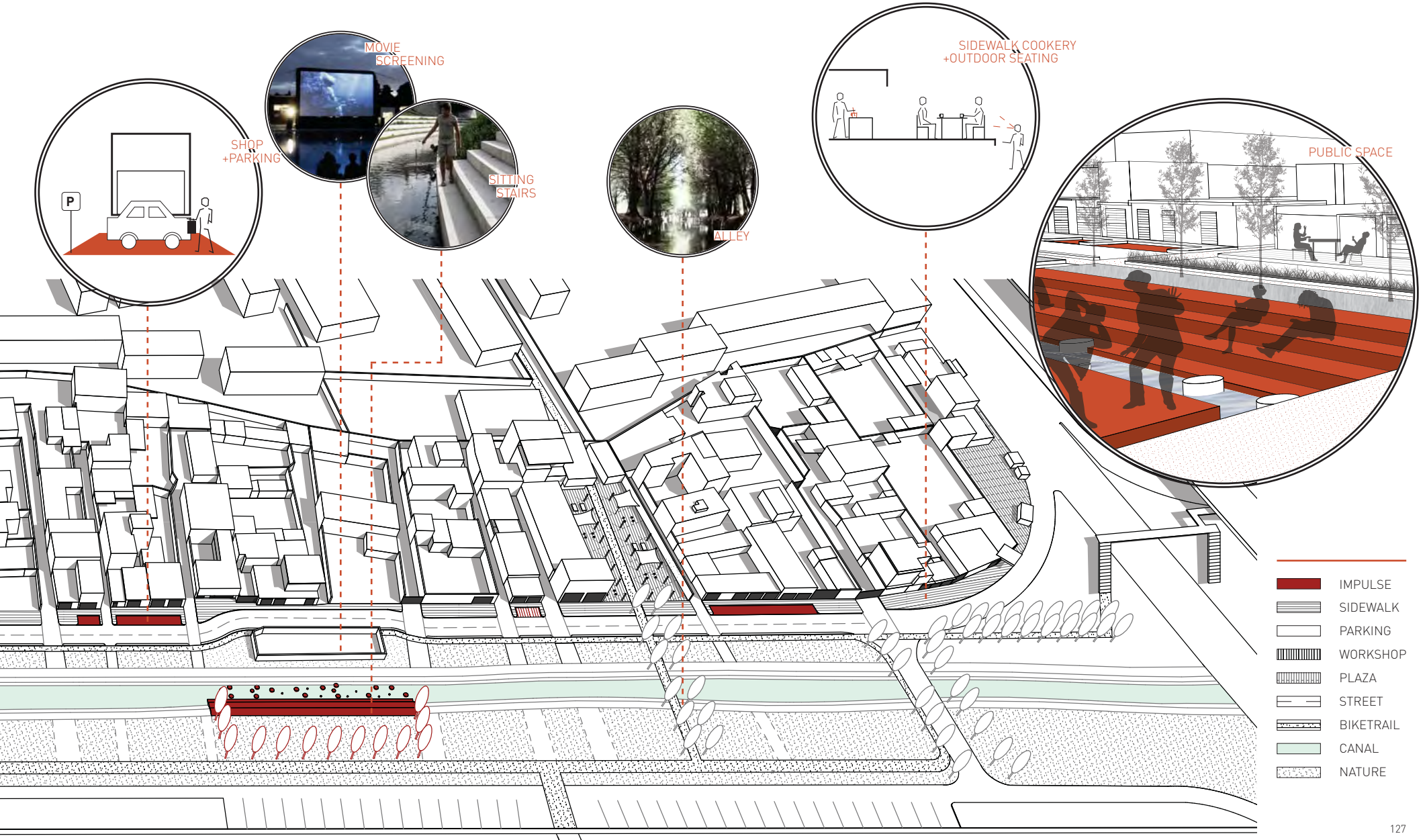



**STORES** + PARKING SPOT
-> providing parking for customers



# 04.3 TOOLBOX PUBLIC SPACE



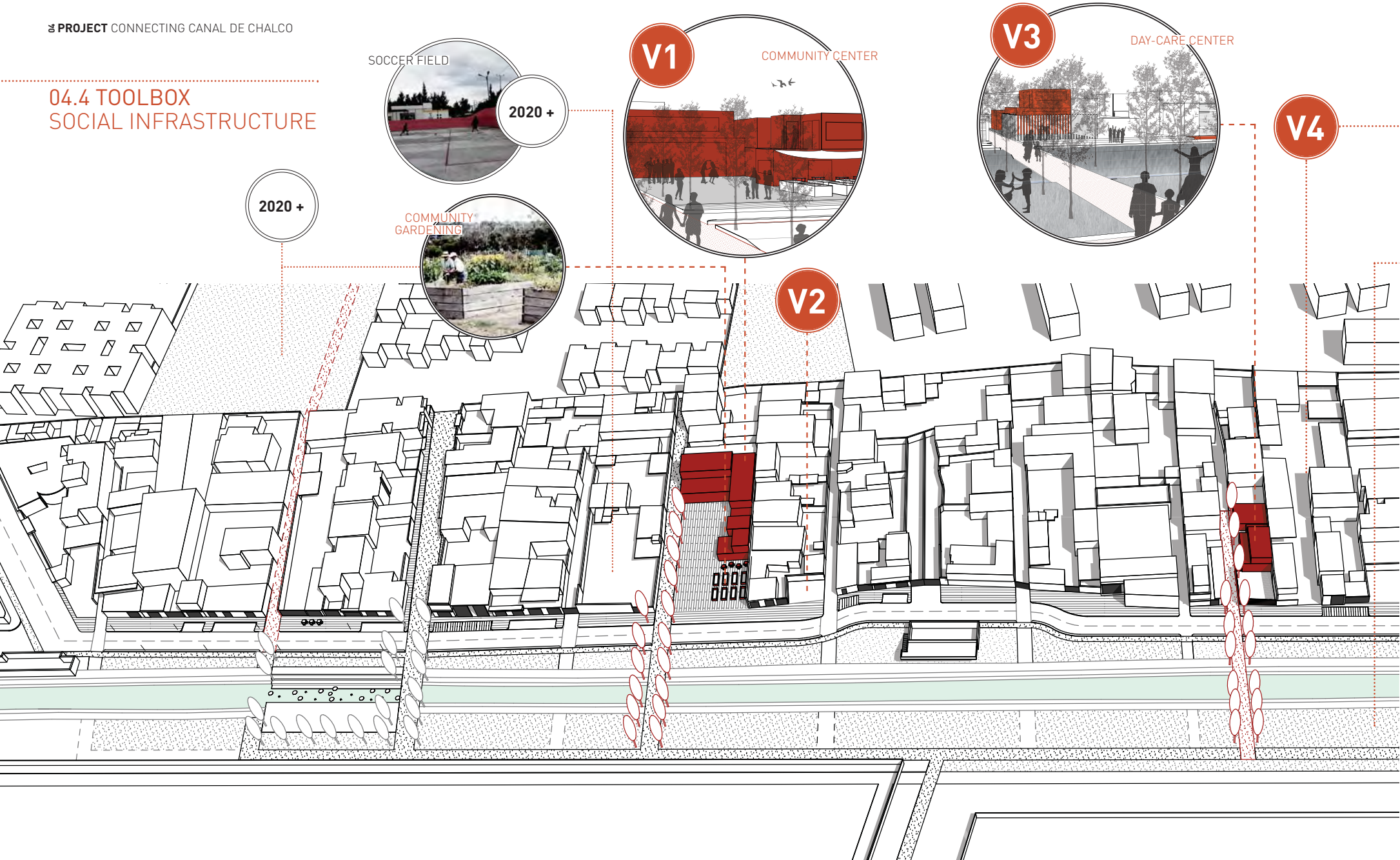

SHOP
+PARKING
P
MOVIE
SCREENING
SITTING
STAIRS
ALLEY
SIDEWALK COOKERY
+OUTDOOR SEATING
PUBLIC SPACE
IMPULSE
SIDEWALK
PARKING
WORKSHOP
PLAZA
STREET
BIKETRAIL
CANAL
NATURE

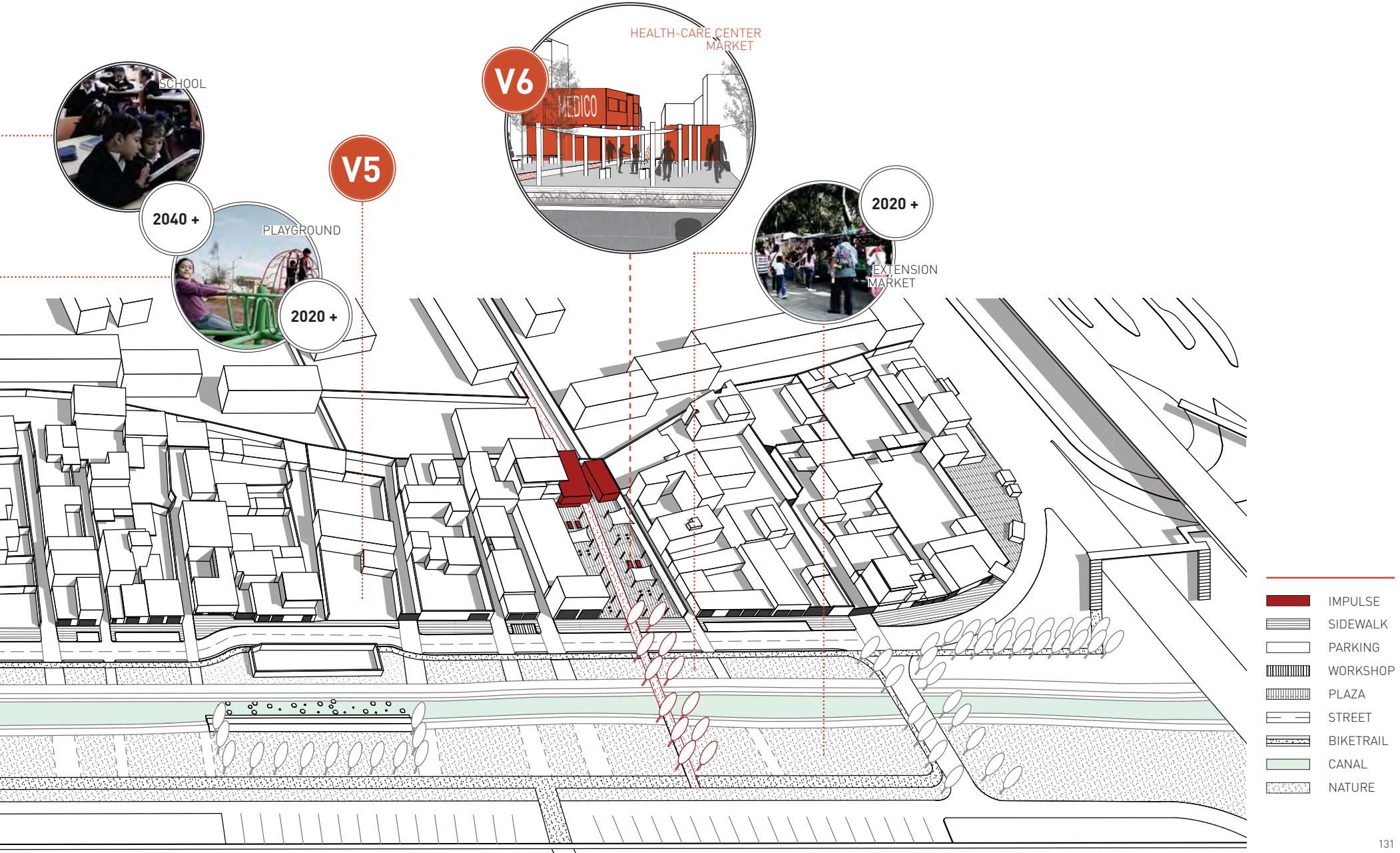
[pic38] Market, Cordoba, Mexico

TOOLBOX

# 04/4
# SOCIAL INFRASTRUCTURE

# 04.4 TOOLBOX
## SOCIAL INFRASTRUCTURE



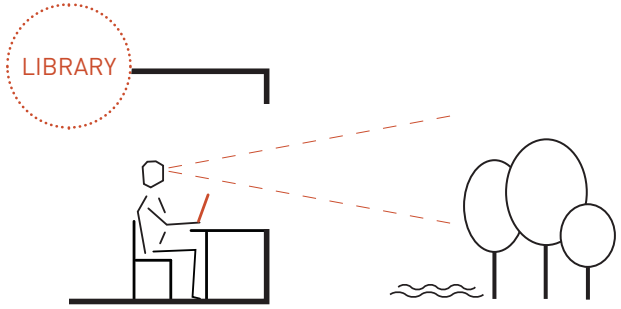

SCHOOL
2040 +
PLAYGROUND
2020 +
V5
V6
HEALTH-CARE CENTER
MARKET
MEDICO
2020 +
EXTENSION
MARKET
IMPULSE
SIDEWALK
PARKING
WORKSHOP
PLAZA
STREET
BIKETRAIL
CANAL
NATURE

MECHANIC
STATIONARY
COIFFEUR
MECHANIC
LAUNDRY
RESTAURANT
CONVENIENCE STORE
24
MUFLES
VOID 1
COMMUNITY CENTER

MECHANIC
MECHANIC
CONVENIENCE STORE
BODEGA
BIKE STORE
V1
V2
VOID 2
2020+ PUBLIC TOILET

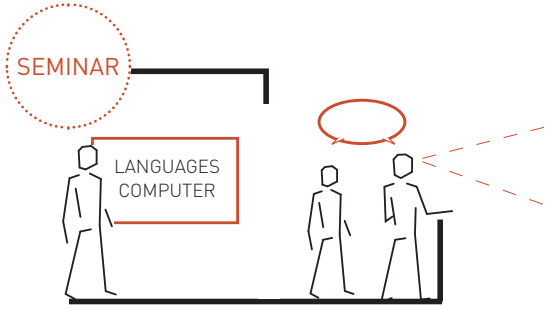
# 04.4 TOOLBOX SOCIAL INFRASTRUCTURE

## 04.4.1 Community Center



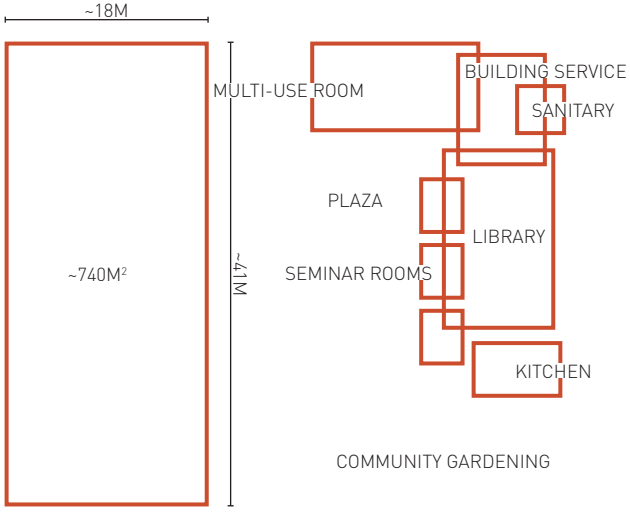

**LIBRARY** = READING + VIEW

-> first floor orientated towards the park and canal

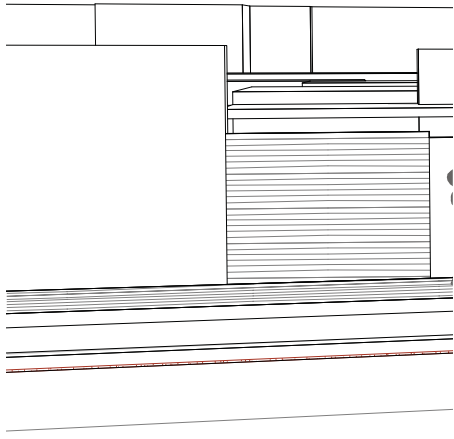


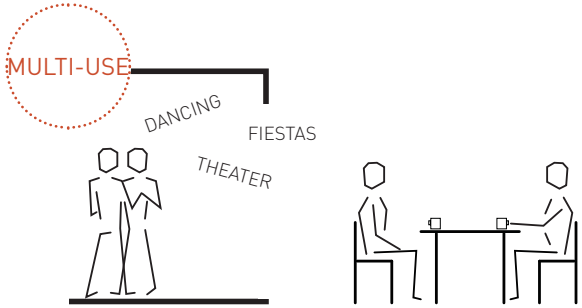

**SEMINAR** = QUIET + TERRASSE

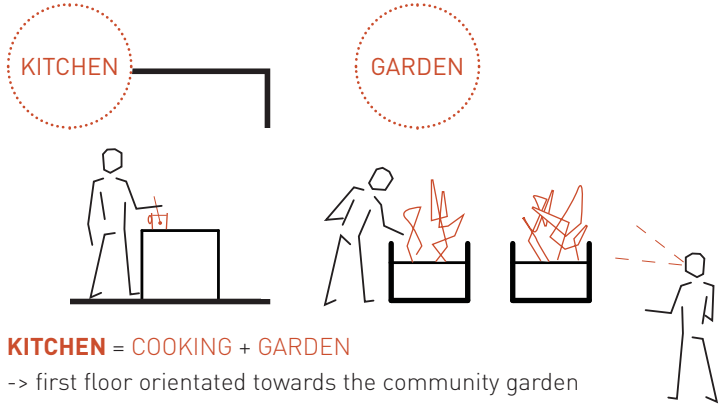
-> ground floor & first floor




| | |
|---|---|
| LIBRARY: | 160M² |
| MULTI-USE ROOM: | 120M² |
| KITCHEN: | 40M² |
| SEMINAR ROOM: | 3 X 20M² |
| BUILDING SERVICE: | 80M² |
| SANITARY: | 20M² |
| TOTAL: | 480M² |





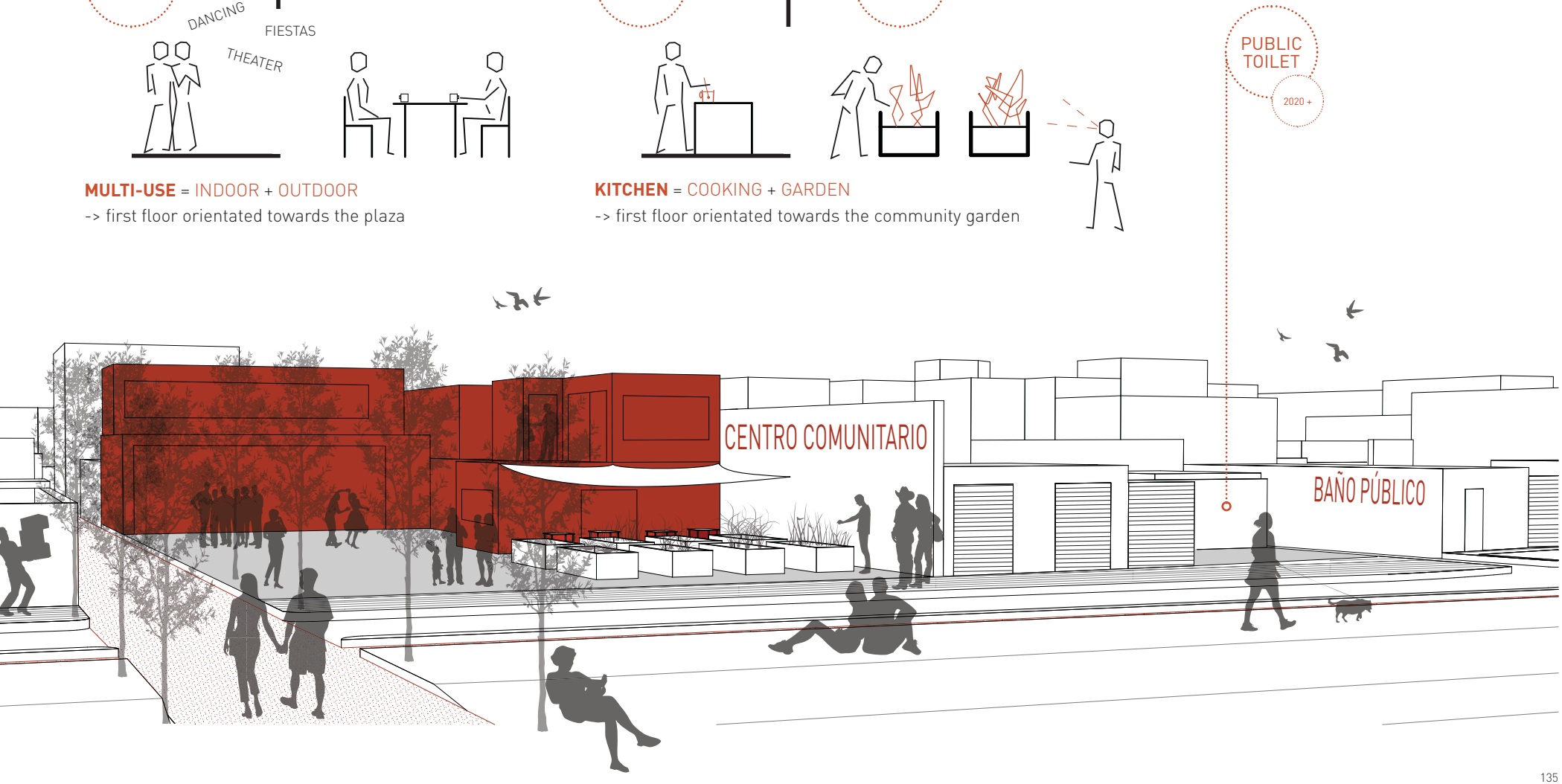




**MULTI-USE** = INDOOR + OUTDOOR

-> first floor orientated towards the plaza

**KITCHEN** = COOKING + GARDEN

-> first floor orientated towards the community garden



# 04.4.1 COMMUNITY CENTER
## Floor Plan

GROUND FLOOR

M 1:500

SIDEWALK
PARKING
WORKSHOP
PLAZA
STREET
BIKETRAIL
CANAL
NATURE

1 MULTI-USE ROOM
2 LIBRARY - ENTRANCE
3 LIBRARY
4 COMMUNITY KITCHEN
5 COMMUNITY GARDENING
6 SEMINAR ROOM
7 TERRACE
8 STORAGE
9 WASH ROOM

FIRST FLOOR

# VOID 3

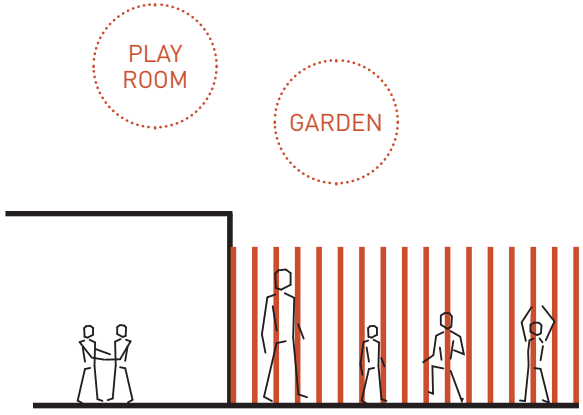
## DAY-CARE CENTER

# VOID 4

## 2040+ SCHOOL

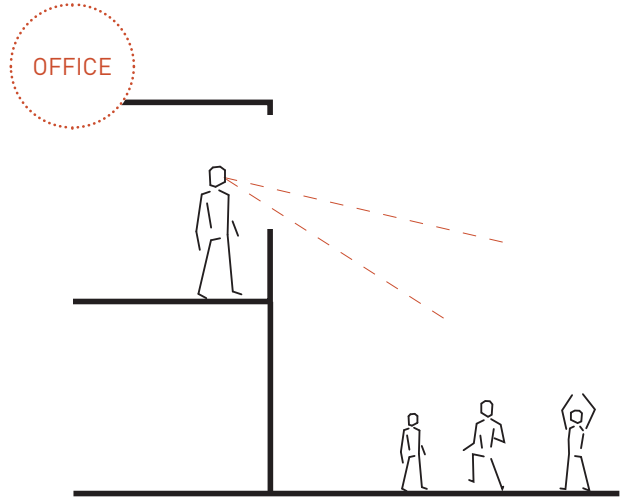
# 04.4 TOOLBOX SOCIAL INFRASTRUCTURE

## 04.4.2 Day-Care-Center



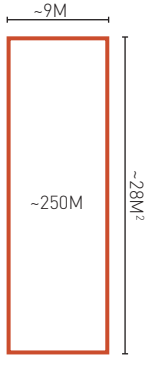

**DAY-CARE** = PLAYROOM + GARDEN

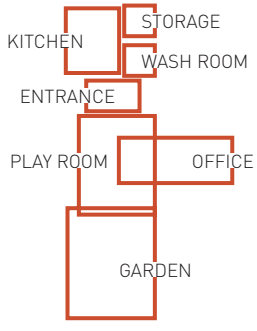
-> ground floor orientated towards the garden



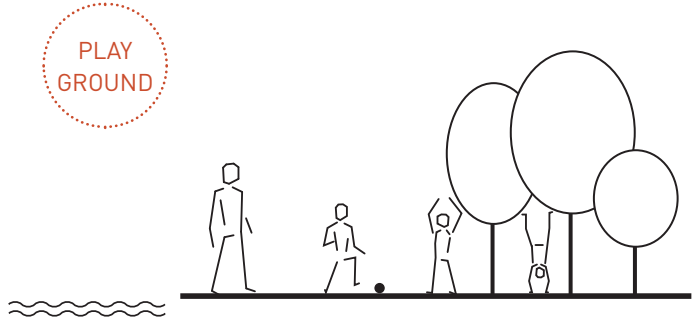

**OFFICE** = WORK + SUPERVISION

-> first floor orientated towards the garden




| | |
|---|---|
| ENTRANCE: | 15M² |
| PLAY ROOM: | 65M² |
| KITCHEN: | 30M² |
| STORAGE: | 10M² |
| WASH ROOM: | 10M² |
| OFFICE: | 40M² |
| GARDEN: | 80M² |
| TOTAL: | 250M² |




**PLAYGROUND** = NATURE + WATER

-> extension, using space by the water

# 04.4.2 DAY-CARE CENTER
## Floor Plan

GROUND FLOOR

M 1:500

SIDEWALK
PARKING
WORKSHOP
PLAZA
STREET
BIKETRAIL
CANAL
NATURE

1 ENTRANCE
2 PLAY ROOM
3 KITCHEN
4 STORAGE
5 WASH ROOM
6 OFFICE
7 GARDEN

FIRST FLOOR

# VOID 5

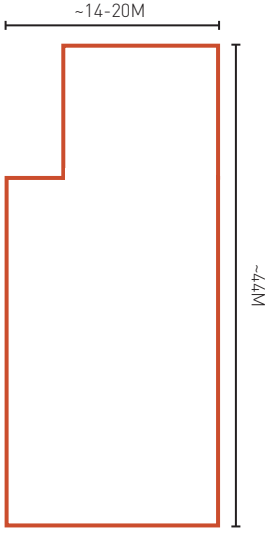
**2020+ COMMUNITY GARDENING**

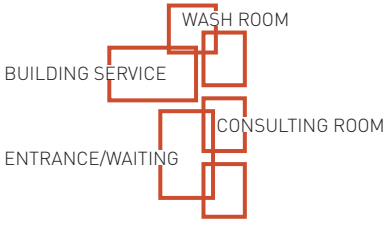
# VOID 6

## MARKET & HEALTH-CARE CENTER

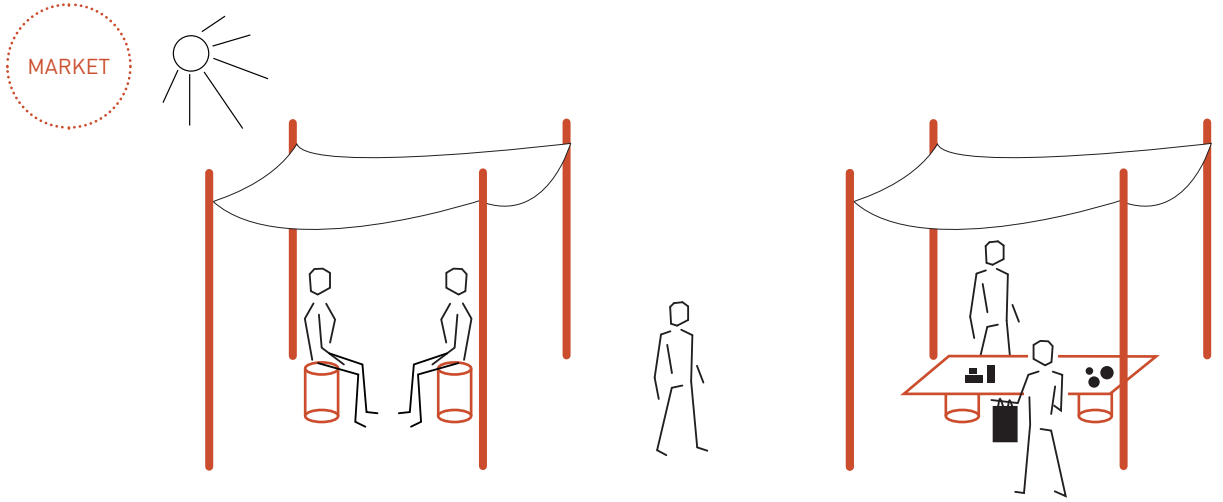
# 04.4 TOOLBOX SOCIAL INFRASTRUCTURE

## 04.4.3 Market & Health-Care-Center



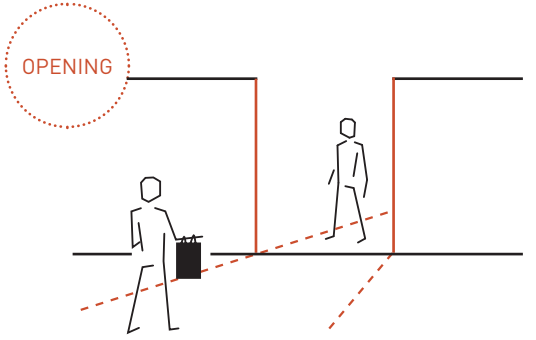




| | |
|---|---|
| ENTRANCE/WAITING: | 40M² |
| CONSULTING ROOM: | 3 X 20M² |
| BUILDING SERVICE: | 40M² |
| SANITARY: | 20M² |
| TOTAL: | 160M² |




**MARKET** = PUBLIC + MULTIFUNCTIONAL USE

-> orientated towards the street; multifunctional structure




**MEDICAL PRACTICE** = PRIVATE

-> back of the plot

+

**OPENING** = SHORTCUT + FUNCTION

-> interaction between informal and formal housing areas

MERCADO
MÉDICO

# 04.4.3 MARKET &HEALTH-CARE- CENTER

## Floor Plan

GROUND FLOOR

M 1:500

SIDEWALK
PARKING
WORKSHOP
PLAZA
STREET
BIKETRAIL
CANAL
NATURE

1 ENTRANCE/WAITING
2 CONSULTING ROOM
3 WASH ROOM
4 PHARMACY
5 STORAGE
6 MARKET

FIRST FLOOR

# OCCUPANCE

CLUTCH Y FRENOS
"3 HERMANOS"
CLUTCH FRENOS
COCINA
Bendix

# GLOSSARY

## SPANISH WORDS

| | |
|---|---|
| *asentamientos irregulares* | irregular settlements |
| *ahuejote* | Salix bonplandiana (Bonpland willow)<br>It is a perennial species of willow trees that planted around the chinampas |
| *capitalino, -a* | people born in the Federal District |
| *chilango, -a* | people migrated to Mexico City, commonly used for rude, mannerless and rowdy people |
| *chilangolandia* | name for Mexico City |
| *chinampas* | floating gardens, complex system of hydraulic infrastructure |
| *ciudades peridades* | lost city |
| *centro histórico* | historic city center |
| *colonias populares* | popular-class neighborhoods |
| *cuartos de azotea* | rooftop homes |
| *defeño, -a* | people born in the Federal District |
| *delegaciones* | 16 boroughs of the Federal District |
| *náhuatl* | language of indigenous tribes |
| *metro linea* | public transport: metro |
| *microbus* | public transport: small bus |
| *plaza mayor* | c.p. *Zócalo* |
| *tamales* | traditional food made of mostly corn-based dough filled with meats, cheese, fruits, vegetables or chilies, which is boiled or steamed in a leaf wrapper |
| *tranjineras* | traditional boats in *Xochimilco* |
| *traza* | European only zone during the colonial period (1521-1810), located in the city center of Mexico City |
| suelo de concervación | conservation land in the Federal District |
| vecindades | traditional colonial houses, often transformed to tenements for Mexico City's low-income population |
| *zócalo* | main square, located in the historic city center of Mexico City |

## ORGANISATIONS

| | |
|---|---|
| FONHAPO | Fondo Nacional de Habitaciones (Mexican National Popular Housing Fund)<br>National Fund for Popular Housing |
| FOVISSTE | Fondo de la Vivienda del Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado (Mexico)<br>Housing Fund for Public Sector Workers |
| INFONAVIT | Instituto del Fondo Nacional de la Vivienda para los Trabajadores<br>National Housing Fund for Private Sector Workers |
| UNESCO | United Nations Organization for Education, Science and Culture |
| *Programa Comunitario de Mejoramiento Barrial* | Community project for neighbourhood improvement |

## GEOGRAPHICAL WORDS

| | |
|---|---|
| *Anillo Periférico Oriente* | Outer Ring Road of Mexico City |
| *Avenida Canal de Chalco* | Street along *Canal de Chalco* |
| *Centro Historico* | Historic city center of Mexico City |
| *Chapultepec Castle* | Residence of the Mexican president |
| *Calzada Tlaplan* | Street, running north to south |
| *Canal de la Viga* | Part of the historical trade way route between Xochimilco and the city center |
| *Canal de Chalco* | Part of the historical trade way route between Xochimilco and the city center, canal still existent today |
| *Canal de Nacional* | Part of the historical trade way route between Xochimilco and the city center, canal still existent today |
| *Cerro de la Estrella* | hill in the district Iztapalapa, Federal District |
| *Ciénega Grande* | water regulation pool |
| *Ciudad Satelite* | middle-class suburban residential area, located in the state of Mexico, north-west of the Federal District |

| | |
|---|---|
| *Ciudad Nezahualcóyotl* | low-income neighborhood in the state of Mexico, bordering with the Federal District (east) |
| *Coyoacán* | one of the 16 boroughs of the Federal District, |
| *Distrito Federal/De-Efe/D.F.* | Federal District, consists of 16 boroughs |
| *Ejidos de Xochimilco y San Gregorio Atlapulco* | Under the UNESCO world heritage protection. agriculture on chinampas |
| *Estados Unidos Mexicanos* | United Mexican States |
| *Estado de México* | one of the 31 states of Mexico, surrounding state of the Federal District, 59 boroughs are part of the metropolitan area of Mexico City. |
| *Estado de Hidalgo* | one of the 31 states of Mexico, 1 borough forms a part of the metropolitan area of Mexico City |
| *Insurgentes* | Street, running north to south |
| *Iztapalapa* | one of the 16 boroughs of the Federal District, located to the east |
| *Iztapalapa de Cuitláhuac* | original town center of *Iztapalapa* |
| *La Ciudad de México* | Mexico City |
| *Lomas de Chapultepec* | upper-class residential neighborhood in the south-west of Mexico City |
| *Mercado de las Flores de Xochimilco* | Flower market of *Xochimilco* |
| *Parque Deportivo Ecólogico Cuemanco* | recreational area with several sport facilities in *Xochimilco* |
| *Paseo de la Reforma* | avenue built in the middle of the 19th century, links the Chapultec Castle with the zócalo. |
| *Pachucha* | city to the north-west of Mexico City |
| *Puebla* | city to the east of Mexico City |
| *Polanco* | former upper class neighborhood , today for the middle class |
| *Querétaro* | city to the nort-west of Mexico City |
| *Suelo de concervación* | conservation land, an area comprising approximately 88.442 ha or 59% of the Federal Districts total area. It is found in 9 municipalities located mostly in the southern part of the city. |
| *Tacuba* | autonomous municipality until 1928, located in the south west of Mexico City |
| *Tacubaya* | an entity separate from Mexico City until the beginning of the 20th century |
| *Tenochtitlán* | the capital of the Aztec empire, founded on an island in the former lake Texcoco in 1325 |
| *Texcoco* | one of the five shallow lakes of a series of lakes that covered the Valley of Mexico |
| *Xaltocan* | one of the five shallow lakes of a series of lakes that covered the Valley of Mexico |
| *Xochimilco* | one of the 16 boroughs of the Federal District, located to the south east |
| Xochimilas | was the first of the seven Nahuatl tribes in reaching the valley of Anahuac, settled in Cuahuilama sacred hill located in the village of Santa Cruz Acalpixca. |
| *Zona Metropolitana del Valle de México* | Mexico City's metropolitan area |
| *Zumpango* | one of the five shallow lakes of a series of lakes that covered the Valley of Mexico |

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