



# ¿WHAT IS A SAFE & SOUND CITY?

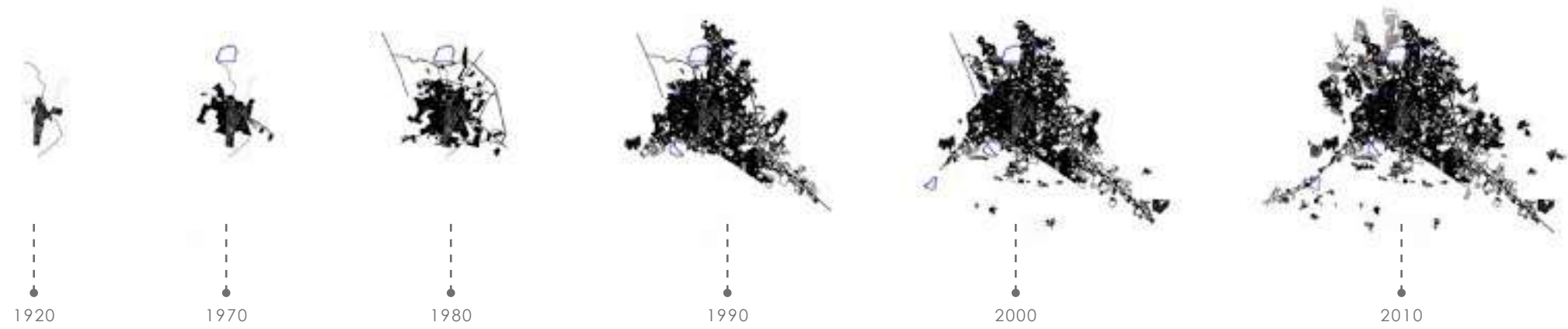
SPACE THAT PROVIDES ENVIRONMENTAL, ECONOMIC AND  
SOCIAL BENEFITS DUE TO THE USE AND PRODUCTION OF  
RENEWABLE ENERGIES.

# CASE STUDY - INTRODUCTION

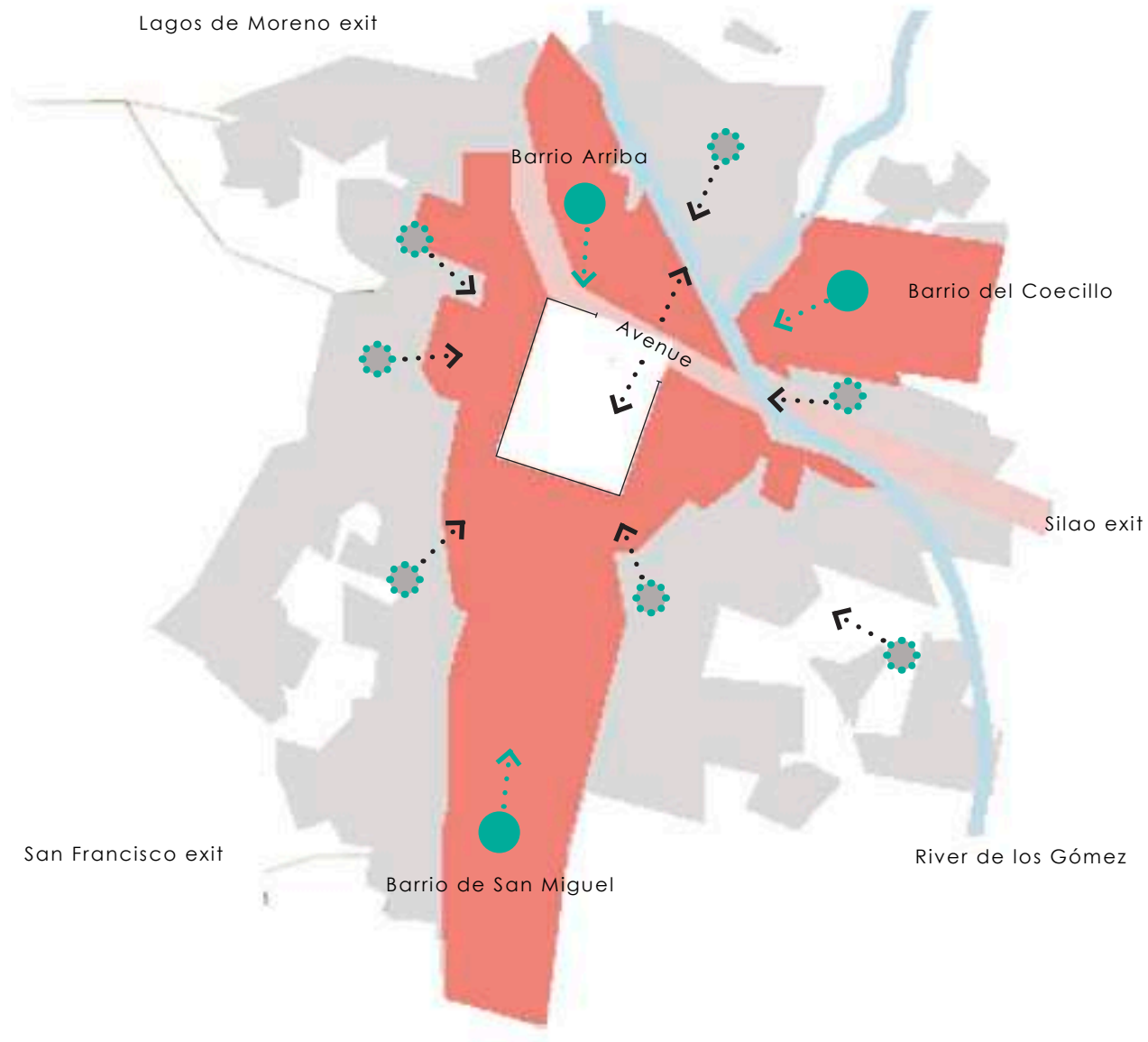
'Barrio de San Miguel' - considered one of the most outstanding places in the city of León, Guanajuato. Characterized for being one of the first historical settlements in the municipality. Local activities such as the *danzón* in front of San Miguel Arcángel's church, in addition to the multiple activities, which are

divided into two types: formal, established by locals and informal, with the so-called *tianguis*. This indicates the need to design occupancy schemes that result in densifying the urban city and compacting it as well.





Urban evolution of León, Guanajuato.



### Symbology

García Gómez MA (2009). Transformaciones Urbanas de León Siglo XX. Tlacuilo Ediciones.

- Expansion from 1940 to 1970
- Multifunctional zones with housing, commerce and industry
- Commercial and administrative center
- Neighborhood Center
- New residential neighborhoods
- Zone interaction

It is relevant that in an eighteen year period analysis (1993-2011)

**The urban city grew by 131%.**

The downtown area of the city occupies 32.54% of the municipality's surface by morphology.

Meanwhile, where the San Miguel neighborhood is located, 85% of León's urban area is located.



## ELECTRIC POWER

Street lighting belongs to the Federal Electricity Commission (CFE), so the municipality is responsible for its maintenance and pays the CFE for energy consumption through a local tax on residential consumers.

It is important to mention that although 76% of the municipality's streets have lighting, the authorities do not have a complete inventory; the municipal department estimates 70,000 light poles, while the CFE indicates that there are 90,000; in addition, not all the lighting has meters, which means that the city does not have complete information on how much the public lighting system is consuming. Only 65% of consumption is measured and the rest is estimated by the CFE.

Public lighting uses 2.9% of the total electricity consumed by the municipality and according to the TRACE (Tool for Rapid Assessment on Cities Energy) analysis, about US \$2 million per year could be saved with improvements in the system.

## SOLID WASTE

The solid waste sector is managed through concessions and contracts with private companies. Solid waste collection is carried out by a group of private operators under the control and supervision of SIAP [Sistema Integral de Aseo Público], a public entity under the municipal government. These companies operate 118 collection routes (91 percent of the total), while SIAP collects solid waste from households on 11 routes (6 rural and 5 peri-urban) using 30 trucks.

In urban and suburban areas solid waste is collected daily from designated points and in rural communities collection takes place every three days. Private operators also collect waste from the commercial and industrial sector, which results in a health risk because the waste is not properly separated.

The landfill, which serves 264,830 households in urban areas and about 15,000 families in rural communities, is managed by a private company under a concession contract. In 2012, León generated 460,380 tons of solid waste. 351,653 tons (76%) were produced by the residential sector and 108,660 tons (24%) by the industrial sector and special and hazardous handling waste. In addition, 13,000 tons of waste were generated by visitors. In 2012, the city generated 309 kg of solid waste per capita.

## WASTEWATER

Water pollution is caused mainly by population growth and industrial activity in the municipality, from tanneries to large companies in the industrial corridor, as well as the progressive increase of urban centers.

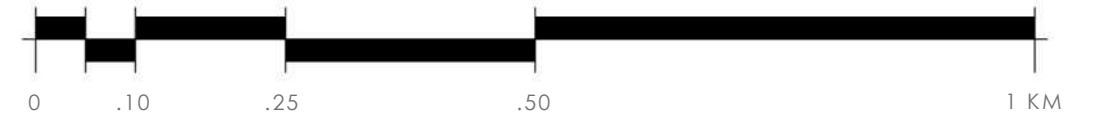
The massive contribution of waste is polluting groundwater, surface water and natural watercourses, and is responsible for the progressive destruction of the fauna and flora. In addition, the uncontrolled supply of chemical substances, heavy metals, etc. makes the water unfit for human consumption. The balance of ecosystems and the harmony between them is thus disrupted.

Depending on their origin, wastewater can be urban, industrial and from agricultural and livestock activities; although there are treatment plants in the city, there is a great demand for attention to polluted rivers.

## AGRICULTURE

In environmental matters, according to the State Institute of Ecology, "sustainable agriculture, controlled use of forests, introduction of wildlife species, aquaculture, establishment of nurseries and reforestation, infrastructure for groundwater recharge and flood control, recreational activities, environmental education and training can be promoted".





## ENVIRONMENTAL MAP

Own elaboration based on information from the Dirección General del Medio Ambiente de León, Gto. [October 2018 to March 2019]

Public Gardens = 42, 668.224 m<sup>2</sup>

WHO recommends between 9 and 11 m<sup>2</sup> of green area per inhabitant. This means that for 28,693 inhabitants there should be at least 258,237 m<sup>2</sup> of green area within the radius of action indicated in the environmental map.

**DEFICIT = 84%**

### Urban Gardens

-Academia metropolitana de policía

5.5 KM from site

-Vivero municipal

14.7 KM from site

-Loma Dorada

14 KM from site

The lack of urban gardens within the radius of action represents an area of opportunity.







## ROAD INFRASTRUCTURE PER BLOCK

Own elaboration based on information from Inventario de Vivienda, INEGI 2016.

For people with motor disabilities | wheelchairs ramp

**40%**

No roads

**42%**

Some roads

**18%**

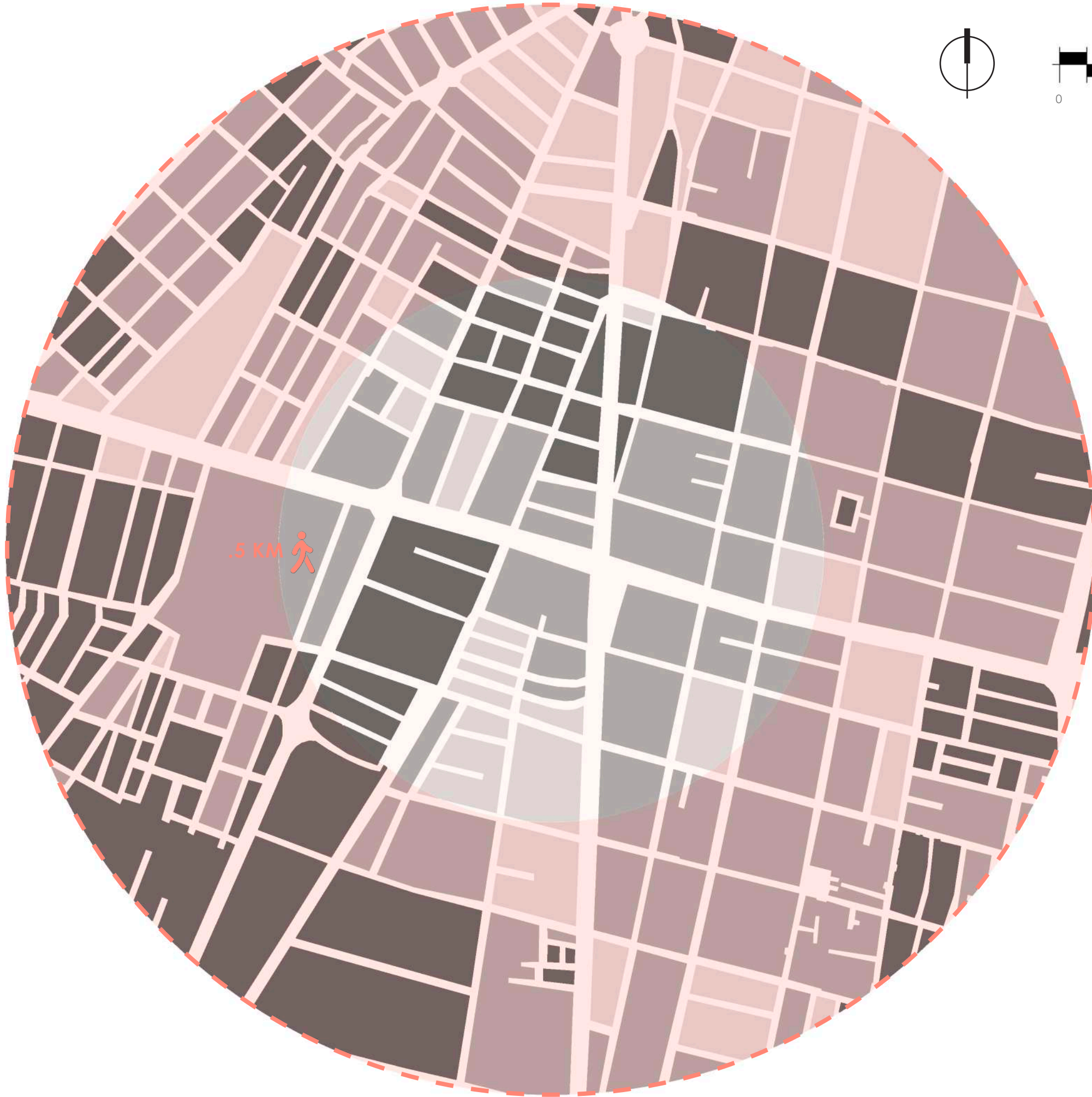
All roads

The high percentage of inaccessibility is an important area of opportunity for project development.

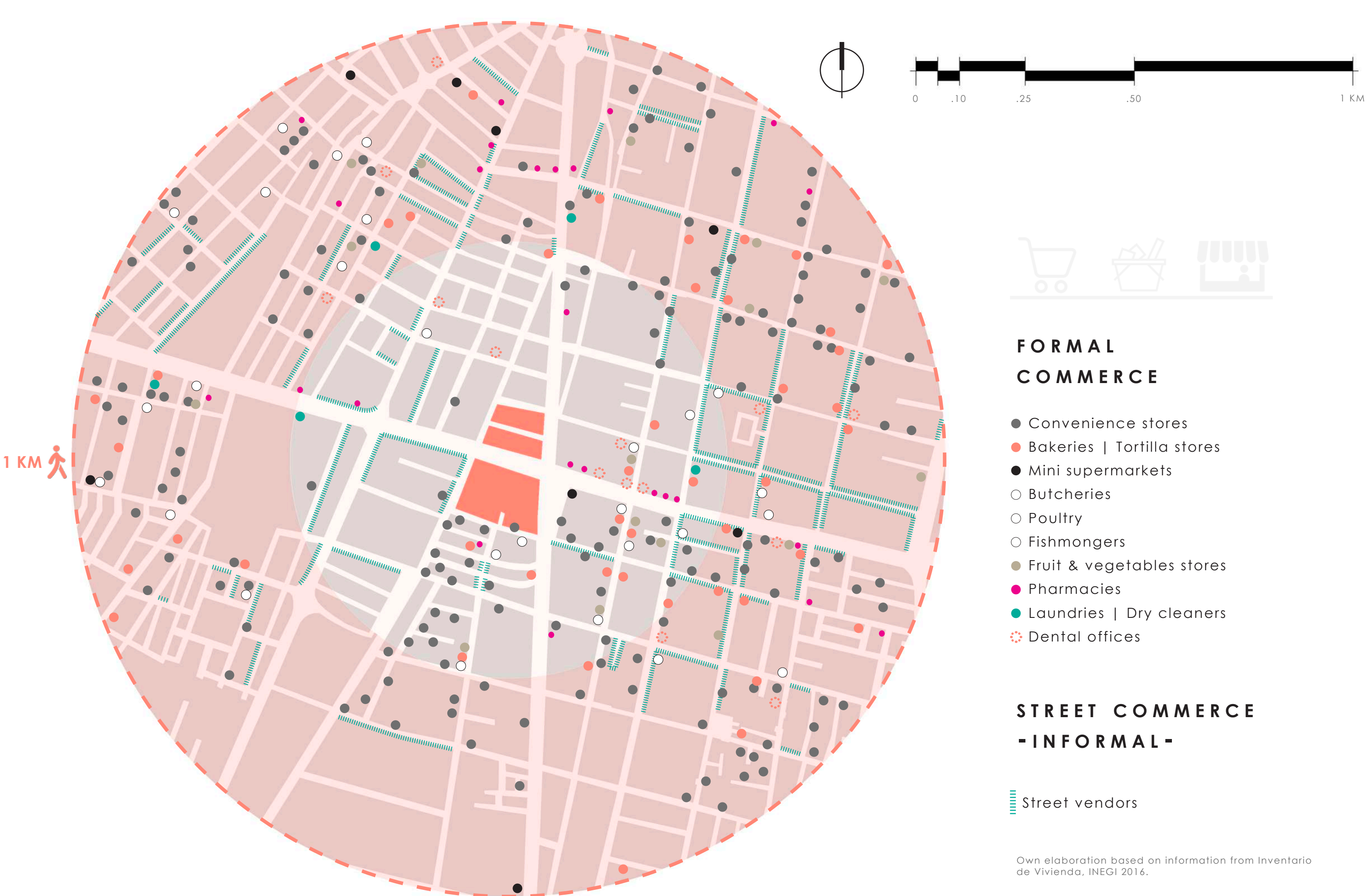
1 KM



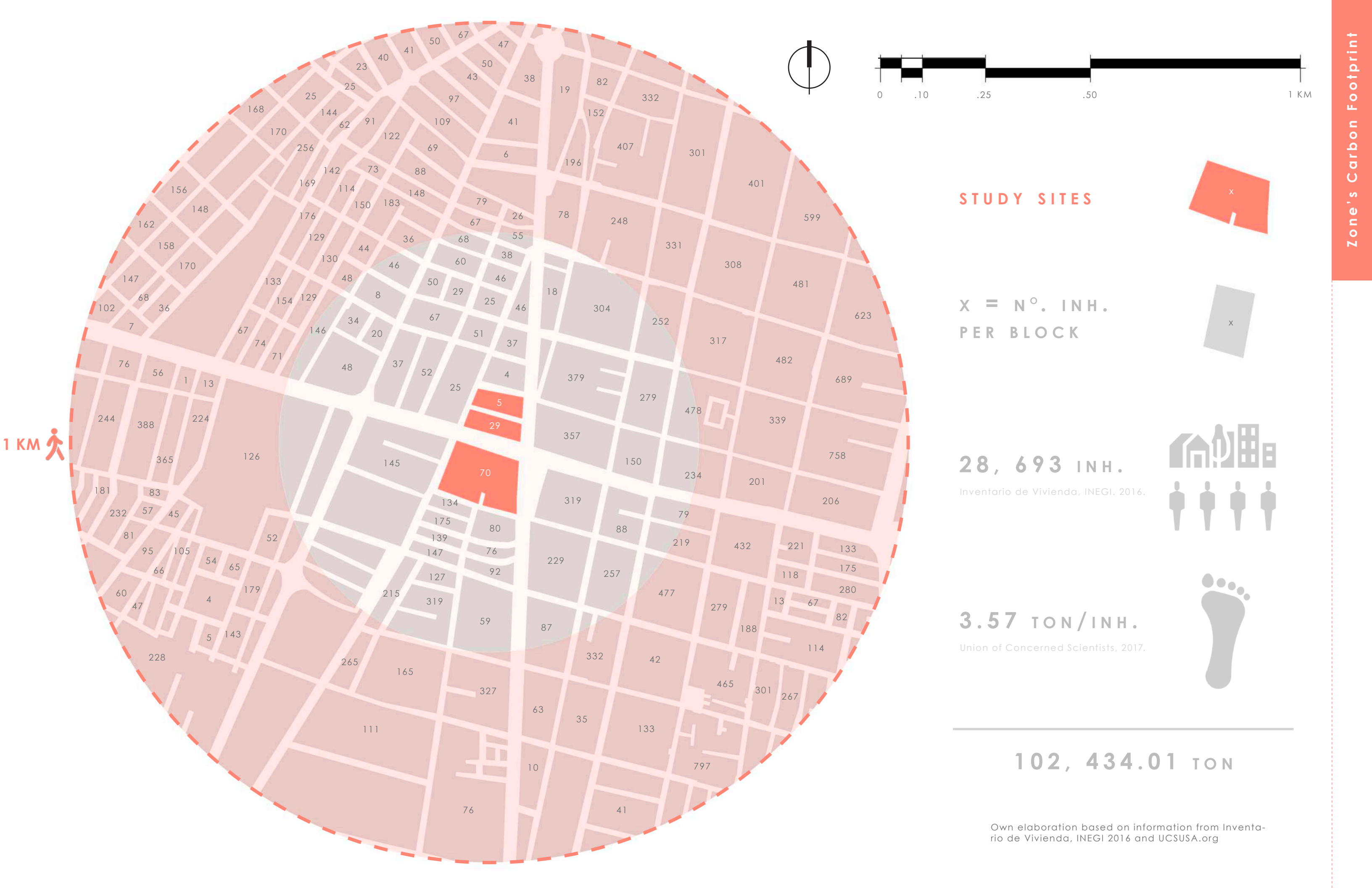
.5 KM

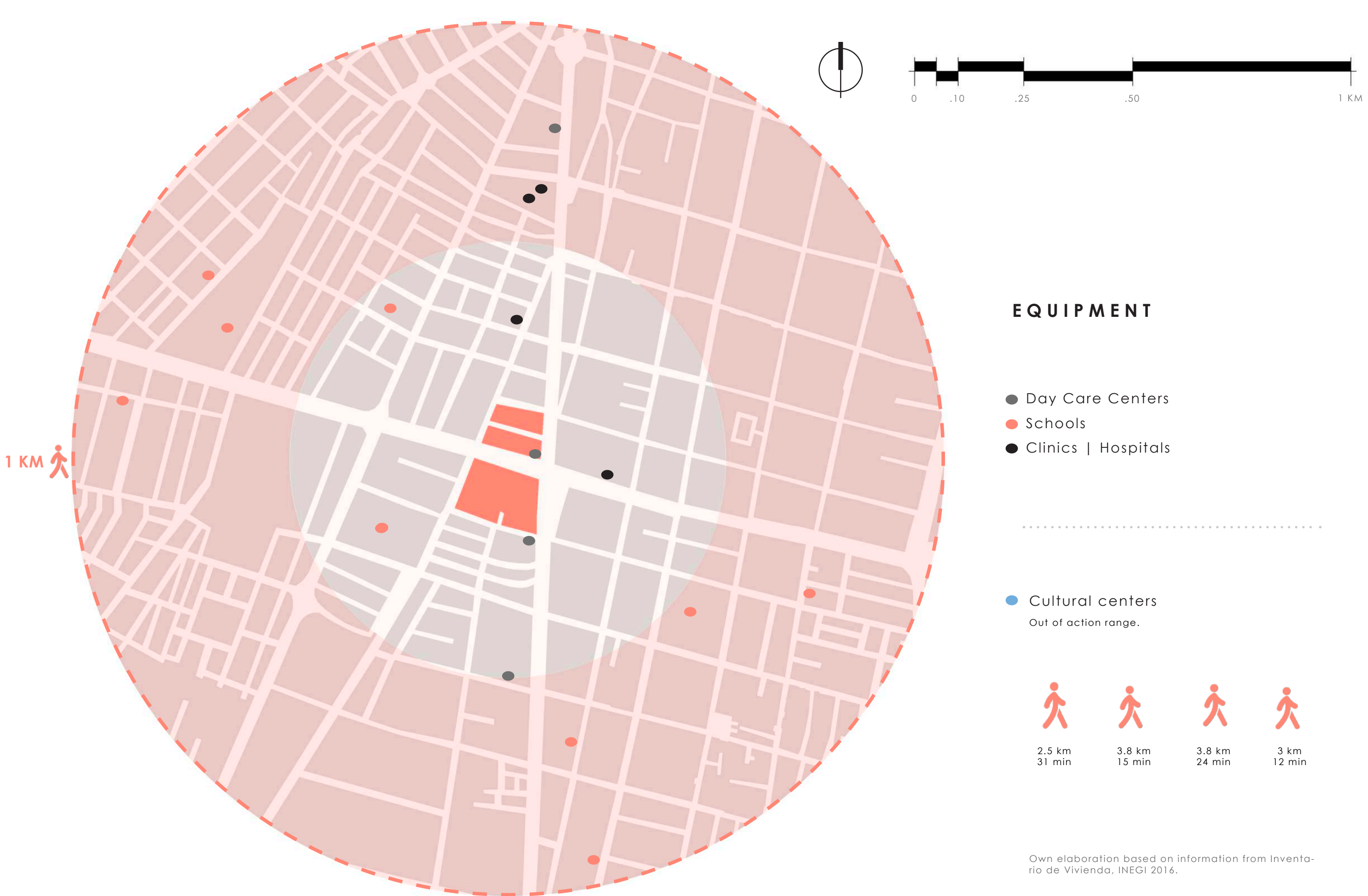




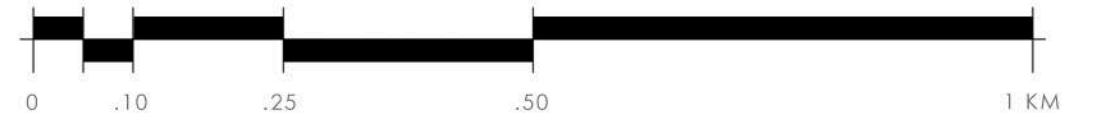
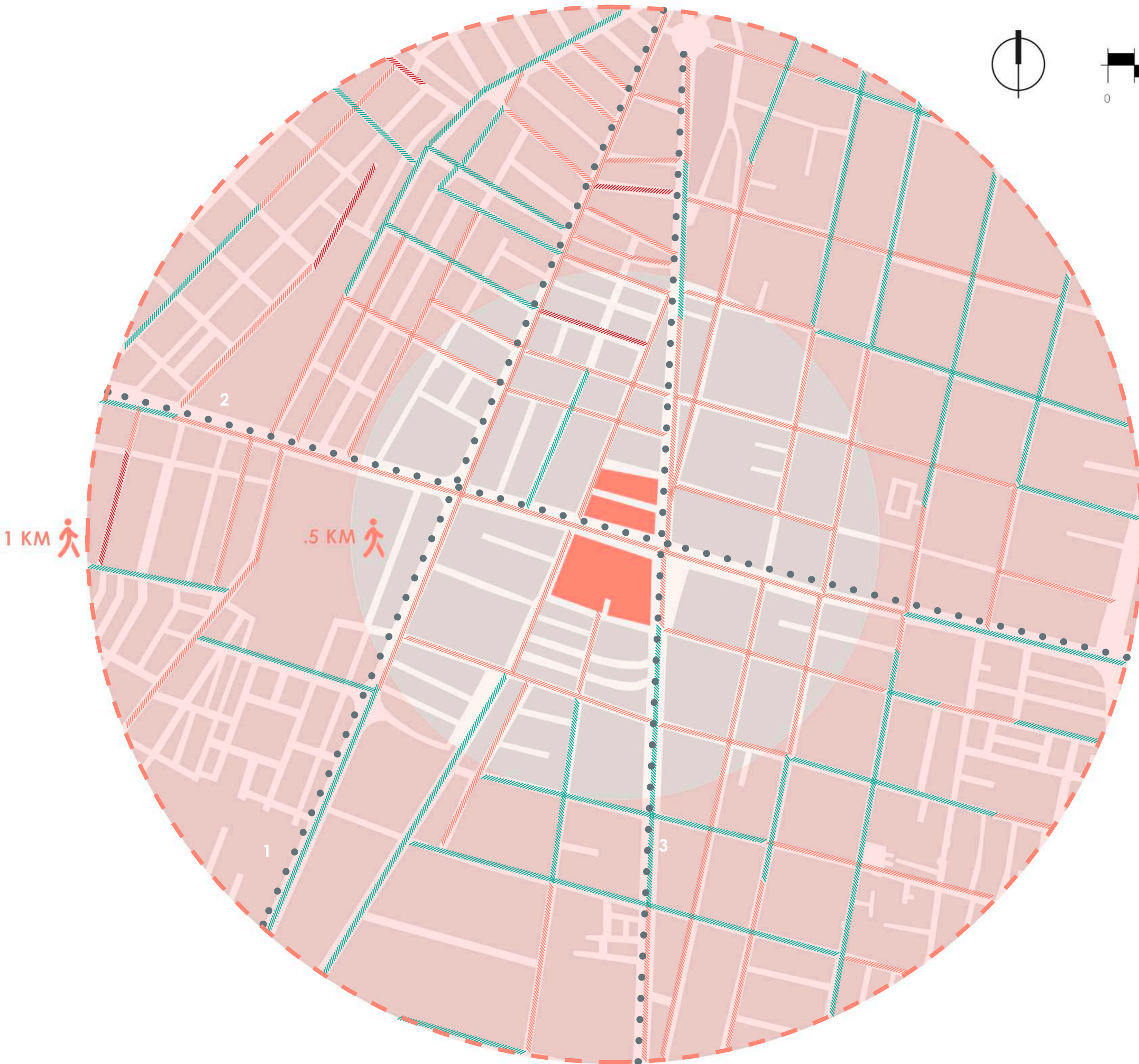












## AVERAGE VEHICULAR TRAFFIC AND MAIN AVENUES

Analysis of the average vehicle traffic from Mon to Fri at midday.

Slow traffic

Intermediate traffic

Rapid transit

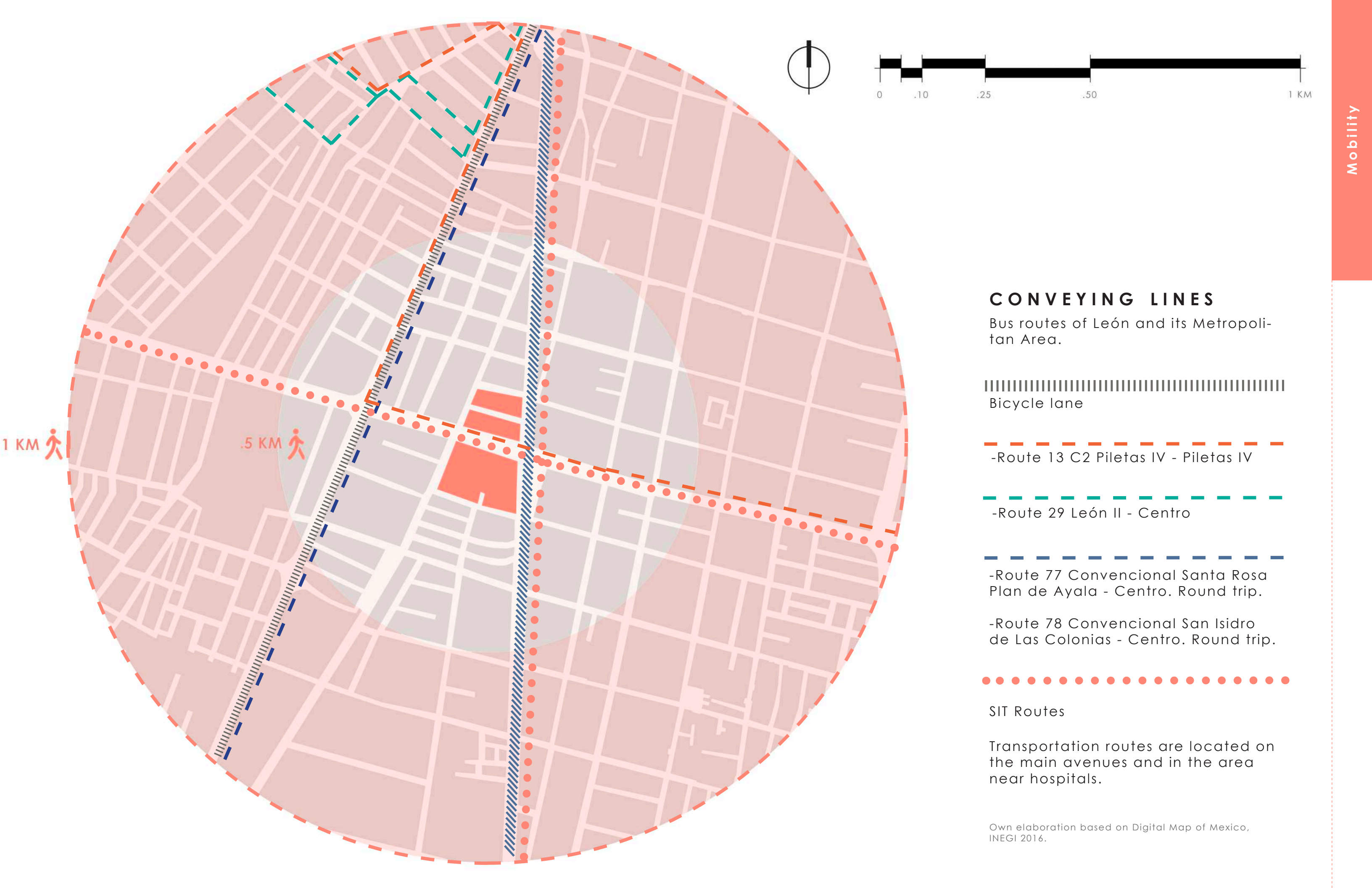
Principal Avenues

1. Ave. Juárez (Connects to the León-Aguascalientes highway)
2. Boulevard Torres Landa
3. Boulevard Venustiano Carranza

Traffic during rush hour ranges mostly from intermediate to fast. The areas with slow traffic coincide with hospitals and schools.

Own elaboration based on Digital Map of Mexico, INEGI 2016.





## CONVEYING LINES

Bus routes of León and its Metropolitan Area.



Bicycle lane



-Route 13 C2 Piletas IV - Piletas IV



-Route 29 León II - Centro



-Route 77 Convencional Santa Rosa  
Plan de Ayala - Centro. Round trip.

-Route 78 Convencional San Isidro de Las Colonias - Centro. Round trip.

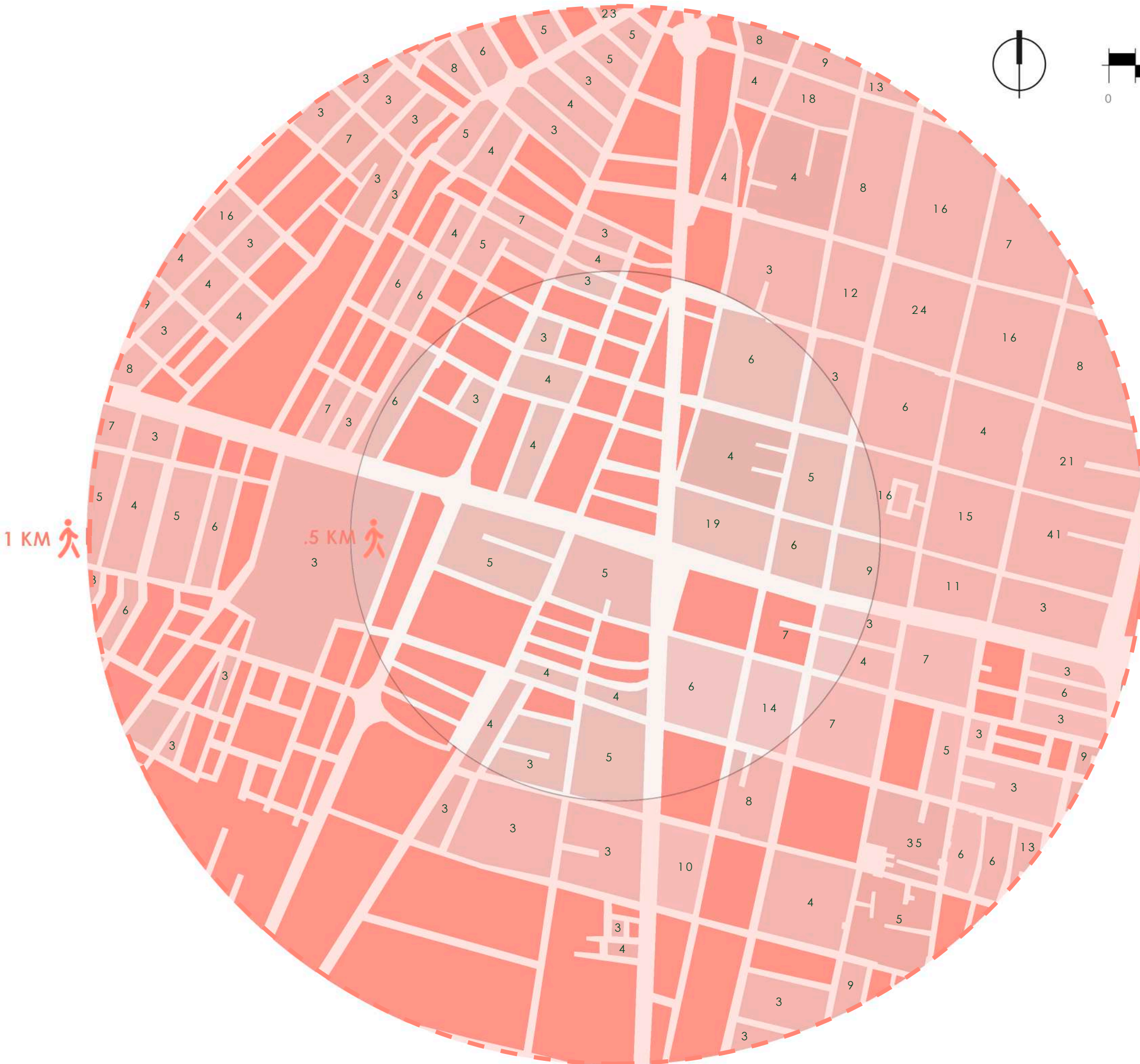


## SIT Routes

Transportation routes are located on the main avenues and in the area near hospitals.

Own elaboration based on Digital Map of Mexico, INEGI 2016.





## HOUSING STOCK

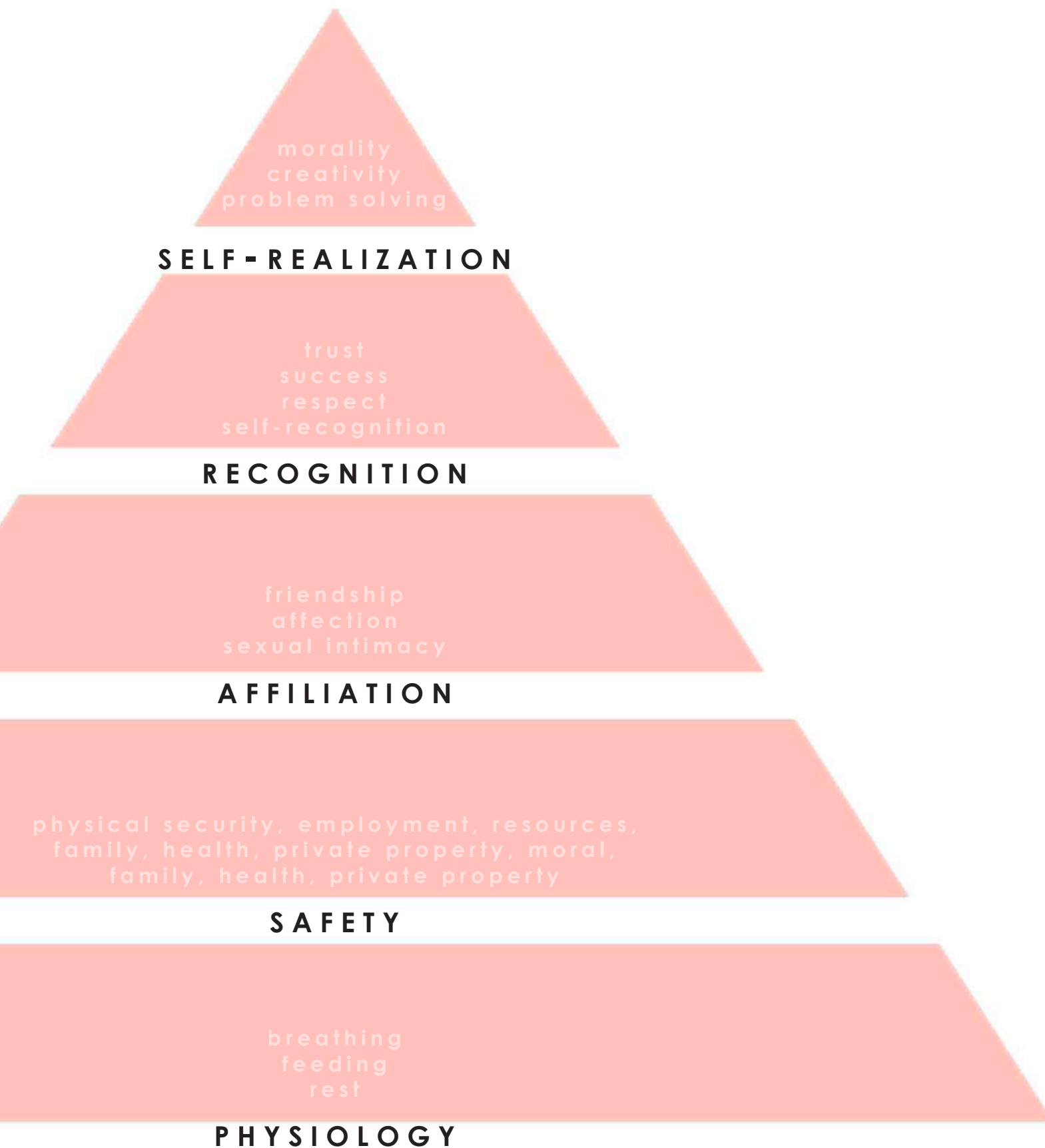
Own elaboration based on Digital Map of Mexico, INEGI 2016.

114 Blocks 100% occupied with a total of 7,901 dwellings

166 blocks with unoccupied dwellings. Total of 801 vacant housing units.

The percentage of uninhabited homes is 10.13%.

For this reason, we believe it is important not to build more residential buildings, but rather to improve the environment to avoid abandonment of the San Miguel neighborhood.



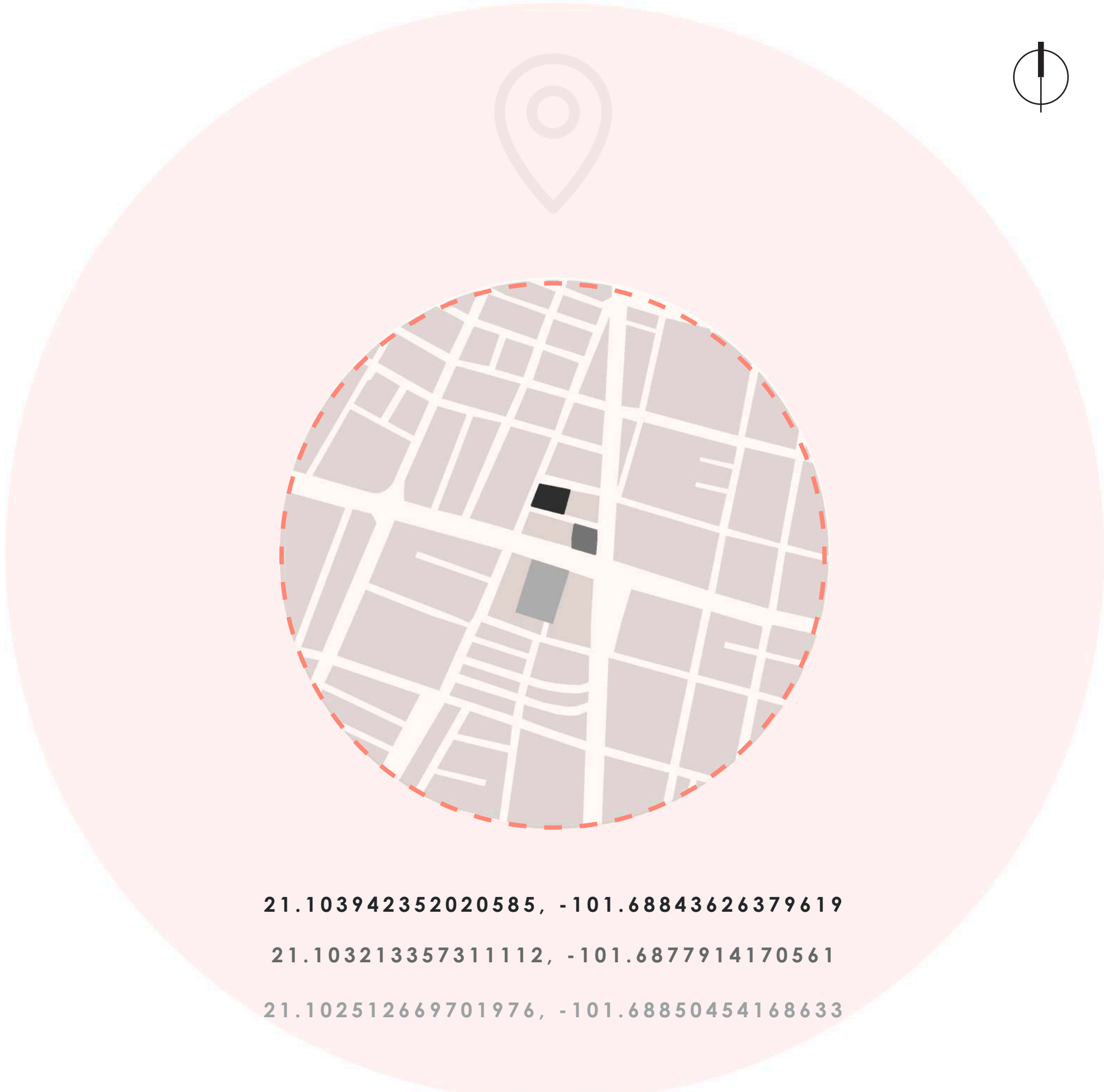
## IMPORTANCE OF SATISFYING THE HIERARCHY OF HUMAN NEEDS WITHIN A SAFE AND SOUND CITY.

Knowing the hierarchy of human needs, it can be concluded that equipment in the cultural, educational, sports and health areas have a high impact on the development of people living in a society, both physically and emotionally.



# PROJECT FEASIBILITY

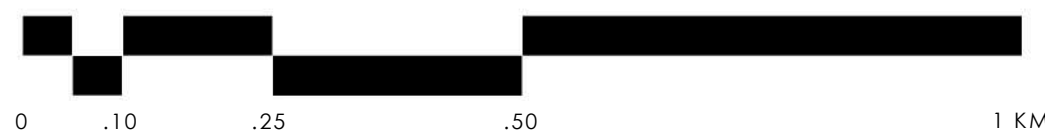
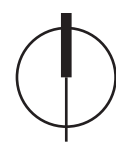
SITE ANALYSIS  
PRODUCT DEFINITION  
SWOT  
STANDARDS AND CERTIFICATIONS  
MASTER PLAN  
SELLING SHOTS



21.103942352020585, -101.68843626379619

21.103213357311112, -101.6877914170561

21.102512669701976, -101.68850454168633



**SITE N° ONE**

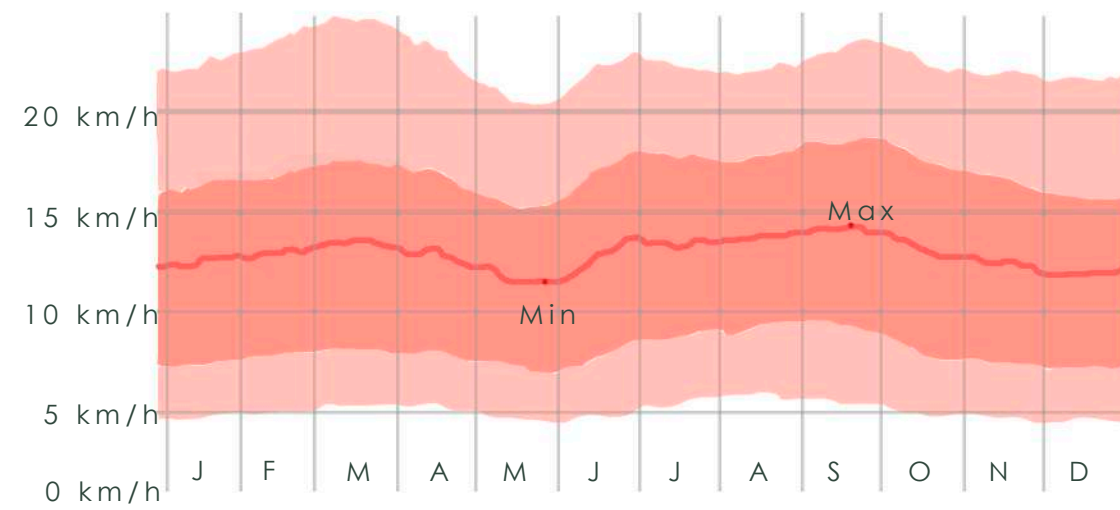
-  Potable water
-  Sewage
-  Electric Power
-  Telephone

**SITE N° TWO**

-  Potable water
-  Sewage
-  Electric Power
-  Telephone

**SITE N° THREE**

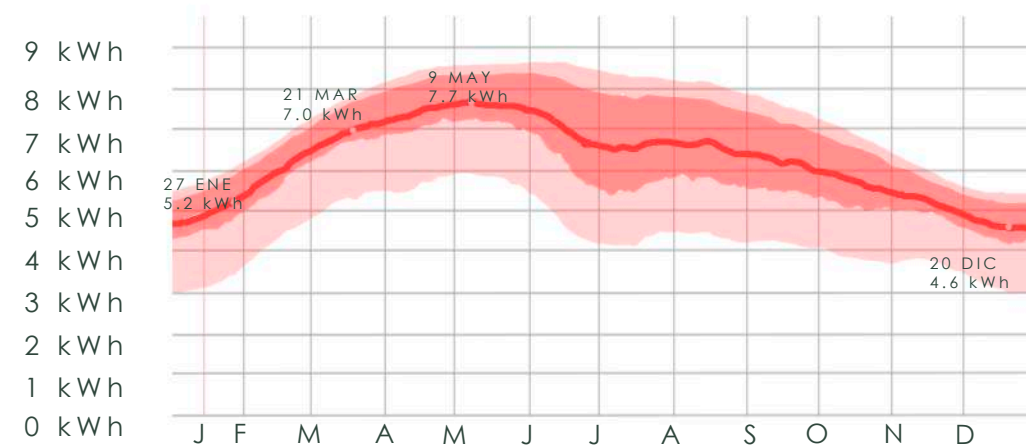
-  Potable water
-  Sewage
-  Electric Power
-  Telephone



The top graph deals with the wide-area hourly average wind vector (speed and direction) at 10 meters above the ground in Leon, Guanajuato. The wind at a given location is highly dependent on local topography and other factors; and the instantaneous wind speed and direction vary more widely than the hourly averages.

Wind variations are slight during the year. The windiest part of the year lasts 4.2 months, from June 14th to October 21st, with average wind speeds over 12.9 kilometers per hour. The windiest day of the year (**Max**) is September 19th, with an average

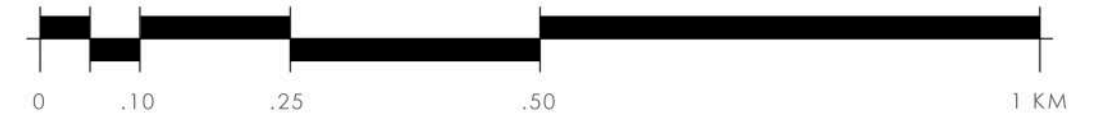
wind speed of 14.3 kilometers per hour. The calmest time of the year lasts 7.8 months, from October 21st to June 14th. The calmest day of the year (**Min**) is May 27th, with an average wind speed of 11.6 kilometers per hour.



Daily average shortwave solar energy reaching the earth per square meter (orange line), with percentile bands 25° to 75° and 10° to 90°.

The graph shows the behavior of the solar energy received in a square meter during 1 year in Leon Guanajuato.

The highest utilization is obtained on May 9, receiving a **Maximum** of 7.7 kWh and the **Lowest** energy on December 20 with 4.6 kWh.



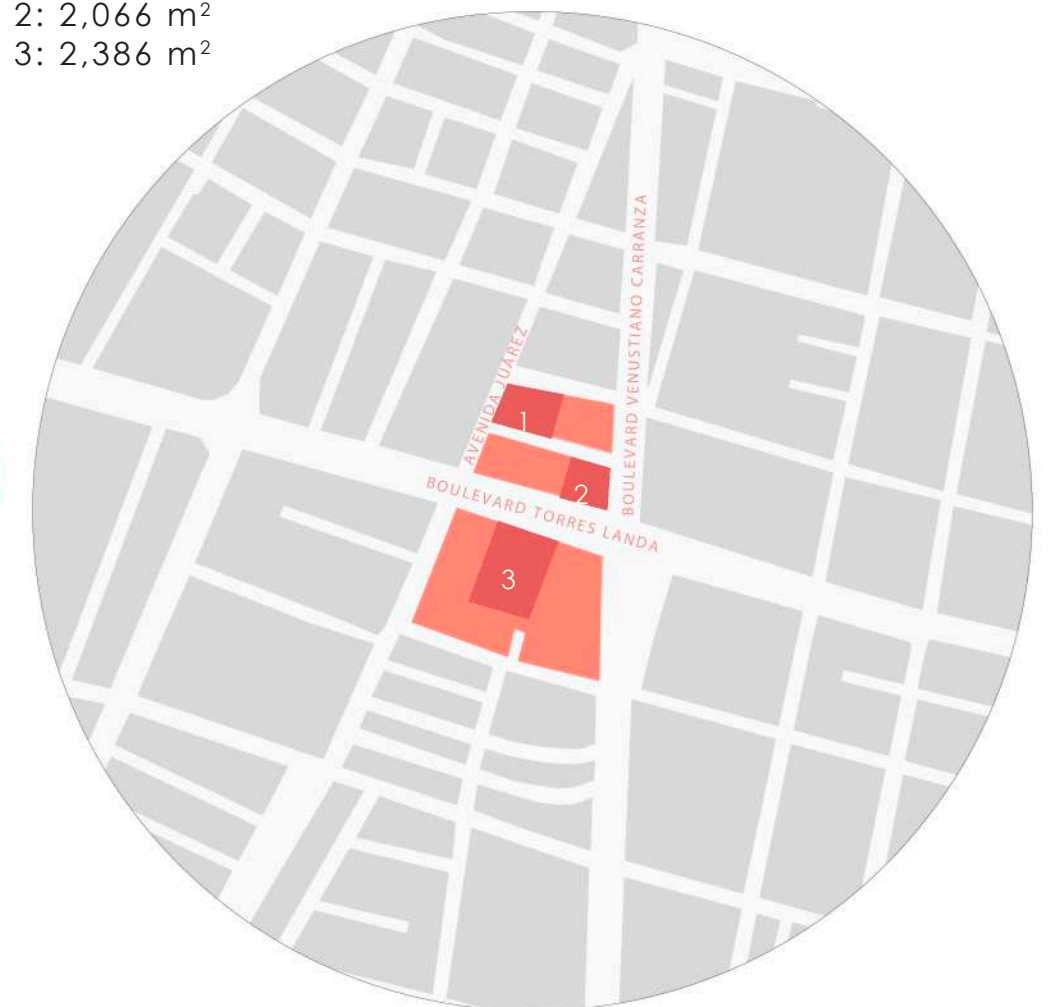
## SITES' CHARACTERISTICS

The sites are located between Juarez Avenue, Venustiano Carranza Boulevard and are divided by Torres Landa Boulevard.

Land use type H8: High density with mixed uses of commerce and services of medium intensity and industry.

Site 1: 2,722 m<sup>2</sup>  
Site 2: 2,066 m<sup>2</sup>  
Site 3: 2,386 m<sup>2</sup>

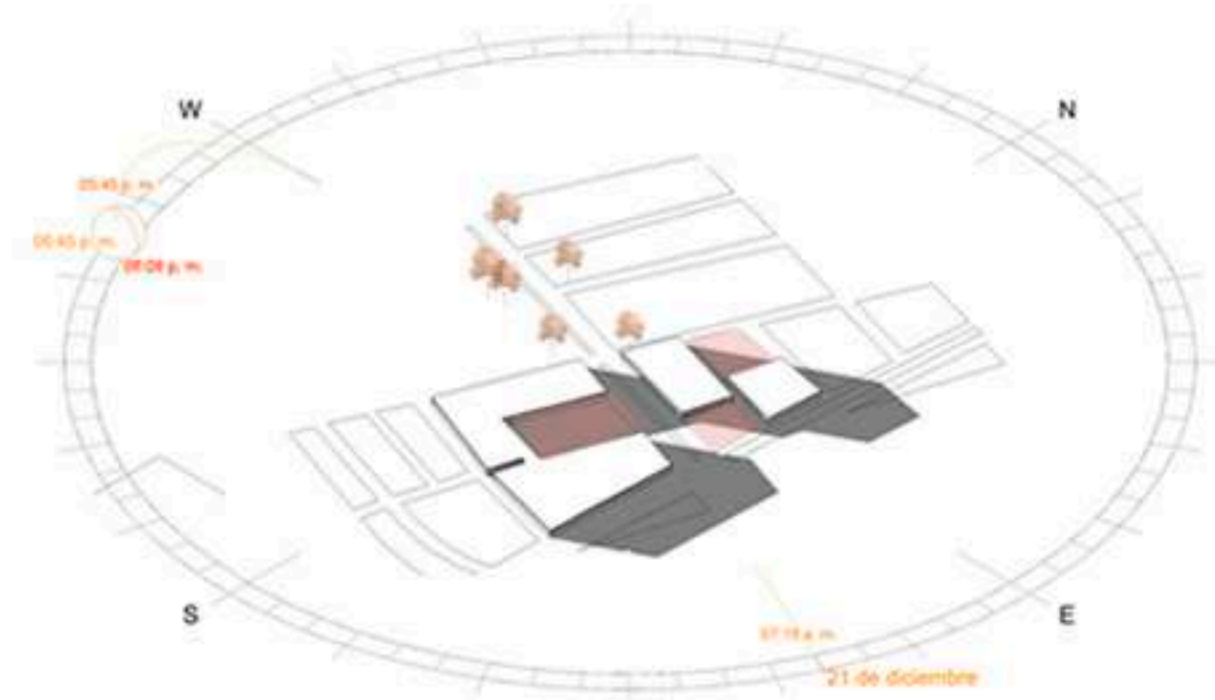
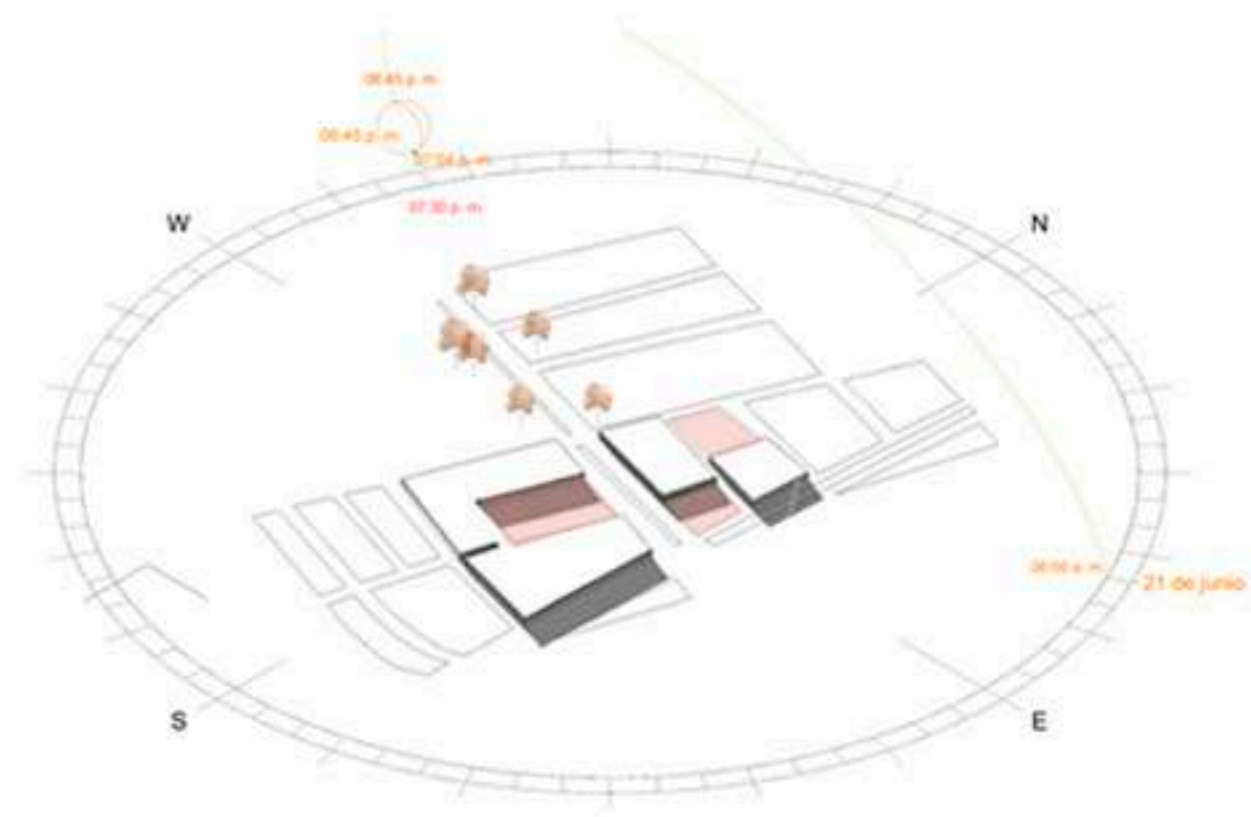
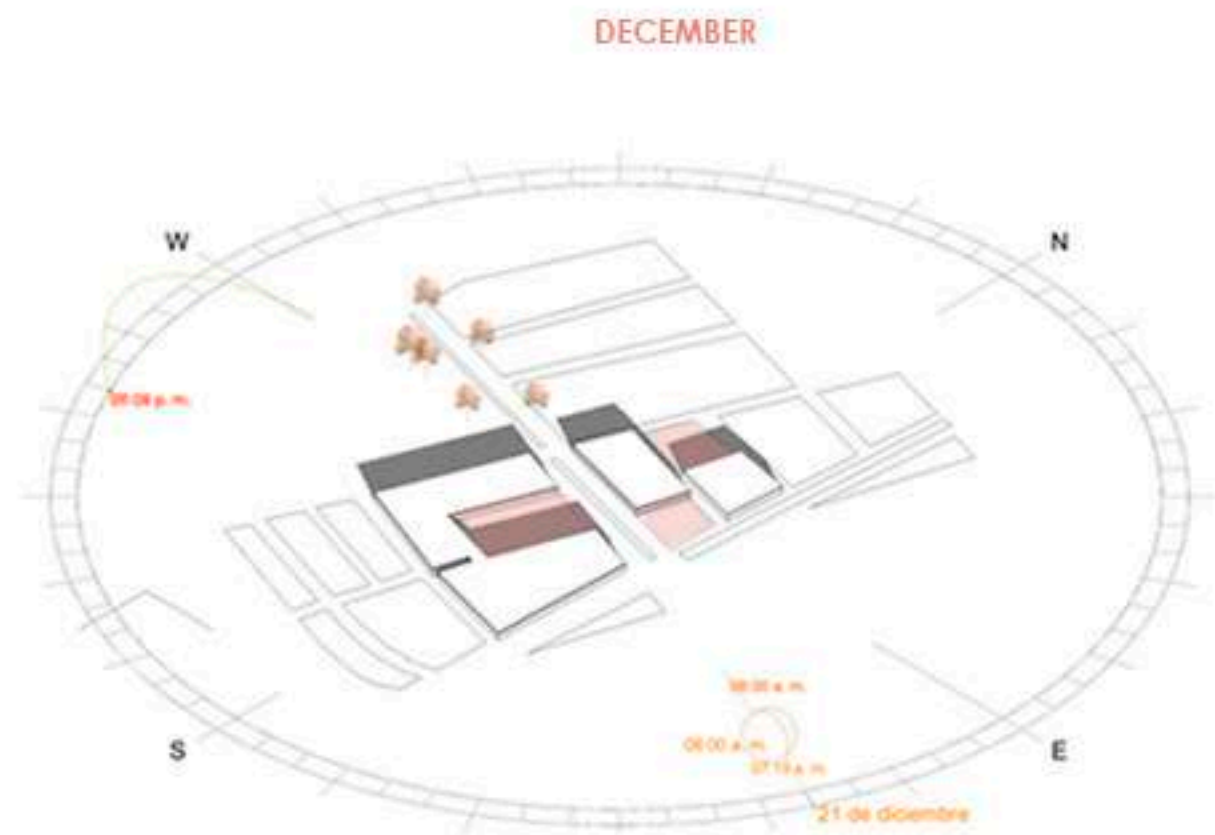
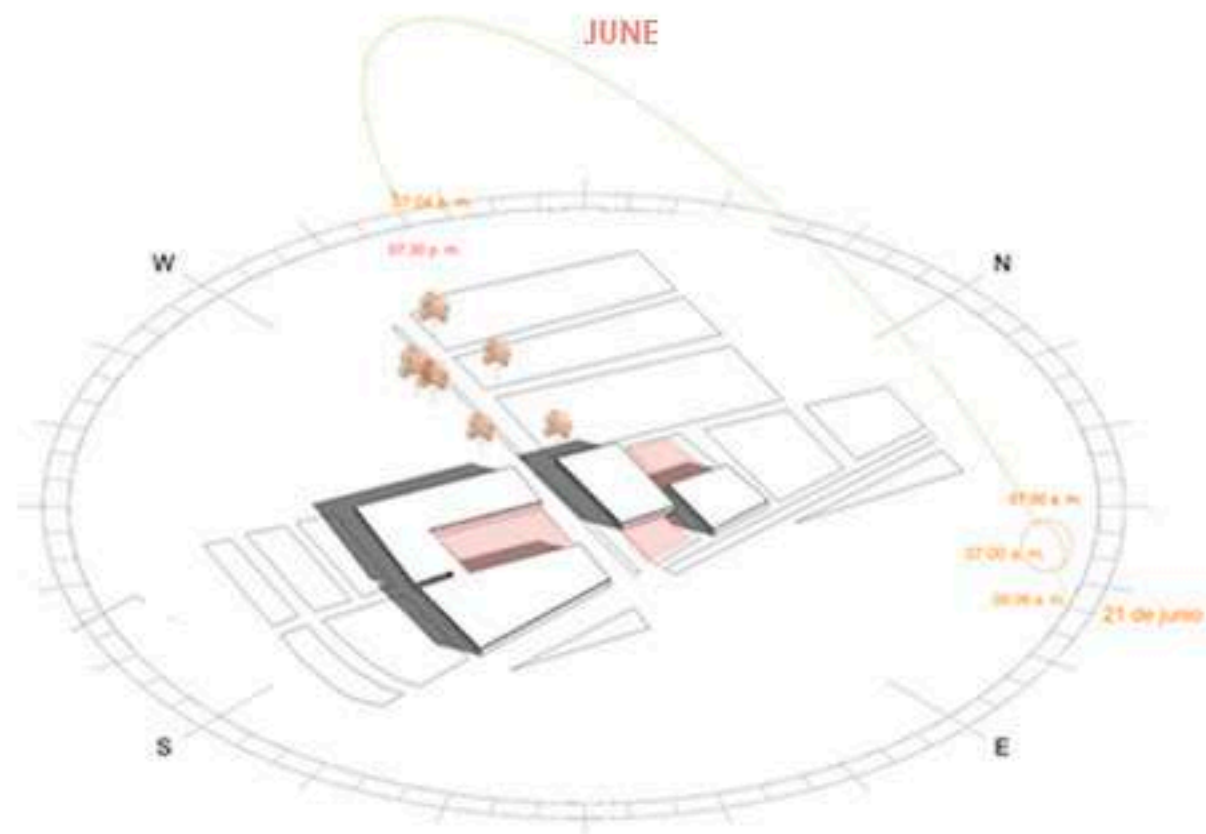
5 KM





MORNING  
6 TO 7 AM

AFTERNOON  
6 TO 7 PM

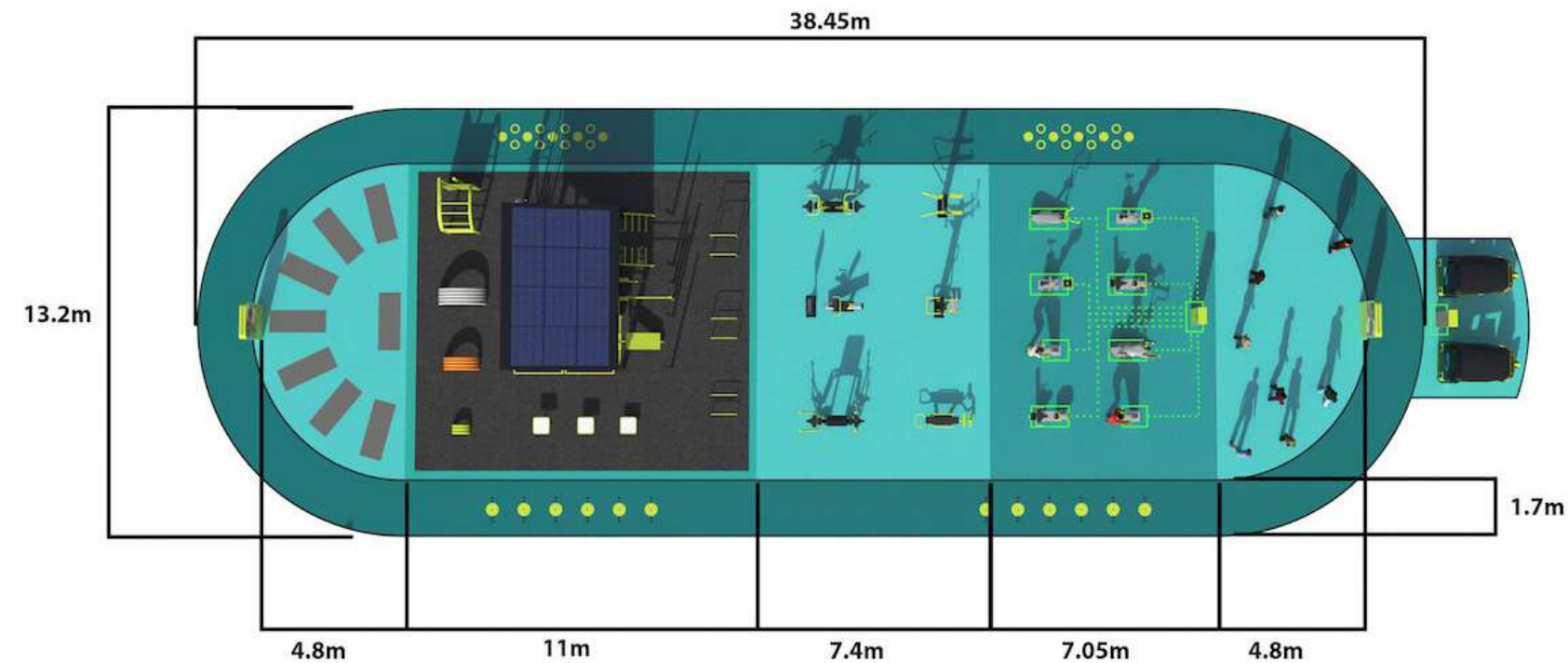




TGO GYM | SUSTAINABLE GYM



The gym that generates energy with the use of its machines and tracks. It helps reforestation and contributes to the recycling of plastic from the sea.



Healthier communities



Encourages movement



Renewable energy is generated while exercising



Smart communities, united and sustainable



1 tree planted for each machine sold

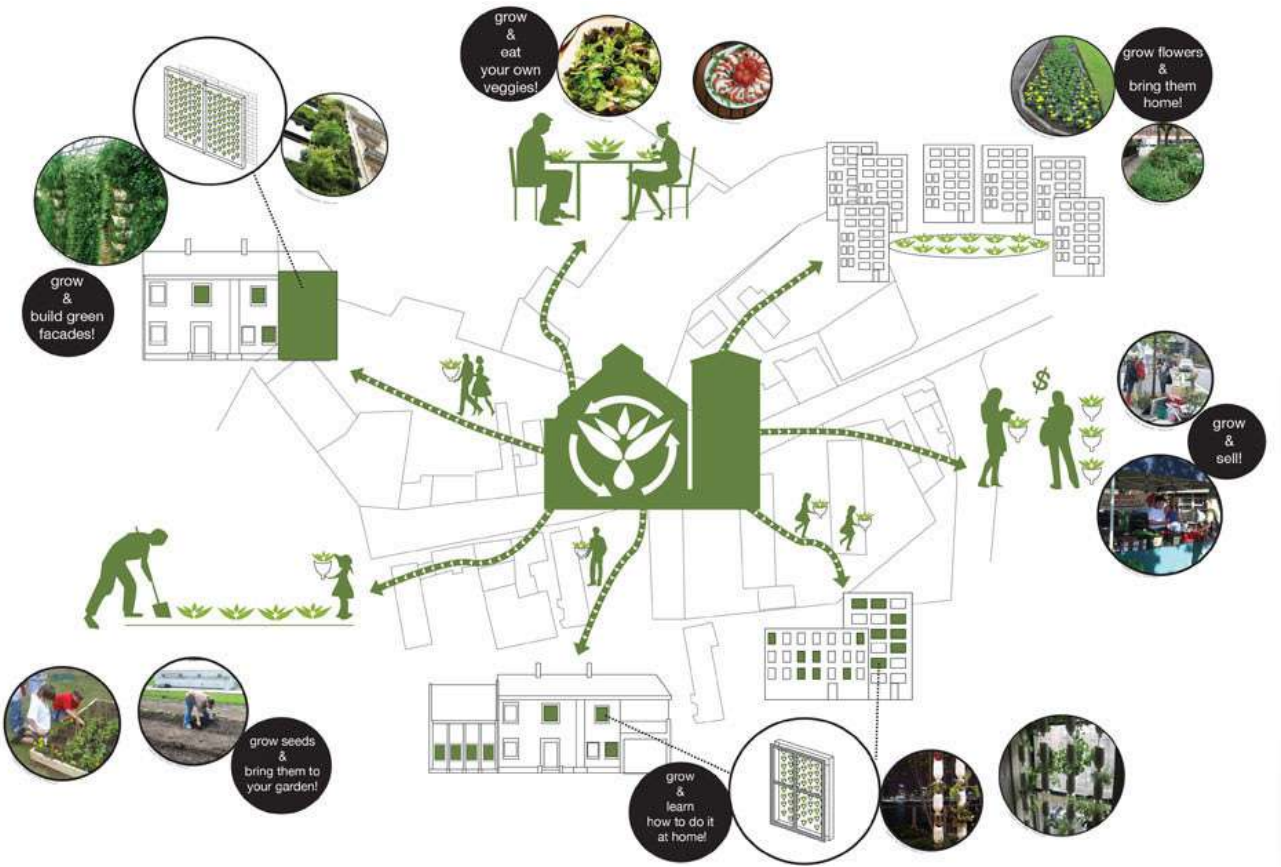


Tracks use recycled plastics from the oceans





# URBAN GARDENS



Objective: to improve the nutrition of the people involved in the social technology of urban gardens. The initiative seeks to favor the relationship of the community with the neighborhood and its environment through the ecological cultivation of food and medicinal herbs in orchards, gardens and other possibilities, depending on the local context.

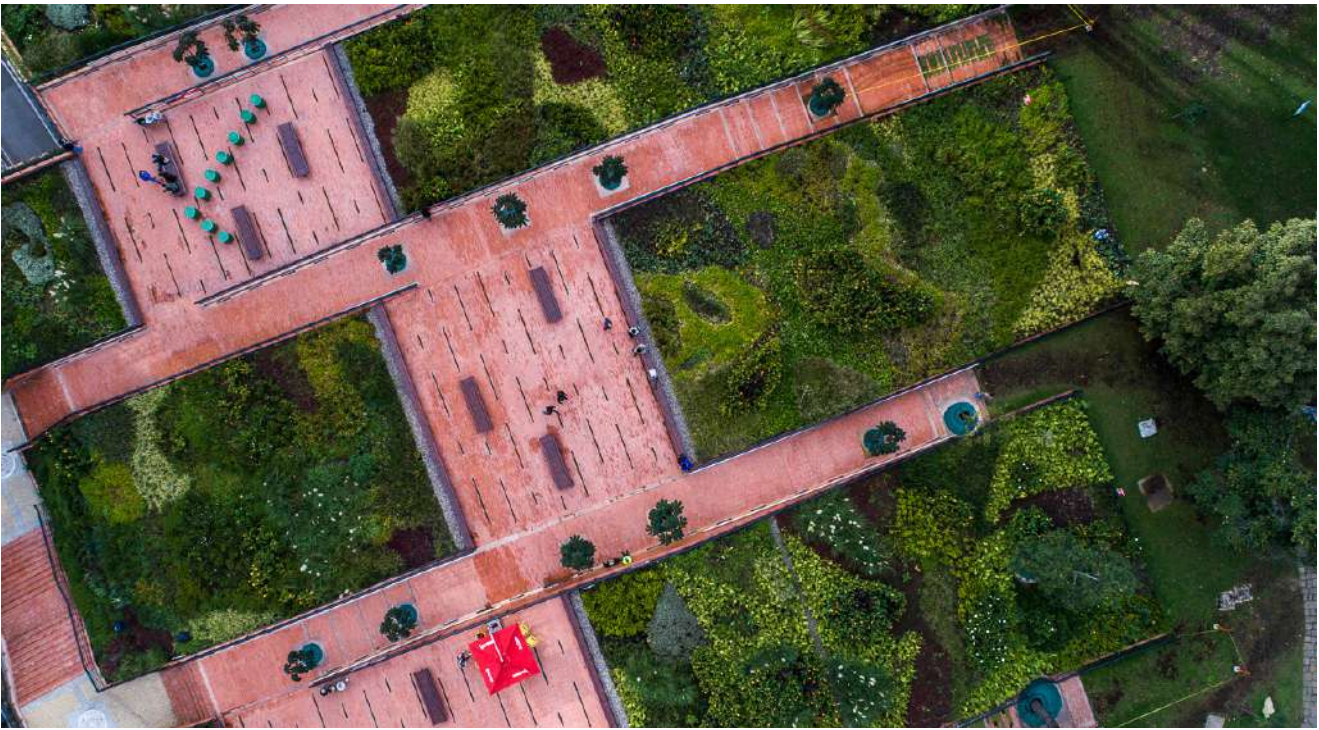
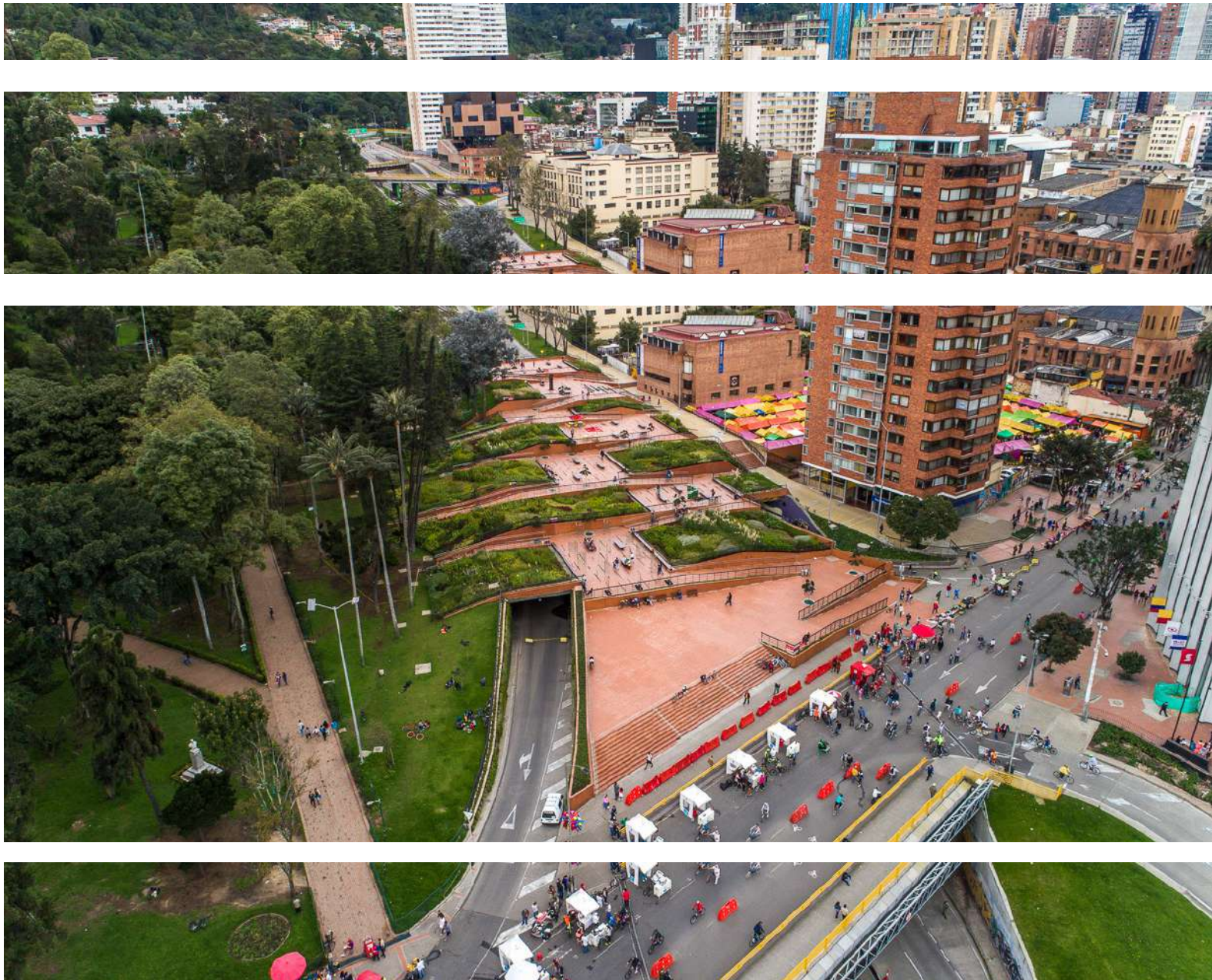
The manual consists of three parts: preparation of the garden, cultivation of vegetables and finally, how to prepare the vegetables from some recipes.





# BICENTENNIAL BOGOTÁ PARK

A project by El Equipo de Mazzanti, the Parque de la Independencia (Bogotá). With a surface area of 7,257 m2 distributed in eight small squares, it has become one of the reconstruction spaces in the center of the city where the main roads that cross it converge. The nature, the living areas, the richness of the architecture, and the urban design, transform a space that was born with the idea of “reattaching” the city, taking advantage of the native trees of the place. A place for the enjoyment and enjoyment of the public space that adorns the capital's landscape.





# HEALTHY COMMUNITY

## OUR PROJECT

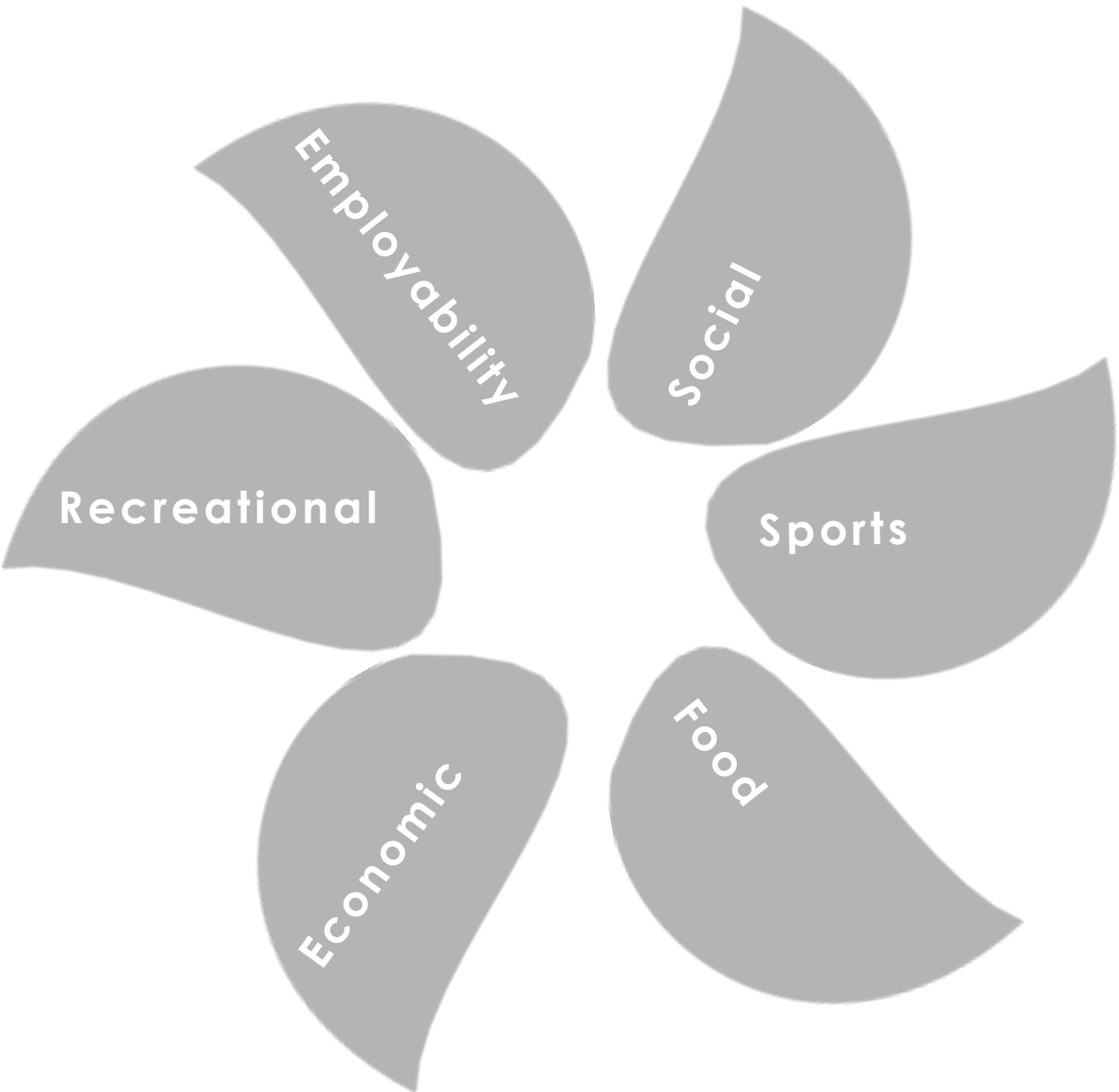


We want cities to be healthy, so we have developed a mixed-use proposal that provides environmental, economic and social benefits from the use and production of renewable energy in 'all its spaces/architectural program'.

## ¿HOW DO WE DO IT?

- 1 Creating more green areas
- 2 Creating recreational areas
- 3 Looking for more Cultural Identity
- 4 Promoting the use of organic sources for food
- 5 Creating sports amenities to encourage physical fitness
- 6 Generate jobs through the creation of an orchard and a market
- 7 Generate renewable energies through solar panels and wind generators with vertical shafts
- 8 Rehabilitating abandoned housing

## BENEFITS



## ¿WHY RENEWABLE ENERGIES?

For a city without emissions, without pollution-related illnesses, with less service expenses, reduction of municipal costs, less solid waste and with more commitment to wellbeing.

S

---

**STRENGTHS**

- There is all kinds of commercial variety (formal and informal)
- Public transportation is efficient in the area, generating great connectivity thanks to the SIT. (Equivalent to 65% of public transport travel demand in León).

- Generate green areas
- Relocate informal commerce (from public roads to bridges).
- Intervene and improve bicycle lanes.
- Placing public lighting.
- Improve sidewalks with ramps and guides that allow universal accessibility.
- Search to reduce the current carbon footprint through a self-sustainable community.

**WEAKNESSES**

---

W

O

---

**OPPORTUNITIES**

- There is an 84% deficit of green areas in the area.
- There is a deficit of sports areas.
- 40% of blocks do not have ramps for people with disabilities, 42% have only 1 roadway and there are no tactile guides/pavement for the blind and visually impaired.

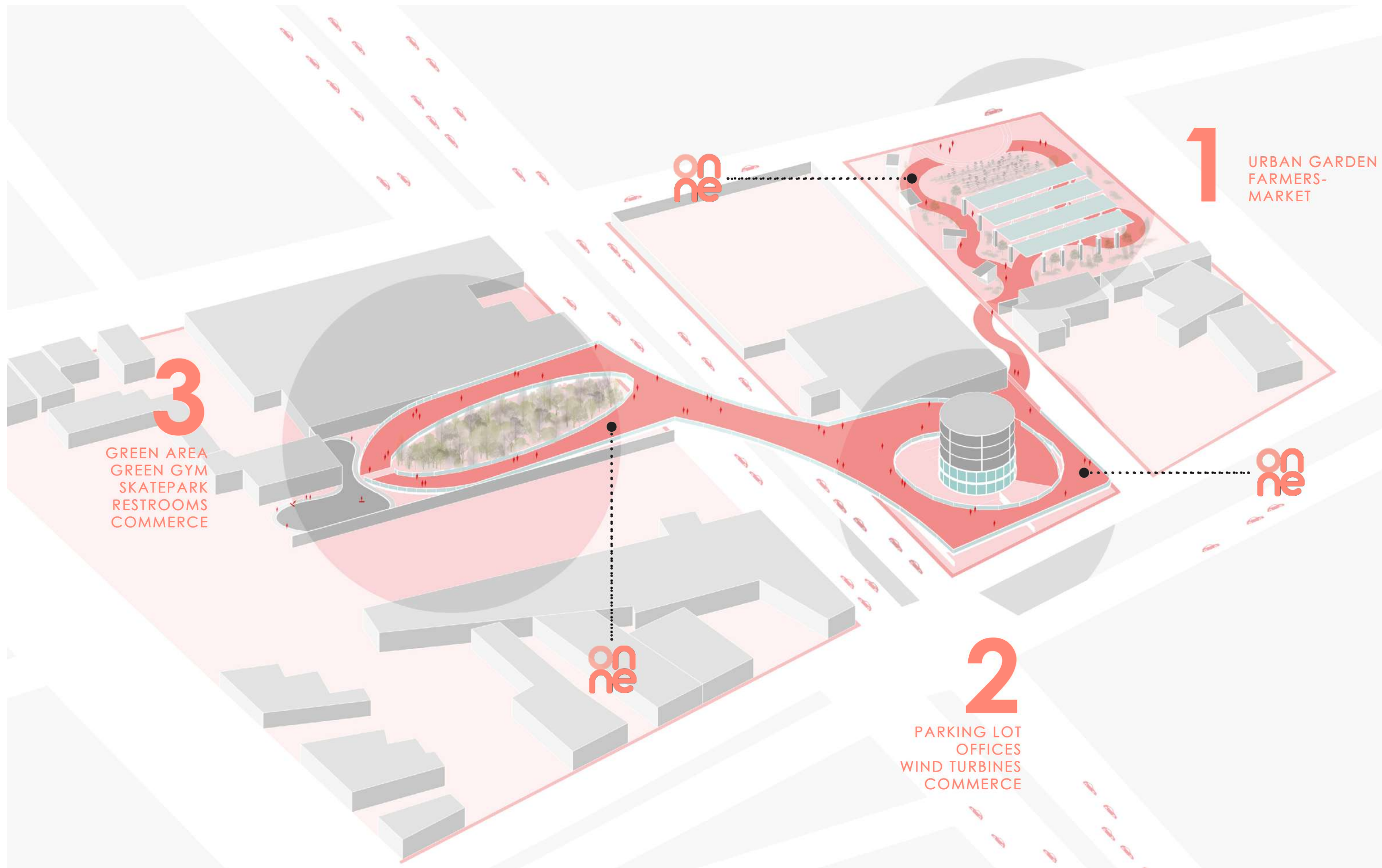
- One of the findings of the site analysis was the rate of uninhabited housing, so we will not seek to generate more housing, but to improve the quality of these.
- The SIT generates a large amount of noise pollution.
- There is a high level of insecurity due to the lack of street lighting in the area.

**THREATS**

---

T





1  
URBAN GARDEN  
FARMERS-  
MARKET

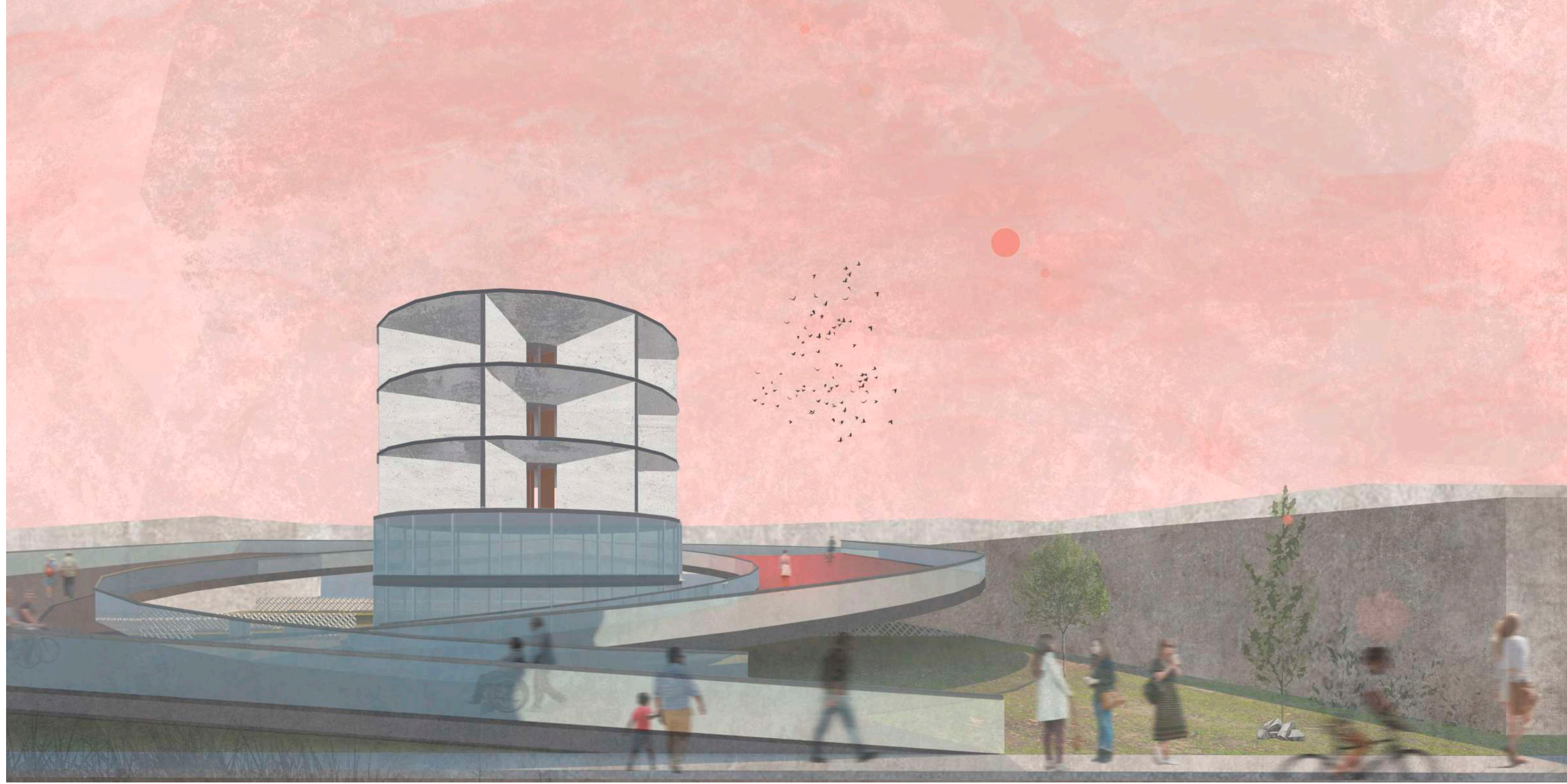
3  
GREEN AREA  
GREEN GYM  
SKATEPARK  
RESTROOMS  
COMMERCE

2  
PARKING LOT  
OFFICES  
WIND TURBINES  
COMMERCE

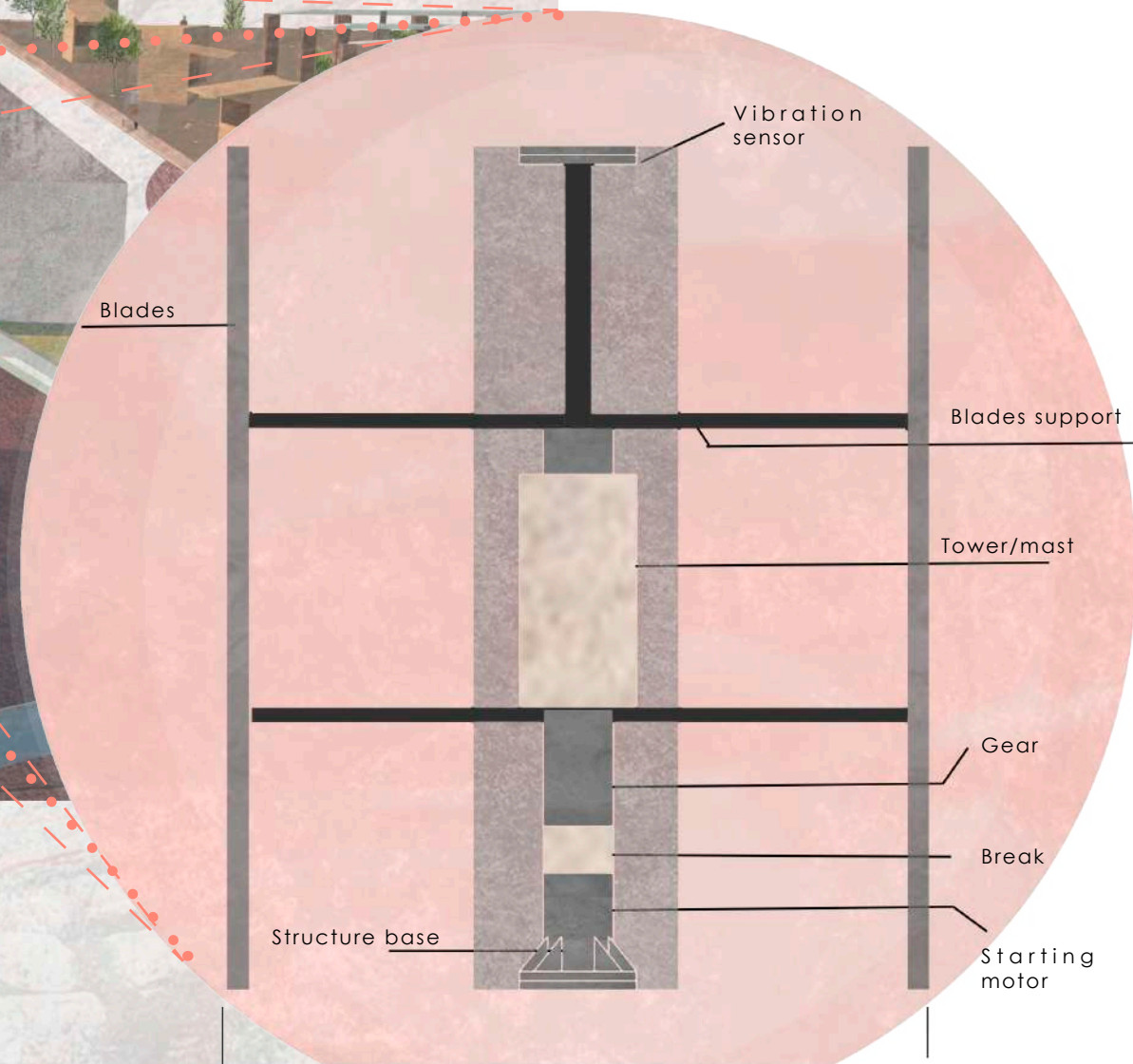
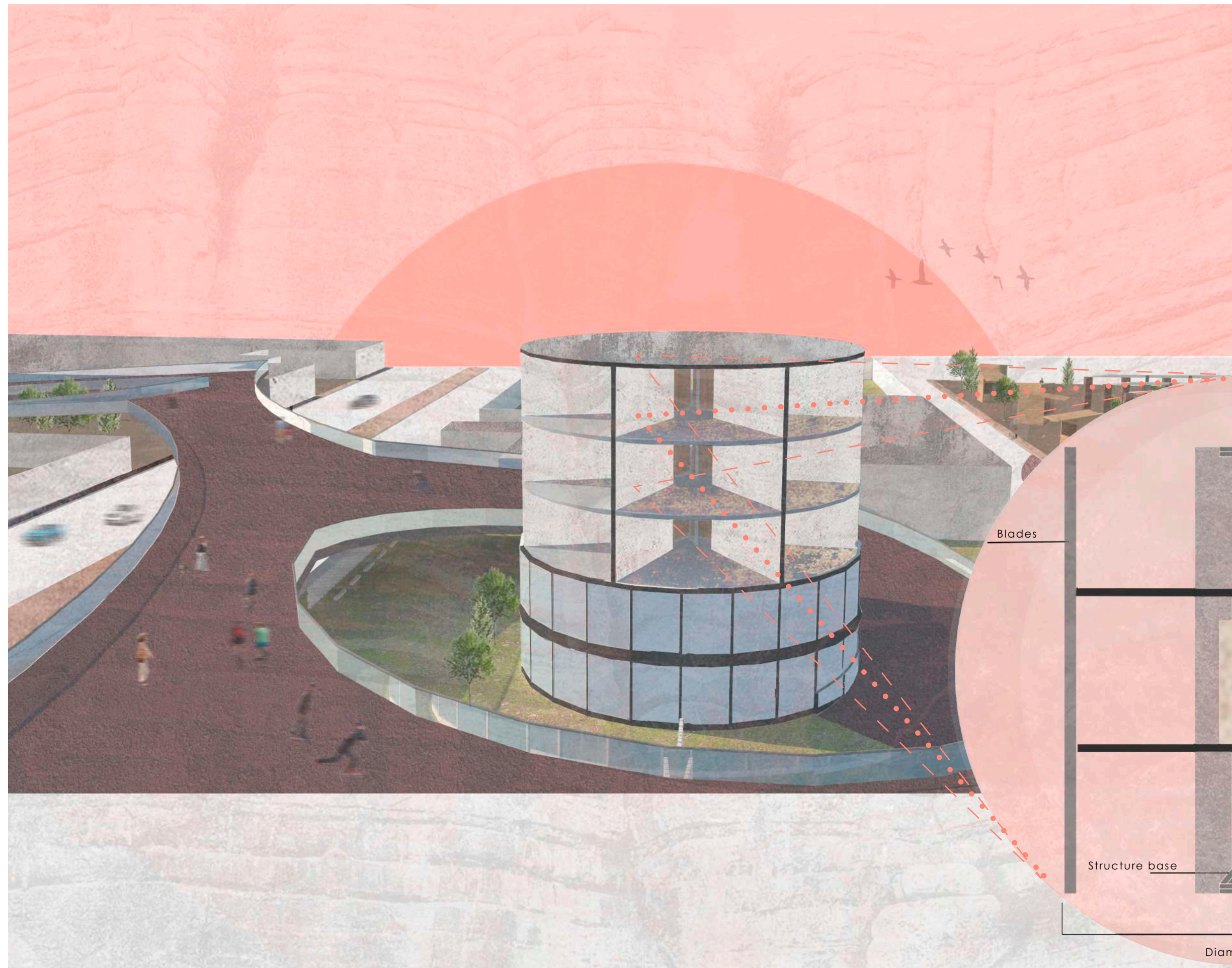






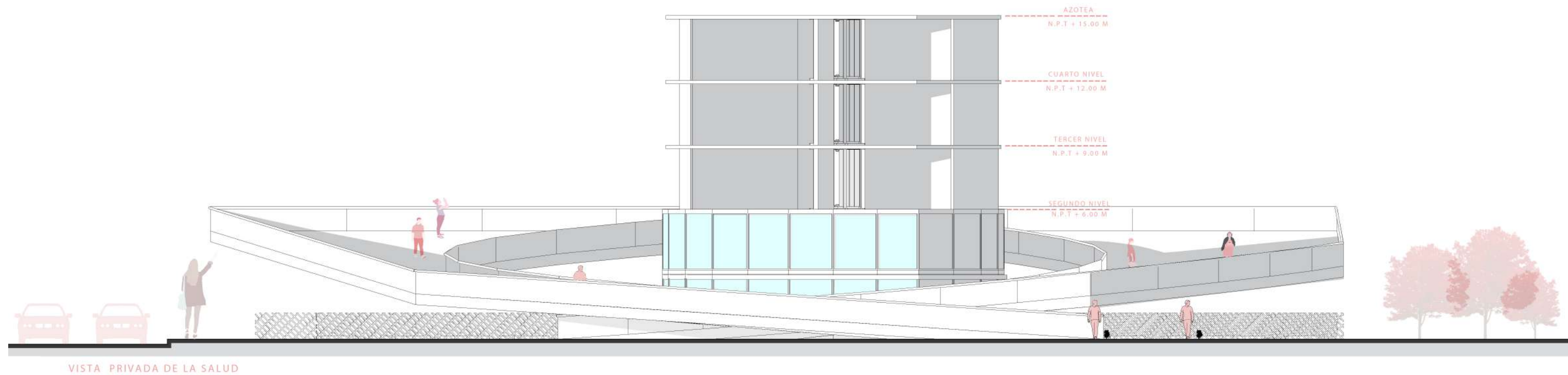




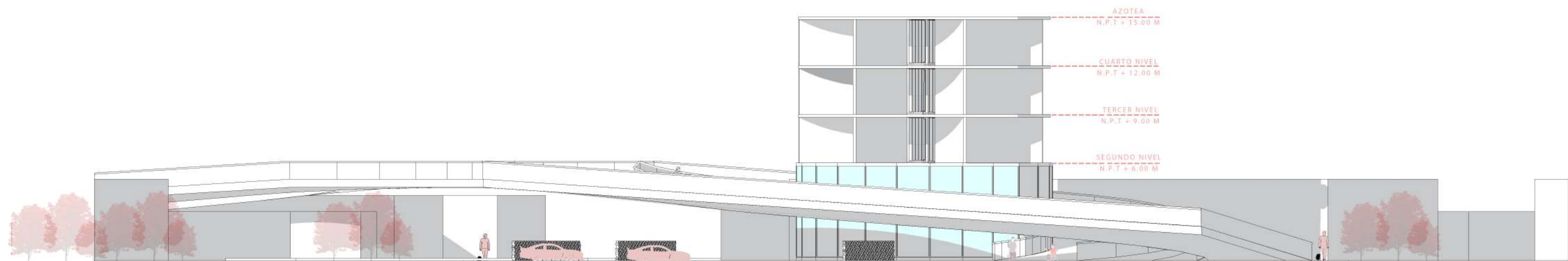


Diameter = 3m





VISTA PRIVADA DE LA SALUD



VISTA AVENIDA VENUSTIANO CARRANZA











