

REDISCOVERING URBAN DENSITY: AMELIORATING LANDSCAPE QUALITY
THROUGH RESIDENTIAL DESIGN IN QUITO, ECUADOR

by

ISABEL JÁCOME

(Under the Direction of Amitabh Verma)

ABSTRACT

Unfortunately, in most countries in Latin America, city planning continues to follow theories responsible for current environmental problems in the world. Ecuador and its capital city, Quito, are no exception. International urban and landscape design trends, such as regenerative techniques, sustainability, and compaction of cities, and contemporary concerns, which include health, environmental issues, and quality of life, are not considered.

This thesis researches Quito's lack of organized, safe, and quality open spaces. It discovers that the absence of these important features and the city's urban growth have caused loss and imbalance of several essential values that contribute to quality of life. It provides design principles applicable to high-density residential projects in order to create, in Quito's future development, a healthy environment to regain balance of these values. Through the analysis of historic and contemporary case studies, literature research, and personal interviews, it seeks for an opportunity of intervention.

INDEX WORDS: Residential design, Landscape design, Environmental values, Quito, Ecuador

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Professional Degree in Architecture, San Francisco de Quito University, Ecuador, 2007

A Thesis Submitted to the Graduate Faculty of The University of Georgia in Partial
Fulfillment of the Requirements for the Degree

MASTER IN LANDSCAPE ARCHITECTURE

ATHENS, GEORGIA

2010

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July 2010

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CHAPTER 1

INTRODUCTION

Ecuador

Ecuador, “a little known landmass straddling the equator on the Pacific coast of northwestern South America, is one of the most diverse countries on the planet” (Bish and Oxford, 9). This country is comprised of four regions “the coastal plain, the inter-Andean central highlands, the flat to rolling eastern jungle” (CIA World Factbook), and the volcanic archipelago. These four areas are commonly known as Costa, Sierra, Oriente, and Galapagos, respectively. The climate varies according to the region, “tropical along coast, becoming cooler inland at higher elevations, and tropical in Amazonian jungle lowlands” (CIA World Factbook).

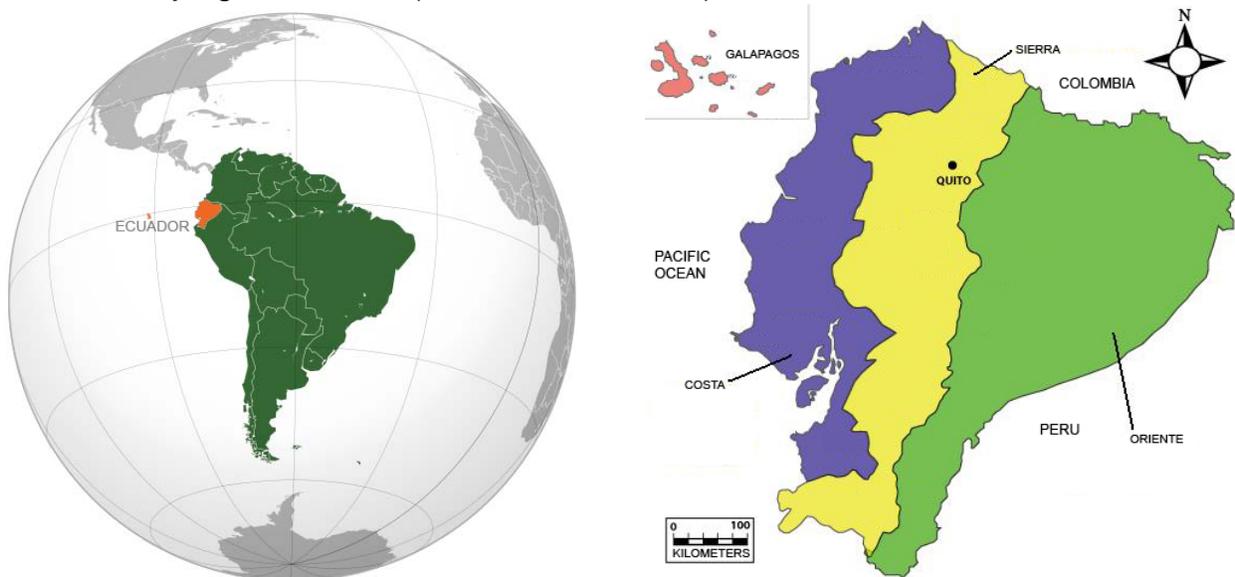


FIGURE 1.1: ECUADOR AND QUITO'S LOCATION (Diagrams by Isabel Jácome)

Ecuador's area is a little over 250,000 square kilometers (96,525 square miles), about the size of the state of Colorado. The country shares borders with two other South American countries: Colombia and Peru. "Ecuador's geography is also impressive, with a wide range of unique features, including Cotopaxi, the world's highest active volcano, and Chimborazo, the volcano whose summit is the point on the globe farthest from the center of the earth" (Bish and Oxford, 9). There are several other volcanoes that are worth mentioning such as Cayambe, where latitude and temperature reach zero degrees, and Tungurahua, which has been active for several years and is presently a tourist attraction. The elevation extremes of Ecuador are zero meters at the Pacific Ocean to 6,267 meters (20,561 feet) above sea level at Chimborazo's summit. Natural hazards include "frequent earthquakes, landslides, volcanic activity, floods, and periodic droughts" (CIA World Factbook).

About the social aspect, Spanish is the nation's official language and Catholicism the predominant religion. Ecuador's population is roughly twelve million people. There are many indigenous cultures such as the Cayapas, Colorados, Andean Kichwa, etc. which have their own beliefs and dialects. The Amerindian languages include Chachi, Tsáchila, Quichua, and Cofán among others.

Ecuador's biodiversity is very broad. This country "has more known orchid species (almost 4,000) than any other country. The figures for birds are just as impressive: Ecuador is home to 1,618 species, approximately double the number found in the United States and almost as many as in Brazil, a country thirty-two times larger" (Bish and Oxford, 9). Several ecosystems can be found in this nation, there are "habitats ranging from permanent glaciers to cloud forests, the Amazon rain forest, scrub deserts,

coastal dry forests, and an oceanic archipelago" (Bish and Oxford, 9).

This country's economy has evolved throughout the years. "In the 1970's, Ecuador went from an agricultural to a predominantly petroleum-based economy. Petroleum exports accounted for half the total by the 1980's although agriculture, including fishing, still employs a third of the labor force. Ecuador is the world's largest exporter of bananas, and shrimp farming has become a booming industry" (Mahasti, Sciupac, and Mahuad Witt, 6).

Statement of issues

There are several environmental themes or topics that have become common in current international urban design trends, such as landscape regenerative techniques, sustainability, environmentalism, and compaction of cities. Current concerns include health, environmental issues, quality of life, social structure, and aesthetic values. Developed countries are finding ways to implement these current trends and also solutions for their concerns, while developing countries, especially Latin America, often continue to follow patterns responsible for current environmental problems in the world.

In Ecuador, where population growth rates are booming and few regulations exist to manage development, urban design is not easy to address. City planning, because of the rapidly growing population's demands, is spontaneous and a quick response instead of being a thought out process. Key factors that may encourage creativity and solutions are ignored. These factors, however, are necessary to consider in order to create successful urban spaces. Such factors include the existing landscape, urban density, and infrastructural needs, such as housing, required to fulfill the population's growth.

Quito, Ecuador's capital, is a city that lacks organization, quality spaces, open

spaces, community spaces, and safety. The absence of all these important features and the way urban development has been driven in this city have caused loss and imbalance of several essential values that contribute to quality of life. These values were once an essential part of Ecuador's culture; but recently, traffic, pollution, and long travel distances have made citizens conscious of the environmental, social, economic, and aesthetic issues that are occurring and that are not being addressed by the government and authorities. Therefore, current circumstances set the stage to bring lost values back and also regain balance between them.

Methodology

This thesis analyzes historic case studies that can make evident different patterns which were traditionally utilized in creating a positive environment. It finds requirements and expectations that Quito's population may have previously had that could be valuable in recapturing the quality of space and life. It then analyzes contemporary practices which are presently creating an undesirable and unsustainable environment. Finally, it provides design principles that will help create, in Quito's future development, a healthier environment to regain balance between the values of quality of life. Through the analysis of historic and contemporary case studies, literature research, and personal interviews, this thesis seeks an opportunity of intervention.

After research is completed and design principles are established they will be applied on a high-density residential project. The goal of this project is to show how the principles can be used to provide a healthier, more sustainable, and livable urban environment by creating enjoyable open-green spaces for recreation, interaction, and the development of a strong sense of community.

CHAPTER 2

QUITO'S URBAN DEVELOPMENT

Quito

Geographical context

Besides the insular region, continental "Ecuador is divided into three regions: the coastal lowlands, the Andean mountain range, and the jungles of the upper Amazonian basin. Nestled on a plateau in the Andes, Quito, at 2,850 meters (9,350 feet), is the second highest capital in the world" (Mahasti, Sciupac, and Mahuad Witt, 6). It is well-known around the world for its historic core surrounded by beautiful natural features. "Occupying a narrow valley in the Andes, Quito's evolution from colonial outpost to modern city has been shaped by legend, myth, topography, and a rising population" (Izurieta-Varea, 30).

The valley where Quito was founded is not the ideal location for a city. The city was "(...) laid over the ravines coming down from the Volcano Pichincha. Despite its inappropriateness to the landscape, this urban core functioned efficiently for more than 400 years, surviving well into the twentieth century" (Izurieta-Varea, 30). Topography in the valley was so irregular that, in order for the Spanish conquerors to lay the colonial grid, a large ravine, Jerusalem, had to be filled. Later, development had a different approach. The landscape was considered and respected and "the topography of the area modified the regularity of that pattern outside the central core" (Zaaijer, 87).

Natural conditions are particular and unique not only within the city, but also in the surroundings. "The region of Quito, with its volcanoes and snow-covered peaks, with winds whistling over the cold moors and the farm lands that lavishly drape themselves over the valleys between 2,500 and 3,000 meters (8,202 and 9,842 feet) above sea level, astounds the onlooker with its exuberant vegetation" (Tasquer and Peralta, 10). Although generous nature can be found in the area, the dynamic borders and contrasts between the city and the countryside make clear how urban development has taken over the natural setting without consideration.

Climate

Climate on the base of the Pichincha Volcano is very constant, mild to cool, throughout the year. "The proximity of the city to the equatorial line, together with its great altitude, gives Quito an exceptional climate allowing it to enjoy several harvests a year, as well as evergreen, blooming surroundings" (Tasquer and Peralta, 11). Temperature variations occur more drastically during the day than during the year:

The typical temperature at noon is 25°C (77°F) with a normal night-time low of 6°C (43°F). The average temperature is 15° C (64°F). The city experiences only two seasons: dry and wet. The dry season, June through September (4 months), is referred to as summer; the wet season, October through May (8 months), is referred to as winter. In reality, you can experience all the seasons in one day. Even though a day may start with a morning of blazing sun and blue skies, in the afternoon you can get a hailstorm and at night mountain mist (MDMQ).

Population

Quiteños, people from Quito, are very friendly and proud of their city. Most of them

realize that the city is growing too fast and with no control. Accommodating all the growth is a difficult task because of Quito's geographic limitations. "According to the census in 2001, this is a city that does not exceed 2 million inhabitants, with a still compelling scale extending, in its central consolidated area, through more than 35 kilometers (21.8 miles) and a width ranging between 3 and 5 kilometers (1.9 and 3.1 miles)" (Tasquer and Peralta, 10-11). This data does not consider one nearby valley, Rumiñahui, that is basically Quito's suburban development, and also the population increase since 2001. These two factors contribute to Quito's current population which, by now, is expected to exceed 2 million as indicated on the following table (INEC).

TABLE 2.1: PROJECTED POPULATION OF QUITO

1990 CENSUS	1,388,500 inhabitants
2001 CENSUS	1,842,201 inhabitants
DEMOGRAPHIC RATE OF GROWTH	2.60%
INCREMENTS	33.00%
EXPECTED IN 2005	2,007,767 inhabitants
RATE OF GROWTH	2.20%
EXPECTED IN 2010	2,215,820 inhabitants

("Instituto Nacional de Estadísticas y Censos" INEC)

History

The capital city of Ecuador has a rich history. In an article published in the journal Cities, this history is summarized very efficiently:

Quito's name is derived from the Quitus - one of the original tribes to inhabit the area in the 11th Century. Conquered by the Caras then the Shyries, invaders from the coast, the territory fell to the Inca ruler Huaina Capac toward the end of the 15th Century. In 1531, the Spanish, led by Francisco Pizarro, landed in Peru,

subsequently capturing and executing Atahualpa, Huaina Capac's heir. Sebastián de Benalcázar, one of Pizarro's lieutenants, took possession of Quito in 1534, though the settlement was razed to the ground by the Incas. On December 6, the town of San Francisco de Quito was established. The following year, construction of the city's first religious building began on the site of the present Cathedral (Mahasti, Sciupac, and Mahuad Witt, 6).

Quito remained part of the Spanish Colonies until 1822 when the Battle of Independence, named Pichincha, occurred. After this event, the city became part of “La Gran Colombia”, a country that comprised what currently is Ecuador, Colombia, Venezuela, and Panama. The republic of Gran Colombia dissolved in 1830 and the Republic of Ecuador was born with its capital, Quito.

Although, the urban development of Quito's colonial town has been controversial and thoroughly analyzed because of its lack of planning, it was added to the UNESCO World Heritage Site List in 1978, as “despite the 1917 earthquake, the city has the best-preserved, least altered historic centre in Latin America” (UNESCO). In general, the city's growth has been clearly constrained by the form of the surrounding valley. Initially, the expansion was gradual and this shape did not present any limitations. “During the four centuries following its foundation, the city's outline and architecture grew at a slow, concentric rhythm around the Plaza Mayor, preserving its compact urban structure” (Tasquer and Peralta, 22). It was in the 19th Century and the beginning of the 20th Century that Quito's development:

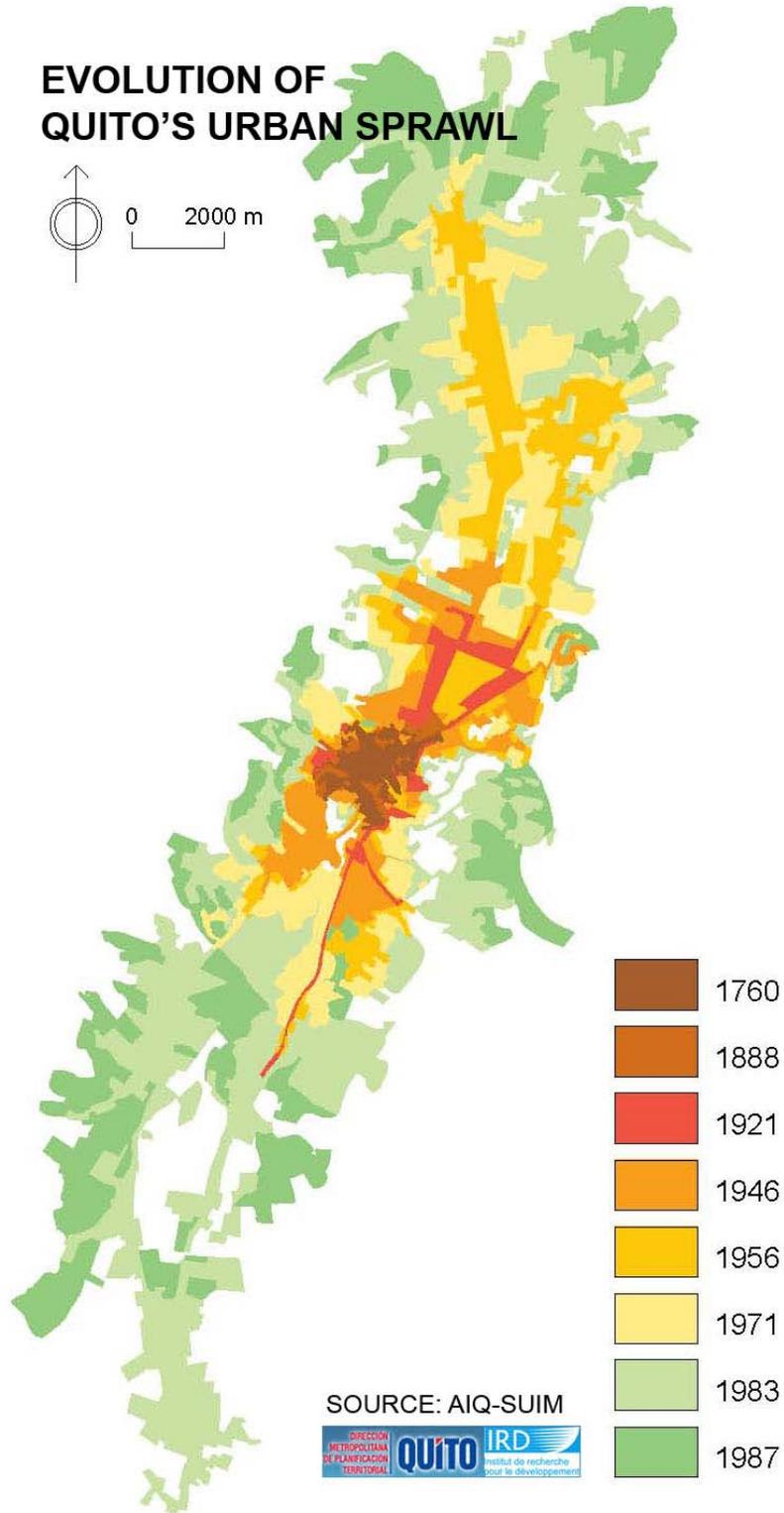
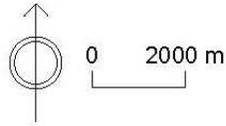
(...) modified the ancient system of concentric growth around the inner city and started a linear expansion within the natural topographic limits. The inner city began

to lose its original social organization. Its traditional inhabitants, the bourgeoisie, left for the northern part of the city in search of new patterns of comfort and the historic centre was gradually invaded by lower income groups. (...) In the south the city rapidly expanded in a series of spontaneous settlements. This process was strongly accelerated from 1974 onwards when the effects of the oil boom were felt in Ecuador. In 1984 the population growth of Quito amounted to 5.2%. Of this, 1.7% was due to natural growth and 3.5% to immigration (Zaaijer, 87).

During this exponential development the city kept its low density. It was not until the last decades of the 20th Century that “the tall building emerged, modifying the urban image. In broad sectors, the city grew vertically” (Tasquer and Peralta, 25). Currently, Quito's development incorporates both the small rural populations and the valleys around it. The limits of the city are uneven: they sometimes respect the topography and geography they lie on and at other times ignore it.

This type of development, called “Bow Tie”, consists of a strong well-configured center that expands in layers that spread, in Quito's particular case, mostly north-south. Layers were configured according to the various needs that characterized different time periods. The typology and shape within every layer of the urban context responded to several political, environmental, aesthetic, and economic conditions as well as the social factors of the time. In Quito, four layers can be easily identified: the colonial center or downtown; the early to mid 20th Century expansion; the vertical growth; and the current sprawl. Each of these is discussed below in specific detail within the context of each case study.

EVOLUTION OF QUITO'S URBAN SPRAWL



SOURCE: AIQ-SUIM



FIGURE 2.1: EVOLUTION OF QUITO'S URBAN SPRAWL (Barrera Guarderas)

For each layer, one example has been selected as an iconic representative of the style and pattern of development. All of the case studies are private projects and, with the exception of the vertical growth which is an apartment building, single-family houses. They were selected as single-family housing has constituted the highest proportion of development during those time periods. Such projects, due to the availability of economic resources and associated with social factors, represent the popular attitudes and social priorities in the latest developing trends of each time period.

Historic case studies

1. Single family house in the colonial downtown: Mejía House.

Background information:

The colonial downtown, or old town, is the center of the city and the heart of the previously mentioned Bow Tie. This neighborhood began to develop when Spanish settlers founded Quito in 1534. Before the Spanish foundation, Quito was a major city that belonged to the Inca Empire. The old town is characterized by narrow stone-paved streets meant for carriages and horses, the streetscape also included wide sidewalks to supply the extensive pedestrian activity of the colonial era. The urban fabric of this area consisted of a tight grid. "The evenly proportioned city blocks and narrow streets connected by well-placed plazas have not been modified in the least" (Mahasti, Sciupac, and Mahuad Witt, 4). Means of transportation and market areas facilitated human interaction and, therefore, the identity and sense of community of this city was really strong.

Quito's colonial core accommodates the working class and indigenous people, which have contributed to the character of this neighborhood for the past half century.

Although people from different statuses who live in different areas of the city commute to downtown everyday to work, they contribute little to the character of this location. In 2006, a very extensive and well-managed restoration project was completed in this part of the capital city, addressing different types of structures and their needs. The appearance of churches and buildings was improved, historic theaters were rehabilitated, and the formerly unsafe streets are now well preserved and ready to be explored again. Some other sites required a deeper intervention, such as structural restoration. This consisted in drilling the original adobe structural walls to strengthen them with a new reinforced concrete framework.

Housing typology follows the Spanish Patio House Style although, currently, most patios have been covered with modern clear glass and steel roofs. "The typical local architecture is characterized by the large, one-or two-storeyed houses with spacious interior patios surrounded by open balconies on the ground and first floor, the patios having a strong domestic and recreational function" (Zaaijer, 89). Everything within the house was organized around this courtyard and, as a consequence of this arrangement, patios were very private and the most important space in the house. Despite the massive structural adobe walls that comprised these houses, they were fairly open to the street but yet conserved a private character.

The case study for this first layer of Quito's urban development, the Mejía House, is located one block northeast from the very center of downtown, "La Plaza Grande." This plaza is surrounded by important administrative, political, and religious buildings such as the Presidential Palace, the Municipal Palace, the Archbishop's Palace, and the Cathedral.



FIGURE 2.2: MEJÍA HOUSE AERIAL
Aerial of Colonial Downtown showing the location of the Mejía House

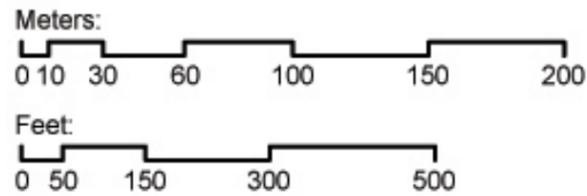
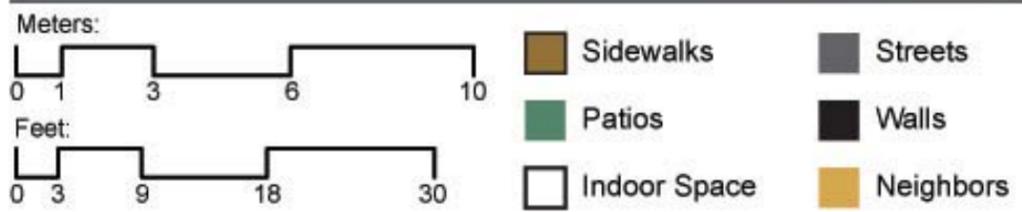
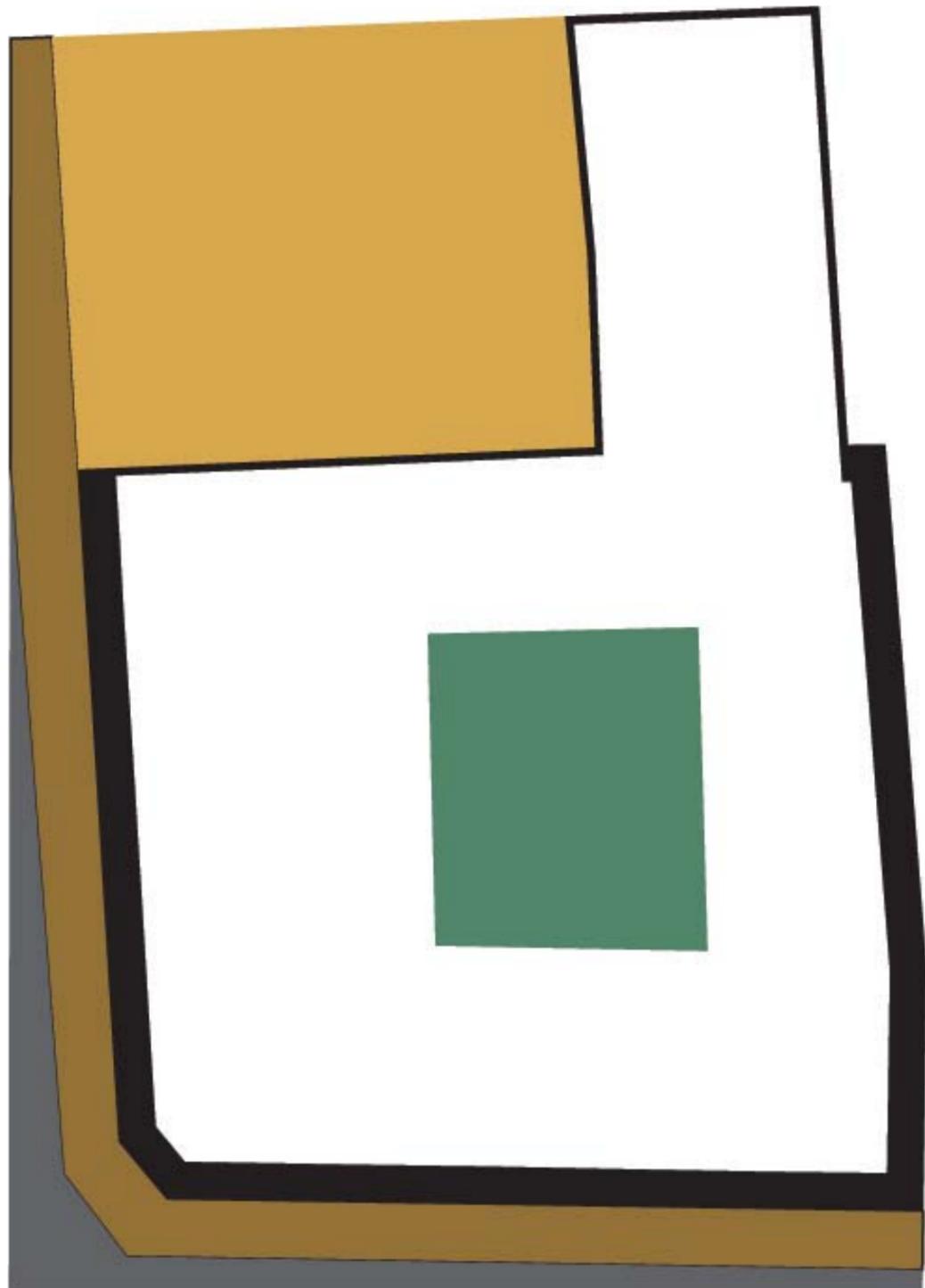
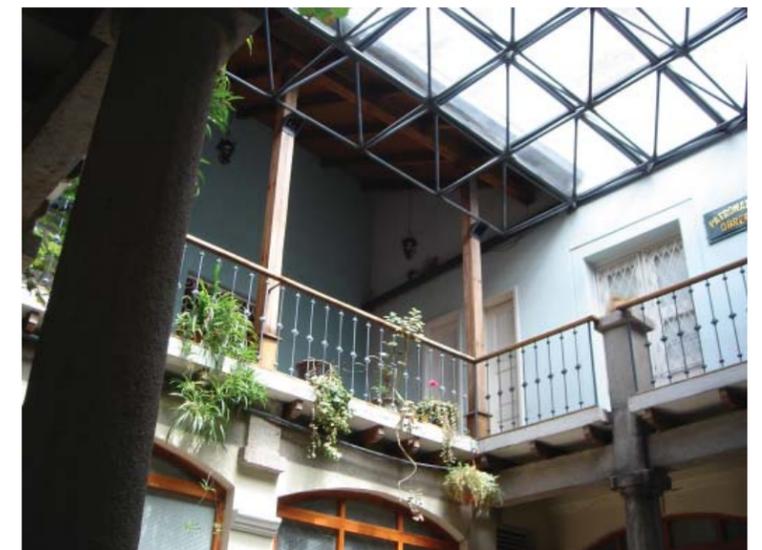


FIGURE 2.3: MEJÍA HOUSE CONTEXT DIAGRAM

- Mejia House
- Plazas
- Streets
- Points of Interest
- Developed Green Areas
- Buildings
- Patios



Mejía House from outside -
 Several openings punctuate the thick adobe walls.
 Two story building that exposes two facades to the street.



Inside the Mejía House -
 Indoor patio that provides connection between stories.
 Metal and glass roof covering the patio, this is not part of the original house.

FIGURE 2.4: MEJÍA HOUSE DIAGRAM AND IMAGES

Findings:

The Mejía house is a good example of a colonial house due to its Spanish Patio House Style and the thick adobe structural walls. Like most houses of the colonial period, this was a single family house where all public rooms were at ground level and all private rooms on the first story. Circulation was always directed around the patio, providing a more frequent opportunity for family members and guests to stumble upon each other and interact regardless of the level they were on.

Patios usually combined both hardscape and landscape. In other words, they were stone-paved with a couple of planters and a tree. Because of the absence of cars and pollution, the presence of market and recreational areas, and the proximity of the undeveloped countryside, greenspaces were not needed within the colonial city. Considering the exponential increase in population, pollution, and development this neighborhood currently has an enormous lack of green public areas because patios fail to supply such spaces. Streets have been widened to fit automobiles, taking over the wide sidewalks giving preference to cars instead of pedestrians. Pedestrians now find themselves in a very uncomfortable situation when walking through this neighborhood's streets. The problem is not only the narrow sidewalks that put them right against a gray building (that used to be white), but also the abandoned narrow alleys meant for carriages that, with the other motorized modes of transportation, have become useless.

This colonial house provides an example regarding social aspects. The sense of community is really strong in this kind of development due to the countless opportunities and places devoted to human interaction. Colonial structures tend to have a good approach to the private-public character dichotomy; subsequently, spaces are provided

with the right attribute according to the hosted functions and activities. Houses are private yet public because of the interaction and relation, at different levels, with the patio and the street. Another important aspect is connectivity. Due to the size of the city at that time, connections and displacements throughout it were quick and fast. Everything was close, within walking distance and easily accessible. Finally, in terms of aesthetics, the colonial typology of Quito provides a defined identity that used to be pleasing. Currently, because of its deteriorated condition, the beauty behind it cannot be easily appreciated.

2. Single family house in “La Mariscal”: Café Cultura.

Background information:

La Mariscal is the second layer in the history of Quito's urban development. This neighborhood was developed between the 1920's and the 1960's as a response to the saturation of the colonial downtown. As people began to feel the need to get away from the city to a cleaner environment they yearned for open areas, like the countryside, that would provide them direct contact with nature. The new neighborhood consisted of large plots of land that each held a single family house and amenities such as stables, themed gardens, and picnic areas. “In the 1930's, renowned foreign architects who had been living in the country since the beginning of the 20th Century, designed neoclassic or historical mansions and palaces on large lots with gardens and trees” (Tasquer and Peralta, 130-131). It was the suburban development of that time. Streets were narrow and meant for carriages since, at the beginning of this period, automobiles were still not common in Quito and only a few members of the upper class owned them. But because of the foreseen popularity of cars, ordinances required large setbacks in order to widen

streets when necessary. By the 1960's the majority of the population owned cars.

The urban fabric was more open than downtown's grid, but pedestrian activity in this area was very low compared to the previous time period. The fact that La Mariscal was not within walking distance from downtown reduced pedestrian activity and therefore, opportunities for human interaction as well. By that time, Quito had considerably grown in size and population. By the 1950's Quito's population consisted of 220,000 inhabitants (Murray, Section 2). "In the 1960's the center of urban life passed from the Historic Center to La Mariscal" (Tasquer and Peralta, 132). After the 1960's La Mariscal stopped fulfilling people's needs for open-green spaces. Quito kept growing and this suburban development was quickly saturated, overbuilt, and green turned into gray.

The case study for this second layer is what used to be a single-family house and now is being converted into a luxurious thirty-room hotel, Café Cultura. It is located close to the southwest boundary of La Mariscal. This neighborhood's boundaries now consist of very busy thoroughfares that contribute to the pollution and deterioration of this once "Garden-City Among the Trees" (Tasquer and Peralta, 130).



FIGURE 2.5: CAFÉ CULTURA AERIAL

Aerial of the early to mid 20th Century expansion showing the location of Café Cultura

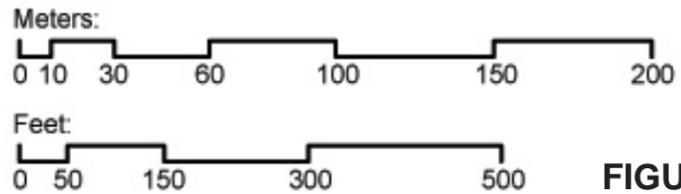
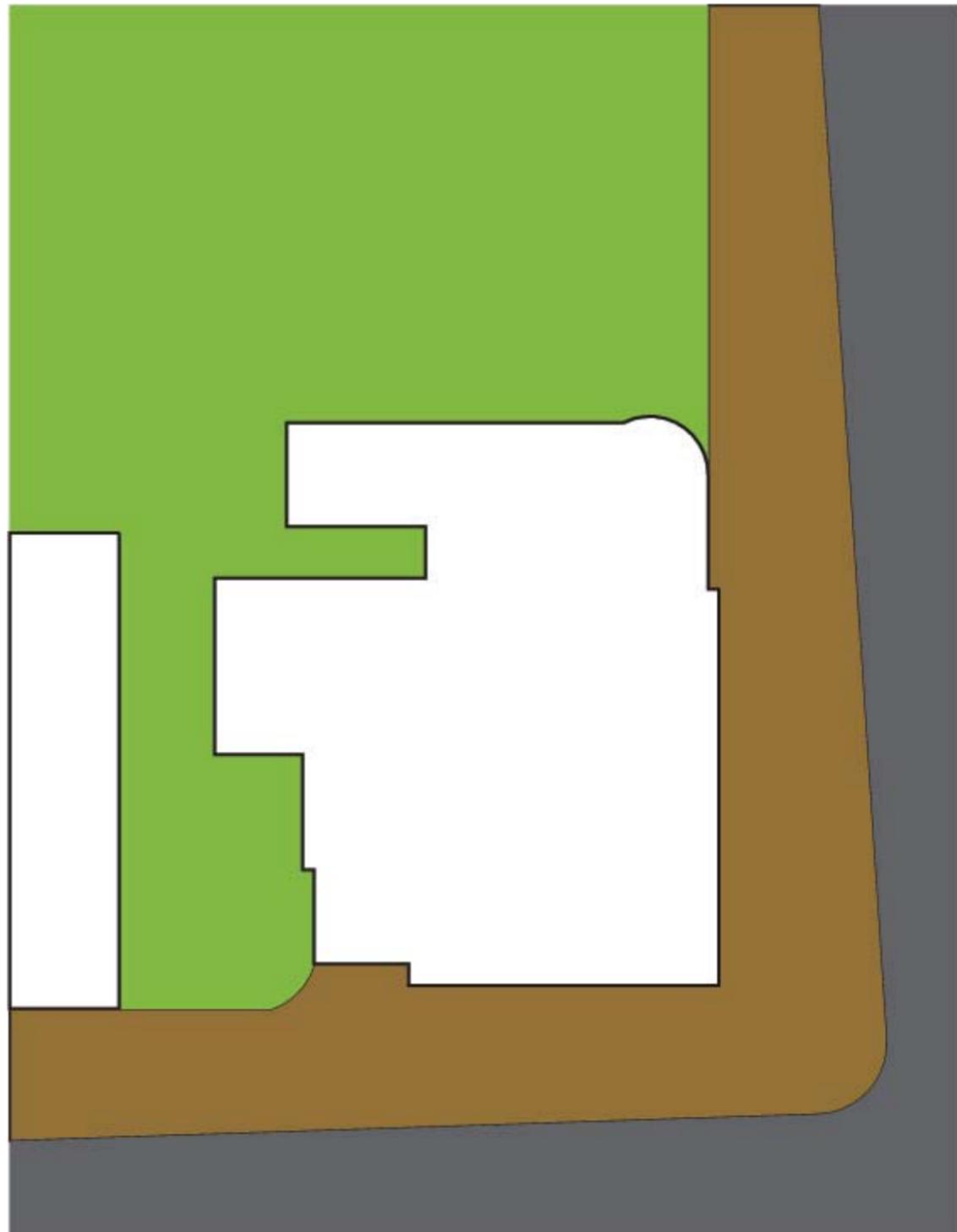


FIGURE 2.6: CAFÉ CULTURA CONTEXT DIAGRAM

- Cafe Cultura
- Plazas
- Streets
- Points of Interest
- Developed Green Areas
- Buildings
- Left Over Space

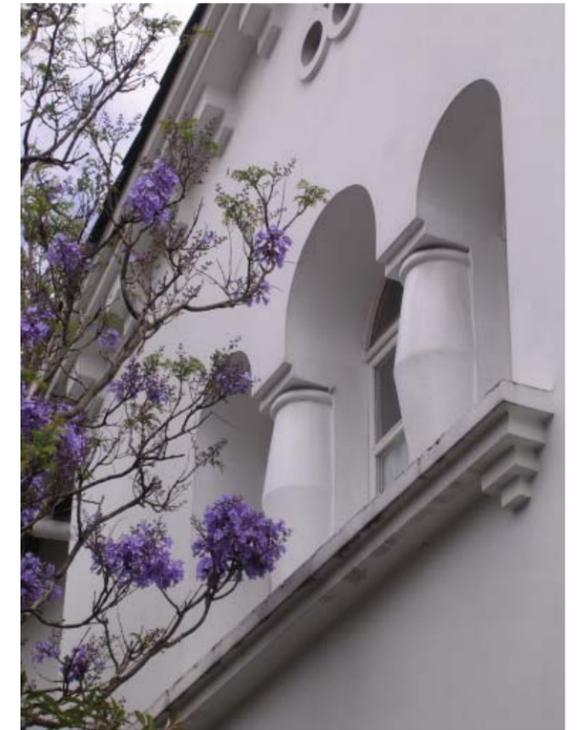


Meters:
0 1 3 6 10
Feet:
0 3 9 18 30

Developed Green Areas
 Sidewalks
 Streets
 Patios
 Indoor Space



Mid 20th Century Style -
Large houses built under european influence.



Café Cultura from the outside -
Despite its deteriorated condition
aesthetics are evident.



Inside Café Cultura -
Rooms with elaborate carved decoration.

FIGURE 2.7: CAFÉ CULTURA DIAGRAM AND IMAGES

Findings:

According to the architect designing Café Cultura, Mateo Madriñán, the original house used to occupy the entire block. The property was so ample that it accommodated a separate house for staff and stables. This house was built in the 1930's by a Mexican Architect, Durini, who was deeply influenced by the Italian Villas and the European styles popular in La Mariscal at that time. These foreign styles developed in Quito because of the immigration, due to World War I, that all South American countries received mostly in the first three decades of the 20th Century. Café Cultura has had two previous renovations and additions before this last one about to take place, the first in the 1960's and the second in the 1990's. These changes are easy to identify because of the use of different materials, such as concrete versus wood, and forms, straight versus curvilinear. Over time, the built structure has taken over most of the site and there is practically no greenspace left. The new project is turning these areas into concrete and building the site to its maximum capacity according to current zoning ordinances. La Mariscal, once characterized by ample green-open spaces and large houses surrounded by setbacks from property boundaries, is now overdeveloped. Setbacks have been taken by streets and buildings have been enlarged (Madriñán).

During the analysis of this case study, several positive aspects of the 1920's – 1960's development were identified which provide a good example regarding the environmental values that have been lost. In the 1930's when the original house was built, there was a concern for green areas and, unlike downtown's development, these areas had a more public character. Setbacks were private open spaces visible from the street and sidewalk; hence, visually public but not publicly accessible. La Mariscal's

development was very sustainable -impermeable surfaces basically were limited to the houses because streets and sidewalks were paved with large stones that allowed infiltration. Connections between the indoors and outdoors were very important and, as a result, wall openings became larger. Despite the lack of pedestrian movement, boundaries between properties were permeable and neighbors were able to know each other, interact, and create community. European influence provided a good aesthetically pleasing model; therefore, all the houses built in this time period were extremely beautiful. Owners resources facilitated the design of every detail to make sure everything matched the overall project.

3. Apartment building in “La González Suárez”: Casabella.

Background information:

The neighborhood in which González Suárez Avenue is located started as a suburban development similar to La Mariscal. During the development of Quito's urban plan, in 1967, this avenue was conceived as an upper class residential neighborhood that would allow a maximum of three-story construction. At that time, La González, as it is popularly known, was barely starting to develop and was mostly a dirt road with houses around it. In the 1970's this urban plan was deeply modified because of unclear reasons. Architect Sixto Durán Ballén during his period as Quito's mayor, from 1970 to 1978, changed the ordinances for this specific avenue allowing taller structures. Buildings up to eighteen stories were built and covered a bigger percentage of the land compared to the original houses. According to the former mayor's statements, the decision was made because the potential of the location of this prestigious avenue was being wasted. This avenue runs in north-south direction along a ridge and it has great

views to both sides, to the impressive Pichincha Volcano on the west and the Guápulo Ravine and the Tumbaco Valley to the east. There are some statements made by different interested parties that mention how profitable these plots became once the ordinances were changed. Upper class owners of these lands persistently asked Architect Durán Ballén to change the regulations and, suddenly, from a small piece of land great incomes could be made because of the vertical development (Hoy 1992).

As a consequence of the previous mentioned process, González Suárez Avenue started its vertical development in the late 1970's. The discovery of new materials provided the means to achieve altitude and higher density. Buildings rose on both sides of the street and kept getting taller as time progressed, beginning with six to eight stories and ending with as many as twenty stories. This is how an elite residential neighborhood was born. Design quality started to decrease and each building was viewed as an independent structure. They were separate entities designed with neither context consideration nor possible formal and functional relations with adjacent buildings.

This modern development started strong and with a big impulse, but ten years later problems started to arise. Quito's population, authorities, planners, and developers, during the 1980's, realized the intrinsic danger of this avenue's location. Despite the fact that geologists had been talking about a geologic fault lying beneath this avenue and warning about the danger of building tall structures in this neighborhood, development continued. Geologists saw the proximity to the deep Guápulo ravine as an aggravating factor instead of an aesthetic asset. Finally, the 1987 earthquake confirmed this geologic fault, but the buildings were already there. La González has always been and

still is a zone of high seismic danger (Hoy 1992).

Another permanent danger that this elite neighborhood faces is airplane crashes. Quito's airport is located in the northern part of the city and these avenues' buildings are in the way of the airplane's approach route. When the airport was built the land around it was countryside, but now that the city has grown and expanded, it is surrounded by mostly developed residential areas. There have been four airplane crashes involving buildings in La González in the last twenty years. The incidents occurred in July 1988 (11 casualties), December 1992 (10 casualties), another one in December 1992 (5 casualties), and the last one in March 2009 (7 casualties). There is a new airport being built in the countryside; but in the meantime, this remains an imminent menace to this neighborhood (La Prensa) (Informada).

This third layer's case study is a twenty-story apartment building designed in 1992, Casabella. It is located towards the center of González Suárez Avenue and belongs to this set of prestigious residential buildings. The design and development of this project took place after the major earthquake of 1987 and in the same year of the two airplane accidents. Finding funds for the building was not an easy task, but finally people were able to buy apartments before the structure was built and provide resources to complete it (Navarro and Banderas Vela).



FIGURE 2.8: CASABELLA AERIAL
Aerial of the vertical growth showing the location of Casabella

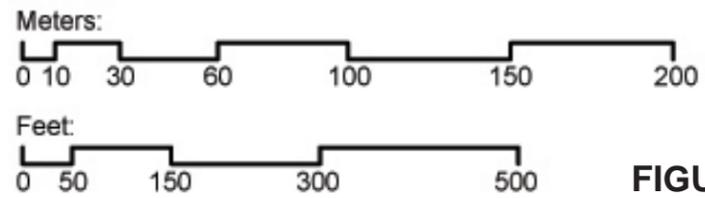
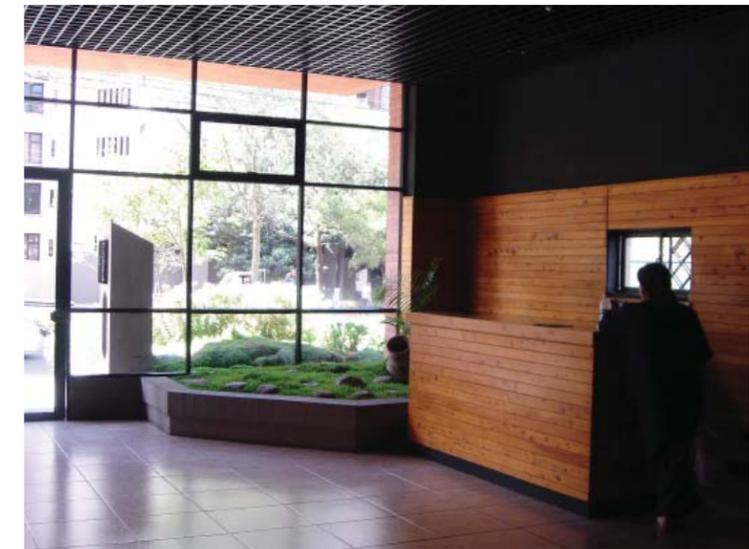
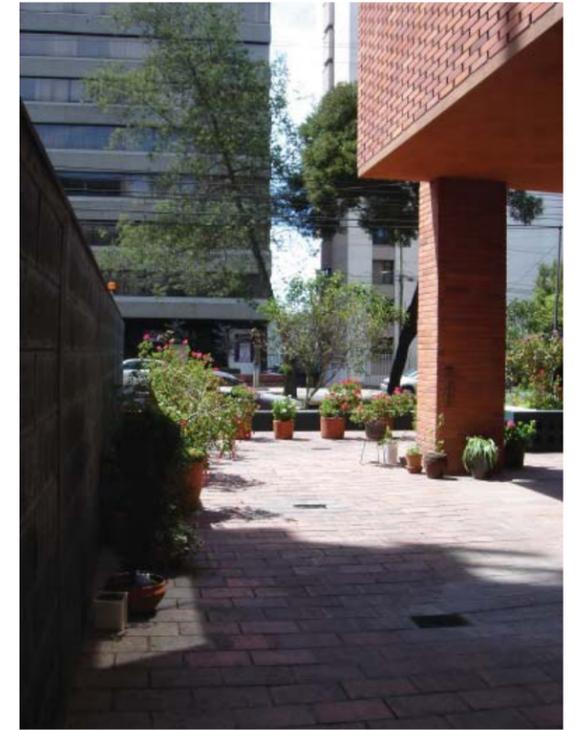
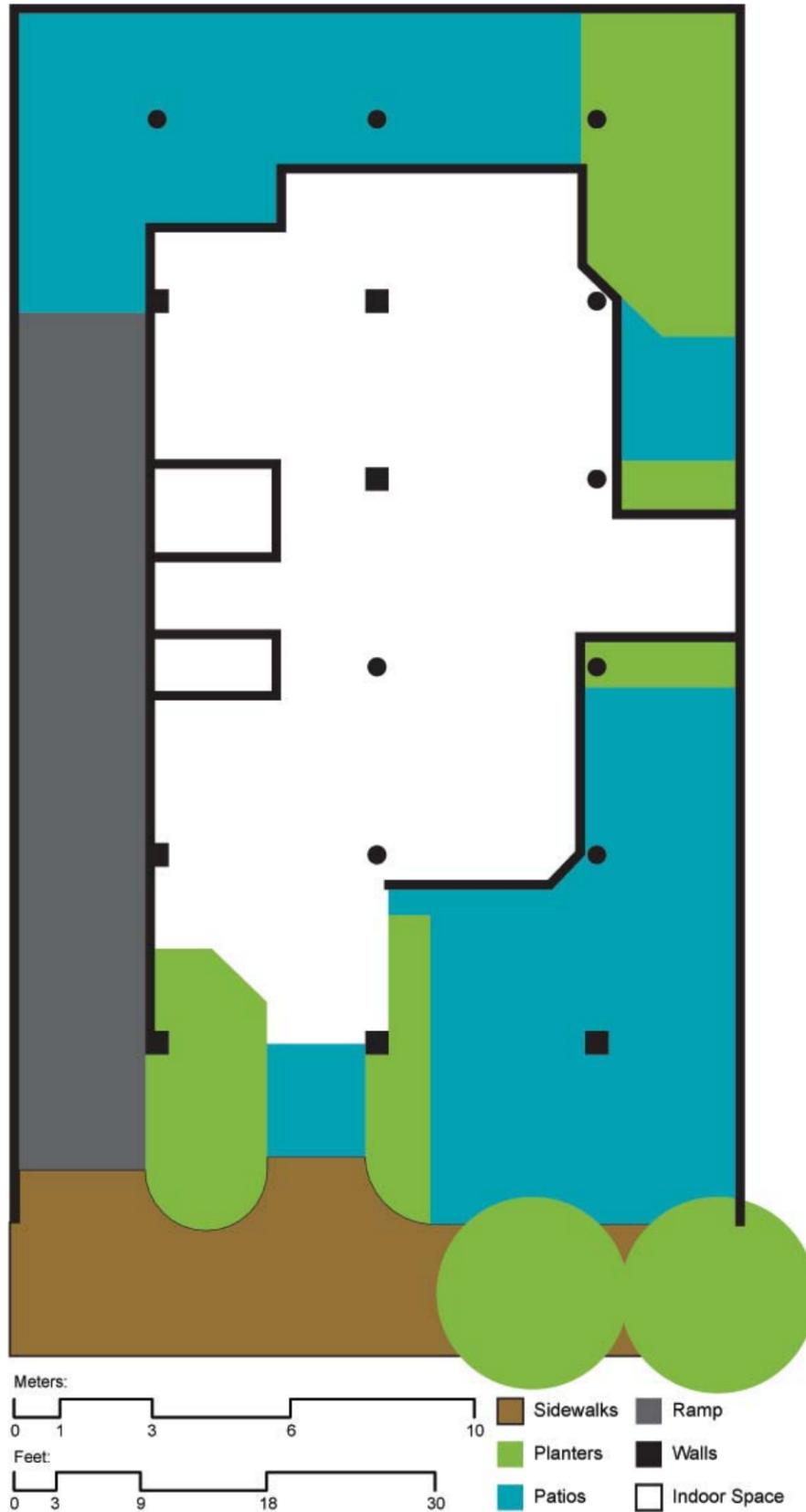


FIGURE 2.9: CASABELLA CONTEXT DIAGRAM





Casabella from the outside -
Aesthetics are innovative.
Interesting use of brick.
Ground level patios are left over spaces.

Inside Casabella -
Dark lobby that is not used.
Access ramp to underground parking.
Uncomfortable and cold indoor spaces.

FIGURE 2.10: CASABELLA DIAGRAM AND IMAGES

Findings:

Casabella is a brick building that illustrates how designers can refine design to achieve improved appearances. According to the architects who designed this project, it was hard to design something aesthetically pleasing and fulfill the profitable square footage and program requirements at the same time. There was no room for manipulation since space was very tight and the building was developed according to the plot's maximum built-up capacity. The design incorporated various amenities such as two levels of underground parking, sauna, lobby with a lounge, ball room, etc. Despite the fact that places for interaction between neighbors were provided, they are never used and residents of this building don't know each other. An interesting fact mentioned by the architects was that the lack of green spaces in this project is due to the client's demand. Apparently providing enough depth of soil for plantings above the parking deck would increase the costs of construction and the expense of maintenance post construction (Navarro and Banderas Vela).

The practice of avoiding green areas in order to reduce project cost has set the stage for other problems to develop. One of these issues is dark shady areas. These can be found throughout the ground level and they basically consist of paved patios that are never used, always dirty, and aesthetically unpleasing. Another issue is the indoor/outdoor relationship as well as the relationship between the project and its surroundings; these two are minimized to just visual interaction. Although, considering the traffic and pollution along this avenue, maintaining superficial interaction may be the healthiest approach.

Some of the positive characteristics identified in this case study are the values of

creativity and aesthetics. Despite the lack of community, this building has its own identity because of the dynamic architecture and interesting use of brick. On the other hand, the extraordinary views from the apartments within this building probably maintain the elite and prestigious status of the neighborhood. Views are mostly a consequence of location; but they can also be a consequence of good design. If the site does not have good views, they can be created.

4. Contemporary single family house in “Tumbaco”: La Viña.

Background information:

Tumbaco is a valley located approximately 15 kilometers (9.4 miles) to the northeast of Quito. Its southern boundary is the Ilaló Volcano which erupted for the last time in 1938 and has been inactive since then. The area comprised by Tumbaco, Cumbayá, and some other contemporary neighborhoods previously served as the setting for trade between the highlands and the rain forest. The original population of the valley consisted of indigenous people and it was approximately 500 years ago when they settled and started building their community church. This native community was devoted to agriculture and the production of charcoal. By the 1920's, most of the valley's forests were being burned and the charcoal produced was sold to the big cities. As time passed, Quito's development started invading the valley with mainly suburban subdivisions. That is how a community that originally was only worried about their plots and charcoal production have recently been protesting against the urban development of the lands located towards the base of Ilaló (Hoy 1997).

Today, Tumbaco and its surroundings are fully developed and contain a broad variety of structures such as schools, country clubs, universities, and residential

projects. Although it has become a small city, the lack of organization and planning of this growth led to problems with utilities and connectivity. The population residing in these neighborhoods has issues with the supply of water, electricity, and sewer system, and also with traffic and mobilization. Despite these important disadvantages, people keep moving into this area, complicating the situation even more. Therefore, ordinances and regulations are not respected and development is getting out of control. Finally, the geologic fault named “Guayllabamba” represents an imminent danger for all the people living in the valley (Rivadeneira).

Most people who live in this valley must commute to Quito to work. There are approximately 32,000 vehicles a day that perform this trip. Since circulation networks between the city and the valley have not been included in Quito's urban plans, they were built according to need. Nowadays, there is one highway in good condition and several other secondary roads that have been modified to serve as connectors. Projects to mediate this problem have been developed, but implementing them requires resources. The altitude difference between Quito and the valley is 400 meters (1,312 feet) and the existing infrastructure leaves no room for winding roads (JLV).

The latest partial plan of territorial regulations for the Tumbaco valley addresses some of the previously mentioned issues but is still pending approval. It analyzes and proposes solutions for the 9,205.3 hectares (35.54 square miles) that constitute the entire valley, of which only 79% is considered as Tumbaco. Population data is also provided and the exponential growth of this area is evident.

TABLE 2.2: PROJECTED POPULATION OF TUMBACO

1990 CENSUS	21,898 inhabitants
2001 CENSUS	38,498 inhabitants
DEMOGRAPHIC RATE OF GROWTH	5.30%
EXPECTED IN 2005	44,634 inhabitants
RATE OF GROWTH	3.80%
EXPECTED IN 2010	52,390 inhabitants
RATE OF GROWTH	3.30%
EXPECTED IN 2015	60,246 inhabitants
RATE OF GROWTH	2.80%
EXPECTED IN 2020	68,210 inhabitants
RATE OF GROWTH	2.50%
EXPECTED IN 2025	76,289 inhabitants

(Marquez)

Luckily the concern of this plan is the quality of life of the population in this district. In fact, the primary goals are the well-being, fulfillment of aspirations, and harmonious coexistence of the population. Marquez, the author of this plan, and his team are aware of the effect infrastructural development has had on the quality of life and how the potential of the land is being wasted. Issues like insufficient and deficient public spaces for the development of community activities, connectivity, and mobility are being addressed (Marquez, 3).

Tumbaco is part of the fourth layer in the history of Quito's urban development. Since this valley is the current suburban and latest development, it displays contemporary styles and trends. This growth, like La Mariscal's, is characterized by ample green open spaces that can be perceived by the general public because of the permeability of property boundaries; but are private in nature. The typology is the same

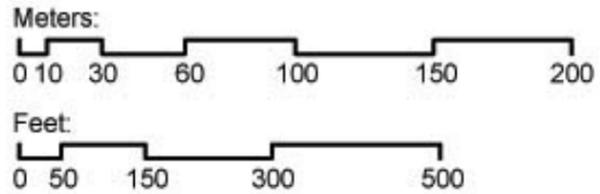
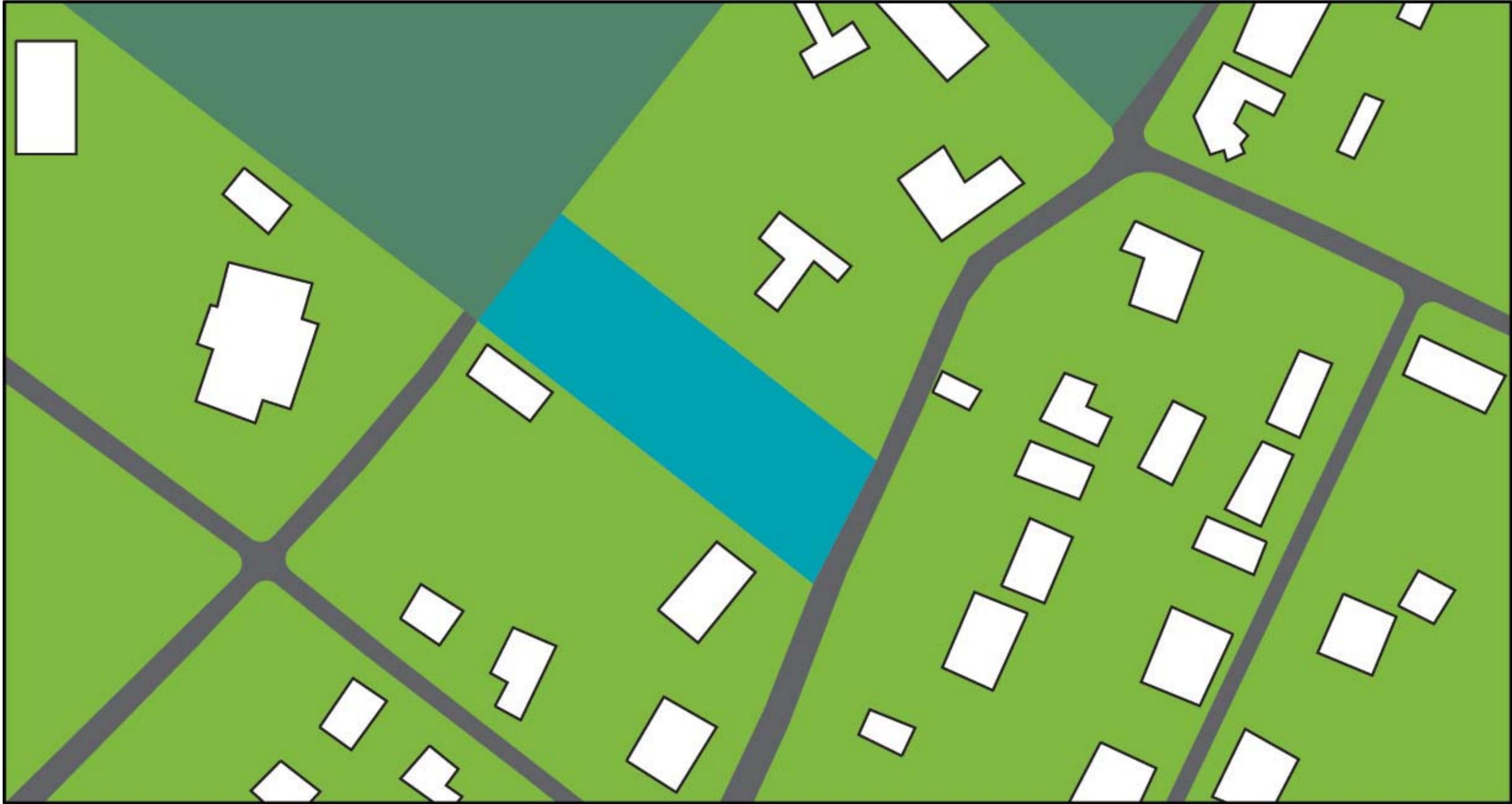
as the 1920's to 1960's development -big sites with a lot of green space surrounding the built portion of the project. The land surrounding Quito's metropolitan area is being built because people, again, seek to escape the city, enjoy clean and healthy environments, and want direct contact with nature. The architectural style throughout this development is very eclectic. Every design has a different approach to the surrounding conditions and a different solution depending on the perspective of the architect, designer, developer, investor, or builder.

The case study analyzed for this layer is a single-family house, La Viña, located in a suburban subdivision in which ordinances have been followed and respected. It is surrounded by large green areas that have been developed, such as yards; and also undeveloped green areas that are going to be preserved in the future. La Viña is located at approximately 14 kilometers (8.75 miles) from Quito, which due to traffic variations could either be a 15 minute drive or a 45 minute drive (Moreano).



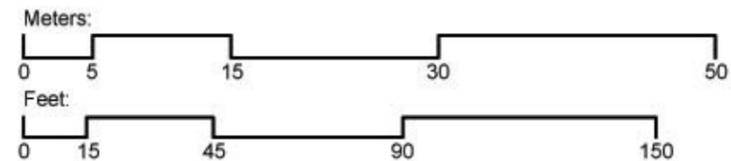
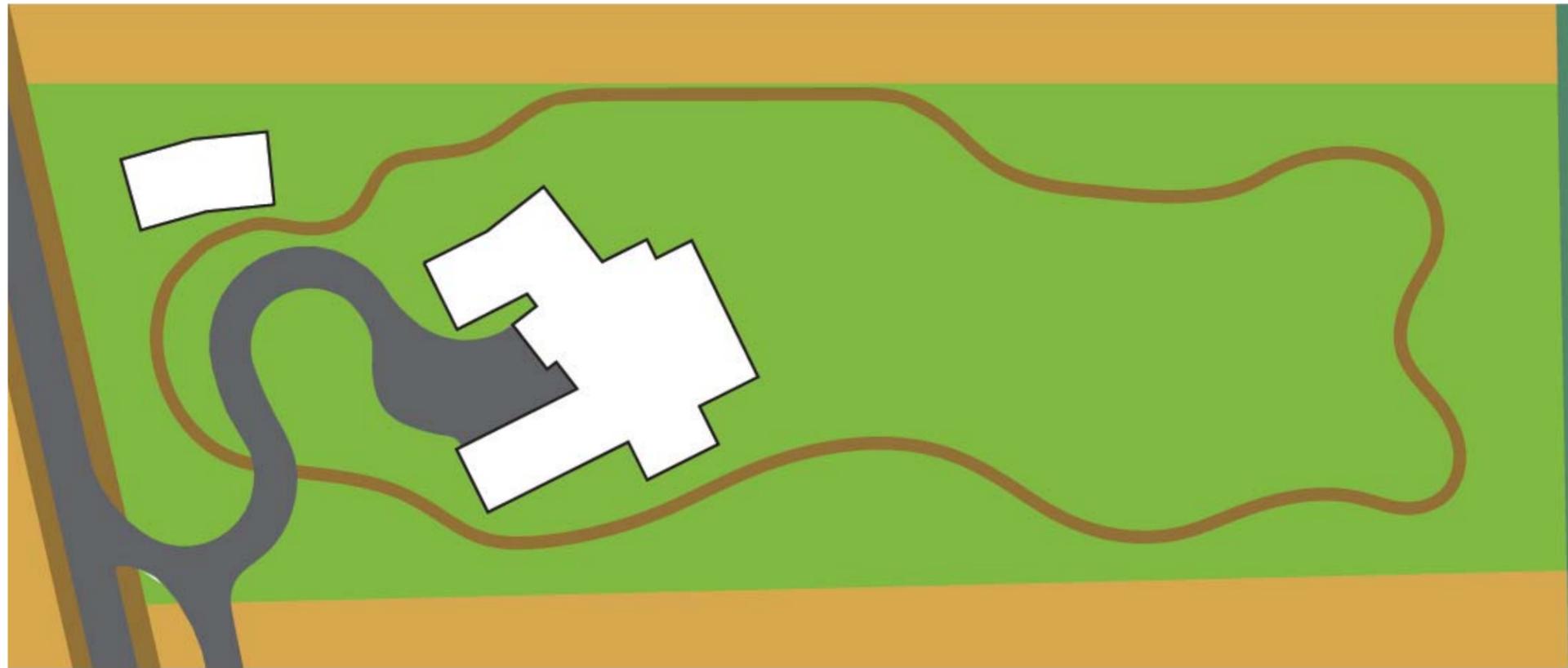
FIGURE 2.11: LA VIÑA AERIAL

Aerial of the current suburban development showing the location of La Viña



- La Viña
- Developed Green Areas
- Undeveloped Land
- Streets
- Buildings

FIGURE 2.12: LA VIÑA CONTEXT DIAGRAM



- Developed Green Areas
- Preserved Green Areas
- Indoor Space
- Sidewalks
- Streets
- Neighbors



La Viña from the outside -
 Aesthetically clean and simple.
 Buried in the topography, retaining wall.
 Flat part of the site left for recreation.
 Close and private to the street.
 Large windows and openings to backyard and view.

FIGURE 2.13: LA VIÑA DIAGRAM AND IMAGES

Findings:

Gonzalo Diez, the architect who designed La Viña, commented on how the site's topography, vistas, natural light, and orientation were all considered during the design process. Because of the privileged location of this house, the indoor/outdoor relation was also emphasized as a major concern for the architect. Physical interaction with the immediate landscape and visual interaction with the distant landscape were addressed in this project (Diez).

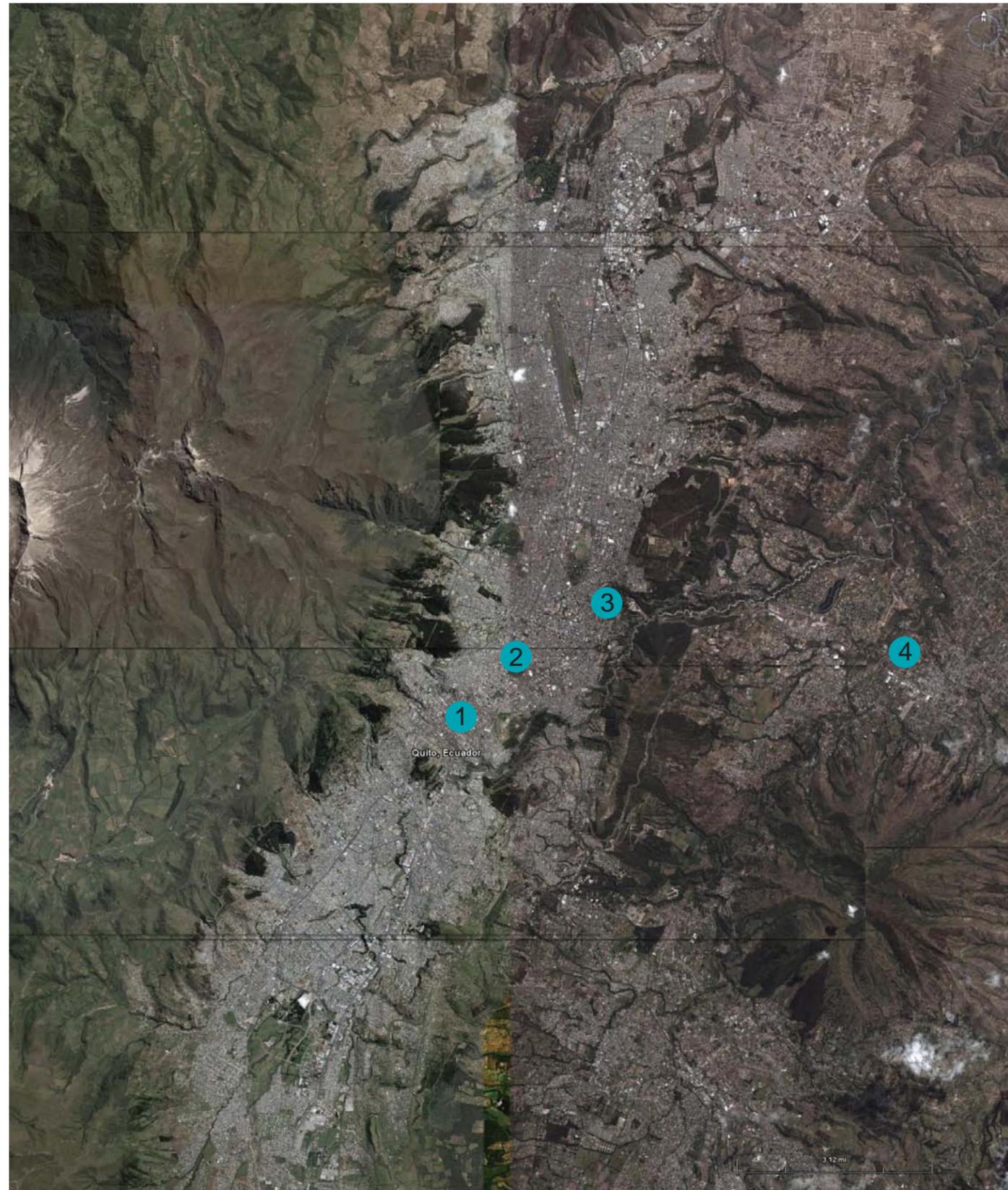
The site was divided in two parts, the steep and the flat part. Most architects would have taken advantage of the flat part and would have located the house there, but Diez decided that the flat part was going to be left for recreation and the steep part was where the house was going to be placed. This decision provided interesting situations that led to a peculiar design. Several issues were easily solved because of placing the house on the slope. One of these issues is privacy; because the boundaries of this property are permeable, the house could have been easily seen by people passing by; but the fact that it is actually buried in the topography, acting as a retaining wall, helped hide it and gave it a sense of privacy. The relationship between the built structure and the landscape was also emphasized with this gesture. Topography was, in this case, barely modified despite the fact that the house is embedded in the land. Overall, Gonzalo was looking for a clean look, a very modern aesthetic that would not get in the way of functionality and comfort (Diez).

Living in this kind of setting seems convenient; but in fact, there are several downsides to it. The large distances between neighbors and the lack of connectivity with the rest of the city provide no opportunity for interaction and no sense of community.

This suburban development pattern can be also qualified as socially unjust. In this case, only the upper class, which has enough resources to buy large expanses of expensive land, has access to healthy green recreational spaces. Further, these people drive long distances everyday, contributing to traffic and pollution in other areas of the city.

According to María Moreano, owner of La Viña, the situation is changing in this area of the city. Regulations and ordinances are being modified to allow more density. For example, the minimum plot area for the new subdivisions is smaller than what it used to be and, in this particular subdivision, it went from 1,000 to 600 square meters (from 3,280.84 to 1,968.50 square feet) and will keep getting smaller (Moreano).

There are several positive aspects of this case study that should be highlighted. The architect's effort to respect the landscape and being innovative without sacrificing comfort is a credible approach. Innovation could be achieved with blunt statements or by introducing the unknown in a subtle manner. Additionally, the aesthetics of the project can be categorized as clean and straightforward which, according to current taste, make it pleasing. The sense of privacy that is perceived by the owners of the house, despite the permeable boundaries and open character of the project, is another positive aspect. Finally, the presence of green areas and the lack of pollution contribute to the healthy environment.



- Historic Case Studies:
1. Mejía House - Colonial Downtown
 2. Café Cultura - Early to Mid 20th Century Expansion
 3. Casabella - Late 20th Century Vertical Growth
 4. La Viña - Current Suburban Development

FIGURE 2.14: LOCATION OF HISTORIC CASE STUDIES WITHIN QUITO

Summary

This evaluation and analysis, of the different layers of the Bow Tie, is meant to search for historic patterns in order to apply the positive precedents in current development. The landscape and community approach of the selected projects is considered typical of their specific time periods. The incorporation of the landscape into the design was evaluated, but there are some other important aspects that were also considered such as architecture, sense of community, quality environment, connectivity, distances, means of transportation, sense of identity, and overall fulfillment of human needs supplied by the development. All these conditions have a deep impact on how comfortable and happy people lived in each different age and case study. Although most of these projects have evolved and changed since their creation, the analysis focuses on the original conditions in which they were conceived. It is clear that, currently, most of them have deficiencies due to further development and unforeseen growth; but these concerns are not part of the scope of this thesis.

After finalizing the analysis of the design examples for the different layers of Quito's development, it can be said that this city has gone through several stages in which priorities were the same, but each time period emphasized a different one:

- In the colonial downtown, social relationships were extremely important. There was a strong established community that would work to remain that way. People were interested in interacting with each other and the built environment helped this purpose. Pollution and the environment did not represent a concern during this time period because automobiles and other polluting agents were not

present. The city was really small and the countryside was really close. It was a healthy and sustainable era. People were able to walk everywhere, from their house to their working place, to the commercial area, recreational area, etc. Aesthetically, the Spanish Patio House Typology provided clear guiding principles for design and construction and, due to good implementation of these principles, Quito's downtown is in the World's Heritage List.

- In the early to mid 20th Century development the main concerns were environmental. This “suburban” development began because of the saturation of the colonial downtown. Downtown looked and felt like big cities during the industrial revolution. Unhealthy and unsanitary conditions expelled the upper class to the new “Garden-City Among Trees” development. This development was very sustainable as it used natural and local materials, and employed local labor. Automobiles were present in Quito at this point, but they did not represent a concern and neither did pollution. Social conditions were not a high priority in this layer. In fact, social interaction decreased during this time period due to the increase in traveling distances and the use of different means of transportation. Opportunities for people to interact did not happen spontaneously and naturally, but had to be planned. The creation of community was probably not addressed at this time because it had never been a concern before, strong identity and community had always been present since the foundation of Quito. Aesthetically, this garden city was characterized by its large houses inspired by Italian Villas, a typology internationally recognized as beautiful.

- In the vertical growth, economic factors guided the development. Developers realized how much profit could be earned from a piece of land and they started building with only this goal in mind. The environment was not considered anymore and there were hardly any open spaces left. The only areas that were not built were setbacks and leftover spaces. Due to this approach to design, buildings stopped talking and interacting with each other and became blocks of concrete hosting the maximum marketable square footage possible. The social aspect was considerably affected by this vertical development. Interaction between people went from high (colonial downtown) , to medium (garden city), to null. This situation could have also been a product of the new increase in traveling distances and the use of cars. People's life became dominated by driving, working, and waiting to get home for privacy, rest, and to recover energy to do the same thing the next day.
- In the current suburban development there is a mix of priorities. This development is equally concerned with most of the previously mentioned aspects; the only one that is left behind is the social aspect. The new suburban neighborhoods are far away from the city and the only means of transportation available is private cars. Like in the two previous time periods, there is an increase in traveling distances because residences are farther away from the city's core where all the activities take place. Despite the few green public spaces provided, recreational areas are comprised of private yards where there is no opportunity for interaction and to meet neighbors and new people. Environmental

concerns are present and people seek to be more in touch with nature and take care of it. Despite the lack of expertise and experience, latest theories on ecological restoration, sustainability, and environmentalism are being applied. Aesthetically, the suburban areas present a strongly contemporary appearance and these houses are seen by architects as an opportunity to be innovative and creative. Suburban development is also economically efficient. Each plot is very expensive and that is why this expansion of the city has been mentioned to be socially unjust.

Quito's urban development has had an evolution of concerns and it is evident how the main priorities of the first and second layers were completely lost during the construction of the third one. The vertical development represents a break or jump in the continuity of this city's development due to the priority given to the economic factor. Now that the importance of the original concerns has been identified, people with resources are working to redirect current development towards a more environmental, aesthetic, and economic oriented approach, as before. Unfortunately, provided solutions are not available for the entire population. While people with economic resources have access to healthier, greener, more beautiful spaces, people belonging to the low income class still have to live in a polluted, unhealthy, and saturated environment.

In Quito, current development does not proportionally address environmental, social, aesthetic, and economic issues at the same time. Suburban development lacks the social aspects and, considering how distant it is from the city, is not sustainable. Development within the city, basically high density residential projects, takes care of community and social concerns while ignoring aesthetics and environmental concerns.

The combination of both types of development can provide a direction for future growth which could efficiently approach problems present in Quito, such as lack of space and infrastructure demand. This combination of theories can also provide the opportunity for values present in old urban patterns to be regained.

CHAPTER 3

VALUES IN QUALITY OF LIFE

Quito's urban development has been very impulsive and unplanned as a quick response to the rapidly growing population. The natural setting of Quito is comprised of high mountains, active volcanoes, agricultural valleys, natural springs, and rivers and cascades. These beautiful natural features that surround this densely populated city, however, cannot be appreciated or even felt when immersed in the heart of Quito. When looking at the city's urban fabric up close, it is easy to notice the scarcity of natural living elements and open spaces. It seems like all nature has been expelled from the city and what is left is just surrounding it but not necessarily interacting or being part of it.



FIGURE 3.1: QUITO AND ITS SURROUNDINGS

Left: Quito and its surrounding natural features (Photo by: Juan Sebastián Jácome)

Right: Colonial downtown grid lacking green elements (Molina, Ortega, and Zhagüi)

The lack of green areas within Quito is directly related to several values that influence life in it and the quality of life itself. These values, that have lost proportion and balance in the developmental process of Quito, can be divided into four different categories: environmental, aesthetic, social, and economic. There are different studies about the benefits that open-recreational spaces provide to citizens of consolidated urban cores and, also, the negative consequences of the under-supply of these spaces. This city's population has lost access to green spaces and providing an adequate amount of recreational areas currently represents a big challenge. Despite the complexity of the situation, values need to regain balance through greening the city in order to begin a healthy and sustainable development that can continue with future generations.

1. Environmental values

Recent urban development, as in most cities, has been focused on automobiles and vehicular transportation, marginalizing pedestrian needs. "In this modern city (Quito), the pedestrian is losing the urban space that he owned for centuries. Ironically, the automobile expresses a more dynamic but also a less human era" (Tasquer and Peralta, 25). This type of development contributes to several kinds of pollution such as: water pollution, air pollution, and noise pollution. As Quito is nested in a valley, it is difficult for pollution to scatter or find a way out.

Extensive impermeable surfaces have been built without considering their environmental impact. These impermeable surfaces produce large amounts of runoff that are directed straight to the sewers. Infiltration basins, bio-retention areas, rain-gardens, and other methods of runoff treatment are not implemented along these major

transportation projects. The lack of these sustainable environmental practices is due to financial reasons and/or ignorance of the subject. In Quito, littering is a prominent problem that, despite currently being addressed by authorities, is not improving. With excessive runoff and litter the sewers end up getting clogged, consequently contaminating the water.

Vehicles contribute to air pollution within the city and surrounding valleys. Quito's Mayor, Augusto Barrera Guarderas, has mentioned and published data that proves that automobiles are the primary contributors to air pollution. Finally, noise is an influential factor when it comes to quality of life. Living right next to a highly trafficked street or major thoroughfare can not only be overwhelming, but also damaging to people's health and well-being. Therefore, as a consequence of this car-driven development, sustainability and health have declined. In Quito, fundamental physical conditions and several other aspects that an environment needs in order to be suitable for the development of a good quality of life within it have been taken away.



FIGURE 3.2: ENVIRONMENTAL VALUES

Left: Quito, litter on the streets after a political event (Hinojosa Ayala)

Right: Quito, extensive impermeable surfaces with no close green areas (Coandes)

2. Aesthetic values

Quito is a city that lacks sense of place and identity. It is difficult to find common aspects or aesthetic trends between new structures and existing ones; and also within the new built environment itself. The factors that currently influence development and construction in this city are removed from moral and ethical concerns. Because developers are mostly concerned about rentability and economic aspects, Quito's appearance has been affected in a negative way. Projects that maximize marketable-profitable space are predominant in current development within the city. Huge volumes of concrete are being placed throughout Quito without acknowledging surroundings and place. Structures are designed and built in order to fit anywhere with no consideration to neighboring environment and site specific conditions. New infrastructure lacking character or identity can be found everywhere now. This approach produces aesthetically unpleasing infrastructure, and when these projects are placed one next to the other a visually polluted image is created.

Quito's visual images are polluted not only by constructions but also by advertising, billboards, and signage. Ecuadorian newspaper, "Diario Hoy", published an article explaining how street ads have gotten out of control. By September of 2005, the billboards in the northern area of the city were divided as follows: 170 were legally authorized, 90 were completely illegal, and 70 were pending the payment for authorization. After these findings, authorities realized that ordinances were not respected and that advertising boards exceeded it's maximum by thirty percent. The main problem here is that exaggerated amounts of display affect quality of life and citizenry safety because attention is distracted from the actually important boards such

as transit signage and traffic announcements. In the article is also expressed how, without the government's intervention, this problem is not going to be solved (Hoy, 2005).



FIGURE 3.3: AESTHETIC VALUES

Left: Townhouse complex with no identity (www.olx.com.ec)

Right: Visual contamination and pollution in Quito (Hoy, 2005)

3. Social values

Social values, as a result of the unhealthy situation described under environmental values, the aesthetic problems that the new infrastructure creates, and the lack of green areas have been almost completely lost.

Quiteños, when perceiving their city as dirty and ugly, do not feel proud of it and do not take care of it. Acts of vandalism and crime have increased in the city which have worsened the situation and set the stage for increasing delinquency. Electronic articles and newspaper articles from 2008 and 2009 have already mentioned a concern for crime's rapid growth. Stolen automobiles, damage to private and public properties, murders, etc. are becoming more common and an everyday event in Quito (González)

(Universo). These antisocial acts and behavior have weakened the social relationships and the sense of community in Quito.

Another factor that negatively affects human relationships is the latest development pattern, urban sprawl. Through people segregation and the promotion of a lonely way of life, it contributes to the decrease of human interaction. "From a social point of view, there are various cities within the city of Quito. Old and modern neighborhoods preserve solid relationships between neighbors and even old social and cultural customs; while in other urbanizations or in apartment buildings, daily relationships and neighborly practices are ignored" (Tasquer and Peralta, 27). The inefficiency of public transportation obligates people to mostly use personal vehicles as their mean of transportation, which collaborates with pollution and works against the creation of community.

The lack of public open spaces for recreation and interaction, and the absence of inspiring aesthetics are weakening the essence of ecuadorian culture and traditions. Quito's society is developing an isolated way of life. People go from hurried mornings to avoid traffic, to polluted work environments, to the afternoon rush hour, and when they finally get home, there is no close outdoor space to relax and enjoy the company from family and friends. This reality makes people resort to other types of entertainment. As a consequence, Quito's culture is now mostly influenced by external international factors, such as TV programs and online entertainment, instead of being strengthened by internal interchange. Family bonds are not as strong as they used to be and customs and traditions are getting lost. The sense of identity and community of the Quiteños has been impoverished throughout the urban developmental process and, with the purpose

of improving quality of life in Quito, they need to be reestablished.



FIGURE 3.4: SOCIAL VALUES

Left: Vandalism and damage to public property (Photo by: Francisco Alvarado Plaza)

Right: Example of aesthetically unpleasant townhouses in Quito (www.olx.com.ec)

4. Economic values

These values are actually being considered in current urban development and, perhaps, they are given too much importance. Presently, it can be said that, development is mostly profit-oriented and economic values outweigh all the values previously mentioned. Investors and fund-providers are interested in profit, numbers, and return incomes; designers and developers are concerned about getting enough funds to bring their projects to reality; and health, sustainability, identity, community, and quality of life are all relegated to a marginal position.

Although economic issues are a primary concern, they should not relegate all other important issues to the background. By focusing on the economic aspect when designing projects, development is taking a wrong approach towards the financial

viability of a city. "The main findings indicate that quality of life is important to local economic development provided that the basic traditional factors such as land, quality workforce, infrastructure and accessible locations are already in place" (Seik). Therefore, projects should definitely consider economic aspects but they should not negatively influence the quality of life. This approach may, in the end, have a counterproductive consequence.



FIGURE 3.5: ECONOMIC VALUES

Left: Two-story house left surrounded by buildings because of change in zoning ordinances (inmobiliaria.com)

Right: Adjacent buildings built to their maximum capacity (Inmobiliaria)

Traffic and transportation issues

Traffic and transportation are important issues that have been partially mentioned above, but need to be analyzed more in depth since they affect all four values that influence quality of life in a city. Environmentally, the excessive use of automobiles

contributes to air, water, and noise pollution. Aesthetically, smog produced by vehicles deteriorates the built structure and traffic reinforces visually polluted images. Socially, the use of personal transportation inhibits human interaction which strengthens community relationships. Finally, economically, it is a waste of natural resources, money, and people's energy and productive time. Therefore, by addressing traffic and transportation conditions in Quito, quality of life is approached from all possible angles.

The abrupt expansion of the city produced a new type of interaction between the center of the city and the surrounding new development. "The multifunctional role of the inner city inevitably produces an intense concentration of traffic, transport and car parking, reinforced by the fact that Quito is a mono-centric and linear city. (...) Environmental pollution is one product of the excessive traffic flow" (Zaaijer, 88).

According to Mayor Barrera Guarderas, from the mobility perspective, Quito's urban development has caused: an increase in the use of personal vehicles with more people commuting long distances; concentration of services, therefore everybody needs to go to the same area; and a lack of mobility choices and networks. Currently, public transportation does not supply the demanded quantity and quality; thus is deficient. Consequently, the number of particular vehicles has significantly increased which affects social, environmental, aesthetic, and economic values altogether (Barrera Guarderas).



FIGURE 3.6: TRAFFIC AND TRANSPORTATION ISSUES

Left: One of Quito's thoroughfares during rush hour (Marketsupport)

Right: Traffic and transportation situation in Quito (Marketsupport)

Transportation is an aspect that large cities can alleviate by increasing their density. The goal is to shorten the distances between residential, business, and recreational districts, in order to make alternate modes of transportation feasible. Alternatives may include biking and walking. In Quito's particular case, high-density residential projects, that are conceived with a holistic approach considering all four values with the right balance, would significantly contribute to ameliorate traffic. Additionally to contributing to this matter, they would also provide a healthier and more sustainable environment with enhanced quality of life.

Presently, Quito is facing a troubled reality that has set the stage to bring values from older patterns back into future development with an appropriate balance. This will make subsequent growth more sustainable in every way. The issues that Quito is facing are present not only in Latin American cities or developing countries' cities, they are a worldwide common denominator in large metropolises. "Urban quality of life research

projects are now being actively pursued by researchers from all corners of the world. (...) they reflect the response of urban professionals and institutions towards meeting the growing aspirations of urban residents to achieve a better quality of life" (Seik). Therefore, the increasing concern for quality of life should also be addressed in Quito.

Since Quito has special affinity and similarity to other Latin American cities because of common characteristics such as: overpopulation, lack of resources, pollution, social issues, etc; this research and its final product can be helpful and serve educational purposes. They can be seen as an example or case study and be used for the formation of future professionals and future development.

It is important to understand that cities are created and they grow, develop, and evolve in order to fulfill the needs of the growing population. Human kind alters nature with structures and infrastructure in order to provide comfort, security, and safety for itself. So all the issues mentioned before are not going to completely disappear, but they can be mediated through different techniques and approaches.

CHAPTER 4
EVALUATION AND ANALYSIS OF CONTEMPORARY TYPOLOGIES
AND FUTURE CONDITIONS

Problems with current development

Most cities in developing countries, including Latin America, have grown in a similar way: an unplanned and disorganized manner. According to Quito's current mayor, Augusto Barrera Guarderas, this city's territorial organization has been guided by horizontal expansion due to low density development. The urban sprawl is oriented mostly north-south and, just in the past couple of years, it has also taken over large valleys located to the east. Due to lack of planning and spontaneous settlements, utility distribution is very inequitable throughout the city. Several neighborhoods are missing some primary services that should be easily accessed by and provided to the city's entire population (Barrera Guarderas).

The "Plan General de Desarrollo Territorial 2000 – 2020 Distrito Metropolitano de Quito (PGDT)" (General Plan for Quito's Territorial Development 2000 - 2020) states that Quito's population density has increased from 61 inhabitants / hectare in 1990 to 91 inhabitants / hectare in 2005 (MDMQ and DMPT, 22). The density expected by 2020 is 101 inhabitants / hectare (MDMQ and DMPT, 87). Mayor Barrera in his recently released mobility plan for Quito, made public on January 11th of this year, explains how Quito's population has grown and is expected to grow until 2025.

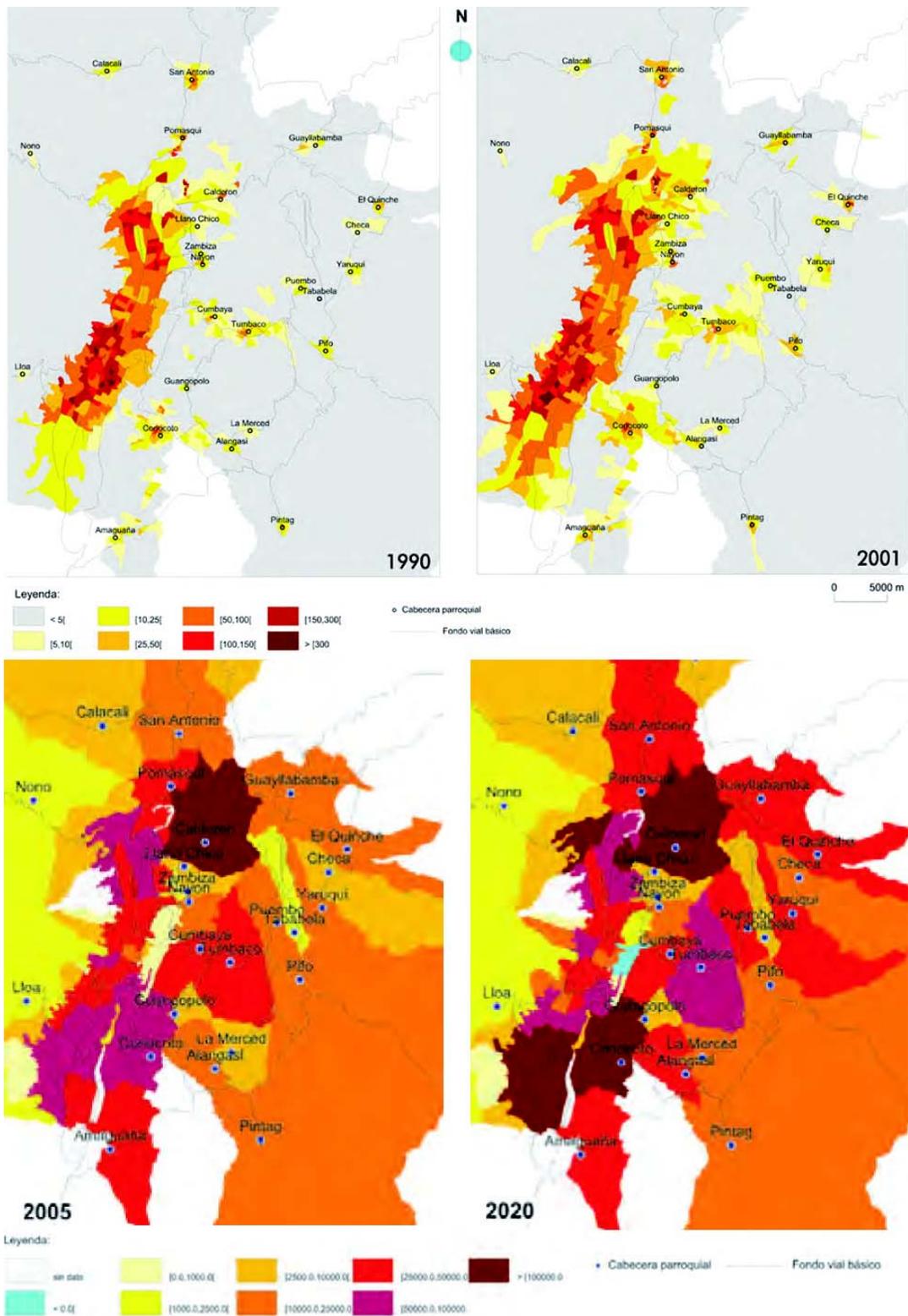


FIGURE 4.1: POPULATION DENSITY OF QUITO

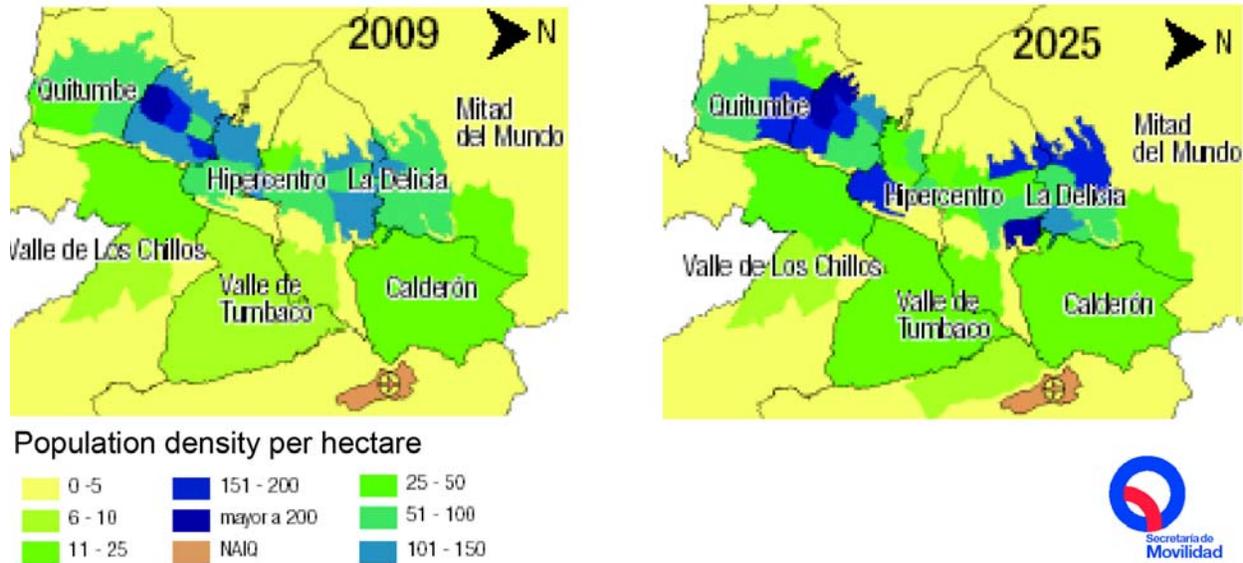


FIGURE 4.2: PROJECTED DENSIFICATION OF QUITO

(Barrera Guarderas; MDMQ and DMPT, 19)

TABLE 4.1: PROJECTED DENSIFICATION OF QUITO BY 2025

POPULATION	2009	2025
TOTAL	2, 156,336	2, 736,638
CITY	1, 546,762	1, 469,436
SUBURBAN	609, 574	1, 267,202

(Barrera Guarderas; MDMQ and DMPT 91)

According to his data, Quito's population will continue to grow at a rapid rate, but the suburban area will become denser while the population that lives within the city will actually decrease. This phenomenon represents serious problems not only in terms of connectivity, transportation, and mobility, which are already being addressed by this plan; but also in environmental and social terms. Quito's mono-centric growth is not conducive to long traveling distances. Services and infrastructure are mostly concentrated in the center and hyper-center of the city, although, a big percentage of

the population needs to have access to these areas almost daily. In the PGDT several strategies have been set out to achieve this much needed change from mono-centric structure to a multi-centric one. According to Urban Planner José Atiaga, Quito's excessive expansion is expensive, represents a threat against hillside stabilization, increases impermeable surfaces and drainage areas, and also increases vehicular pollution (Atiaga, 5). Several other negative consequences will result from expansion, such as the building rural agricultural land and decreased sense of community, due to reduced human interaction.

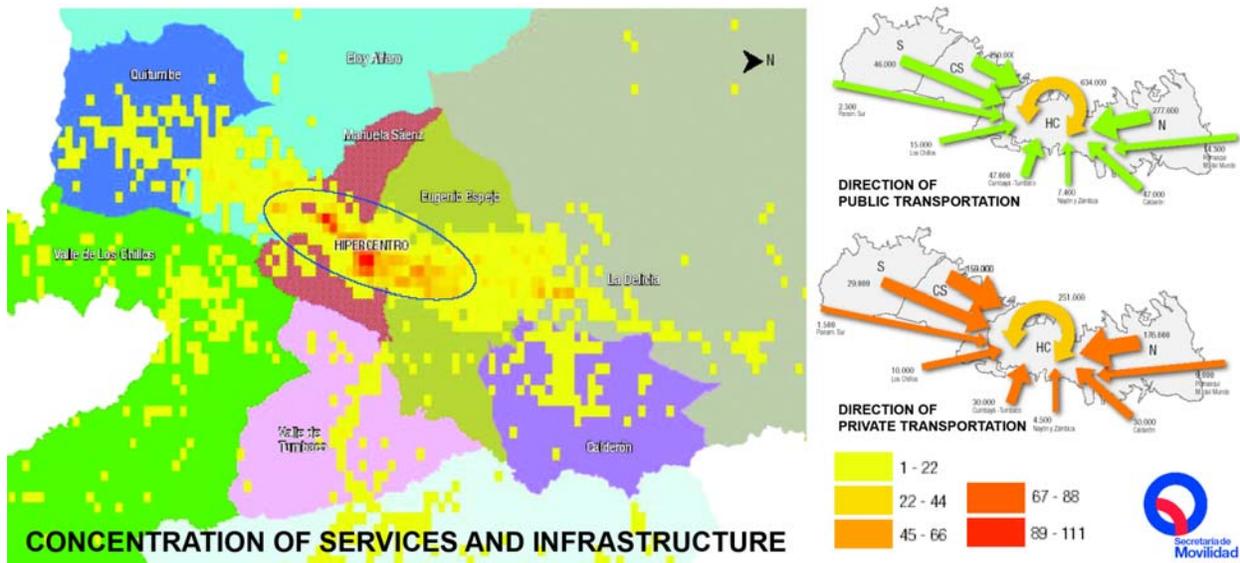


FIGURE 4.3: CONCENTRATION OF SERVICES AND INFRASTRUCTURE

(Barrera Guarderas)

On top of the population's growth and the horizontal expansion of the city, Quito is reaching the spatial limits of its geographic location. There are two prominent mountain chains located to the east and west side of this capital city that act as boundaries, and different ravines and rivers that contain it to the north and south. The totality of this land is already developed, some of it built to its maximum capacity in Quito's center and

hyper-center, and the rest is part of the suburban development which will be denser in the near future.

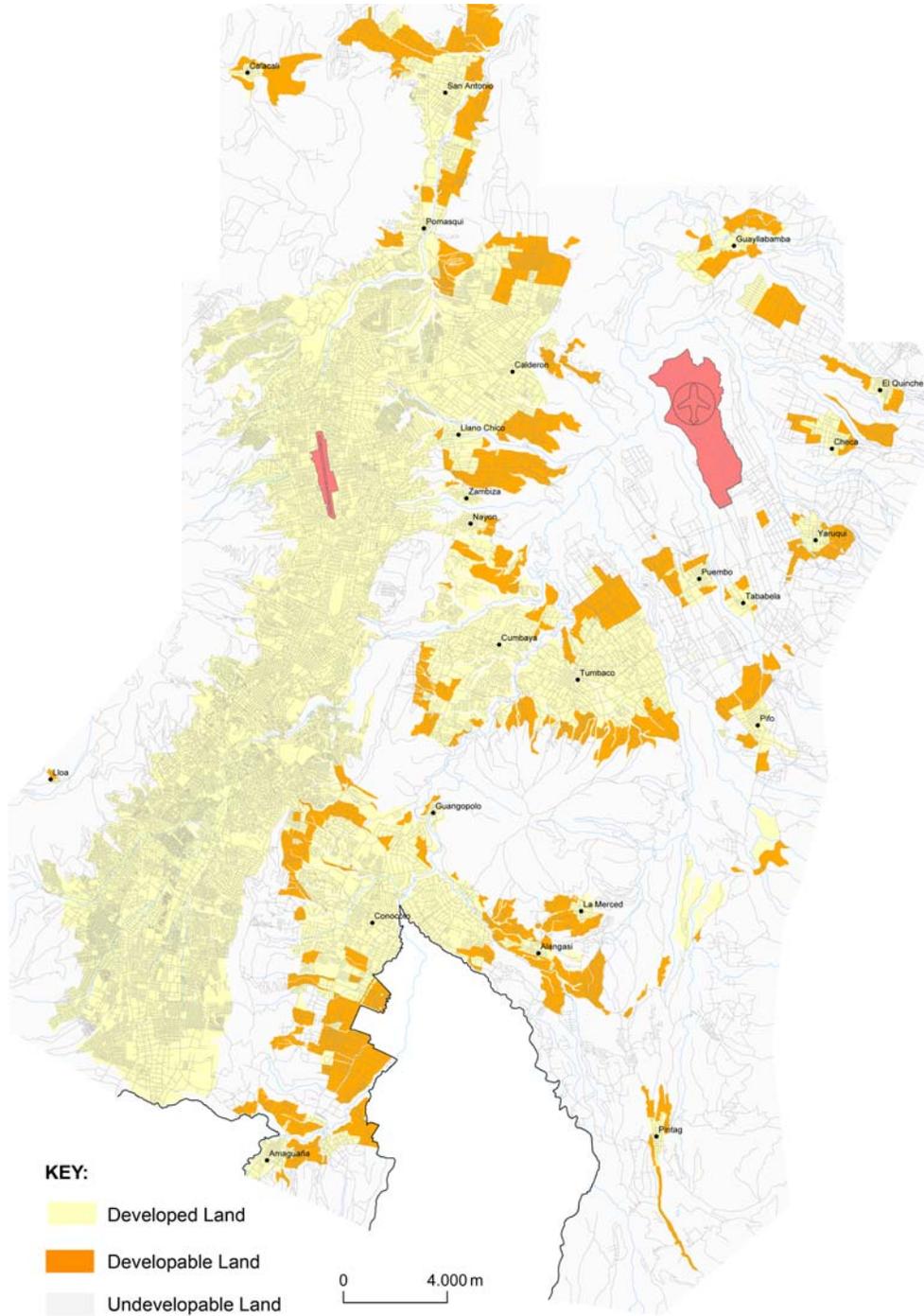


FIGURE 4.4: QUTO'S LAND CATEGORIZATION

In the previous map, taken from Quito's Planning Department's website, is evident how space is lacking and how the city is growing in density. Land is divided into developed, developable, and undevelopable. Developed land represents the area that was already developed by 2000 and was going to be adapted in order to fulfill population's demands until 2010. Because of rates of growth and the manner in which the land has been occupied, this adaptation can be seen as exploitation of the land. Developable land represents the region to be developed until 2020 to supply new demanded infrastructure. As seen on the map, this land does not represent a large area; but, because of a denser development, it should be enough for the upcoming ten years' growth. Undevelopable land is basically comprised of natural areas that should be preserved and unsafe regions such as ravines, steep slopes, ridges, mountains, hillsides, etc (MDMQ and DMPT, 32-34).

To keep Quito from growing and to limit immigration is a nearly impossible task. Ecuador has very few large cities and, as an inevitable trend, people move to places where there is a possibility for better life, hence, to cities that act as economic catalysts. Additionally, Quito may not be Ecuador's largest city; but is the country's capital city, a characteristic that gives it an intrinsic importance and prominence. Therefore, regulations about population growth and immigration, as well as providing it with other city centers and making Quito multi-centric, can be long term solutions. But in the short term, population is inevitably exponentially growing and the new demands need to be fulfilled.

Quito's Planning Department has defined a new pattern of development in the PGDT valid until 2020. Currently, Quito is guiding its development towards the re-concentration

of the urban sprawl. It is mentioned that the city needs to be compacted. There are several reasons that make this idea so appealing. The expansion of the urban fabric has affected the economy, sustainability, quality of life, and governability of the city. By compacting it, energy expenses, utility expenses, and the development of agricultural land and natural resources will be reduced. This new pattern will also make it easier to provide basic services and utilities to citizens, preserve natural areas, and create places where people can interact, relate, and inhabit (MDMQ and DMPT, 31-32).

When comparing Quito's 2003 and 2005 Land Use Plans, it is evident how more density is allowed in urban centers and how the urban sprawl keeps growing. It is visible how natural areas are changed into low density residential areas, low density residential into medium density, and from medium to high. Some areas of the city that were already high density residential now allow multiple uses, and agricultural land is being mixed with residential as well. Most of these changes occur towards the eastern side of the city, the valleys. This trend needs to be cut short in order stop developing agricultural land and support the compaction of the city (DMPT 2003) (DMPT 2005) (CMQ 2006).

From the housing and residential perspective, Quito's development is facing serious problems. Lately, and because of the previously mentioned conditions, Quito has seen a predominance of high density projects like apartment buildings and townhouses. Unfortunately, this type of growth segregates population and limits the ability to provide public spaces because the few open areas left are occupied by them. Another important problem that the city confronts is the increase of illegal settlements in the periphery, near preserved ecological areas (MDMQ and DMPT, 22-23). In fact, Quito has 356 legal and constituted neighborhoods, 82 approved subdivisions, and 357 informal and illegal

settlements (DMQ 2008). This means that about fifty percent of the houses are built without the direction and supervision of professionals in the construction and design fields. Most of these structures are located in dangerous areas of the city, classified as undevelopable, and represent a threat in case of natural disasters such as, volcano eruptions and earthquakes, both recurrent phenomenons in Quito. It is proven that, despite the high density residential projects that provide houses within the city, illegal settlements around it keep increasing. According to Architect and Urban Planner José Atiaga, Professor at San Francisco de Quito University, this happens because the housing supply caters to middle and upper classes, and not to the low income class. There is enough housing in Quito; but it is not correctly directed. People who have a house are being offered another; but people who need a house cannot find one that is affordable.

TABLE 4.2: HOUSING TYPOLOGIES IN QUITO

TPOLOGY	URBAN	SUBURBAN
HOUSE – VILLA	30.30%	66.70%
APARTMENT	49.00%	15.10%
OTHER	20.70%	18.20%

(INEC)

This table, elaborated with data from INEC's 2005 and 2006 census and survey, shows how housing is divided in Quito into different typologies. As current trends promote high density, the percentage of apartments will increase in both regions of the city, urban and suburban (DMQ 2005-2006).

The PGDT mentions the need to promote and facilitate a constant supply of urbanized land, while considering the different necessities and family types within the

demanding population. Several strategies are proposed in order to accomplish this goal and also contribute to the compaction of the city: densification of Quito's center and hyper-center; occupation of existing vacant land within the consolidated urban fabric; regeneration and reprogramming of underutilized land; improvement and renovation of existing housing projects; provision of new housing projects through rehabilitation and construction; and the development of projects through citizen participation in order to strengthen the sense of community and achieve a long term commitment (MDMQ and DMPT, 60-61). Furthermore, the design and construction of holistic and integral housing projects that allow sustainable use of land, improvement of public spaces, increase in quality of life, and embellishment of the urban image, is requested and urged (MDMQ and DMPT, 24-25). These projects can provide guidelines and principles for other housing projects and also set an example for future development, not only in Ecuador; but in other Latin American countries too.

The inclusion of green areas in housing projects in Quito can have several benefits within the project and also help provide solutions for issues that affect the city as a whole. Housing projects become static and ineffective when they are not accompanied by spaces that allow the development of human activities (Atiaga, 6). This city, because of its consolidated urban fabric and the necessity for high density, lacks green spaces necessary to create a healthy environment. Spaces required for human interaction, recreation, and reinforcement of the sense of community are missing.

In 1993, a newspaper published the opinion of several professionals in different fields regarding Quito's growth and urban development. A historian said that Quito should preserve the existing forested hillsides because, otherwise, instead of being

surrounded by a perimeter fence of trees that provide a beautiful vista, the city will be limited by a fence of aesthetically unpleasant housing projects. An architect commented that during its development, Quito had no defined boundary for years and, during this period, urbanization was allowed in areas that should have been preserved. Finally, an urban planner made clear that throughout Quito's development, authorities should have set aside land destined to become green recreational areas. But instead, part of this land was devoted to projects of social character and the rest was sold to private parties (Albornoz Tinajero). This information makes evident that these concerns, regarding the lack of green public spaces and the preservation of natural areas in Quito, have been present within the public and professional realm for more than 15 years.

Another newspaper article published in “Diario Hoy” in 1994 reveals the population's concerns not only towards the quantity of green public spaces; but also the quality of the few existing ones. It explains how kids spend more time in front of the TV than outdoors because public spaces for recreation are not maintained and seem more detrimental than beneficial. Most of the small neighborhood parks either serve as a place to store construction materials or host unauthorized structures. After reporters talked to Quito's Parks and Recreation Department, they came to the conclusion that there are two types of parks in the city: the prominent large open areas that are maintained by the authorities because they contribute to Quito's image, and the small neighborhood parks that are not considered important and are often not maintained. According to Quito's Parks and Recreation Department representative, there are no resources to maintain and supervise all public spaces in Quito, so they have focused only on the important and prominent ones. By the end of this article, there is a call for

private involvement. It is believed that the lack of public resources can be alleviated through private cooperation in order to save and protect the few green spaces that are left in Quito (Hoy 1994).

Quito's authorities have been actively working on providing and improving green spaces since the beginning of this century (Hoy, 2004). In 2004 a goal regarding green areas and all the strategies to achieve it were explained in a newspaper article. Municipalities of Ecuador's two largest cities -Quito and Guayaquil- are trying to provide 5 square meters of green space per inhabitant. Currently, Quito has only 50% of this required green area. The city provides 9 thousand hectares of green spaces to its citizenry when the number should be as high as 18 thousand hectares. Due to this data and the concern it aroused, a reforestation project was started in Quito in 2002. Through this project, 3.5 million trees have been planted throughout Quito's major parks. Fernando Velasco, the project manager, says that this is just the beginning, but not enough to reach the five square meter goal for which, according to him, 6 years and 7 million trees are needed. Velasco also talked about the problem with maintenance that was already a concern in 1994. He explained that even if green areas are built and already there, it is extremely hard to take care of them and make people care. Authorities think that the solution to this problem is to have community members actively involved and constantly participating in maintenance labors (Hoy 2004).

As a consequence of environmental and social concerns between 1993 and 2004, translated into worries about quantity and quality of green areas, the need for more and better recreational spaces has been revealed. From this important discovery, in the PGDT, developed mostly in 2000 and updated every 5 years, the need to provide more

green public spaces and improve the existing ones is mentioned; but there are no proposed strategies or plans on how to achieve this goal. The only new noticeable project that addresses this aspect is the Bicentennial Park and Convention Center that will take over the soon to be vacant land once Quito's airport moves to its new location. The current airport is situated on top of 130 hectares in the core of the north of the city.

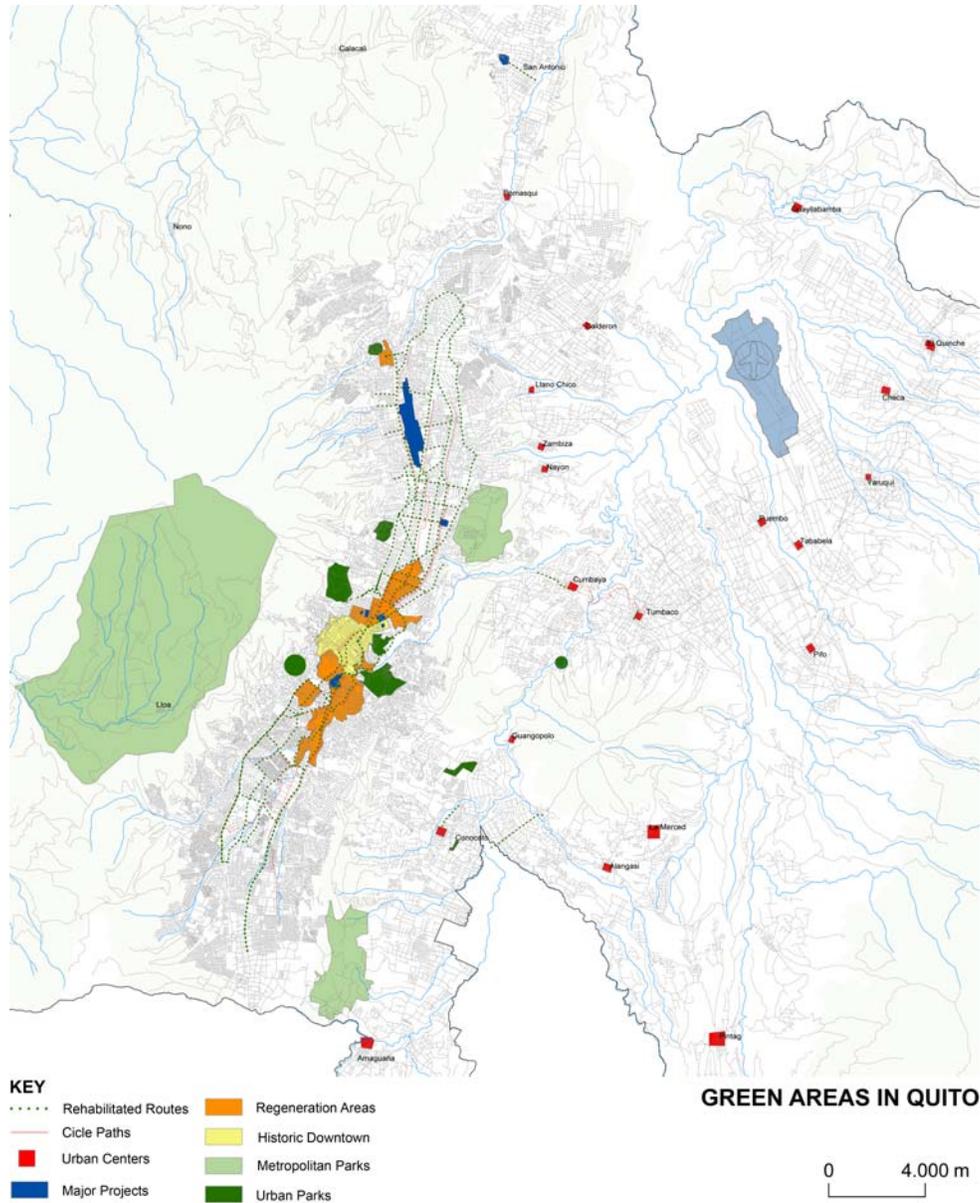


FIGURE 4.5: GREEN AREAS IN QUITO (MDMQ and DMPT)

Although authorities, prominent professionals, and the general public have spoken out about this topic, projects in Quito remain conceived and built with no consideration for environmental and social matters. Recently, 25 hectares (61.77 acres) of mature eucalyptus forest were cut down to clear a site for the construction of a residential project. This project is comprised of 760 apartments of 88 square meters (947.25 square feet) each and is large enough to be built by 4 different construction companies at the same time. Diario Hoy mentioned that the municipality sold this forested hillside to the private sector when, as mentioned in 1993's article, it should probably have been preserved in order to provide a clear boundary for the city and beautiful vistas. The project manager says that they have all the paper work in order and, in fact, Quito's Department of Environment is supervising the project to make sure that noise, dust, and contamination produced by the construction site complies with regulations. People in the neighborhood already complain about the negative effects of this project even though it is still under construction. The observations include the sliding of hillside soil that clogs the sewer system around the area, inconvenience because of road construction, increase in vehicular circulation, and risk of floods (Hoy 2010).



FIGURE 4.6: HOUSING PROJECT ENVIRONMENTAL IMPACT (Hoy 2010)

Nivel de confort, or comfort level in Quito, based on housing conditions, was revealed through a study by Quito's Planning Department in 2006, which compares housing conditions in 1990 and 2001. According to the data provided, the comfort situation has improved considerably between these years. Since 1990, more houses have been provided with electricity, land phone, water, and sewer system and also building materials and overcrowding have improved (DMPT 2006). Strangely, something that is not considered in this study, but has an important influence in comfort and quality of life, is the accessibility to recreational areas and green spaces. As long as the authorities do not consider this parameter as influential for the quality of life, it will not be a concern for future development.

Considering that the construction of high density residential projects in Quito is currently at its peak, it is important to provide a viable, clear, and efficient solution to approach the creation of quality green recreational spaces and the provision of housing projects at the same time.

Contemporary case studies

The case studies presented in this chapter represent the solutions that are currently provided for the housing and green space demand in Quito. Two different high density residential typologies, apartment building and townhouses, represent this development and are analyzed in this section of the thesis.

1. Apartment buildings: Parque Real.

Background information:

Parque Real is a project designed and built by Uribe & Schwarzkopf. "Uribe & Schwarzkopf was established in 1973 as an architecture firm that understood the

housing needs in Quito at that time" (Uribe and Schwarzkopf, 15). After just a few years of practice, they say, "we deepened our approach and specialized in housing for the middle class. Our designs became more technical and more functional, always bearing in mind the needs of the clients and their purchasing power" (Uribe and Schwarzkopf, 15). This company is representative of Quito's urban growth because it builds a large percentage of the housing projects in the new development. They have achieved accountability and continuity by taking control of the entire process, from conception of the project to execution and construction. They plan, promote, and build apartments, commercial space, suites, and some single-family houses.

According to an electronic article, Uribe & Schwarzkopf is different from other architectural firms because of the way they commercialize their projects. They offer financial deals through different means which gives their customers several convenient opportunities and possibilities of purchasing. This firm is the only one in Ecuador that has built more than 200 projects in 34 years; it employs directly and indirectly more than 2 500 people per year providing stability and a professional future for many of them; and it was also the first architectural firm to actually build a smart building in Ecuador. All of the previous facts provide evidence of the size of this company and also emphasize its prominence and influence in Quito's urban development (macrovisionmedia).

The site where the case study is located has an area of 22,721.85 square meters (244,583.96 square feet) and was previously an industrial site occupied by a textile factory. It was "a run-down industrial district, laden with smoke and heavy traffic" (Uribe and Schwarzkopf, 16). Parque Real consists of 12 towers, 846 apartments, 60 commercial premises, 2 office towers, and a hotel. The total built-up area of the project

is 103,912.73 square meters (1,118,543.91 square feet) (Uribe and Schwarzkopf, 111). The design process took from 2001 to 2005 and construction is still not finished, 12 towers have been erected and 3 are still under construction. Some of the completed towers are already inhabited and the entire project is expected to have “4,000 people living in it” (Uribe and Schwarzkopf, 17).

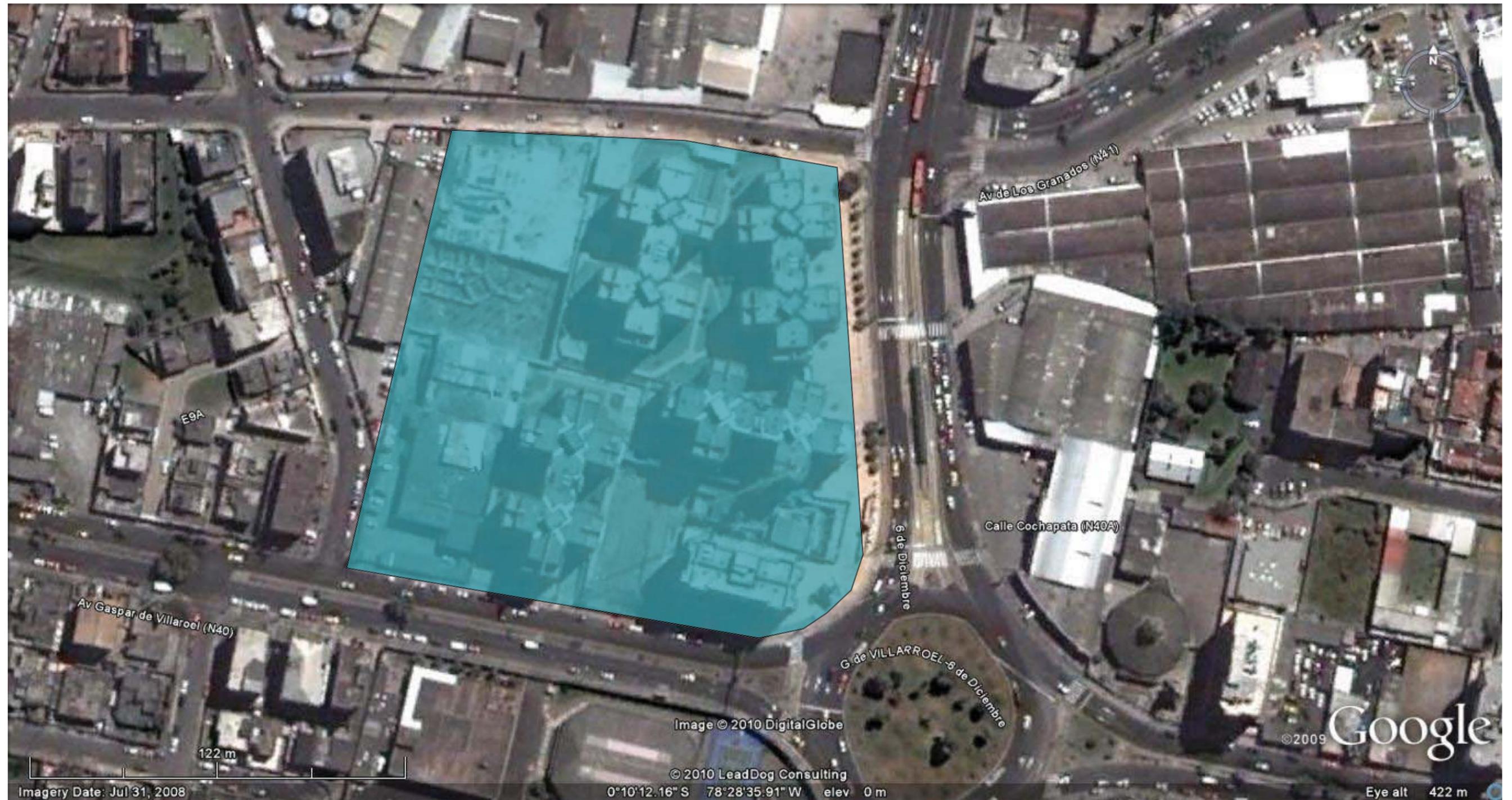


FIGURE 4.7: PARQUE REAL AERIAL

Aerial showing the location of Parque Real and its surroundings

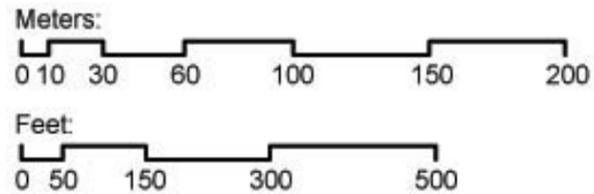
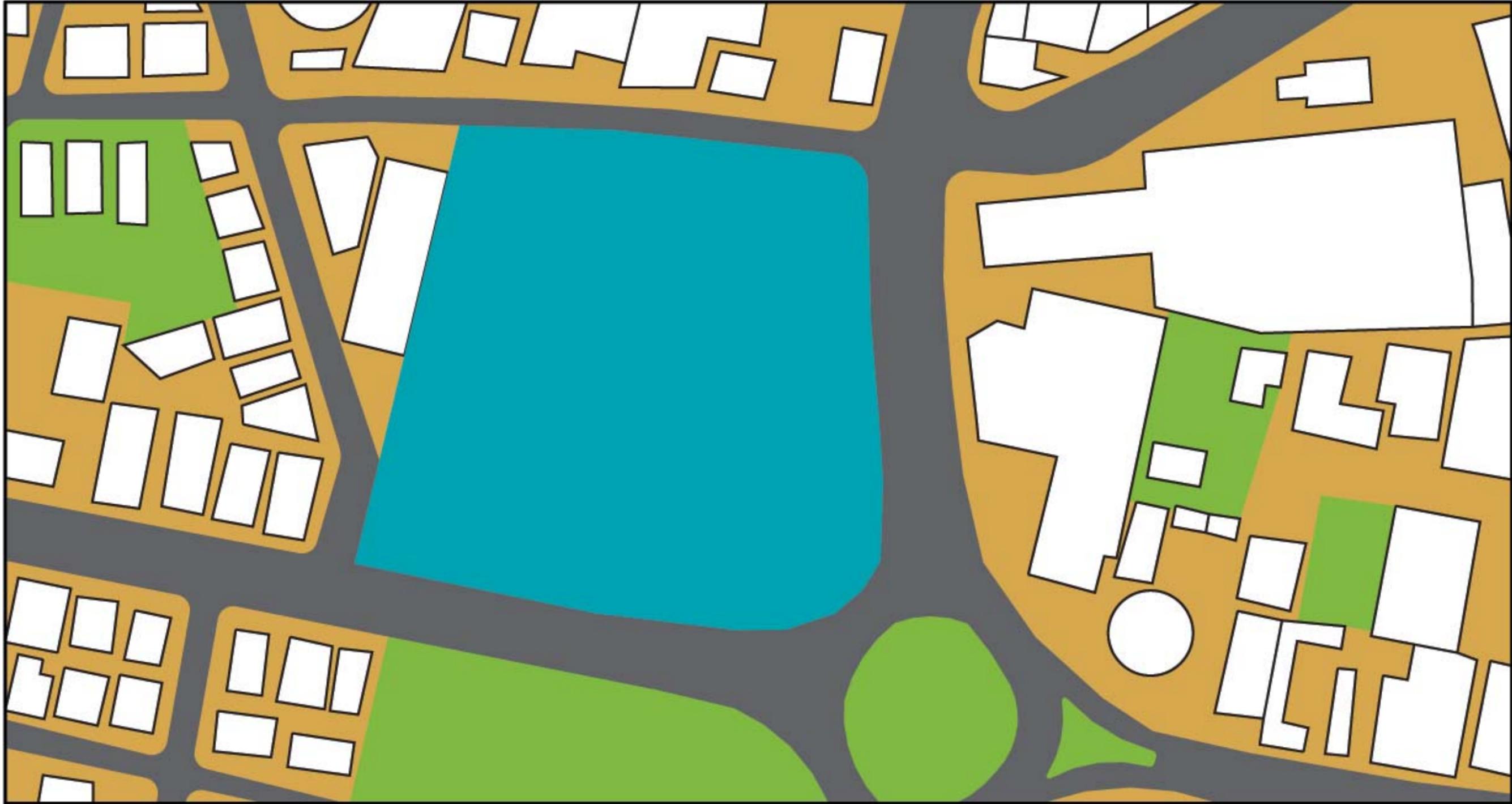
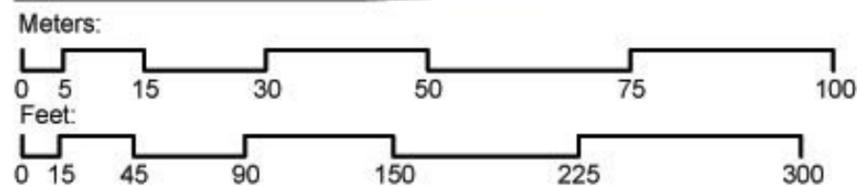
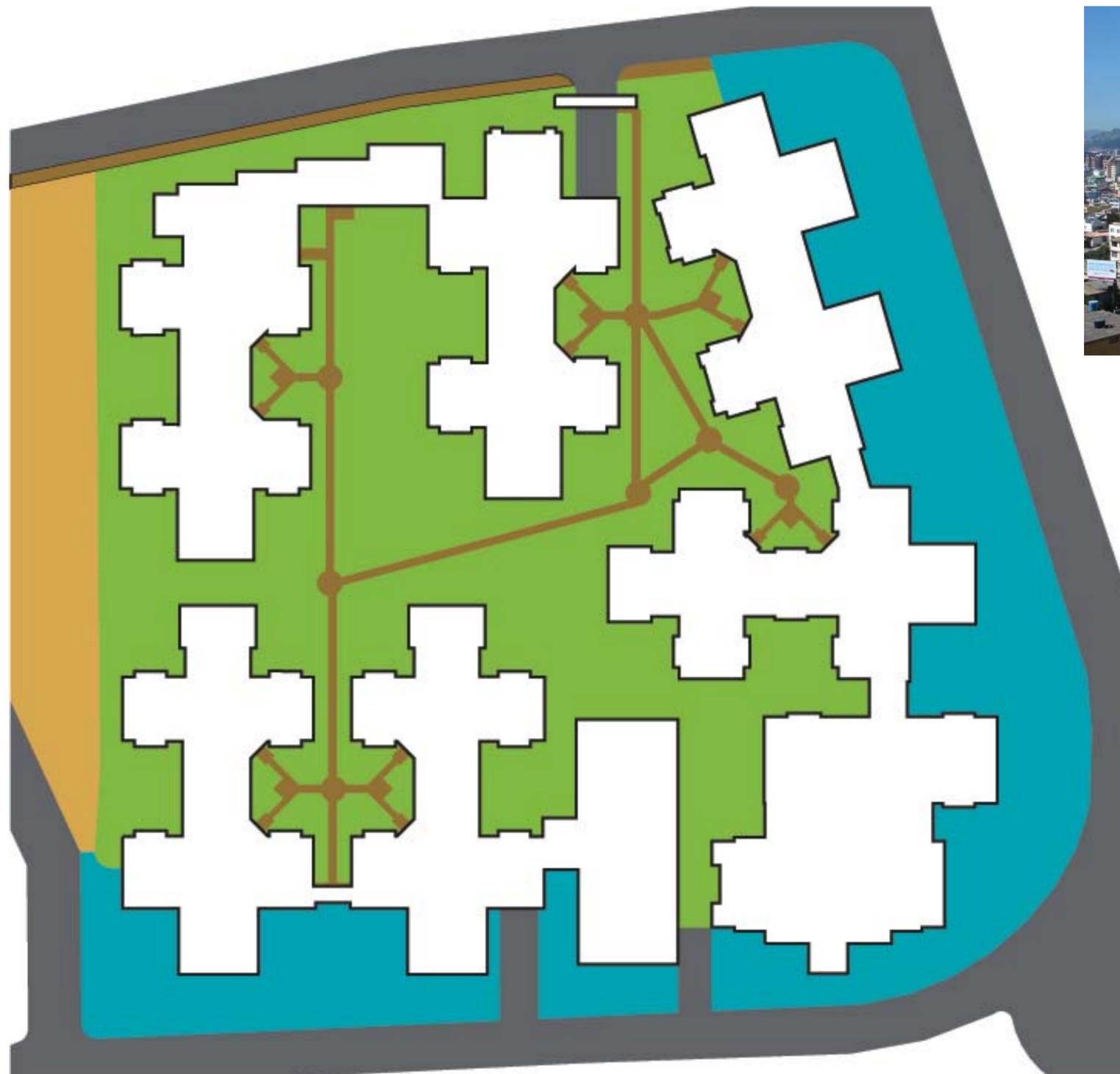


FIGURE 4.8: PARQUE REAL CONTEXTE DIAGRAM

- Parque Real Apartment Buildings
- Developed Green Areas
- Streets
- Buildings
- Left Over Space



- Sidewalks
- Developed Green Areas
- Plazas
- Streets
- Indoor Space
- Neighbors



Parque Real from the outside -
Out of scale compared to
surroundings.
Perimeter plazas sporadically
used.



Inside Parque Real -
Green areas not enough
for inhabitants.
Not enough depth of soil.

FIGURE 4.9: PARQUE REAL DIAGRAM AND IMAGES

Findings:

Parque Real is built to its maximum capacity and the few open areas left have been used for landscape and hardscape. The design includes a "perimeter that merges with the public space. Small plazas are meeting points in the ensemble" (Uribe and Schwarzkopf, 111). These plazas work to a certain point: during the day they are used mostly by general public, since the two adjacent avenues are main thoroughfares with public transportation; but at night they are abandoned. Commercial activity around the courtyards stops after office hours so there is no attracting factor, therefore, project dwellers stay in their apartments and enjoy the so yearned for privacy and isolation after an exhausting day of work.

On the other hand, green spaces within the project seem nice and large; but are not enough for 4,000 people. These areas are probably underutilized because no landscape architect was included in the design team, therefore, they have been relegated to be the leftover space managed by the gardener. Additionally, this housing project has a very large underground level below the entire site, leaving no soil depth to work with in the landscape design and plant selection. Despite the previously mentioned characteristics, an interesting programming element that this project includes, usually not included in other projects, is the possibility for general public to enjoy a part of it. Parque Real provides an interesting approach to the private / public dichotomy.

Finally, the architecture of these apartment buildings provides a barrier and it is a good attempt to filter pollution. With these tall and massive buildings, the polluted air and noise from adjacent primary streets is perceived in a muffled way. Due to the prominence of the structures and the chosen materials, these buildings provide identity

to the neighborhood and its inhabitants. Despite these two positive aspects about the infrastructure, when examined in context, Parque Real provides no consideration to its surroundings; it is totally out of scale and blocks views and air circulation to its neighbors. Additionally, the physical indoor/outdoor relationship within the project is null; it is limited to visual.

Overall, the project is a good attempt to improve the quality of life; but it appears to do a little here and there, but not enough as a whole. Environmentally, green areas are definitely not ideal; but they are a better than what is usually provided in other apartment complexes. Even though these areas lack environmental functions, they help just by not being impermeable surfaces. Socially, Parque Real provides an identity, but no sense of community. Neighbors do not know each other. Even though spaces for recreation and interaction are provided, they are not used and as a consequence, human relationships are weak. Aesthetically, these towers have a strong character, which could be beneficial or detrimental, depending on the point of view. In this case, the fact that it provides a clear image and identity is a positive thing. Finally, economically, the housing project has been very profitable, due to certain conditions, such as configuration of the apartments (area vs. number of rooms), mixed uses, lack of soil depth, investments in plant materials, and maximized profitable areas.

2. Townhouses: Génova.

Background information:

Génova is a townhouse project design by architect Roberto Villacreses. The 88 houses are targeted towards the mid to high economic statuses. On the site where Génova is currently located, there was previously a beautiful house with a wooden

structure, slate roof, children's playground, BBQ area, and surrounding mature pine forest. It had a pleasing rustic feeling and look. The owner decided to sell his property and move to the new suburban development in the valleys because zoning ordinances changed. Now all the houses in the area are also being sold and turned into high density housing projects (Arteaga).

The architect, by completely clearing the site for the new development, revealed that environmental concerns did not represent a priority. In the design process of this project, landscape architects were brought in after all the built structures were finished. They received a master plan that showed the house footprints and a delineation of the areas destined to be green spaces. In Quito, a project with these characteristics is required to have a minimum of 8% of the total area as recreational green areas. Obviously Génova was built to the site's maximum capacity with profitable saleable space; therefore, the process of designing the open areas required plenty of creativity. It was basically turning leftover space into pleasing, fun, and interesting areas (Arteaga).

Ricardo Arteaga, the landscape architect, and his team of designers worked on Génova during the first three months of 2004. The landscape project comprised retaining walls, small recreational area, BBQ area, playground, workout circuit, planters, hillside, and pavement patterns for pedestrian, vehicular traffic, and parking spaces. The implementation of this design took 2 years, during which many changes were made to fit budget requirements. Once Génova was completely finished, Arteaga left a management and maintenance instruction booklet for use by the gardeners or the gardening company to be hired. Although information was made available, it has not been used or followed (Arteaga).



FIGURE 4.10: GÉNOVA AERIAL
Aerial showing the location of Génova and its surroundings

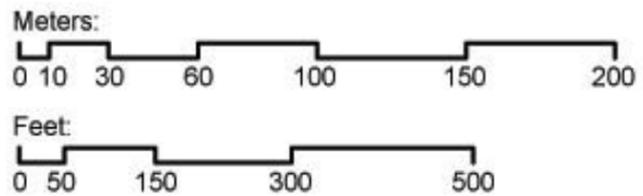
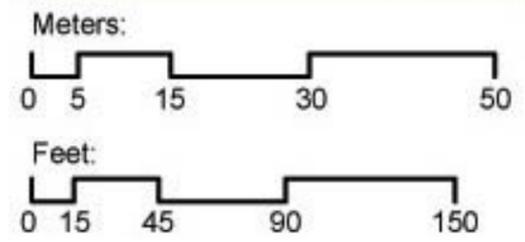


FIGURE 4.11: GÉNOVA CONTEXTE DIAGRAM

- Genova Townhouses
- Streets
- Buildings
- Developed Green Areas
- Undeveloped Land
- Left Over Space



- Sidewalks
- Eco-pavers
- Developed Green Areas
- Patios
- Streets
- Indoor Space
- Plazas
- Neighbors



Génova -

Presence of steep useless hillside and other deficient green areas.
Eco-Pavers used to make the project look greener.
Mature pine forest was cleared in order to build this project.

FIGURE 4.12: GÉNOVA DIAGRAM AND IMAGES

Findings:

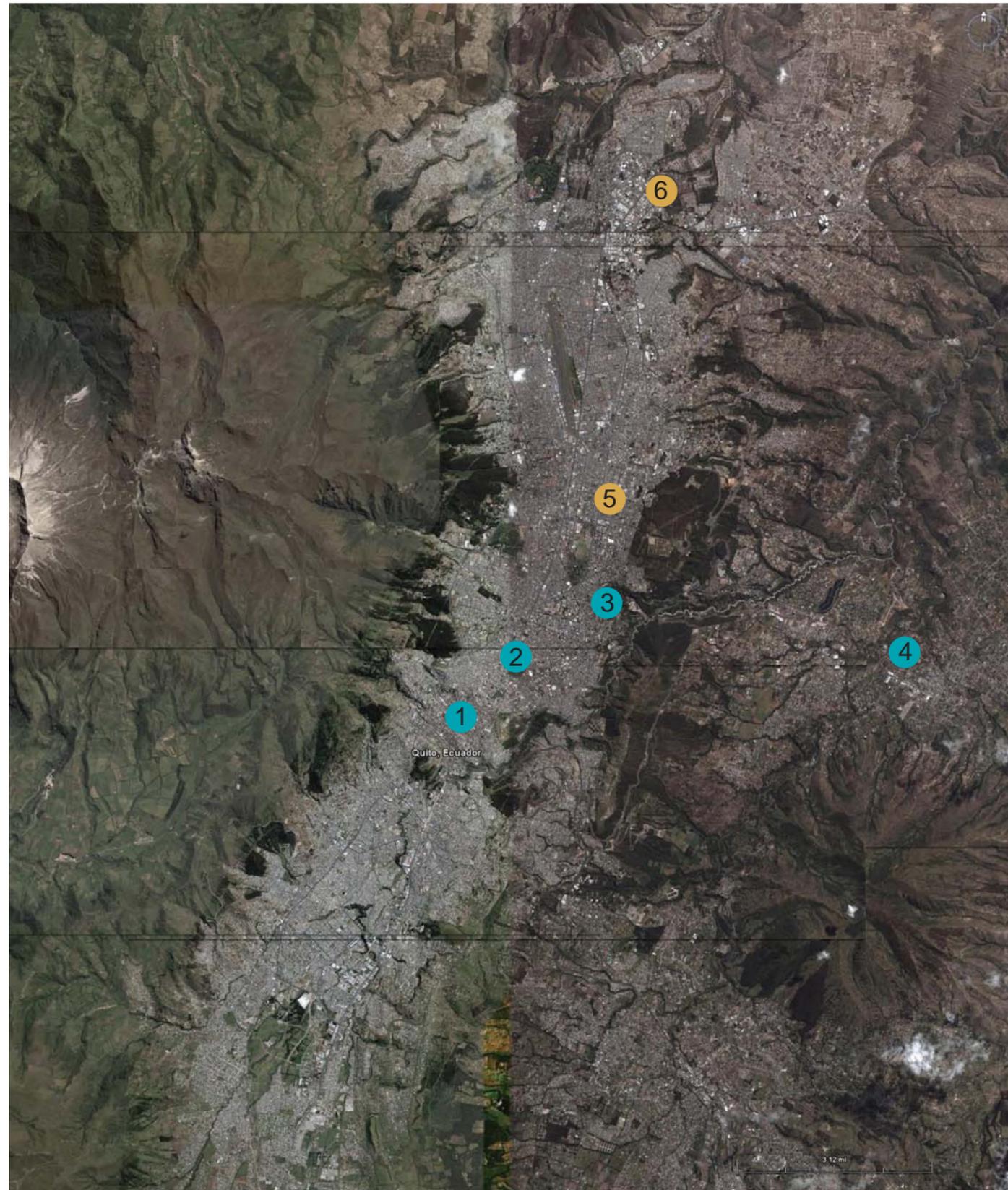
Génova is a residential complex that provides examples of positive and negative aspects of the current high density development in Quito. One of the aspects worth highlighting is the strong sense of community, despite the lack of identity. This typology, more horizontal than apartment buildings, provides more opportunities for human interaction and the creation of relationships. In this project, neighbors know each other, their kids play together, and they are always attentive and helpful. Another positive aspect, mostly because of location, is how connected all these people are to the rest of the city. Even though the fact that the project was developed towards the northern part of Quito, the proximity to a big multi-modal station it makes easy for the residents to move around the city.

On the other hand, the lack of green spaces is evident. The large hillside towards the edge of the property is so steep that it becomes useless and inaccessible for residents as a recreational space. The only green area that could be used for recreation is right next to Quito's perimeter highway. Pollution produced by vehicular traffic can be perceived in the project due to the lack of a green area that could act as a buffer. Furthermore, the other green spaces are a product of the use of Eco-pavers. All parking spots in the project are paved with material that allows groundcover to grow. When there are no cars parked, it looks green, but once everybody is home it becomes a regular parking area.

Private and public dichotomy in this project is difficult to analyze. There is lack of privacy, but at the same time, it contributes to stronger community bonds. Moreover, the projects surrounding Génova follow the same typology and pattern. There are several

townhouses in the area and they all contribute and emphasize the public character of life in high density residential projects.

Comprehensively, Génova is a successful project in terms of community. Environmentally, it definitely has a deficit in quality and quantity of green recreational areas. Notably, the destruction of a mature pine forest, that belonged to a villa-like house, reflects the blindness of architects and planners towards environmental practices. Socially, as mentioned before, this townhouse project allows a strong sense of community through human interaction. Aesthetically, it looks like the neighboring projects. It definitely does not provide a distinct image to which people can relate and identify with. Ultimately, referring to the economic aspect, Génova has evidence of being a profit-oriented development; therefore, it was an economic success for its developers.



- Historic Case Studies:
 1. Mejía House - Colonial Downtown
 2. Café Cultura - Early to Mid 20th Century Expansion
 3. Casabella - Late 20th Century Vertical Growth
 4. La Viña - Current Suburban Development
- Contemporary Case Studies:
 5. Parque Real - Apartment Buildings
 6. Génova - Townhouses

FIGURE 4.13: LOCATION OF CONTEMPORARY CASE STUDIES WITHIN QUITO

Opportunities for intervention

Quito's position as the capital city of Ecuador makes it an economic catalyst and continues to attract people looking for job opportunities and better quality of life. The population is and has been rapidly growing, and immigration to this city is difficult to regulate and control. The increase in inhabitants has led to the replacement of most of the single family houses with big yards developed in the early to mid 20th Century, as in Génova's case, with high-density residential projects. These projects are designed from the perspective of investors and developers and have consequently decreased the amount of green open spaces in these neighborhoods. On the other hand, people located in suburban neighborhoods are forced to drive and deal with traffic for extended periods of time every day. They have several advantages that the suburb provides, such as immediate access to green spaces and reduced pollution and contamination; but there is also a down side which is having to commute long distances so frequently.

The reality is that Quito is a large city with contradictory demands. The growing population demands housing and equipment infrastructure as well as green open spaces and quality of life. Both are required in close proximity so that they can be immediately accessed to avoid long traveling distances. Development is moving towards the compaction of the city and the configuration of live-work spaces. Therefore, the fact that there are not enough public green spaces in Quito seems more worrying and serious. However, and as a result of this lack, the quality of the existing spaces is inadequate. The available acreage is not enough to supply current populations needs and land is not used for environmental purposes. Because of Quito's consolidated urban fabric, it is very difficult to expropriate extensive land in order to build parks and create

public open recreational spaces. As a result, Quito must rely on private green spaces to fulfill the current population's needs and societal expectations regarding healthy environments that will contribute to a better quality of life.

As Quito runs out of space and the population keeps growing and demanding, it seems that the only solution to supply all the needed infrastructure and open spaces is high urban density. Although there are several ways to approach the problem of urban development within the city of Quito, this thesis focuses on high density residential projects as the most practical and rational approach.

Based on the two high density residential projects previously analyzed, it can be said that housing development in Quito is currently profit-oriented. Because of giving too much importance to the economic aspect, new projects are sacrificing the quality of spaces and the quality of life that develops within them. Furthermore, designs are also sacrificing the environment and threatening Quito's sustainability by cutting down forests and replacing them with impervious surfaces surrounded by open spaces with no environmental function.

High density residential projects are seen as an opportunity to bring private green open spaces to a consolidated city, like Quito, while supplying it with housing and other needed infrastructure; hence, setting the stage for values to regain the right proportion. This approach to high density housing is not a new theory; it has been addressed before and is a universal concern. There are many documents and examples on how to achieve this goal; but none, however, are site specific to Quito, considering geographic location and demographics.

CHAPTER 5

INSPIRATION

Global conditions

The lack of green spaces in consolidated cities is a concern all around the world. There are several designers as well as authorities, investors, and developers that recognize this concern as a major issue. It has not only involved aesthetic issues but also health, sustainability, community, and future development. "Managing the environmental quality of large cities is already proving a tall challenge, from the vast squatter settlements of Lagos, Nigeria, that lack clean water and sanitation to the smog-generating traffic jams of Los Angeles" (Daniels). Each city has its own problems; but despite their differences, all of them are facing troubled realities that necessitate growth towards the creation of more livable and enjoyable spaces. "Cities must prove to be a winning alternative for healthy places to live; they must promote social harmony; they must demonstrate a valid role in national economic security" (Daniels). Cities must be efficient in every aspect: social, economic, aesthetic, and environmental.

Contemporary large cities have failed to fulfill current people's needs. Previous development did not foresee today's conditions; therefore it was not planned contemplating future possibilities. Due to growth lacking sustainability principles, cities

have reached a point where there needs to be a fundamental change in principles for development. "In order to truly reduce our carbon footprint, Americans must shift from car-dependent, metropolitan areas comprised of specialized districts to complex, vibrant, mixed-use urban environments where jobs, shopping, entertainment, and housing are intermixed and are fundamentally oriented around transit and pedestrians" (McCullough). Latin America and developing countries, including Ecuador, have a tendency to see developed countries as role models. In this case, the carbon footprint situation in South America is not as bad as in the United States. So the undesirable developmental pattern applied in North America, which developing countries have adopted as model, should not be followed any further. These countries should jump ahead and start applying the solution before the problem is worsened.

Density "is a sustainability silver bullet, providing across-the-board reductions in per-capita resource use. These reductions occur in proportion to increasingly development density. Even better, this same density silver bullet provides local, regional, and global benefits" (Farr, 103). The need for density is not only manifested in the United States; but several countries around the world have also stated this concern or have already implemented this development pattern:

As metropolitan regions continue to expand across the globe, signs increasingly indicate that the current spatial forms and organization of metropolitan landscapes are becoming less sustainable and more vulnerable to change because of larger environmental trends such as global warming, fossil fuel depletion, and biodiversity

loss. Translational research that involves scientists, landscape architects, planners, and engineers will be crucial for guiding best practices in sustainable development toward the goals of metropolitan landscape sustainability, resilience, and regeneration (Musacchio, 5).

There is "an economic hypothesis that gained much currency in the 1990's by suggesting that economic prosperity initially leads to environmental decline, but eventually a self-correction mechanism leads to environmental controls" (Ali). Now that it is understood that "a quality environment produces jobs, whereas a polluted environment destroys them" (Daniels), the presence of "environmental, economic and social (equity) sustainability" (Daniels) is valued and much needed to secure a viable future for current developing cities.

Remedial approaches

In order to help remedy the lack of quality spaces and sustainability in large cities several techniques and small-scale interventions have been done such as: rain-gardens, bio-retention areas, energy efficiency to waste reduction, solid waste disposal, brownfield redevelopment, rain-water harvesting, urban agriculture, neighborhood beautification, sensitivity to natural features and urban ecosystems, etc. Yet there are some other deeper attempts to solve these problems. These attempts have become trends and styles with their own guidelines and set of design principles.

Some of these trends or design movements are:

- New Urbanism: "Proponents argue that unlike recent urban forms, New

Urbanism integrates traditional urban morphological characteristics to create vibrant, pedestrian-friendly communities that have a relatively low environmental impact. Although carried out in a variety of ways, New Urbanism is often implemented through traditional neighborhood developments, which include high building densities, mixed uses, grid street patterns, narrow streets, and short setbacks" (Conway). This movement has been highly criticized; but it constitutes an attempt to solve current urban problems.

- Landscape Ecology: "Design from the ecologists' perspective is usually used in the context of the creation of reserve systems for biodiversity and/or specific wildlife species. Landscape architects and planners design for wildlife in relation to human needs and other environmental concerns (eg., water quality, visual quality, and recreational access)" (Musacchio, 2). By uniting these two approaches to design, Landscape Ecology is another movement concerned with current environmental quality in large cities.
- Landscape Urbanism: "is an interdisciplinary approach that, in theory, amalgamates a wide range of disciplines including landscape architecture, urban design, landscape ecology, engineering, etc, It is also committed to addressing the many challenging issues and conditions facing contemporary cities" (Livesey, 45). An interesting aspect of this movement is how landscape urbanists "allow for a general design to evolve over time, rather than existing as a static pictorial composition" (Livesey, 47).

- Sustainable Urbanism: “is walkable and transit-served urbanism integrated with high-performance buildings and high-performance infrastructure. Compactedness (density) and biophilia (human access to nature) are core values of sustainable urbanism” (Farr, 42). This trend shares interests and concerns with all of the above.

Negative aspects of current urban development have been identified. “Sprawl is environmentally destructive, socially segregating, and economically dependent on cheap, plentiful, and imported energy” (Daniels). Therefore, urban density is presently a popular subject. All the previously mentioned theories on how to improve current unsustainable cities have considered it as a method of reaching sustainability. Dealing with density is not a simple task. As a response to current city configuration the word density has a negative connotation. Furthermore, “the words ‘high-density housing’ conjure up images of closely spaced highrise apartment towers with a consequent lack of daylight, reduced open spaces, and blocked views. Even at medium and lower densities, there is little public awareness of the different potential configurations of buildings and their impact on streets and neighborhoods” (Ellis, 36). This image immersed in people’s minds has inspired designers’ imagination and creativity in order to achieve density and sustainability without sacrificing quality of life.

Quality of life can be altered by improving environmental, social, aesthetic, and economic aspects of projects. Designers like the architects Ken Yeang and Arthur Erickson provide some examples of the combination of density and quality.

Yeang is originally from Malaysia, a country that, compared to Ecuador, has about thirty percent more area and more than twice its population. This may have been the reason why this architect started researching green skyscrapers as early as the 1980's. Malaysia is a country that has found a way to a more stable economy, which moved it from the developing country to newly industrialized country category. Several similarities can be found between Ecuador and Malaysia; but it seems Malaysia is a little ahead on the path. So analyzing a successful architect that is a figure not only in his country but internationally can be helpful for the purpose of this thesis.

Erickson is an architect that influenced and helped Vancouver in its process of becoming a city based on sustainable density. This city is a role model for older cities such as New York and San Francisco. It is a good example of what urban development should be directed to. Despite the large differences between Quito and Vancouver, regarding economic, political, and social aspects, it is definitely worth analyzing a city and its initiator which are both recognized world wide.

Ken Yeang is an associate at T.R. Hamzah and Yeang International. "The firm's design expertise is in their ecological approach for the design of large projects and buildings that include consideration given to their impacts on the site's ecology and the building's use of energy and materials over its life-cycle" (Hamzah and Yeang). This architect has also written several books about sustainable intensive building. In his book, *Green Skyscraper*, published in 1999 he says: "some of the basic premises of 'green' design should be obvious to all, and yet buildings continue to be produced

without these premises in mind" (Yeang, 279). He also emphasizes how:

Traditional architectural education, obviously, will have to be modified. Ecology and environmental biology will have to be included in architectural curricula. In addition, related disciplines such as resource conservation, recycling, energy and materials management and pollution control are also germane to ecological design and must also be taught (Yeang, 282).

Here are some images of projects done by his architectural firm:



FIGURE 5.1: TECH-LINX TECHNOLOGY PARK (Hamzah and Yeang)



FIGURE 5.2: JABAL OMAR TOWERS (Hamzah and Yeang)



FIGURE 5.3: EDITT TOWER (Hamzah and Yeang)

Another good example of high-density urban development is Vancouver. This city has set an example of sustainable density for other densely populated cities such as New York and San Francisco. In fact, Vancouverism is a relatively new technique

influencing urban planning and architecture. It is “a form of social bonus zoning, in which extra density in housing developments is granted in return for such public amenities as cultural facilities, parks, schools, and social housing” (Broddy). The starting point of Vancouver's urban plan is also very different, “rather than create an overall city diagram indicating where the tallest structures should be, they did the opposite--they mapped where the view corridors must remain open and not be blocked by views” (Chappell). So far, several neighborhoods in Vancouver have been developed with this typology, including False Creek, Yaletown, Coal Harbor, and West End.

Vancouver is also a city pioneer on the EcoDensity Planning Initiative:

EcoDensity is the product of over two years of creative thinking and challenging public debate on how density, design, and land use can contribute to environmental sustainability, affordability, and livability. EcoDensity is a Charter that commits the City of Vancouver and its citizens to address change more proactively and adapt our city and our way of life to meet the challenges we all face (Vancouver).

Arthur Erickson was an influential architect and designer in Vancouver's process towards a sustainable city. His concept of architecture reveals his design philosophy which explicitly states a concern towards people and their surroundings:

Architecture, as I see it, is the art of composing spaces in response to existing environmental and urbanistic conditions to answer a client's needs. In this way the building becomes the resolution between its inner being and the outer conditions imposed upon it. It is never solitary but is part of its setting and thus must blend in a

timeless way with its surroundings yet show its own fresh presence (Erickson).

Here are some of his projects:



FIGURE 5.4: PROVINCIAL LAW COURTS (Erickson)



FIGURE 5.5: KING'S LANDING (Erickson)

A city that can also be seen as an example, because of its similar condition to Quito, is Bogotá, Colombia's capital city. Bogotá is a city that has been through an urban development process analogous to Quito's. In the book "I Saw a City Invincible: Urban Portraits of Latin America", the saturation and unhealthy situation of Bogotá's colonial downtown in the late 19th Century is described:

The streets and plazas of the city are infested with pickpockets, drunks, lepers, loafers, and even crazy people. Nightfall places everything sacred at the exclusive disposition of crime and vice. Incredible scenes take place only a few steps from the door of the cathedral. (...) The material decay goes hand in hand with moral decay. The state of the streets, with their piles of filth, is suitable only for guaranteeing unsanitary conditions. The water service or supply is such that the houses that should get water will quickly depreciate after being burdened with a tax favoring the bricklayers and plumbing. Street lighting, except on a few commercial streets, comes from the moon (Joseph and Szuchman, 106).

From this point, the city's expansion was inspired by the necessity for cleaner, healthier, more enjoyable spaces, close to the countryside and undeveloped land.

The suburban development of the early to mid 20th Century took place and "the pace of urban growth accelerated with the development of motorized transport and particularly when private car ownership exploded in the 1970s. Gradually, the urban area spilled across Bogota's administrative boundaries. (...) Since then, the city has again spread beyond its boundaries" (Gilbert, 249). A major difference that this city's

development has with Quito's is the creation of new centers, the evolution from a mono-centric to a plural-centric city. "New sub-centres have also emerged, many located around shopping malls (...), others connected with office developments (...), new transport termini (...), and wholesale market centres (...). During the past twenty or thirty years, the central area's dominance has declined sharply" (Gilbert, 250-251). Despite this major difference though, Bogotá has faced, during the latest urban development, the same issues Quito is dealing with now.

Alan Gilbert, in 1996, analyzed Bogotá and identified the city's most important urban problems. "(Bogotá) has a serious housing problem and far too many families live in bad accommodation" (Gilbert, 251). This condition was worsened by the rapidly growing population that most Latin American cities had to deal with, therefore, "most low-income settlements are developed through illegal processes. Between 1935 and 1985, 31 per cent of all housing was built on land that was developed illegally" (Gilbert, 253).

Another problem identified by Gilbert is pollution. Apparently, environmental conditions in Bogotá during the late 20th Century were decadent. Water, air, and noise pollutions were reaching unlivable levels:

The level of pollution affects the health of communities living close to the river and its tributaries. Sanitary conditions close to the Tunjuelito river in the south of the city are particularly bad. Since the polluted water is also used for irrigation, all of Bogotá's people are at risk when they consume milk and vegetables produced near to the city (Gilbert, 260).

The last problem that both Latin cities share is traffic congestion. “The major cause of congestion is the huge expansion in private car ownership. Between 1977 and 1985, the number of road vehicles registered in Bogotá and ten nearby municipalities increased annually by 8 per cent (Gilbert, 260). Although in Colombia's capital, this problem has already been effectively addressed with the implementation of efficient public transportation and the TransMilenio. TransMilenio is a rapid transit bus system that has 9 lines throughout the city and a total of 84 kilometers (54 miles).

Colombian architects, urban planners, and authorities have begun to remediate some of Bogotá's problems through different approaches. Rogelio Salmona was an architect particularly helpful in ameliorating these matters and he approached these urban issues through high-density residential projects.

He was a craftsman who wanted to make buildings that add without subtracting and serve without dominating (..) Like Niemeyer, he worked with the great modernist giant, Le Corbusier. And like Le Corbusier, modernism for him was a mission, an impetus to Utopian thinking, a mandate to build transformative buildings that bettered the lives of those who lived in and among them. Unlike Le Corbusier, Salmona seemed aware of the dangers of modernism, its power to disconnect the architect from place and tradition, its frequent contempt for the local and dismissive neglect of long legacies of material knowledge (Kennicott).

Architect Salmona was the first Latin American to receive the Alvar Aalto Medal, therefore an eminence in Colombian architecture. He was “a leading proponent of

redesigning urban spaces to instill a sense of interaction among residents in the face of endemic political tension and crime” (Romero). Rogelio Salmona was an architect who addressed all aspects of architecture, environmental, social, aesthetic, and economic.

Salmona did a vast variety of high-density residential projects that would “sought to incorporate his buildings into the surrounding landscape” (Romero). He would design quality open recreational areas for human interactions and provide pleasing aesthetics that have created a strong identity for Bogotá at the same time. This architect's projects in Colombia's capital city have not only strengthened the sense of community between bogotanos, but also have set an example on how to approach improve quality of life through high-density residential projects.



FIGURE 5.6: MUSEO QUIMBAYA (Durán)



FIGURE 5.7: LAS TORRES DEL PARQUE (Hervia)

Recommendations

To conclude this chapter, it is worth mentioning that, on one hand, “greening the city has become a necessity as an antidote to suburban sprawl, to protect public health, and to promote economic prosperity and social integration” (Daniels). On the other hand, cities need to grow in density and not in physical dimension in order to be more efficient and sustainable. Both, seemingly contradicting theories, actually complement each other with the common goal of improving quality of life.

Since high density has a negative connotation within the public realm, it is important to change this perception. A compact city can provide every service, space, and opportunity that current cities provide, but in a more sustainable way. In a dense city, in addition to all of its benefits, commuting distances could be shorter, pollution could decrease, the environment could be healthier, walking and biking could be efficient means of transportation, social bonds could be tighter, sense of community could be stronger, etc. All of these conditions can be improved with density.

Quality of life has become a large influence in city planning. This component of urban design needs to be approached from all possible perspectives. It should follow people throughout the day: at home, work, recreation places, and along the way; and it should cover all four values that have been repeated along this thesis: social, economic, aesthetic, and environmental. Although a holistic approach is needed, only residential design in Quito, Ecuador is addressed in this thesis.

Lately, high density residential projects have become a common practice to provide housing in Quito. As illustrated in the previous chapter, current housing projects' designs fail to fulfill the population's needs by over-weighting economic values. Although this type of residential project is presently leading the construction industry, the approach to values needed for quality of life does not seem to change. Because of these projects' lack of values' balance and physical dimension, they are affecting not only quality of life within them; but also quality of life in Quito. Therefore, the most effective way to ameliorate the living conditions and situation is to improve the design of the projects that

makes the largest percentage of construction. In this way, landscape quality in the city will increase through residential design.

To improve quality of life in high-density residential projects in Quito, some of the techniques used by Yeang, Erickson, and Salmona can be applied to forthcoming development:

- Yeang's basic concept of built structures describes his approach to architecture and surrounding landscape:
Any built form spatially displaces the ecosystem upon which is it located by virtue of its physical presence and form. Besides this areal impact, the built form also modifies the climate, which itself is one of the major determining factors of an ecosystem. The built environment as a system and the earth with its ecosystems as the environment must both be considered simultaneously in the ecological approach to design (Yeang 1995, 189).
Yeang also presents innovative and modern aesthetics which provide inspiration for creative ways of providing greenery within a project.
- Erickson's way of conceiving density and the success of Vancouver should also be considered when designing in Quito. Vancouver's view corridors have been a prominent element in providing good quality of life. Density should neither inhibit vistas nor obstruct open green spaces.
- Salmona's holistic approach to design should be set as role model. With his architecture and especially high-density residential projects, he improved

several aspects of a decaying city. He provided an identity for Bogotá with his aesthetic approach, ameliorated environmental issues through the provision of green spaces and high density, and addressed social aspects without ignoring the economic factor.

The residential aspect of Quito has been researched, analyzed, and improved through a set design principles and application in this thesis. The principles have considered the universal trends and examples provided by other countries and explained in this chapter.

CHAPTER 6

DESIGN PRINCIPLES & APPLICATION

Design principles

Throughout the development of the previous chapters, some design concepts have been identified as aids for regaining the lost balance between the values of quality of life. There are positive aspects in each of the case studies and examples which can be applied to current situations in order to rebuild the good conditions that they previously helped create. These useful ideas can be translated into design principles to be applied in high-density residential projects in Quito, Ecuador.

This thesis presents ten design principles that are a consequence of the combination of present international urban and landscape design practices and Quito's local condition. These principles, that seem logical and are common sense, have been proposed, argued, and used many times throughout the design field. But here, they are stated and made specific to the previously mentioned location and type of project. The design principles have been loosely categorized; although, due to their broad nature, they can overlap and fall into more than one category.

Environmental principles

1. Ecological appropriateness

A design should consider and fulfill both nature's and human needs. A project is required to approach the surroundings in a sustainable – ecological way without sacrificing human comfort, especially residential projects. Also, ecological appropriateness comes with the understanding of the contextual environment; therefore, technology and innovative techniques needed to reach this understanding should be applied. On one side, high-density residential projects often disrespect topography. Landforms are, sometimes, deeply altered, consequently disrupting existing ecosystems. Also, the inappropriate use of plant materials is very common. Existing and proposed vegetation should work together in order to accelerate and optimize nature's recovery and future growth after the intervention. On the other side, a healthy and beautiful environment contributes to human comfort, well-being, and satisfaction. So high-density residential projects need to provide this environment.

2. Maximized functional green areas

Functional green areas are spaces that, on top of being green and open for recreation and interaction, serve an environmental purpose. In Quito, spaces with environmental purposes and ecological practices are not commonly seen. Through the increase of these functional green areas, Quito's environmental conditions would improve and pollution would decrease. For that reason, it is important to include them in future development. In high-density residential projects, specifically, the implementation of bio-retention areas, rain-gardens, rain-water harvesting, and civic agriculture can be very efficient. Use of these techniques could also serve an educational purpose. The

public would learn about these practices and, consequently, they would become more popular and used.

3. Pollution reduction

Large cities presently face a state of permanent pollution due to excessive vehicles, trash, impermeable surfaces, lack of air circulation, etc. Current housing projects do little to remedy these issues, and set the stage for a significant number of people to live in contaminated environments. Functional green areas can take care of some water filtration and infiltration; but air and noise pollution remain unaddressed. High-density residential projects should try to protect their inhabitants from all types of pollution. Structures and greenery can be use as buffers to the outside. They can block noise and promote air circulation or block smog. By using fundamental elements of the project to accomplish alternative purposes, the overall design can become innovative, out of the ordinary, and efficient.

Aesthetic principles

4. Increased aesthetic value

Pleasing aesthetics have a strong influence on the sense of identity and community, and therefore, on quality of life. Enhanced aesthetic value is comprised of several factors such as materials, colors, style, and context. Materials have different effects on a projects aesthetics; for example: wood produces a warm cozy image, while steel produces a cool clean look. Colors have an effect similar to materials; warm colors produce welcoming, active environments and cold colors produce soothing

environments. Style and context are two aspects that should come together. Style should be chosen according to context; one should complement the other. Neighborhood beautification, an international trend, should also be taken into account. In high-density residential projects, aesthetic matters are harder to address. On top of considering the surroundings, they need to consider their inhabitants' preferences which can vary in a wide range.

Social principles

5. Inclusive relationship with surroundings

There are two types of relationships between people and their surroundings: passive/visual and active/physical. Due to Quito's outdoor conditions, the relationship of quiteños with their environment has been limited to a passive/visual one. Even though an active/physical relation has been proven beneficial in several ways, in most cases, it is not practiced. Being outdoor and being active improves physical, emotional, and mental health. For this reason, the promotion of an active/physical relationship is necessary. High-density residential projects should provide pleasant outdoor environments that would inspire people to go outside. A variety of activities should be provided so that people's interest is maintained. Outdoor spaces could include: sports courts and fields, BBQ areas, playgrounds, community gardens, walking and biking trails, educational stations, etc.

6. Enhanced social interaction

Sense of community is a strong influential factor in quality of life. For a community to

grow and develop, human interaction is necessary. In Quito, the sense of community has been affected negatively because of the decrease in human interaction, related to the lack of places where this can happen. Subsequently, these spaces must be provided in future development to regain the sense of community that has been lost. Providing spaces is not enough, it is necessary to ensure their liveliness. A common tactic to guarantee activity during day and night is to have mixed uses. Plazas with restaurants and retail shops combined with residential uses are effective. Semi-public spaces, such as common areas in high-density residential projects, can include outdoor activities like the ones mentioned under principle 5 to attract people. It is important to realize that open spaces by themselves are not successful in bringing people together, it is common interest that does.

7. Private / public balance

A balance between private and public is important to generate good quality of life. On the one hand, a sense of community and identity are deeply connected to human interaction and public spaces where bonding happens. Residences and places where people perform daily activities, on the other hand, need to be private. Semi-public areas are key to the development of tight human bonds; they are spaces where people can meet but they are not widely public. When designing, it is important to think of human activities and provide all types of spaces necessary for their realization. In high-density residential projects, spatial arrangement and typology can affect private/public balance and social dynamics. Often, townhouses promote interaction and generate opportunities

for the development of neighborly relationships, while apartment buildings are socially less effective because privacy predominates.

8. Safety considerations

The need to be safe is part of human nature, therefore, safety considerations need to be addressed when designing. Besides location, alarm systems, dogs, etc. there is plenty that can be done with the form and design itself. Do not leave dark, shady, left over spaces, especially at ground level. These spaces provide opportunities for unsafe situations and they also accumulate trash, unwanted objects, and rain water if not drained properly. Due to the usual size and conditions of these areas, they become unpleasant, and useless, therefore abandoned and dangerous. In high-density residential projects, safety is easier to address because of the presence of a large number of people. Mishaps are not likely to happen when surrounded by potential help. However, design should always pay attention to ground level spaces and avoid awkward left over areas that could represent a threat. If designed carefully, all spaces could be an opportunity for recreation and interaction.

Economic principles

9. Maximized positive views

Positive views are always appreciated. Offices, houses, and sites with views are always sought-after because of the positive feelings they provoke. People enjoy being in them since they inspire calmness, tranquility, and relaxation. All these sensations have a positive effect on people's behavior, health, and life. Unfortunately, not all places

have nice views. This aspect can be tightly related with geographical location and surrounding structures and development. However, disregarding location, there is plenty a designer can do in this matter. Views can be created within a project. Attractive features and natural areas can be immersed in the project, in this way, defeating the need to resort to external landscapes. High-density residential projects have the advantage of large sites. Space is an important resource when it comes to designing accents that will enhance views. Views will also promote the project and will benefit return incomes and profit.

10. Complementary relationship with context

As explained under principle 1, ecological considerations with the context are necessary, but social considerations are equally important. Social context should be considered in every aspect of the design process. Programming, aesthetics, structures' form, infrastructures' placement, circulation, hardscape, etc. should work towards supplying what is missing. They should behave as a complement of existing conditions and also foresee future conditions to complement them as well. This is how high-density residential projects can provide good quality of life to their inhabitants and also improve it for the surrounding neighborhood. If the area is lacking recreational spaces, retail, basic services, etc. they can be provided through the new project. Another matter that is essential, but difficult to be approach through a private project is transportation. Connectivity with the rest of the city should always be optimal and projects should approach and improve this issue as much as possible. If overall conditions are

improved, then the project's value will increase.

Projects that provide settings that contribute to a better quality of life can be designed by following these principles. High-density residential projects in Quito, Ecuador have more potential to be improved by paying attention to these ten aspects. Following this section, an application of these principles is developed. This project represents an example of how they can be used in a particular setting. However, is important to keep in mind that they can be applied in diverse ways to several projects in different locations.

Site information, inventory, and analysis

The site where the high-density residential project of this thesis will be developed is located in the San Rafael area, in “El Valle de los Chillos”. This neighborhood is where the city meets the suburban development. Because of this condition, ordinances in San Rafael have recently changed and, what used to be part of the suburban development is now overbuilt. The land use plan allows the following uses in this section of the city: residential, multiple uses, equipment uses, and ecological preservation. (Perez)

- Residential: consists of single family houses, small housing projects, and high density residential projects combined with offices related to neighborhood services (CMQ).
- Multiple use: refers to residential and commercial use in one structure (CMQ).
- Equipment use: it is comprised of educational, cultural, social well-being, health, recreational, religious, and public administration facilities (CMQ).

- Ecological preservation: includes forests, parks, right of way of natural features, flooding planes, and protective vegetation (CMQ).

The previous use was mainly residential only allowing single-family houses. Except for ecological preservation, all the current uses allow taller structures and a higher FAR than before. The minimum plot size is also smaller (Perez).

TABLE 6.1: PROJECTED POPULATION OF EL VALLE DE LOS CHILLOS

1990 CENSUS	73,894 inhabitants
2001 CENSUS	116,946 inhabitants
DEMOGRAPHIC RATE OF GROWTH	4.30%
EXPECTED IN 2005	132,601 inhabitants
RATE OF GROWTH	3.20%
EXPECTED IN 2010	152,170 inhabitants
RATE OF GROWTH	2.80%
EXPECTED IN 2015	171,739 inhabitants
RATE OF GROWTH	2.40%
EXPECTED IN 2020	191,309 inhabitants
RATE OF GROWTH	2.20%
EXPECTED IN 2025	210,878 inhabitants

(Perez)

Most of the site's immediate context has considerably changed in the past few years. Buildings and high-density residential projects have replaced large houses and their yards. Currently, three single-family houses can still be found on the site. It is probable, based on previous patterns seen in the city, that investors and developers will buy this land and turn it into a housing project which would not be environmentally friendly. This site represents a typical case of profit-oriented development; therefore, it provides an

opportunity to demonstrate a different way of designing housing projects.

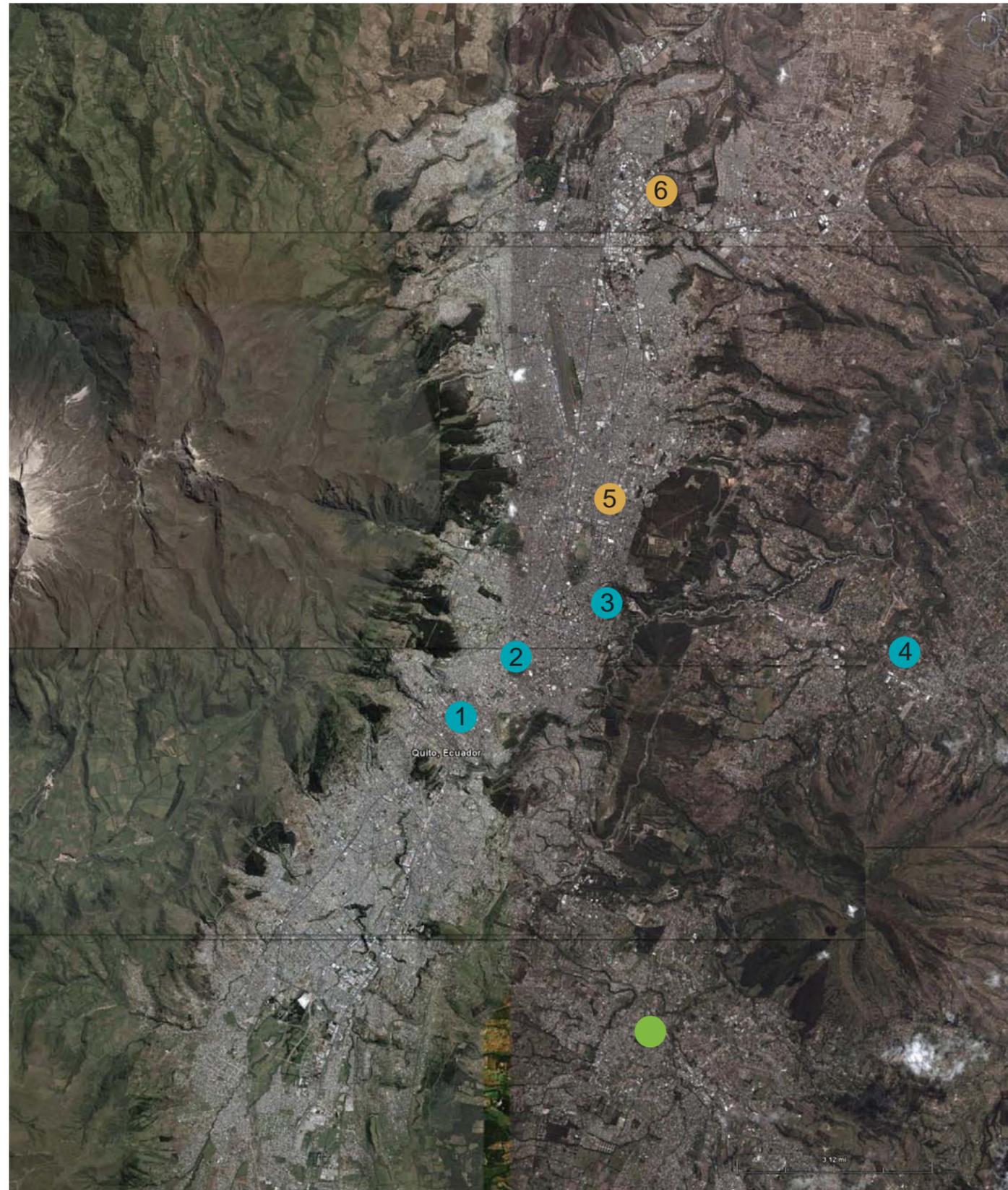
The site's total area is 1.24 hectares (3.07 acres), and the FAR is 50%. Structures can be 3 stories tall or a total of 9 meters (29.53 feet). Zoning ordinances require a 5 meter (16.4 feet) setback from the street, a 3 meter (9.84 feet) setback from neighboring properties, and a 10 meter (32.8 feet) setback from the river. The area excluding setbacks is 0.86 hectares (2.13 acres) (Figure 6.10).

- Figure 6.1 shows the location of the case studies, historic and contemporary, and also the location of the site within Quito.
- Figure 6.2 shows the site's immediate context and the highly commercial area nearby. In this area all services can be found as well as public transportation which provides connectivity with the rest of the city. This figure also shows the presence of the “Santa Clara” river, which is an attractive feature of the site and also a river that overflows during rainy periods, apparently during a 20-year storm event.
- Figure 6.3 explains the site's connectivity and transportation. Major thoroughfares are located just a block away from it. However, traffic, noise, and pollution are not as noticeable on site because the access street to it is a cul-de-sac. A dead-end street always ensures no through traffic, privacy, and safety. All of these characteristics are reinforced, in this case, by the “Santa Clara” river.
- Figure 6.4 is a site inventory. Major features have been traced such as

structures, hardscape, water features, and major vegetation. Other elements such as temporary fences, doors, and minor vegetation have not been shown. Soil survey research indicate that the soil on site is a mix of thick sand and clay. This type of soil is stable and able to support two to three-story structures with no problem. The presence of thick sand makes drainage easy, it naturally takes water to the lowest points which are all located towards the river without the need of human intervention. Surrounding uses are also denoted as well as the sun's trajectory. Because of Quito's location so close to the equator, the amount of sunlight received from the north and south sides is the same. Therefore, the only important information regarding this matter is the direction of dawn and dusk which provides orientation of morning and afternoon sunlight.

- Figure 6.5 is a circulation analysis. Existing pedestrian and vehicular circulation was traced as reference for future design. Current vehicular circulation is particularly important because of the required maximum slope for driveways which is 10%. Current pedestrian circulation on site has taken place naturally, therefore, it provides paths that common sense and human comfort have developed according to topography and other site specific conditions.
- Figure 6.6 is an elevation analysis. The lowest point of the site is about 2,395 meters (7,857.61 feet) and the highest about 2,410 meters (7,906.82 feet)

- above sea level. The site is a fairly stable hillside, with no high points or low points within it, just at the borders.
- Figure 6.7 is a slope analysis. The figure clearly identifies three areas with steep slopes that would need to be respected and remain untouched. Most of the site's slope is easy to work with and prone to efficient and viable development. Some of it, because of existing structures, has already been graded in a reusable way. Consequently, building footprints will need to be considered during the design process.
 - Figure 6.8 presents sections of existing conditions. These sections are an accurate representation of topography and buildings. Vegetation has been placed just to identify open green spaces and are not placed precisely where trees are currently located on site.
 - Figure 6.9 is comprised by different images of the site that show existing conditions and the suburban character of it. There is old and mature vegetation on site and some trees have grown to an art-like shape providing a natural feature to be looked at. The generous driveway is also shown, which is well designed and used often. The old stone water feature is still working and it can be turned on. The last photo provides an idea of the architecture of all three structures and particularly the house on the upper portion of the property.



- Historic Case Studies:
 1. Mejía House - Colonial Downtown
 2. Café Cultura - Early to Mid 20th Century Expansion
 3. Casabella - Late 20th Century Vertical Growth
 4. La Viña - Current Suburban Development

- Contemporary Case Studies:
 5. Parque Real - Apartment Buildings
 6. Génova - Townhouses

- Site

FIGURE 6.1: LOCATION OF SITE WITHIN QUITO



FIGURE 6.2: SITE'S CONTEXT MAP - Aerial of the site and its surroundings.

According to the land use map, the immediate context of the site is comprised by residential use, multiple use, equipment use, and natural areas. The site is located at the edge of a highly commercial area that is active all day. The setbacks and flooding areas related to the "Santa Clara" river are natural areas to be preserved.

- Santa Clara River
- Highly Commercial Area
- Enclosed Area: Site

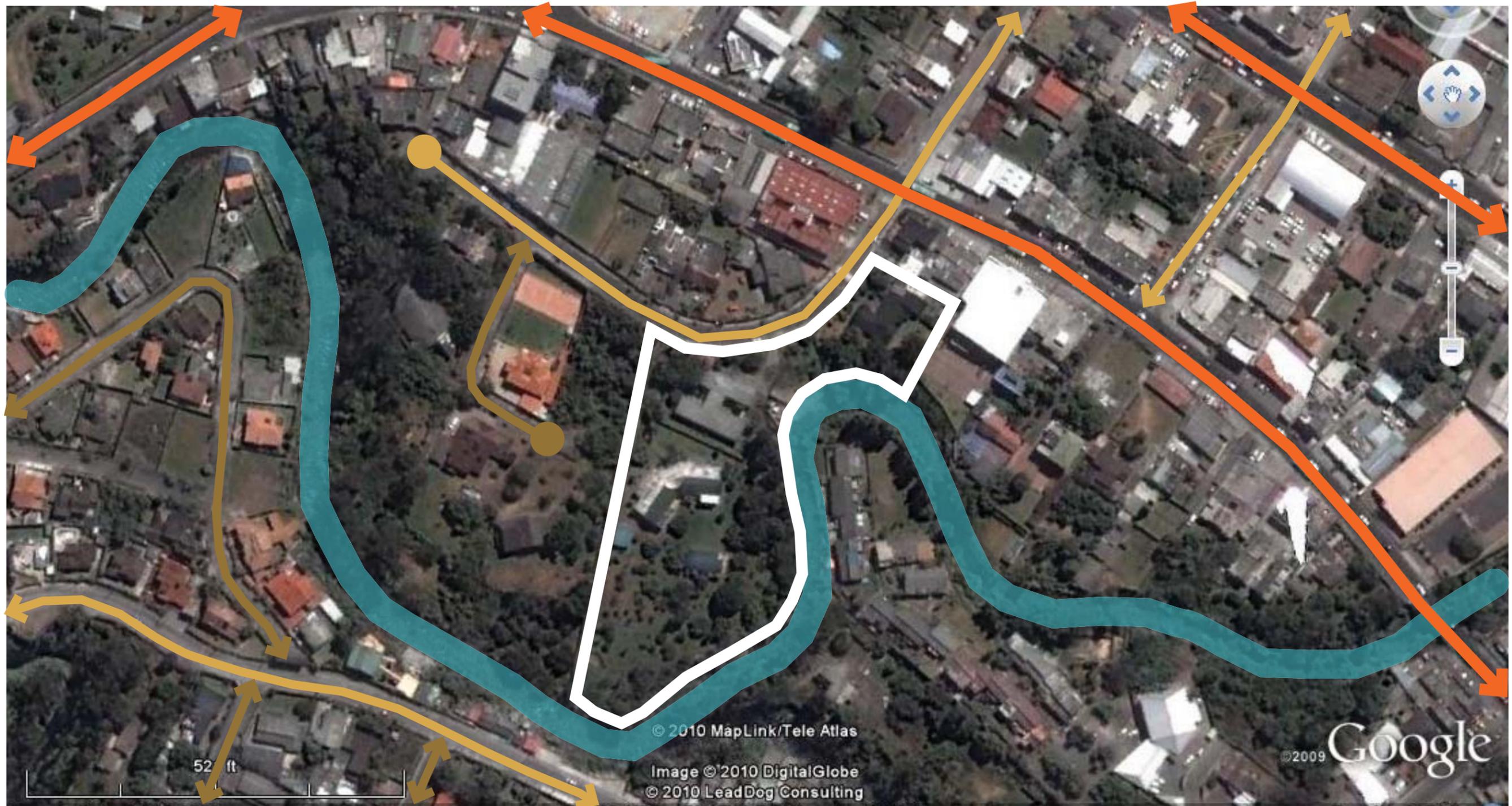


FIGURE 6.3: SITE'S CONNECTIVITY AND TRANSPORTATION

Public transportation and major thoroughfares are located close to the site. Several bus stops can be found within a ten minute walk which provides good connectivity with the rest of the city. The site's access street is a culdesac that ensures no through traffic, privacy, and safety which is also reinforced by the "Santa Clara" river.

- █ Primary Avenues
- █ Santa Clara River
- █ Secondary Streets
- Enclosed Area: Site
- █ Neighborhood Roads

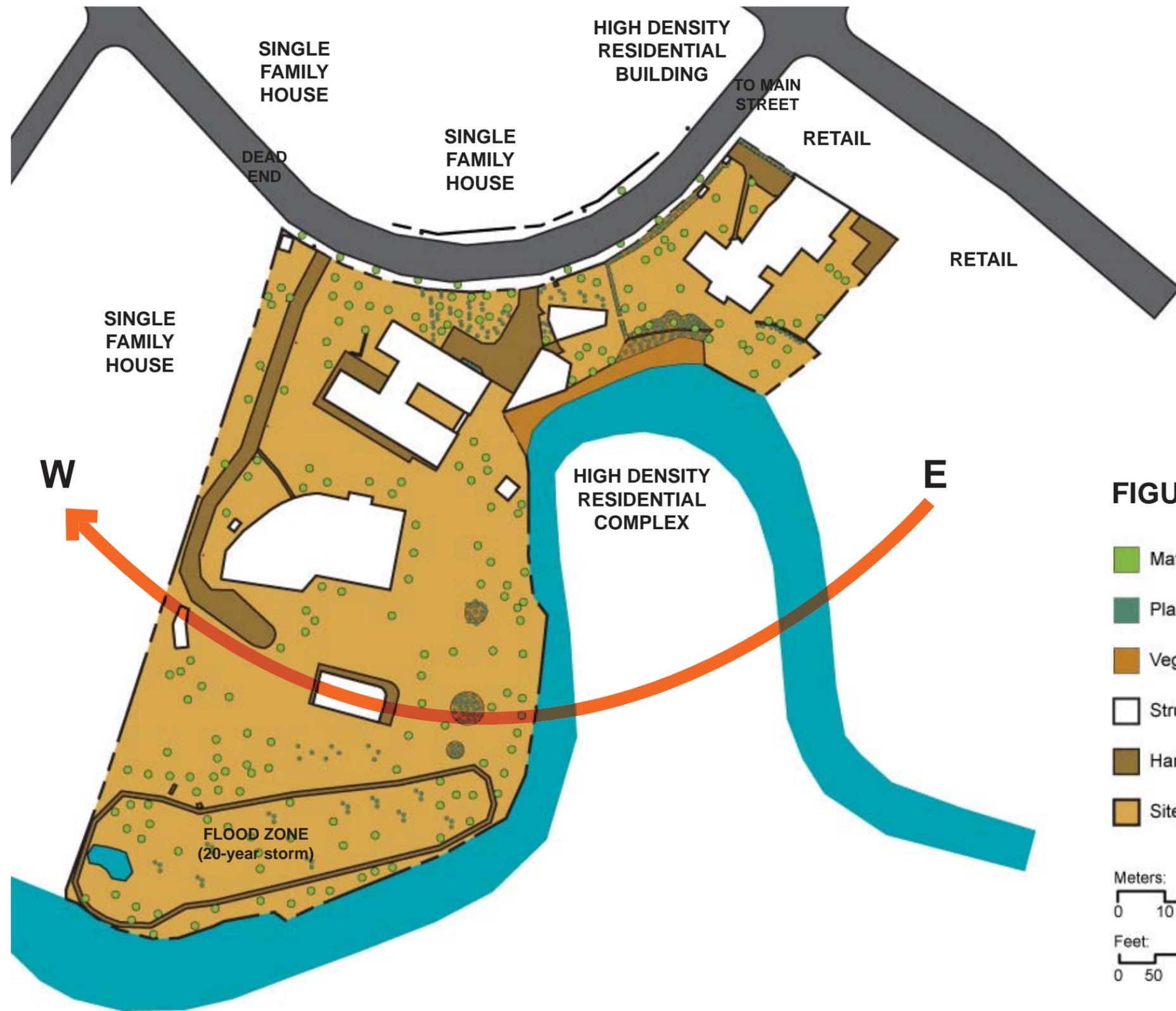
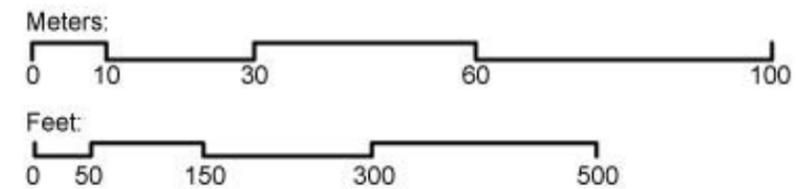


FIGURE 6.4: SITE INVENTORY

- | | |
|------------------------|-------------------|
| Mature Trees | Streets |
| Plants | Street Lights |
| Vegetated Areas | Santa Clara River |
| Structures | North Arrow |
| Hardscape | |
| Site and Property Line | |



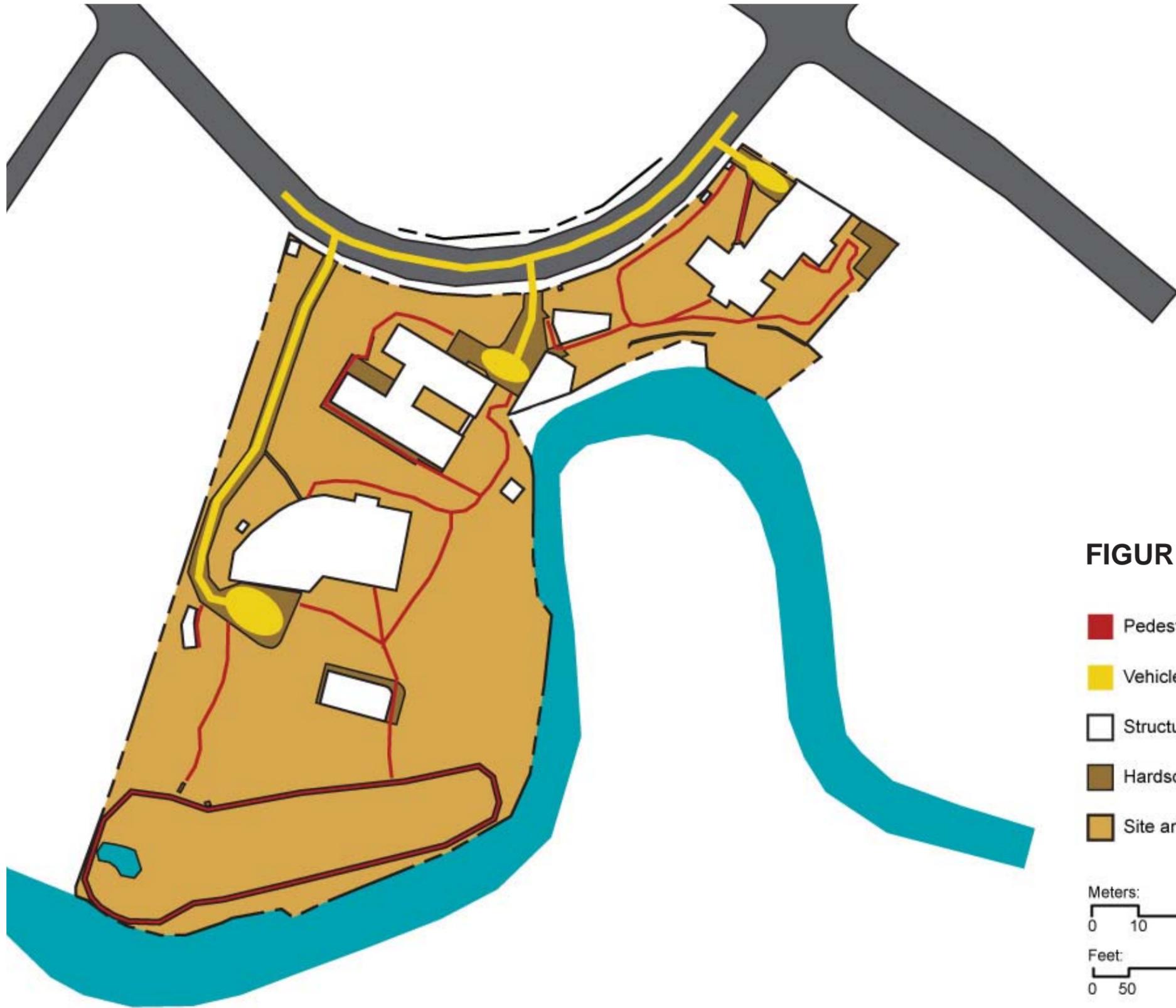
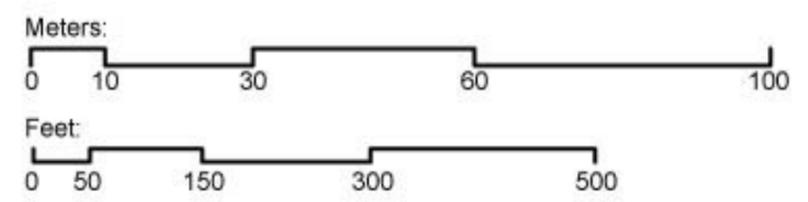


FIGURE 6.5: CIRCULATION ANALYSIS

- Pedestrians
- Vehicles
- Structures
- Hardscape
- Site and Property Line
- Streets
- Santa Clara River



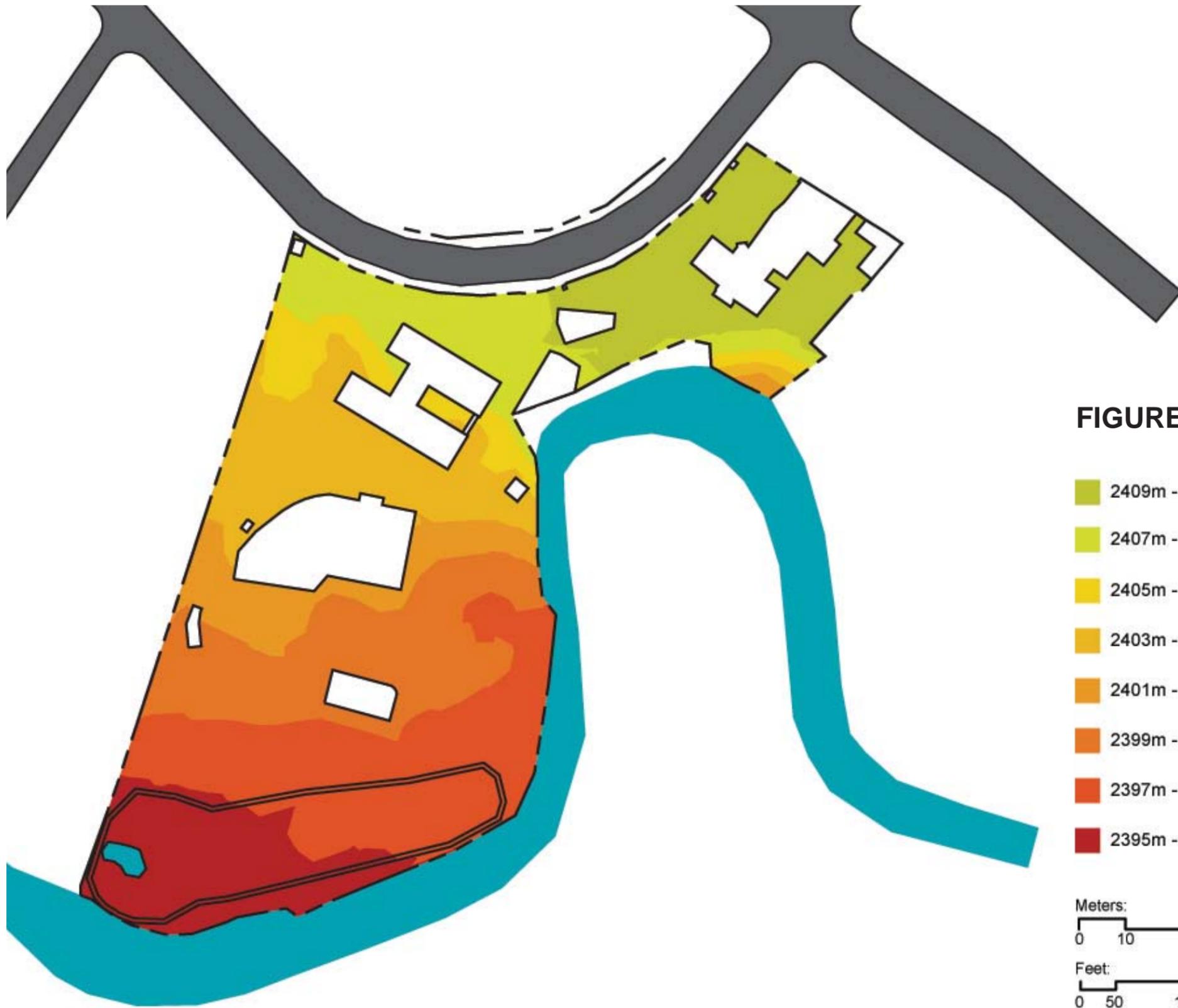
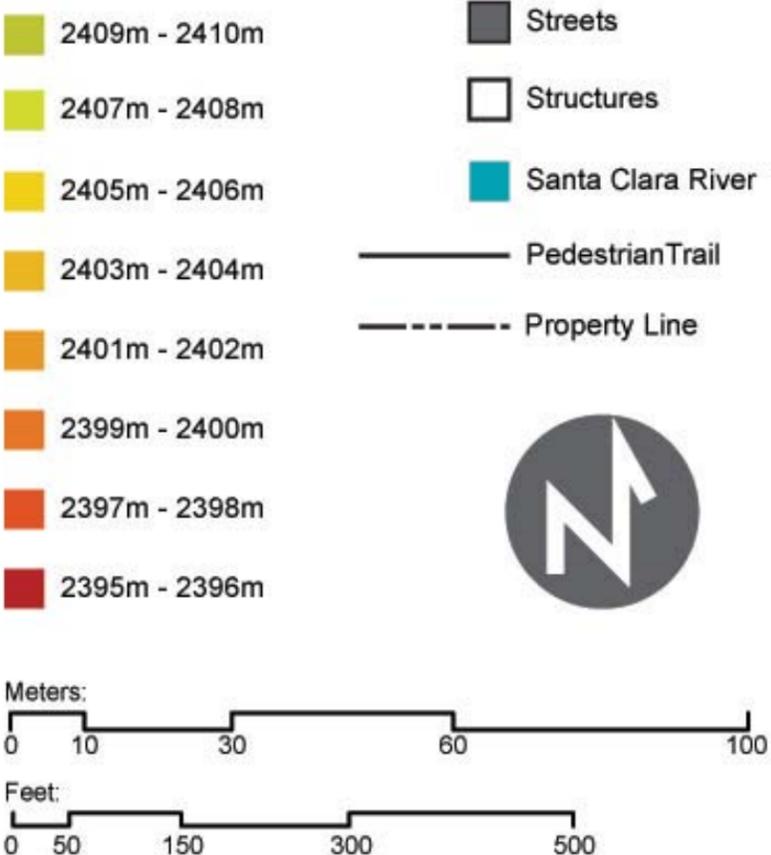


FIGURE 6.6: ELEVATION ANALYSIS



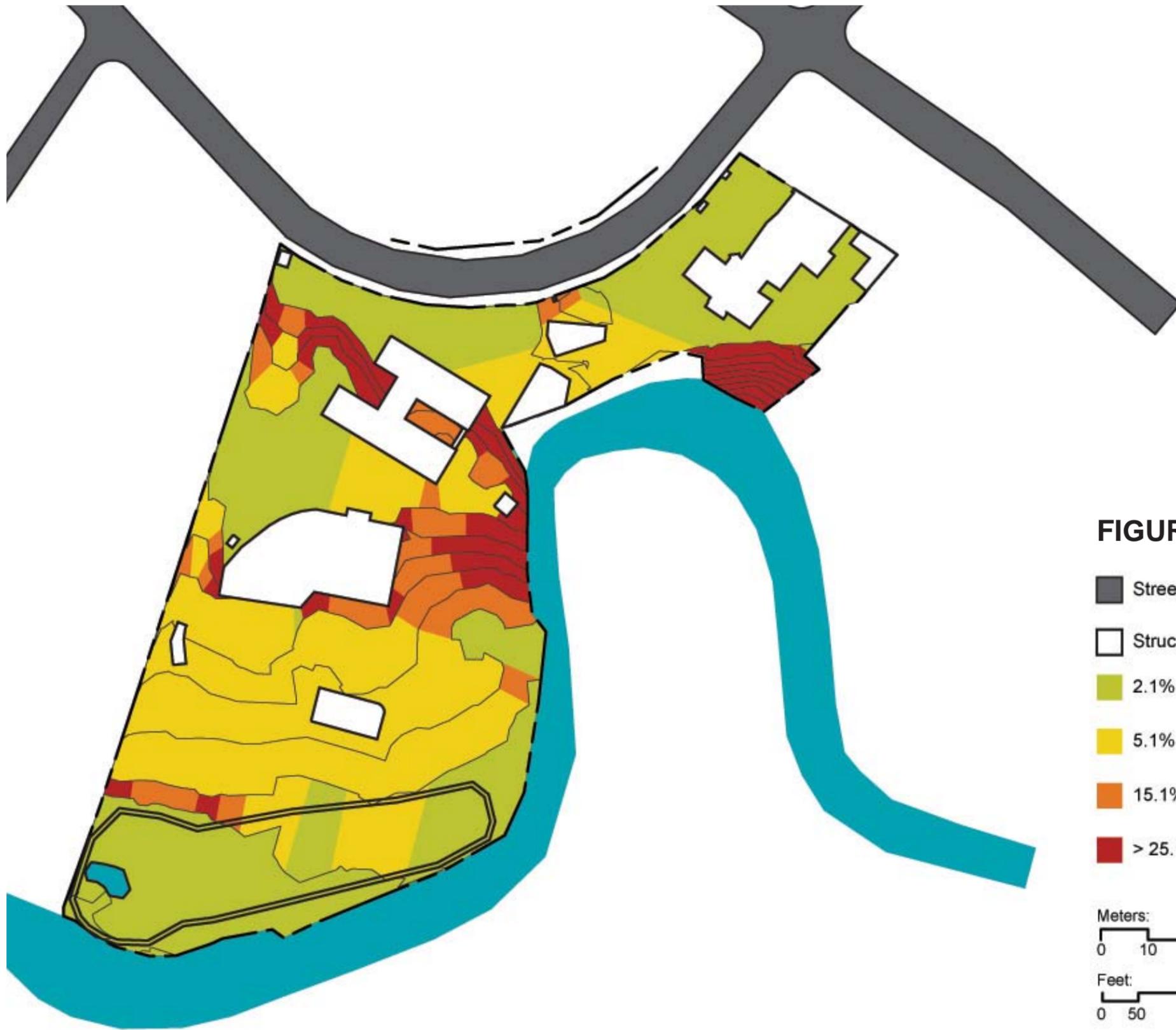
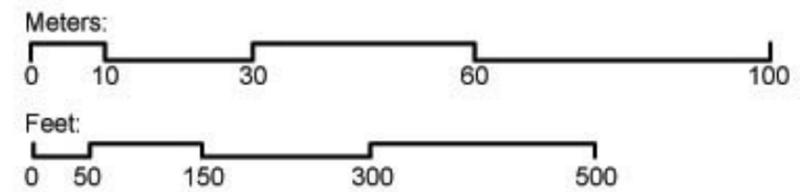
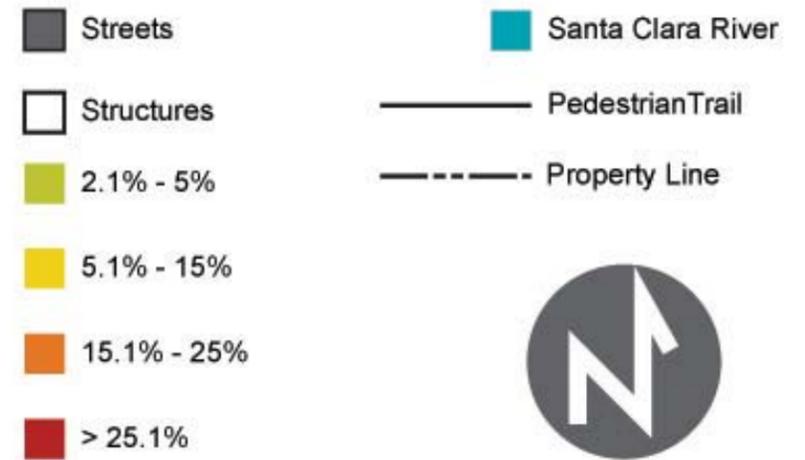


FIGURE 6.7: SLOPE ANALYSIS



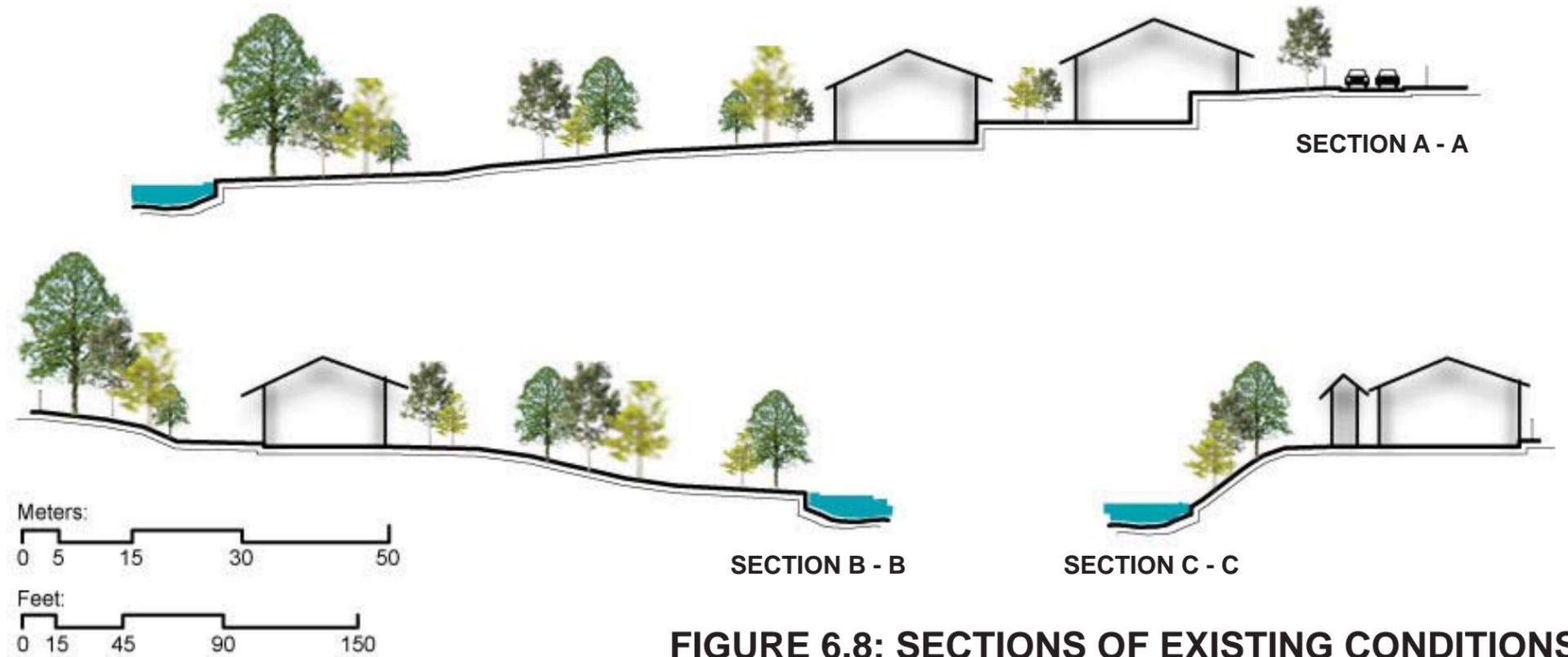


FIGURE 6.8: SECTIONS OF EXISTING CONDITIONS



Mature art-like vegetation



Lower vehicular access



Water feature



Upper house

FIGURE 6.9: IMAGES OF EXISTING CONDITIONS

Design application

A high-density residential project has been designed on the previously analyzed site.

Regarding the design principles, this project addresses them as follows:

1. Ecological appropriateness: Steep slopes that were found on site are left untouched and used as features to provide vistas. The existing driveway is used in order to utilize already graded land. Houses are provided with garages and cross ventilation for human comfort.
2. Maximized functional green areas: Bio-retention areas are proposed on site and a list of recommended plants is also provided. Steep slopes are stabilized with vegetation. Other practices such as solar panels, rainwater harvesting, and green walls and roofs are recommended for the architecture.
3. Pollution reduction: A vegetated buffer towards the access street is provided. This buffer also provides privacy for the common grilling area. Buildings are also used as buffers, they isolate vehicular circulation within the project so that common and open areas are free of automobiles, noise, and pollution.
4. Increased aesthetic value: The aesthetics of the project are loosely addressed. It is suggested to make architecture dynamic and, also, apply sustainable and ecological practices as mentioned before.
5. Inclusive relationship with surroundings: Quality open recreational areas are easily accessed from any location within the project since they are scattered throughout the site; and units have two free facades that face open areas,

- providing views. Both, active and passive relationships are addressed.
6. Enhanced social interaction: To ensure people's presence in common areas, the design has set the stage for several activities to happen, including a community garden, children's playgrounds, a grilling area, bio-retention areas with an educational purpose, and outdoor furniture to provide comfort.
 7. Private / public balance: This aspect is approached through the provision of public, semi-public, and private spaces. Also, this design consists of a small-scale townhouse project divided into two complexes that would minimize the lack of privacy that typical townhouses have.
 8. Safety considerations: The project can be accessed through two entrances, pedestrian and vehicular, both of which are designed to be easily controlled. Useless, small, left over spaces are minimized, and the building configuration allows neighbors to notice if any unsafe situation is happening.
 9. Maximized positive views: Housing units are provided with openings and views to two sides minimum. Most of them have one natural view, a product of the site's location and features, and one created or designed view. Through this method, views have been maximized throughout the project.
 10. Complementary relationship with context: Building heights, circulation, hardscapes, and program are planned considering the contexts. The parking area and plaza supply usable spaces that the neighborhood lacks. Street frontage buildings harmonize in height with surrounding ones.

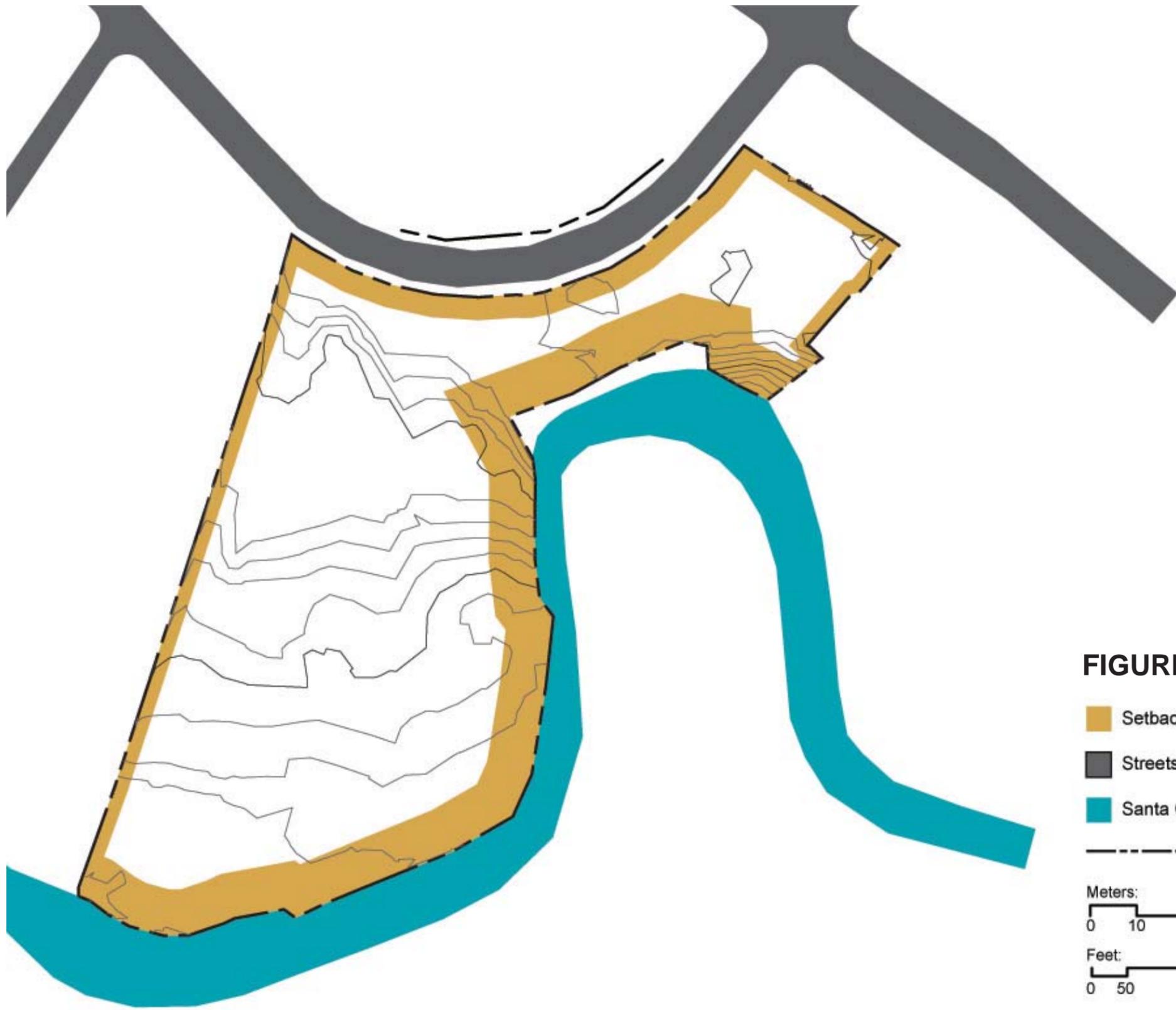
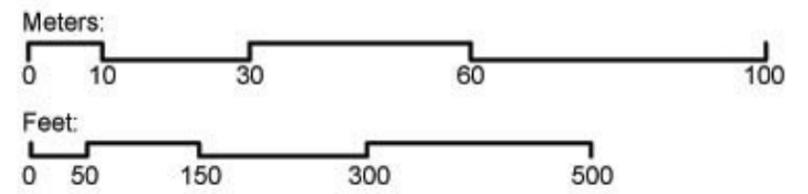


FIGURE 6.10: SITE WITH SETBACKS

- Setbacks
- Streets
- Santa Clara River
- Property Line



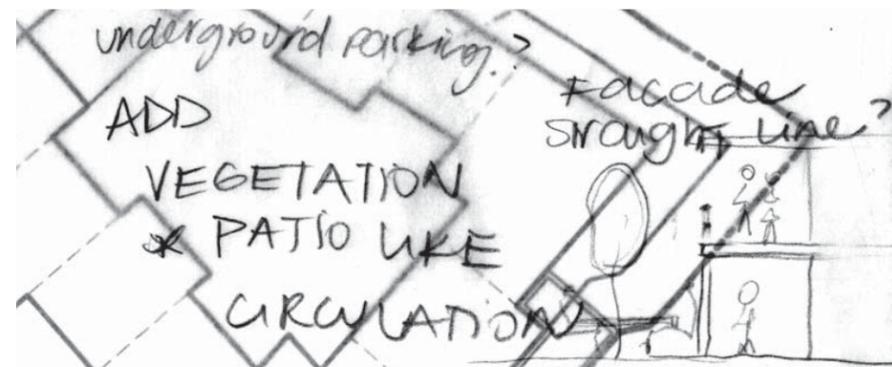
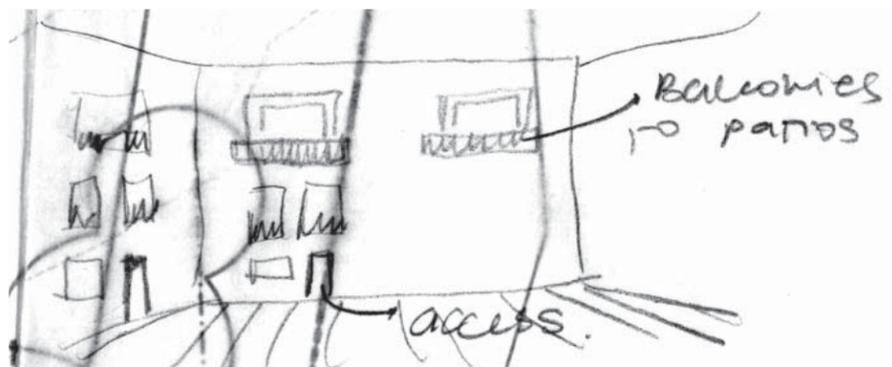
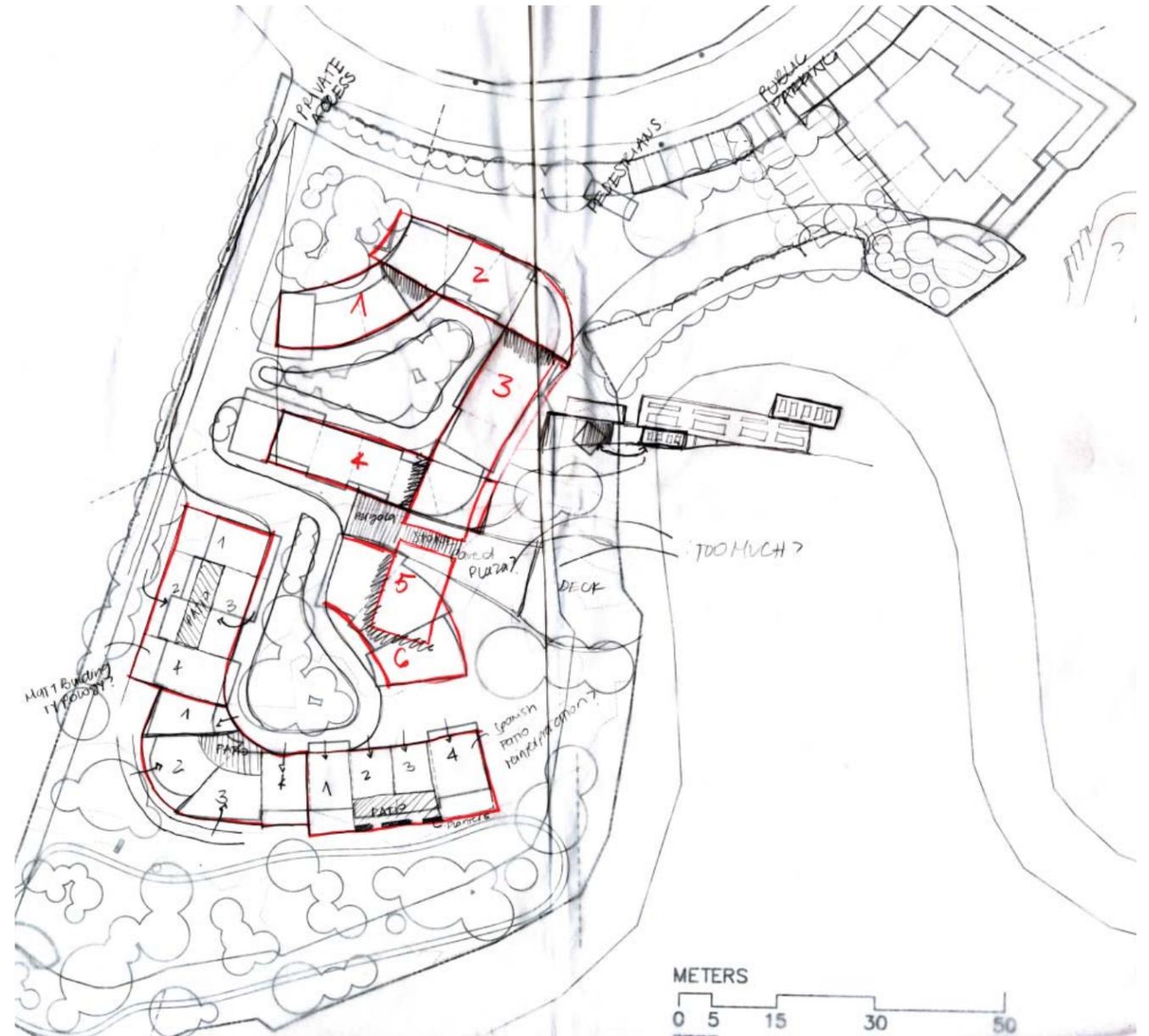
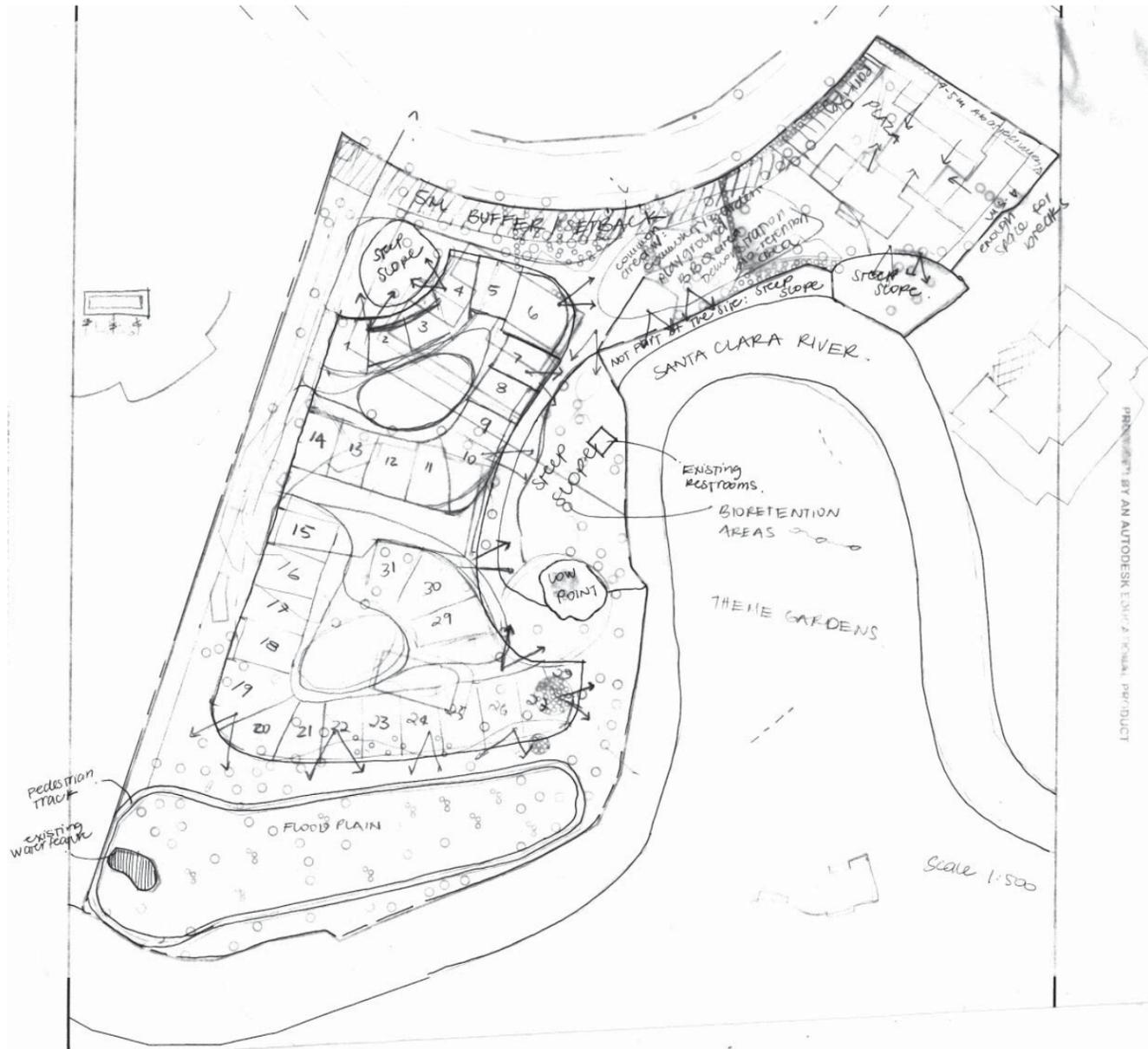


FIGURE 6.11: PROCESS

These sketches show steep slopes that were left untouched; illustrate some ideas of outdoor activities; and provide different reinterpretations of the typical patio previously used in Quito's residential architecture. The patio idea was applied to housing units and public retail area. Ecological and social aspects were considered in the design process.

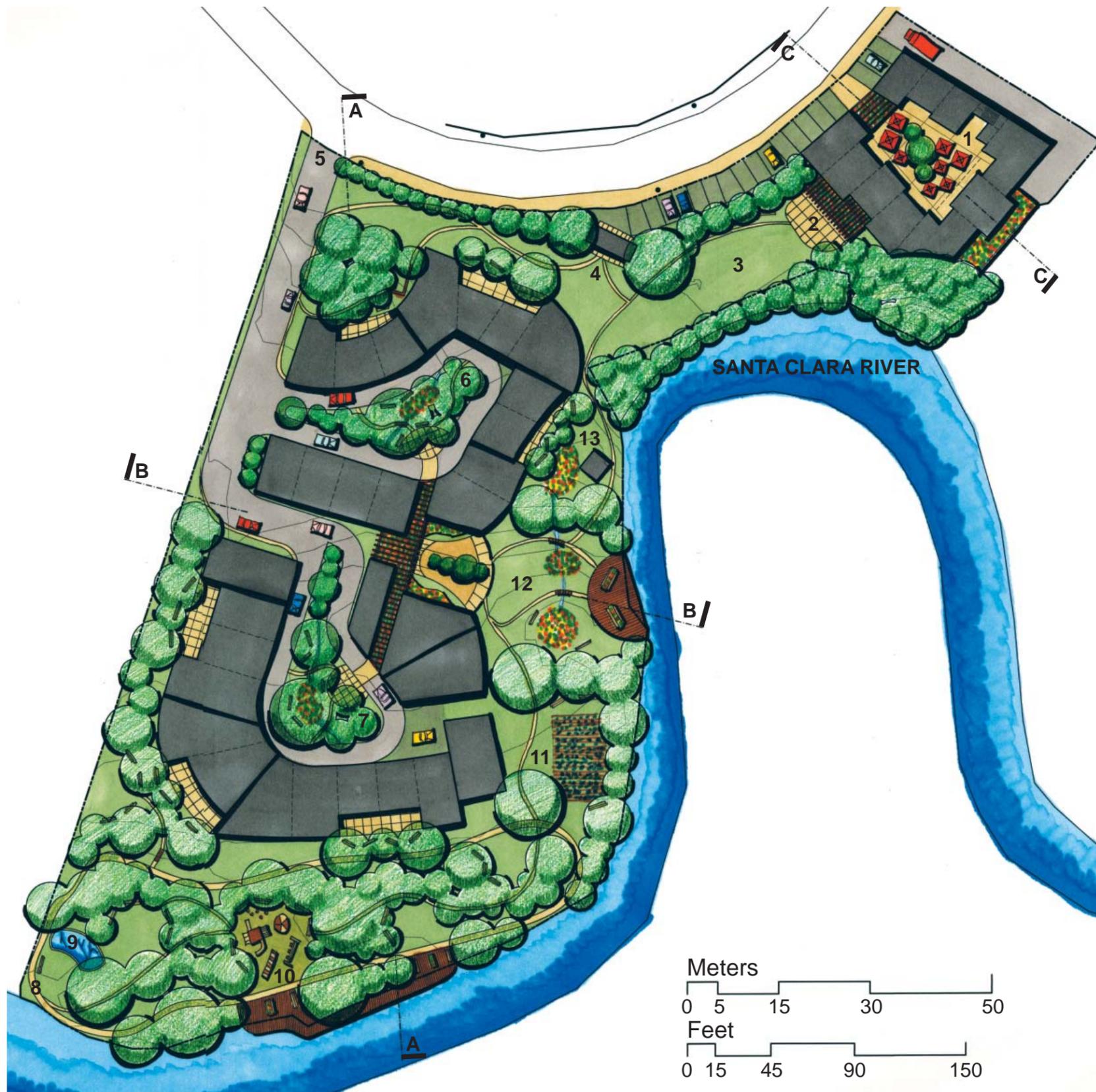


FIGURE 6.12: MASTER PLAN

- 1. Commercial plaza with restaurants and retail
- 2. Grilling area
- 3. Soccer lawn
- 4. Visitors and pedestrian entrance
- 5. Vehicular entrance
- 6. Building #1 complex
- 7. Building #2 complex
- 8. Biking and walking track
- 9. Water feature
- 10. Playground
- 11. Community garden
- 12. Common area with plaza and deck
- 13. Restrooms



FIGURE 6.13: UPPER AREA

1. Vehicular service entrance for retail
2. Eco-paved public parking spaces
3. Commercial plaza
4. Structure with retail on ground level and apartments on upper levels
5. Grilling area with pergola
6. Soccer lawn
7. Slope stabilized with vegetation
8. Backdrop planter for retail venues

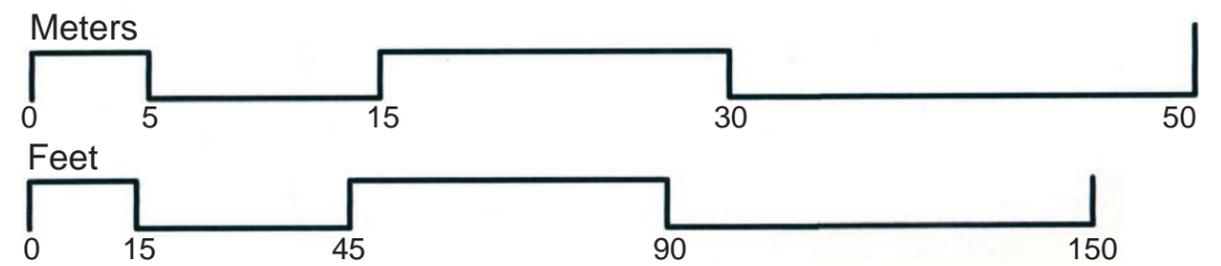




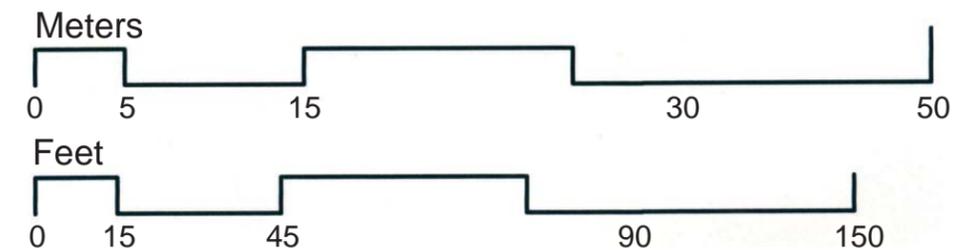
FIGURE 6.14: MIDDLE AREA

1. Main vehicular entrance
2. Vehicular access to building complex #1
3. Vehicular connection to building complex #2
4. Housing units building complex #2
5. Garden with bioretention area and gathering area for building complex #1
6. Eco-paver access to garages
7. Existing restrooms
8. Patio shared between housing units (typ)
9. Slope stabilized with vegetation
10. Main visitors and pedestrian entrance



FIGURE 6.15: LOWER AREA

1. Vehicular access to building complex #2
2. Patio shared between housing units (typ)
3. Vegetated buffer to neighboring property
4. Small amphitheater for children's parties
5. Picnic area
6. Existing water feature
7. Picnic area
8. Existing biking and walking track
9. Children's playground
10. Boardwalk over the river
11. Gathering area by the river
12. Gathering area
13. Community garden
14. Housing units building complex #2
15. Eco-paved access to garages
16. Garden with bioretention area and gathering area for building complex #2
17. Entrance to main common area and connecting pergola
18. Main plaza
19. Bioretention areas with educational purpose
20. Main deck overlooking the river



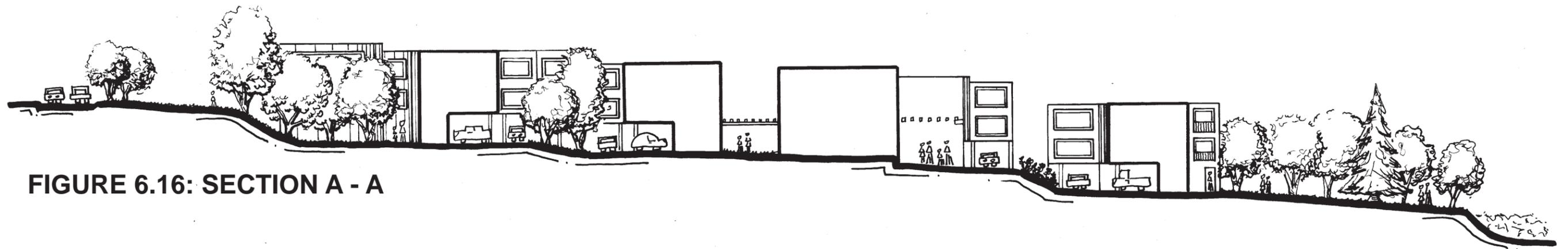


FIGURE 6.16: SECTION A - A

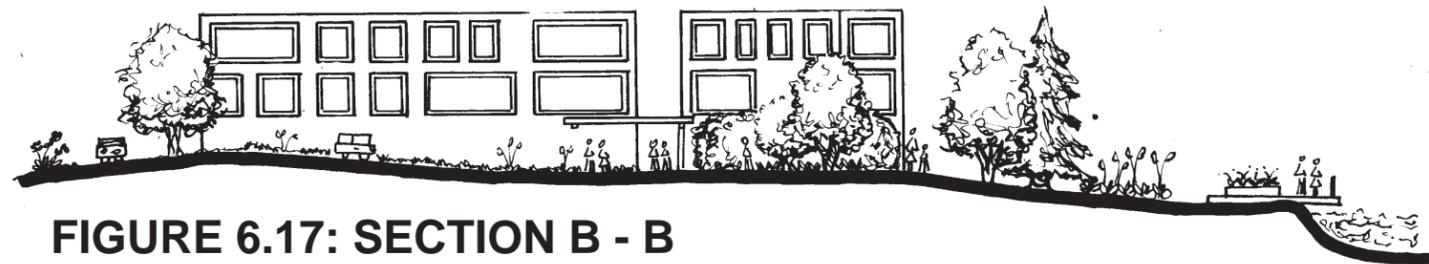
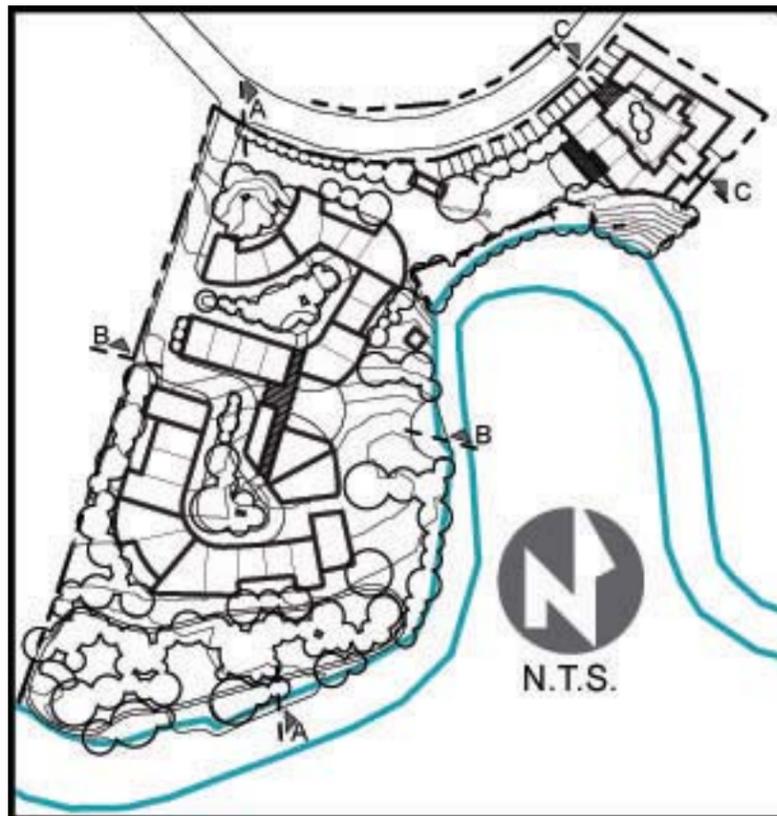


FIGURE 6.17: SECTION B - B

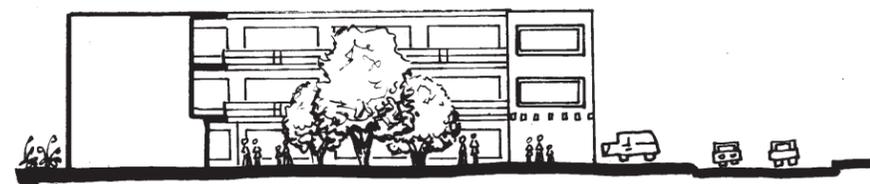
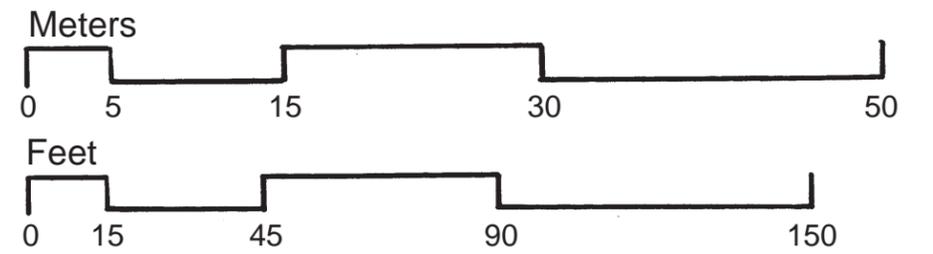


FIGURE 6.18: SECTION C - C



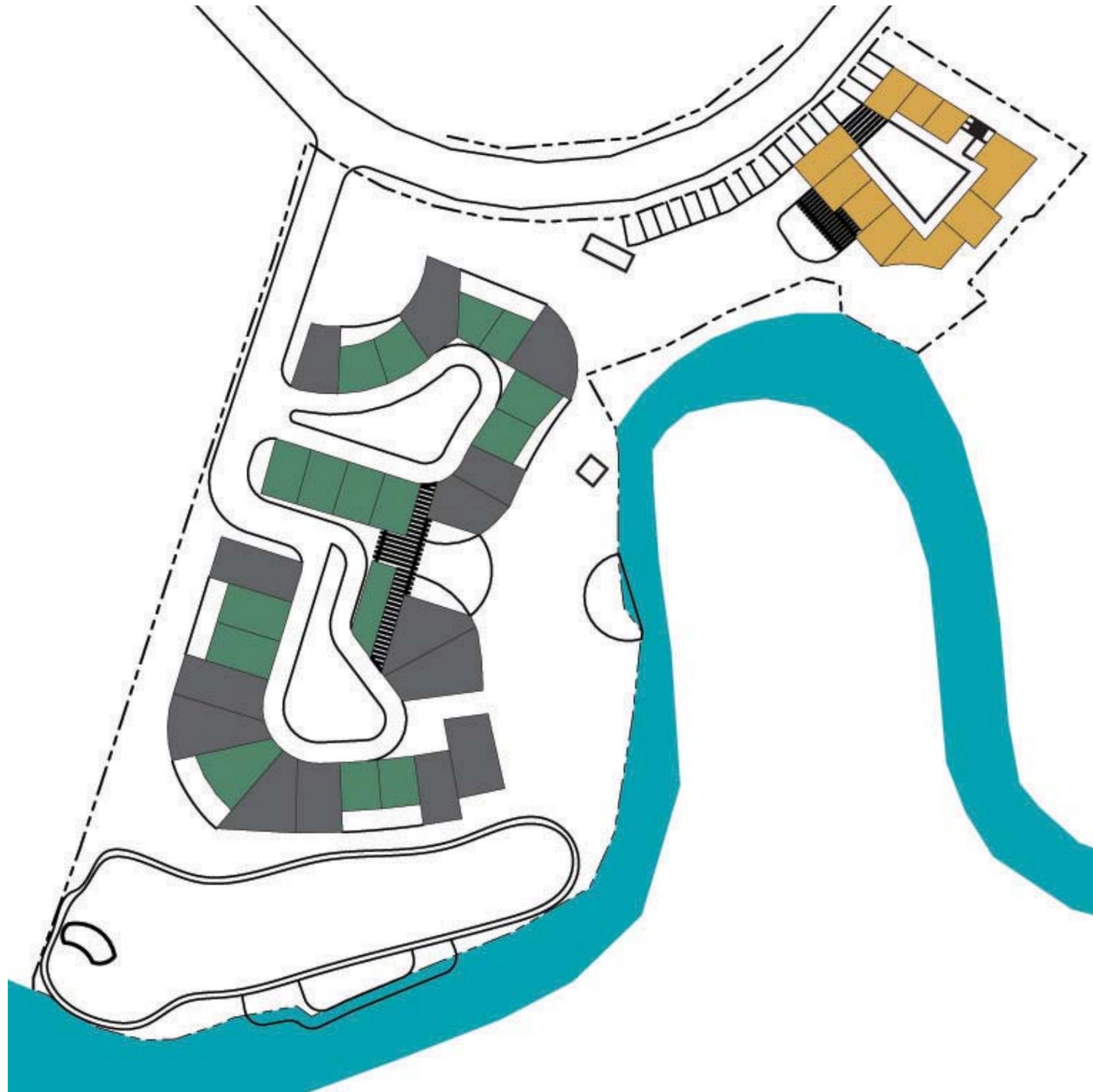


FIGURE 6.19: TYPES OF HOUSING UNITS

In order to provide a more diverse community, housing units were designed with the purpose of mixing social strata. According to location, parking units, and square footage, their value varies. Therefore, smaller units with no parking spaces closer to main thoroughfare will be more affordable than larger houses with garages closer to the track.

■ High Income
 ■ Mid Income

■ Low Income
 ■ Santa Clara River

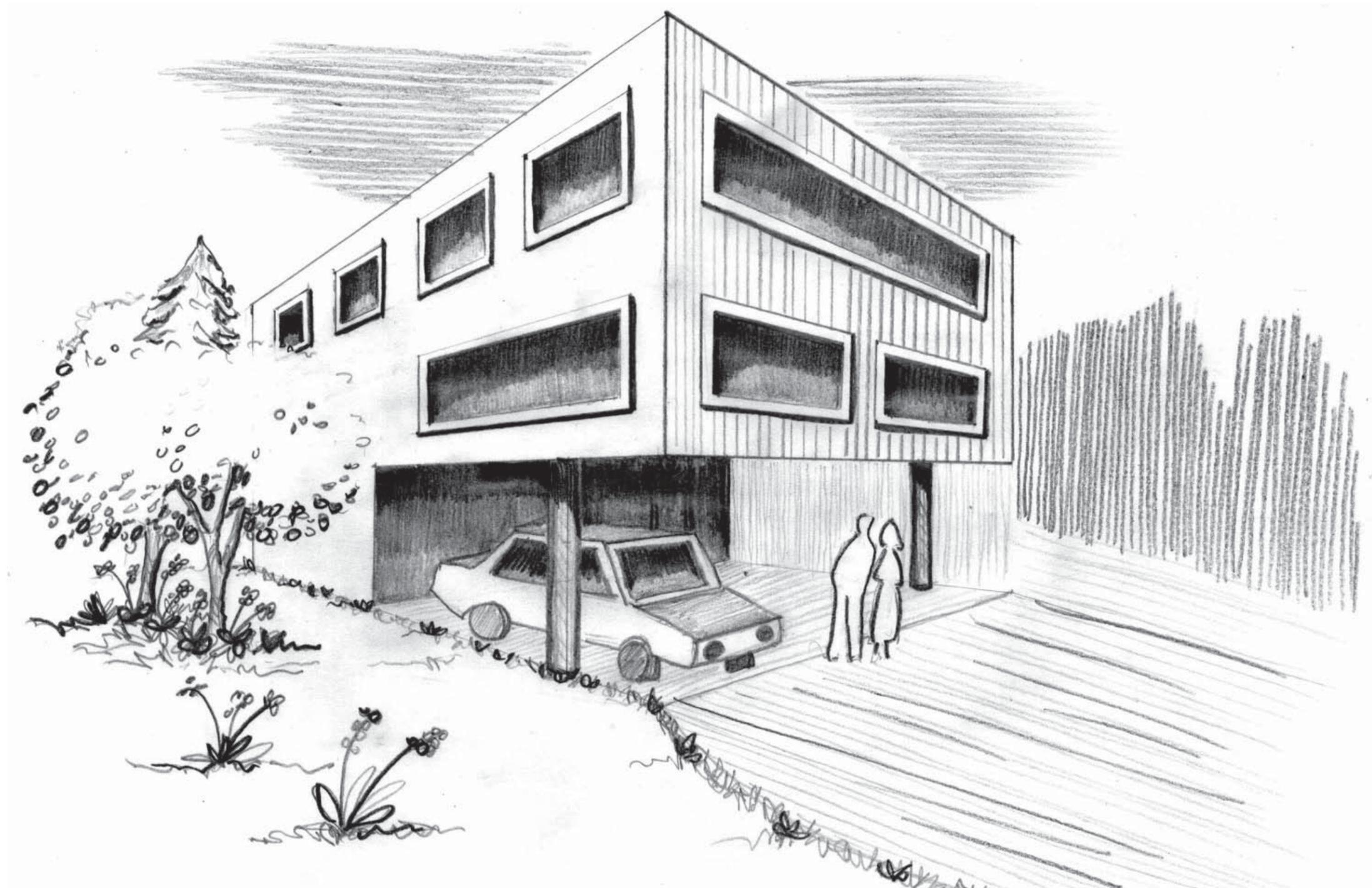


FIGURE 6.20: HOUSING UNIT PERSPECTIVE

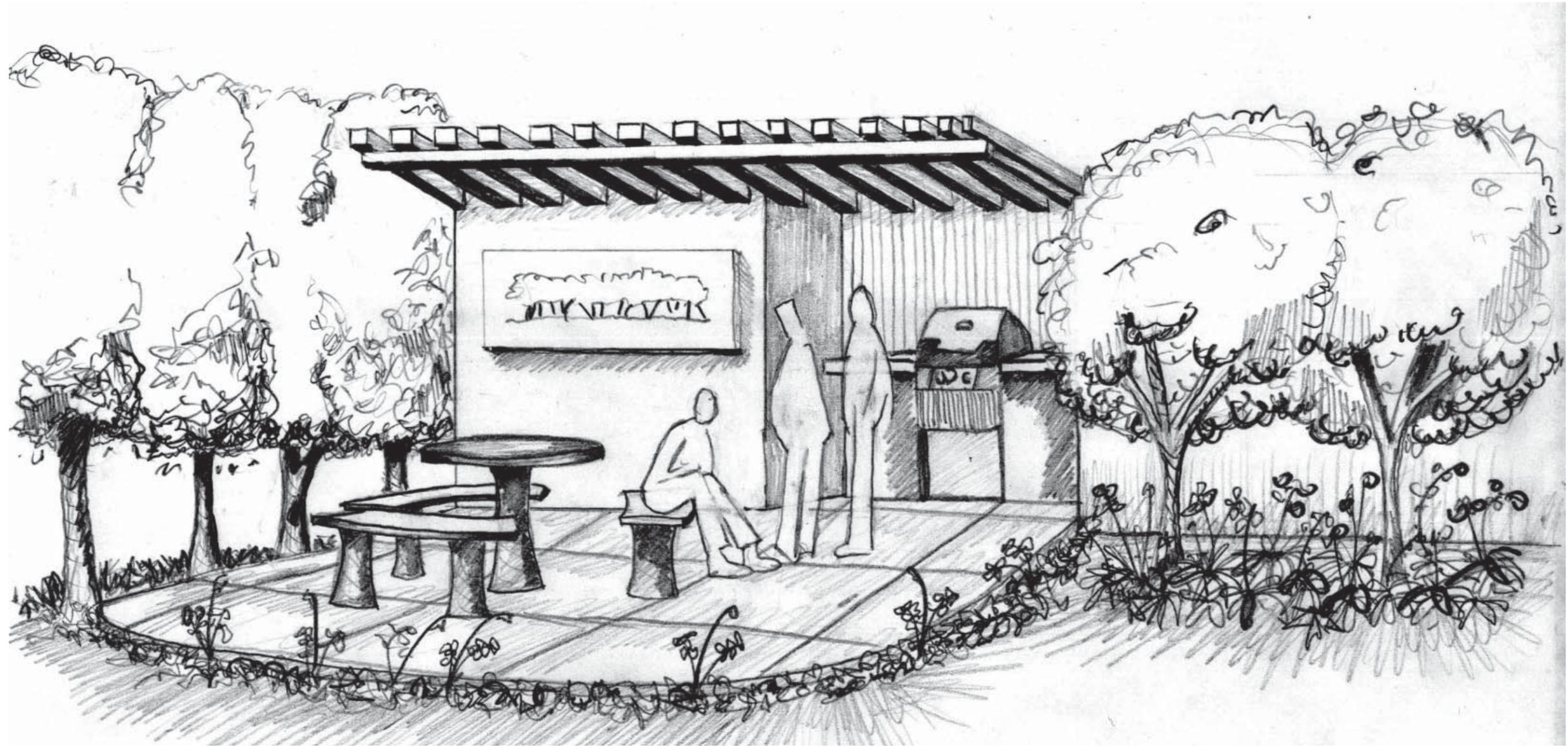


FIGURE 6.21: GRILLING AREA PERSPECTIVE



FIGURE 6.22: RETAIL PLAZA PERSPECTIVE

Common areas should be accessed by emergency vehicles. There are wide green paths that allow transit of these vehicles. These green areas should use eco-pavers, structural soil, or vehicular accessible grass.

The patios that are shared between housing units are a recreation of the architectural style of the colonial period. Balconies are suggested for these areas. Also the use of rain-water harvesting to provide water features within the patios is recommended. This practice will not only provide interesting aesthetics, but will also refreshen and moist the usually dry environment.

TABLE 6.2: LIST OF SUGGESTED PLANTS

BOTANICAL NAME	COMMON NAME
GROUNDCOVERS	
Alyssum maritimum	Granizo
Azorella pedunculata	Almohadilla
Begonia spp.	Begonia
Cineraria	Azulina
Crassula portulacea	Matacallos
Dianthus caryophyllus	Clavel
Festuca ovina glauca	Barba de Gato
Gazania splendens	Primavera
Hemerocallis hybrida	Nardos
Impatiens hybrida	Miramelindas
Iresine aureoreticulata	Escancel
Iris xiphium	Iris
Liriope muscari	Lirio
Matthiola incana	Alhelí
Pelargonium peltatum	Geranio

Petunia hybrida	Petunia
Portulaca grandiflora	Portulaca
Sedum	Platanito
Tropaeolum majus	Mastuerzo
Verbena erinoides	Verbena
TALL GROUNDCOVERS	
Agapanthus africanus	Agapanto
Anthurium spp.	Anturio
Canna spp.	Atchiera
Chysanthemum maximum	Crisantemo
Gazania hybrids	Dormilona
Hippeastrum vittatum	Azucena
Hydrangea hotensia	Hortensia
Kniphofia uvaria	Cresta de Gallo
Lychnis coronaria	Oreja de Conejo
Rosa spp.	Rosa
Zantedeschia aethiopica	Cartucho
SHRUBS	
Arbovitae	Pino libro
Barbadesia spinosa	Espino Chiñian
Bougainvillea	Buganvilla
Brugmansia arborea	Floripondio
Brugmansia sanguinea	Guantug
Buxus sempervirens	Boj
Cortaderia selloana	Carrizo
Cupressus mecrocarpa	Yucca Aloifolia
Cyperus papyrus	Papiro de Egipto
Euphorbia cotinifolia	Nacedero
Fagaria chiloensis	Frutilla
Fuchsia hybrida	Zarcillo

Hibiscus rosa-sinesis	Cucarda
Hypericum laricifolium	Romerillo
Ligustrum vulgare	Trueno
Neriun oleander	Laurel Rosado
Piper nigrum	Pimienta Blanca
Phyllanthus salviifolius	Cedrillo
Physalis peruviana	Uvilla
Senna multiglandulosa	Chin-chín
Spartium junceum	Retama
Spirea tomentosa	Spirea
Vaccinum floribundum	Mortiño
VINES	
Heliotropium arborescens	Heliotropo
Jasminum grandiflorum	Jazmín
Passiflora spp.	Taxo
Plumbago capensis	Enredadera azul
Rubus fruticosus	Mora
TREES	
Abutilon megapotamicum	Farol Chino
Alnus acuminata	Aliso
Araucaria excelsa	Araucaria
Caesalpinia spinosa	Algarrobo
Callistemon citrinus	Calistemo
Cedrela montana	Cedro
Ceroxylon ventricosum	Palma de Cera
Chionanthus pubescens	Arupo
Citrus limonum	Limón
Cupressus spp.	Ciprés
Delostoma integrifolium	Yalomán
Eriobotrya japonica	Nispero

<i>Euphorbia pulcherrima</i>	Estrella de Panamá
<i>Inga insignis</i>	Guaba
<i>Jacaranda mimosifolia</i>	Jacarandá
<i>Juglans neotropica</i>	Nogal-Tocte
<i>Laurus nobilis</i>	Laurel
<i>Magnolia grandiflora</i>	Magnolia
<i>Malus spp.</i>	Manzana
<i>Myrtus communis</i>	Arrayán
<i>Opuntia ficus-indica</i>	Tuna
<i>Oreopanax ecuadorensis</i>	Puma-maqui
<i>Parajubaea cocoides</i>	Coco Cumbi
<i>Persea americana</i>	Aguacate
<i>Pinus patula</i>	Pino Rojo
<i>Podocarpus oleifolius</i>	Sinsín
<i>Prunus serotina</i>	Capulí
<i>Shinus molle</i>	Molle
<i>Tecoma stans</i>	Cholán
<i>Tectona grandis</i>	Teca

(Arteaga) (Ramirez)

CHAPTER 7

CONCLUSION

Quito is a city that follows urban developmental patterns responsible for current environmental problems in the world. In Ecuador's capital, these patterns have led to unsustainable and undesirable conditions which are presently showing their environmental, social, aesthetic, and economic consequences. Pollution is a problem in this city; the excessive use of personal vehicles and the city's setting in a valley contribute to the emission and buildup of contaminants due to the lack of air circulation. Long commuting distances and traffic are also an issue; the percentage of the population that lives in the suburbs is significant and there is no efficient public transportation that connects these neighborhoods with the core of the city. Floods are also common due to impermeable surfaces, clogged sewer systems, and lack of environmental practices. These major issues urgently need to be addressed.

Present development tries to minimize horizontal expansion of the city and works towards the compaction of it. In this way, agricultural and rural land that surrounds Quito will no longer be developed. Through the increase of density in the city, quality of life can be deeply affected. Therefore, it is important for future dense urban development to consider aspects and values that contribute to quality of life.

Residential projects are more susceptible to this matter. Housing projects are promptly needed in Quito due to the rapidly growing population. Current high-density

residential development is not providing an appropriate environment for quality lifestyles. Consequently these projects are seen as an opportunity to remedy some of the previously described problems.

In order to understand what is important for Quiteños when it comes to quality of life, and to understand the city's urban development, four case studies, corresponding to the four major expansion periods of the city, were analyzed. Through this process, values that have regularly been part of life in Quito were discovered and followed through the development. All four time periods present aspects that have been categorized in environmental, social, aesthetic, and economic values. A different value is prioritized in every stage; therefore, all of them are important to the city's population.

Current dense development within the city was also analyzed through case studies in order to find out how they address values in quality of life and see how they can be improved. Additionally, some of the solutions given around the world to the same city problems were mentioned and researched. The overall problem that Quito faces is a common trend in developing countries, especially Latin America. Unfortunately, in these countries, development is unfair and quality of life is only available and affordable by wealthy people who live in the suburbs.

To ameliorate the situation in Quito, this thesis provides a set of design principles that can be applied to high-density residential projects in Quito, Ecuador, specifically; but also to a wide range of projects. An example of how to apply them is provided.

The importance of this study is the identification of Quito's particular issues, their sources, and the value of landscape within Quito. In order to address a problem, it is fundamental to know its origin and once the start point is located, solutions can be more

easily found. The landscape in Quito can be a powerful tool to remedy current urban problems. By improving landscape conditions within the city, the overall quality of life can be improved as well. Because of this thesis' focus on high-income high-density residential projects, several other types of development were left unaddressed. A study on these projects can help have a holistic understanding of Quito's current issues and therefore a more solid and founded solution for them. For example, research on the counter part of the previously analyzed matter would be focused on low-income high-density residential projects which are also a large percentage of current development and can definitely, if improved, make a big difference in quality of life. Although this study's design application provides housing units that will have different economic value in order to integrate residents of varying income levels, this is done from the social perspective. Proper research and analysis on the low-income subject is still needed.

Design principles represent the beginning of the solution for Quito's deeper problems described before, and they do not pretend to completely solve all issues. Although they are just the starting point of the improvement of quality of life in this city, they present a solid foundation and an introduction to a critical matter that would need further exploration. This investigation sets the stage for research to keep building on and for practical solutions to be found and applied.

Design guidelines were purposely left as broad concepts and statements. This gives designers the opportunity to fine-tuned them during the application process and therefore, get a varied range of results. This can also be done with all the information presented in this thesis. Elements from the historic case studies such as: the Spanish Patio House Style, the “Garden City among Trees” aesthetics, the use of traditional

materials like brick, or modern materials like steel; can be introduced in forthcoming development in a variety of ways. In the design application example of this research, the Spanish Patio House Style was reinterpreted in order to strengthen Quito's culture, traditions, and identity. Lessons provided by internationally recognized architects such as Ken Yeang, Arthur Erickson, and Rogelio Salmona can also be applied to different settings and fine-tuned. Yeang's designs obviously require vast economic resources but they provide inspiration for smaller scale interventions in countries like Ecuador and cities like Quito.

After this profound analysis of Quito, the identification of its problems, and the statement of a possible partial solution, the improvement of quality of life within it seems closer. Imagining this city as an enjoyable place to live and as an example for fellow Latin American cities sounds fair. Quiteños should realize what they have in their hands and work towards recovering what has been declared a World Wide Heritage Cultural Site instead of letting it decay. Although Quito's history, culture, and beauty is so rich and deeply immerse in its population that can never be lost.

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