



POLITECNICO DI MILANO

School of Architecture, Urban Planning,  
Construction Engineering

## **Toronto suburbs revisited**

Strategic design for revitalization of a sprawl neighborhood

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**To my father, my family, and my professors that supported me in my architecture journey**



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## Abstract

The thesis deals with the challenges of sprawl development and its consequences on our environment, into an existing recently developed neighborhood. The aim is to develop proper methodology in understanding sprawl, and offer strategies for design, to revitalize it.

A suburban neighborhood, in Richmond Hill city, within Canadian Metropolitan of the Greater Toronto Area, was chosen as the case study of this project. A recent residential neighborhood, clearly affected by sprawl and its consequences. The characteristics of this neighborhood provide the needed foundation for the development of my research.

Sprawl development is one of the most common development patterns in urbanized areas in Canada and the United States. In the last half of the 20th century, the consequences of this pattern, in addition to hastening climate change, have become extremely destructive to their society, economy, and environment.

In this project, besides understanding the sprawl development, its general causes, and its consequences, I tried to study its specific characteristics in my case study, and offer strategies for design to revitalize the intervention area.

The process starts with researches based on cartographic and bibliographic sources, continues with accurate analysis on urban, neighborhood, and architectural scales, which leads us to problems and solutions, and concludes by defining principles, developing future visions, and offering strategic solutions.

Keywords: Architectural Design; Urban Design; Strategic Design; Sprawl; Sustainable architecture; Toronto; suburbs expansion

## Astratto

La tesi affronta le sfide dello sviluppo sprawl e le sue conseguenze sul nostro ambiente, in un quartiere esistente di recente sviluppo. L'obiettivo della tesi è sviluppare una metodologia adeguata per comprendere lo sprawl e offrire strategie di progettazione per rivitalizzarlo.

Un quartiere periferico, nella città di Richmond Hill, all'interno della metropolitana canadese della Greater Toronto Area, è stato scelto come caso di studio di questo progetto. Un quartiere residenziale giovane, chiaramente colpito dallo sprawl e dalle sue conseguenze. Le caratteristiche di questo quartiere forniscono le basi necessarie per lo sviluppo della mia ricerca progettuale.

Lo sviluppo incontrollato è uno dei modelli di sviluppo più comuni nelle aree urbanizzate in Canada e negli Stati Uniti. Nell'ultima metà del XX secolo, le conseguenze di questo modello, oltre ad accelerare il cambiamento climatico, sono diventate estremamente distruttive per la loro società, economia e ambiente.

In questo progetto, oltre a comprendere lo sviluppo dello sprawl, le sue cause generali e le sue conseguenze, cerco di studiare le caratteristiche specifiche nel mio caso studio e di offrire strategie progettuali per rivitalizzare l'area di intervento.

Il processo inizia con ricerche basate su fonti cartografiche e bibliografiche, prosegue con un'analisi accurata a scala urbana, di quartiere e architettonica, che porta a problemi e soluzioni, e si conclude definendo principi, sviluppando visioni future e offrendo soluzioni strategiche.

Parole chiave: Progettazione architettonica; Progettazione Urbana; Progettazione strategica; espansione suburbana; Architettura sostenibile; Toronto; Sprawl

## Introduction

The thesis begins with urban-scale study on the Greater Toronto Area, followed by data collection from bibliographic sources and mapping. Several indicators, including history, development, population, density, diversity, economy, transportation, and culture, have been studied within The GTA. The footprint of sprawl development inside the Metropolitan is defined as an outcome of researching these primary factors.

Another phase of research has been done exclusively on suburban regions of the city in order to get more exact information on sprawl in GTA by researching a number of factors, including: population, demographics, economy, transportation, and culture. Due to characteristics such as population density, commuting cost, and employment opportunity distribution, the results reveal that sprawl development is most visible in suburban neighborhoods of the GTA.

After understanding the existence of sprawl development, four questions have been answered by using scientific references and previous studies on this subject, including: what is the meaning of sprawl? What are the general causes of sprawl? Why has sprawl happened in Toronto? And what are sprawl consequences?

In order to get more familiar with the characteristics of sprawl development in the Greater Toronto area, an analytical phase has been done from urban to architectural scale. The analysis phase begins with choosing a strip covering every layer of the area, and mapping several indicators within our strip including: build up development, density, health and safety, job opportunities, median income, diversity, and more. By overlapping indicators, we reach to a generation strip which divides our strip into ten generations.

Each generation has been analyzed in urban scale, neighborhood scale, and architecture scale by studying maps, urban sections, matrix, images, and technical drawings, for every generation and studying their characteristics and sustainability one by one. As the main result of analysis by comparing the generations, it clarified that sprawl belongs to which generations, and what is the reason for this development pattern in each generation.

As the next step, we studied several recent studies about sprawl development in order to understand why, despite many efforts to confront sprawl for decades, we are still facing it in the most developed countries.

After research and analysis phases as the first step of the project, a manifesto has been provided to define principles for our design phase. We use "The new urbanism" principles as the basis of our manifesto.

Going to our area of intervention after analyzing the characteristics of the area, several conditions have been defined to understand the problems and potentials of the area more precisely. By using the conditions, we developed our visions of the future of the area considering both the conditions and our principles.

By having our defined vision as the last step of the project, we defined several strategies in order to revitalize our intervention area. These strategies are defined in a precise order in three steps: near future strategies, middle future strategies, and far future strategies.

# 1

## **01 TORONTO**

- 1.1 Where is Toronto**
- 1.2 History**
- 1.3 Development**
- 1.4 Population**
- 1.5 Diversity**
- 1.6 Economy**
- 1.7 Transportation**
- 1.8 Culture**
- 1.9 Summary**

## Toronto

Beginning with gathering general information as the study of our area, starting with territory scale the city itself and specifically its suburbs separately in a more preside way.

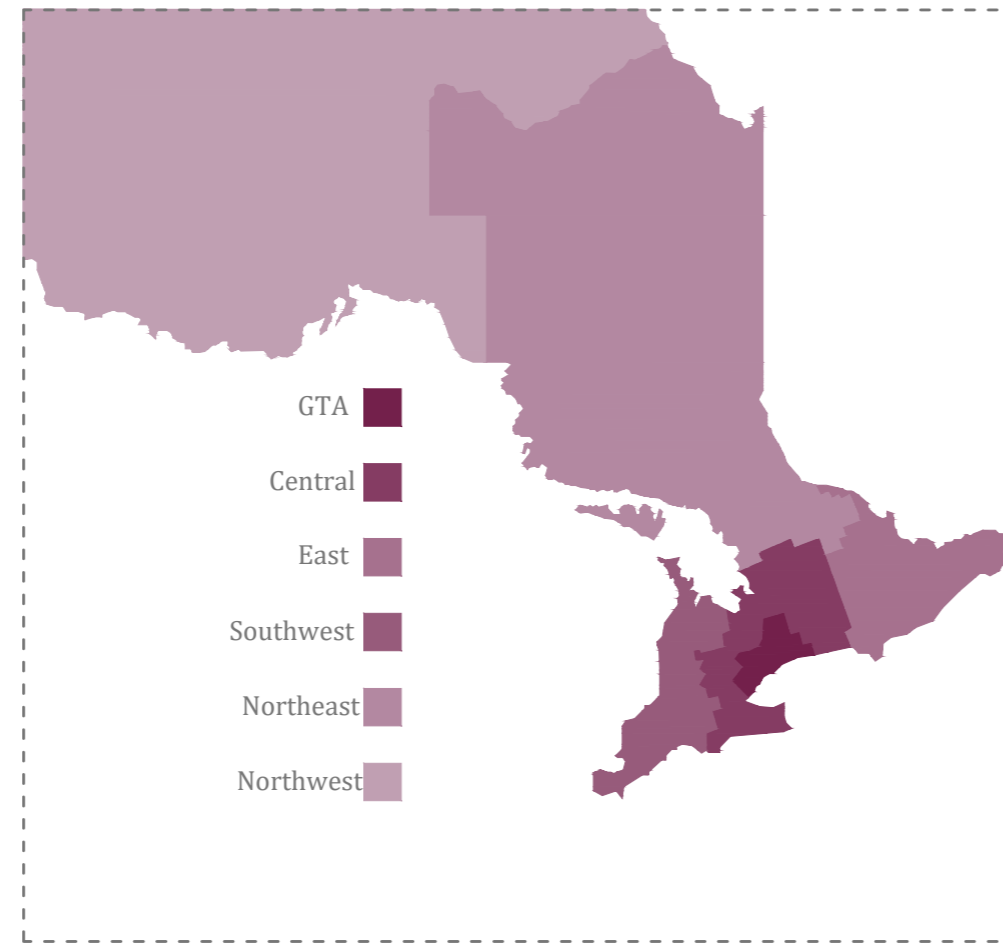
### 1.1 Where is Toronto

With a population of 2,731,571 people, Toronto is the most populous city in Canada and the fourth most populous city in North America. Toronto is the capital of the Canadian province of Ontario. The province's total urban agglomeration population is 9,245,438 people, and the population of (GTA) The Greater Toronto Area, which includes Toronto city, is 6,417,516 people.(Statistics Canada, 2016)

Toronto is widely regarded as one of the most cosmopolitan and multi-cultural cities in North America and the world, as well as a commercial, financial, cultural, and artistic hub.(Walks, 2016)

People moved to this area more than 10,000 years ago and lived on a broad sloping plateau dotted with rivers, deep ravines, and urban forest. When Mississauga surrendered the area to the British crown in 1793, the British established the town of York, and later during the War of 1812, this area was designated as the capital of Upper Canada, when the town was heavily damaged by American troops during the Battle of York. (Benn,2006)

In 1834 York was renamed and incorporated into the city of Toronto, and during Canadian Confederation in 1867 it was designated as the capital of the province of Ontario, the current area of the city is 630.2 square kilometers after expanding its original borders through both annexation and amalgamation.(Masters, 1947)(Glazebrook, 2013)

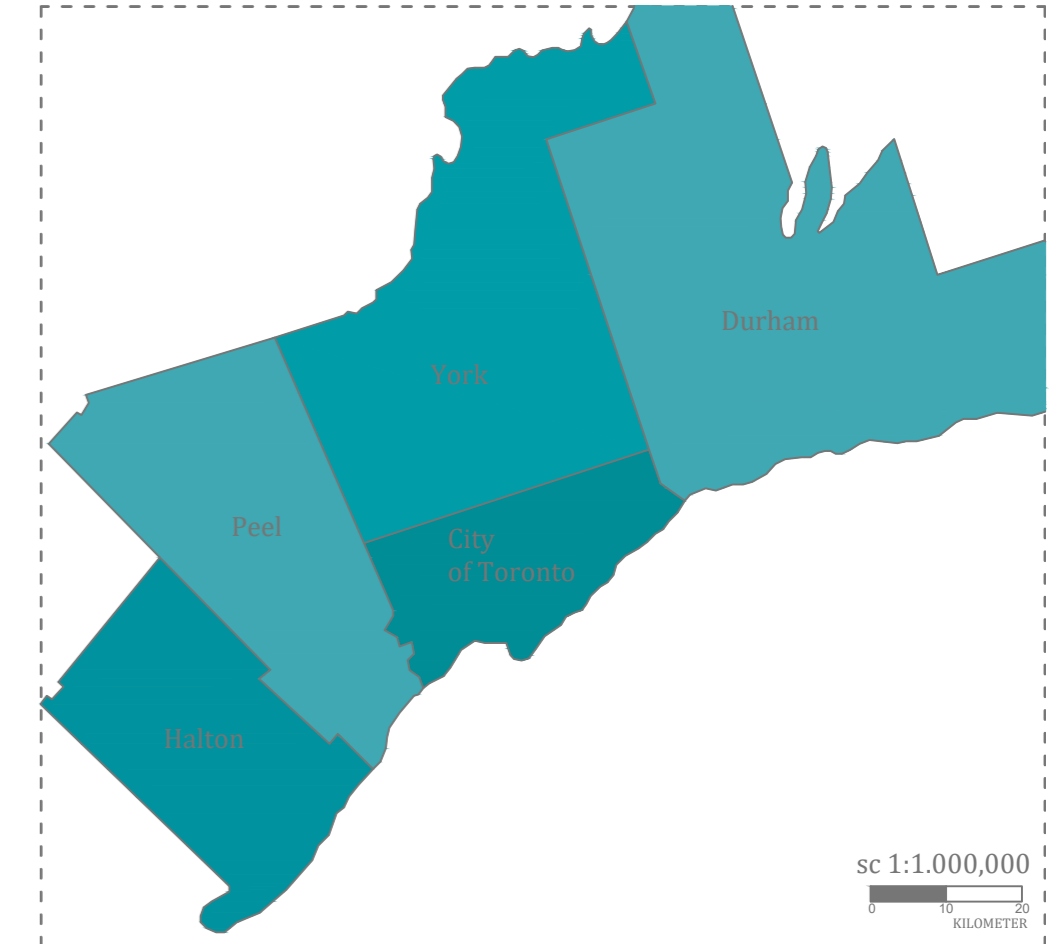


1.1 Ontario territory map

The greater Toronto Area has an historical role as an important destination of immigrants to Canada which is reflected by its current diverse population. The visible minority of the area is more than 50 percent, and among its inhabitants more than 200 distinct ethnic origins exist. More than 160 languages are spoken in the area while the primary language is English.(Careless, 2002)

The city of Toronto is known for its many high-rise buildings and skyscrapers, especially the CN Tower (the tallest free-standing structure in the Western Hemisphere). The city also attract over 43 million tourists each year due to its varied culture institutions such as numerous numbers of its museums and galleries, and its festivals, entertainment districts, public events, sport activities, and its historical sites. The Toronto city is home of the headquarters if Canada's major national broadcast network and media outlets and it's a well-known center for music, theater, motion picture production, and television production.(Relph, 2013)

The economy of the city is highly diversified with strengths in technology, design, financial services, life sciences, education, arts, fashion, aerospace, environmental innovation, food services, and tourism, and its also home to the Toronto Stock Exchange, the headquarters of Canada's five largest banks, and the headquarters of many large Canadian and multinational corporations.(Walks, 2016)



1.2 GTA territory map

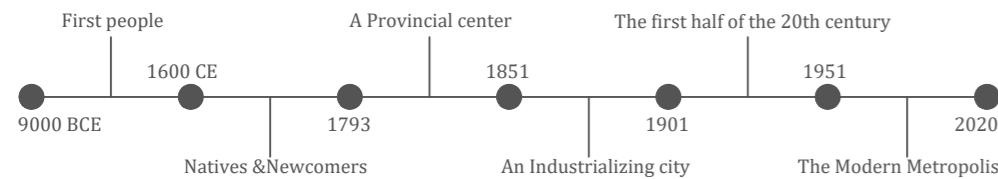


## 1.2 History of Toronto

The greater Toronto area, the Ontario province capital, located on the north shore of Lake Ontario, and the current hub of the nation's commercial, financial, industrial, and cultural life, has a long history of settlement. Since shortly after the last ice age people have lived here, and when British colonial officials founded the 'Town of York' in 1793, the urban community created. In 1834, That backwoods village grew to become the 'City of Toronto' and today Toronto has emerged as one of the most livable and multicultural urban places in the world through its subsequent evolution. Toronto's history can be divided into 6 main timelines:

1. First people(9000 BCE to 1600 CE)
2. Natives and newcomers(1600-1793)
3. A Provincial center(1793-1851)
4. An Industrializing city(1851-1901)
5. The First half of the 20th century(1901-1951)
6. The Modern Metropolis

According to our subject we are not going to study the far past, and will focus only on the near past, which directly effects the current situation of Toronto city and its suburbs in terms of Architecture and Urban design. (Benn, 2016)



## 1.3 Toronto history time line

By looking back to 1950, what is clear is the fact that many factors and consequences transformed Toronto into the city it is now from the place it was once. First, the unusual high level of immigration from so many countries was the important key to this transformation, the key to the formation of the modern community. Beside this important fact, another factor that has a high impact on the city was the settlement of the majority of the population in modern suburbs which appears in the 1950s, and also the people's positive reaction to suburbanization was another factor of the evolving character of the city. These factors represent the different evolution of the city compared to American centers.(Benn, 2016)

There are many other factors that have impact on the evolution of Toronto such as a rising standard of living, a shifting economy, development in commercial culture, changes in the nature of work and employment, increasing education, and the growth of personal freedom. Although most of these factors are common throughout the First world, its necessary to understand Toronto's evolution as one of the important node affecting the world.(Benn, 2016)

After the 1950s there were many other factors that have impact on forming modern Toronto today, from using coal as people's primary heating fuel in the 1950s-60s to widespread use of home air-conditioning from 1970s simultaneous to global warming, and to more recent effects of technology such as personal computers, the INTERNET, cell phones, and many other new developments on the life of the people and their interact with the world around them.(Benn, 2016)

In the 1974, Toronto was described as 'a city that work' by Anthony Astrachan beside many other reporters from magazines and newspapers in the United States who admitted Toronto in the 1070s, comparing vibrancy of Toronto's downtown neighborhoods with the depression problems that many American centers were facing it with their hollowed-out cores and hopeless slums.(Benn, 2016)

The pattern of growth is a big indicator in comparing United States cities and Toronto and part of the differences between them stemmed from it. The Toronto suburbanization was rapid, similar to the development in the United States, but the one in the US received far more government subsidization compared to the one in Toronto, and this fact contributed to a bigger move of the American middle class away from their downtown. (Benn, 2016)

On the other hand, the comparative health of Toronto's older neighborhoods encouraged people who had moved to the suburbs to come back to the center to revitalize areas that had begun to fall into decline, but because of the fact that the residents of the inner city enjoyed bigger incomes than suburban neighbors by the mid 1970s, Toronto's success in preserving its inner neighborhoods was shown.(Benn, 2016)



1.4 Toronto Skyline 1970

Toronto has faced challenges in more recent years, that have taken some luster off the accolades of its 19670s. Maybe because outside of Canada in major western countries, governments provide a higher level of financial support and fundraising tools for municipalities which allow cities to face their needs better than here in Toronto, in presence of small support from the federal government, beside the fact that running Toronto and preserving its quality of life has been difficult due to programs implemented by the province of Ontario.(Benn, 2016)

Nevertheless, compared to other large North American cities, most of Toronto's problem including its suburbs are smaller, thus the chance of success in attempting to solve them are higher, which bodes well for the future of the city of Toronto.(Solomon, 2019)

Toronto today is a large and complex urban center, which embraces a strong economy, rich cultural underpinnings, and an inclusive community, where work and live condition in it is one of the best on the planet. Although like any other similar large city it is facing important challenges, and knowing its history is crucial to face them consciously. (Glazebrook, 2013)



1.5 Toronto skyline 2020

### 1.3 Development

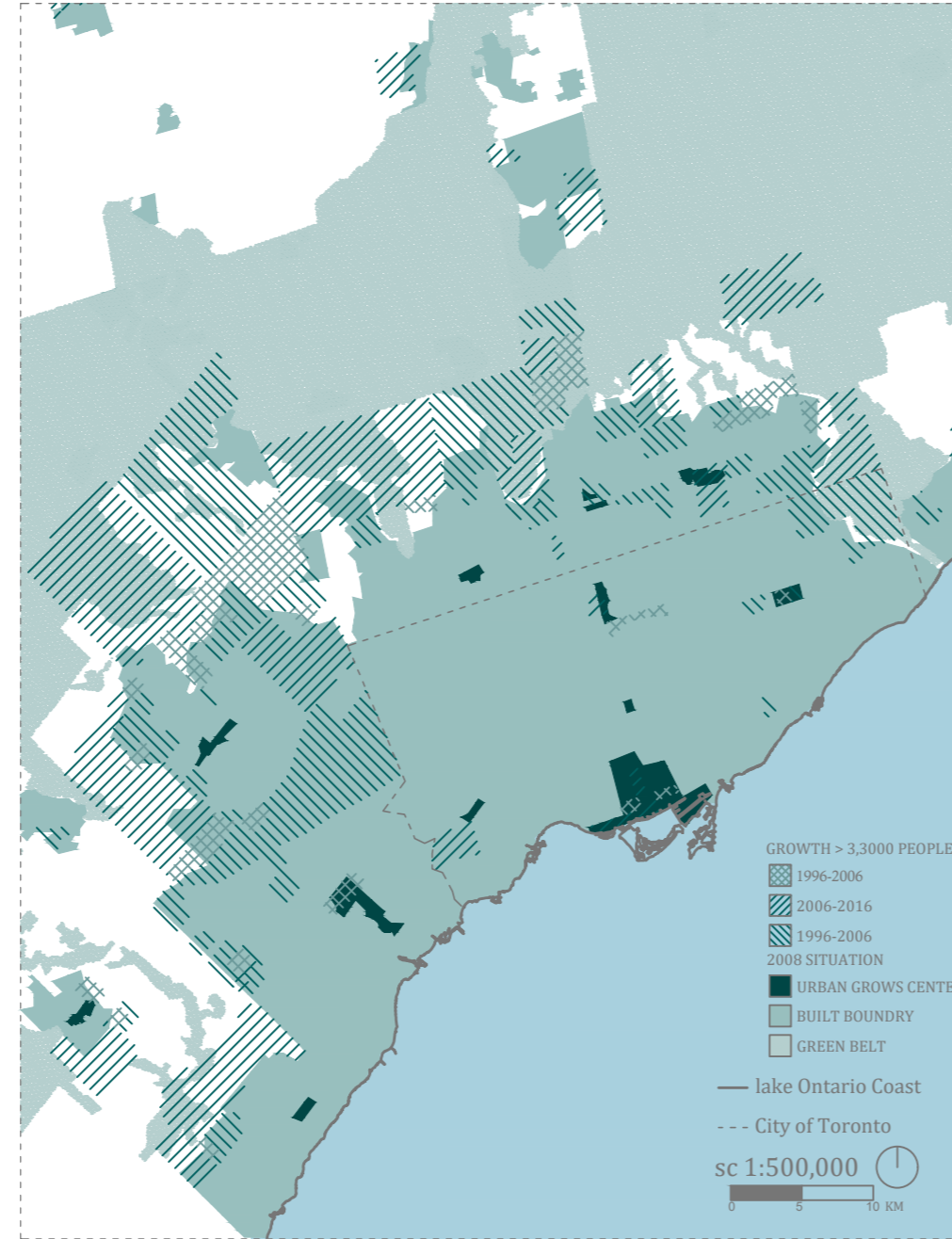
The development of Toronto started thousands of years ago when the first people moved to this area and This city has seen a long history of development, thus this research is limited to more recent development history of the city which was effecting the today situation of Greater Toronto area.

In the 1890s and 1900s, due to the tapping of Northern Ontario's forests and mines and the settlement of the Canadian West, further markets and resources was opened into Toronto, which in turn dealt with either Montréal or New York as outlets or as suppliers, and in 1911 more factory growth as the consequence of cheap energy provided by Hydro-Electric power commission of Ontario. The influence of investments spread even beyond Ontario's borders to the regions. (Lewyn, 2011) (Harris, 1991)

In 1914 Toronto's financial head offices, factories and stores made Toronto a second national metropolis, while the larger and older Montréal still held the economical lead. By the first World War the investment and manufacturing of Toronto expanded to larger scales in different businesses and industries due to its location.(Lewyn, 2011)

In 1920s, by growing the population to approximately over half a million people, development of the city continued as new suburban municipalities. Although this growth was shocked by the great depression of the 1930s, some financial sectors of Toronto stay higher than average health, due to the help of gold and silver mining in Northern Ontario. (Lewyn, 2011)

In 1934 the employment rate slowly began to improve and high unemployment was stopped by the coming of World War 2. In the postwar era, the economy of Toronto boomed due to consumer spending, electronic shaping, and machine industries, and house construction which leads to growth population to over one million people in the Greater Toronto Area by 1951. (Lewyn, 2011)



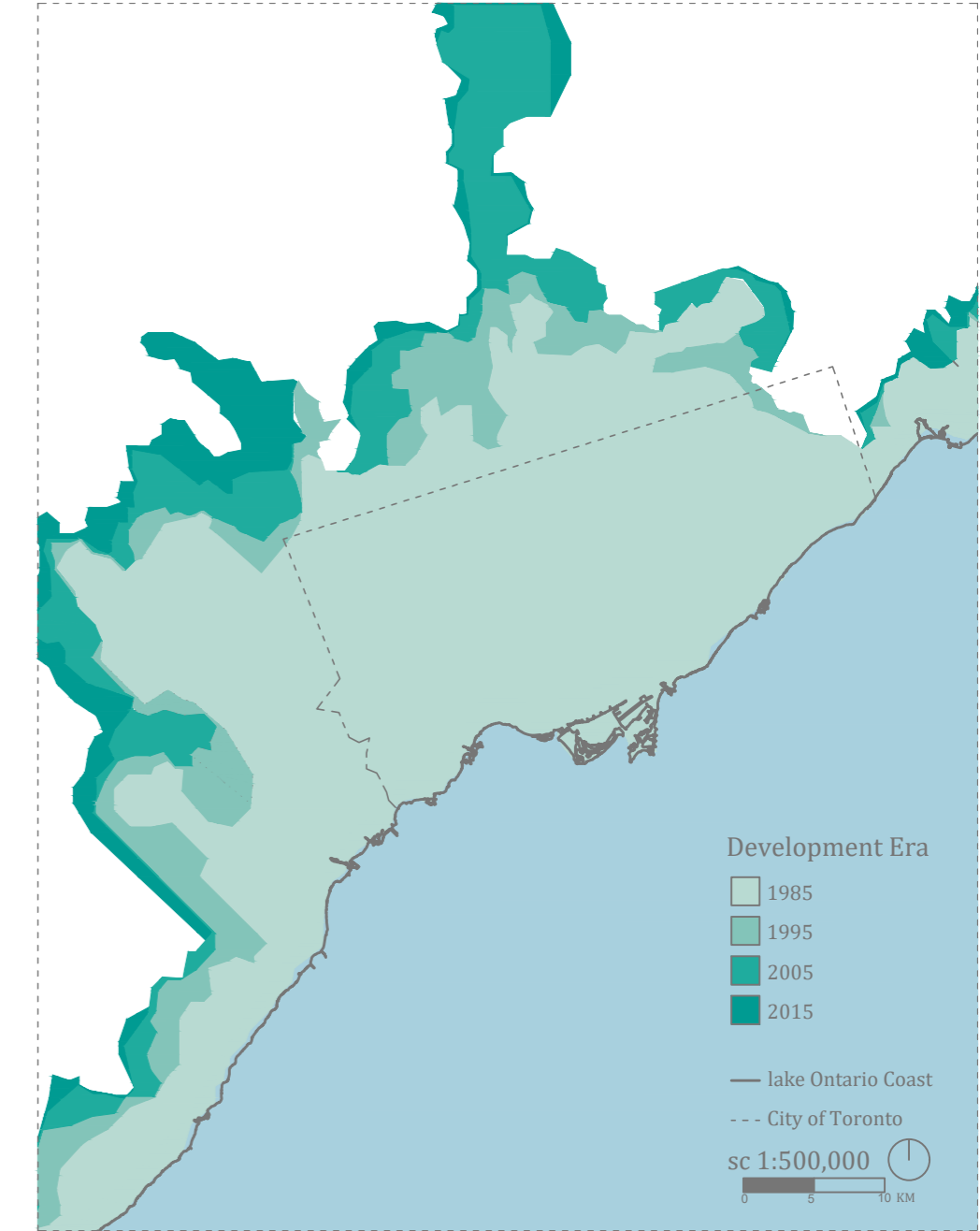
1.6 Toronto development map

In 1953, the Metropolitan government was set up due to the needs of services for this urban complex and its suburbs. The Metropolitan Toronto Authority handled requirements widely under a vigorous first chairman. The construction of the subway system and arterial roads, and the undertaking of parks and drainage projects.(Lewyn, 2011)

In 1967, by amalgamating small suburbs, a metro structure was created for the city of Toronto and five boroughs, which all became cities by 1991, except East York. (Lewyn, 2011)

In 1998, the new Mega-city of Toronto came into existence when all small cities lost their individual municipal structures, and eventually as a national and international financial hub, the Greater Toronto Area gained priority over Montreal, and now the GTA has a major hold on information media and leads the country in its concentration of specialized services such as advertising and professional facilities. (Lewyn, 2011)

In the second half of the 20th century, the population of the Greater Toronto Area doubled, while the amount of land consumed by the metropolitan area developed to 3 times bigger, clearly because the newer suburbs are less dense than the central old city of Toronto, this low density leads the residents of suburbs to drive longer to drive to most destinations, which consequently increase traffic congestion and air pollution, beside many other considerable problems that low density development of suburbs can create.(Lewyn, 2011)



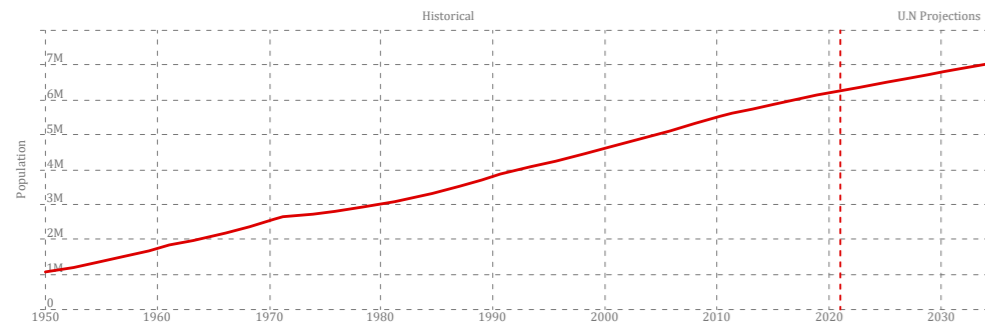
1.7 Toronto build up development since 1985



### 1.4 Population

The Greater Toronto Area is the most populous metropolitan area in Canada and 4th in North America. It includes the City of Toronto and the regional municipalities of Durham, Halton, Peel, and York. In total, the region contains 25 urban, suburban, and rural municipalities. (Statistics Canada, 2016)

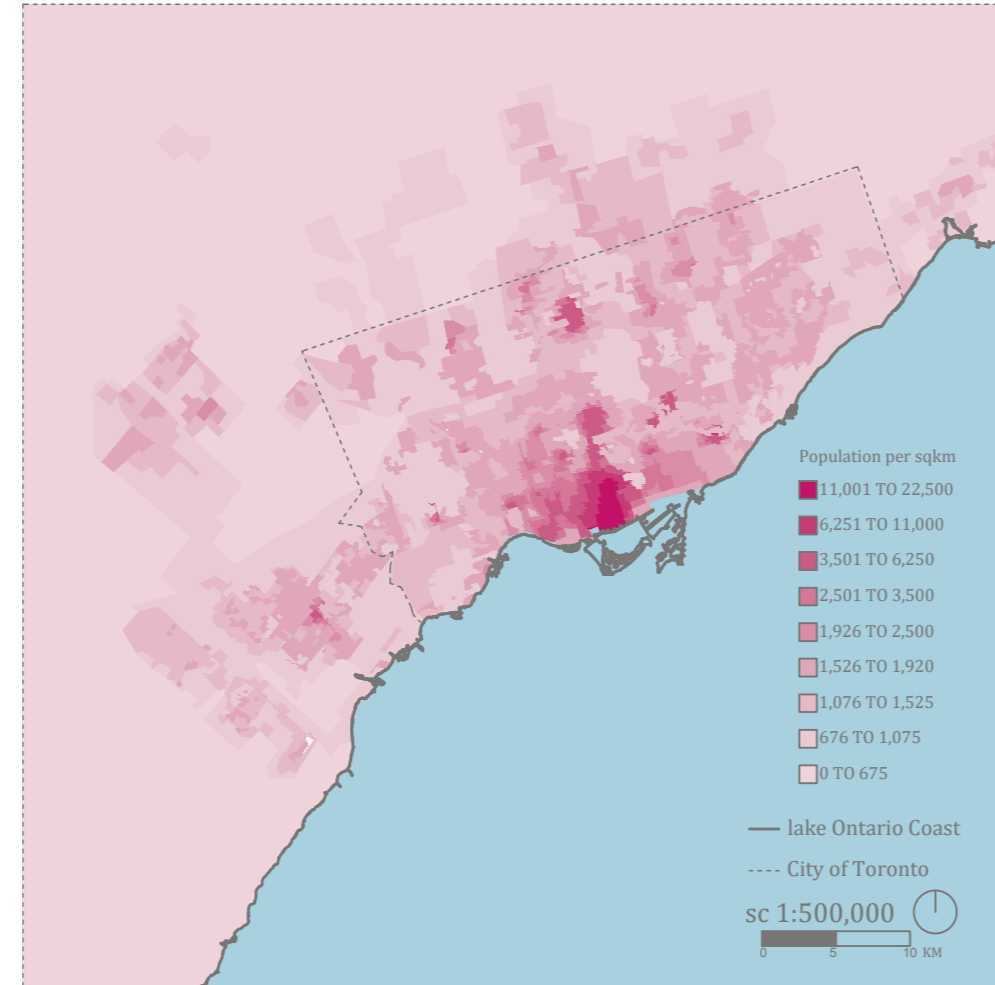
The population of Toronto greater area was 1,068,000 in 1950 which increased to 6,197,000 in 2020. It is predicted that the population of GTA will be about 7,000,000 in 2035, The Greater Toronto Area is projected to be the fastest growing region of the province. (https://www.macrotrends.net)



1.8 Toronto population GROWTH chart

### City Size and Population Density

The land area of Toronto (City) is 630.20 square kilometers with a population density of 4,334 people per square kilometer, While the land area of Toronto greater area is 7,124 square kilometers with a population density of 849 people per square kilometer which is a quarter of the city center density. (Statistics Canada, 2016)



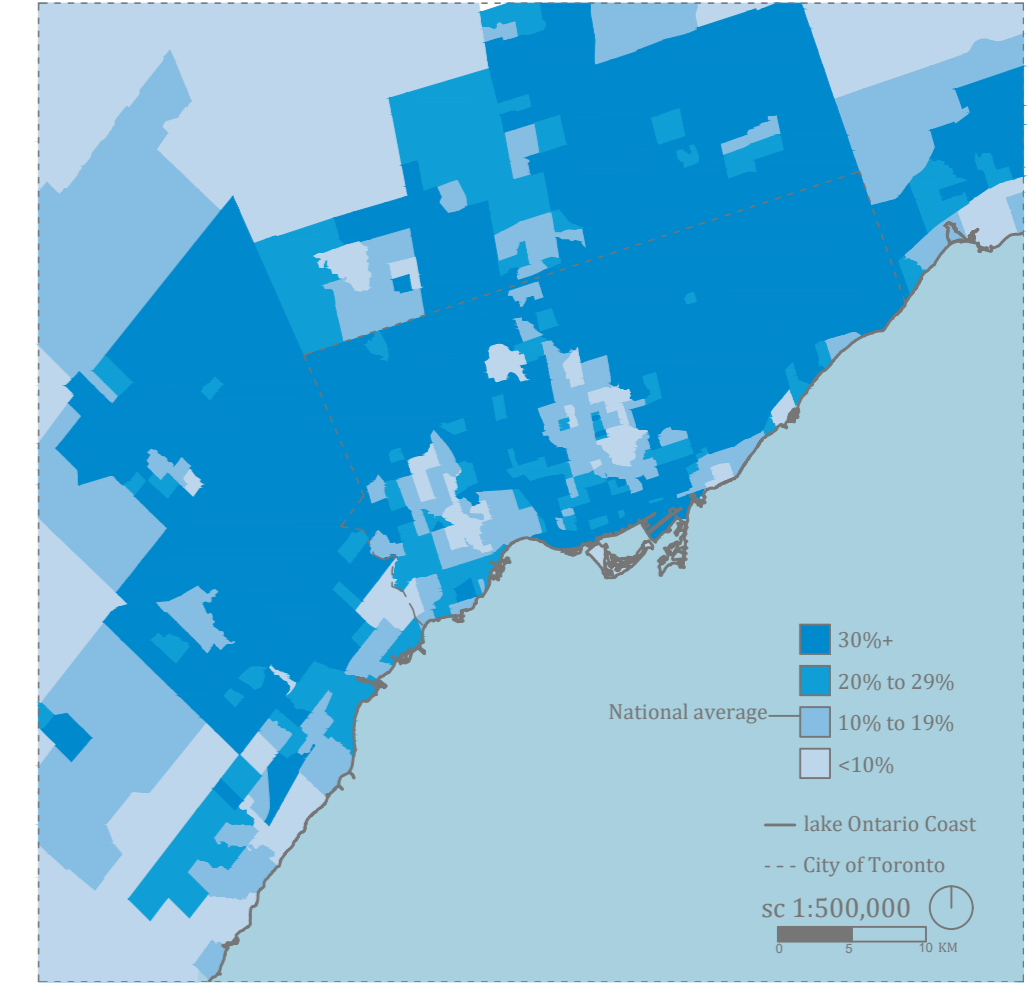
1.9 Toronto population density map

### 1.5 Diversity

According to the 2016 Census, the racial composition of Toronto was: White: 50.2% East Asian: 12.7% (10.8% Chinese, 1.4% Korean, 0.5% Japanese) South Asian: 12.3% Black: 8.5% Southeast Asian: 7.0% (5.1% Filipino) Latin American: 2.8% West Asian: 2.0% Arab: 1.1% Aboriginal: 0.7% (0.5% First Nations, 0.2% Metis) Two or more races: 1.5% Other race: 1.3%. (Statistics Canada, 2016)

The most common ancestry groups were: English (12.9%), Chinese (12.0%), Canadian (11.3%), Irish (9.7%), Scottish (9.5%), East Indian (7.6%), Italian (6.9%), Filipino (5.5%), German (4.6%), French (4.5%), and Polish (3.8%). Other common groups include Portuguese, Jamaican, Jewish, Ukrainian and Russian. According to this diverse population, Toronto is home to many ethnic neighborhoods such as Little India, Greek town, Corso Italia, Chinatown and Little Jamaica. (Statistics Canada, 2016) The Greater Toronto Area has the second highest percentage of foreign-born residents around the world after Miami, due to its huge percentage of foreign-born population which is around 50%, but in Toronto case unlike Miami, there is no dominant culture or nationality which also make it one of the most divers cities around the world. (Statistics Canada, 2016)(Siemiatycki, 2017)

Today the 49% of the total population of the Greater Toronto Area belong to a visible minority group which was less than 15% in 1981. The most common religion in the Greater Toronto Area is Christianity with 54.1%, (28% Catholic, Protestant 12%, Orthodox 4,3%, and other denominations 10%). After Christianity Islam 8%, Hinduism 5.6%, Judaism 4%, and Buddhism 3% are the most common religions in GTA, considering that almost a quarter of the population has no religious affiliation. This level of diversity both in race and religious will heavily increase cultural diversity in Greater Toronto Area. (Statistics Canada, 2016)(Nowlan, 1991)



1.10 percentage of visible minorities

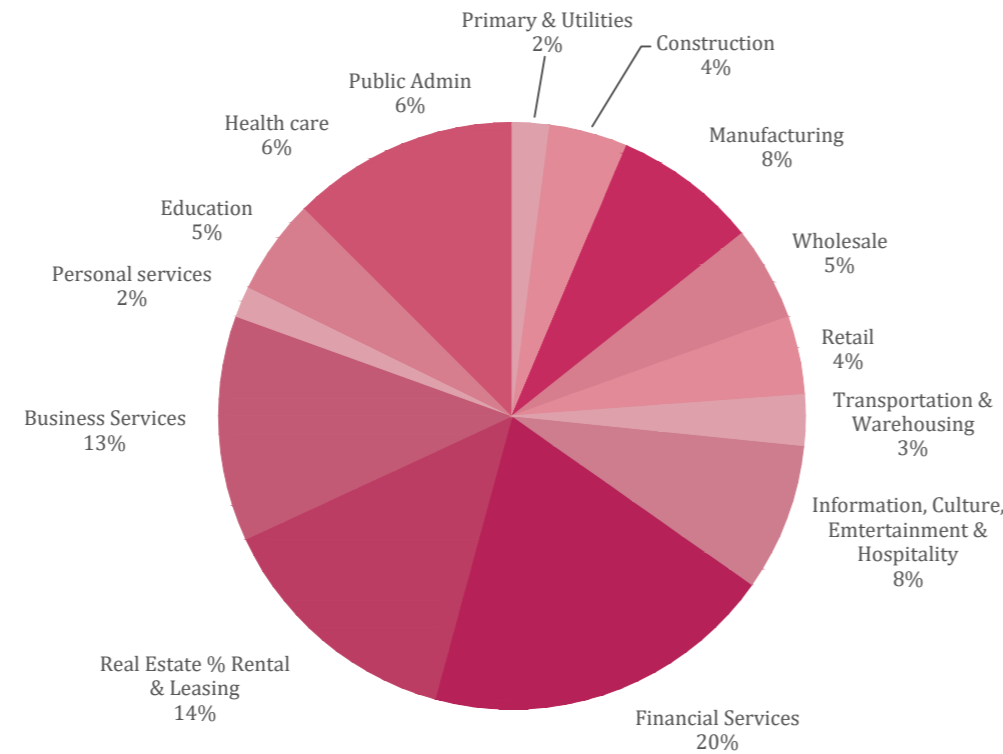
### 1.6 Economy

The Greater Toronto Area has a mixed economy that is not dominated by one single industry or sector. The city's three largest industries are financial services, real estate and wholesale and retail trade. The economy of the city has gone through the stages of railway and industrial hub, commercial lake port, financial nexus, and high level services and information center over its history.(Simmons, 2009)

In today Toronto, besides the persistence of the railway role, air and automotive transport have also been modified. Its port and commercial functions remain important but relatively less compared to the past. Its financial power continues to increase and its office-service sector stays superior in the country, and even though its industry has lost ground to foreign competition, it remains high in value. (Simmons, 2009) (Benn, 2016)

The Toronto Stock Exchange is considered one of the leaders in North America after New York, and many Canadian insurance and investment companies are centered in the city center such as the Toronto Dominion Bank, Imperial Bank of Commerce, and Bank of Nova Scotia. Since the second world war to the present, Toronto labor has been stable and conservative in character compared with other large cities around the world, because the war influenced the economies and policies of the city. Today, professional, clerical, manufacturing, retail and service work are examples of what the city's labor force is massed. (Benn, 2016) (Hulchanski, 2010)

In an overall view, The Great Toronto Area can be seen as a city of wealth and also a city of poverty, in Toronto access everyday necessities are not the only ability related to people's income and wealth, but the critical health and well-being outcomes are also related. (Musterd, 2013) (Walks, 2016)



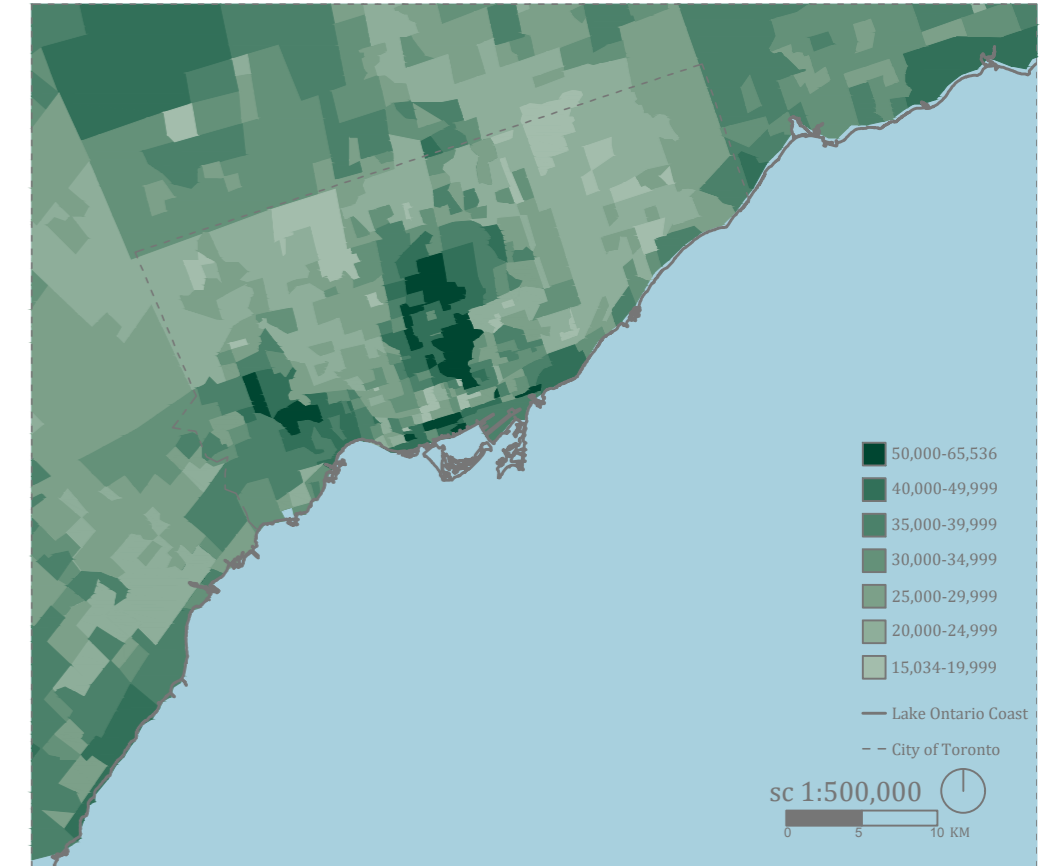
1.11 GDP by industry in Toronto, 2016

Numerous number of Cultural activities and events in Toronto have been mentioned before, but not only access to these activities and even with your friends, but also other important factors which define your life such as where you live, how happy you are, your connection with your friends, your ability to afford education, even basic ability to afford food, all of them are related and depends on your income. (Darroach, 1983)(Walks, 2016)

In another world, not only Toronto is the city with the most inequality in all over the country, but also during recent decades, this inequality has been growing extremely fast. In last 35 years minorities such as newcomers, young generations, and racialized population had no income growth, while the rest of the society approximately had more than 50% income growth.(Musterd, 2013)(Hulchanski, 2010)

Expenses such as costs of child care, tuition, transit, and housing have all raised during the recent decades, while the incomes for most people have barely increased. Toronto is the most expensive major city in Canada to live in. Poverty rate exists and remains in Toronto but it has started to decline the last years, high poverty rate is mostly related to certain demographic which mentioned before, such as newcomers and racialized population.(Darroach, 1983) (Walks, 2016)

The distribution of poverty is also related to the location of living, its visible that poverty is more in suburban area and high classification mostly living in city center and active cores of the area, and on the other hand also there is more variety of income and life style in centers comparing to suburbans.(Walks, 2016) (kanbur, 2000)



1.12 Median after tax income



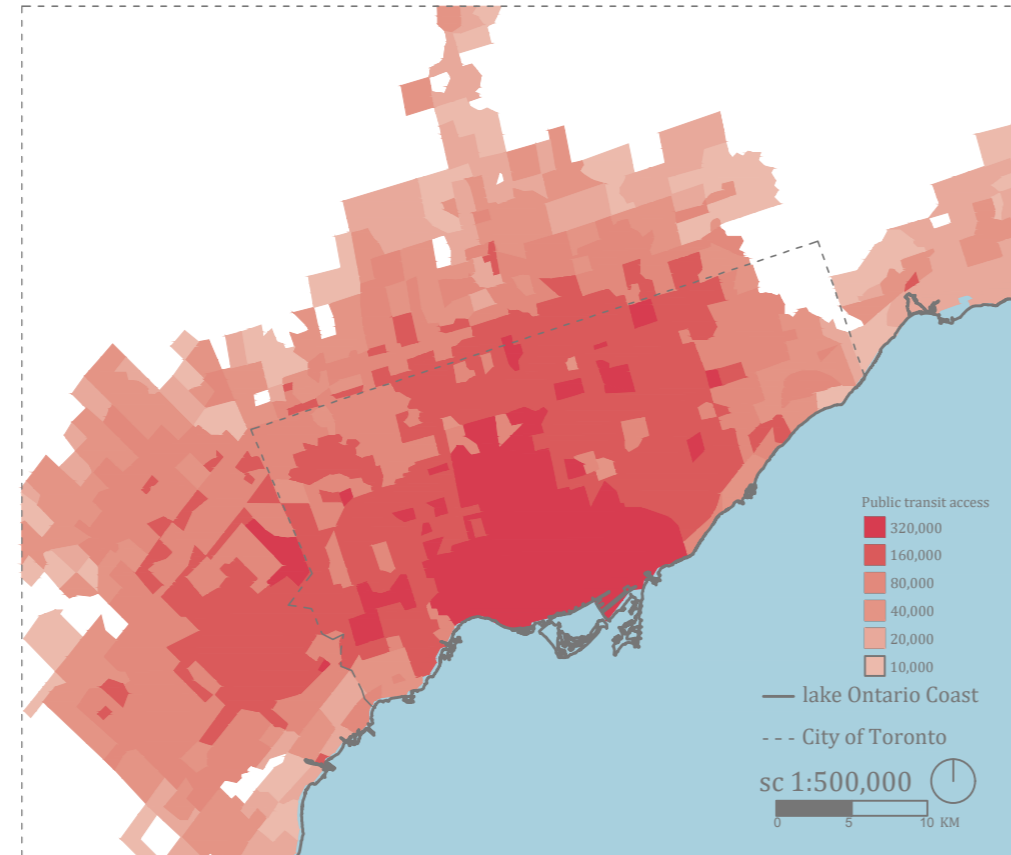
### 1.7 Transportation

TTC, or The Toronto Transit Commission, is the largest transit system in the province and the third largest in North America. TTC operates different kinds of public transportation such as subway, streetcar, bus, and light-rail transit lines. The Toronto Transit system is a focal point in municipal political debates, due to its crowding and funding problems. Also, a network of bike lanes exists in the city trying to be an alternative to the public transit, but according to the huge size of the city and long distances this cycling infrastructure can not adequately serve the city's population, especially in compared to other Canadian cities.(Foth, 2013)

Recently in 2006, an agency of the Ontario government was created to improve the coordination of transportation in the Greater Toronto Area. In next years they introduced a regional public transit service and an electronic fare card with the goal of allowing passengers to transfer between different transportation systems easier, which non was not successful enough to make the Greater Toronto Area a public transit friendly city and reduce the usage of cars. In terms of car traffic, Toronto is the second most congested city in the country following Vancouver and among the top 10 in North America, serviced by many major highways and expressways.(Foth, 2013)

Railways, beside supplying the city and distributing the products of the city inside and outside Canada, also provide passenger service mostly to destinations outside the Greater Toronto Area. Water traffic still is active in bringing bulk goods by lake or direct overseas shipments.(Foth, 2013)

The busiest Canadian airport which offers national and worldwide travel is Toronto's Lester B. Pearson International Airport, beside another smaller airport which mainly offers short haul flights to eastern Canada or the United States.(Foth, 2013)



1.13 Number of jobs that can be accessed within 45 minutes using public transit

### 1.8 Culture

Toronto is considered the main urban center in English Canada and one of the most important ones in North America. Toronto is the home of the large University of Toronto (1827), Ryerson University (1948), the more recent York University (1959), the Art Gallery of Ontario, the Ontario College of Art And Design, the world-renowned Royal Ontario Museum, the innovative Ontario ScienCenter, the Toronto Symphony Orchestra and the National Ballet of Canada. Other nationally eminent artistic, musical and library institutions are found here along with top Canadian centers of medical and scientific research, and the world-class Toronto Zoo. Toronto's rich multicultural variety is reflected in the performing of arts, and its English Canada's leading theater town.(Polese, 2004) (Walden, 2017)

The city of Toronto has been a potent factor in Anglo-Canadian literature as a national base for literary periodicals for a long time, publishing houses and successions of noted authors from Goldwin Smith and Sir Charles G.D. Roberts, to E.J. Pratt, Morley Callaghan, Marshall McLuhan, Northrop Frye, Margaret Atwood and Robertson Davies. Similarly, in art, it has been the base for Paul Kane, the Group of Seven, Tom Thomson and numerous more recent painters such as Harold Town, as well as musicians such as Glenn Gould.(Walden, 2017)

Popular concerts attract large crowds, notably at Ontario Place, a lakeside recreational area, or at the Canadian National Exhibition, Canada's largest annual exposition. Other leading public draws include hilly High Park, Fort York (restored to the days of 1812), Casa Loma (The grandiose castle home of a 1900s financial magnate), the CN Tower and Toronto Islands, a harbour park preserve.(Walden, 2017)



1.14 University of Toronto, Canada's cultural center since 1827

## 1.9 Summery

The Greater Toronto Area is the most important urban area of the Ontario province with Toronto city within it as the center of the province. This urban area is the most populous city in the country and forth in North America with the total population of 6,417,516 in 2016.The GTA in and international center of business, finance, art, and culture, and is recognized as one of the most multicultural and cosmopolitan cities in the word.

More than 50 percent of residents belong to a visible minority population group, and over 200 distinct ethnic origins are represented among its inhabitants. While the majority of Torontonians speak English as their primary language, over 160 languages are spoken in the city. The diverse population of Toronto reflects its current and historical role as an important destination for immigrants to Canada.

The development of Toronto started in thousands of years ago when first people moved to this area and this city has seen a long history of development, influenced by many political and economical factors including both first and second World Wars, and industrialize era.

The Metropolis of Toronto today is a huge and complex urban center, and similar to all other large urban centers facing important challenges to solve. But at the same time Toronto continues to flourish as an exciting city, with a strong economy, rich culture, and inclusive community, to be one of the best urban centers around the world for live and work.

Although the Total population of GTA is estimated to be around 6 million today, it was just around 1 million in 1950, and many consequences leads to this high rate of population growth in the last half a century, this population growth rate and some other factors leads to an unbalance density distribution in a way that the density of Toronto city is 4,149.5 people per square kilometer, while the density of Greater Toronto area is 849 with Toronto city within it.

Toronto is the main urban cultural center in English Canada home to many cultural centers such as universities including the biggest one in the country, museums, art centers, and many events.

The economy of the Greater Toronto Area is a mixed economy which is not dominated by just one single industry, financial services, real state, wholesale, and retail trade can be mentioned as the largest industries of the city. Today the railway role in economy of the city still persists but it has been modified by air and automotive transportation beside the existence of commercial lake port and usage of waterways both for supplying the city and export city's production to national and international destinations.

Toronto has the largest transit system in the province and the third largest in North America, which operates different kinds of public transportation such as subways, buses, light-rail transit lines and street cars, and beside the existence of bicycle lanes in the city, Greater Toronto Area still struggling with commuting issue due to far distances and overcrowded streets, in other world Toronto is not a public transit friendly city which is highly dependent on car usage.

Strategic location near Lake Ontario, being close to Mega cities of North America, Huge economy and potential finances, being the first multicultural city in the world, having the third largest transit system in North America, and many other factors we mentioned lead people to move, live, and work in the Greater Toronto area in a relatively small number of years, and this fact forced people to find their accommodation around the city center of Toronto in suburban areas. Beside the fact that most of the job opportunities, cultural centers, universities, public transit and services are located in Toronto city, most of the population of the Greater Toronto Area are living in the suburbs around the center and most of them in a very long distance from the city center. All the mentioned facts means a more precise research specifically on the suburban areas of the Greater Toronto Area is necessary to understand the urban challenges of the city.

# 02

## **02 TORONTO'S SUBURBS AREA**

**2.1 Population and demographics**

**2.2 Economy**

**2.3 Transportation**

**2.4 Commutation**

**2.5 Culture**

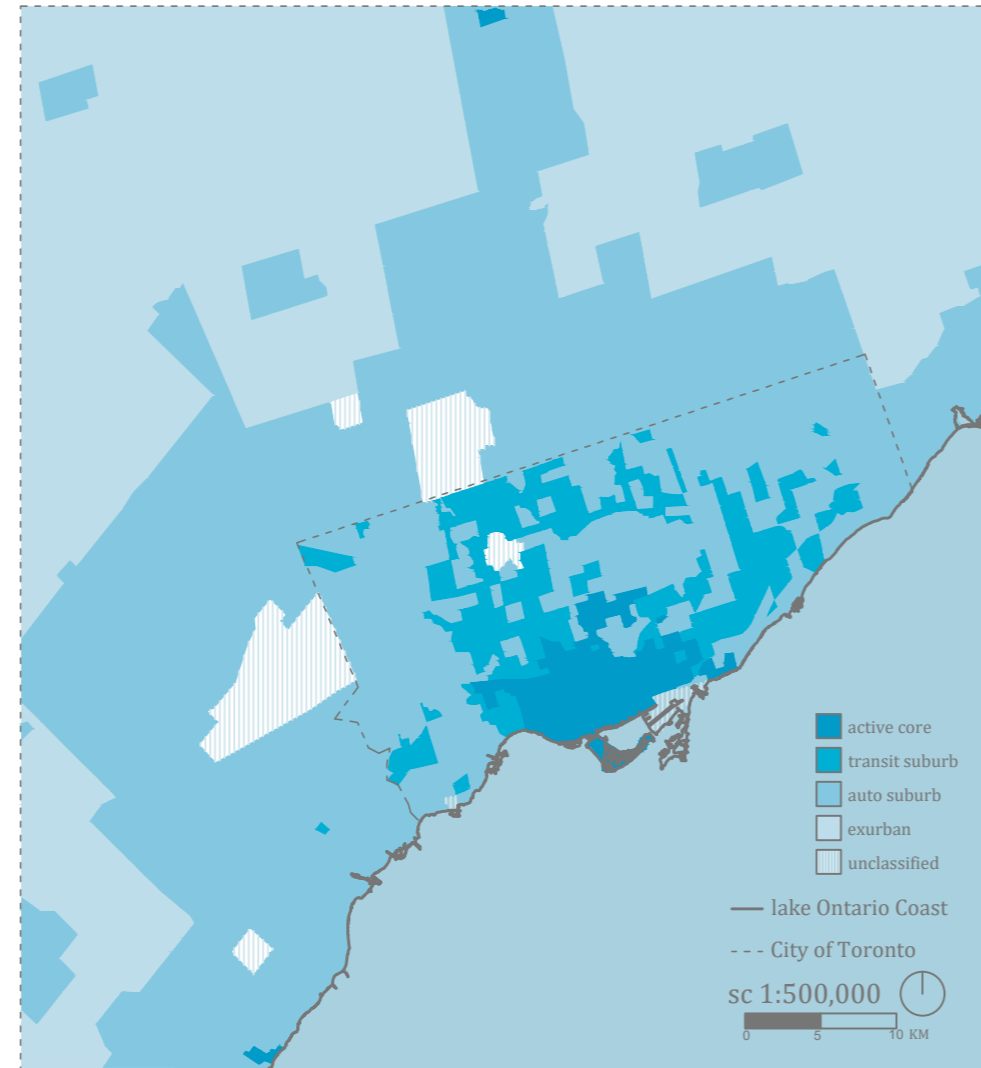
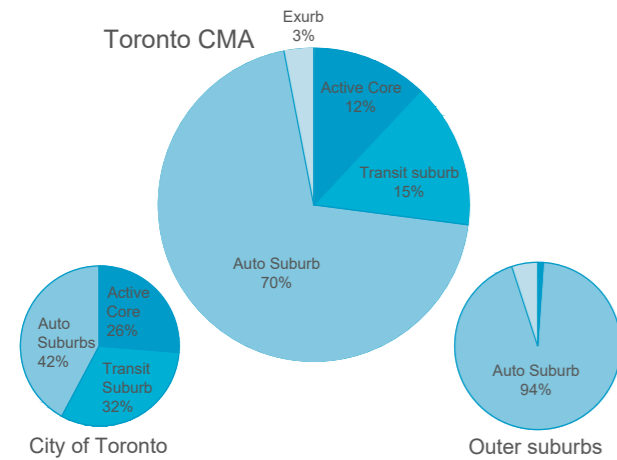
**2.6 Summary**

## Toronto's Suburban Areas

Once it had been discovered that the Greater Toronto Area has a sprawl footprint, we need to conduct another phase of bibliographical and cartographic research on the suburban areas of the GTA specifically, and study several indicators more precisely in suburbs.

### 2.1 Population

As it was mentioned before, the total population of the Greater Toronto Area is around 6 million people, which in 2016 roughly 5.2 million of these people or 88% of the total population was living in the suburbs. This 88% can be defined as 70% auto suburb(4,143,000), 15% transit suburb(890,000), and 3% exurb(168,000). Another 716,000 people or 12% of the total population were living in active core.(Solomon, 2019) In another way, 4.3 million (73% of the total population) lived in less sustainable auto suburbs and exurbs in 2016, while 1.6 million(27% of the total population) lived in more sustainable areas including active cores and transit suburbs. In an smaller scale analysis near 60% of the population of the city of Toronto live in more sustainable development, while 99% of the population of the outer suburbs(Greater Toronto Area except the Toronto city) live in less sustainable development, as the city of Toronto represent the active core area of the GTA.(Solomon, 2019) (Hoa, 2004)(Statistics Canada, 2016)



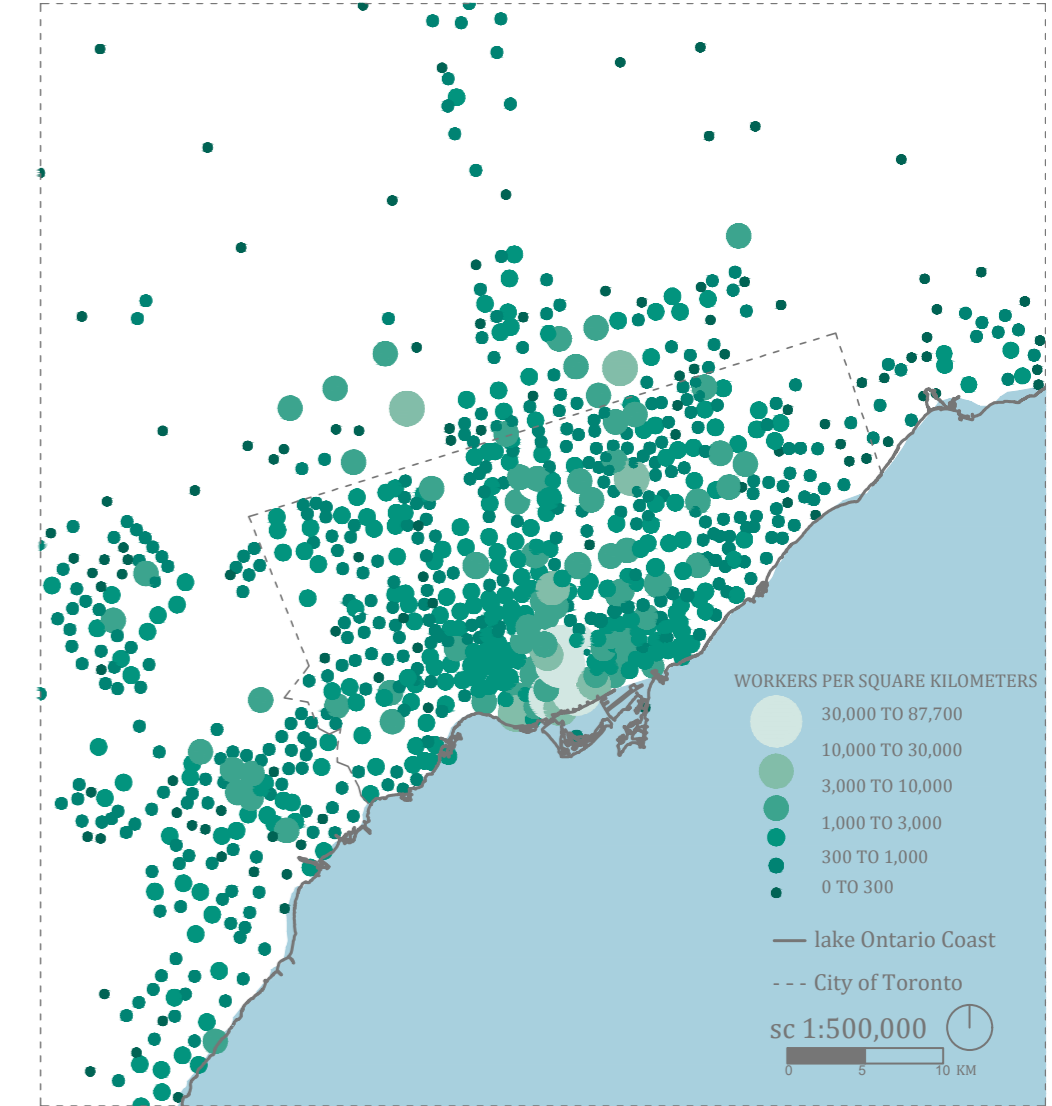
2.2 Suburb classification

### 2.2 Economy

The economy of Greater Toronto Area is the largest contributor to the country's economy at 20% national GDP, and since 2009, this GDP has had a growth rate of 2.4 percent, which is more than the national average. (Solomon, 2019)

The employment density (number of jobs per square kilometer) distinguishes the sequence of Greater Toronto Area urban development and the economic changes over time, its shows the fact that, the current active core which was the first to be settled before subsequently redeveloped rapidly, from a city as a place to live, to a center filled with skyscrapers, high-rise office buildings and shops. (Simmons, 2009)

The active core has from 87,000 to 90,000 workers per square kilometer, while the surrounding tracts of the prewar city have 3,000 to 10,000 workers per square kilometer, and this number reduces as much as we go far from the center to 0 to 300 workers per square kilometer. In other words where more people are living there are less job opportunity, and where less number of people are living is full of job opportunities which attract people from outside the area, it's not necessary to mention that this unfair distribution of job opportunity will indirectly increase commuting time, heavy traffic, air pollution, and many other indicators which reduce the sustainability of a city. (Simmons, 2009)



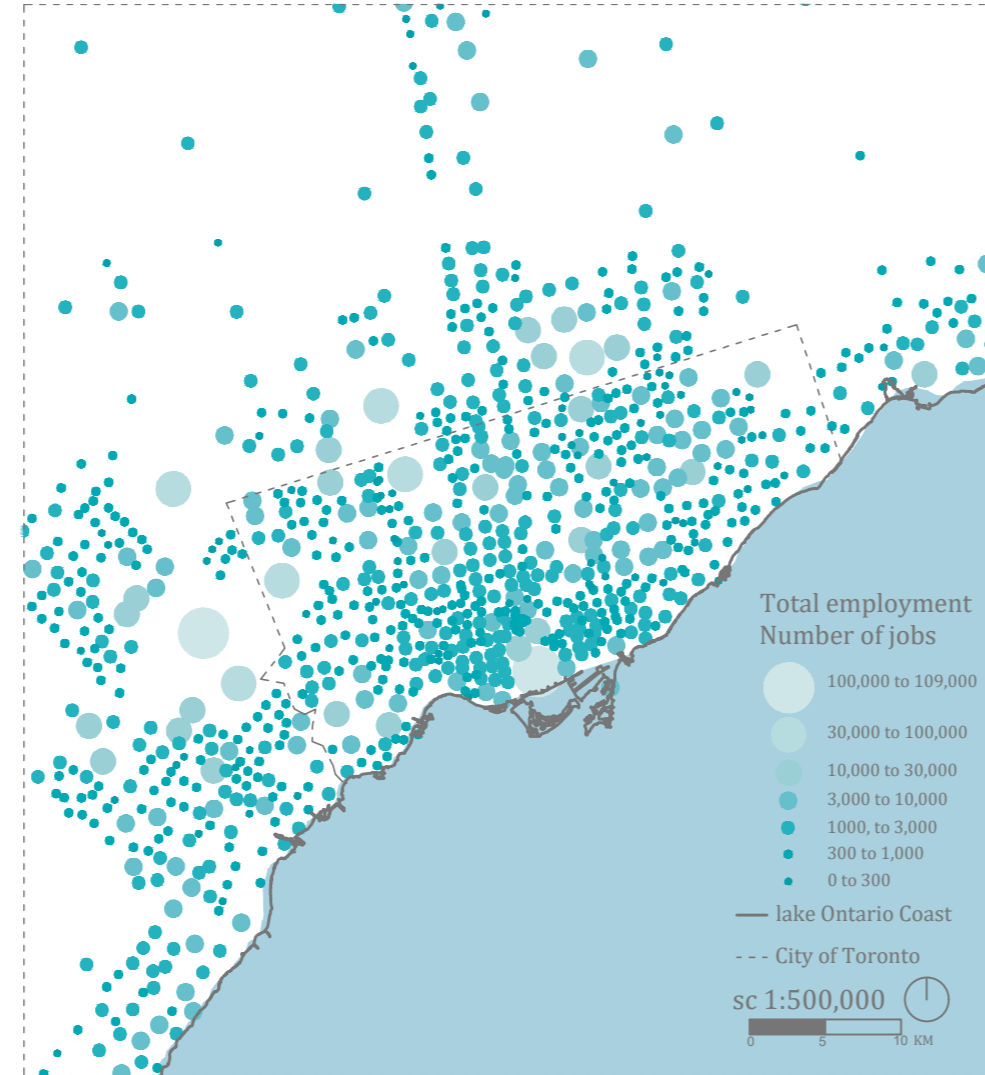
2.3 employment density, workers per square kilometer within the GTA



The current active core of the Greater Toronto Area was settled a long time ago, but recently it has been repeatedly redeveloped in a way that's not similar to what it has been before, today the active core represents a high density urban center, a jungle of high-rise offices with transportation hub which brings in commuters from all over the region. The work force in the center is highly dominated by finance and business services, of course plus services for this workforce such as food and accommodation. A surprising amount of public activities still continue in the active core such as City Hall, provincial government, medical complex and universities, the growth if this services is modest but still positive.(Simmons, 2009) (Willms, 2018)

In contrast to the city core, the Inner city, which includes the part of the city that was developed before the second World War in the era of street cars, is losing jobs at the rate of 7 percent over five years. It has been proven that the older houses in this area, which are private neighborhoods with more accessibility, are highly attractive to higher income families and the services they need, then consequently the business services and blue-collar jobs are relocating to less expensive and more accessible locations. (Simmons, 2009)(Willms, 2018)

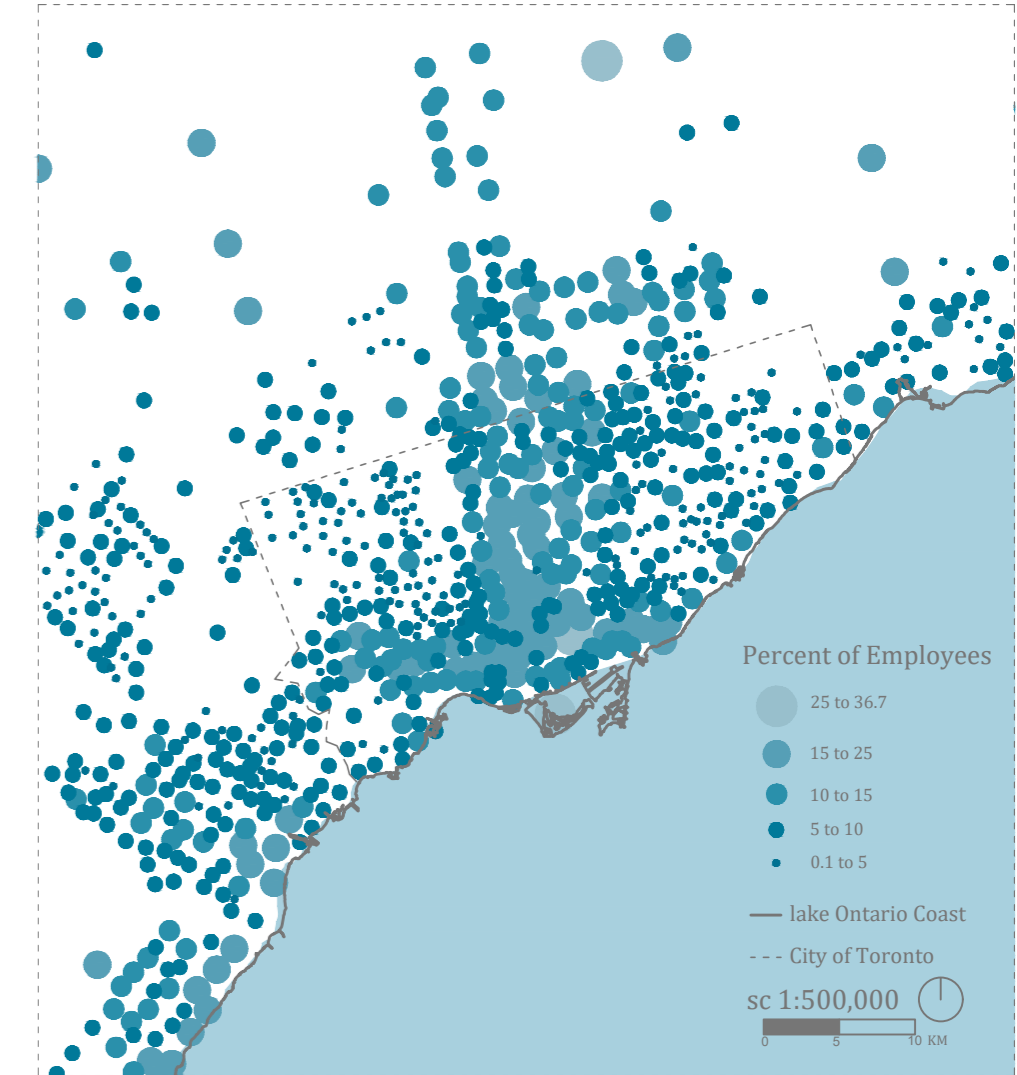
The suburban zone in the outer city, which was developed between 1950 and 1970 as the first wave of suburbanization now is available for redevelopment. At the beginning early suburbia was designed in a way that the father of the family would drive to work, and the mother and the kids would walk to the school and the shopping center. The workplace were going to be industrial district, which now losing its place to public sector activities and offices complexes for services to business, even the overall job growth is roughly positive, but these area are losing their blue-collar job opportunities.(Simmons, 2009)(Willms, 2018)



2.4 Overall distribution of employment within the GTA

The suburbia in the Greater Toronto Area, which is defined as the regions surrounding the city of Toronto, during the last 30 years, absorbed most of the population growth. Consequently, every adult is mobile, employment and consumer services are dispersed, and most of the employment growth is just services. All of these consequences of this pattern of urban development lead to lack of a relationship to the earlier spatial structure of the city even with huge concentrations of employment. (Simmons, 2009) (kanbur, 2000)

Another interesting data of the economic situation within the Greater Toronto Area is the growing proportion of individuals who work at home. The range of the percentage is very wide, from maximum 36 percent to zero, some higher values found in the edge of the suburbs and rural areas, which referring to rural lifestyle and include mostly farmers, but visible high percentage in the core center of the urban area represents another lifestyle, mostly people work at home who are professionals, with moderate to high incomes, as its visible by their location. (Simmons, 2009)



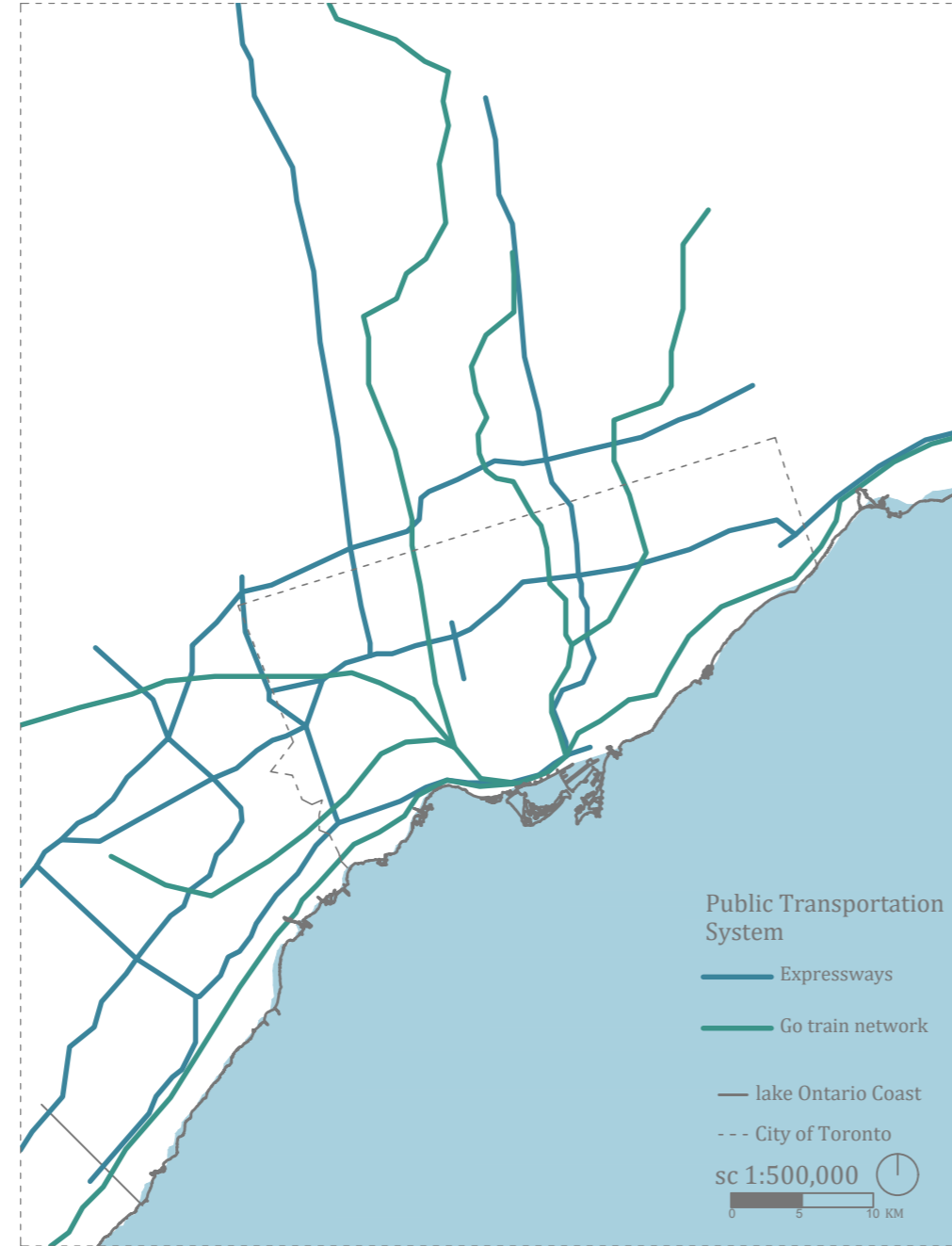
2.5 People working from home percentage

### 2.3 Transportation

In case of Greater Toronto Area, evolving from a pedestrian city, to the street car era and the automobile is an important aspect of the effect of distance in the transportation system, but also varying to reflect the public investment in selected areas of the city including subways, expressways, and the train system is an indicator. The transportation network can be defined as a relation between specific nodes of the past and the potential growth of the future, which is understandable from subway stops, expressway intersections, and GO Train stations. The construction of the transportation network follows a sequence that tracks recent employment growth.(Willms, 2018)(Foth, 2013)

In the suburban areas of the GTA, subway stops mostly represent locations which have developed before, including areas of previous growth, rather than areas that are growing currently. In contrast, the stations of another kind of GTA transportation system, which is GO train, are in potential growth areas that may develop in future as growth nodes. Another fact is also important to consider, that many stations in suburban areas are just parking lots or Expressway intersections, may belong to the past or future of employment growth, depending on their location. (Willms, 2018)

The subway stops have been designed to attract and serve a variety of activities, but it has proven they have been attractive mostly to service to business, and public services, rather than being oriented to blue-collar activities, which have to be a priority. Highway intersections, which are mostly suburban, are attractive to both industry and offices apparently due to their wider network, opposite to GO Trains which is mostly attractive to blue collars, because they are still moving on old rail lines, which end in current industrial areas. In a general view, the transportation system is oriented to the most developed employment locations, but the response was not distributed fairly in all the sectors, especially for blue-collar activities, which means the public transportation is still focusing on the city center and active cores. (Willms, 2018)



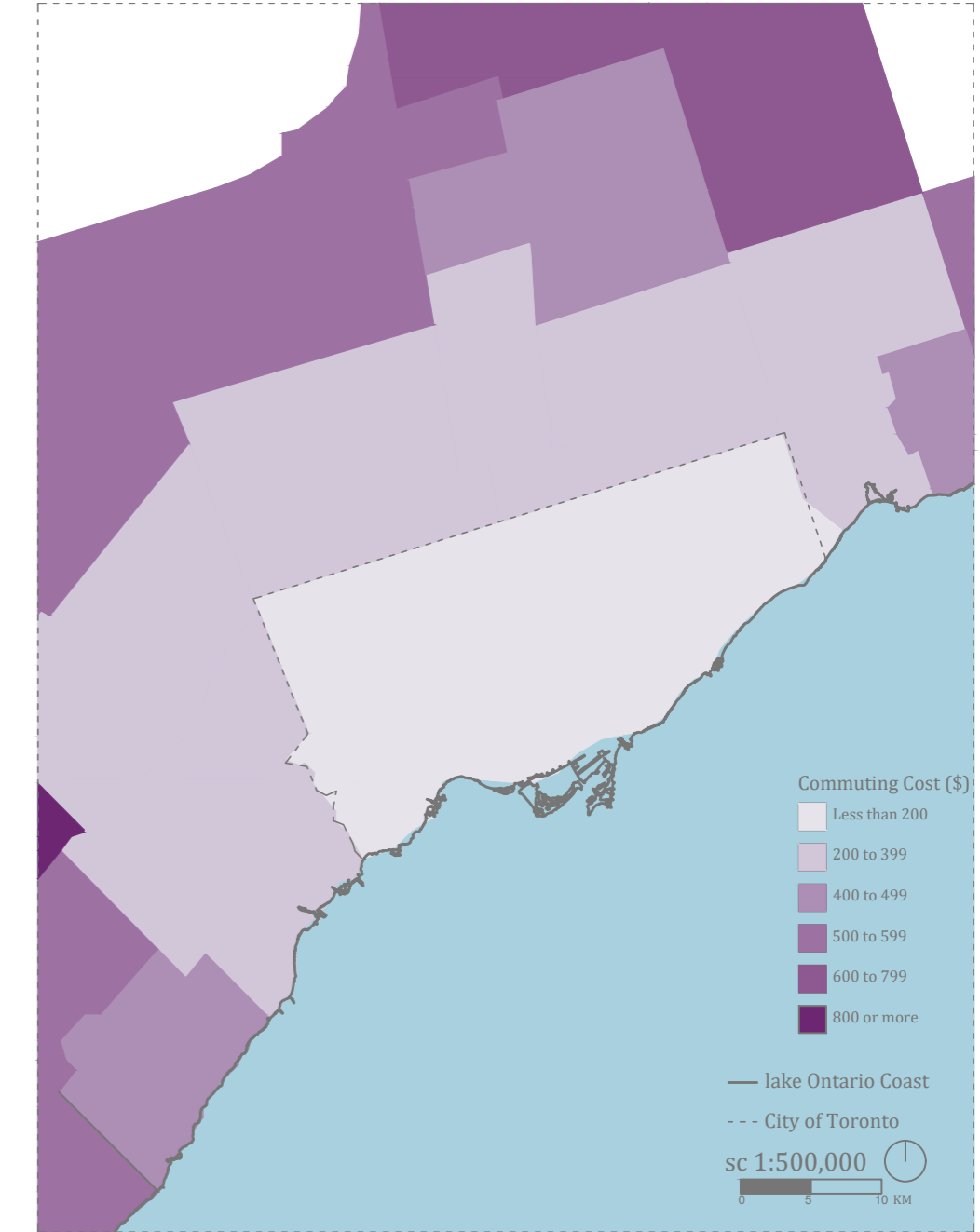
2.6 Public transportation system

### 2.4 Commutation

There is a complicated relation in the Greater Toronto Area between the cost of your place and the cost of your commutation. By moving to the suburbs around the city the added cost of everyday long commute usually outweighs the saved money from the cheaper accommodation. Although homeowners attracted by the affordability of a house with a plot of land can save the commuting cost by using public transit, then the wasted time of using public transit instead of driving will be the trade-off the money you save.(CBC, 2016)

The range of commuting cost is an average of under 200 Canadian dollars a month in the city center, to more than 800 Canadian dollars a month in the outer suburbs, and for the closer suburbs the cost of commuting is estimated an average between 200 and 400 Canadian dollars per month. This estimated price is when just one person commutes in each household, then the numbers will be higher if both partners commute, and on the other hand this numbers just considered the average cost of operation a vehicle, not the cost of parking or another added expense. (CBC, 2016)

According to the fact that within the city center, many people bike, walk, or use public transit to their work, because of the short distances, the average cost of commuting is just 115 Canadian dollars a month. Generally the cheapest way of commuting for suburban areas is using public transit, but as it takes much longer compared to living in the city center or using your personal car, it means you are spending your valuable daily time in trade of money, which is referring to wrong urban planning.(Kennedy, 2002)



2.7 commuting cost per monthx

## 2.5 Culture

Over the last 50 years, culture and art have been powerful drivers of the Greater Toronto Area growth, they have transformed big areas of the center of the city to what it is today. The general global reputation of the GTA became a dynamic cultural center that sits near the top of several livability indicators. But the important fact is that most of the vibrancy and wealth generated by culture is compacted in the city center. While the suburban areas are more diverse in nationality, religion, and culture, they are years behind in levels of creative development and infrastructure compared to city center neighborhoods.(Noble, 2009)

The wrong distribution of cultural investment is leading to a condition in which the city center is made up of cultural oases while the suburbs are deserts in terms of cultural activities. Although organizations such as Urban Arts are trying to do their best in the suburbs with modest resources, to keep the suburbs alive with street festivals, art in the public spaces, and other events, the important missing key to fair distribution of culture is frequent cultural programming, a sustained investment, density of cultural venues, and reasons for creative people to stay in the suburbs and be attracted to their neighborhood.(Noble, 2009)

According to the World Cities Culture Forum, the housing affordability crisis has become the biggest threat to culture in global cities including Greater Toronto Area. As artists are priced out of the city center in GTA, suburban areas become more attractive for them due to cheaper real state, and every part of suburban areas should compete to attract creative people to reach a higher level of cultural value.(Noble, 2009)

The Greater Toronto Area has big disparities between the city center and the suburbs in terms of wealth, income, and opportunities. A higher proportion of suburban residents struggle with the effect of poverty compared to residents of the city center.(Noble, 2009)

In suburban areas culture has a more complicated relation with poverty, in a way that poverty and its consequences such as lack of free time, lack of happiness, health illness, hopelessness, and lack of personal investment reduce the cultural activities in the suburban neighborhoods. But on the other hand, this damage social cohesion in the suburban neighborhood can be built with the help of artists and cultural institutions. Art and cultural organizations can help society to connect to a new pathway of opportunities, engage marginalized youth, and define a new narrative about a place to live without its previous problems. The only way to reach this relation between culture and suburban areas is to bring the needs of suburban communities and artists together, which can happen in urban intervention in neighborhood scale.(Noble, 2009)(Harris, 1991)

In other words this cannot be a call for a conquest of the suburbs by new people from outside the region or a new round of displacement. This cultural awakening of the suburban area should are from the ground up. Strategies defined for these areas and interventions should be carefully managed in a way that suburban communities remain inclusive neighborhoods.(Filion, 2011)(Noble, 2009)

## 2.6 Summery

In the 1950s, as a response to a booming population, urban crowding, and industrial pollution in North America, new suburban neighborhood created. In this new areas, industry and economical activity was completely separated from residences, automobile was the best, quick, efficient, and affordable way for commuting, and large single detached family houses with generous lots were accessible to middle class. Toronto Greater Area was one of the urban areas affected by these factors.

The first ring of automobile-dependent suburbs which were constructed around Toronto city between 1950 and 1980, are today referred to inner or transit suburbs, while in contrast the suburbs which were constructed after 1980 with a longer distance to the city center are called outer suburbs or exurbs.

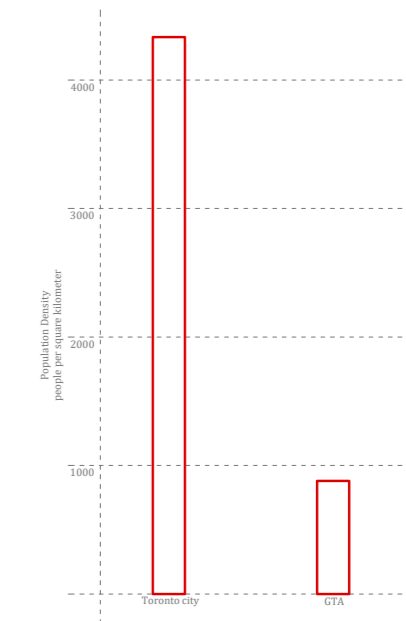
Over the last three decades, the urban economy has been completely transformed, when the old economy of blue-collar activities has given way to an explosion of services, and within this transformation the location priority of industries has also been transformed and replaced, such as residential development which moved from the inner city center to the suburbs, and replacement of competition for businesses in the city center instead of old industries around the center.

The need for the rapid growing of the city due to the mentioned factors coincides with the need for various industrial sectors to adjust their location requirements, consequently the city lost its mix land use with long distances to the city center during the period of rapid development.

The city center was the first place to be settled once snow is a jungle of high-rise offices, economic activities, and shops with 10,000 to 100,1000 workers per square kilometer, while the surrounding suburban areas which were previous industrial areas once, became low density areas with 3,000 to 300 workers per square kilometer.

Roughly two-thirds of the total dwelling units in the Greater Toronto Area are in suburban areas around the city center, while most of the job opportunities, cultural activities, shops and commercial centers, and educational activities are inside the city center of Toronto.

What is clear out of the all data is that Greater Toronto Area is affected by sprawl development heavily in its suburban areas. The population density in Toronto city is 5 times more than the population density of the Greater TorontoArea,andthisisjustoneoftheindicatorsthathasimpactonlifequality which is not distributed well in GTA between the city center and its suburbs.



2.8 Population density

# 03

## **03 RESULT**

**3.1 What is sprawl**

**3.2 General causes**

**3.3 Why sprawl happened in Toronto**

**3.4 Sprawl consequences**



## RESULTS

After it turns out that the Greater Toronto Area is affected by sprawl development in its suburban area due to the researches, it is crucial to answer following questions what is sprawl? What is its general causes? Why it usually happens? Why sprawl happened in Toronto specifically? What are the general consequences of sprawl development on our environment? Our economy? Our society? Our culture? And generally on humans life?

### 3.1 What is sprawl

The phenomenon of sprawl has been described in various ways, ranging from development aesthetics to local street patterns.(Galster et al., 2001). While there is no universally accepted definition of sprawling land development, there are several common characteristics pervading the literature that can help us understand and even measure its occurrence. These include:

1. **Low-Density**, single family dwellings. The most frequently cited feature of sprawl is the abundance of large-lot (usually 1-5 acres depending on the development context), residential housing developments that consume large amounts of previously vacant or productive land. Density, in this sense, can be represented by median lot size, the number of dwelling units per neighborhood, or median floor space of single-family units (Song & Knaap, 2004).
2. **Automobile Dependency** even for short trip. Because sprawling development patterns create large distances between dwelling units and segregate different land uses, residents are forced to rely on automobiles at the expense of alternative forms of transportation. Also, the cul-de-sac dominated street patterns within these neighborhoods foster a lack of connectivity and serve as an obstacle for walking and biking to nearby destinations (Benfield et al., 1999). Reliance on the automobile also encourages the development of homogeneous neighborhoods that lack a mixture of land uses (Song & Knaap, 2004).

3. **Spiraling Growth outward from existing urban centers.** Sprawl is also conceptualized as low-density development rapidly expanding away from more compact urban cores. Approximately 80 percent of the acreage used for recently constructed housing in the U.S. is land outside urban areas; almost all of this land (94%) is in lots of 1 acre or larger (Heimlich & Anderson, 2001).
4. **Leapfrogging Patterns of development.** Another well-known characteristic of sprawl is dispersed development, which favors the development of parcels situated further out in the countryside over the vacant lands adjacent to existing development.(Torrens & Alberti 2000). Leapfrogging creates a haphazard development pattern that consumes large amounts of land.
5. **Strip Development.** “Ribbon” development, in which residences or commercial properties line roads extending outward from urban centers is another prominent characteristic of sprawl (Tsai, 2005). Homes arranged along rural highways present hazards related to traffic safety; commercial strips comprised of fast food chains and large retail stores cater to automobile access and are often fronted by expansive parking lots.
6. **Undefined Edge between urban and rural areas.** Sprawling residential development extending outward from urban centers tends to blur the division between urban and rural domains (Heimlich & Anderson, 2001). This development pattern is often associated with the encroachment of open space and agricultural lands.

It is important to note that sprawling development patterns are tied to the context of the urban-suburban landscape. Low-density residential units may mean different things in the city of Houston than in a small town in coastal Maine. Also, one development project or neighborhood does not make for sprawl; rather, sprawling development must be assessed as an overall pattern at the regional level. As an overall pattern of development.

Infrastructure drives the growth of cities by providing the essential framework for residential development. After new development takes place, residents then demand improvements in infrastructure that further ignites development along the urban fringe. Widespread access, provided by improvements in transportation infrastructure and relatively inexpensive gas prices, allows developers to utilize cheap land located outside the city center (Gillham, 2002).



3.1 Example of sprawl development in GTA suburbs

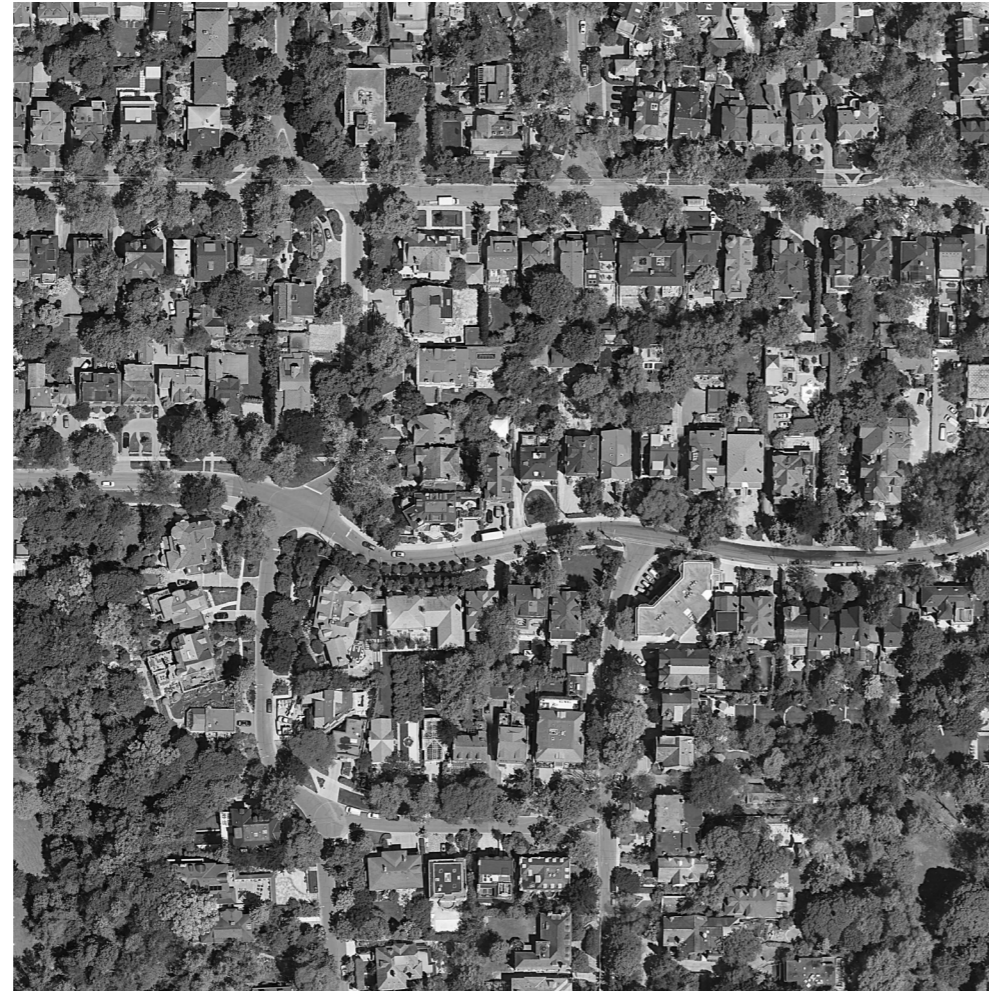


### 3.2 General Causes

Sprawl is the result of a complex set of interrelated socioeconomic and cultural forces. Land value, however, is often considered the chief driver of development patterns. Sprawl tends to occur where property values are lower on the periphery of urban centers (Pendall, 1999). Economists identify three underlying forces that interact with land values to create spatial urban expansion or sprawl. First, population growth results in the outward expansion of urban areas (sometime population decline also can be a precursor to sprawl). Second, rising incomes allow residents to purchase larger living space. These residents locate where housing options are less expensive, in suburban and ex-urban areas generally located at the outskirts of metropolitan areas (Carruthers & Ulfarsson 2002). Third, decreasing commuting costs produced by historical investments in transportation infrastructure also fuel outward expansion of development (Brueckner, 2000).

Race has been identified as another socioeconomic indicator of urban and suburban sprawl. Racial strife in the centers of cities such as Los Angeles and Detroit led to an out-migration of middle- and upper-class whites to the urban fringe (Daniels, 1999). This relocation of residents, known as “white-flight” can lead to more spread-out metropolitan areas and lower property values (Carruthers, 2003). Age has also been considered an important factor in determining the spatial pattern of development. Specifically, younger families promote sprawl and patterns by seeking out affordable housing options at the urban fringe (Zhang, 2001). Finally, it should not be overlooked that even though sprawl may be an unsustainable form of growth, people strongly prefer to live on larger lots in suburban communities.

The American dream of homeownership usually involves a large yard in a newer, low-density neighborhood.



3.2 Example of sprawl development in GTA suburbs

### 3.3 Why sprawl happened in Toronto

#### 1. Highways.

Toronto city and the Greater Toronto Area is located in Ontario province, the provincial government of Ontario is one of the reason that sprawl development happened in the GTA, by supporting the construction of highways and also sewers network in its suburban areas. On the other hand it has to be mentioned that, the favorite kind of neighborhood of local people is also low density development. The main reason for supporting the construction of these highways is to relieve congestion, but unfortunately the impact of the highways in the most positive view was just unclear. In the 1990s, most of the Greater Toronto Area’s highway network was crowded especially at peak periods. The expressways which were built by the provincial government to suburbia filled those areas and the roads there with cars. Obviously the goal of the government was not to create a low density sprawl development around the city, but commuters would naturally prefer the cheaper land of suburbia with bigger space for living in beautiful single detached family housing when its accessible, which became possible due to the new highways, then sprawl happened indirectly as a consequence of unplanned highway construction. In the absence of highway access, suburbs would be less popular for homeowners, as many surveys show that they prefer locations with highway access.(Willms, 2018)(Woudsma, 2016)

#### 2. Sewage And water services

By the 1940s, suburban growth was highly impeded by the absence of water and sewer services, as in the suburbs of the Greater Toronto Area around 20 percent of homes used outhouse services, which was not a perfect situation. But in 1957, the Ontario Water Resources Commission (OWRC) was established by the provincial government of Ontario, to help the growing areas of the province by improving public services.

Even an announcement was published by the provincial government through this commission, that it would fund more sewage and water services for the Greater Toronto Area’s suburbs, not only the existing suburbs, but also the proposed development sites, which some of them were not planned by the region’s land use plans. (Willms, 2018)(Woudsma, 2016)



3.3 Toronto high ways 1970s



### 3. Wrong Planing

In the 1950s, the GTA planner where trying to limit population density in the suburbs which was developed recently, it was stated in the city's 1943 plan, that the suitable population density for those suburbs would be 10,000 people per square mile(3.861 people per square kilometer) for those suburban areas( much less than the density of today's Toronto neighborhood density). But ultimately the population density of GTA suburbs became even less dense with the population density between 8,000 to 4,700 people per square mile(3.000 to 1.800 people per square kilometer) in older and newer suburbs. The new growth were taking place at a unit density between 6 and 10 unit per acre, while the density in Toronto's older residential neighborhood was around 20 to 30 units per acre. Low-density areas are commonly automobile-dependent because, with just a few dwellings on each block, only some few people can walk to nearby destinations. A consequence of automobile-dependency will be the need of numerous parking. Another factor which reduced the population density and also employment density in suburban areas of GTA was the need of parking, it's not just limited to residential buildings, but also the need of parking for commercial building and offices wasted a lot of land, because there was a rule for providing parking, but not an obligation for vertical parking under or around the ground, then its clear what will happen in cheap lands of suburban areas. (Willms, 2018) (Woudsma, 2016)

### 4. Economy

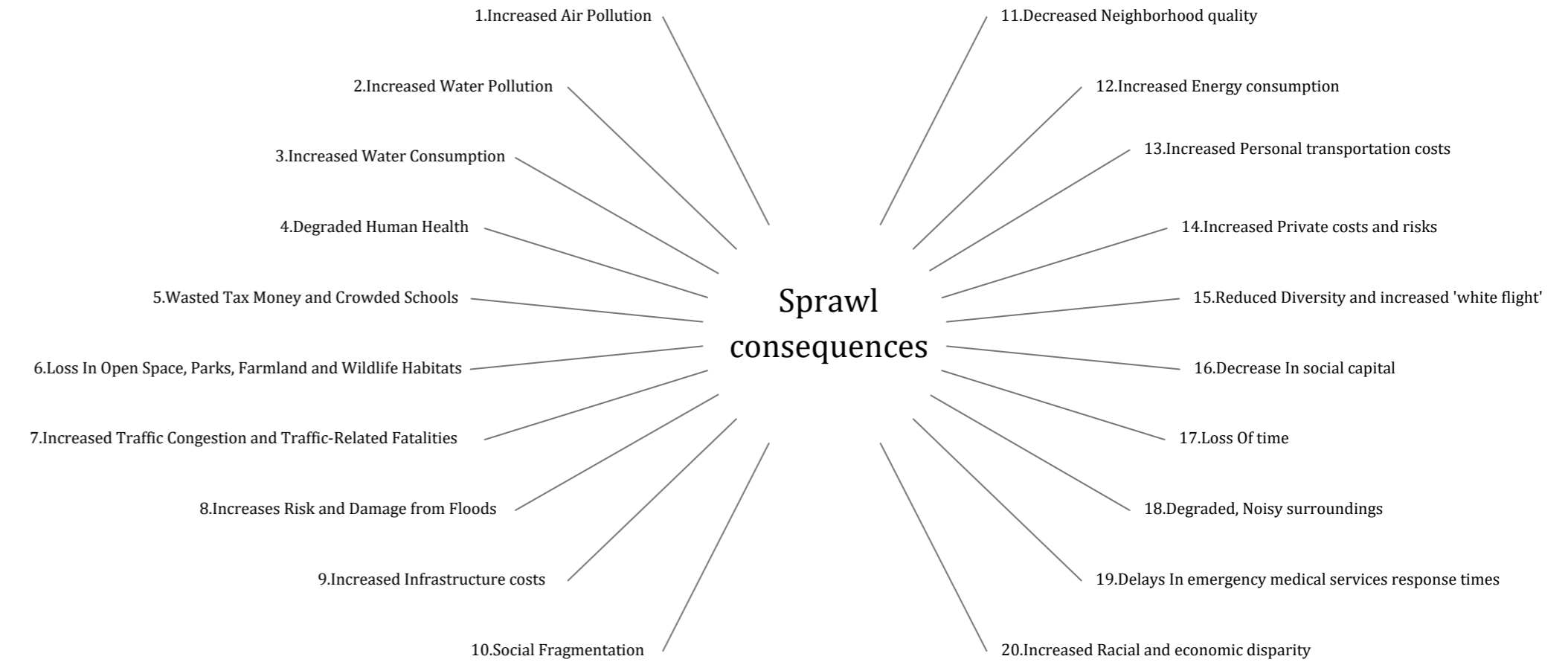
According to the higher costs associated with downtown life, living in the suburb was the only economical choice left, a place to live which rent is lower, free parking is accessible, and build wealth through the home ownership is possible, that's why the economical sustainability argument against suburban development, become not important in front of individual of families economical struggles. (Willms, 2018)(Woudsma, 2016)



3.4 City of Toronto

### 3.4 Sprawl consequences

Many other effects of urban sprawl on different aspects of sustainability such as environmental, economic, social, and cultural can be listed, but these are the most important, and visible ones, that are common in most of the sprawl development conditions around the world. (Squires, 2002)(Zhao, 2010) (Bhatta, 2010)(Nechyba, 2004)



3.5 Sprawl consequences

# 04

## **04 Urban, Neighborhood, Building**

**4.1 Analyzing the strip**

**4.2 Generations strip**

**4.3 Introduction to 10 generations**

**4.4 Analyzing the generations**

**4.4.1 Hedget Communities**

**4.4.2 Flipped & Flourishing**

**4.4.3 Settled & Certain**

**4.4.4 Vertical Islands**

**4.4.5 Insecurity Deposit**

**4.4.6 Diverse city**

**4.4.7 The Remade City**

**4.4.8 Genx Suburbs**

**4.4.9 Suburbia Redefined**

**4.4.10 Small Town Satellites**

**4.5 Generations Analysis results**



## Urban, Neighborhood, Building

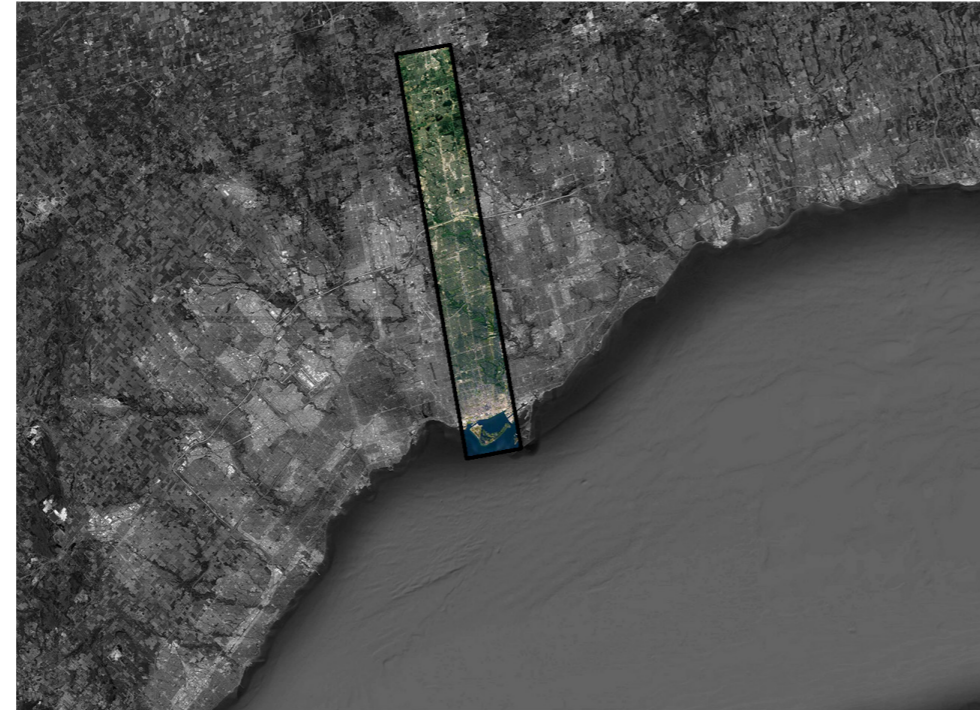
Following the research on the Greater Toronto Area's Active Cores and Suburban Areas, it is clear that the GTA is affected by sprawl in its suburban areas; therefore, a strip was chosen for the next steps of analysis in order to have a closer and more precise look at different scales of Urban, Neighborhood, and Building.

### 4.1 Analyzing the strip

The strip should cover all generations of the city in terms of location, development layers, infrastructure level, density, life quality, distance to city center, and sustainability. Then the chosen strip is a huge rectangle with dimension of 45 kilometers to 6 kilometers covering all the layers starting from the lake coastline, city center, active core, downtown, to old suburbs, new suburbs, agriculture and farmlands.

The main goal of this strip is to classify different urban generations inside the GTA, understand the different conditions of neighborhoods in the city, the reasons for these differences, and study the sprawl in them, find out more precisely:

1. Where sprawl is happening.
2. Why sprawl is happening.
3. How heavy are the sprawl consequences on sustainability.

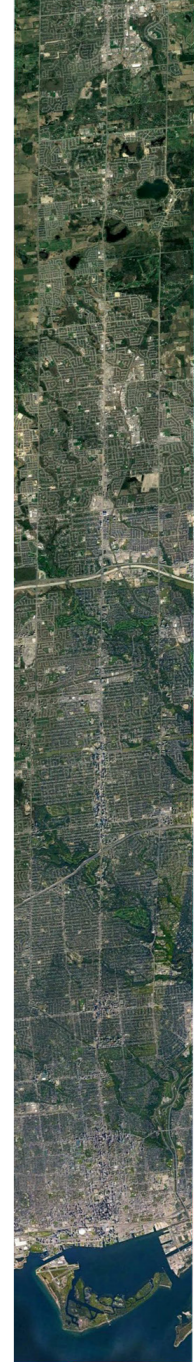


4.1 Strip location in Greater Toronto Area

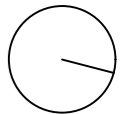
In order to classify the generations of the Greater Toronto Area and ability to mark them in the strip eleven indicators are chosen to analyze.

1. **Build Up Development**
2. **Unit Density**
3. **Shopping Centers**
4. **Education**
5. **Health & Safety Services**
6. **Job Opportunities**
7. **Job Access By Public Transit**
8. **Median Income**
9. **Parks & Waterways**
10. **Urban Centers**
11. **Diversity**

These 11 chosen indicators are essential indicators to understand the situation of a neighborhood, in terms of sustainability in economical, environmental, social, and cultural point of view, and also in terms of life quality, wealth or poverty, happiness or hopelessness, and accessibility or isolation. In this way its possible to divide the city into several generations for the next level of analysis on them.



4.2 Strip Satellite map



Sc 1:100,000



**Built up development**

- 2011 built up area
- 2001 built up area
- 1991 built up area
- 1971 built up area

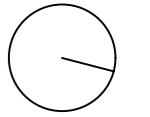
4.3 BUILT UP DEVELOPMENT



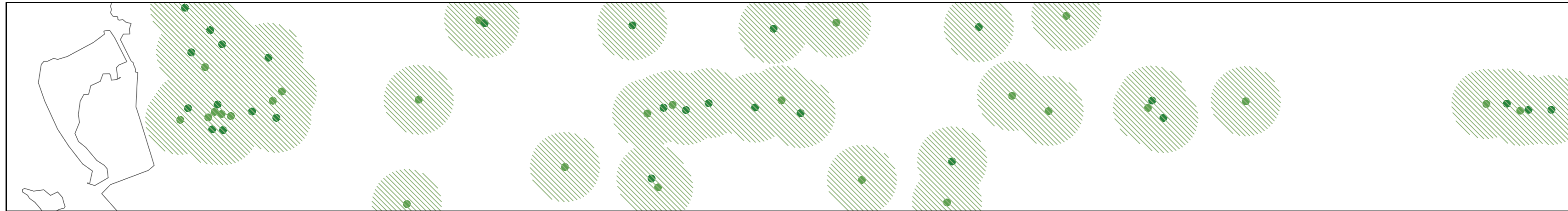
**Dwelling unit density  
(unit per hectare)**

- 100+
- 50-100
- 20-50
- 5-20
- 1-5
- 0

4.4 DENSITY



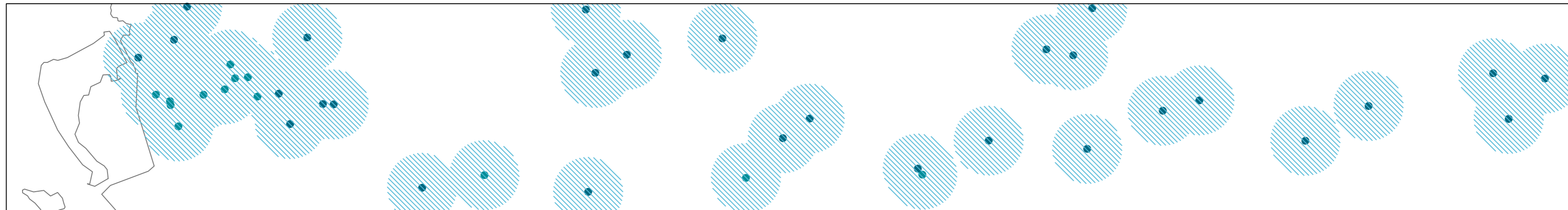
Sc 1:100,000



4.5 SHOPPING CENTERS

**Areas with distance less than 1km to shopping centers**

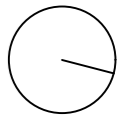
- SUPERMARKETS
- MALLS



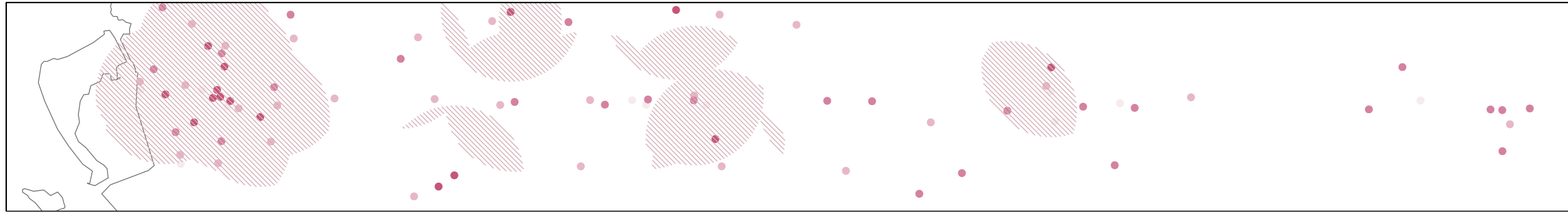
4.6 EDUCATION

**Areas with distance less than 1km to schools or universities**

- universities
- schools



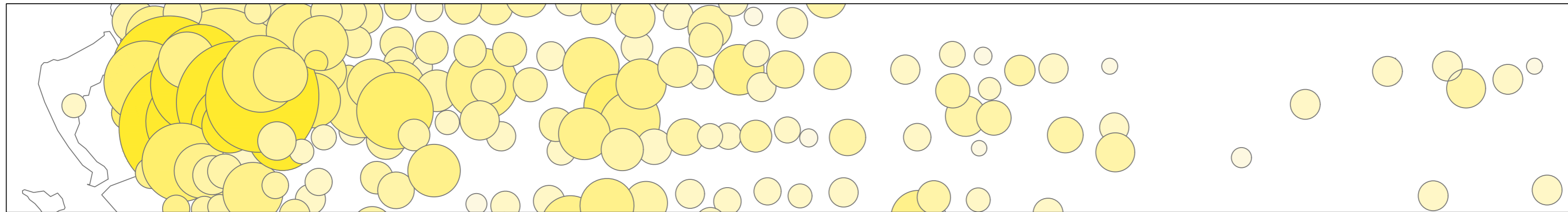
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**Areas with distance less than 2 km to all the facilities**

- hospitals
- pharmacies
- fire stations
- police stations

4.7 HEALTH & SAFETY

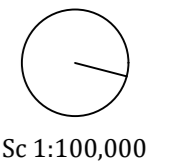
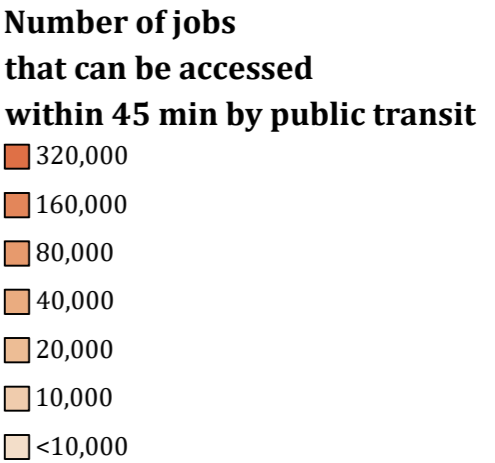


**Number of jobs available (worker per square kilometer)**

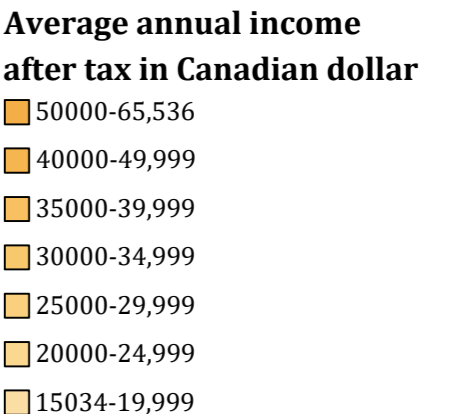
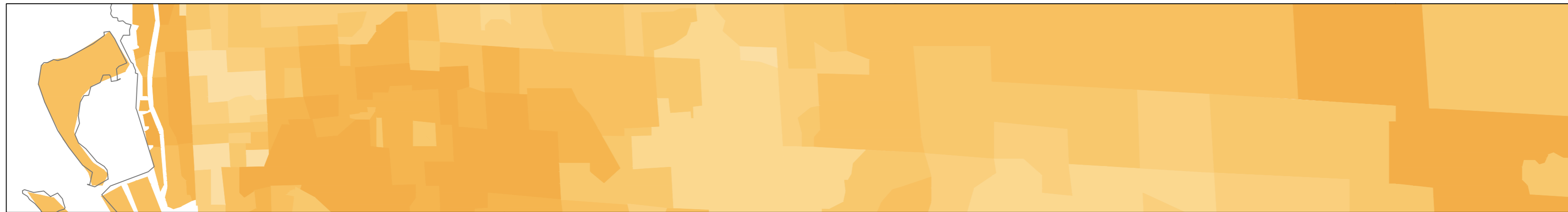
- 30,000 to 87,700
- 10,000 to 30,000
- 3,000 to 10,000
- 1,000 to 3,000
- 300 to 1,000
- 0 to 300

4.8 JOB OPPORTUNITIES(workers/sqm)

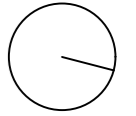




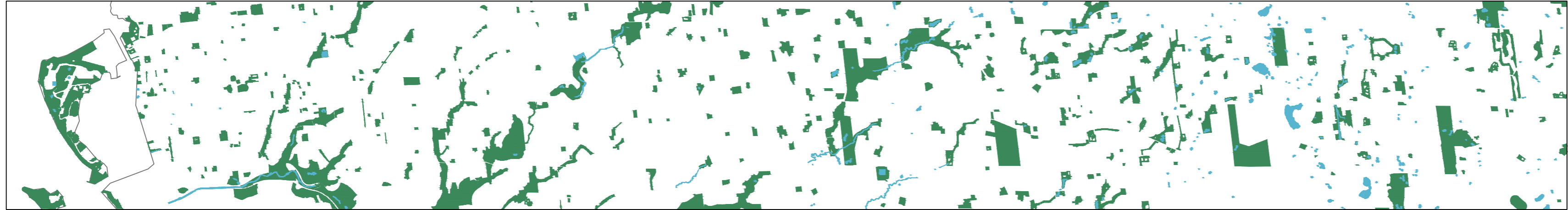
4.9 JOB ACCESS BY PUBLIC TRANSIT



4.10 MEDIAN INCOME

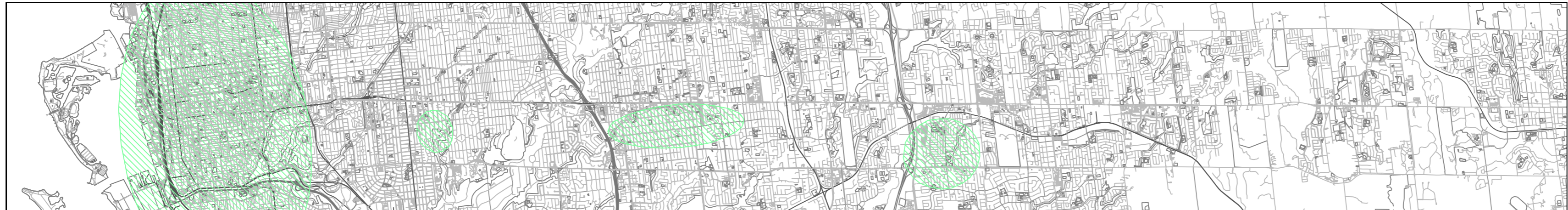


Sc 1:100,000



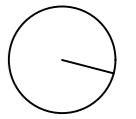
water ways  
parks

4.11 Nature



urban centers

4.12 URBAN CENTERS



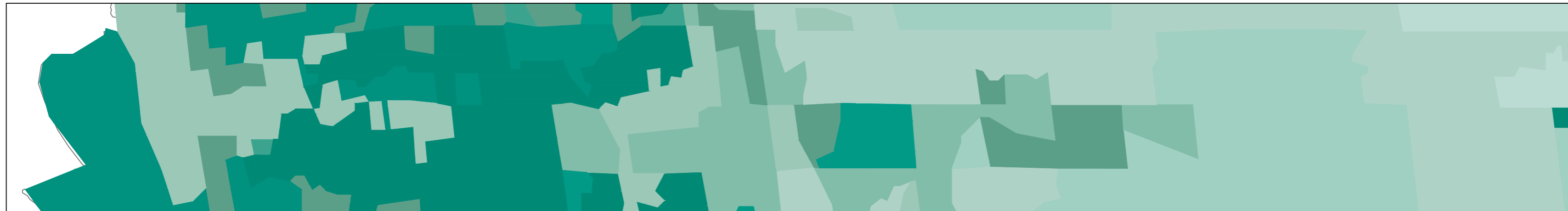
Sc 1:100,000



**Percentage of visible minorities**

- 30%+
- 20%-29%
- 10%-19%
- <10%
- not available

4.13 DIVERSITY



- hedget communities
- flipped & flourishing
- settled & certain
- vertical islands
- insecurity deposit
- diverse city
- the remade city
- genx suburbs
- seberbia redefined
- small town satellites

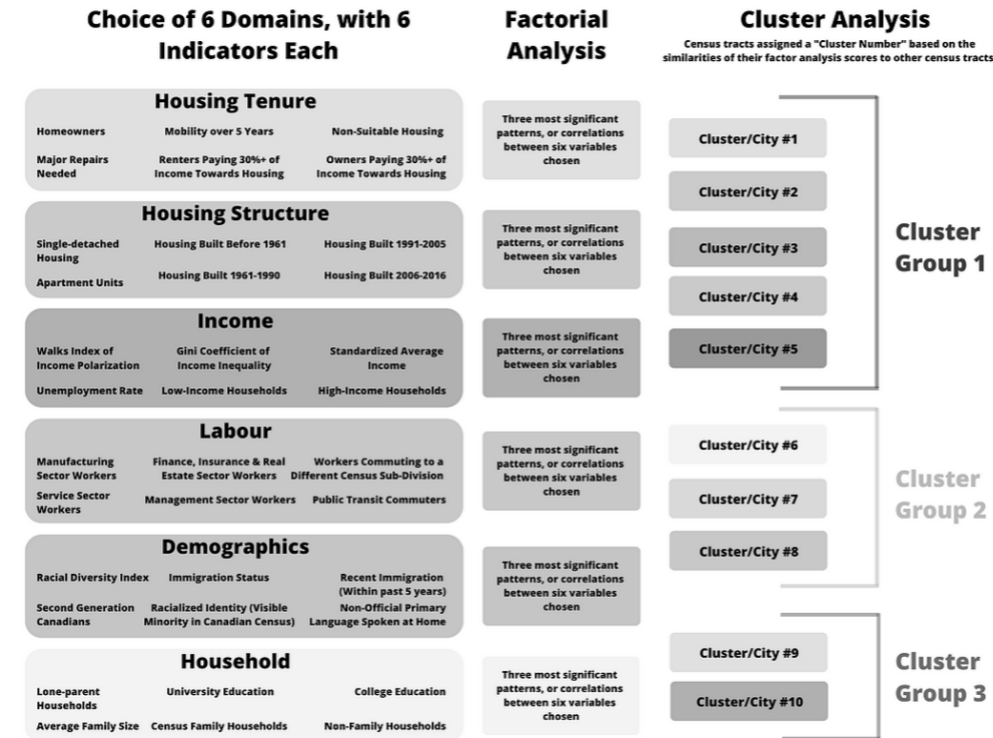
4.14 GENERATION MAP

#### 4.2 Generations strip

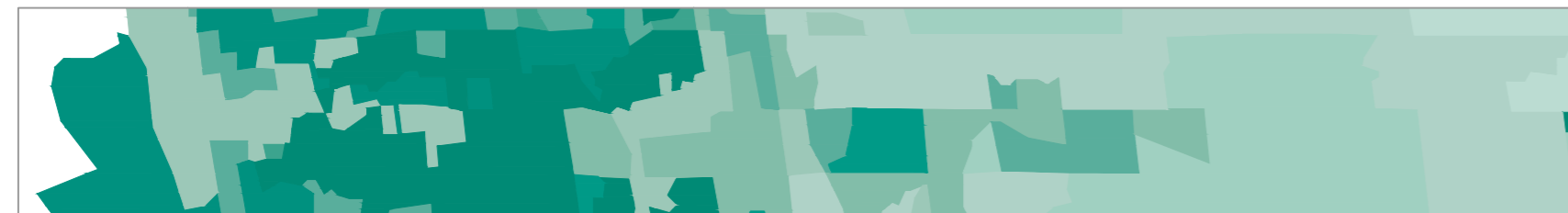
After analyzing 11 important indicators of the strip its possible to reach a final strip as Generation strips by overlapping all the layers, there is an already existing map from (<https://www.tencitiesproject.org>) which divided the GTA (greater Toronto area) into 10 generations including:

1-hedget communities, 2- flipped and flourishing,3-settled and certain, 4-vertical islands, 5-insecurity deposit, 6-diverse city, 7-the remade city, 8-genxsuburban, 9-suburbia redefined, 10-small town satellites. (<https://www.tencitiesproject.org>)

The map of (<https://www.tencitiesproject.org>) has been chosen as our generations map because it's derived by studying plenty of factors and indicators, and more importantly it completely fits to overlap of our 11 indicators.



4.15 Tencitiesproject methodology structure



- hedget communities
- flipped & flourishing
- settled & certain
- vertical islands
- insecurity deposit
- diverse city
- the remade city
- genx suburbs
- seberbia redefined
- small town satellites

4.16 Generations strip

sc 1:200.000

#### 4.3 Introduction to 10 Generations of GTA

- Cities of Wealth**

**A collection of communities sharing very high levels of wealth and homeownership. Split into two groups, established long-term wealthy neighborhoods and more recently gentrified parts of the urban core.**

- Hedget Communities:** Wealthy and established family households living in exclusive neighborhoods close to Toronto downtown, mostly single detached homes built prior to the 1960s.
- Flipped & Flourishing:** Former working-class communities in Toronto downtown neighborhoods that have been gentrified. Now home to wealthy households living close to their workplace and high users of public transit.
- Settled & Certain:** Most comprised of post-war suburban neighborhoods with modest incomes and single detached homes. long-term residents living in the early suburbs that have now become the core of much larger suburban cities

- The Urban Cities**

**A mix of neighborhoods sharing more urban characteristics, both in Toronto and throughout the GTA. City types range from dense apartment clusters to mature mixed suburbs to parts of the urban core totally remade into new condominium buildings.**

- Vertical Islands:** Communities scattered throughout the east and west ends of Toronto. Housing also entirely apartment buildings, with many residents renting. High proportion of households facing financial stress with payments.
- Insecurity Deposit:** Neighborhoods largely situated in Toronto mature suburbs directly to the east and west of the downtown core. mostly single-detached housing and wealthier households compared to most other surrounding urban areas.

**6. Diverse City:** Neighborhoods with many immigrant and racialized communities living in a mix of apartments and houses. fairly high level of rental stress.

**7. The Remade City:** New apartment buildings that are remaking Toronto core. Contrasting levels of wealth and disparity, and high proportions of income spt on housing costs.

- The Suburban Cities.**

**Communities almost entirely outside of Toronto's boundaries. Includes successive waves of suburbanization and the rural areas and towns, many of which are developing their own suburban rings.**

**8. Genx Suburban:** Suburban communities neighborhoods with suburban characteristics from 1980s onwards. Also includes small villages and rural areas.

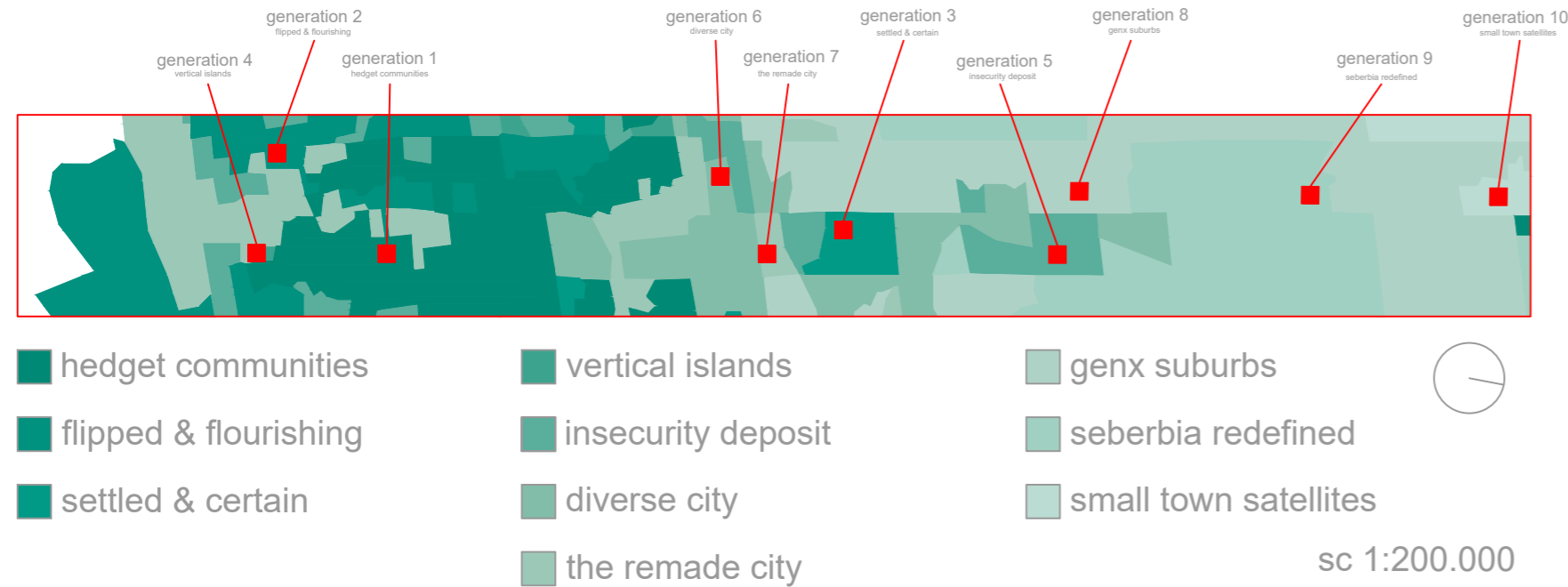
**9. Suburbia Redefined:** Millennial suburbs, mostly constructed since the 2000s. More diverse demographics compared to earlier suburbs, and more townhouses and apartments.

**10. Small Town Satellites:** A mix of rural areas and small villages across the GTA



#### 4.4 Analyzing the Generations

After finding 10 generations of the Greater Toronto Area, in order to answer our three main questions including understanding which parts of the city are affected by sprawl development, why, and what are the consequences, 500M\*500M samples are chosen from each 10 generations to study, analyze and compare to each other. These 500m \* 500m samples have been chosen completely randomly and the outcome conclusion of each sample, will be a representative of the condition of each generation. The condition of generations will be analyzed through these samples in three levels of urban scale, neighborhood scale, and architectural scale for all the 10 defined generations.



4.17 Generation's sample locations

#### A) Urban characteristics:

First starting the analysis in Urban scale in the sample by studying the Urban characteristics of the area, land use, density, access, functions, relations, public transportation, infrastructures, main typology of housing, presence of services and facilities, and at the end understanding if the area is sustainable. Sustainable in terms of economical, Environmental, Social, and cultural and finding out the reasons if they look sustainable or not and how being effected by sprawl development has impact on these qualities.

#### B) Neighborhood characteristics:

In the next step I am going to analyze each generation in a middle step of scale as the neighborhood, the sample will be 100M\*100M, which is chosen randomly within the bigger sample of urban scale. A matrix is designed out of the neighborhood sample showing the relations between houses, and their relation with the street, solid void relations, green and hard pavements, and privacy concept of the neighborhood, beside studying the view and appearance of the neighborhood.



4.18 Analyzing the Generations process

#### C) Architectural characteristics:

As the last step of analysis one of the buildings randomly is chosen within the neighborhood sample for a more precise and closer look to main architectural characteristics of the generation, orientation, proportion, and dimensions of the plot, number of families living in it, its relation to the street and its neighbors, accessibility, parkings, greeneries, age of the building and its price and appearance, and it's relative energy and water consumption, and at the end the priority and important factors for its residence, and the way they are using it.

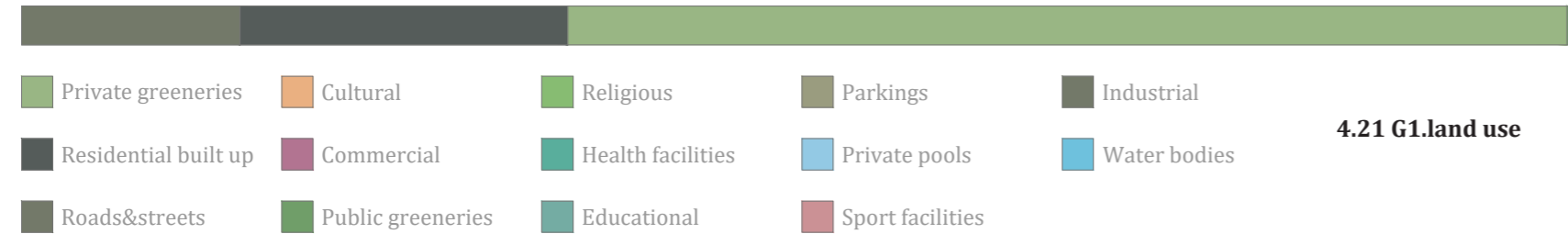
These process of analysis has been done in these 3 scales for all the 10 Generations of GTA

#### 4.4.1 Generation 1: Hedget Communities

Although the City of Hedged Communities is nestled among other urban "Cities" close to Toronto's core, it's been placed within a different category due to a few key reasons. Whereas the surrounding cities feature lots of apartment buildings, non-family households, a strong diversity of cultures and linguistic backgrounds and a mix of income brackets, the neighborhoods of Hedged Communities are generally home to relatively well-off homeowner families living in single detached homes. Many of these neighborhoods are associated with established wealth, and line up with David Hulchanski's wealthier City #1 in his well known study of Toronto's Three Cities, which examined growing income inequality across the city. Even though these communities lie directly within the heart of Toronto, these communities have a lot more in common with some of the GTA's suburban areas. (<https://www.tencitiesproject.org>)

Population	Percent of total population
321,362	5.4%
Average household income(after tax)	Residents moving every 5 years
\$177,820	31%

4.19 G1 General information table



#### - Urban characteristics:

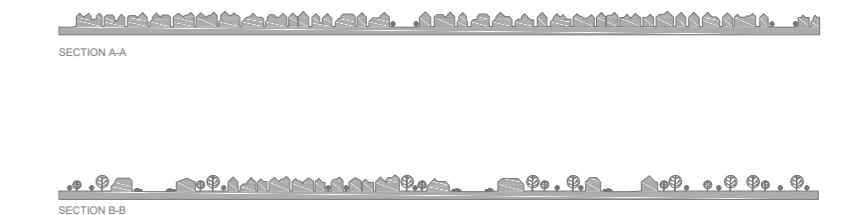
A 500m\*500m sample of this generation is chosen in order to understand and analyze the urban characteristics of it. The number of residential units in this sample is 480 then the average density of generation will be around 19 dwelling units per hectare.

Easy and fast access to the highway and short distance to the city center and being close to bus stops are the most important positive characteristics of this sample. We can also mention 100% residential usage which means a quite and gentle neighborhood. An average of 1000 square meter for each lot, straight entrance to single family houses and private parkings bring more privacy and quietness for residents of the area. Fancy lifestyle, beautiful facades, and expensive private houses are mentionable about the area.

Although the area is relevantly a rich area because of the willingness of the residents themselves to privacy and quietness, there is no other function but residential in the sample, not a well definition of the neighborhood nor a well defined gathering center or public greeneries, and more importantly not any shopping center accessible by walk or bicycle. Being completely residential, forces all the residents to daily use of their personal vehicles and leave the spiritless neighborhood for any kind of activity.

And the dominate typology of single family hosing not only is a waste of time and increases distances, but also highly increases the energy consumption for hitting the house compared to more compact kinds of housing.

What is clear about this area is this area is heavily affected by sprawl development, but not the similar sprawl with suburban areas of the city.



**- Neighborhood characteristics:**

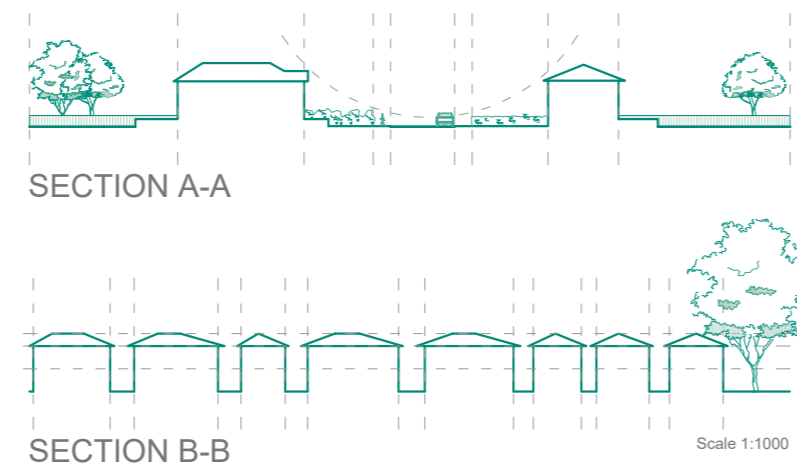
A 100M\*100M sample is chosen in order to understand and analyze the neighborhood characteristics of this generation more precisely.

A relatively high amount of both personal and municipality expenses in order to have a high quality neighborhood is visible in this sample. Wide view of the street, long view for houses windows both to their backyard and front yard, variation in vegetation and designed pedestrians on both sides of the streets, are evidence for this high classification of the neighborhood.

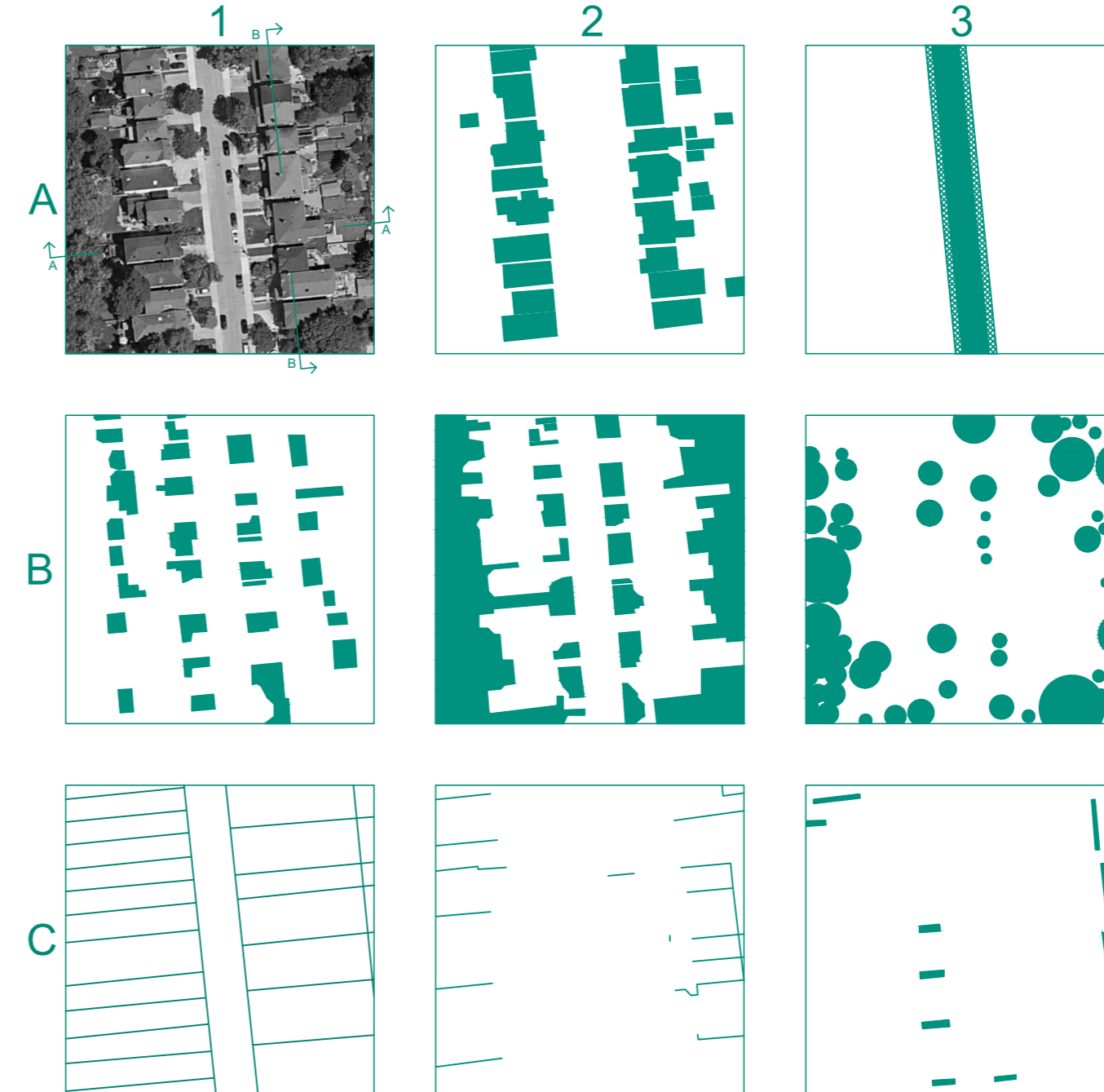
In the matrix we can also see a low percentage of solid compared to voids, a high percentage of greenery, and more importantly a small amount of walls or fences which show the privacy and safety of the neighborhood.



4.23 G1.Neighborhood Scale View



4.24 G1.Neighborhood Scale Sections



4.25 G1.Neighborhood Scale Matrix

- A1: satellite image
- A2: solid & void
- A3: street & pedestrian
- B1: private hard pavements
- B2: greeneries
- B3: trees
- C1: plot borders
- C2: walls or fences
- C3: vegetation barriers

SCALE 1:2000



**- Architectural characteristics:**

One of the residential buildings of this sample is chosen in order to understand and analyses the architectural characteristics of this generation more precisely.

A common point about the architectural characteristic of the sample is the long proportion of the lots that happened because of the thick proportion of the blocks, a hundred percent of buildings in the sample are single family houses with long proportion and the direction of half of them is east-west. Single detached two-story family houses with a small front garden covered with lawn and a covered parking attached to the house itself, with a long backyard with huge trees in it is the main architectural characteristic of the area.

This long proportion and for some of them east-west direction reduce the quality of light coming inside and the quality of view, and on the other hand relevantly narrow facade reduced the quality of the plan inside, which are the negative characteristics of the area.

We can also mention high usage of energy for hitting the houses which are vulnerable to cold outside air from all the sides, every single dwelling units are exposed to relatively harsh weather of Toronto city form their all six sides which means huge waste of energy comparing to any other kind of housings.

**- Sustainability of the chosen sample**

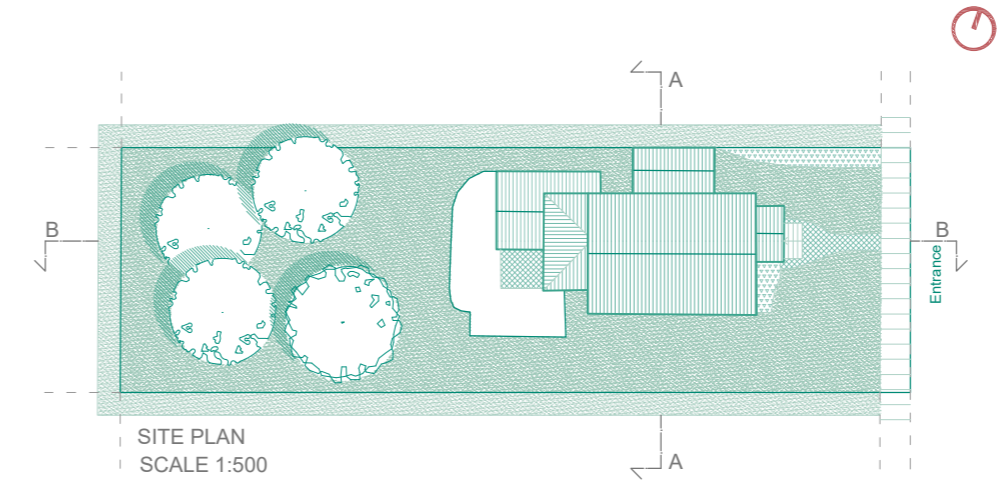
Because of high energy consumption for hitting, lack of nonresidential activities and missing of mix use design, and obviously waste of municipality expenses in presence of low density this sample cannot be economically sustainable. Huge amount of fuel used both for hitting and transportation, and also big usage of water for private greeneries for each private land, this sample cannot be sustainable in terms of environment. Low density, poor neighborhood, lack of center, lack of designed definition, and long distance between neighbors lead this generation not to be sustainable socially.



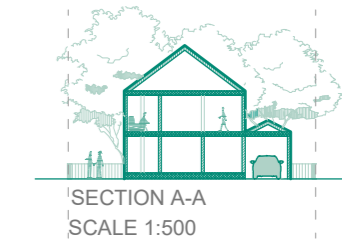
4.26 G1.Architectural Scale Satellite image



4.27 G1.Architectural Scale street view



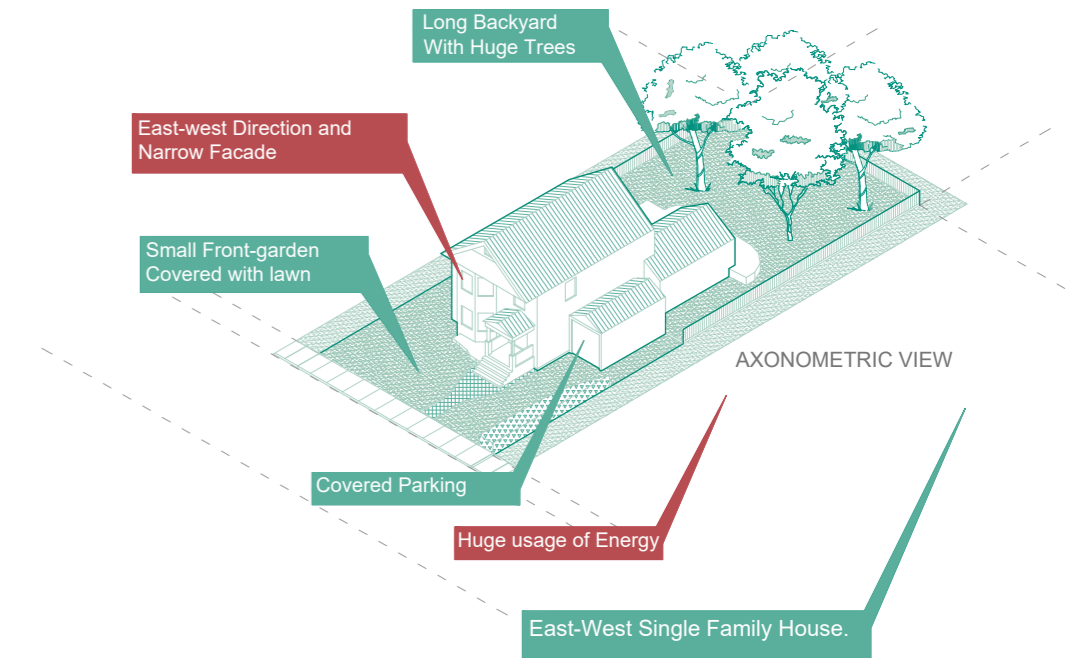
SITE PLAN  
SCALE 1:500



SECTION A-A  
SCALE 1:500



SECTION B-B  
SCALE 1:500



AXONOMETRIC VIEW

4.28 G1.Architectural Scale technical view

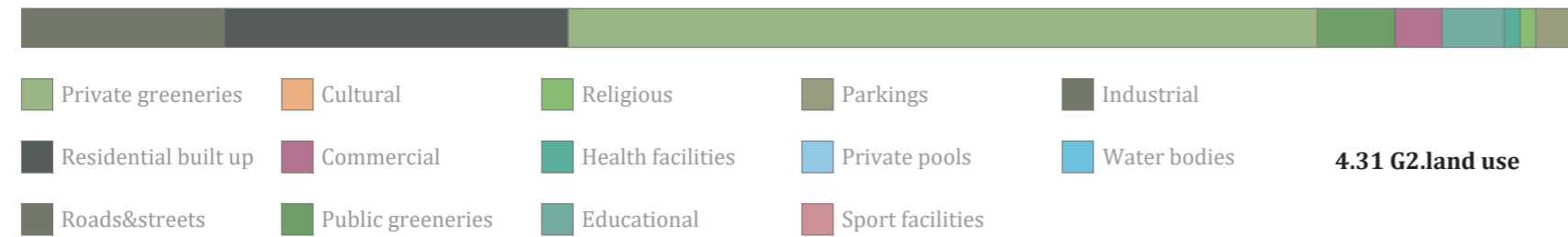


#### 4.4.2 Generation 2: Flipped & Flourishing

The City of Flipped & Flourishing is a collection of some of Toronto's oldest and most layered neighborhoods. Many of these neighborhoods have seen a past life of being urban working class neighborhoods close to the city's core. With the increased value of downtown living, these neighborhoods have been gentrified over the past few generations and are now some of the wealthiest parts of Toronto. With a quarter of homes constructed before 1961, these communities have some of the oldest housing stock that has been renovated for a new group of wealthier residents. While this city is not as wealthy on average as the City of Hedged Communities, it is the second wealthiest city and generally are positioned directly surrounding many of the wealthiest parts of the GTA that make up the Hedged Communities neighborhoods. (<https://www.tencitiesproject.org>)

Population	Percent of total population
366,632	6.2%
Average household income(after tax)	Low income households
\$93,909	22%

4.29 G2 General information table



4.31 G2.land use



Generation 2:  
flipped & flourishing  
500M\*500M  
sample location

4.30 G2. Sample location

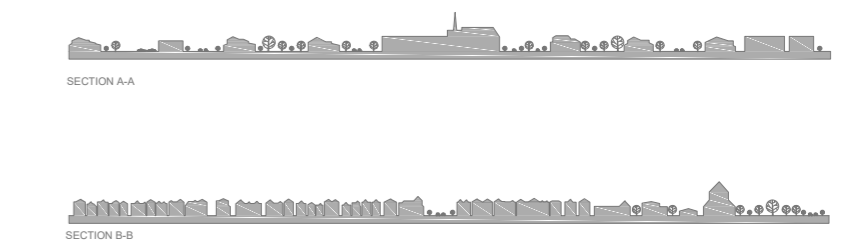
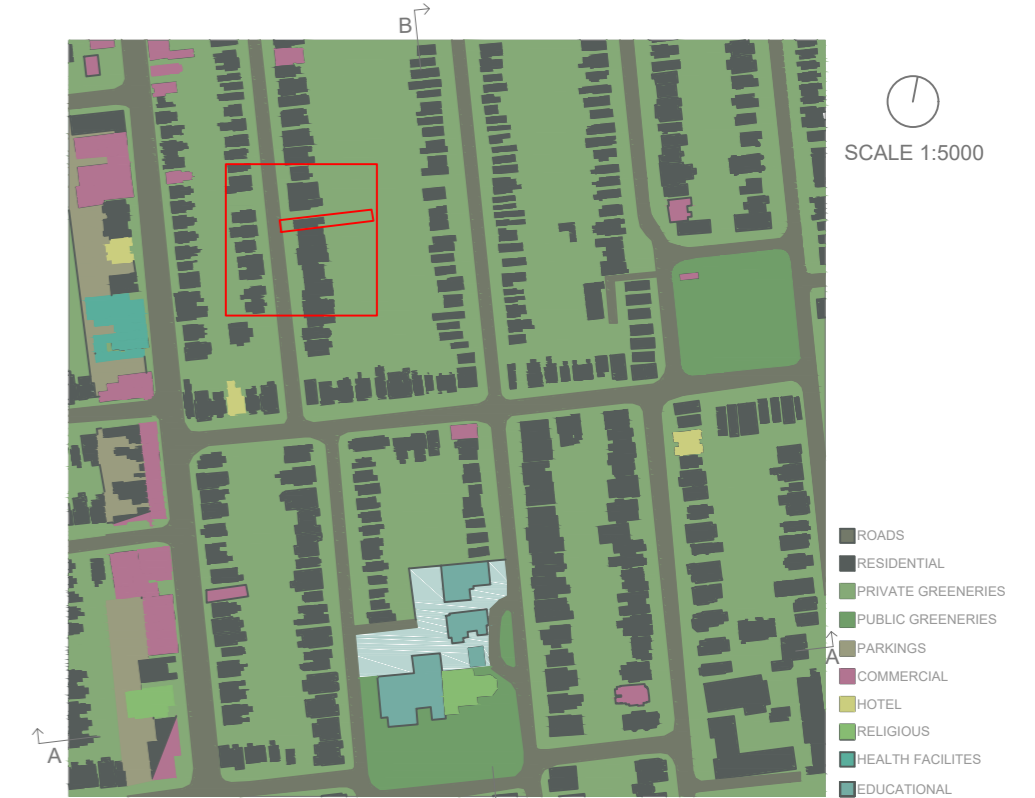
#### - Urban characteristics:

A 500m\*500m sample of this generation is chosen in order to understand and analyze the urban characteristics of it. The number of residential units in this sample is approximately 430 then the average density of generation will be around 17 dwelling units per hectare.

Mixed usage of land is the first and most important positive characteristic of the sample, we can see a main street with high presence of variate function on its side such as commercial, stores, health facilities and probably offices which can be both a high job opportunity for the residents themselves and on the other hand a street for answering their daily needs.

There are 2 visible public greeneries inside the sample which are relevantly well-defined to be a social and gathering center of the residents, all the mentioned characteristics and designed blocks and good proportion of distances made this neighborhood walkable for residents, to reach their daily destinations. Also, we can mention the church and educational complex close to it as a historical element which gives the neighborhood needed personality to be recognized by its residents.

The wrong direction of blocks forces almost all the houses to rotate in the wrong direction, looking to the west light and losing the south light by being covered by their neighbor, and also big thickness of the blocks reduces the design quality of the houses force them to have less facade to the street and long depth and narrow backyard which is relevantly useless dimensionally.



4.32 G2.Urban Scale sample

**- Neighborhood characteristics :**

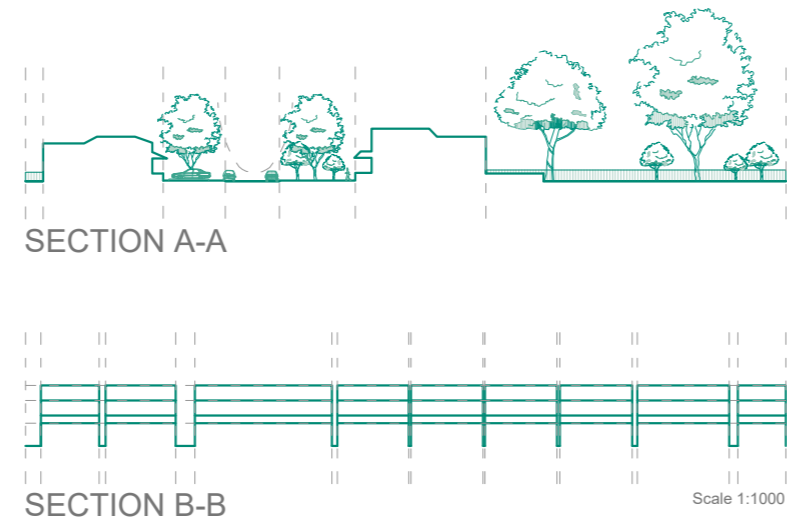
A 100M\*100M sample is chosen in order to understand and analyze the neighborhood characteristics of this generation more precisely.

Due to the high price of the land the distance between buildings in this sample is lower compared to other samples with single detached family houses, in a way that they could be mixed with each other into more functional apartments with less waste of space and energy, but they remain as single detached family houses which shows that the preference of people themselves is this kind of housing because we know that this generation belongs to the wealthy classification of the city.

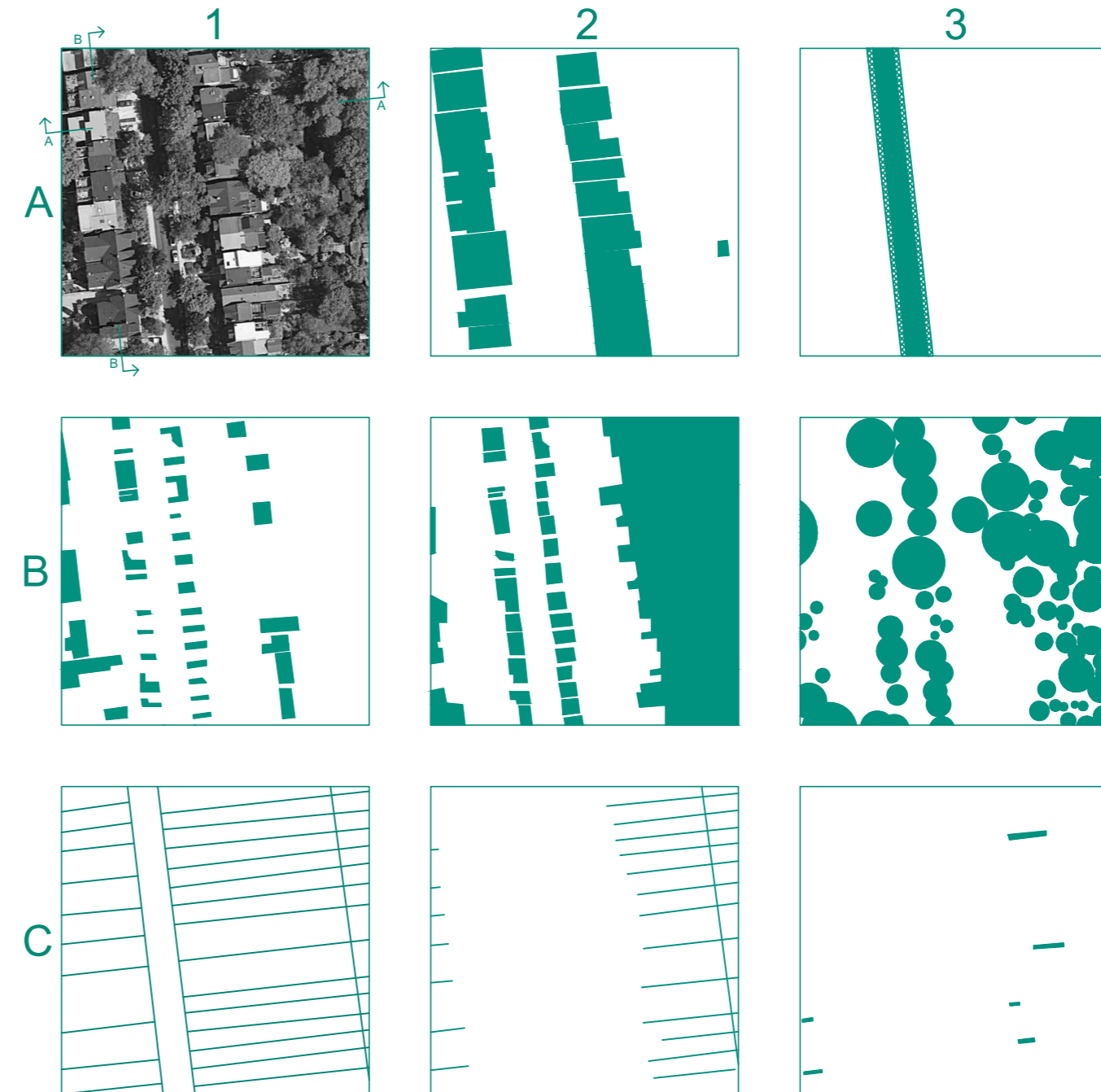
Same to first generation pedestrian path in both side, variate and beautiful greeneries, expensive facades are evidence of the high expenses of municipality and people themselves to this neighborhood. More fences and walls visible in the matrix, show that higher density of the neighborhood reduces the safety and quietness of the area.



4.33 G2.Neighborhood Scale View



4.34 G2.Neighborhood Scale Sections



4.35 G2.Neighborhood Scale Matrix

- A1: satellite image
- A2: solid & void
- A3: street & pedestrian
- B1: private hard pavements
- B2: greeneries
- B3: trees
- C1: plot borders
- C2: walls or fences
- C3: vegetation barriers



**- Architectural characteristics:**

One of the residential buildings of this sample is chosen in order to understand and analyses the architectural characteristics of this generation more precisely.

The first and most obvious architectural characteristic of this generation is long and out of shape plots, which are also mostly in west-east direction, as the dominant typology of the dwelling units is single detached family housing. Mentioned factors will reduce the light coming inside the home, both in terms of intensity and quality, and also will reduce the number of internal spaces that can have proper view.

Beside the expensive neighborhood space quality of the housing themselves is quite low, not only the building itself but also the backyards are not usable as a nice view or any activity due to the same problem of long proportion of the plots.



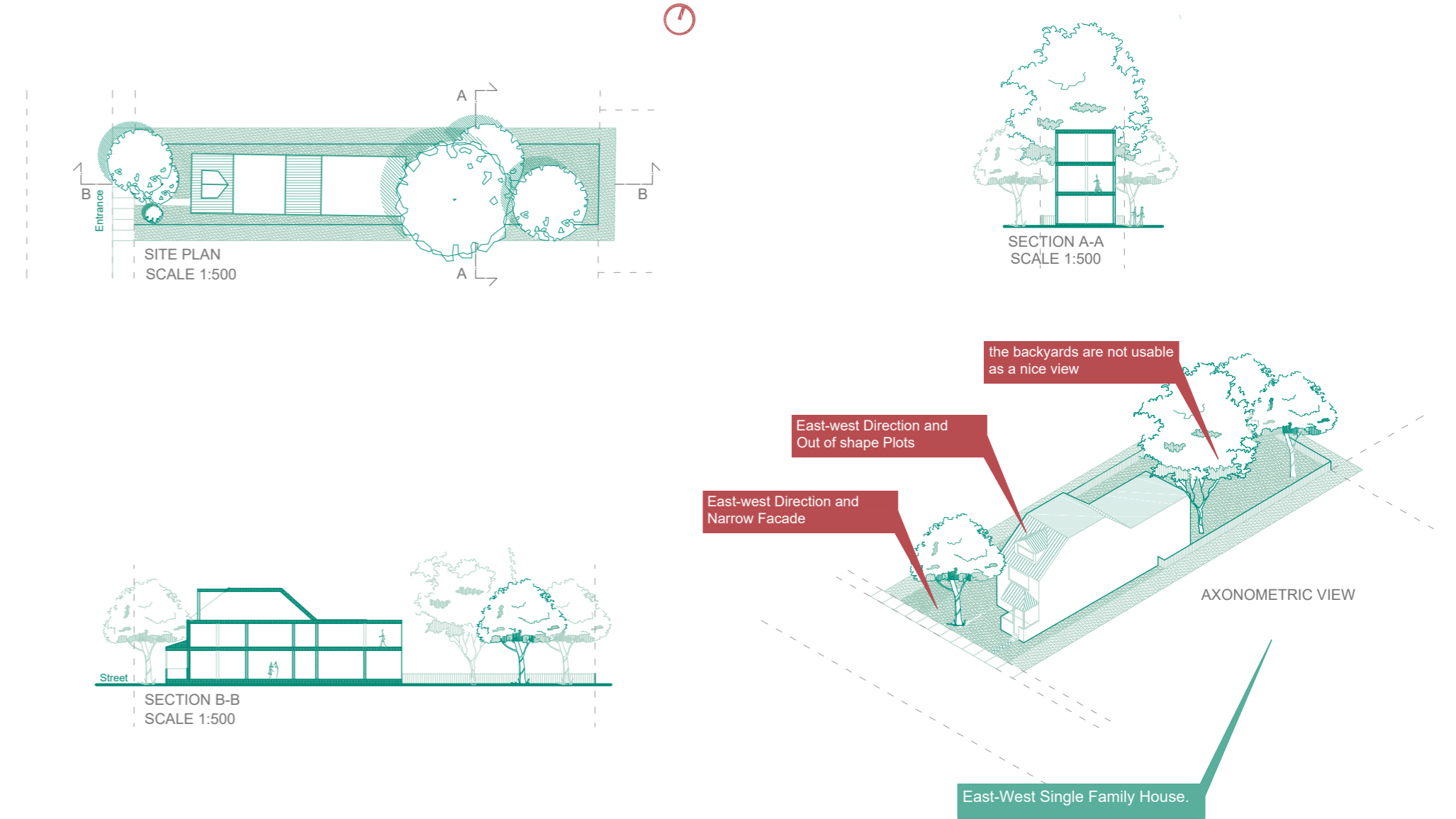
4.36 G2.Architectural Scale Satellite image

**- Sustainability of the chosen sample**

A high mixture of functions, suitable density, and short distances are big reasons that let people save their time every day and also give a good distribution of municipality expenses which makes the area economically sustainable. Suitable public green area, being a walkable neighborhood, relevantly dense residential buildings makes this area environmentally sustainable. Because of the presence of public greeneries, urban elements, gathering spaces we can call this sample a well-defined neighborhood, with short distances between neighbors and their gathering places which makes this area socially sustainable. Beside the wrong proportion of the blocks and relatively low density, this sample looks sustainable due to the presence of public greeneries, variety of functions and available services.



4.37 G2.Architectural Scale street view



4.38 G2.Architectural Scale technical view



#### 4.4.3 Generation 3: Settled & Certain

The neighborhoods that make up the City of Settled & Certain are a grouping of mature suburbs circling Toronto's urban core. These communities are a large part of the foundation of the GTA's early suburbs. It is a mix of older housing, with about a fifth of housing constructed before 1961 and half constructed between 1961 and 1980, and is surrounded by later waves of suburbanization from the 1980's onwards. Relative to the rest of urban Toronto, this City has a higher percentage of single-detached housing (43%) and an average annual household income (\$80,318). Residents of this City are highly settled, with just under a third moving every five years. These communities are, on average, less diverse when compared to other "Cities"; 44% of individuals are racialized, and 39% speak a primary language other than English or French at home. Housing is slightly more affordable than the regional average, with the average dwelling valued at \$587,322 compared to \$739,914 across the GTA. About 23% of residents use public transit to get to work, and about 40% commute a long distance, crossing a census sub-division to get to work. (<https://www.tencitiesproject.org>)

Population	Percent of total population
584,661	9.9%
Average household income(after tax)	Home owners
\$80,318	76%

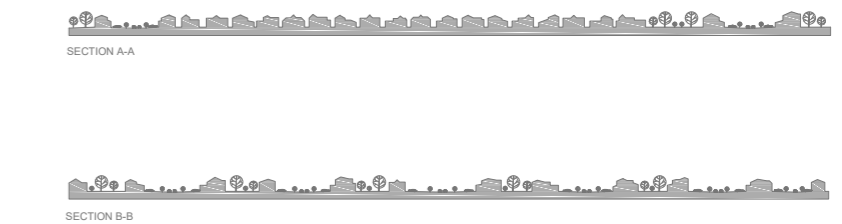
4.39 G3 General information table

#### - Urban characteristics:

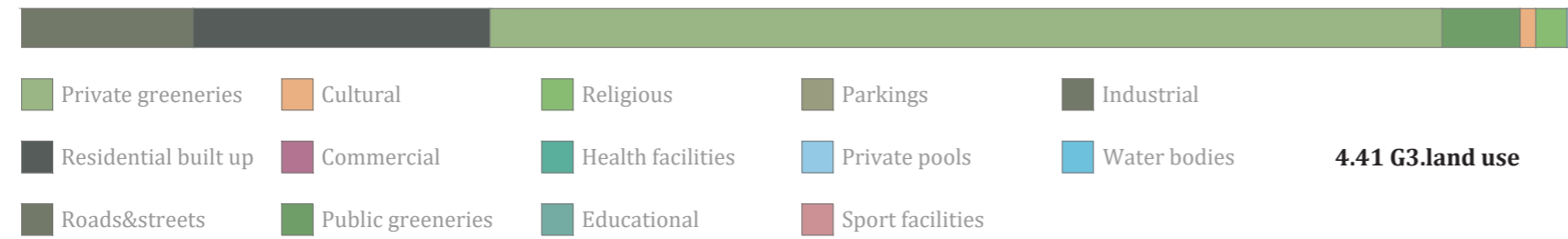
A 500m\*500m sample of this generation is chosen in order to understand and analyze the urban characteristics of it. The number of residential units in this sample is approximately 290 then the average density of generation will be around 12 dwelling units per hectare.

The most visible urban characteristics of this sample are high ratio of residential building which are close to a hundred percent single detached family houses, but the difference with generation 1 and 2 is the bigger size of the lots for each house which leads to sprawl consequences.

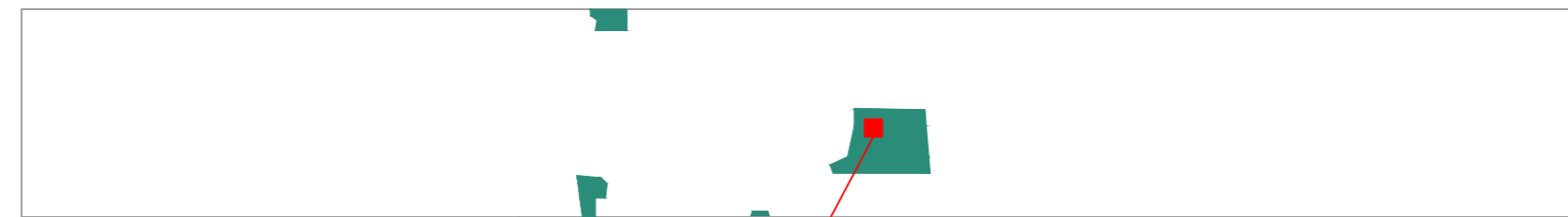
Distance from public transportation, services, and shopping centers are big problems happens in this sample beside the high water and time consumption for private greeneries and pools for each family. Quietness, tranquility, and privacy are other considerable urban characteristics of the sample.



4.42 G3.Urban Scale sample



4.41 G3.land use



Generation3:  
settled & certain

500M\*500M  
sample location

4.40 G3. Sample location

**- Neighborhood characteristics :**

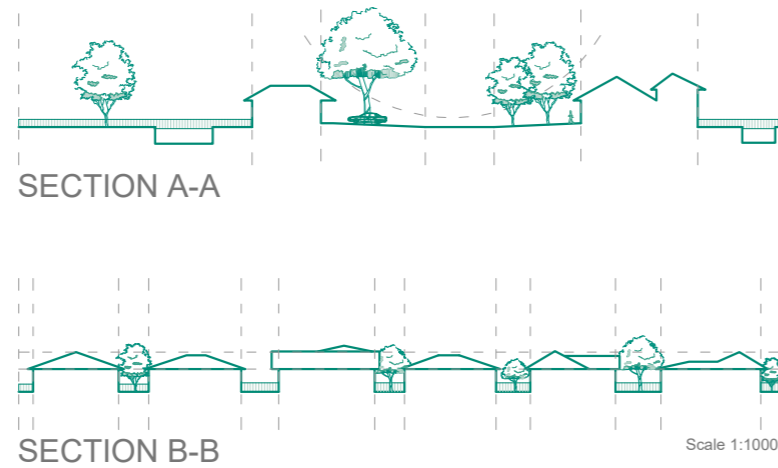
A 100M\*100M sample is chosen in order to understand and analyze the neighborhood characteristics of this generation more precisely.

A wide view of the main street and deep front yards are the most considerable characteristics of the neighborhood, which brings quietness and calmness for the residents.

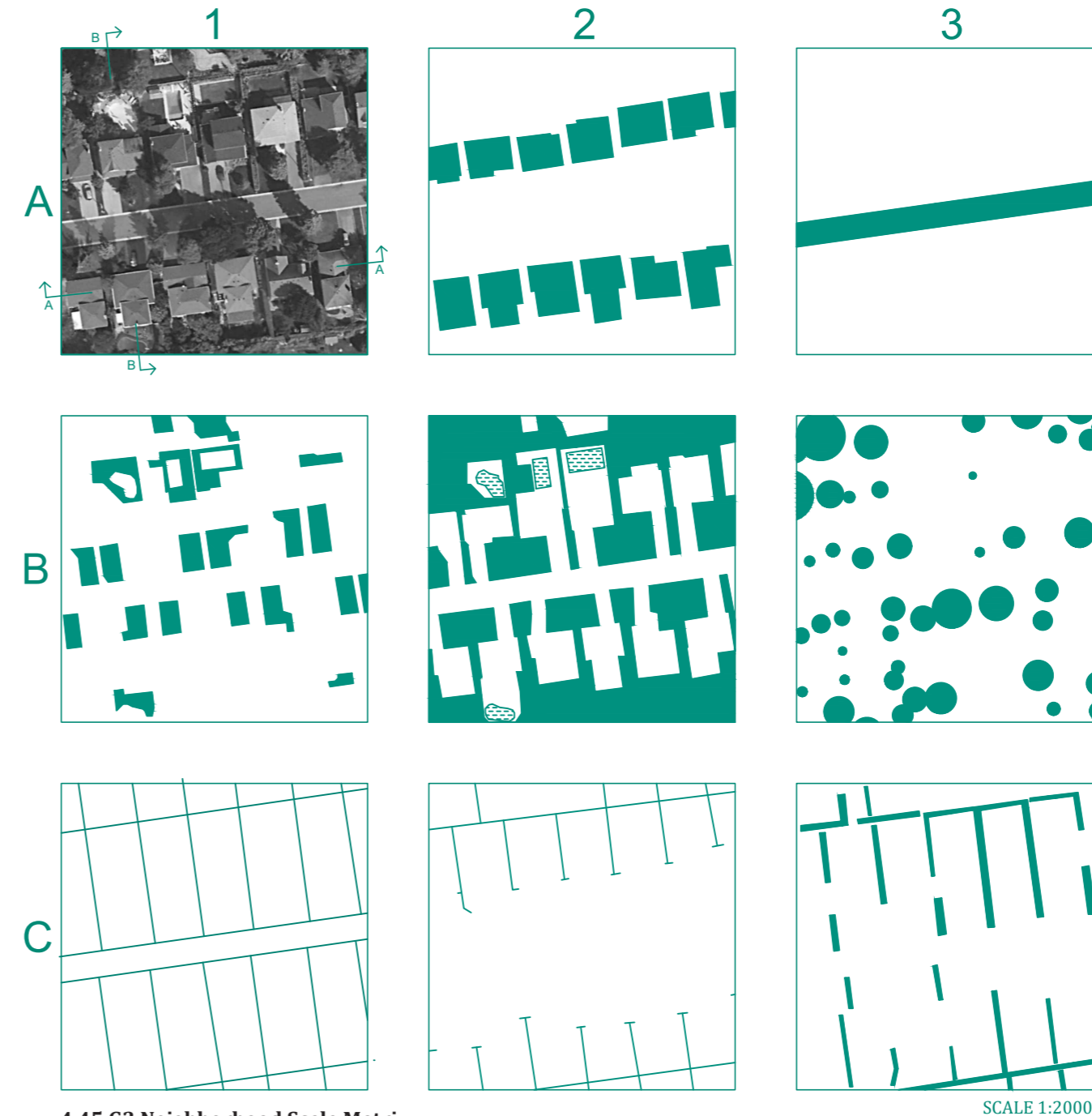
High presence of walls and fences and also vegetation barriers compared to other generations indicate lower rate of safety. These barriers, which are a combination of physical walls and vegetation rows, exist behind the houses to separate the backyard of neighbors, and residents care more about the privacy of their backyard and their private pool compared to other samples, but their front yard is totally open to neighbors, and there is no separated pedestrian path in the neighborhood.



4.43 G3.Neighborhood Scale View



4.44 G3.Neighborhood Scale Sections



4.45 G3.Neighborhood Scale Matrix

- A1: satellite image
- A2: solid & void
- A3: street & pedestrian
- B1: private hard pavements
- B2: greeneries
- B3: trees
- C1: plot borders
- C2: walls or fences
- C3: vegetation barriers



**- Architectural characteristics :**

One of the residential buildings of this sample is chosen in order to understand and analyses the architectural characteristics of this generation more precisely.

The most repeated architectural characteristics visible in this generation are private pools in the backyard of the houses. Big area of private greeneries both in the front yard and backyard, covered parking attached to the houses, and more covering of the backyard by using fences and vegetation barriers are other important architectural characteristics of the sample, which inform of the importance of privacy in their backyard.

All the housing in the area are single detached family houses but with better views in both their front and backyard compared to other generations, which is due to the lower price of the land in this area.

**- Sustainability of the chosen sample**

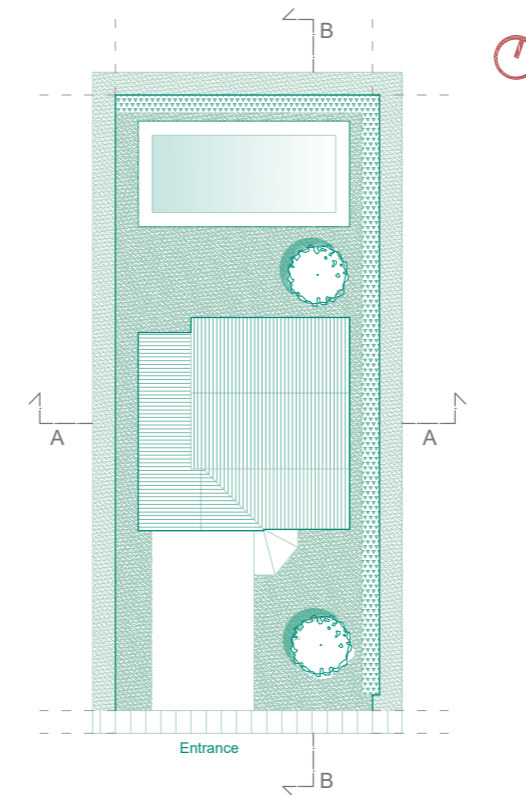
Economical: there is no possibility for doing any kind of activity for the residences by walking or bicycle or even public transportation, and using personal vehicle is an obligation. Beside this fact, low density and long distance between houses increase the cost of all kinds of infrastructure per dwelling unit. Beside high usage of personal vehicles and huge water consumption for personal purposes per unit, dominant single detached family houses typology of the area increase the energy consumption of the heating system especially considering harsh weather of Toronto greater area. The presence of religious and cultural activities, and public greeneries could increase the social sustainability of the area but still the long distances between these activities for many houses is a weakness.



4.46 G3.Architectural Scale Satellite image



4.47 G3.Architectural Scale street view

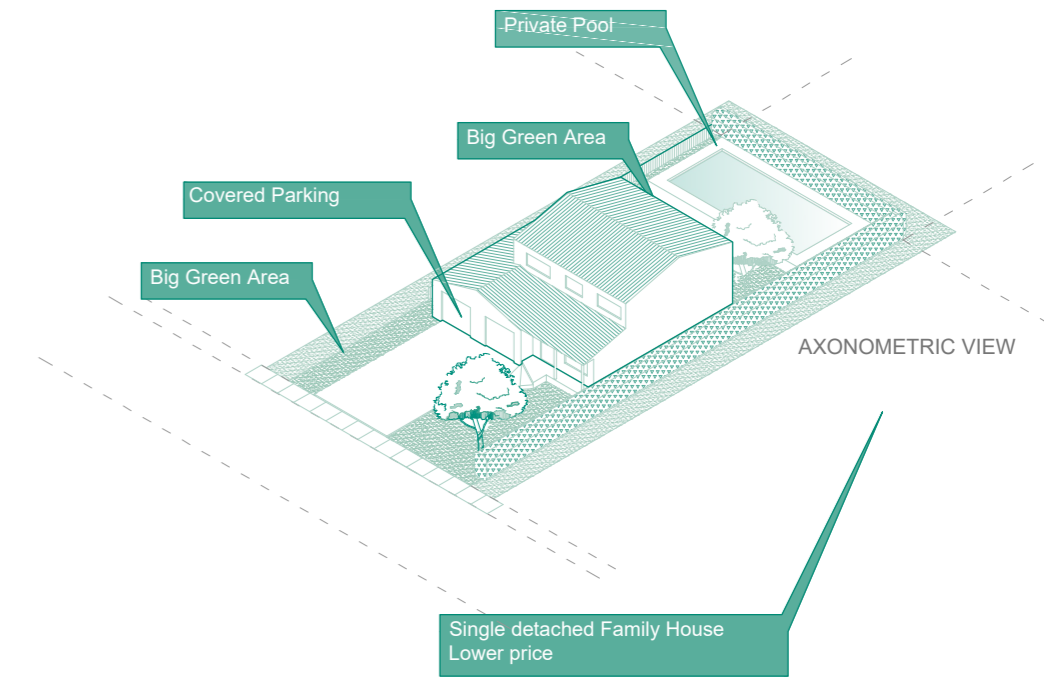
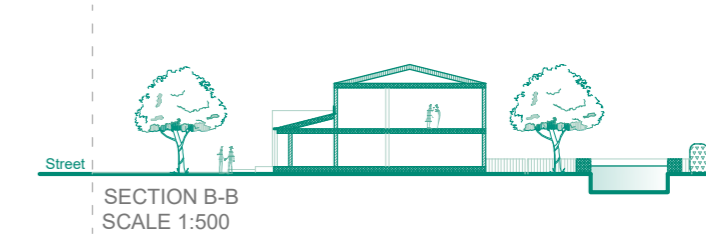


SITE PLAN  
SCALE 1:500



SECTION A-A  
SCALE 1:500

4.48 G3.Architectural Scale technical view



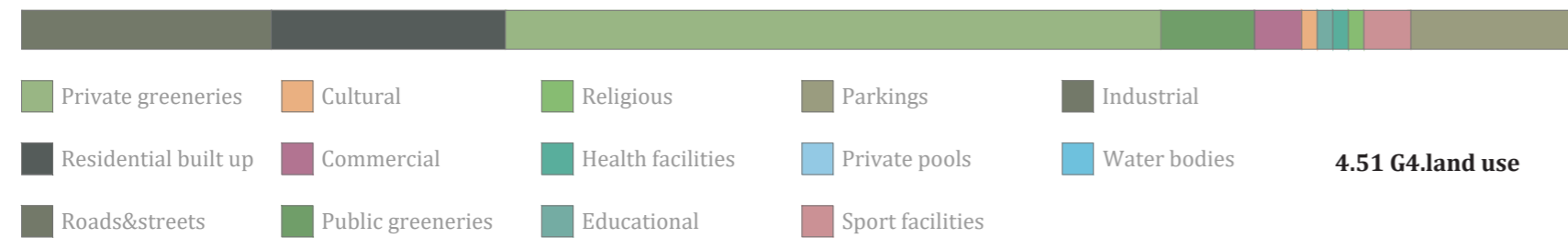


#### 4.4.4 Generation 4: Vertical Islands

The City of Vertical Islands are an archipelago of dense apartment building clusters across Toronto's north-east and north-west regions. These communities were largely built between 1961-1980, and almost 80% of the residents live in apartment buildings. A high proportion of residents are also in low-income brackets, and this City has the highest overall economic inequality among residents. The City of vertical Islands has both the highest level of low-income households (27.1%) and subsidized housing (28.2%). These neighborhoods also have the highest percentage of housing that is non-suitable (overcrowded) and in need of major repair. With the most affordable monthly rents compared to the other 9 cities, the City of Vertical Islands shows that these clusters of dense apartments provide an important housing stock for the GTA's lower-income renters. As the city continues to change it is imperative that these neighborhoods are not forgotten, and that investment is made to improve housing conditions for some of the city's most marginalized populations. (<https://www.tencitiesproject.org>)

Population	Percent of total population
394,247	6.7%
Average household income(after tax)	Renters
\$51,581	69%

4.49 G4 General information table



4.51 G4.land use



Generation4:  
vertical islands

500M\*500M  
sample location

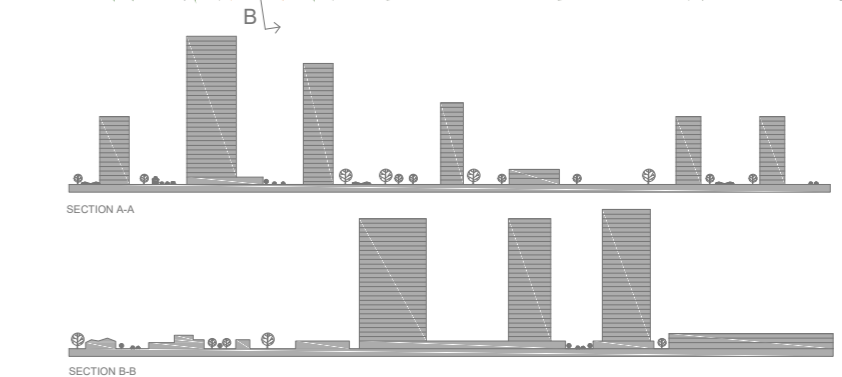
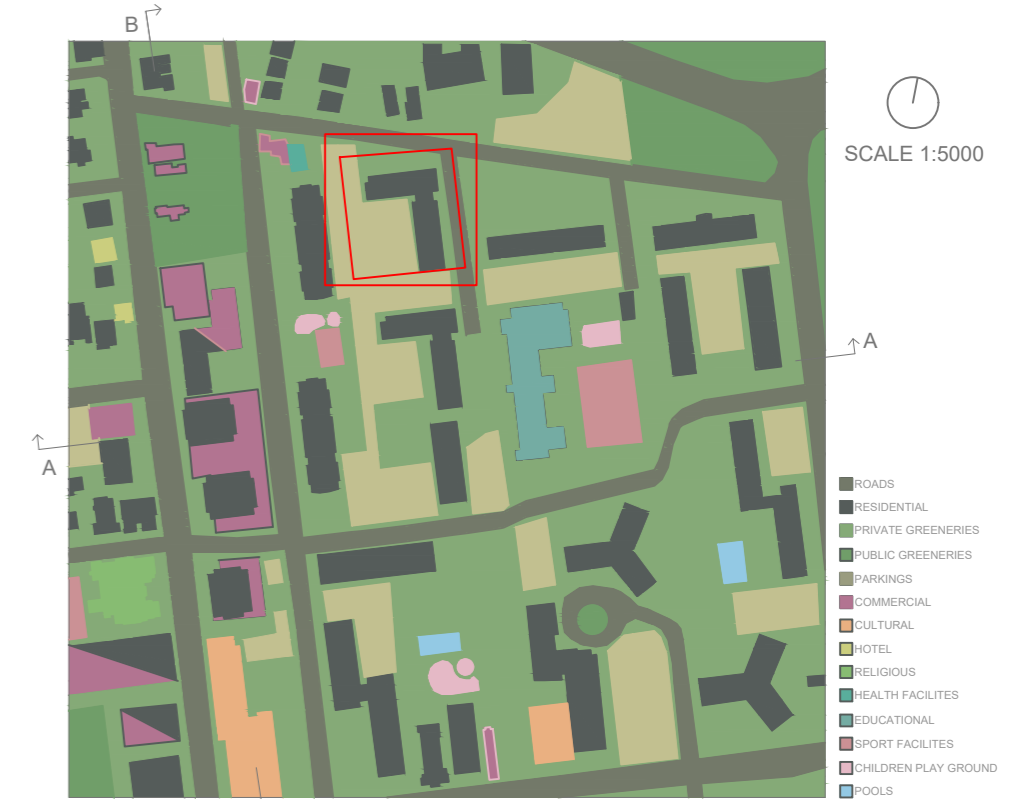
4.50 G4. Sample location

#### - Urban characteristics:

A 500m\*500m sample of this generation is chosen in order to understand and analyze the urban characteristics of it. The number of residential units in this sample is 6500 then the average density of generation will be around 260 dwelling units per hectare.

The best positive characteristic is the high mixture of usage in the sample, having different kind of function and facilities makes this area walkable and residents can access their job, shopping centers, services, and facilities easily by walk, shared green areas children play grounds and public sport courts, fast access to main street and city center and variate possible activities are other important positive characteristics of this sample.

The density of the area is relevantly high and there are several high apartments which means less light entrance to the neighborhood and a very busy and crowded atmosphere. On the other hand a high percentage of land use is dedicated to parking for residential apartments which means more hard pavement, spiritless surrounding, and fewer greeneries.



4.52 G4.Urban Scale sample

**- Neighborhood characteristics:**

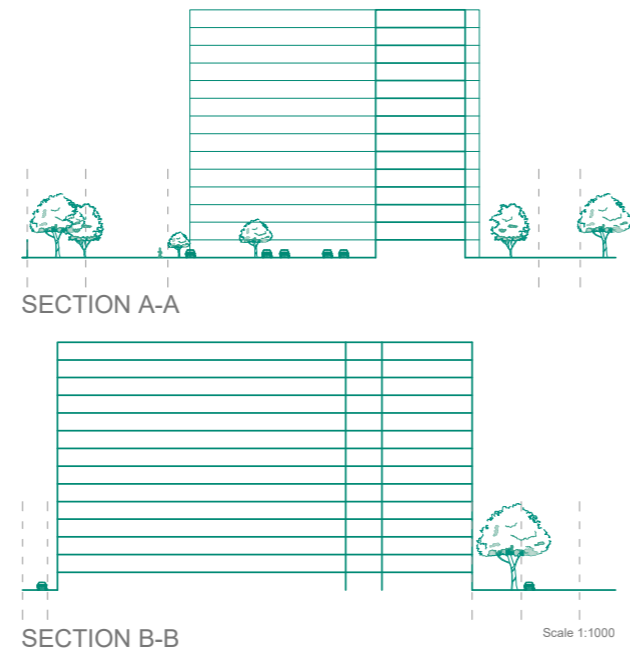
A 100M\*100M sample is chosen in order to understand and analyze the neighborhood characteristics of this generation more precisely.

The neighborhood characteristic of this sample is totally different from other samples in many aspects, in a way like this sample is in another city. The presence of an active atmosphere, lower percentage of greeneries with the view of high-rise buildings, pedestrian paths on both sides of the street, and crowded traffic are the different characteristics of this neighborhood.

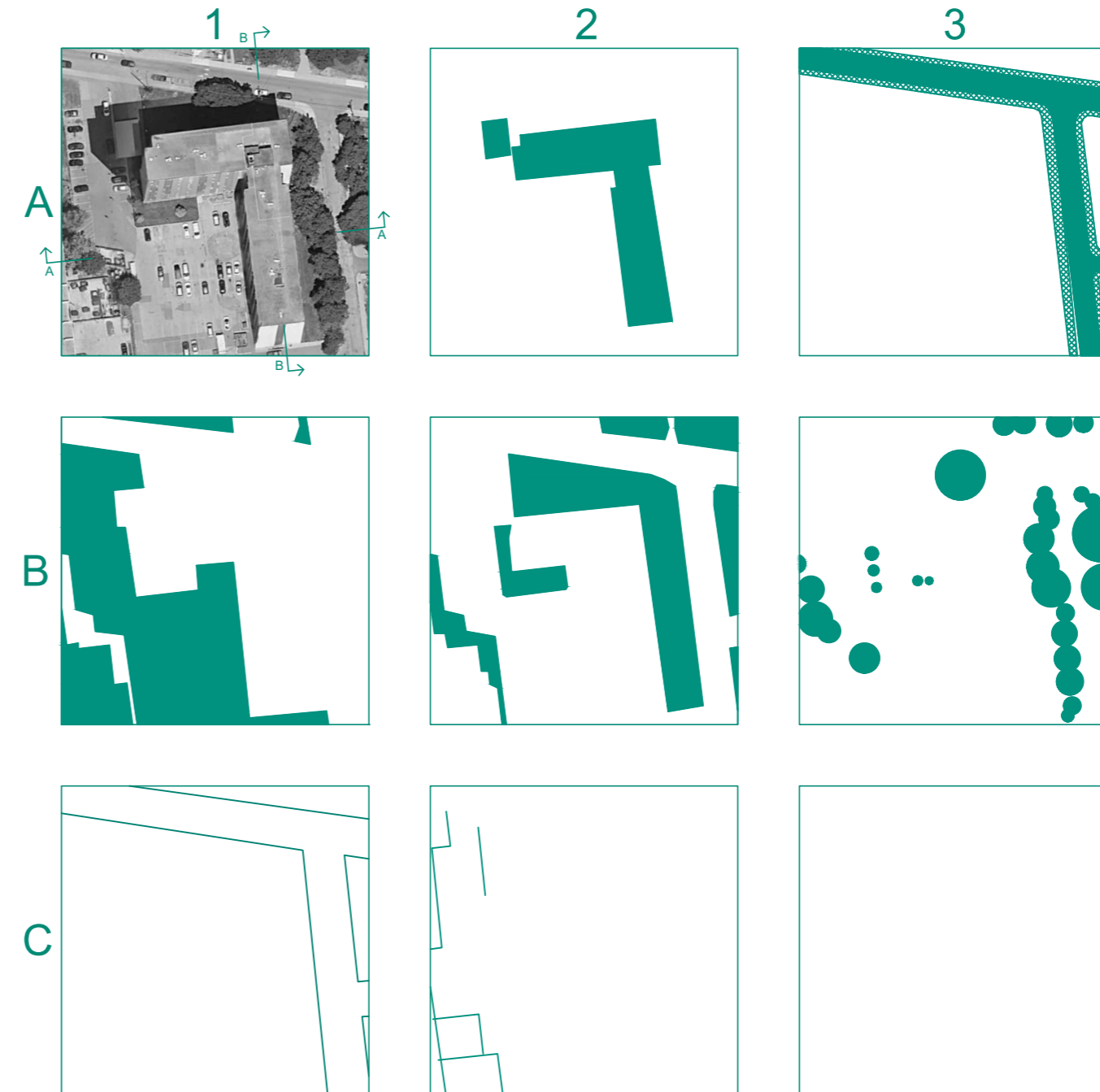
One high-rise apartment instead of several single detached family houses, brings high population density to the neighborhood, and a higher social relation between neighbors as a consequence. Besides the fact that a high percentage of the neighborhood is covered by hard pavement for parking, the density is still relatively high.



4.53 G4.Neighborhood Scale View



4.54 G4.Neighborhood Scale Sections



- A1: satellite image
- A2: solid & void
- A3: street & pedestrian
- B1: private hard pavements
- B2: greeneries
- B3: trees
- C1: plot borders
- C2: walls or fences
- C3: vegetation barriers

4.55 G4.Neighborhood Scale Matrix

SCALE 1:2000



**- Architectural characteristics:**

One of the residential buildings of this sample is chosen in order to understand and analyses the architectural characteristics of this generation more precisely.

Architectural characteristics of this sample are very different from other generations, mostly high rise dense apartments with around 15 storage and probably around 20 units on each floor.

Very dense and crowded apartments which covered parking in the basement with small share of greeneries between the residents and access to children's play grounds and sports courts in their area is the main architectural characteristic of this sample.



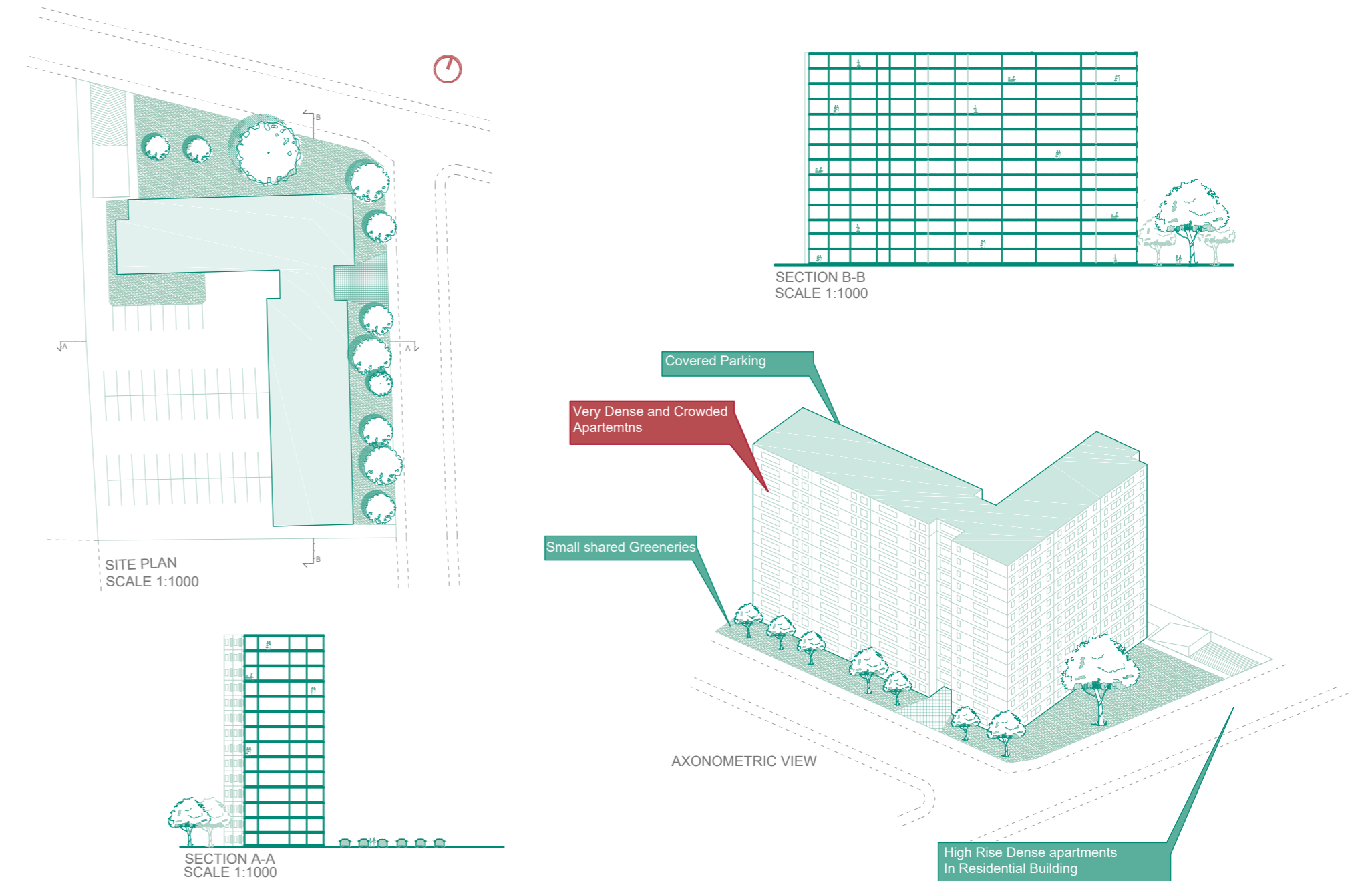
4.56 G4.Architectural Scale Satellite image

**- Sustainability of the chosen sample**

High density of the area and high rise apartments leads to cheaper houses, and also being multi-functional walkable neighborhood with variate accessible job opportunity and services makes this sample economically sustainable. Because of its very high density, crowded streets, and more importantly high level of land use dedicated to parking and hard pavement this sample cannot be environmentally sustainable. Close relation of neighbors, existence of gathering places, children play grounds and public sport facilities can make this sample socially sustainable.



4.57 G4.Architectural Scale street view



4.58 G4.Architectural Scale technical view

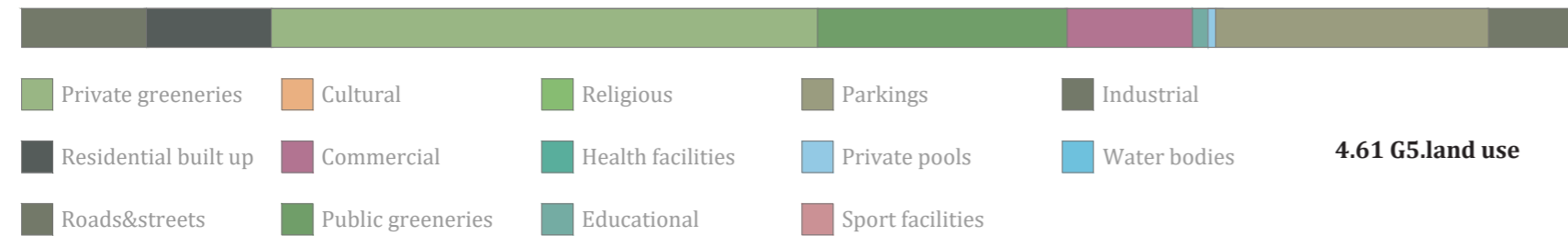


#### 4.4.5 Generation 5: Insecurity Deposit

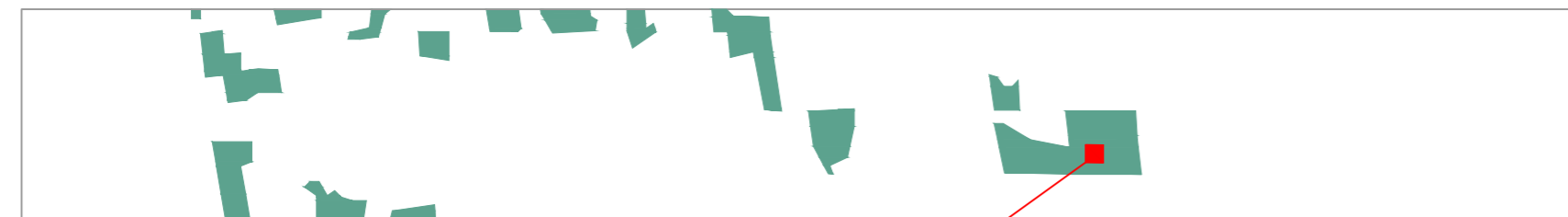
The City of Insecurity Deposit largely represents many of the challenges faced by renters across the urban landscape of the GTA. About 60% of housing in these communities are apartment buildings, almost 20% higher than the GTA average, and 47% of residents are renters. Residents live in housing stock that is on average older (over 75% constructed before 1980) and almost half of renters pay over 30% of their income towards monthly rent. This group of neighborhoods also has a low proportion of family households (61%), suggesting a higher proportion of single adults living. Residents also highly rely on public transit (35% vs the GTA average of 25.4%), and about one in five works within the service sector. Many of these communities also align with David Hulchanski's "City #3" from his well-known study of "The Three Cities of Toronto." The communities and residents living within the City of Insecurity Deposit remind us that strong urban policies are needed to support rental housing in both the urban core and suburbs. (<https://www.tencitiesproject.org>)

Population	Percent of total population
897,657	15.1%
Average household income(after tax)	Household paying +30% on rent
\$64,239	46%

4.59 G5 General information table



4.61 G5.land use



500M\*500M  
sample location

4.60 G5. Sample location

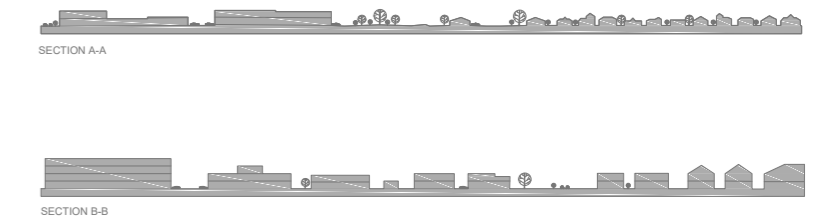
Generation 5:  
insecurity deposit

#### - Urban characteristics:

A 500m\*500m sample of this generation is chosen in order to understand and analyze the urban characteristics of it. The number of residential units in this sample is 170 then the average density of generation will be around 7 dwelling units per hectare.

The first visible characteristic of the sample is high land use percentage of commercial and industrial activities, these activities bring job opportunities for the residents of the area beside reducing distances for daily activities such as shopping for the families, still other functions are separated from residential neighborhood by a public greenery, but the distance is not that much in a way resident can reach there by walk or riding bike.

Beside the visible borders between residential and nonresidential areas, this sample can be considered more mixed use compared to some other samples which are completely residential, and still the low density of the area, high ratio of single detached family houses, and huge public greeneries for every house shows the presence of sprawl development consequences, such as low energy efficiency and high water usage, which lead to air and water pollution.



4.62 G5.Urban Scale sample

**- Neighborhood characteristics:**

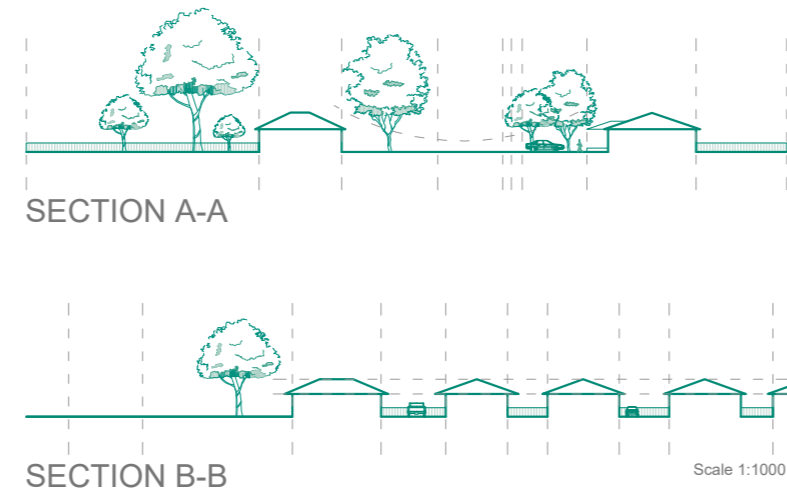
A 100M\*100M sample is chosen in order to understand and analyze the neighborhood characteristics of this generation more precisely.

There are many factors visible in this neighborhood such as deep front yards, absence of any fence or barriers between houses, and low population density, which make the area a very quiet and calm neighborhood, suitable for walking near the street, which does not reach any significant destination for kilometers but residential, not any park, cafeteria, or any kind of cultural center which can be a good motivation to walk along the street.

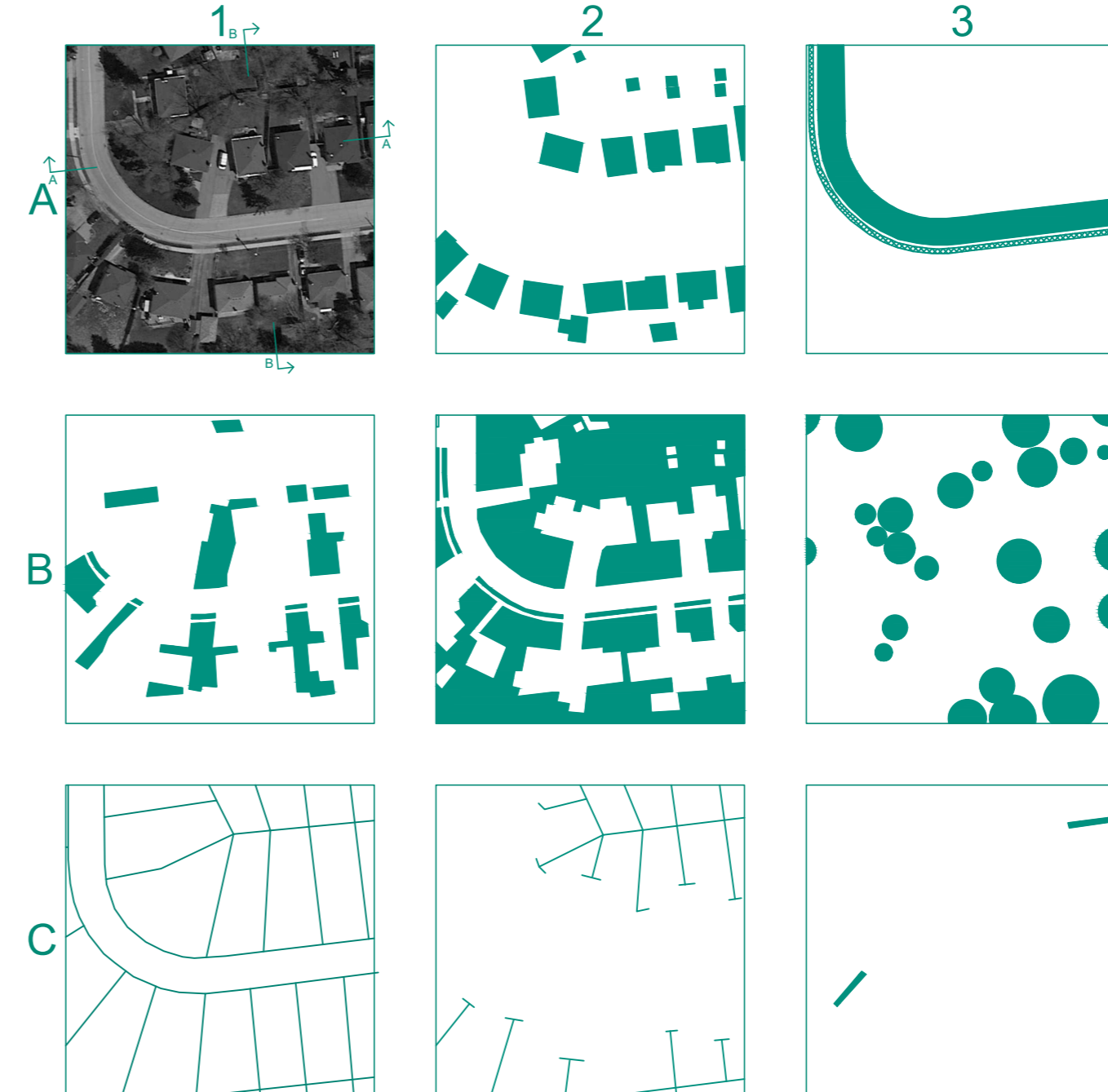
Although the street view looks friendly and socially mixed, every house has their privacy in their backyard which is protected by fences or even walls for the family gathering in their huge trace, enjoying their private greeneries in their quiet backyard.



4.63 G5.Neighborhood Scale View



4.64 G5.Neighborhood Scale Sections



4.65 G5.Neighborhood Scale Matrix

- A1: satellite image
- A2: solid & void
- A3: street & pedestrian
- B1: private hard pavements
- B2: greeneries
- B3: trees
- C1: plot borders
- C2: walls or fences
- C3: vegetation barriers

SCALE 1:2000



**- Architectural characteristics:**

One of the residential buildings of this sample is chosen in order to understand and analyses the architectural characteristics of this generation more precisely.

In this generation the dominant typology of housing is also single detached family house similar to many other generations, but obviously not as beautiful and expensive as the more wealthy generations.

Mostly one stores family houses without covered parking, with a backyard covered with fences and a storage in a corner. Due to the large lands and relatively good orientation of the buildings, there is more freedom to use proper light and view from every side. But this freedom to every side of the building will heavily increase the energy consumption of the house during the winter, especially in harsh winters of Toronto.

**- Sustainability of the chosen sample**

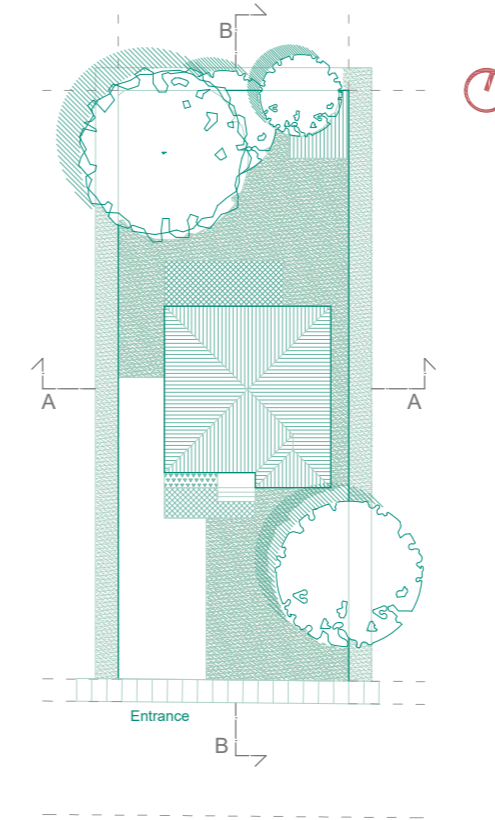
Economical: very long distances, lack of services, facilities, and job opportunities, high usage of energy for hitting and transportation, and not being walkable are all reasons for this sample not to be sustainable economically. Although there is a high percentage of greeneries in the area, but first of all most of this greeneries are private around the houses which are time and water consuming to preserve for residents themselves, and on the other hand hundred percent of single family houses and big lots for each family makes the distances very long and force residents use car for their daily life. Obviously high energy consuming for hitting the single detached family houses makes this area environmentally not sustainable. The neighborhood is not defined by any well-designed gathering place or element and on the other hand the relation between neighbors is poor due to high distance and poor urban design which makes this area socially not sustainable.



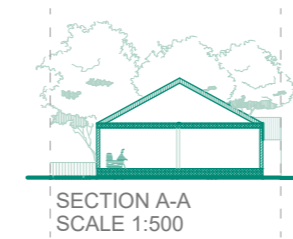
4.66 G5.Architectural Scale Satellite image



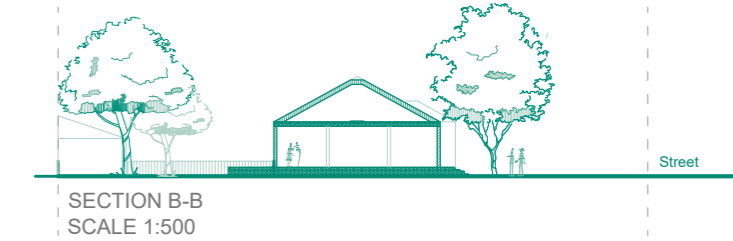
4.67 G5.Architectural Scale street view



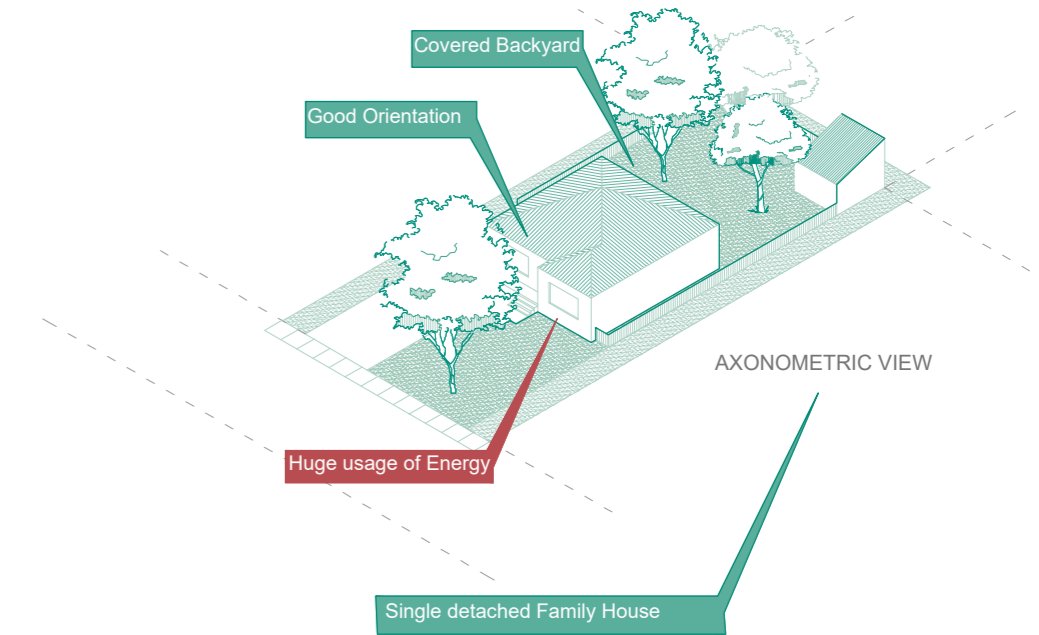
SITE PLAN  
SCALE 1:500



SECTION A-A  
SCALE 1:500



SECTION B-B  
SCALE 1:500



AXONOMETRIC VIEW

4.69 G5.Architectural Scale technical view

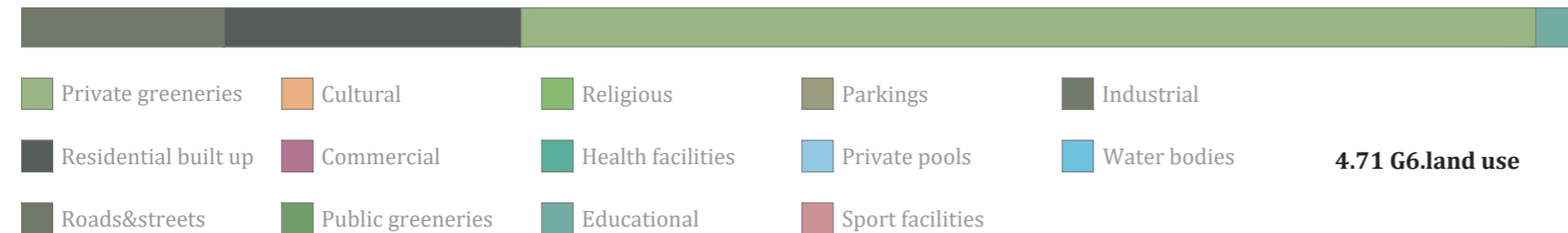


#### 4.4.6 Generation 6: Diverse City

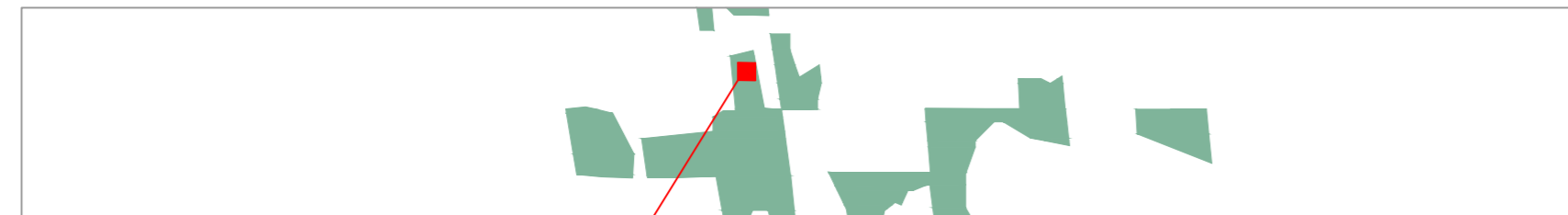
The neighborhoods comprising Diverse City are a mix of largely middle-income neighborhoods, comprised of apartments and single-detached housing built between 1960-1980, mostly located in Toronto's northeast (with a few additions throughout Mississauga and Markham). With 64% of residents currently having immigrant status, this City has the highest concentration of newcomers across the GTA (the GTA average is 45%). A similar proportion of (62%) speak a primary language other than English or French at home. This collection of neighborhoods is also home to the highest percentage of racialized individuals, with over three-quarters of residents identifying as racialized. Compared to many other parts of the GTA, there are relatively few second-generation Canadians (24% compared to the overall average of 28.4%). Rental stress is a big issue, with just under half of renters paying over 30% of their income towards housing costs. Housing values are higher compared to many other parts of the City of Toronto, with the average dwelling priced at slightly above \$680,000. The communities of Diverse City are a crucial part of the diversity that defines Toronto, and makes up a large part of the city's mature post-WII suburbs. (<https://www.tencitiesproject.org>)

Population	Percent of total population
488,727	8.2%
Average household income(after tax)	Individuals from racialized communities
\$76,037	77%

4.69 G6 General information table



4.71 G6.land use



Generation 6: diverse city

500M\*500M sample location

4.70 G6. Sample location

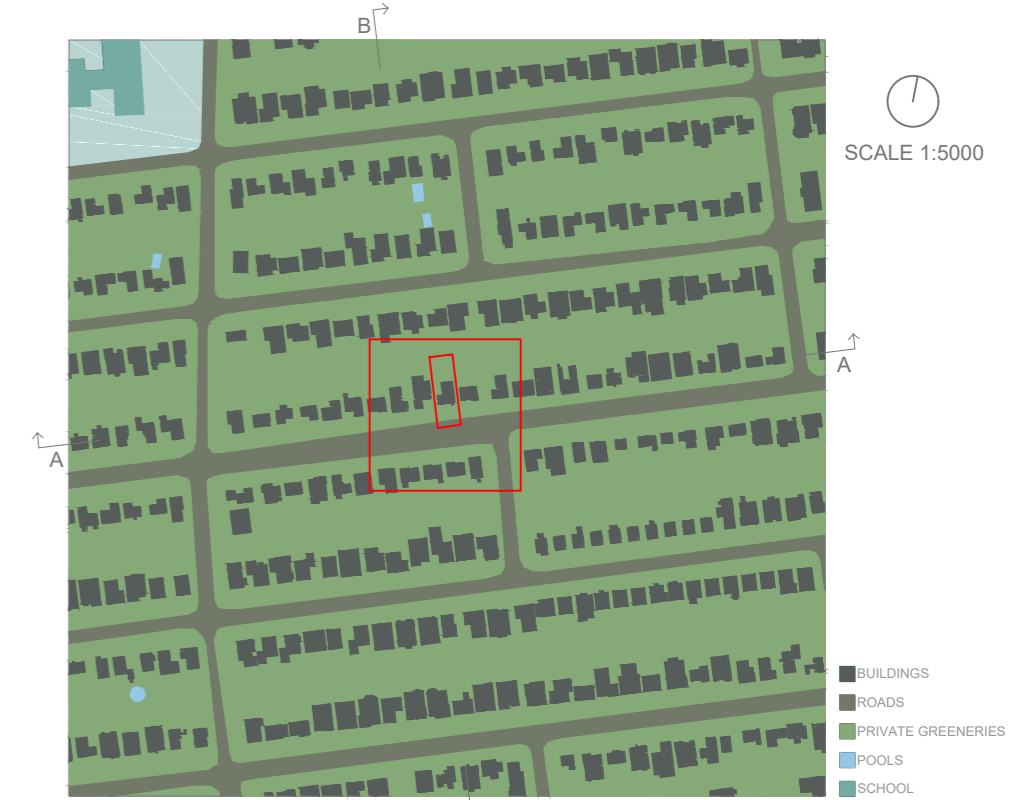
#### - Urban characteristics:

A 500m\*500m sample of this generation is chosen in order to understand and analyze the urban characteristics of it. The number of residential units in this sample is 300 then the average density of generation will be around 12 dwelling units per hectare.

High ratio of residential land use is the first visible characteristic of the sample, mostly single detached family houses with front yard and a long out of shape back yard which happened due to wrong proportion of the blocks. The positive characteristic to be mentioned can be the correct orientation of all the plots but still low percentage of residential buildings with high percent of public greeneries will have many negative impacts of low density in the area.

This sample cannot be called a multi-functional urban area, and also the population density is quite low, although these factors will bring peace and quietness for the residence beside privacy, but they will make the sample completely automobile-dependence.

There is no way to reach any destination by walking or riding a bike in this urban sample, and residence have to use their personal vehicles to do any kind of daily activities, such as reaching school and sports facilities for children, beside work places and shopping centers for adults. There is no need to mention how destructive these factors are for the environment and economy.



4.72 G6.Urban Scale sample

**- Neighborhood characteristics:**

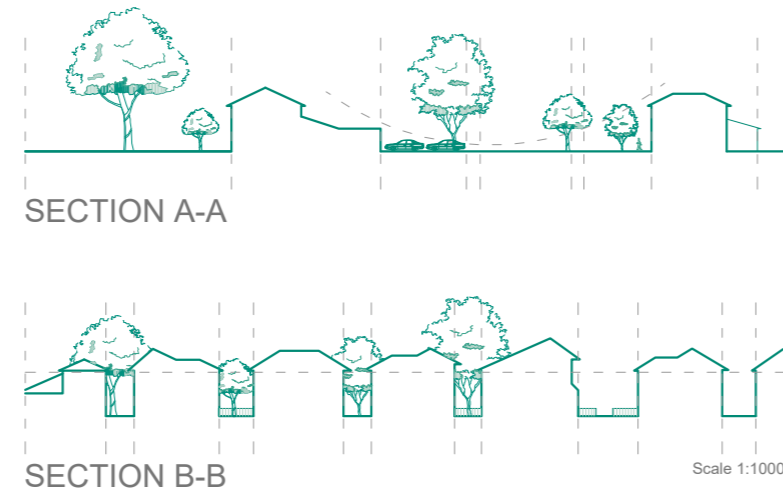
A 100M\*100M sample is chosen in order to understand and analyze the neighborhood characteristics of this generation more precisely.

A remarkable characteristic of this neighborhood compared to others is the admirable effort to create a walkable neighborhood, considering the pedestrian path along the street and other path connecting the street to others through the block, but this effort cannot be successful at all while there is no attractive destination to reach by walking in the neighborhood, at the end, residents have to drive their personal vehicle.

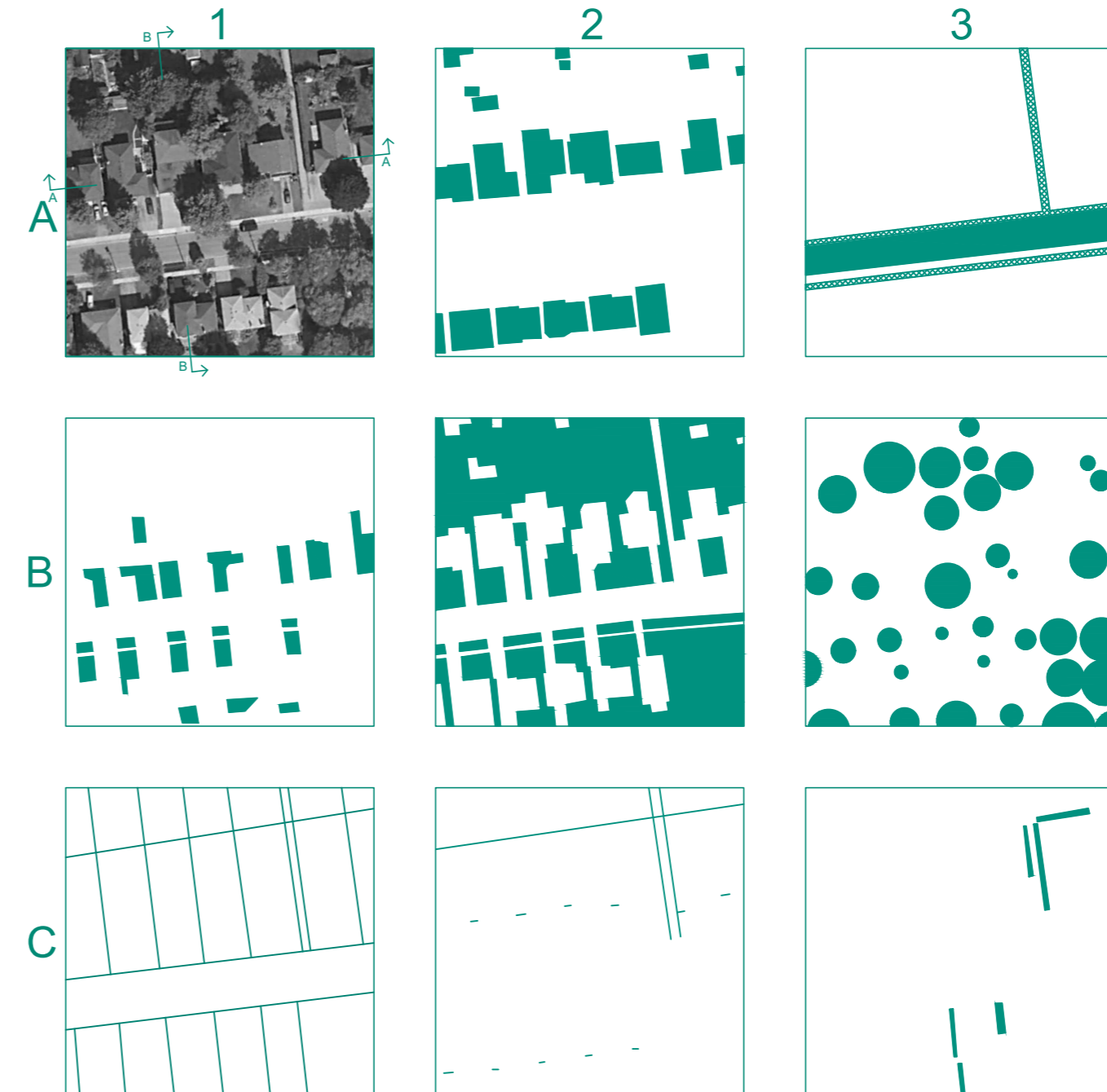
Besides the wide view of the street and deep front yards of single detached family houses, the neighborhood is more compact according to less distance between houses compared to other samples, which is used as a factor for giving more privacy to the backyard and separating it from public view.



4.733 G6.Neighborhood Scale View



4.74 G6.Neighborhood Scale Sections



4.75 G6.Neighborhood Scale Matrix

SCALE 1:2000

- A1: satellite image
- A2: solid & void
- A3: street & pedestrian
- B1: private hard pavements
- B2: greeneries
- B3: trees
- C1: plot borders
- C2: walls or fences
- C3: vegetation barriers



**- Architectural characteristics:**

One of the residential buildings of this sample is chosen in order to understand and analyses the architectural characteristics of this generation more precisely.

In this sample, architectural characteristics are quite similar to the one before which were a hundred percent single family houses. Which has the same front garden, same backyard, same proportion of front yard and backyard, same dimension of the house itself, same access and circulation, but with an attached cover parking.

The most clear difference is the correct proportion and orientation of city blocks which leads to correction of houses orientation and proportion, which bring better light, better view, and less energy waste from the sides compared to other generation single detached family houses.



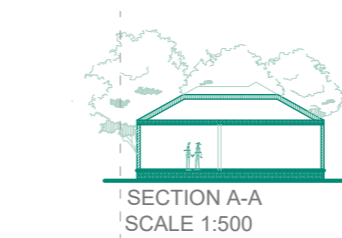
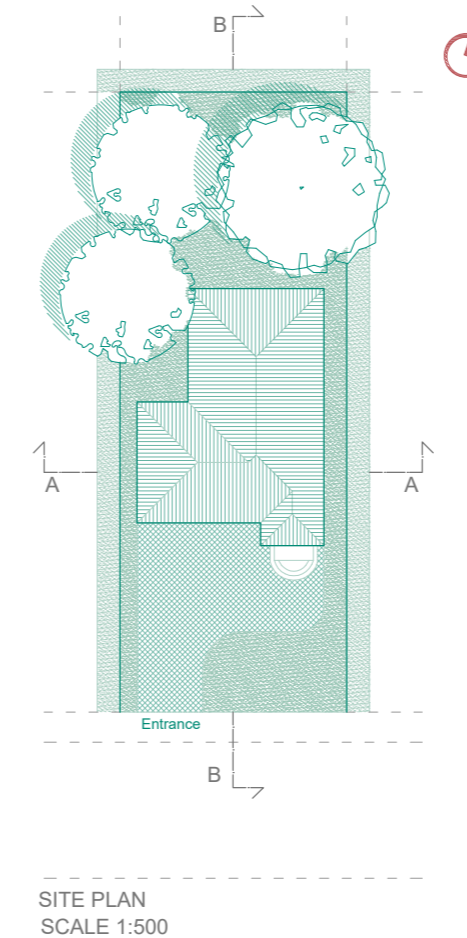
4.76 G6.Architectural Scale Satellite image

**- Sustainability of the chosen sample**

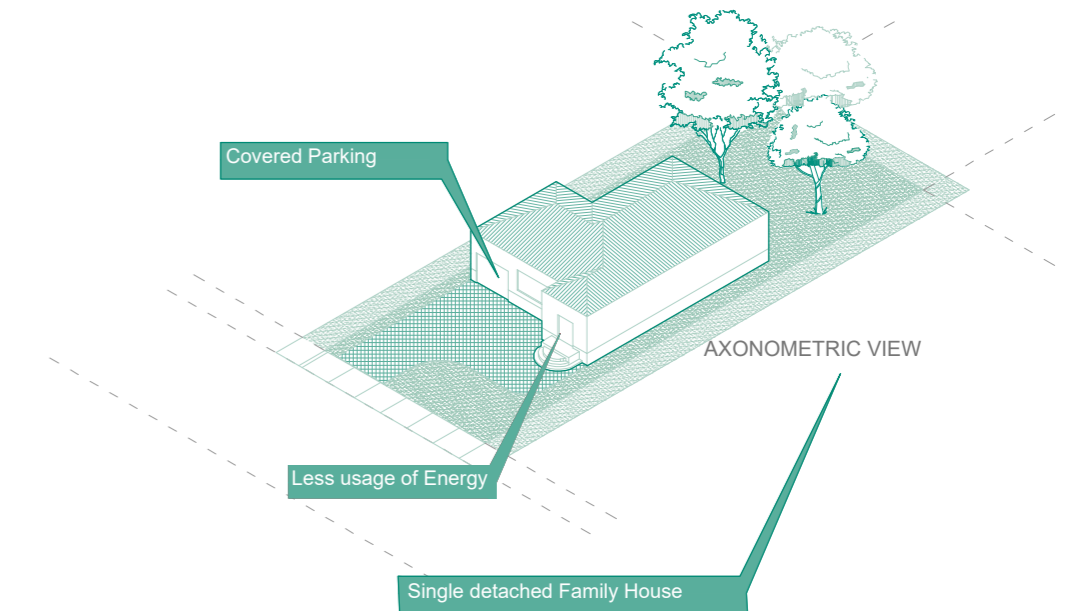
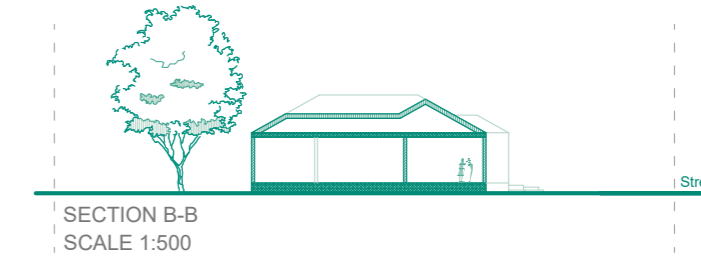
Beside one of the biggest issues of the area which is being automobile-dependence, there are many other factors that make this area not sustainable in terms of economy, such as absence of any kind of job opportunity, and big number of municipality expenses per capita, due to low density. Large size of the backyards for every house, which exist due to long proportion of the blocks, now become private gardens being used by just one family or even an individual. Which heavily increases the water pollution per person, beside the huge amount of fuel usage both for hitting single family houses and commuting to the outside of the sample. And there is no need to mention that, due to lack of any public place as gathering for neighborhood, and lack of other functions, this sample is poor in terms of social sustainability.



4.77 G6.Architectural Scale street view



4.78 G6.Architectural Scale technical view



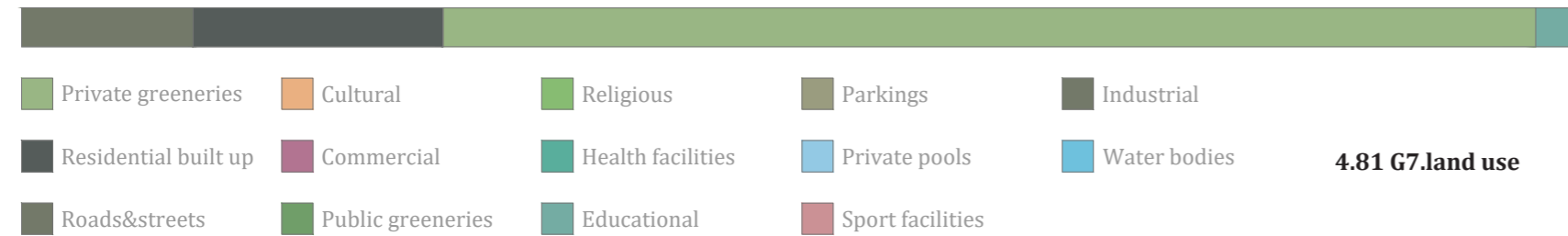


#### 4.4.7 Generation 7: The Remade City

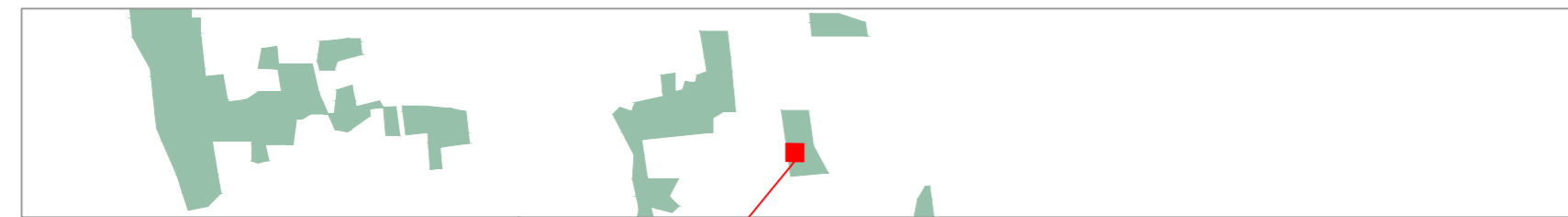
With more than 9 out of 10 residents living in apartments, With over half of housing being built since 2001, these are relatively new neighborhoods catering to young professional renters. Residents living in these neighborhoods are highly mobile (64% moved within the past 5 years) and single individuals, many of whom are renters. Similar to the City of Vertical Islands, the Remade City has a high distribution of income across its neighborhoods. While 22% of residents are in the low-income bracket, 15% belong to the highest decile for average income. Many residents work in the Finance, Insurance, Real Estate or Science and Technology sectors, and are likely single renters early on in their career. On the other hand, 22% of residents also work in the service sector and are less likely to be able to be homeowners in the future. In short, this City represents a diverse group of single mobile apartment renters in some of the newest “versions” of Toronto’s urban fabric. (<https://www.tencitiesproject.org>)

Population	Percent of total population
473,376	8%
Average household income(after tax)	Residents moving every 5 years
\$72,566	64%

4.79 G7 General information table



4.81 G7.land use



Generation 7: the remade city

500M\*500M sample location

4.80 G7. Sample location

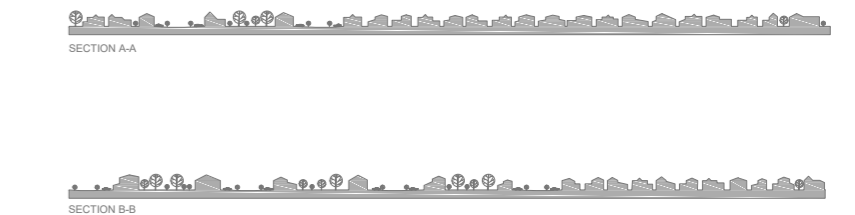
#### - Urban characteristics:

A 500m\*500m sample of this generation is chosen in order to understand and analyze the urban characteristics of it. The number of residential units in this sample is 250 then the average density of generation will be around 10 dwelling units per hectare.

Beside many similarities of this sample to other samples outside the city center, such as being highly residential with low density due to mostly single detached family houses and high percentage of private greeneries, this sample looks different in terms of blocks modification.

This difference indicates that this urban area developed more recently compared to other samples, and urban designers tried to give identity to small neighborhoods by using curves and various distribution of lots, an effort which was not successful at all.

Giving identity to a neighborhood is not possible by just separating housing from each other, reaching this goal needs to consider many other factors such as hierarchy of accesses, gathering places, parks or any other potential node for cultural activities, and a higher density of population with correct relation to each other to enjoy their neighborhood. Non of the mentioned factors are not visible in this sample and changing the orientation of roads randomly is an effort leads to reduce the light quality of houses with no other result as a trade-of.



4.82 G7.Urban Scale sample

**Neighborhood characteristics:**

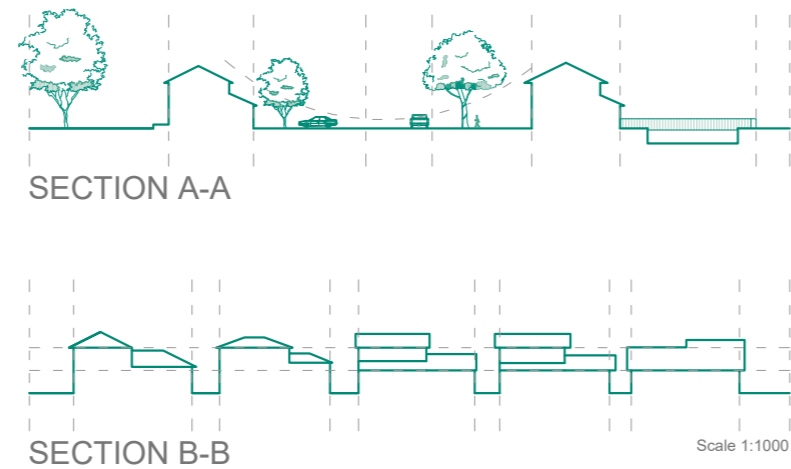
A 100M\*100M sample is chosen in order to understand and analyze the neighborhood characteristics of this generation more precisely.

One of the remarkable neighborhood characteristics of this area compared to other samples is more precise division of plots, due to its recent development as it was mentioned in urban scale analysis. This orderly arranged division of plots gave better proportions to the neighborhood as its visible in the street view.

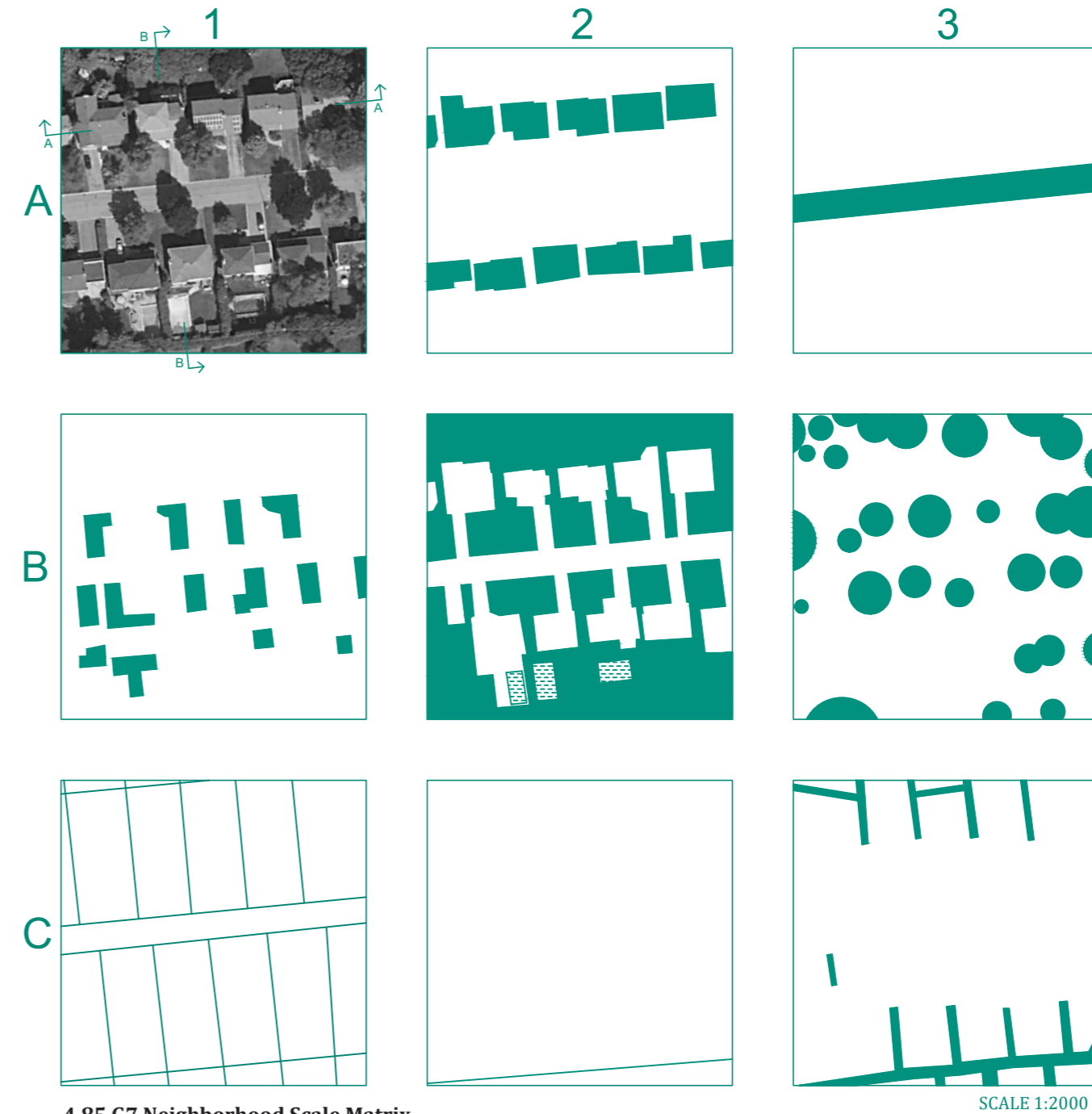
Although all of the dwelling units are single detached family houses, but at least the distance between houses are less then the area between them is less, which is not using in the best possible way in most of the generations. And as it is visible the privacy of the backyards where most of them have a private pool is very important for the residents, and they are covered with vegetation barriers.



4.83 G7.Neighborhood Scale View



4.84 G7.Neighborhood Scale Sections



4.85 G7.Neighborhood Scale Matrix

- A1: satellite image
- A2: solid & void
- A3: street & pedestrian
- B1: private hard pavements
- B2: greeneries
- B3: trees
- C1: plot borders
- C2: walls or fences
- C3: vegetation barriers

SCALE 1:2000



**- Architectural characteristics:**

One of the residential buildings of this sample is chosen in order to understand and analyses the architectural characteristics of this generation more precisely.

The first remarkable architectural characteristic of this sample, is the big and dense vegetation barrier around its backyard, although the front yard of the houses are completely open to their neighbors without any kind of barrier.

The dominant typology is single detached family houses, but compared to other generations the situation of orientation and proportion is much better, because the neighborhood has developed more recently with more logical division of plots.

**- Sustainability of the chosen sample**

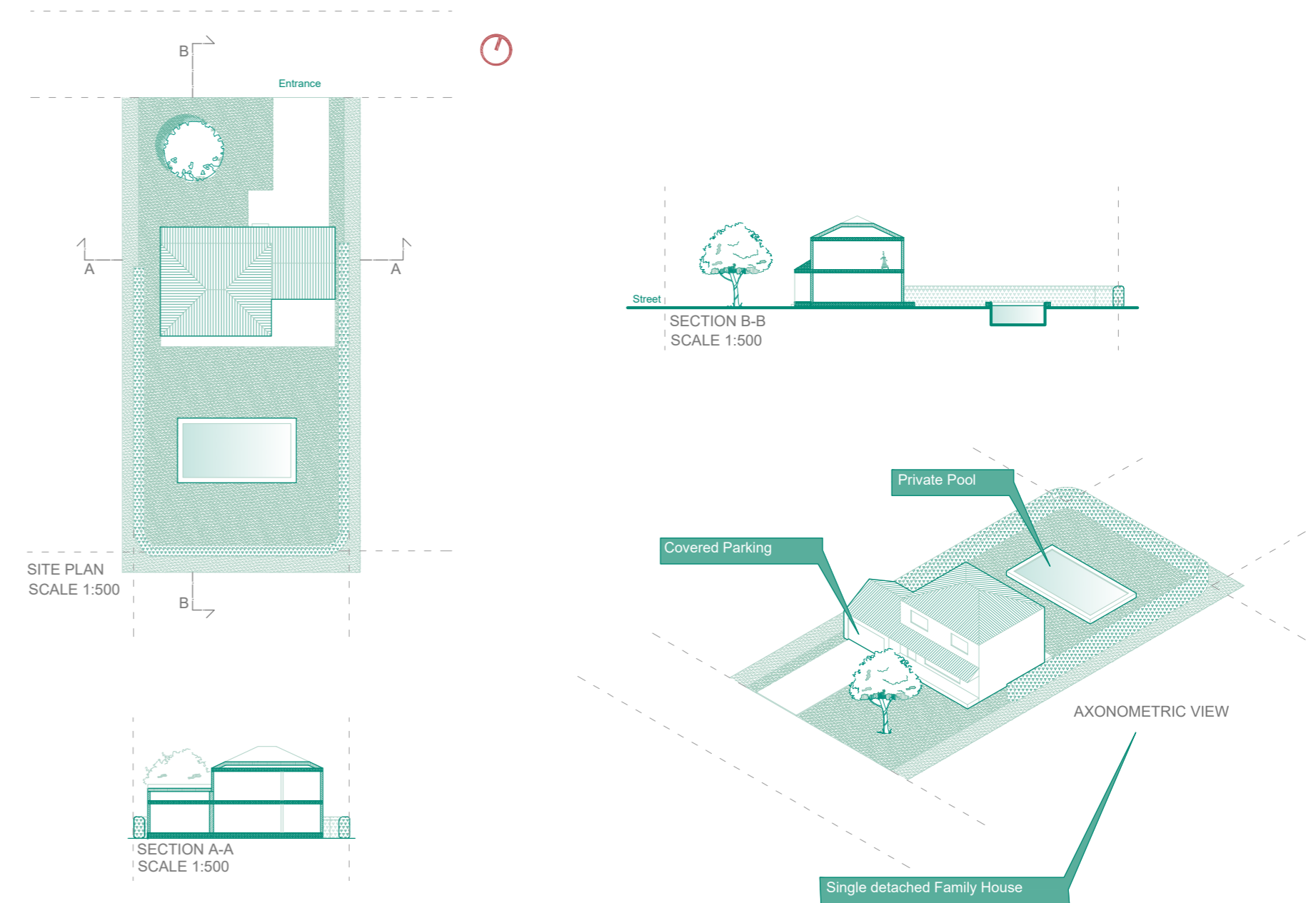
Because of high energy consumption for hitting, poor access to public transportation and long distances to services and facilities, low population density, lack of job opportunities, this generation is not sustainable economically. Again huge amount of fuel used both for hitting and transportation, and also big usage of water for private greeneries and private pools for each private land, this generation cannot be sustainable in terms of the environment. Low density, poor neighborhood, lack of center, and long distance between neighbors lead this generation not to be sustainable socially. High residential land use and no presence of other functions such as bars, restaurants, educational and cultural centers are the reasons that this generation is not sustainable culturally.



4.86 G7.Architectural Scale Satellite image



4.87 G7.Architectural Scale street view



4.88G7.Architectural Scale technical view

SCALE 1:500

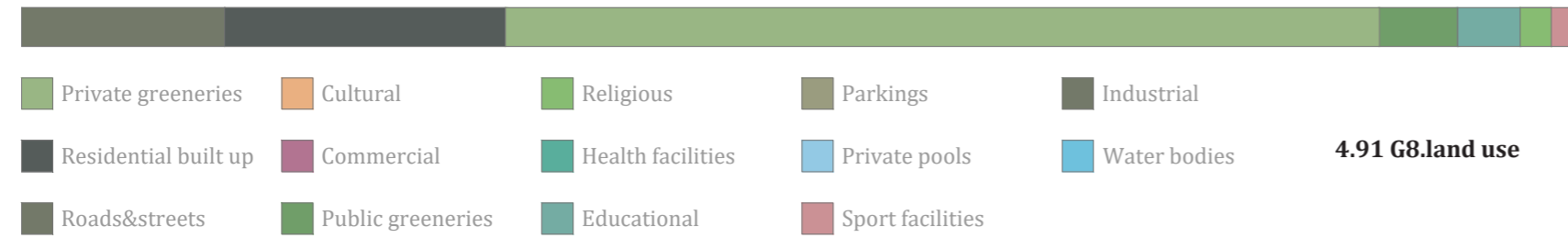


#### 4.4.8 Generation 8: GENX suburban

The City of GenX Suburbs largely came into their own during the 1980's and 1990's. With over one million residents living in this category of communities, this "City" represents the first major wave of mass suburbanization following the original mature post-war suburbs. Stretching across the 905 belt, these communities fit our traditional image of the suburbs: single-detached housing, family households and upper-middle class economic status. In short, this City encompasses the large wave of suburbanization during the 1980's and 1990's that has had a major impact on the landscape of the GTA today. (<https://www.tencitiesproject.org>)

Population	Percent of total population
1,084,030	18.3%
Average household income(after tax)	Residents moving every 5 years
\$108,292	28%

4.89 G8 General information table



4.91 G8.land use



500M\*500M  
sample location

4.90 G8. Sample location

Generation8:  
genx suburbs

#### - Urban characteristics:

A 500m\*500m sample of this generation is chosen in order to understand and analyze the urban characteristics of it. The number of residential units in this sample is 260 then the average density of generation will be around 10 dwelling units per hectare.

The remarkable presence of a church, school, public park, and sport facilities in this urban sample, indicates the fact that the social and cultural characteristics of this area are better compared to other samples. Although the presence of cultural and social activities in an urban area cannot significantly increase the job opportunities of that area, but it still gives some less tangible values to the surrounding neighborhood around it.

Automobile-dependency still can be seen in this sample for adults in order to reach their daily job and shopping centers, but at least for activities for children are reachable in their neighborhood without their need of their parents vehicles, beside going every day to school, activities such as social and religious gatherings, sport activities, and maybe cultural events in neighborhood scale.

The proportion of residential blocks in the sample are highly various from long rectangles which leads to single detached family houses one near each other in a row, to squares which lead to not defined relation between backyards of houses in the middle. Beside the effort of designers to reach divers neighborhoods in terms of shape, identity of the blocks are still similar to each other, such as low density, high percentage of private greeneries, no presence of public transit, and no job opportunities for the residents, which are all visible consequences of sprawl development in this sample.



4.92 G8.Urban Scale sample

**- Neighborhood characteristics:**

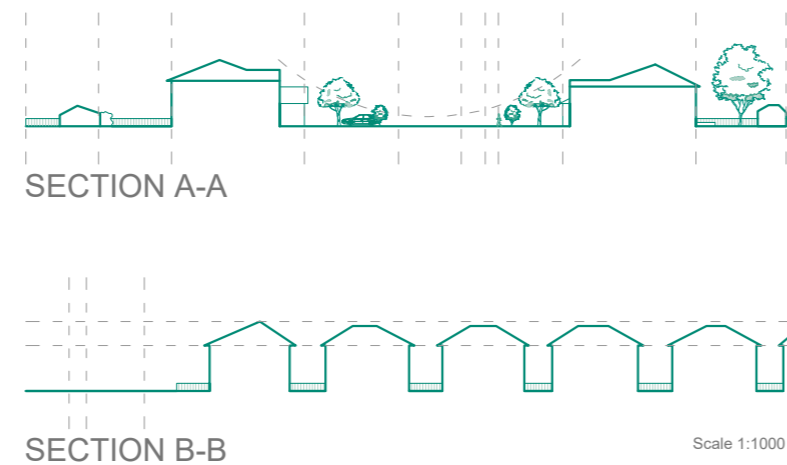
A 100M\*100M sample is chosen in order to understand and analyze the neighborhood characteristics of this generation more precisely.

A wide view with a long distance between houses on both sides of the street is the most significant characteristic of this neighborhood, this character take places due to cheap price of the land in this area, which leads to huge plots with big front yards.

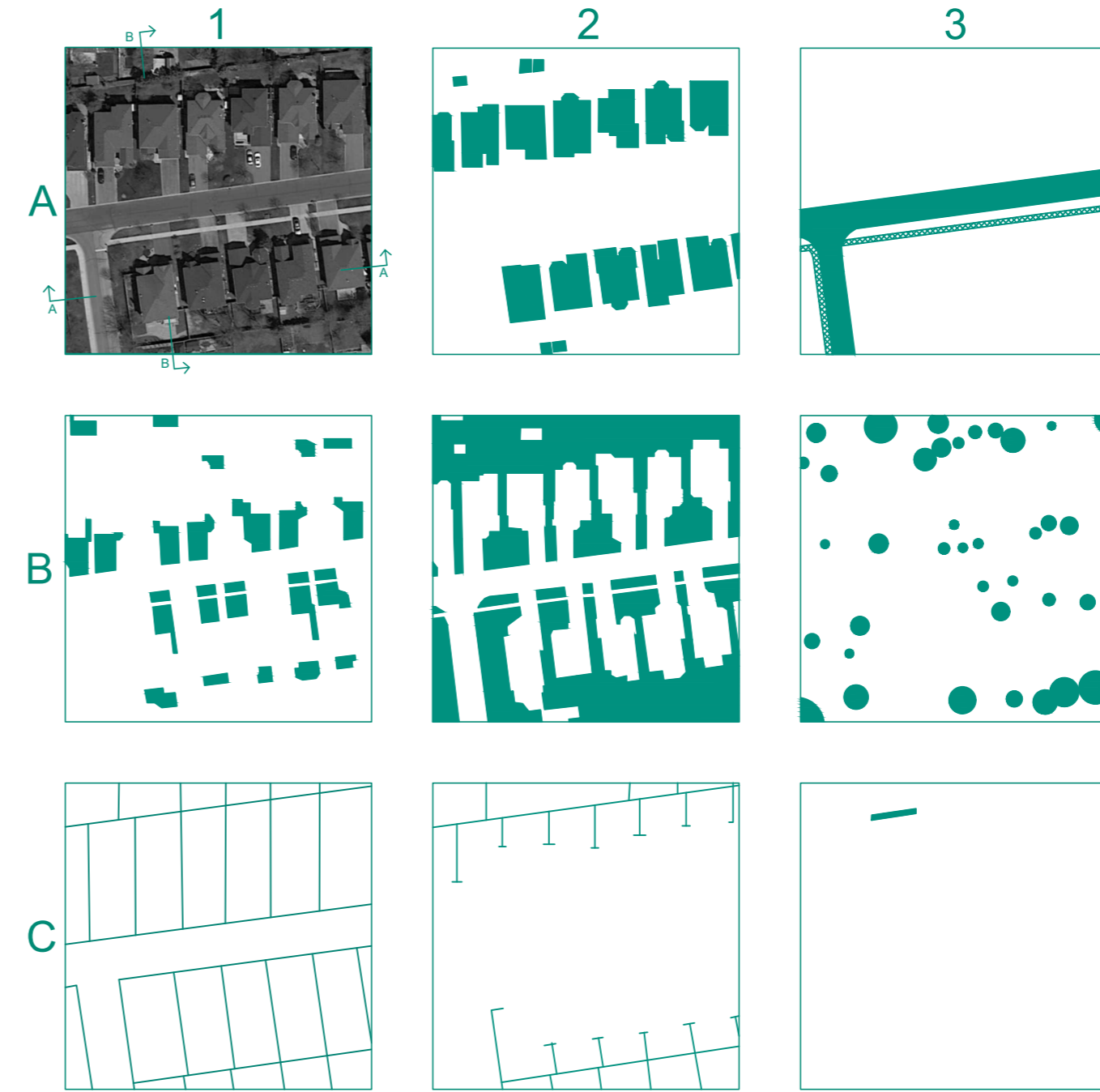
These big lots with low price let the residences have big two story single family houses, with a great view to the street and to their green backyard. The quietness and privacy of the neighborhood is clear, but all the factors which are the reason for this quietness, such as high percentage of land use greeneries, big plots, and big private backyards are creating other issues and problems in a bigger scale, problems which are known as sprawl development consequences.



4.93 G8.Neighborhood Scale View



4.94 G8.Neighborhood Scale Sections



- A1: satellite image
- A2: solid & void
- A3: street & pedestrian
- B1: private hard pavements
- B2: greeneries
- B3: trees
- C1: plot borders
- C2: walls or fences
- C3: vegetation barriers

4.95 G8.Neighborhood Scale Matrix

SCALE 1:2000



**- Architectural characteristics:**

One of the residential buildings of this sample is chosen in order to understand and analyses the architectural characteristics of this generation more precisely.

According to the facades, most of the houses in this sample were built recently. Single detached family houses are very similar to each other probably developed by a single developer. What is typical of these houses is their relatively large size of 2 storage with a attached big parking.

Most of the architectural characteristics are quite similar to old single detached family houses in Toronto, even though these houses are newer. Characteristics such as the number of families living in one building, the privacy and usage of the backyard and front yard, relation with neighbors, and the entrance and circulation to the house.

**- Sustainability of the chosen sample**

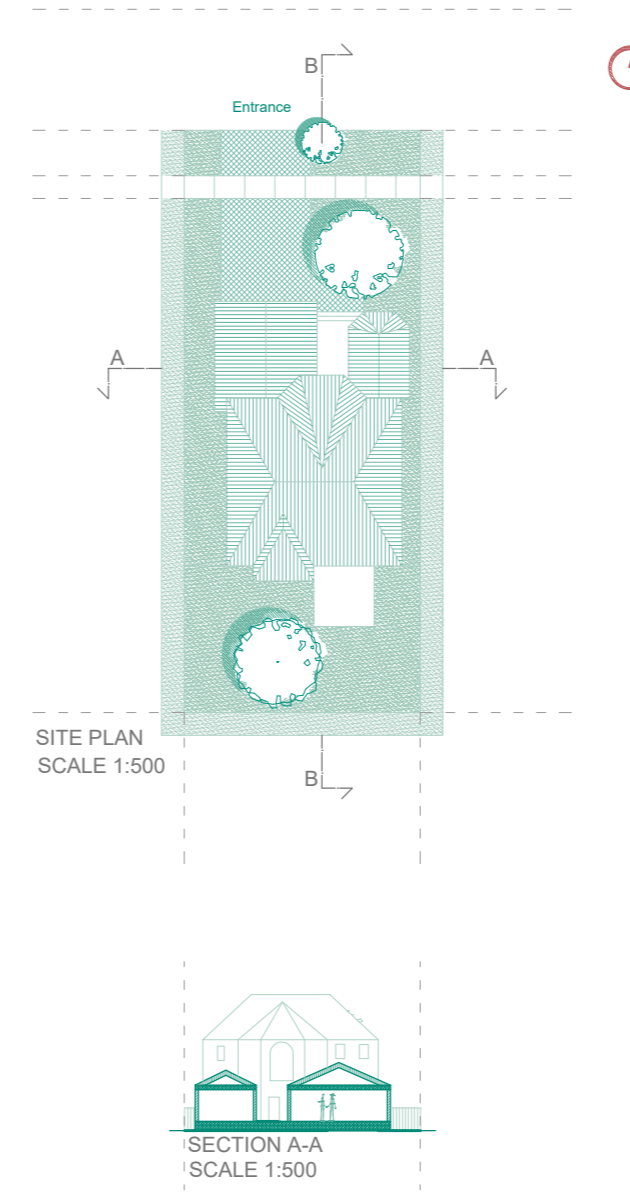
Economical: Due to the low density of the sample the expenses of the municipality will be relatively high when it's divided by the number of the residents in the area, expenses for infrastructure, maintenance, and facilities which makes this sample economically not sustainable, because the same amount of foundation could have been used for more number of people under higher density situations. The dominant typology of housing, which is single detached family housing, leads to damage to the environment by high usage of water for irrigation for big private gardens for every family. But in terms there are some functions in the sample which can be used for cultural activities, besides being used as social gathering nodes for neighbors.



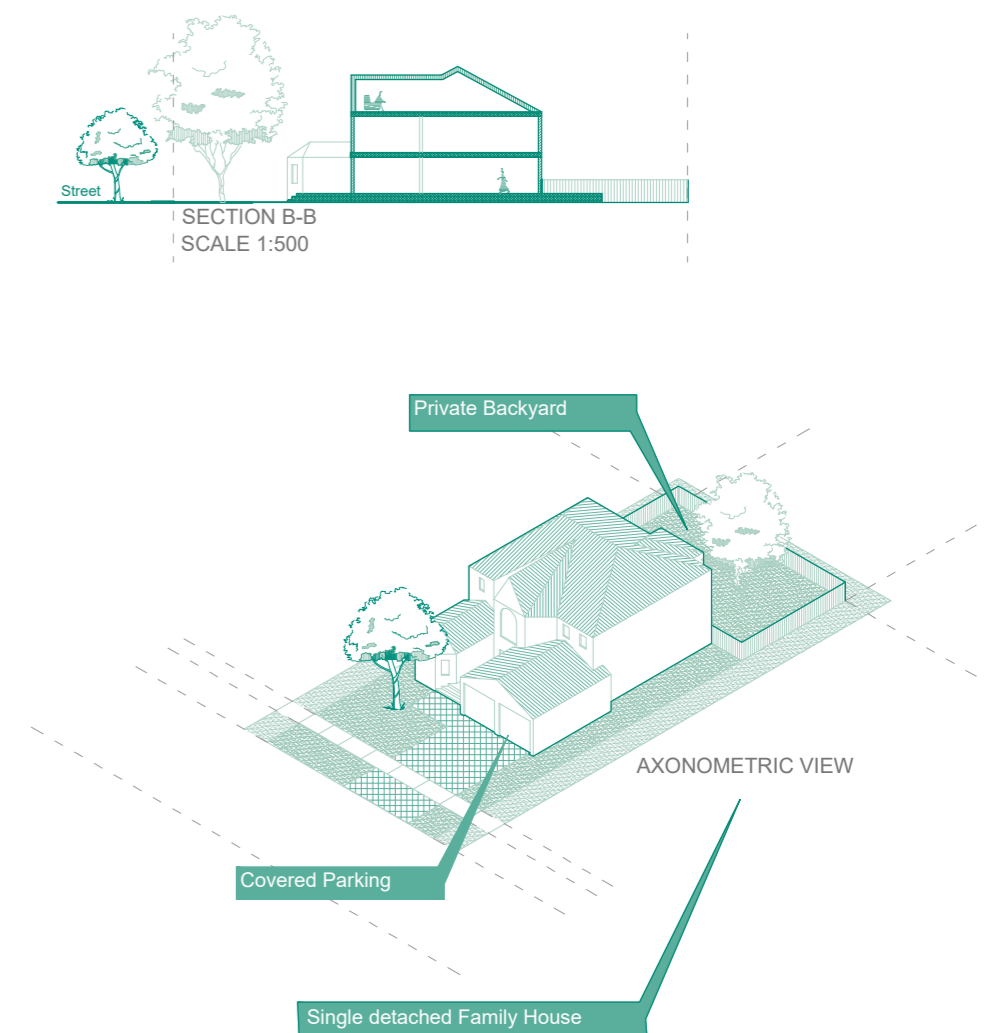
4.96 G8.Architectural Scale Satellite image



4.97 G8.Architectural Scale street view



4.98 G8.Architectural Scale technical view





#### 4.4.9 Generation 9: Suburbia, Redefined

The tenth and final city is "Suburbia Redefined." These communities are the suburban frontier of the GTA, forming a ring around the older mature suburban cores of Brampton, Mississauga, Richmond Hill, Milton, Markham, Pickering and others. These communities are home to about 16% of the GTA, or just under one million people, and have largely been built since 2001. While just 2% of the housing stock are apartments, single detached housing makes up just 63%. This means that the most recent wave of suburban development includes a lot of townhouse and semi-detached housing stock. This new generation of suburban development is also much more diverse than past suburban waves. 72% of residents identify as racialized, far higher than any other "cities" in suburban GTA. These neighborhoods also share the highest percentage of family households with the City of Hedged Communities (81%). While homeownership is (relatively) affordable compared to other parts of the GTA, these neighborhoods have the highest average monthly rent (\$1690) and one of the higher levels of renter stress, with 47% of renters putting more than one-third of their income towards housing costs. (<https://www.tencitiesproject.org>)

Population	Percent of total population
941,738	15.9%
Average household income(after tax)	Individuals identifying as racialized
\$98,910	72%

4.99 G9 General information table



- Private greeneries
- Cultural
- Religious
- Parkings
- Industrial
- Residential built up
- Commercial
- Health facilities
- Private pools
- Water bodies
- Roads&streets
- Public greeneries
- Educational
- Sport facilities

4.101 G9.land use



Generation 9:  
suburbia redefined

500M\*500M  
sample location

4.100 G9. Sample location

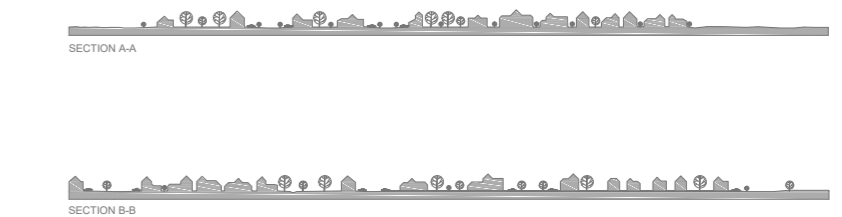
#### - Urban characteristics:

A 500m\*500m sample of this generation is chosen in order to understand and analyze the urban characteristics of it. The number of residential units in this sample is 126 then the average density of generation will be around 5 dwelling units per hectare.

This sample is the first one within our 10 samples of the 10 generations, which include some natural water bodies, not developed plots, and abandoned lands, which indicates that these suburban areas are close to the edge of the urbanized area and have been developing recently.

There is an extremely high amount of sprawl development foot print visible in this sample. Low population density of 5 dwelling units per hectare, quite low presence of other functions but residential, big amount of public greeneries, and being automobile-dependence testify about it.

Being about 45 kilometers away from the city center or in other words 50 minutes drive, means that this urban area has to provide its own job opportunities and every kind of facilities and services for the daily life of its residents which is not visible here. As a consequence almost every resident of the area has to drive their own personal vehicle to reach their daily destination.



4.102 G1.Urban Scale sample

**- Neighborhood characteristics:**

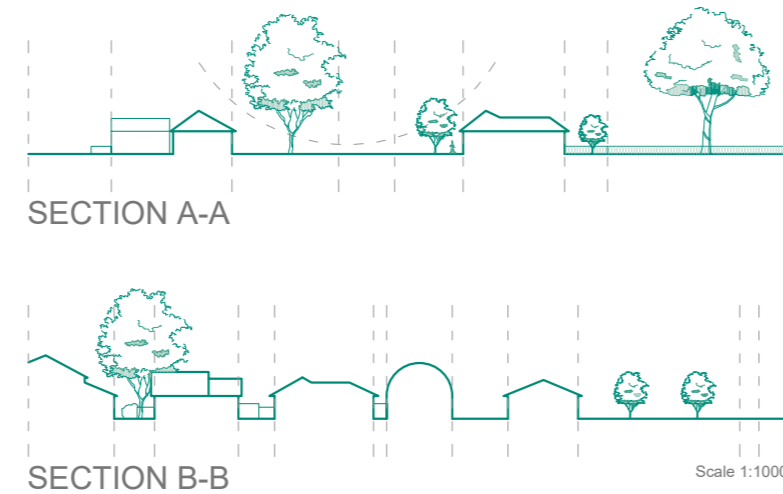
A 100M\*100M sample is chosen in order to understand and analyze the neighborhood characteristics of this generation more precisely.

The first characteristic to consider in this neighborhood is poor attention of the municipality to this area. Whether it is due to recent development of this area or not fair distribution of foundations in the city, these characteristics highly reduce the space quality of the neighborhood.

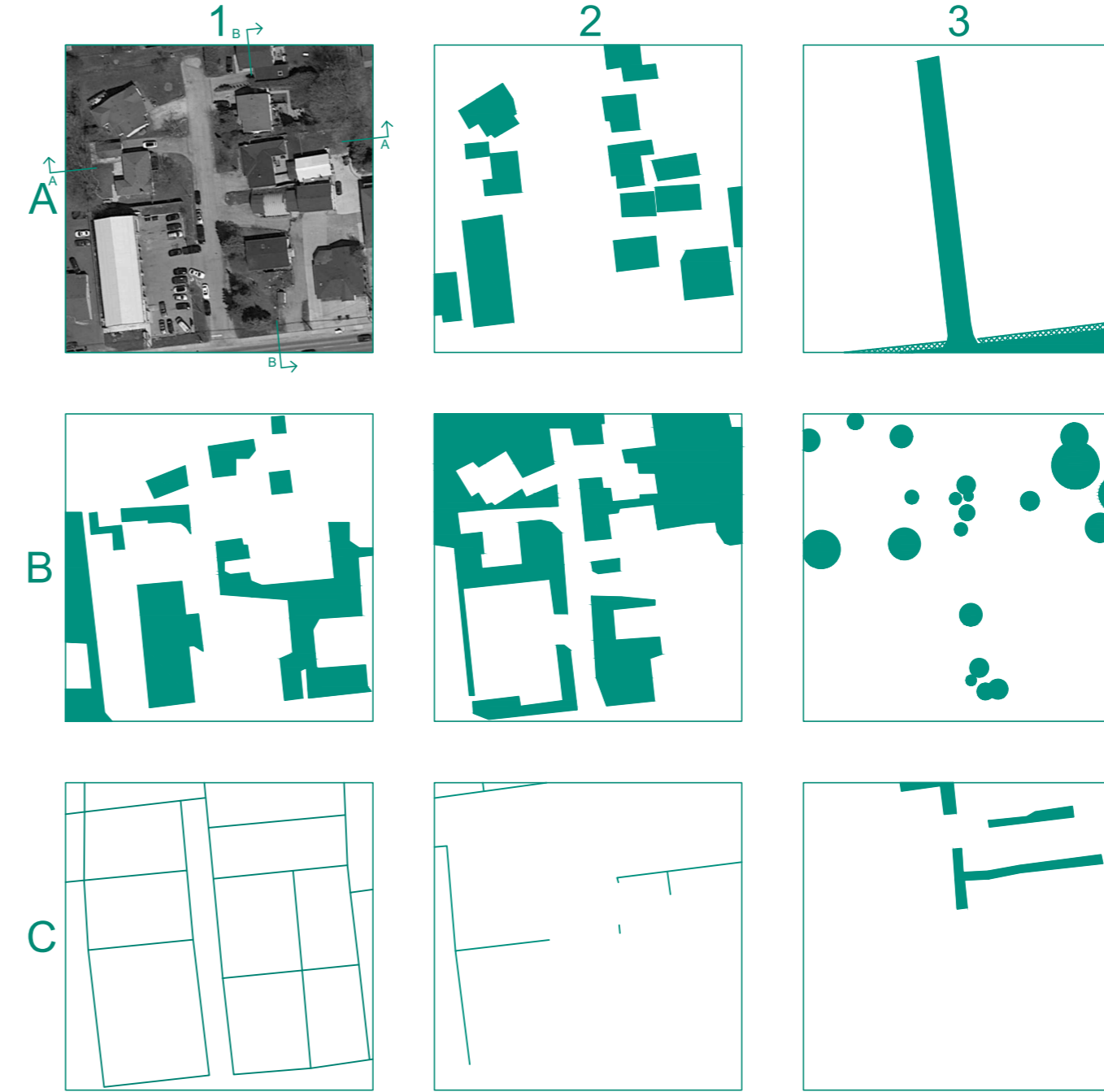
Beside the absence of well designed streets, infrastructure, and side walks, the private properties are not designed well either. Poverty is showing itself significantly in this neighborhood, in small and sad residential houses hiding themselves behind trees, near a car repair shop without any kind of filter. The irregular distribution of out of shape plots, beside relevantly small expenses of residents themselves, is an important factor to consider.



4.103 G1.Neighborhood Scale View



4.104 G1.Neighborhood Scale Sections



4.105 G1.Neighborhood Scale Matrix

- A1: satellite image
- A2: solid & void
- A3: street & pedestrian
- B1: private hard pavements
- B2: greeneries
- B3: trees
- C1: plot borders
- C2: walls or fences
- C3: vegetation barriers

SCALE 1:2000



**- Architectural characteristics:**

One of the residential buildings of this sample is chosen in order to understand and analyses the architectural characteristics of this generation more precisely.

The first remarkable architectural characteristic to be mentioned in this sample is poverty, low attention to the front yard, backyard and the building itself is visible. The dominant typology of housing in this sample is also single detached family houses, but small one store houses, without proper design and materials, apparently built to use temporarily, but they will be used for many years due to poverty of the residents.

Still, a large area of private greeneries exists around these family houses, but not in order to create a beautiful view similar to other generations of the city, here the usage of greeneries looks to be walls, to hide the poverty behind it and isolate the lifestyle of the residents from the city.

**- Sustainability of the chosen sample**

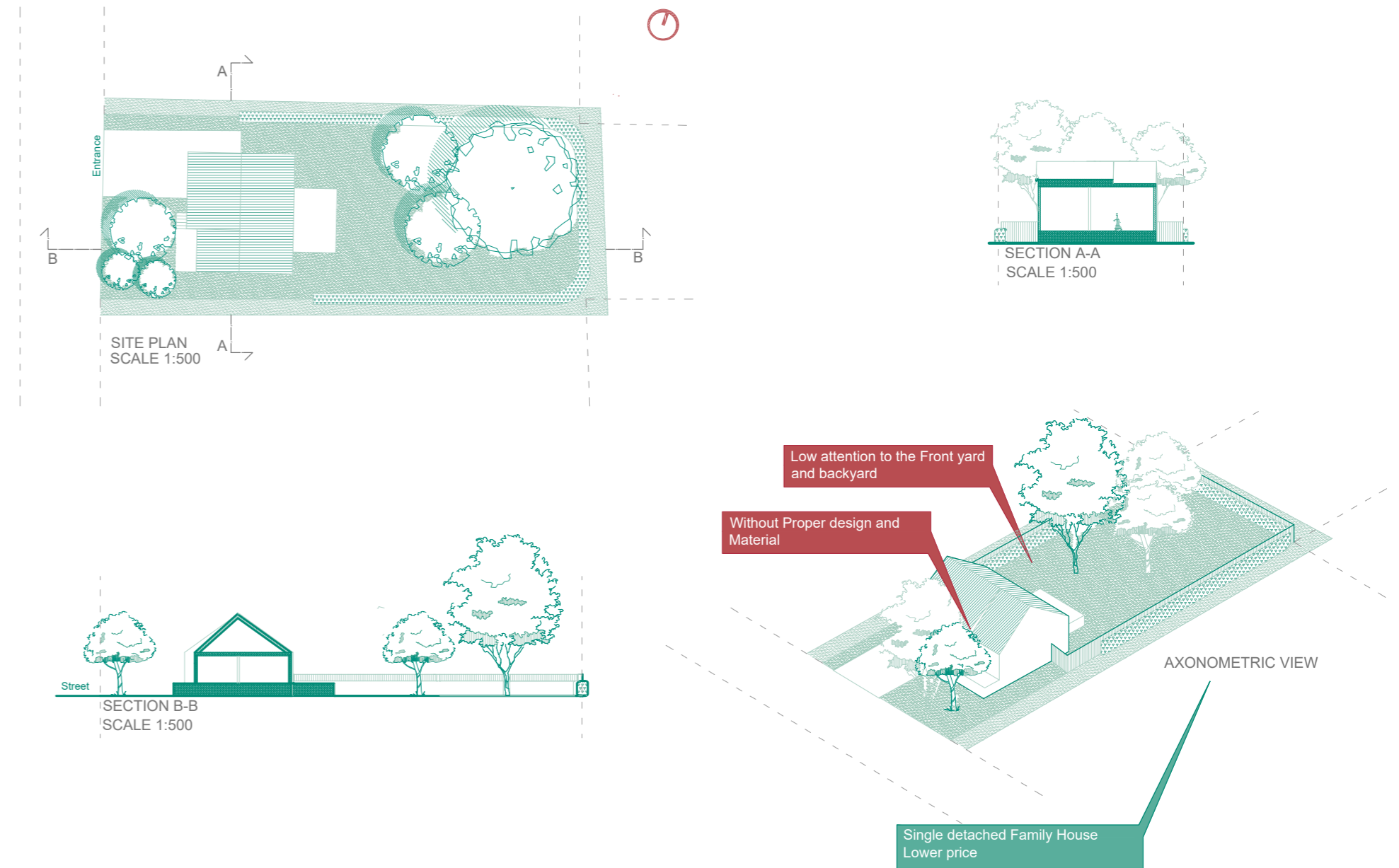
Economical: Without need a deep analysis, the economic problems of the area are visible due to poverty, but the high ratio of poverty in this sample compared to other samples is the consequence of many factors such as low price of land which helps residents to be in the same classification with their neighbors. And due to the long distance of this area to the city center there is an obligation to have a car for every resident while they are not in a good economic condition. On the other hand, in terms of environment many lands have been abandoned and left as private greeneries in the backyards of houses which are not even considered well by the residents and will be a huge waste of water and time. And many other factors as the consequence of the economic problem will make this area a not sustainable neighborhood in terms of social activities, as an example the hopelessness which creates due to the waste of several hours of residents time just to reach their work every day, without an improvement in their life quality.



4.106 G9.Architectural Scale Satellite image



4.107 G9.Architectural Scale street view



4.108 G9.Architectural Scale technical

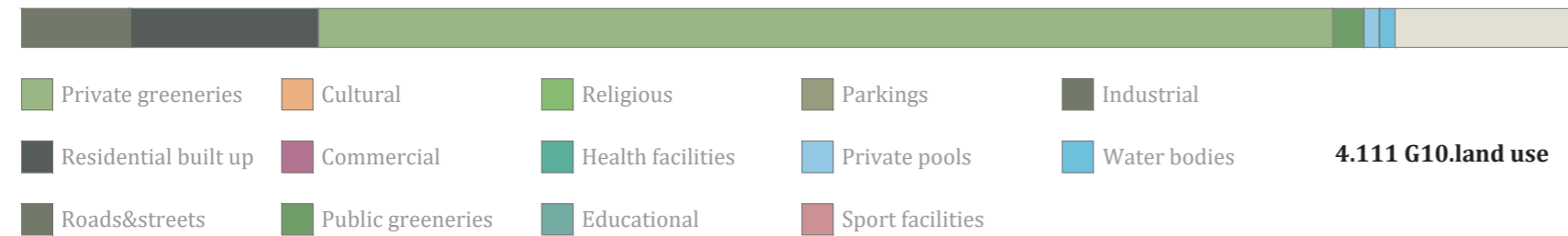


#### 4.4.10 Generation 10: Small Town Satellites

The City of Small Town Satellites is a collection of smaller villages and towns on the outskirts of the GTA. A little over one-fifth of the housing within this City was built before 1961, and a vast majority of housing is single-detached houses. A number of these towns such as Milton, Georgetown and Aurora have newer surrounding suburban areas that belong to other, newer "Cities." These communities are very stable, with only 1 in 3 residents moving over a 5 year period, and many residents are employed within the science and technology sectors. These communities are also defined by a high percentage of family households and a high level of residents with university education. These towns, on average, also are less diverse, with just 11% identifying as belonging to a racialized community, and only 18% of residents having immigrant status, compared to 45% across the GTA. (<https://www.tencitiesproject.org>)

Population	Percent of total population
375,268	6.3%
Average household income(after tax)	Residents moving every 5 years
\$91,925	34%

4.109 G10 General information table



4.111 G10.land use



Generation10:  
small town satellites

4.110 G10. Sample location

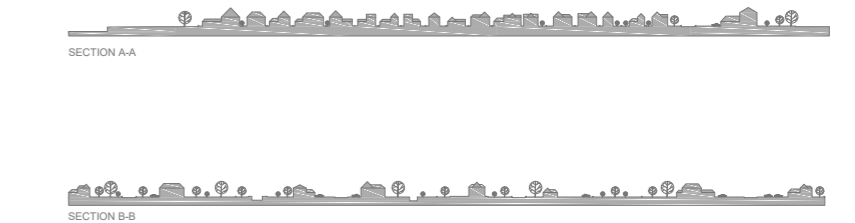
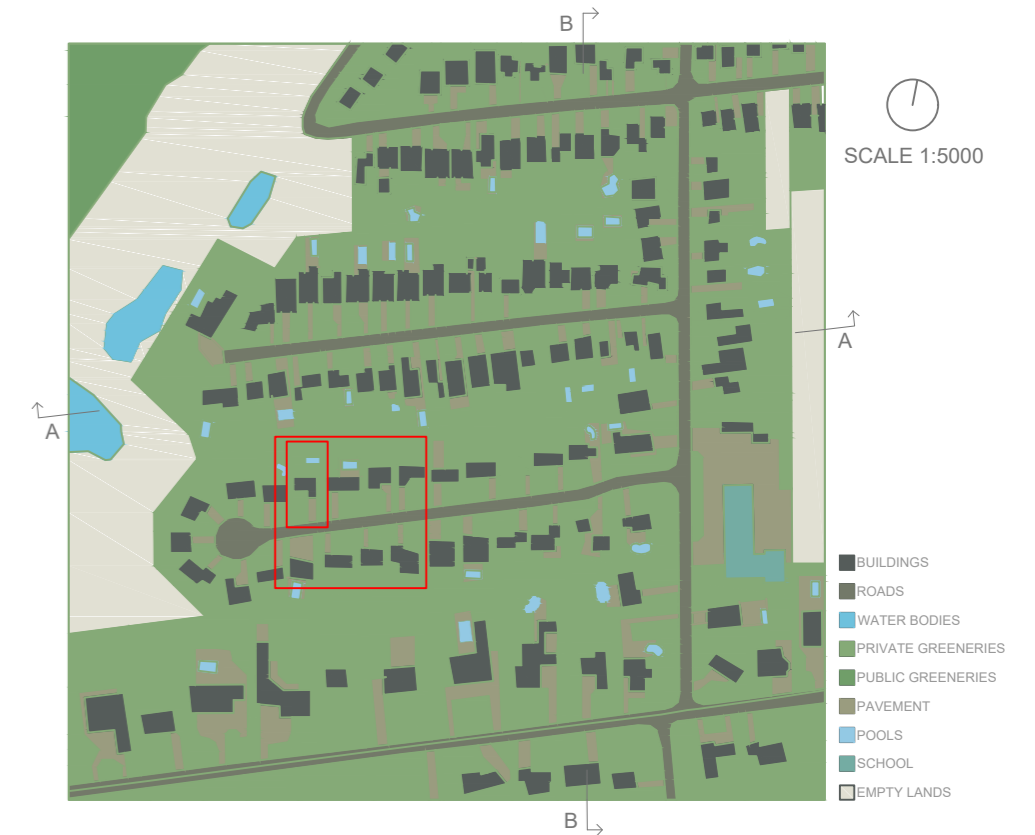
#### - Urban characteristics:

A 500m\*500m sample of this generation is chosen in order to understand and analyze the urban characteristics of it. The number of residential units in this sample is 135 then the average density of generation will be around 5 dwelling units per hectare.

An average of 2000 square meter area for each private land, private gardens, private pools, private parking, single detached family houses which mean proper light, high level of privacy, all these factors informs this generation has a high quality of living for its residents, On the other hand buildings distances from the road edge, big greenery percentage, beautiful facades and big amount of light coming to neighborhood makes the space quiet, peaceful, and beautiful.

There is not any kind of public transportation available in this 2.5 hectares, more than 95% of the land use is residential and there is very poor presence of services and facilities in the area, then close to 100% of residents should leave the neighborhood in order to access their job, any kind of facilities, services, or shopping centers.

On the other hand, as this neighborhood is 50 km away from the city center people have to drive an average of 1.5 hrs to reach the city center and back. 100% of residential buildings are single detached family houses which increase the energy usage of hitting which is an important point in Toronto climate. The low density of the sample leads to increase the service expenses per person, such as expenses of building and maintenance of roads, greenery, water and waist water, and cleaning services.



4.112 G10.Urban Scale sample

**- Neighborhood characteristics:**

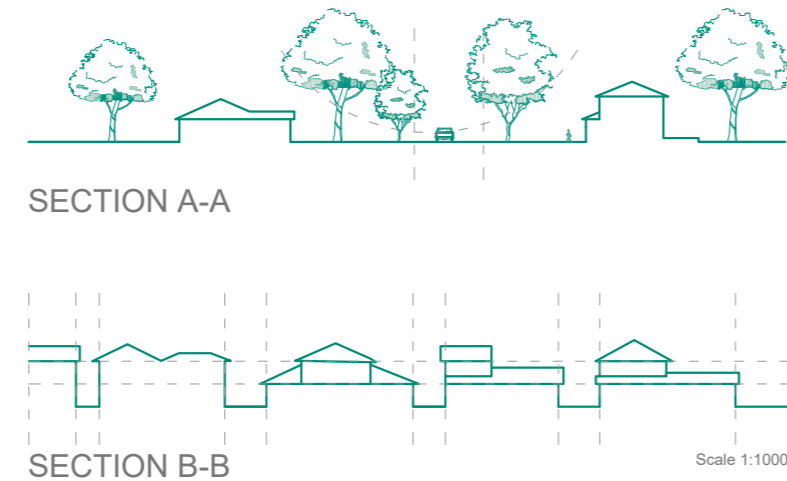
A 100M\*100M sample is chosen in order to understand and analyze the neighborhood characteristics of this generation more precisely.

The presence of the big trees in the street views, indicates the huge front yards of single detached family houses, which exist due to the low price of the land in this neighborhood. This fact brings beautiful greeneries, trees, nice view, quietness, and privacy to the neighborhood, but can have many negative impacts as the sprawl consequences which are not visible here.

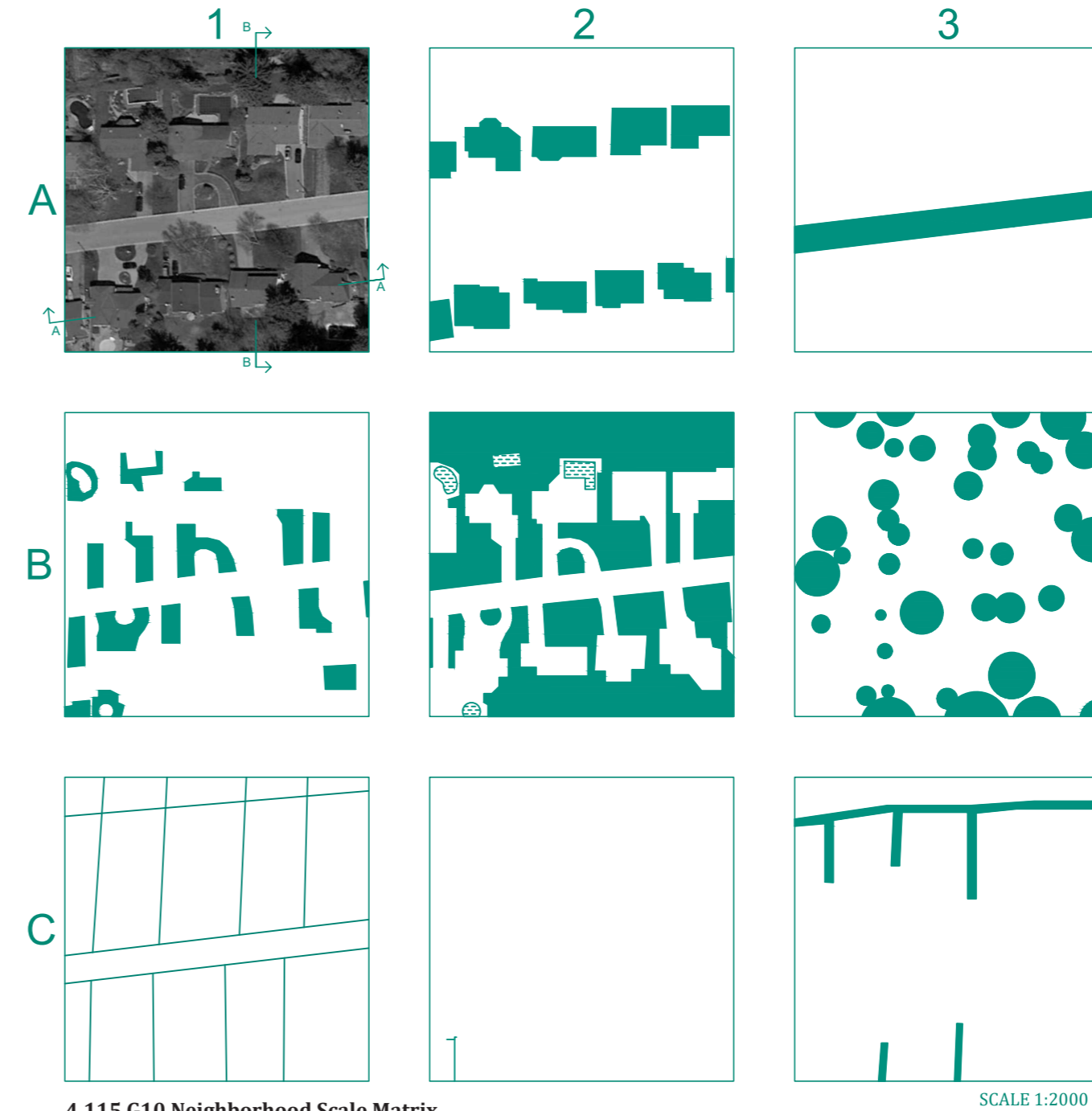
Besides the high percentage of private greeneries both in front yards and backyards of the houses, the small distance between houses even when they have a lot of space, and vegetation barriers between the neighbors behind the houses, informs of the importance of privacy for the residents of the neighborhood.



4.113 G10.Neighborhood Scale View



4.114 G10.Neighborhood Scale Sections



4.115 G10.Neighborhood Scale Matrix

- A1: satellite image
- A2: solid & void
- A3: street & pedestrian
- B1: private hard pavements
- B2: greeneries
- B3: trees
- C1: plot borders
- C2: walls or fences
- C3: vegetation barriers



**- Architectural characteristics:**

One of the residential buildings of this sample is chosen in order to understand and analyses the architectural characteristics of this generation more precisely.

Every single residential building in the sample are single detached family houses, but the most visible deference of this sample is bigger size of the plots, which is due to low price of the lands, compared to other generations. Although in the first look this freedom gave the opportunity to residents to have their personal covered parking long front yard, and a pool in backyard which is covered in all dimensions by vegetation barriers, but in this long distances between buildings to each other and leaving all the sides of the house vulnerable to Toronto's harsh temperature will heavily increase the energy usage for hitting in the winter.

There is no need to mention that on a smaller scale this big size of the plot being used by just one family, will lead to sprawl and its destructive consequences, not only environmentally, but also socially and economically, for both the neighborhood and the city.

**- Sustainability of the chosen sample**

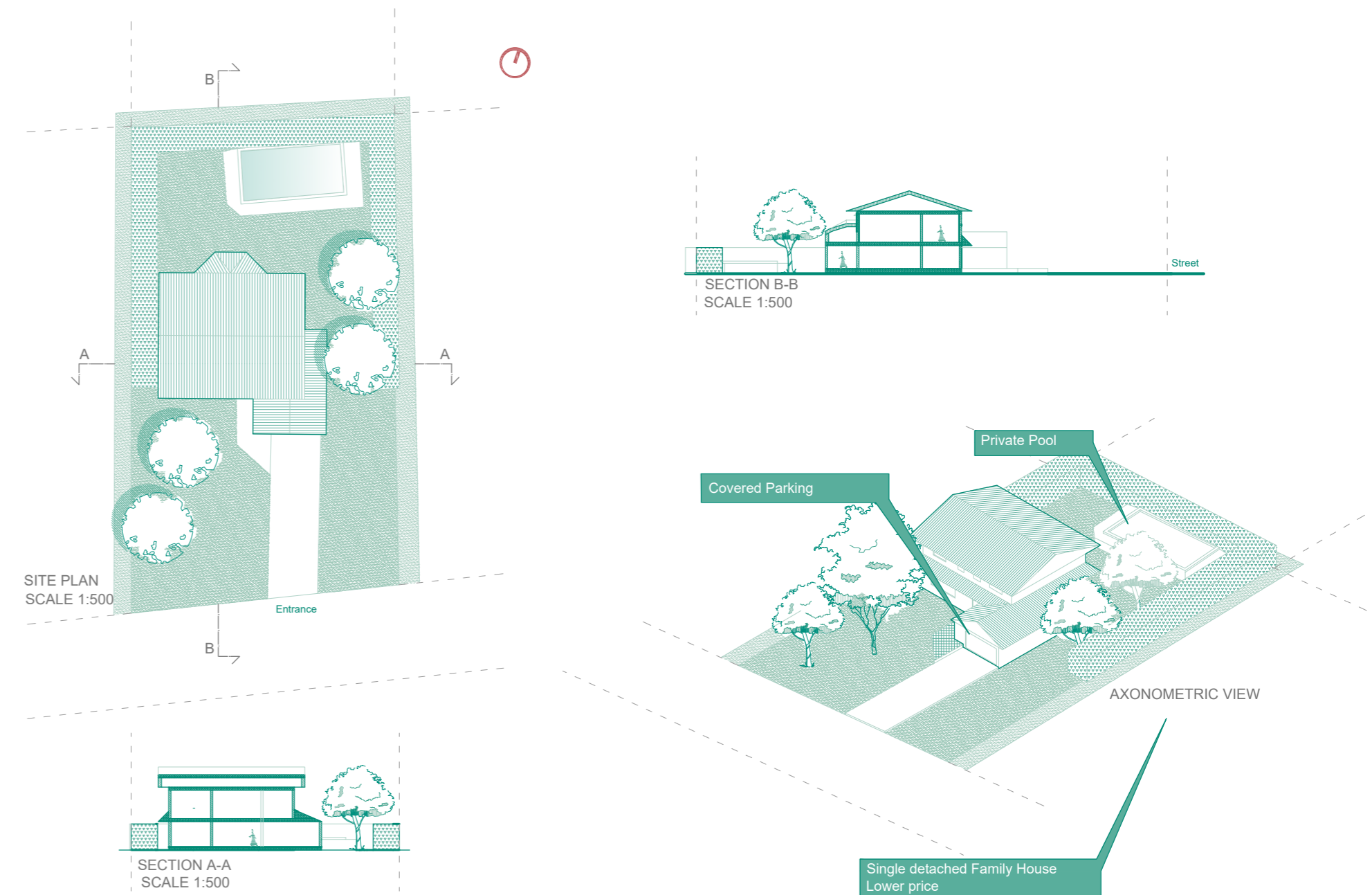
**Economical:** This neighborhood can be seen as an economically sustainable neighborhood, due to being dominantly residential, especially because every dwelling unit's typology is single detached family houses. These conditions heavily reduce the population density of the area, and, as a result, the resident distance to their daily destination will increase without the chance of using the public transportation system. On the other hand, the low density will increase the infrastructure and maintenance expenses for the municipality which lead to waste of tax money. A very high ratio of private greenery per family in this area is destructive to the environment due to usage of water for private proposes, including private pools and private big gardens which are used by just one family.



4.116 G10.Architectural Scale Satellite image



4.117 G10.Architectural Scale street view



4.118 G10.Architectural Scale technical view



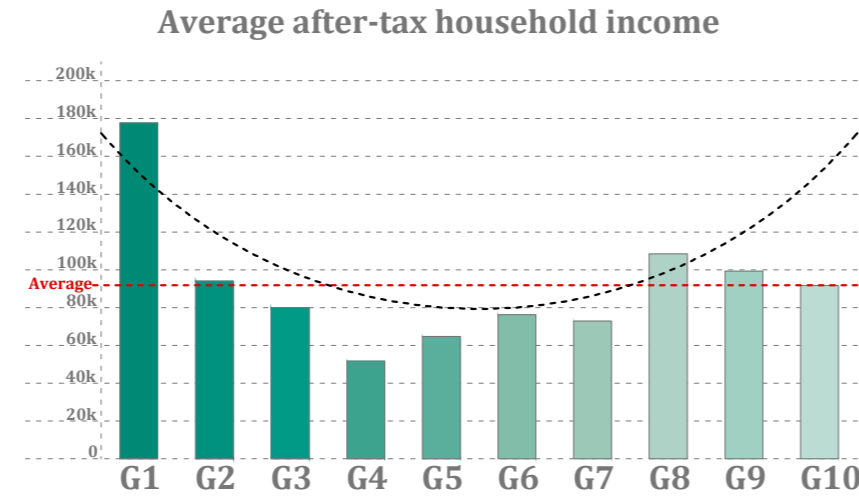
#### 4.5 Generation analysis results

According to the sample analysis which has been done in urban, neighborhood, and architectural scale, a remarkable fact is visible, which is, as far as we go far from the city center, we see more sprawl development, and more sprawl effects as consequences, not only in generation 8, 9, 10 which are very far suburbs of the city center but also in generation 1 which is the richest classification of the city.

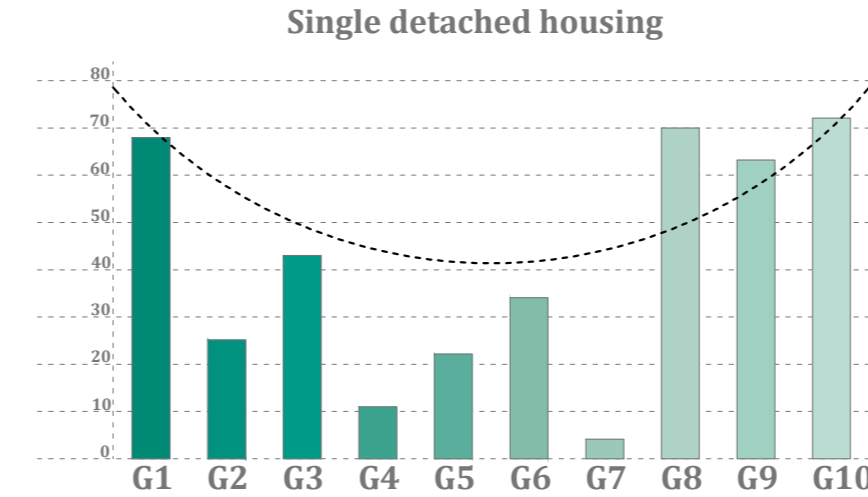
This result is completely visible, both in analysis of the samples, and in several diagrams comparing generations with different indicators. This indicators include average income, homeowners, single detached housing typology percentage, racialized population percentage, public transit commuters, and newcomers percentage, all can be important indicators to show sprawl development footprint.

For example, in the homeowners diagram it is visible that the percentage of people who own their houses is more in the last 3 suburban and the first high classification generation. And in the single detached housing chart, it is visible, that this kind of typology is more dominant in the mentioned generation. The racialized population chart indicates the fact that the racial diversity is much less in generation one and generation 10 compared to generations which are located in the city center, such as generation

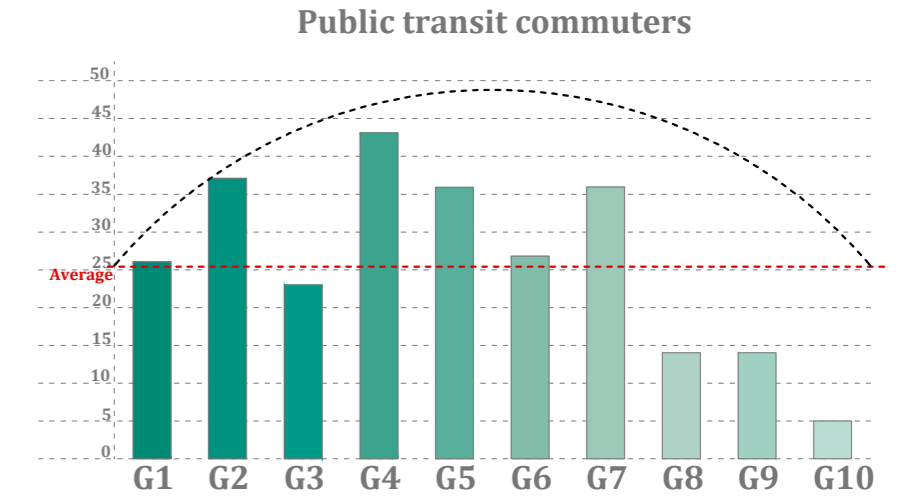
And the usage of the public transportation system is much less in generation 1 and last 3 suburban generations, similar to the percentage of newcomers which is understandable in public transit commuters and newcomers charts.



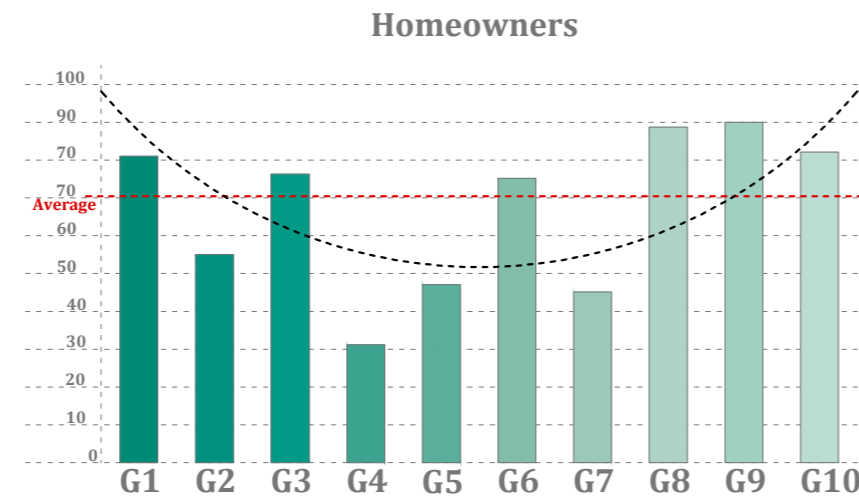
4.119 Average after-tax household income chart



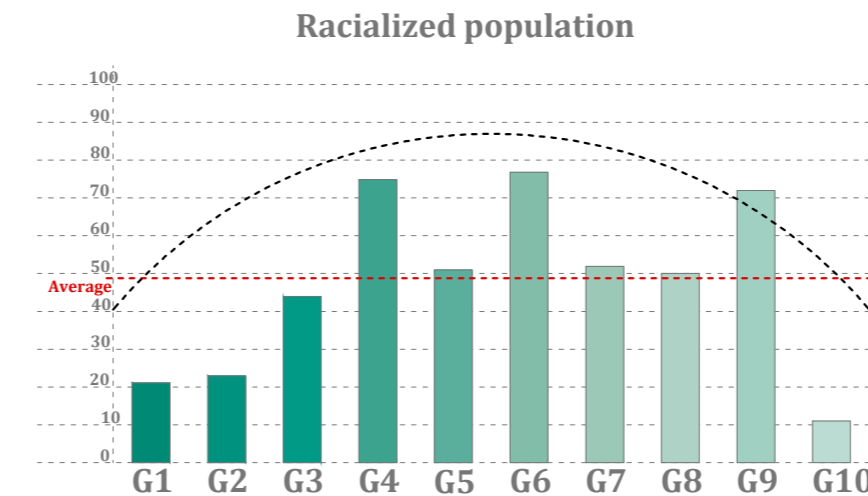
4.121 Single detached housing percentage chart



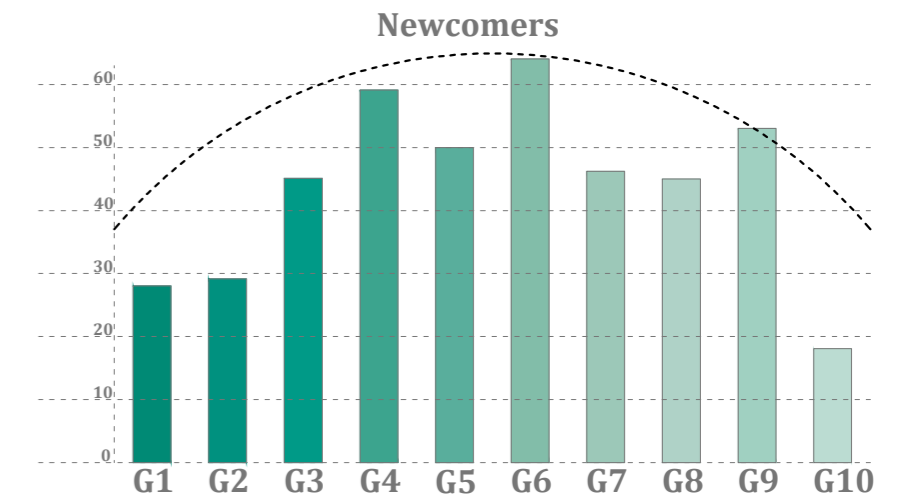
4.123 Public transit commuters chart



4.120 Homeowners percengate chart



4.122 Racialized population percentage chart



4.124 newcomers chart

#### 4.6 Sprawl consequences in intervention area

This is very important to understand, although sprawl development is visible both in the highest classification and lowest classification of the city than in other parts of the city, as mentioned before, the reasons why sprawl happened are completely different in them.

About the low classification of generation 9 and 10 as suburban, sprawl development happened due to the relation of low average income and the low price of the land. But in generation one, as the highest classification of residents of the city, the sprawl development happened, because the residents prefer to live in a quiet, fancy, beautiful, and green neighborhood, which has no racialized minority, newcomers, or diversity, and they wanted a fully residential neighborhood with no other function and crowd traffic, because they do not need any but private school for their children, and they can reach any destination they want with their expensive cars, because they are close enough to city center.

As the reason for sprawl development is different in these two conditions, the consequences will also be different and our strategy as designers regarding this issue should be different. For example, in both conditions, people rarely use public transportation. In lower classification conditions, it is because they do not have access, while in generation one it is because they do not need to. One of the most affected by sprawl areas in the Greater Toronto Area is the chosen intervention area which is located in generation 9 of the city, very far from the city center, recently developed, with a visible footprint of sprawl development. It is important to find out if the sprawl consequences are visible in this area, and how heavily the sprawl consequences have affected the sustainability of this area.

By studying every 20 general sprawl consequences which have been mentioned before, it will be clarified how important this situation is, and how important it is to confront it, not just to save the earth from global warming, but also for having a more sustainable city, more sustainable neighborhood, and more sustainable lifestyle.



4.125 intervention area

#### 1. Increased Air Pollution

Cars, trucks and buses are the biggest source of cancer-causing air pollution, spewing more than 12 billion pounds of toxic chemicals each year, or almost 50 pounds per person. Because of sprawl first of all distances increases the distance between this area to the city center is about 30 kilometers, and there is no public transportation serving this area. On the other hand, the lack of facilities like shopping centers, health facilities, and job opportunities makes residents of the area drive hours per day to do their needed activities.

On the other hand, a hundred percent of residential buildings in the area are single detached family housing, obviously vulnerable to cold air outside from every direction, especially in the cold weather of Toronto city, then the consumption of energy to keep ward the houses is extremely high compared to more compact kind of residential houses.

#### 2. Increased Water Pollution

As rain water picks up gasoline, lawn chemicals, heavy metals, paint spills, motor oil, pet wastes, construction site erosion and other pollutants in runoff from lawns, driveways, roads and parking lots, which can eventually travel in large, concentrated amounts, polluting nearby water sources, such as a stream, river or lake. Furthermore. In our case in this area on one side big amount of fossil fuel of cars and house hitting systems and on the other hand abandoned not develop sites with natural water bodies which area all sprawl development consequences increase water pollution.

#### 3. Increased Water Consumption

Again, single family houses with big lots around maybe 2000 square meters for just one family means a large percentage of private greeneries on each land. These greeneries are private for the use of just one family with a huge amount of water consumption for irrigation. And because of low density, washing the side walks and streets themselves is also considerable as a sprawl consequence.

#### 4. Degraded Human Health

In this area, it is almost impossible for residents to do any of their daily activities by walking, no shopping center close, no public transportation station and no job opportunities force people to always use their cars to reach their destination. Having no reason to walk or bike, besides the high production of greenhouse gases has degraded human health.

### **5. Wasted Tax Money**

There are around a hundred families living in this sample of 25 hectare area, which means 4 families per hectare. Obviously, the tax money spent in this area on infrastructure such as roads, streets, greeneries, and electricity network, is a big waste compared to more compact areas because it's just used by a hundred families.

### **6. Loss In Open Space, Parks, Farmland and Wildlife Habitats**

As the distance between this area to the city center is 30 kilometers much more than needed, compared to the total population of the city and based on historical maps, all this area where farmlands in not far past and sprawl development destroyed natural parks and farmland as the green ring around the city, this kind of development also threat the definition of the borders of a city which are farmlands in our case because it can develop and grow for ever without any red line.

### **7. Increases Risk and Damage from Floods**

Generally destroying wetlands, natural parks, and trees increases the risk of flood and damage to it, and because of the low density of sprawl we need to destroy more of nature for less population, on the other hand single family houses, wicker structures of them, and flattening the ground are all the reasons which increases risk and damage from floods which are all visible in our area.

### **8. Increased Traffic Congestion and Traffic-Related Fatalities**

Again lack long distances, lack of job opportunity and facilities, and impossibility of public transportation increase the usage of personal vehicles with usually one passenger, and also increase the need of traffic related fatalities, not only because of more number of cars and time needed for driving but also because of not well define and separated areas in sprawl development.

### **9. Increased Infrastructure costs**

All the necessary infrastructure costs such as roads, electricity networks, waste water network, even schools and hospitals are serving fewer people under sprawl development situation, obviously because of low density, distances from residents increases and more infrastructure will be needed to connect people to services.

### **10. Increased Social fragmentation**

Long distance between neighborhoods, lack of cultural and communication centers, lack of urban well-defined gathering places such as piazzas, bars and restaurants, parks, children's playgrounds, and, on the other hand, big areas of each lot for single family houses, are effects of sprawl development which we can see all over our area which increases social fragmentation.

### **11. Decreased Neighborhood quality**

In sprawl development, it is hard to define the neighborhood as there is no clear border or a center, and as we can see in our area, most of the factors that increase the quality of a neighborhood are missing, such as gathering areas, sport facilities and children play grounds, being walkable and suitable for bicycle, and small distances with a good social relation between neighbors.

### **12. Increased Energy consumption**

One of the most important effects of sprawl, which is also very visible in our area, is increasing energy consumption. As it was mentioned before, two main factors of sprawl characteristics which increase energy consumption are single detached family houses, which are extremely vulnerable to outdoor air, which increases energy needed for hitting the house and the other one is long distances, lack of public transportation, which increases private vehicle use for almost everyone which leads to more energy consumption.



### **13. Increased Personal transportation costs**

Again, we have to mention the lack of public transportation, long distances, and lack of facilities and services as a reason all the residents of the sprawl development, including our area, have to use their private cars, which, because of the car costs itself, fuel, and the infrastructure needed personal transportation costs increases comparing to more compact developments.

### **14. Increased Private costs and risks**

Big lots of land, big areas of single family houses, and the lack of some services close to residents in sprawl development highly increase their private costs. For example, in our intervention area, each house has around a thousand square meters of greeneries around it, which is the family's responsibility to preserve it. Also, the sidewalk in front of it and the house itself for just one family will be expensive and also time-consuming.

### **15. Reduced Diversity and increased 'white flight'**

Urban sprawl can lead to white flight. Urban sprawl leads to racial segregation as minorities are often left behind in the poorest parts of a region, especially newcomer minorities who are not supported as much as older residents, and they are not economically strong themselves. This problem may not be as widespread as it has been in the past, but it's present nonetheless.

### **16. Decrease In social capital**

Low density, high percentage of residential land use, low economic support, long distances, are all the reasons that can lead to a decrease in social capital. In our intervention area, the poor social capital is completely clear, due to the lack of any place as a socially valuable node for the neighbors.

### **17. Loss Of time**

Losing time and wasting life is one of the most obvious consequences of sprawl development, due to low density and lack of job opportunities and services. Several hours of the day are spent driving to work or other daily destinations, because on the other hand, development of the public transit network is not possible due to low density. It is clearly visible that, in our area of intervention, the public transportation network is not developed in a way that can be used by residents for their daily tasks. And it cannot be developed because there are many small numbers of people who will use it due to low population density, and it will not be logical for a municipality to develop such a loss of tax money.

### **18. Degraded, Noisy surroundings**

Due to many factors which are common indicators of urban areas affected by sprawl development, such as poor economic situation of the families, less municipality attention, poor urban and neighborhood design, these neighborhoods have become degraded and noisy. As an example in our area of intervention, many single family houses are close to a car repair shop with no filter and no proper design, and many houses have closed, not designed related to the abandoned river, and its abandoned surroundings.

### **19. Delays In emergency medical services response times**

Because of the high distances to every destination for residents in sprawl development area due to the low density, reaching every facility and services will be delayed. Emergency medical services are one of the most important ones which also delay in response. Not only due to the long distances which are mentioned, but also due to regular heavy traffic, because areas developed under sprawl are heavily automobile-dependence. This situation also exists in our intervention area, the car dependency is completely visible, and the closest hospital or emergency facility is several kilometers away.

### **20. Increased Racial and economic disparity**

When residents relocate outside a city's core, they take their tax dollars with them. Often, it is the city's poorest residents that are left behind. This creates economic disparity and stratification based upon location. It also creates funding problems for the core, which directly affects the money available for education, crime prevention, and maintenance and upkeep. Poor infrastructure and maintenance services for public areas of our intervention area indicate the lack of municipality attention to this area, beside the economic challenges of the individuals themselves which is also visible.

# 05

## **05 Previous Studies**

**5.1 A Manifesto for a new Suburbia**

**5.2 To build the Cities of the Future, we must get out of our cars**

**5.3 How the Green New Deal Could Retrofit Suburbs**

**5.4 The Economic Defense of Sprawl (And What's Wrong With It)**

**5.5 Huge Public appetite for mixed-use communities**

### Previous studies

Up to now, by understanding the city and its suburb situation, analyzing important indicators which affect life quality, dividing the city into different generations to compare them and analyzing them more precisely by choosing a sample from each generation and understanding their urban scale, neighborhood scale, and architectural scale characteristics, it is clear that the city is affected by sprawl and what are the reasons. We find a sprawl footprint in our area of intervention, and we find out that the consequences and effects of sprawl are very high.

Before starting to define the ideal vision for the intervention area, strategies to reach it, and try to confront sprawl consequences, A big question is that, despite the huge number of researches and studies has been done about sprawl development, its consequences, and many tries to solve its problem, why we still facing sprawl even with faster growth rate and worth situation all around the world specially in North America.

Several recent studies about sprawl consequences and tools to confront it randomly have been chosen, and an abstract of them is written here to find out the answer to this question, why their suggestions could not confront sprawl in the best possible way. Including:

1. Eight ideas for future-proofing the suburbs, by Alissa Walker
2. To build the cities of the future, we must get out of our cars by Robert Kunzig
3. How the Green New Deal Could Retrofit Suburbs by Amanda Kolson Hurley
4. The Economic Defense of Sprawl (And What's Wrong With It) by Michael Lewyn
5. Huge public appetite for mixed-use communities by Industry Insights

### 5.1 A Manifesto for a new suburbia, By Alissa Walker

The abstract of this article is 8 ideas from 8 experts to rethinking suburbia, from eliminating single-family zoning to densify sprawl to reducing carbon footprints—even undoing the long-term impacts of segregation and facing the realities of rising poverty.(Walker, 2019)

Those 8 ideas are:

1. Walking, helps suburbs become places worth being by meeting the untapped demand for walkable neighborhoods.
2. Emission, encourages suburban homeowners to reduce their carbon emissions by getting involved in local government and advocating for change.
3. Aging, Embrace density in suburban communities to welcome aging residents.
4. Lawns, bring transparency to homeowners' association rules when they impact environmental policies.
5. Land use, quickly finds new uses for dead and dying suburban infrastructure.
6. Poverty, turns neighboring suburbs into regional cooperatives to combat poverty.
7. Schools, build flexible education systems that can better serve suburban families.
8. Economic opportunities, break down housing barriers to make the suburbs more inclusive.(Walker, 2019)

### 5.2 To build the cities of the future, we must get out of our cars, By Robert Kunzig

The suggestion of this article is that the cities would stop expanding so voraciously, paving over the surrounding nature around them; instead they'd find better ways of letting nature into its core, where it can touch people.(Kunzig, 2019)

They had grow in dense clusters and small, walkable blocks around a web of rapid transit. These cities of the future would mix things up again: They'd no longer segregate work from home and shopping, as sprawl does now, forcing people into cars to navigate all three; they'd no longer segregate rich from poor, old from young, and white from black, as sprawl does, especially in the United States. Driving less, paving less, city dwellers would heat the air and the planet around them less. That would slow the climate change that threatens, in this century, to make some cities unlivable.(Kunzig, 2019)

### 5.3 How the Green New Deal Could Retrofit Suburbs, By Amanda Kolson Hurley

This article suggests that the way the Green New Deal can harness the spirit of the Greenbelt is not by building new towns from scratch. That could fuel sprawl and would be resource-intensive, even if the new buildings were net-zero-energy. The better approach is to retrofit existing suburban places to be more sustainable, livable, and equitable. Working with states and localities, the federal government could perhaps choose a handful of pilot sites to test and refine strategies, and roll them out from there.(Hurley, 2019)

Upgrading and building affordable housing—near job centers and transit, and to the highest standard of energy efficiency—would help meet an urgent need while enabling green-workforce training. The government could prioritize extending or building light-rail and bus-rapid-transit systems in the suburbs, and redesigning roads for walking and biking, so more suburbanites can leave their cars at home (or never need to buy them in the first place). (Hurley, 2019)

Federal funding might be linked to loosening local zoning laws that raise housing prices and increase segregation. (In fact, presidential hopefuls Sen. Elizabeth Warren and Sen. Cory Booker both recently floated bills that embrace this principle.) With legalized duplexes and “granny flats,” as well as new affordable housing, suburbs would densify and be able to support more local transit, businesses, and services, and become more socioeconomically integrated.

The Green New Deal could also have seed money for initiatives that, for example, turn obsolete parking lots into wetlands, establish community land trusts, or kick-start small-business incubators in aging shopping centers. (Hurley, 2019)



#### **5.4 The Economic Defense of Sprawl (And What’s Wrong With It), By Michael Lewyn**

The traditional libertarian-ish argument for suburban sprawl is that it is a product of the free market, and that the free market has created, no government may tear asunder. A wide variety of popular and scholarly commentary (including plenty of my own work) has criticized this view, by pointing out that the government has encouraged automobile-dependent suburbia in a wide variety of ways.(Lewyn 2019)

As demand for urban housing has grown, the 1990s view that consumers prefer suburbs to urban cores has become implausible. But as housing costs have exploded, a new pro-sprawl argument has risen instead: the theory that government-supported suburbanization makes housing more affordable by opening up new land for development. For example, in his generally worthwhile recent book *Order Without Design*, Alain Bertaud writes that to “maintain a responsive supply of developed land, municipalities must therefore finance and build the expansion of primary infrastructure into a city’s periphery.” In the U.S. context, such “primary infrastructure” usually means sprawl-generating highways. (Lewyn 2019)

This argument has a significant basis in fact: sprawling American cities do generally tend to be cheaper than compact ones (though there are exceptions in both directions: walkable Philadelphia is cheaper than sprawling San Diego). But it also seems to me that sprawl is not the best way to create more housing, for several reasons. (Lewyn 2019)

First, although sprawl is one way to create extra land, it is not the only way to do so. As Bertaud wisely notes, a city can “create” additional land by allowing more housing on urban land. For example, if a city allowed more multistory buildings instead of reserving huge chunks of cities for single-family houses, it would essentially be creating developable land in the air, thus increasing the supply of land. Similarly, if the city allowed smaller yards, it would increase the supply of land available for housing. (Lewyn 2019)

This need not mean a city of 90-story skyscrapers; cities could allow incremental height increases instead, so that neighborhoods now reserved for one-or two-story houses could have four-story apartment buildings, and places with four-story apartment buildings could have eight-story buildings. (Lewyn 2019)

Second, sprawl creates transportation costs for drivers that at least partially offset the benefits of cheap real estate. For example, a typical household in Suffolk County, Long Island (the outer suburb where I work) spends over \$14,000 on transportation, while a typical household in Manhattan spends just below \$6,300 and a typical household in Queens spends just over \$8,200 (more data here). It could be argued that the transportation cost gap between driving and active transportation is artificially inflated by public subsidies for public transit. But if policymakers use public transit subsidies as an excuse to support pro-sprawl policies, they create a self-fulfilling prophecy: pro-sprawl policies force transit to cover more territory to serve the same number of people, thus making transit more expensive and increasing per-capita transit subsidies. For example, New York’s subway loses less than \$1 per ride, while the rail systems of sprawling cities such as Santa Clara lose far more. (Lewyn 2019)

Third, sprawl development creates a variety of externalities that are typically not reflected in housing costs. The growth of automobile-dependent suburbs leads to increased vehicle use, which leads to increased greenhouse gas emissions and other pollution of all sorts, as well as an increased likelihood of death and injury from automobile crashes. (Lewyn 2019)

In theory, it is possible that these externalities could be taxed and regulated away. For example, a state could calculate the social cost of automobile-related pollution, and impose a tax or fee sufficient to equal that cost. But sprawl actually makes it less likely that this could occur; when most people spend their lives inside their automobiles, they are likely to resist any attempts to tax car use, and increased taxation of cars becomes politically radioactive. (Lewyn 2019)

It could also be argued that the rise of electric cars or some other technology will wipe out the environmental impacts of cars. This argument lacks merit, because in recent years, American automakers and consumers have chosen gas-guzzling, dangerous sport utility vehicles rather than energy-efficient vehicles. As a result, American vehicles are not as energy-efficient as some of their European counterparts. Moreover, a single-minded focus on miles per gallon overlooks the other externalities caused by sprawl, such as increased injuries and death from speeding vehicles. (Lewyn 2019)

In sum, a government that aggressively promotes sprawl development might increase the supply of housing. But there are more environmentally friendly ways of achieving the same result. (Lewyn 2019)

#### **5.5 Huge public appetite for mixed-use communities, By Industry Insights**

This article argues that the popularity of retail centers as one-stop-shopping destinations appears destined to grow as developers continue to introduce new types of uses at their properties, including entertainment, medical services and housing. (Insights, 2019)

Shopping centers are especially well-positioned to add new uses, given their expansive parking lots and their ambitions to re-purpose big-box space. Moreover, their customers have become increasingly accustomed to finding reasons to visit besides shopping. It suggests using shopping centers as mixed use multi-functional centers. (Insights, 2019)

# 06

## **06 Conclusion**

**6.1 Research & Analyzing the Final Result**

**6.2 The Problems**

**6.3 The Solutions**

## Conclusion

### 6.1 Research & Analyzing Final Results

According to research that has been done in the Greater Toronto Area, studying many indicators such as location, history, development, population, diversity, economy, transportation network, and culture, both for the City of Toronto and the suburban areas around it, we reached the result that the Greater Toronto Area is affected by sprawl development.

By understanding what the sprawl development definition is, and why it usually takes place, and considering the research about the Greater Toronto Area, it was clarified why sprawl specifically happens in GTA.

Due to high density and many other factors in the city center, such as high economic activities, strong presence of the public transit system, and a good distribution of facilities and services, including hospitals, universities, and cultural centers, it was clarified that the sprawl impact does not exist all over the Greater Toronto Area, then a precise Analysis was necessary in order to answer the questions: Where sprawl exists, how heavy and important are its consequences, and what is the reason for each affected area?

In order to have a more precise look, a long strip sample with a huge dimension was chosen, which had every different kind of urbanized area of GTA within it, from the coast of the lake, downtown, and city center, to the old suburbs, recent developed suburbs, and the border of the urbanized area with the farmlands and nature.

Eleven important indicators which have an important impact on the city have been analyzed, such as density, distance to centers and facilities, diversity, job opportunities, and access to jobs by public transit. Analyzing these 11 factors lets us to classify the GTA into ten different generations. This classification considers many factors from average income of the residences, development era, job opportunities, to density and diversity.

By choosing a sample of each of the city generations, we analyzed all of them on 3 different scales of urban, neighborhood, and architecture, and studied the sustainable of the sample, which let us answer our questions including where is sprawl presence? How heavy are its consequences? What are the specific reasons in each area? And what is the difference in sprawl between them?

After it was clarified that sprawl is presence in our area. In order to understand the heaviness of its impact in our intervention area, we studied every 20 general sprawl consequences one by one, which leads to this answer, that the sprawl consequences impact is destructive there. And the reason for the presence of this development pattern there is different from some other parts of the GTA. For example, the low price of the land, the presence of highways and sewer system, the high rate of population growth in a specific period, and low income of newcomers and racial minorities were the result led to sprawl development in our area of intervention. While the reason for sprawl development in another part of the city was coming from wealth, and the will of the residents themselves.

For example, in the higher classification of the GTA people, residents desire to have big houses with fancy front yards to represent their wealthy lifestyle, and they would like to live in a quiet neighborhood without any other function or job opportunities or even public transit, because they do not need any of these due to their wealth, it is not similar to our area of intervention, which is completely different.

The existence of sprawl development, the reasons why it has happened, its difference with sprawl in other parts of the city, and the heaviness of its consequences, as impact are clear in our area of intervention.

Before we started to define the vision and strategies for our intervention area for facing sprawl development, we studied several previous studies about sprawl. It was clarified that recently, there were many research about sprawl development and suggested ideas and tools to repair it, such as making walkable neighborhoods, attention to job opportunities, mixed use and denser neighborhoods, reusing abandoned buildings, changing policies and forcing the real state to stop developing sprawl, and many other ideas.

The question is why, after such a huge amount of attention, research, and efforts, none of them is not working as well as possible, and we are still struggling with sprawl facing its growing fast and its consequences effecting human life, damaging the environment, and reducing sustainability all around the world especially in North America and Eu-rope.



## 6.2 Problems

**1.** Most of the studies look at the sprawl in a very general view and all the studies are similar in different contexts in America, Canada, or Europe. But the characteristics of sprawl in any city or even in its different neighborhoods are different, because of their economy, their environment, their culture and their diversity.

Based on these factors of each city or each neighborhood of each city, the sprawl that happened there might be different, and obviously the answer to them will be different. Consequently, the term sprawl itself is very general and might have numerous definitions in each area. Then we cannot answer numerous questions with one single answer.

**2.** Besides the fact that we cannot solve all the sprawl developments around the world with 1 similar tool, we are not using a significant manifesto about the characteristics of a good neighborhood, which makes us confused about what the goals are to achieve before we get to our tools.

**3.** The last problem is that most of the suggested tools and strategies are stuck in an optimistic dream, that sprawl in a neighborhood can be solved in 1 year with 1 program, a design program to demolish every house and its infrastructure and build a new high density beautiful neighborhood with high rate of sustainability.

## 6.3 Solutions

The answer to the first problem can be all the research and analysis that has been done in previous phases in order to understand the reasons for sprawl happening in each area of GTA and what kind of sprawl it is. In the end, those differences clarify the fact that the strategy and tools to confront the sprawl has to be different for each neighborhood, according to the reasons the sprawl happened there.

The answer to the second problem can be to use “THE NEW URBANISM” manifesto as the definition of a well design and sustainable neighborhood, which help us to define our vision of a sustainable neighborhood, the new urbanism can be a module of what is sustainability and how a city, neighborhood, and building have to be in order to reach a sustainable life. The principles of The New Urbanism has to be considered beside the residents desires which are clear now due to research and analysis.

The answer to the third problem can be a more realistic point of view, try to define a step by step strategy to be done during the time, understanding the fact that it’s not possible to demolish everything and design whatever we believe is good, and having plans for the near future, middle future, and far future to remove sprawl consequences of an area of intervention and reach sustainability slowly.

# 07

## **07 Manifesto**

### **7.1 Ideal Environment**

### **7.2 Principles**

**7.2.1 The Region: Metropolis, City, and Town**

**7.2.2 The Neighborhood, The District, and The Corridor**

**7.2.3 The Block, The Street, and The Building**

## Manifesto

Following our research, analysis, and studies, and understanding of the city's current situation and also its different generations and neighborhoods, which include the chosen area for intervention, and the presence and effect of sprawl development on it, we are going to define our vision and our strategies for the chosen area of intervention.

### 7.1 Ideal Environment

Before that, first of all, it is absolutely necessary to clarify what is the ideal environment we want to reach and how it should be. There are many questions about the definition of the ideal environment: What is sustainability? What is a sustainable city? What is a sustainable neighborhood? What is a sustainable building? How can we reduce environmental effects? How can we improve our economic situation? How can we improve our social characteristics? There are many questions that have to be answered before understanding the ideal environment.

On the other hand, another problem is that an ideal city never means an ideal neighborhood, and an ideal neighborhood never means an ideal house. In a way, a sustainable, well-designed city can have a terrifying neighborhood within it and a self-sufficient smart sustainable house has nothing to do with its neighborhood social problems.

The experience of the last 50 years shows that putting sustainable expensive houses near each other, without paying attention to the outcome, will lead to a fatal problem such as sprawl development, and on the other hand, designing a high density urban center without considering the dwelling units inside it can lead to many other environmental, social, and cultural problems.

It is not possible to propose a single huge independent design project as the result to answer all the sustainability requirements and solve sprawl problems without a high amount of expenses and disrupting life in the neighborhood, similar to what Le Corbusier was trying to do in the 1950s which was not successful. Besides this fact, there is a low chance to convince several neighbors to cooperate in a complicated, expensive multi-functional project to have a more sustainable neighborhood.

From a more realistic point of view for reaching an ideal environment in existing cities, several principles are needed to define an ideal environment, principles considering all the scales, principles that can work at the same time in a parallel way, principles which are not antonym to each other, and principles which are possible to be done during time and applied on existing situations during a specific time without demolishing everything and building again.

Unfortunately, there is still no globally accepted definition of ideal environment or sustainability around the world to follow, so in this thesis I am going to reframe the 27 principles of "The new urbanism" considering the characteristics of our area and the significant demands of the locals which is not similar all around the world and have a deep root in their history and culture.

The reframed principles of "The New Urbanism" will be followed as our goal to reach all the scale of urban, neighborhood, and architecture. These principles will help us to define our vision of the intervention area and define the strategies in the next step, to face sprawl development and reach a higher level of sustainability.

### 7.2 Principles

#### 7.2.1 The Region: Metropolis, City, and Town

1. Metropolitan Regions are defined geographically by topography, watersheds, coastlines, farmlands, regional parks, and river basins. The metropolis is made up of numerous cities, towns, and villages, each having its own distinct core and boundaries.

2. The metropolitan region is a critical economic unit in today's world. This new reality must be reflected in government cooperation, public policy, physical planning, and economic initiatives.

3. The Metropolis is inextricably linked to its rural hinterland and natural environments. The connection is environmental, economic, and cultural in nature. Farmland and nature are as important to a city as a garden is to a home.

4. The edges of the Metropolis should not be blurred or eliminated as a result of development patterns. While reclaiming marginal and abandoned areas, infill development within existing metropolitan areas conserves environmental resources, economic investment, and social fabric. Metropolitan areas should establish measures that promote infill development over periphery expansion.

5. New development adjacent to urban boundaries, where suitable, should be arranged as neighborhoods and districts and integrated into the existing urban pattern. Noncontinuous development should be arranged as cities and villages with its own urban borders, with a jobs housing balance in mind, rather than as bedroom suburbs.

6. Towns and cities should be developed and redeveloped in accordance with historical patterns, precedents, and limits.

7. Cities and towns should bring together a diverse range of public and private uses in order to sustain a regional economy that benefits people of all economic levels. To match job possibilities and avoid poverty concentrations, affordable housing should be distributed throughout the region.

8. The physical organization of the region should be supported by a transportation framework. Transit, pedestrian, and bicycle systems should improve access and mobility throughout the region while decreasing reliance on automobiles.

9. Revenues and resources can be shared more collaboratively across municipalities and centers within regions to minimize damaging tax base competition and to encourage logical coordination of transportation, recreation, public services, housing, and community institutions.



### 7.2.2 The Neighborhood, The District, and The Corridor

**10.** The neighborhood, district, and corridor are critical components of the Metropolis’ development and renewal. They form distinct areas that inspire citizens to take ownership of their upkeep and evolution.

**11.** Neighborhoods should be compact, walkable, and mixed-use. Districts often emphasize a single particular use and, to the greatest extent practicable, should adhere to neighborhood design principles. Corridors connect neighborhoods and districts on a regional scale; they can range from boulevards and rail lines to rivers and parkways.

**12.** Many everyday activities should be within walking distance, allowing those who do not drive, particularly the old and young, independence. Interconnected roadway networks should be structured to promote walking, minimize the number and length of motor trips, and conserve energy.

**13.** A vast range of housing types and price levels within neighborhoods can bring people of all ages, races, and incomes into everyday interaction, building the personal and civic bonds required for a real community.

**14.** Transit corridors, when correctly planned and coordinated, can aid in the organization of metropolitan structures and the revitalization of urban cores. Highway corridors, on the other hand, should not remove investment from existing centers.

**15.** Appropriate building densities and land uses should be located within walking distance of transit stops, allowing public transportation to become a viable alternative to driving.

**16.** Civic, institutional, and commercial activities should be concentrated in neighborhoods and districts rather than isolated in faraway, single-use facilities. Schools should be sized and positioned such that youngsters can walk or ride their bikes to them.

**17.** Graphic urban design standards that serve as predictable guides for change can promote the economic health and harmonious evolution of communities, districts, and corridors.

**18.** Within neighborhoods, a variety of parks, from tot lots and village greens to ball fields and community gardens, should be provided. Open spaces and conservation areas should be used to define and connect different communities and districts.

### 7.2.3 The Block, The Street, and The Building

**19.** The physical delineation of streets and public spaces as places of shared usage is the basic aim of all urban architecture and landscape design.

**20.** Individual architectural projects should be connected to their environment in a seamless manner. This is a problem that transcends fashion.

**21.** The revival of metropolitan areas is contingent on safety and security. The design of streets and buildings should promote safe settings while without sacrificing accessibility and openness.

**22.** Automobiles must be effectively accommodated in modern city construction. It should do it in a way that is considerate of pedestrians and the nature of public space.

**23.** For pedestrians, streets and squares should be safe, comfortable, and fascinating. When properly built, they stimulate walking and allow neighbors to get to know one another while also protecting their neighborhoods.

**24.** Local climate, topography, history, and building practice should inform architecture and landscape design.

**25.** Civic buildings and public meeting places necessitate significant sites in order to reinforce community identity and the democratic culture. They deserve a separate form because their function differs from that of other buildings and sites that make up the city’s fabric.

**26.** All structures should present their occupants with a clear sense of their location, weather, and time. Natural heating and cooling technologies can be more resource-efficient than mechanical ones.

**27.** The preservation and revitalization of historic buildings, districts, and landscapes attest to the continuity and evolution of urban society.

# 08

## **08 Vision**

### **8.1 Conditions & Visions**

### **8.2 Reasons of choosing this area**

### **8.3 Intervention area current characteristics**

### **8.4 Intervention area current situation model**

### **8.5 Conditions**

#### **8.5.1 Empty plots**

#### **8.5.2 Properties with very Old buildings**

#### **8.5.3 Inutile Integrable Large Backyards**

#### **8.5.4 Inutile Smaller Backyards**

#### **8.5.5 Considerable Distances between Buildings**

#### **8.5.6 Public Greeneries and Parks**

#### **8.5.7 Dead end Alleys**

#### **8.5.8 The Combination of Streets and Front Gardens**

#### **8.5.9 Condition's Outcome Model**

### **8.6 Visions**



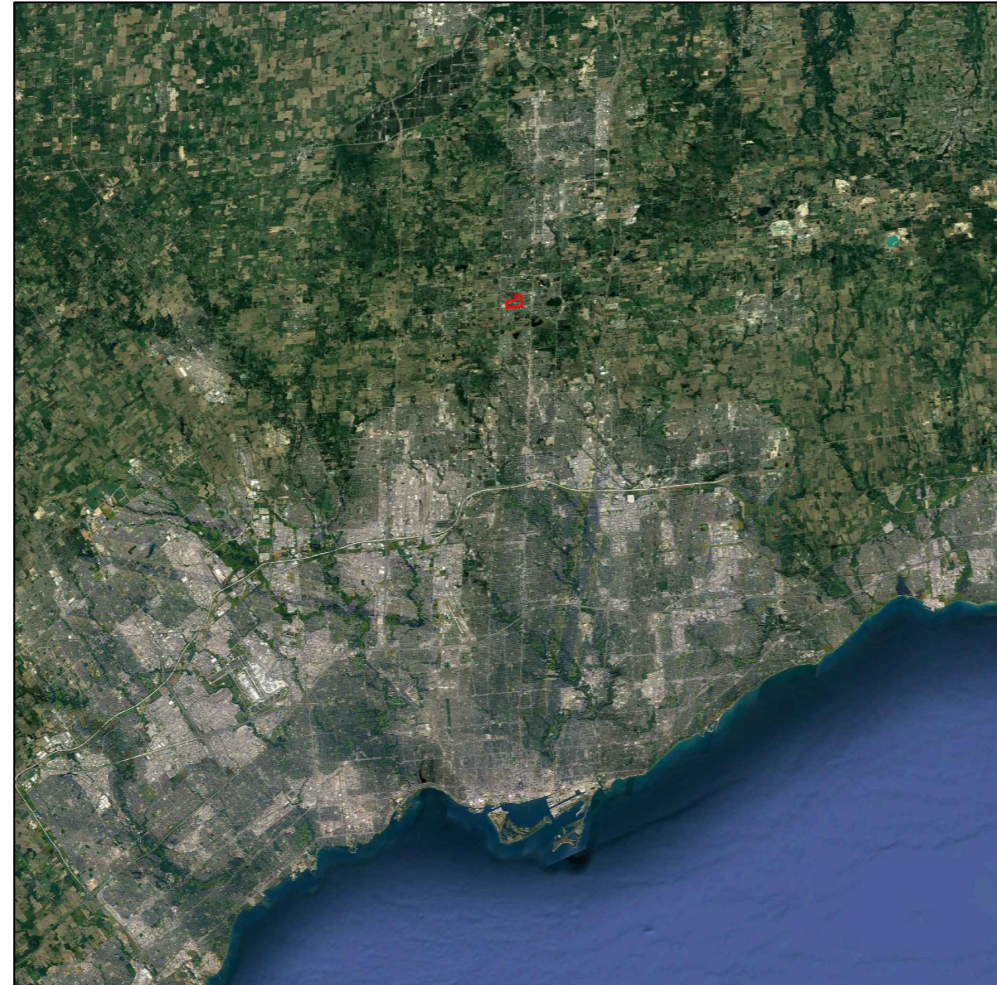
## Visions

As the architectural vision for the area which is chosen for intervention, we will start with understanding the conditions of the area, the problems and potentials of the area, and if we can take advantage of the potentials and solve the problems, what can be reached at the end as the outcome of the project.

### 8.1 Conditions & Visions

According to the research and analysis that has been done, the characteristics of an ideal urban environment are clear, both due to defined general principles and due to the demands of the residents of this generation of the Greater Toronto Area.

What the situation and characteristics of the intervention area will be, after applying our principle and changes, considering the specific conditions of the current situation of the area will be the architectural vision of the project.

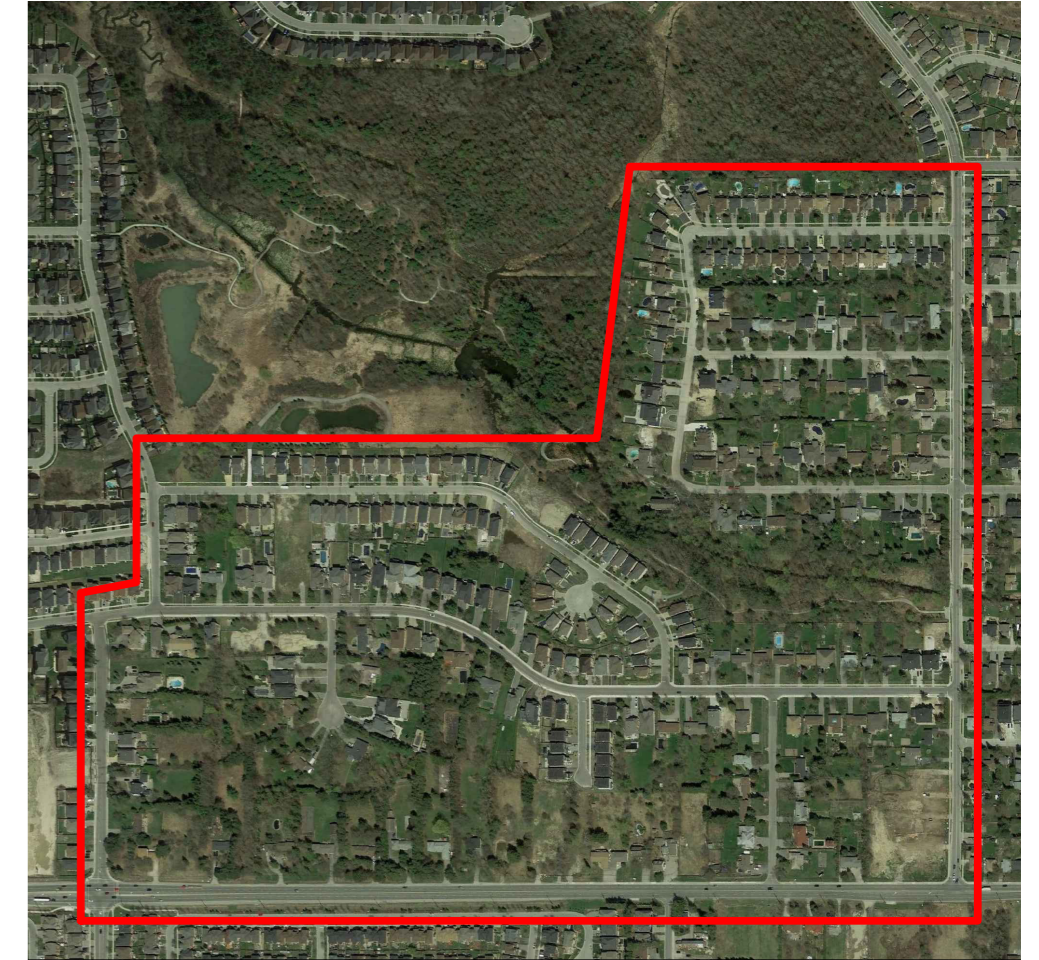


8.1 Intervention Area location in the GTA

### 8.2 Reasons of choosing this area for intervention

This is the area of the intervention map which was chosen for the following reasons. The main goal of the project is to increase the sustainability of a low-cost neighborhood in the Greater Toronto Area which turned out to be affected by sprawl development. This area was chosen inside the very far suburbs of the GTA, which, as we analyzed, is heavily affected by all the sprawl development consequences as it is also clear on the map, but on the other hand, the reason why this specific area was chosen is because of the complexity of its context, and many various conditions which usually appear in affected by sprawl urban areas.

The best way to propose a solution to confront sprawl is to propose it in a context with different conditions inside it, such as old single detached family houses with huge not well-used backyards, recent developed housing with smaller plots, abandoned land, demolished houses ready to be rebuilt, untouched nature, and highways. This marked area as an intervention area includes all the mentioned conditions inside it and the complex relation between these conditions in one neighborhood.



8.2 Intervention Area Satellite Map



### 8.3 Intervention Area Current Characteristics

This urbanized area was developed in the 1980s, due to the presence of a highway network, good access, and low prices, as it was mentioned before as the specific result of sprawl development in the Greater Toronto Area.

The area is 53.4 hectares and 240 housing exists within it currently, which means 240 dwelling units totally, because the houses are “single detached family houses”, which means the population density is equal to 4.5 dwelling units per hectare.

There is not any kind of activity or function present within the area but residential, and a poor park and children’s play ground which is not well-preserved and well-used currently. The chance of having local cultural activity is quite low.

The only existing public transit stations close to the area are bus stops which are near highway in the south and avenues on the east side of the area with a distance of about one kilometer to the houses in the corner. Clearly the only way of commuting for residents is their personal vehicle, Not just because of the lack of a good public transit network, but also due to the lack of any shopping centers, job opportunities, schools, churches, even bars and restaurants, and generally no facility or service can be reached by walk or bicycle for the residents of our intervention area. Besides the lack of any destination to reach by walk or bicycle for the residents, in a way that there is nowhere which is possible to go except the apparently abandoned park, the visual charm and pedestrian friendly of the neighborhood is low in the area, with no motivation for their residents to walk, talk, meet each other, or have any kind of social activity.

From an overall view, the chosen intervention area is in very bad condition in all terms of sustainability. The reasons are all related to sprawl development consequences, directly or indirectly.

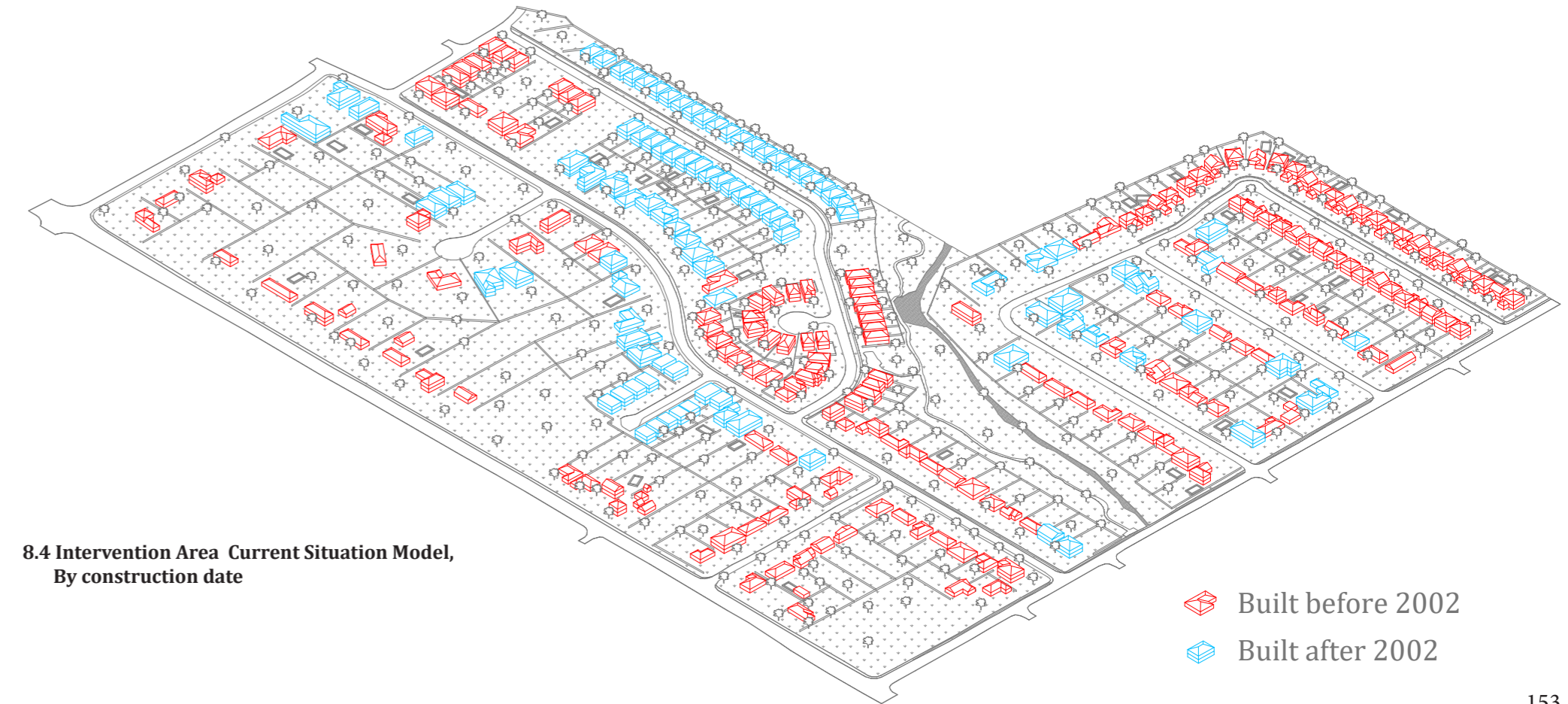


8.3 Intervention Area view

### 8.4 Intervention Area Current Situation Model

The following model is the intervention area current situation, which is differentiating buildings due to their construction date. The variety of construction in the area shows that this neighborhood is not stable yet and has changed since the 1980s when people started to move to this suburban area to today. Many of the new buildings are built free in a row which were taken from nature and added to urbanized areas recently, and many of them are built as replacements for older buildings. There is also empty plots in the corner which was not clearly empty. Before, it was demolished waiting to be replaced with new housing.

In order to clarify the conditions of this area, the age of the buildings is an important issue. For example, two buildings may be very similar in condition but one of them is five years old while the other is 30 years old. This difference has to be considered carefully when the conditions are defined. The reaction to a new building has to be very different to an old building with apparently similar conditions. Then this characteristic (age of building) is considered in defining every condition.



8.4 Intervention Area Current Situation Model, By construction date



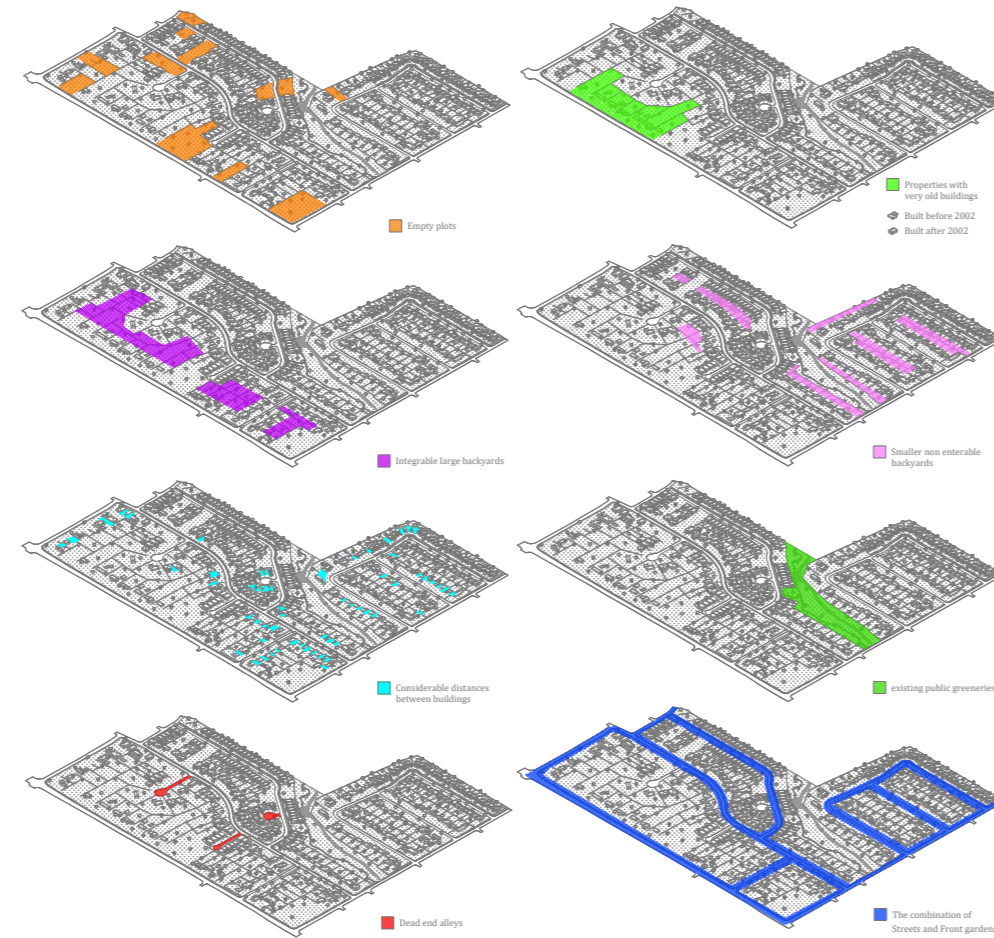
## 8.5 Conditions

In order to propose the idealistic architectural vision for the chosen intervention area, every condition within the area will be differentiated, marked, and analyzed carefully. This lets us to specify their problems and potentials, to decide how to react to each condition to solve its problem and take advantage of its potentials in order to reach a sustainable neighborhood, with less footprint of sprawl development consequences, as our architectural vision, considering our defined principles and local preference.

Seven conditions have been found within the intervention area, including: empty plots, properties with very old buildings, Inutile Integrable large backyards, Inutile small non integrable backyards, considerable distances between buildings, Public greeneries and parks, and Dead end alleys.

Mentioned conditions will be marked and analyzed in our intervention area model, to understand the differences between them, their location characteristics, their relation with surroundings, and their problems and potential, in order to react in the best possible and define the final architectural vision step by step for the whole area.

The conditions might overlap each other or do not cover some areas. Our focus is on the conditions with most potential to reach an ideal neighborhood, according to the mentioned principles and also local preferences.



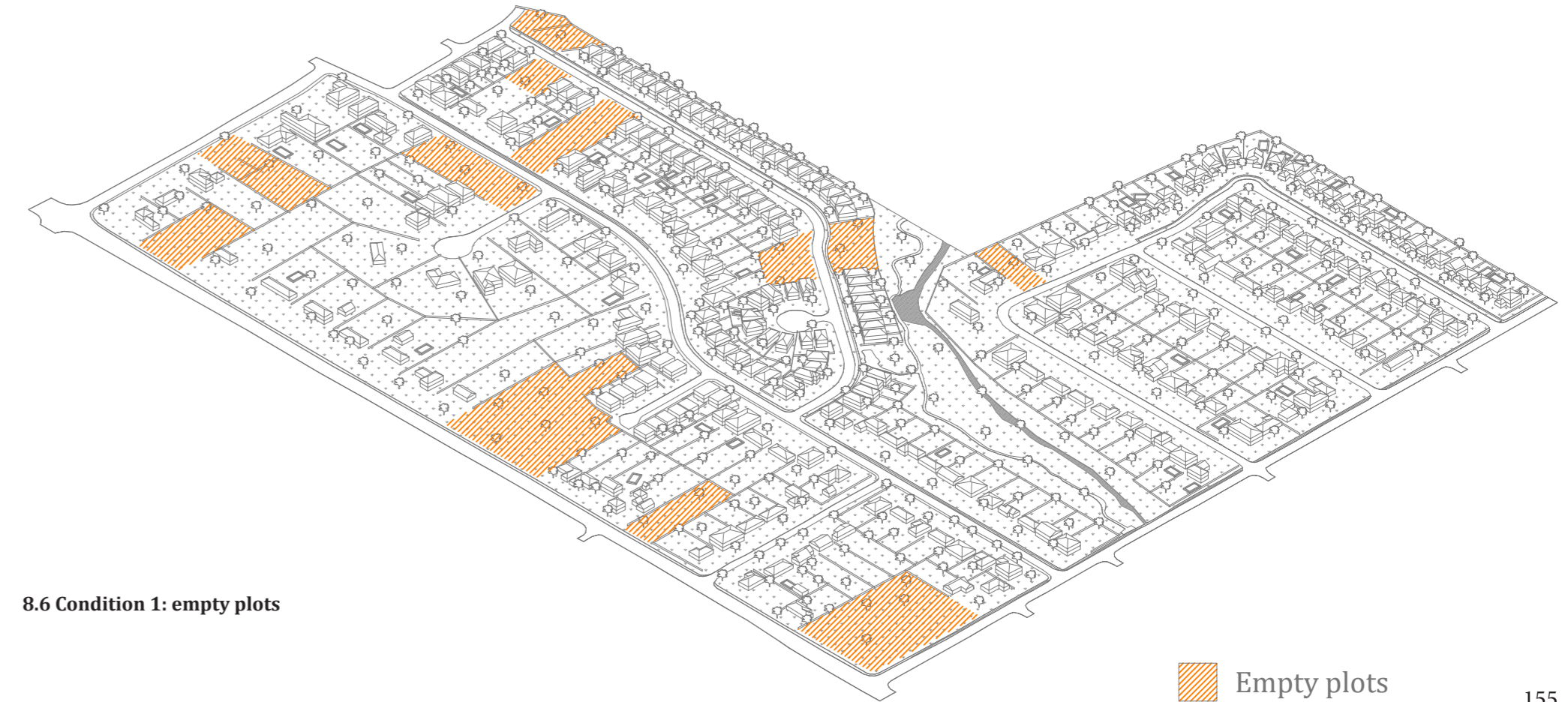
8.5 Conditions within the intervention area

### 8.5.1 Condition 1: Empty plots

This condition includes the areas which are known as empty plots ready for development. Some of these plots have been agricultural lands before which are abandoned now due to being surrounded by the city, and some of them had buildings in them before which were demolished recently for future developments.

The variety of this condition is considerable. Some of them are in the corner of two streets, some of them are facing the highway, and some of them are deep in the neighborhood, and the reaction to each of them will be different.

The great potential of this condition is new developments with no need to demolish existing buildings. The decision about this condition heavily depends on the positioning of the land. Some of them are proper for commercial activities, some of them have the potential for social and cultural activities, and some of them are more suitable for residential purposes. This condition can be merged with other conditions to reach a bigger dimension and the possibility of reaching a better result.



8.6 Condition 1: empty plots

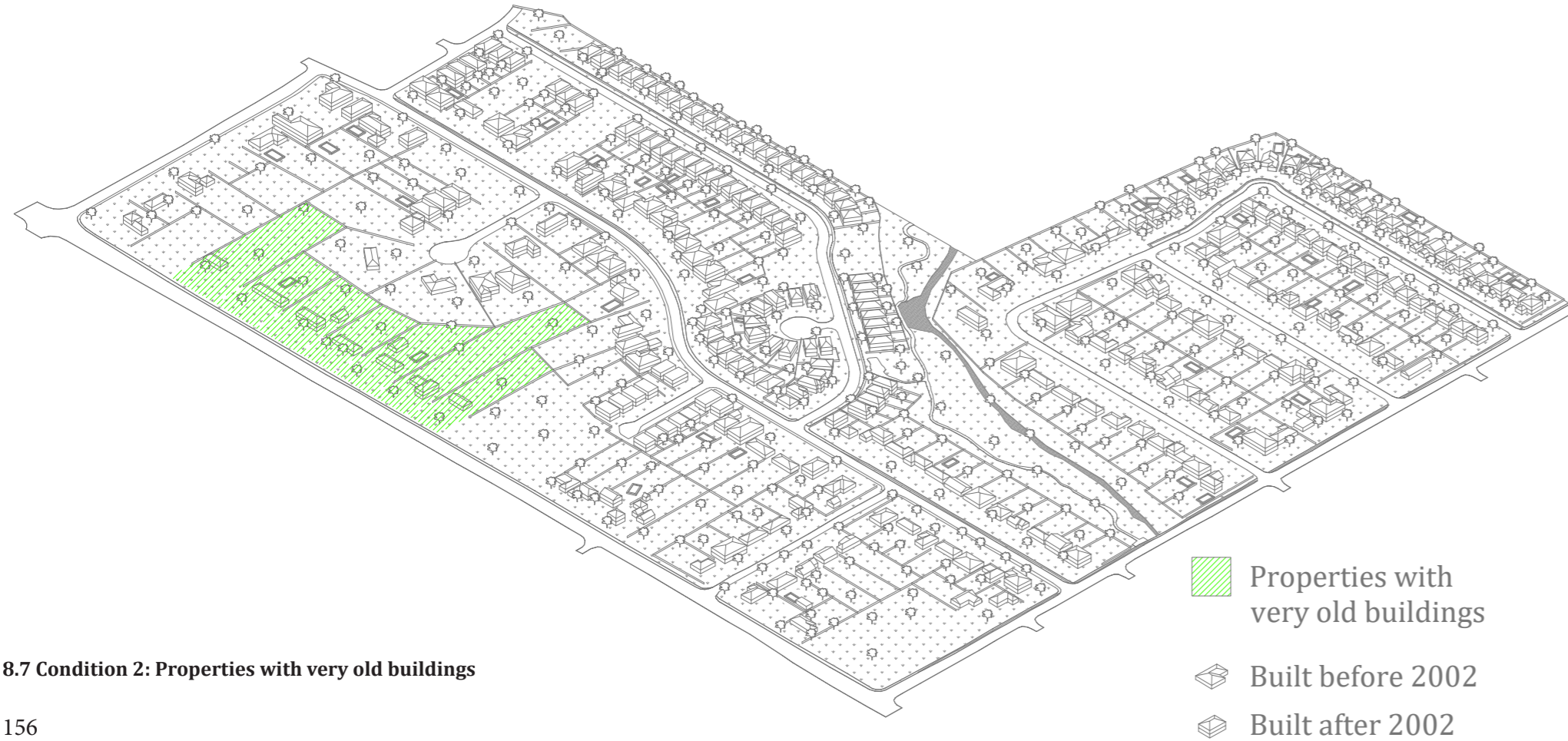


### 8.5.2 Condition 2: Properties with very Old Buildings

This condition includes several private lands with very old buildings inside them. These buildings are abandoned due to their bad condition or are being used as dwelling units by poor families.

The situation of the existing buildings inside these plots is not worth preserving or restoring, and they have to be demolished for redevelopment. On the other hand, because these buildings were built when the land was cheap in this area, the proportion of the buildings is quite small compared to the plot. In a way, they look like farm houses from the past.

The potential of this condition is very similar to the condition one which is empty plots, because these building have to be demolished sooner or later for redevelopment, then this condition can be merged with empty land if present around them for bigger projects, in order to bring profit both for their landlords and for the neighborhood, and for the city in the bigger scale.

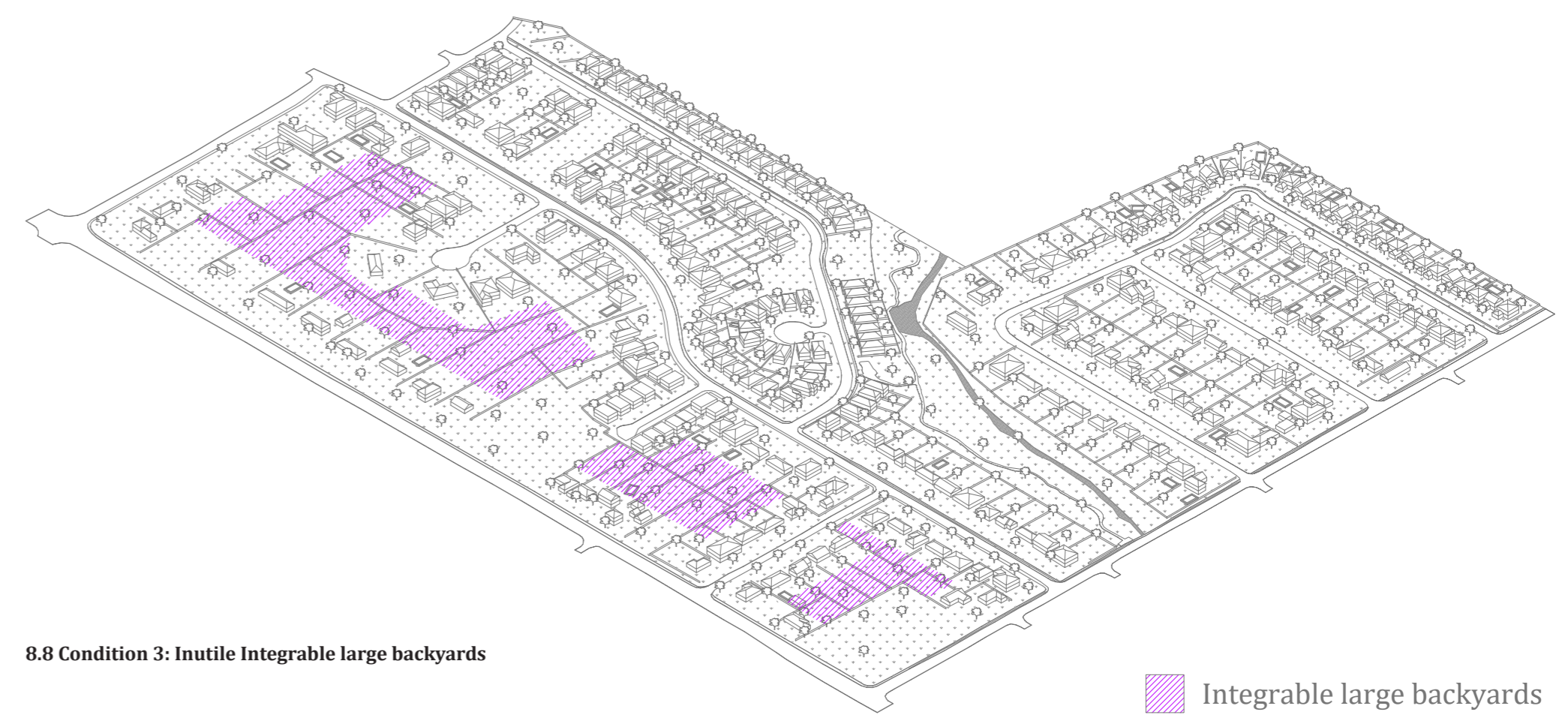


8.7 Condition 2: Properties with very old buildings

### 8.5.3 Condition 3: Inutile Integrable large backyards

This condition includes huge backyards of some properties inside the area which are not being used by the owner, can be integrated with the backyard near it, and are very big. These lands were used as farms by the owner in the past but now are completely abandoned or are not used in the best possible way. These lands are huge areas with high potential, just hiding behind residential buildings with no proper usage.

The main potential of these lands is to merge with each other in a new division for a unit project, or also can be used to build new residential units by the owner to bring profit by selling or renting them. The proper plan for these lands highly depends on the possible access to them, their positioning, and their area. They can even become productive centers or greeneries for public use by merging with each other or with other conditions.



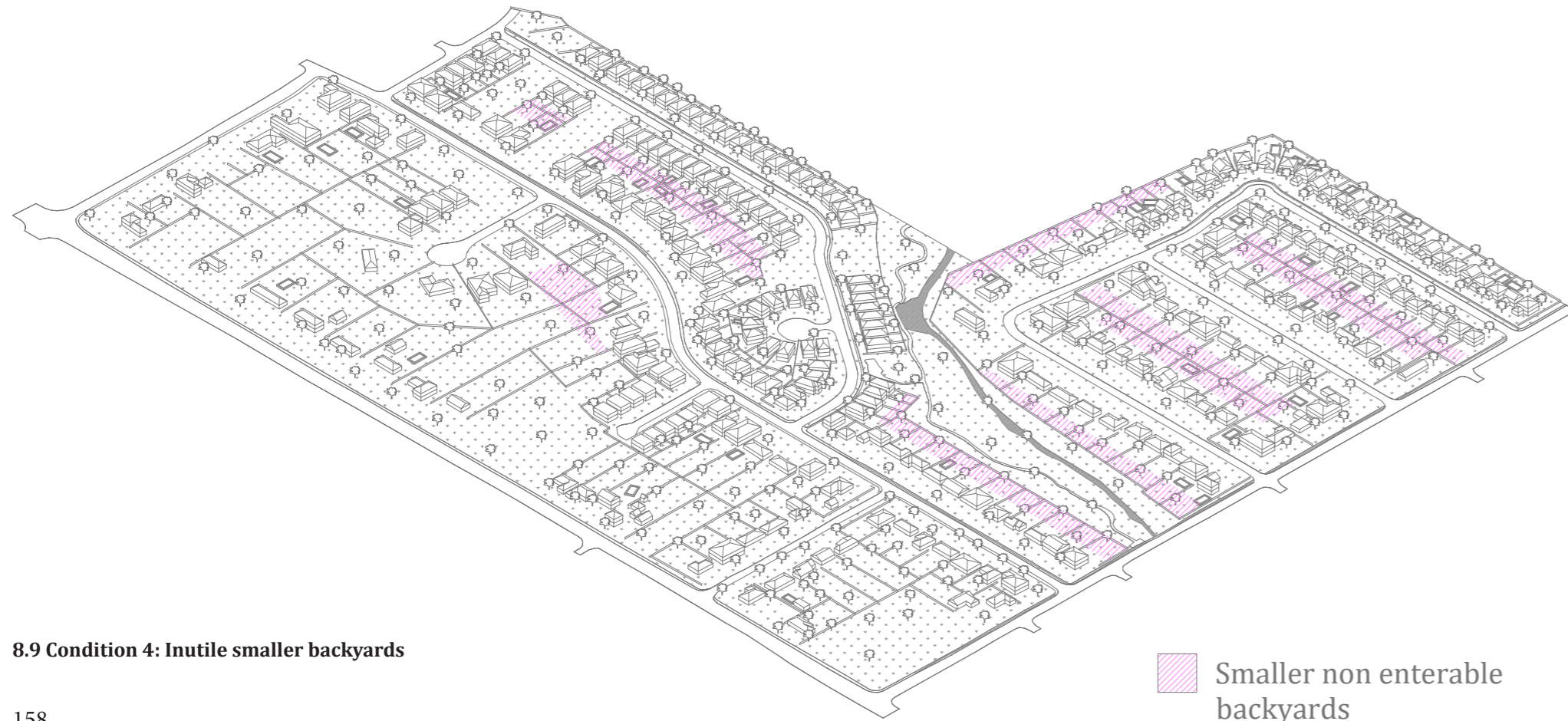
8.8 Condition 3: Inutile Integrable large backyards




#### 8.5.4 Condition 4: Inutile Smaller Backyards

This condition includes smaller backyards which are inutile and not used well by the owner, and they are quite similar to the last condition. But these lands are considered a completely different condition because of two big differences. The first difference is their dimension which is smaller than the last condition and the other difference is their positioning in a way they do not have the possibility to integrate into each other to reach a piece of land with good proportion.

These lands do not have the potential to merge with each other for any activity except residential due to their dimension, proportion, and location. But the residential usage potential is still high, which means they can host new housing built by the owner or investors. This investment will happen only if a bright future appears for the area, which can be possible by other actions in the neighborhood.



8.9 Condition 4: Inutile smaller backyards

 Smaller non enterable backyards


#### 8.5.5 Condition 5: Considerable distances between buildings

This condition includes small areas between two buildings, although usually each half of it belongs to one of the neighbors. This area has great potential, which can be used if neighbors have a plan for it. This area has no usage except as a corridor for access to the backyard, which is also possible from inside the building, and usually houses have no windows in the left and right direction, except windows just for ventilation in a few cases.

The problem with these areas, besides wasting land, is let the sides of the building be vulnerable to the harsh weather of winters. This problem can be solved by taking advantage of its potential, which can be new independent residential units near older houses, suspended small studios by using neighborhood structures, new staircases for new structures on top of the existing single family housings near it, or even big trees to cover the walls against the coldness of the winter.



8.10 Condition 5: Considerable distances between buildings

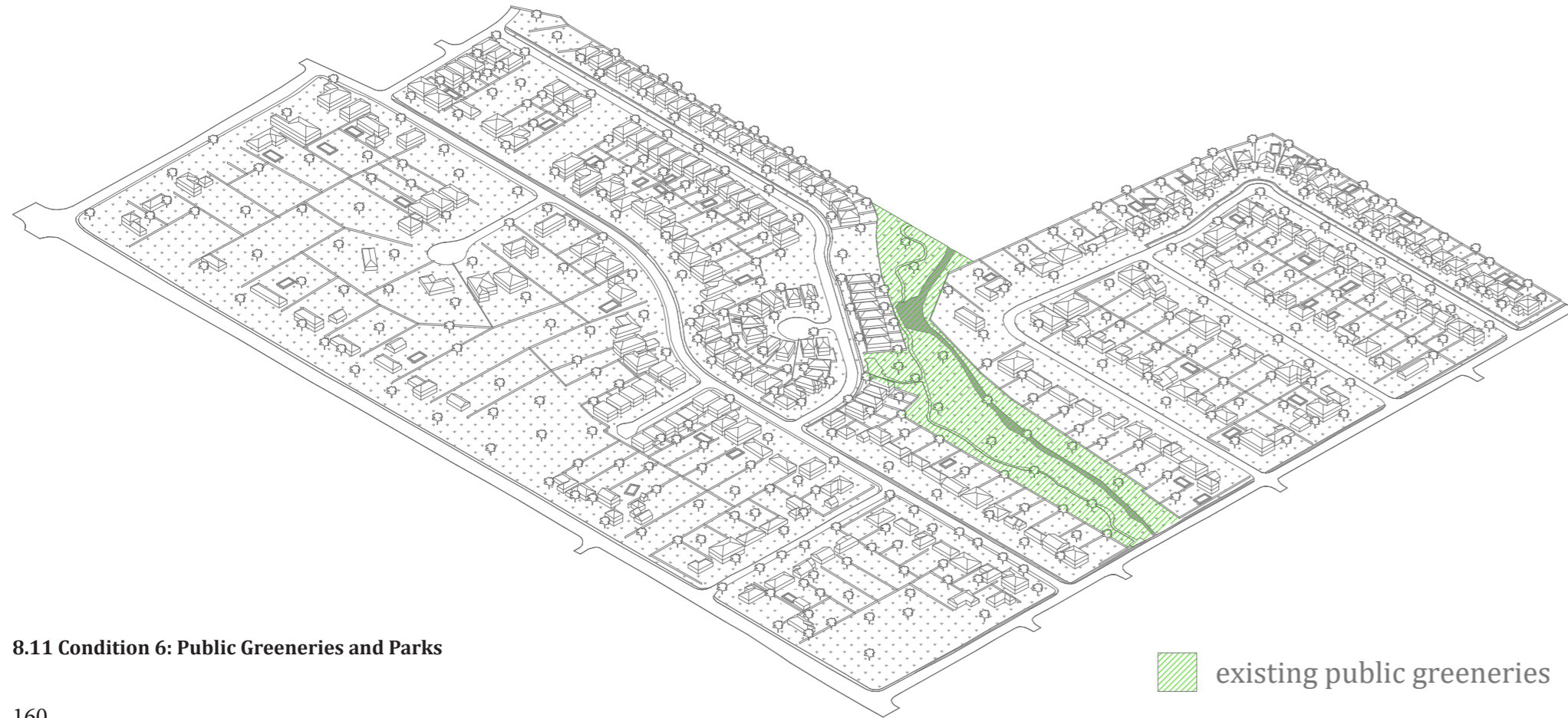
 Considerable distances between buildings



### 8.5.6 Condition 6: Public Greeneries and Parks

This condition includes existing parks or public green spaces in the area, which are apparently not used by the residents. Besides, most of the residents in this area have their own private green space in their backyard, and the high distance to this public green space, the area has its own problems with attracting neighbors.

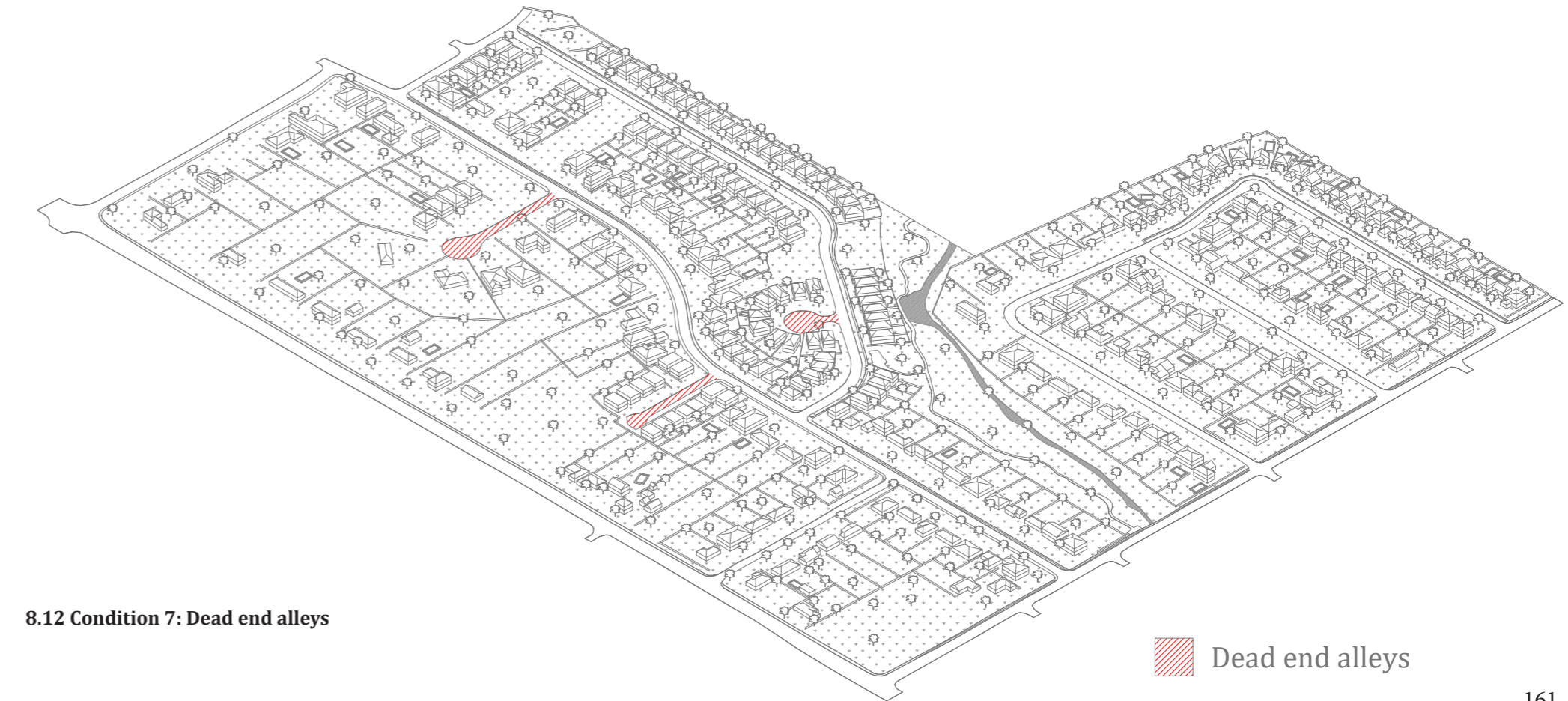
This condition has great potential in attracting people due to the presence of the natural river inside it and its location surrounded by a residential neighborhood, but it is not working as well as possible, because of the poor access to it, not-defined relation to the neighborhood, and lack of designed attraction.



### 8.5.7 Condition 7: Dead end Alleys

This condition includes alleys in the area which are short alleys with a circle at the end of them for turning the cars with several out of shape residential plots around this circle. All of them were added recently compared to the age of the neighborhood itself to provide access to more number of residential units, which are all single detached family houses.

The main potential of these dead end alleys is to continue and connect to another street for a better and complete circulation, reduce the waist of the land for the turn circle which is just used by a few families, and make the whole area more walkable by providing more connections. The potential of this condition will be variate due to its relation with conditions around it. If the alley can continue to connect to another street, it depends on the existing houses in its direction.



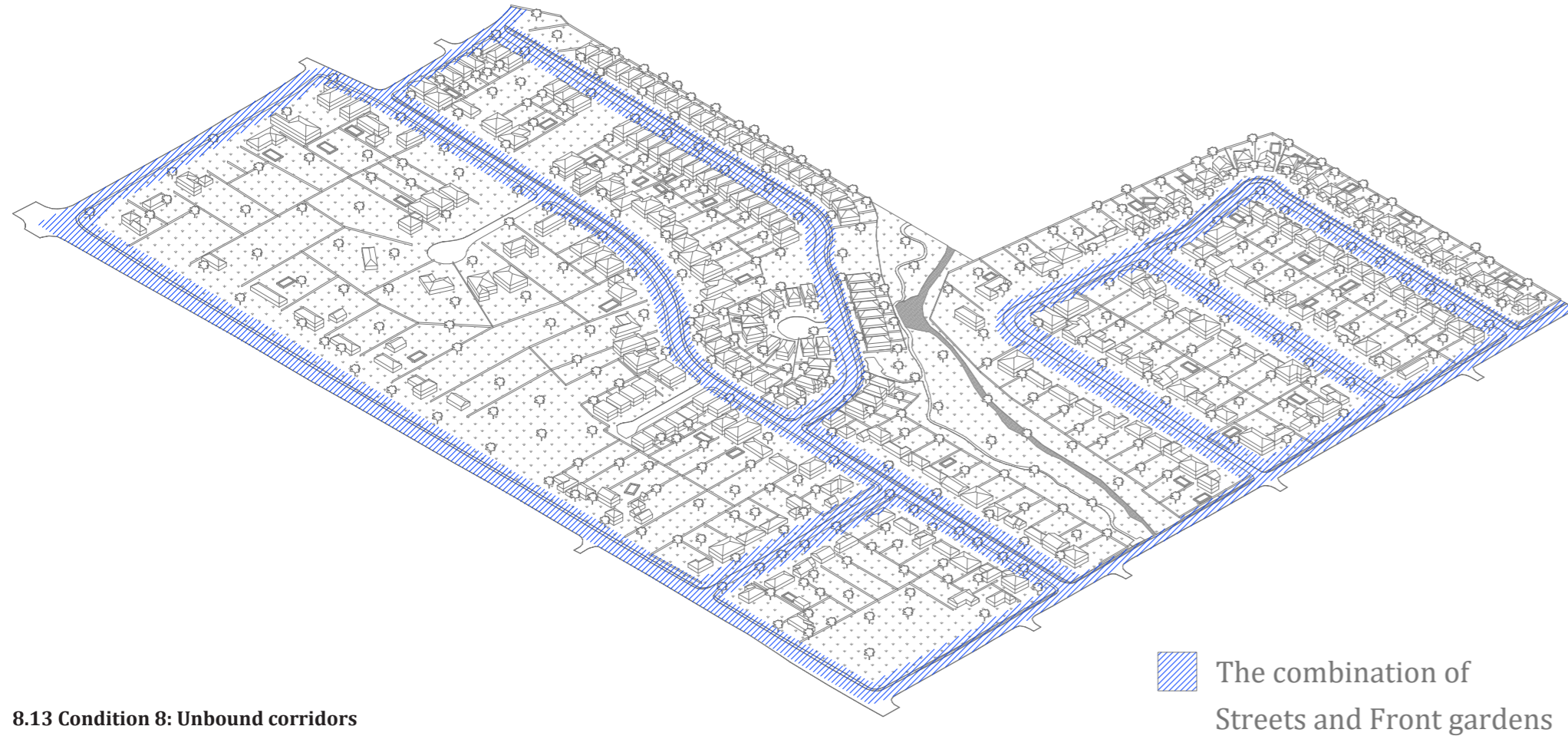



### 8.5.8 Condition 8: The combination of streets and front gardens

This condition includes almost every street and corridor inside the neighborhood. Most of the streets inside the neighborhood are not designed well with no public well-preserved green space or standard pedestrian or calculated parking along the street.

On the other hand, most of the streets are surrendered with huge front yards of single detached family houses on both sides of them which don't have a good and defined relation to the street or a correct function due to their huge area

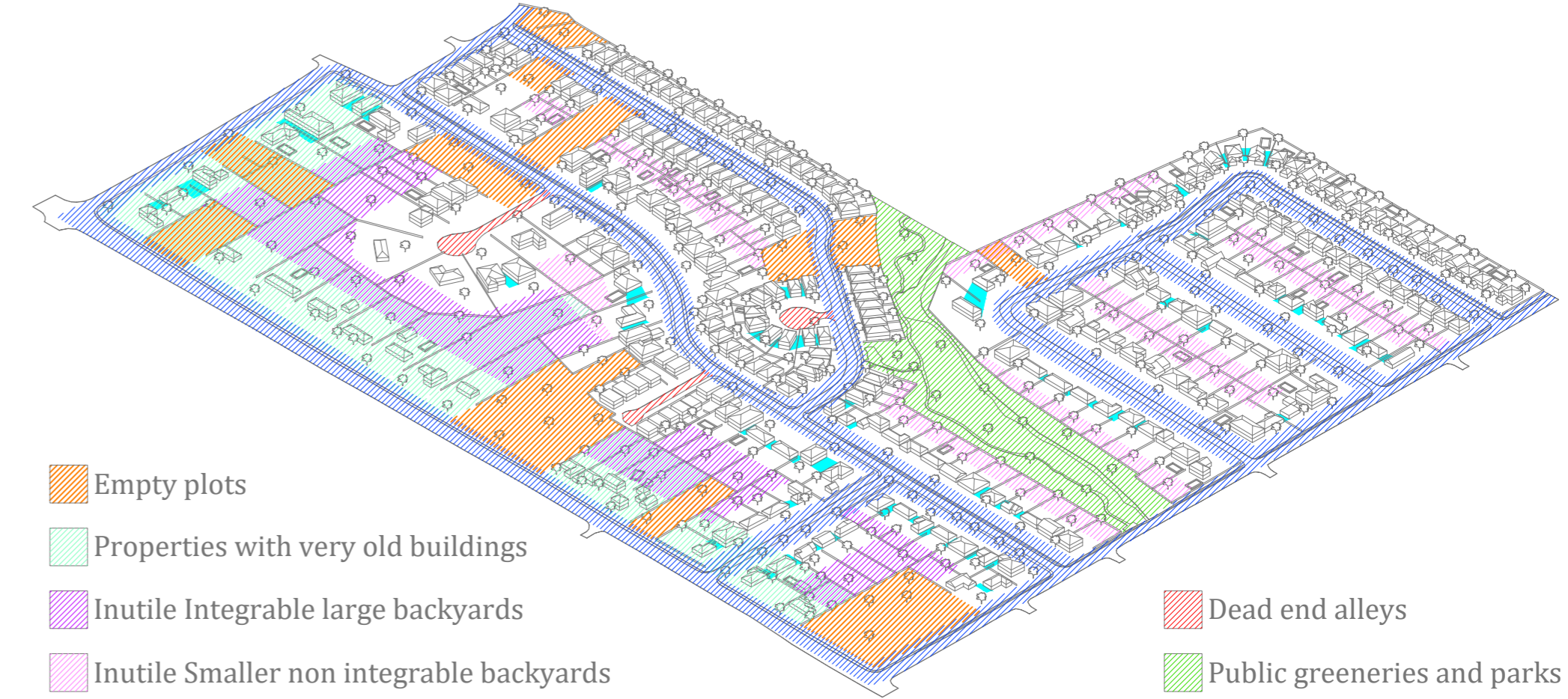
This condition has numerous of potential to be used. First of all, it is important to have well-designed streets with green spaces, parking, and pedestrian lanes along them, and considering the big space of front gardens of single detached family houses on sides them many other suggestions can be offered, including facilities, infrastructure, residential, and even commercial function in some cases. What is clear is that this condition is very important to study and revitalize.











 The combination of Streets and Front gardens

8.13 Condition 8: Unbound corridors

### 8.5.9 Condition's outcome model



-  Empty plots
-  Properties with very old buildings
-  Inutile Integrable large backyards
-  Inutile Smaller non integrable backyards
-  Considerable distances between buildings
-  Dead end alleys
-  Public greeneries and parks
-  Combination of streets and front gardens

8.14 Condition's outcome model



## 8.6 Visions

According to several indicators including our reframed principles, characteristics of the intervention area, and different conditions within the area and their potentials and their problems, 14 future visions have been defined for the intervention area.

These visions are our imagination of a future for this area of intervention which is completely doable and possible, considering the current situation, how the area has to be in order to achieve sustainability in all its terms, including: environmentally, economically, socially, and culturally.

These 14 future visions for the intervention area are:

An identifiable neighborhood to motivate locals to take responsibility of their maintenance and evolution

A pedestrian friendly neighborhood where daily activities occur within walking distance especially for children and elderly

A neighborhood with an available broad range of housing types and price levels to bring people of different ages, races, and income into daily interaction for a diverse community

A neighborhood with available transit stops within walking range to be an alternative to personal vehicles

A neighborhood with a concentration of civic, institutional, and commercial activities in important sites to increase the value of the neighborhood and reduce distances

A neighborhood with a various range of greeneries from parks, to play grounds, to community gardens, to be accessed by walking or cycling for residents

A neighborhood with a precise design of streets and corridors for a safe and secure community

A neighborhood with interesting and comfortable squares and streets for pedestrians to know each other and protect their community

A neighborhood with usage of renewable energies and energy saving architectural elements

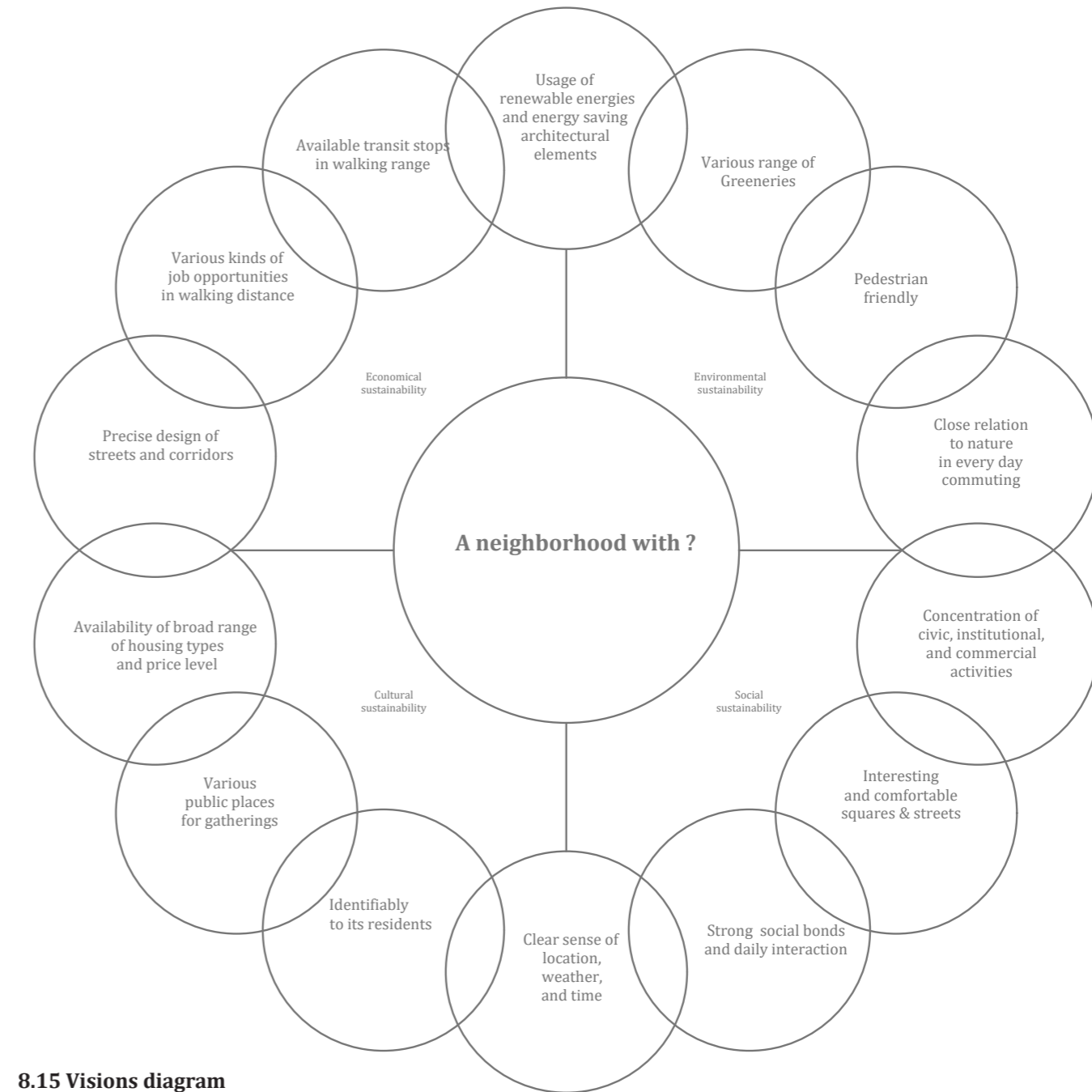
A neighborhood with a clear sense of location, weather, and time

A neighborhood with various kinds of job opportunities within walking distance of residents of every strength and ability level of the community

A neighborhood with various public places for gathering neighbors from every age to improve community identity and social reinforcement

A neighborhood with corridors and passages with close relation to nature, in everyday commuting of residence to improve mental health

A dense and compact neighborhood with strong social bonds and daily interaction between neighbors



8.15 Visions diagram

# 09

## **09 STRATEGY**

- 9.1 Strategies Schedule**
- 9.2 Near Future Strategies**
- 9.3 Middle Future Strategies**
- 9.4 Far Future Strategies**
- 9.5 From Sprawl to Sustainability**
- 9.6 Visual and Statistical Results**
- 9.7 Matrix comparison**
- 9.8 Future visions achievements**
- 9.9 Achievement of the Project**
- 9.10 Architectural scale example**



## Strategies

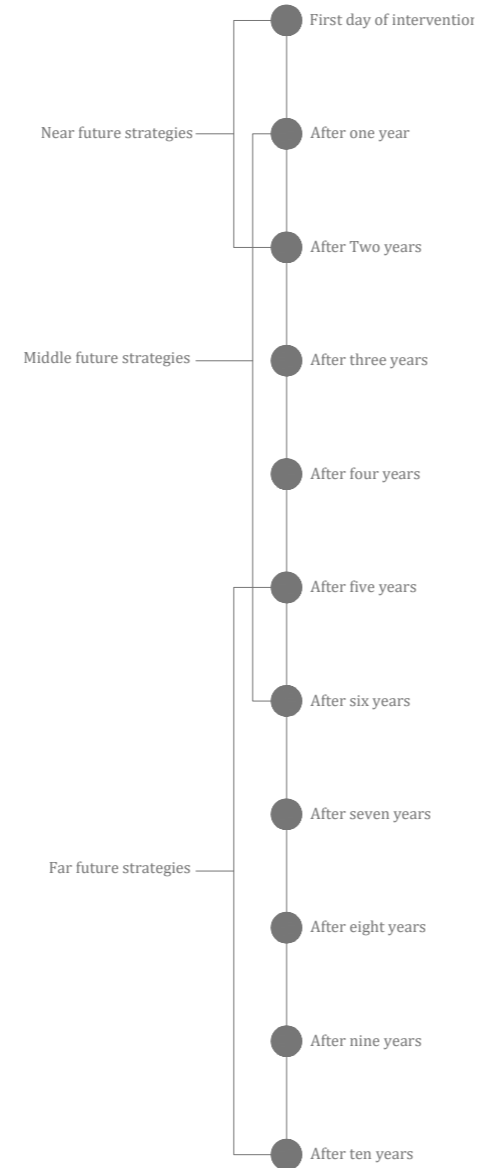
Because of the conditions of the intervention area, its potentials, and our principles of an ideal neighborhood, our visions of the intervention area are now clear about what it should and can be in the future. In general, suburban areas are more complicated than city centers because of the freedom granted to individuals, the real estate market, lower land prices, and low population density, all of which restricts municipalities' ability to improve the quality of space and the sustainability of suburban areas.

### 9.1 Strategies Scheduling

As architects-researchers, our best possible response for this complex context of Toronto suburban areas would be a long-term strategy that can be implemented step by step in order to try to increase density, sustainability, life quality, and solve the sprawl development problem, without the need for an immediate large foundation and disrupting residence living.

The general strategy for our intervention area is divided into three groups: near future (0-2 years), middle future (1-6 years), and long future strategies (5-10 years). This schedule took into account both the current state of each condition in the intervention area as well as the required investment from locals and municipalities.

All strategies can be classified as one of three types: infrastructure, landscape, or built up, and all three types begin with small projects in near future strategies, progress to larger projects in middle future strategies, and finish with more time-consuming and expensive projects in far future strategies. It is critical that we continue to improve every aspect of the neighborhood in parallel, within our strategy schedule.



9.1 Strategies schedule

### 9.2 Near Future Strategies

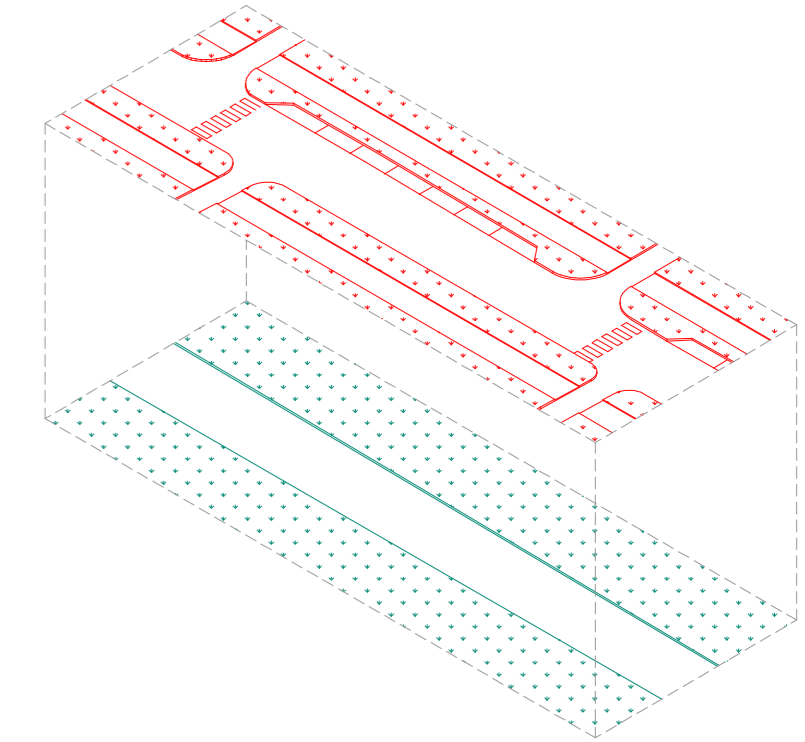
This first group of strategies is near future strategies, and it is the first step of strategies for the beginning of intervention.

The most important characteristics of near future strategies are their low cost, simplicity, and speed, which means they can be implemented quickly by either the neighbors or the municipality.

The second important feature of near future strategies is that, in addition to being helpful in improving the quality and sustainability of the neighborhood, these strategies must be designed in such a way that they can be regarded as great motivation as well as needed infrastructure for future larger strategies. These strategies can elevate the neighborhood's value, infrastructure level, and development potential in order to attract more investment from locals, municipalities, and outside developer companies.

Another important point is that beginning the process with near-future strategies will not be a good answer in a one-dimensional way; instead, we need small strategies that improve the quality of infrastructure, landscape, and built-up areas in parallel, so we need small strategies that improve the quality of infrastructure, landscape, and built-up areas in parallel.

Correction of street design through the addition of pedestrian paths, bicycle lanes, parking, public greeneries, and new alleys for future development.

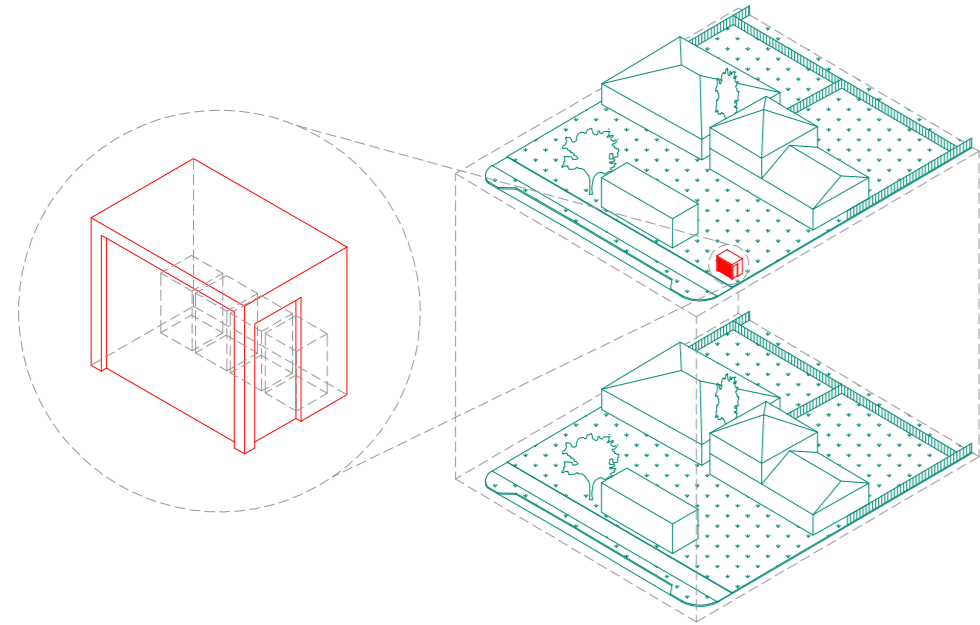


#### 9.2 Near Future Strategy 1

To achieve a sustainable neighborhood, it is absolutely necessary to have well-designed corridors, with standards of the dimensions and correct order of the street, side parking, public greeneries along the street, and a pedestrian way which can be divided into bicycle and pedestrian separately depending on the width of the existing street.

In addition, new alleys for future development are required, which will serve as motivation and infrastructure for other strategies in the future.

Adding box facilities for waste segregation to the neighborhood in close proximity to each residential unit

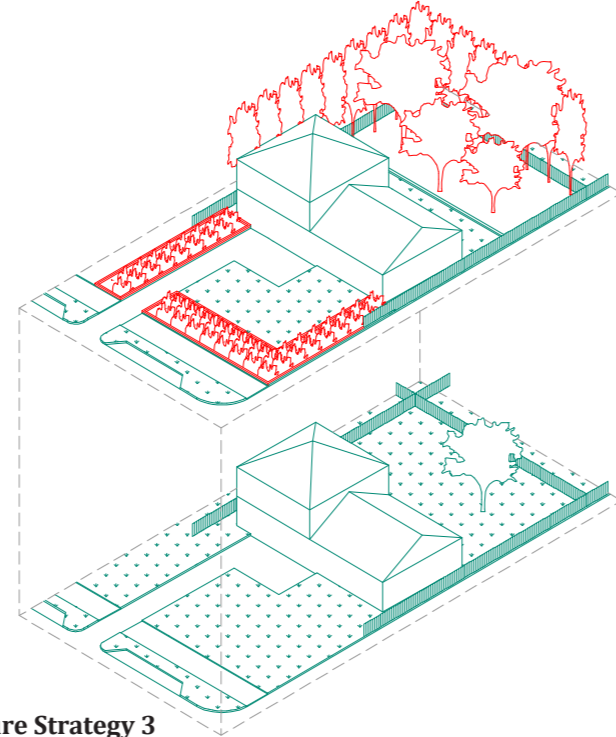


### 9.3 Near Future Strategy 2

These waste segregation boxes, in addition to being low-cost, are very important for the neighborhood's environmental and economic issues, as well as the quality of the space by hiding waste in designed trashcans in a covered box rather than leaving it near the street as it is now.

On the other hand, another important aspect of these facility boxes is that they can serve as infrastructure and motivation for larger facility projects in the future. After a few years, if every house in the neighborhood changes their lifestyle to segregate their waste, it will be logical for the municipality or any independent relevant company to invest in a burn and recycling center to the neighborhood economically.

Adding more sustainable kinds of greeneries with less water and maintenance required instead of grass in the front garden and backyard of houses

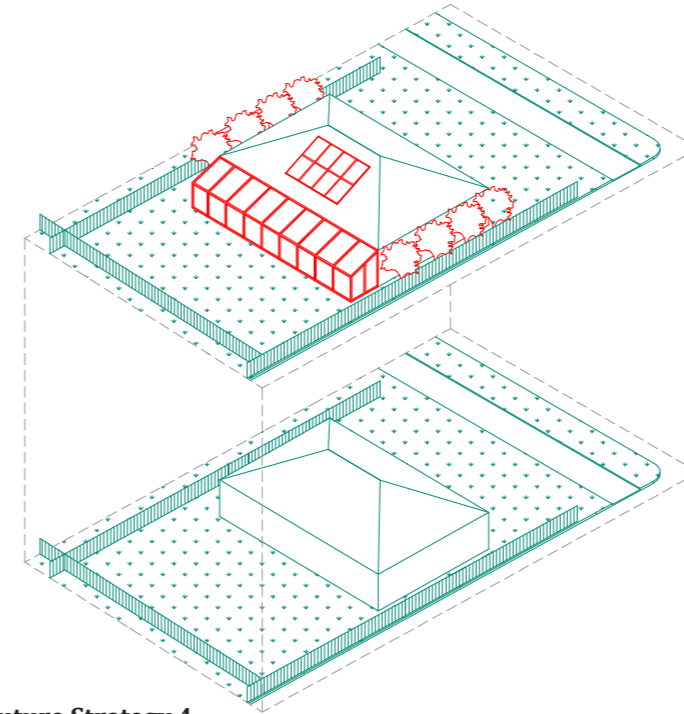


### 9.4 Near Future Strategy 3

On a large scale, landscape revitalization in small private lots of houses is critical. When we consider all of the houses in the neighborhood, we see a large area of grass that is a complete waste of water and maintenance time.

This grass should be replaced with trees and bushes, which are more sustainable, require less water and maintenance, and are far more beneficial to the global environment. Both on a small scale of the house itself due to its production, wind blocking, and covering the house against sun and cold weather, and on a global scale due to preventing floods, reducing greenhouse gases, reducing water pollution, and directly assisting with the global warming problem.

Adding architectural elements to reduce building energy consumption and increase the use of renewable energies such as solar panels.



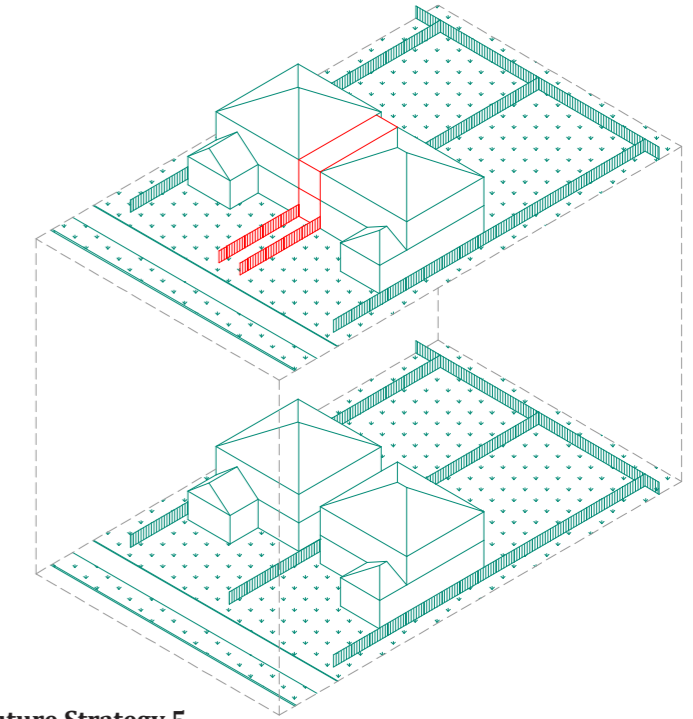
### 9.5 Near Future Strategy 4

Given Toronto's relatively cold winters in comparison to other parts of the world, it is critical to reduce the energy consumption of existing buildings by utilizing low-cost architectural elements such as greenhouses, insulation, and vegetation barriers around vulnerable building walls.

Aside from lowering the building's energy consumption, the use of renewable energies, such as solar panels, will have a significant impact on the quality of the neighborhood.

If each house implements these small strategies on a larger scale, the neighborhood will become a sustainable and inspiring neighborhood for other neighborhoods in similar situations.

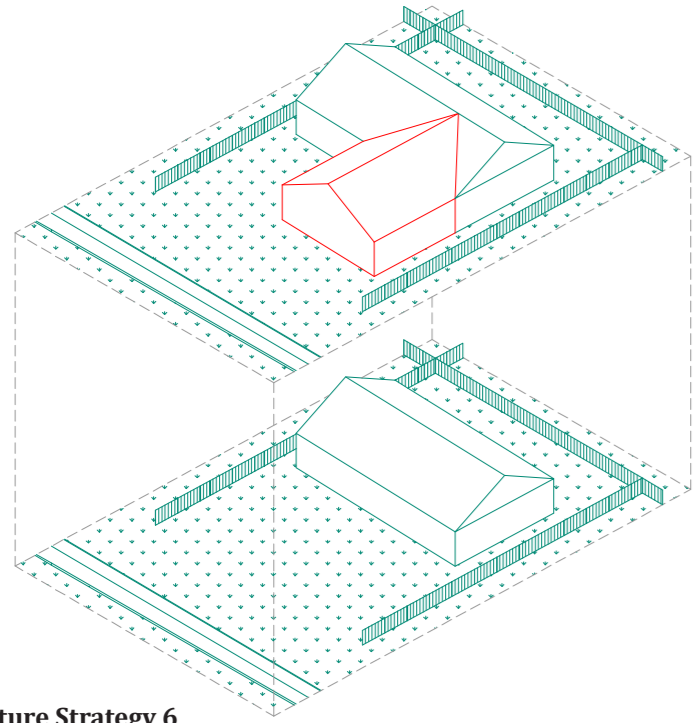
Adding new studio or small residential unit in extra inutile distance between buildings



### 9.6 Near Future Strategy 5

One of the previously mentioned important conditions was the distance between two single detached family homes. According to analysis which has been done on all the generation mostly in none of them, this area is not used for any purpose and increases the hitting energy consumption of the houses by leaving a side of the building vulnerable. A good strategy would be to add a new studio or small residential unit in this area, which would be extremely low cost compared to normal conditions because it could rely entirely on existing structures on both sides. This strategy, in addition to providing economic benefit to the owners of existing houses, will increase the diversity of housing typologies in the neighborhood, which may attract lower-income families or single people and increase social diversity.

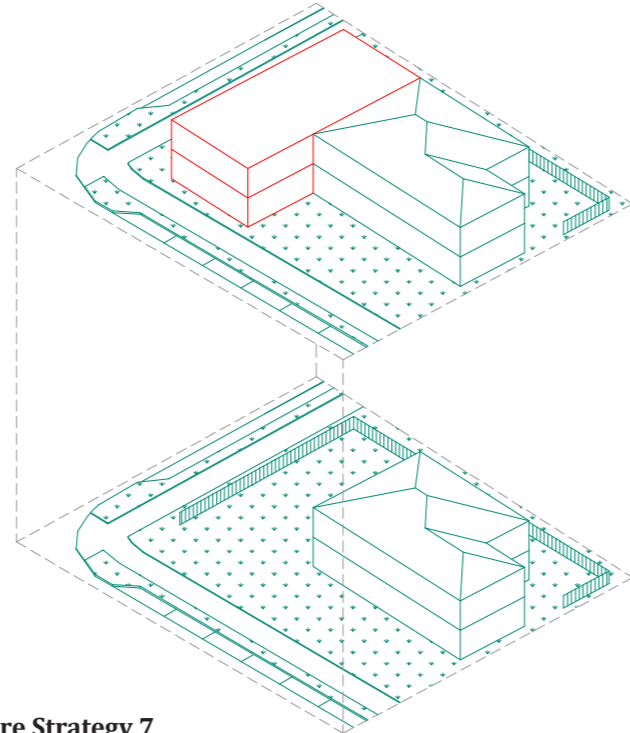
Creating new attached rooms or workshops in private yards of single detached family houses.



**9.7 Near Future Strategy 6**

The relatively large private yards of single detached family houses are one of the most important conditions in the neighborhood. Several strategies can be suggested for these conditions, depending on a variety of factors. One of the factors is the extra yard space, and another is the current situation of the family who lives there. In some cases, the family is not interested in adding more residential units and welcoming another family, because if the family's population is already large. In this case, new attached rooms or even workshops can be added to the existing house, improving life quality on a small scale while also reducing waste lands in the area, which affects neighborhood quality.

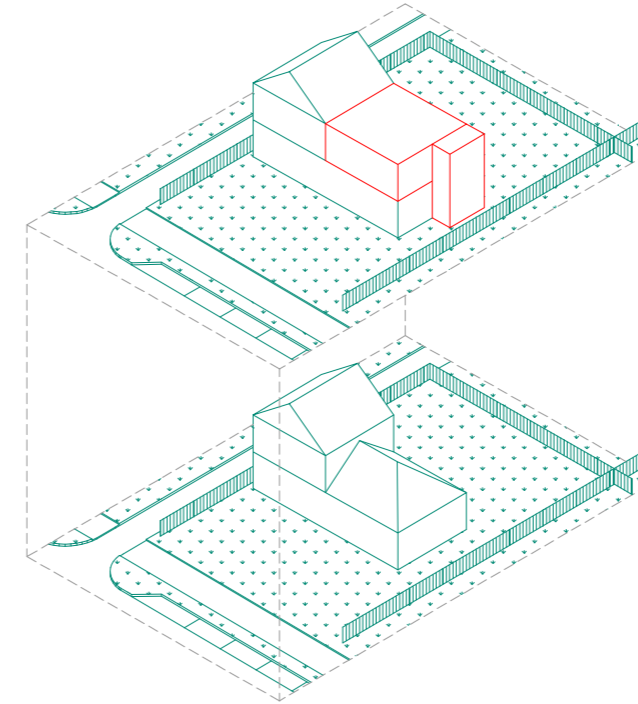
Adding new attached residential units in private yards of single detached family houses.



**9.8 Near Future Strategy 7**

Because of the aforementioned reasons, the backyards of the neighborhood's single detached family homes are far too large for the use of a single family. One viable option would be to add another residential unit attached to the existing one, which would be relatively inexpensive due to the existing house's structure. Aside from increasing the neighborhood's population density, this strategy will reduce energy consumption for both families, divide maintenance and tax expenses between them, and increase their daily social interaction. By increasing population density, this strategy will also act as an essential future motivation for larger projects in the neighborhood.

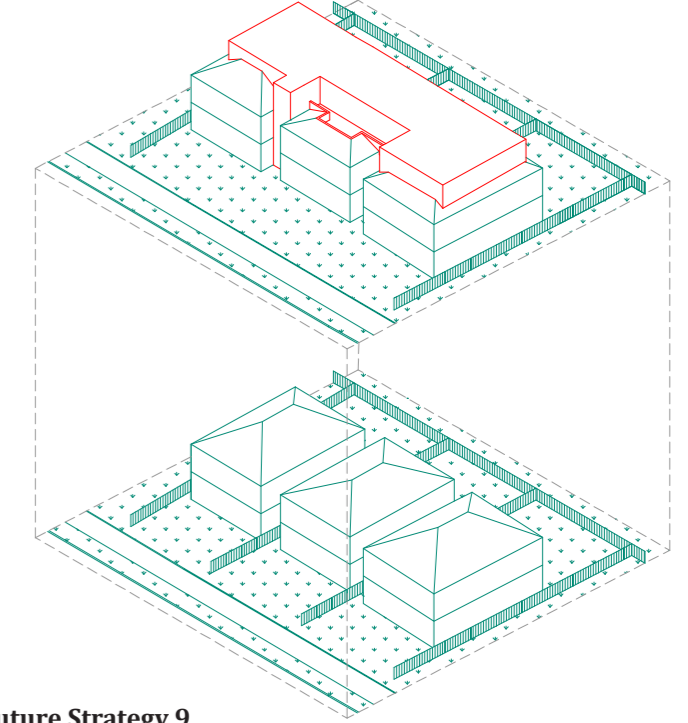
Adding new studio or small residential units on top of the existing newer residential units with a durable structure.



**9.9 Near Future Strategy 8**

In some cases, the construction of a single detached family house is new, and the structure is strong enough that a new residential unit can be built on top of the existing building's roof. This strategy is dependent on the condition of the existing building and has the potential to profit both the owner of the existing house and the surrounding neighborhood. Due to the existing structure, construction costs will be much lower than if a new unit were built detached from the yard, and increasing density directly improves neighborhood quality by increasing social interaction and many other factors that will attract investors to the area.

Adding new studios or small residential units on the top of the roof of two or several single detached family houses with a shared new staircase



**9.10 Near Future Strategy 9**

In some conditions, there are two or more single detached family houses which are new and with a strong structure. A suggestion to this condition could be adding one or several residential units on top of the existing houses which use a common staircase and access. Due to existing structure and infrastructure, these new units will be relatively low cost compared to building units on the ground and will bring good profit for the owners if they can cooperate and invest in a shared project. Aside from the profit for the owners, which is a good motivation, this strategy will improve the quality of the neighborhood on a larger scale due to many social, environmental, and economic factors.



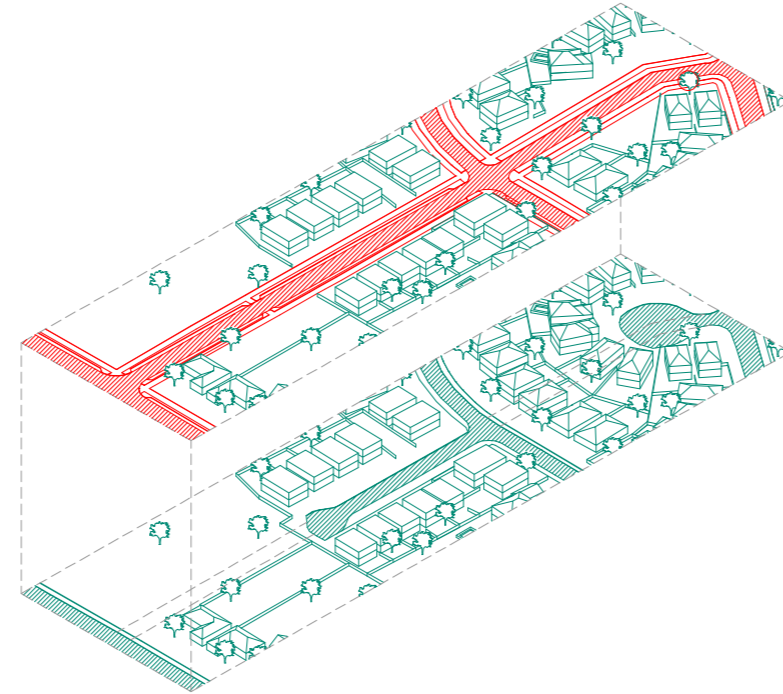
### 9.3 Middle Future Strategies

Middle future strategies, as the name implies, are those that are medium in terms of cost and time for the second step of revitalization.

These strategies have a higher cost and time requirement than near future strategies but a much lower cost and time requirement than far future strategies. These strategies must also be considered as motivation for larger strategies in the future and must provide needed potential for future investments in addition to being helpful in improving the quality of the neighborhood on their own. For example, by increasing density, improving circulation, increasing daily commutation, and improving the neighborhood's appearance, investors will be drawn to the area for future projects.

The parallel approach to designing strategies mentioned in near future strategies must continue in this step, taking into account every aspect of an environment such as infrastructure, landscape, and built-up areas.

Connecting dead-end streets and completing the faulty network of car and pedestrian corridors

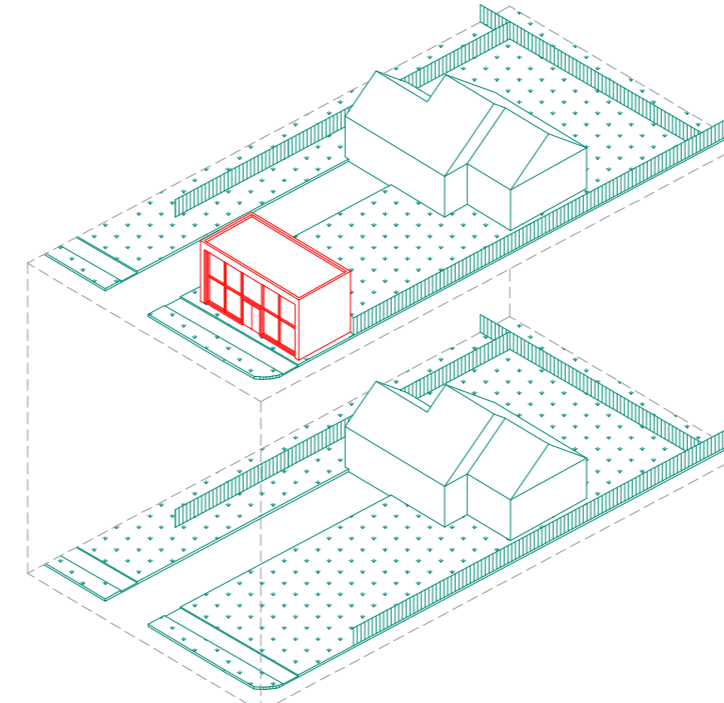


#### 9.11 Middle Future Strategy 1

Several dead end streets are a significant condition within the intervention area. The best way to deal with this situation is to reconnect these streets. Reconnecting the alleys will not only complete the car path and pedestrian network in the neighborhood, but will also bring more life and security to the existing houses along these dead end alleys.

By connecting them to the network, more people who do not live on the street will pass by every day. This increase in commuting will be a motivator for other street activities, not just residential, and can be a motivator for any type of investment in new projects.

Putting shops in the big front gardens of single detached family houses with big yards and commercial potential

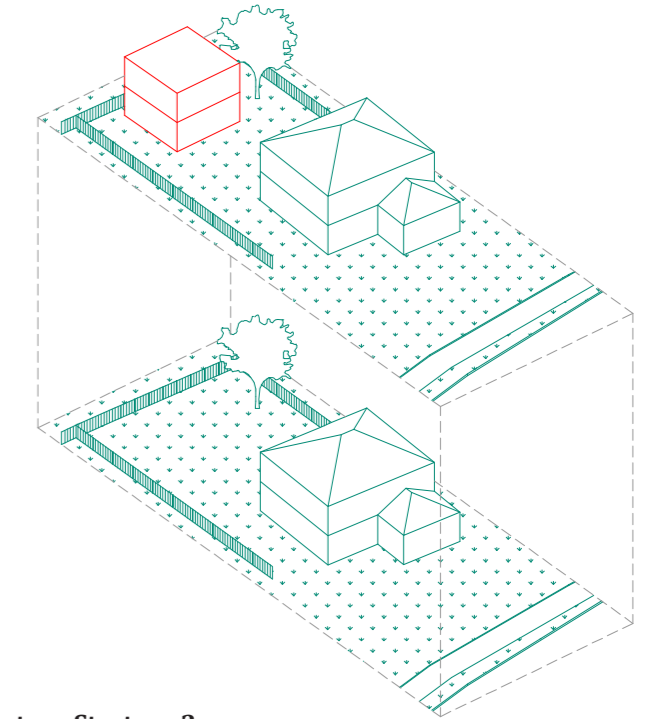


#### 9.12 Middle Future Strategy 2

In some cases, the existing single detached family houses in the area have a high potential for economic activity in their front yard, which is determined by a variety of factors, including the size of their front garden and the location of their plot.

In these cases, it is a good idea to add small buildings along the street that can be shops, production workshops, or a combination of the two, depending on the owner's demand and the potential of the plot. This strategy is relatively low-cost and quick to implement, and, aside from the economic benefit to the owner, it can be viewed as an important motivator for future larger strategies, as it will attract larger investments to the neighborhood if they believe the neighborhood is thriving.

Adding new residential units in large backyards of single detached family homes that are larger than needed for one family and have the potential to accommodate more families.

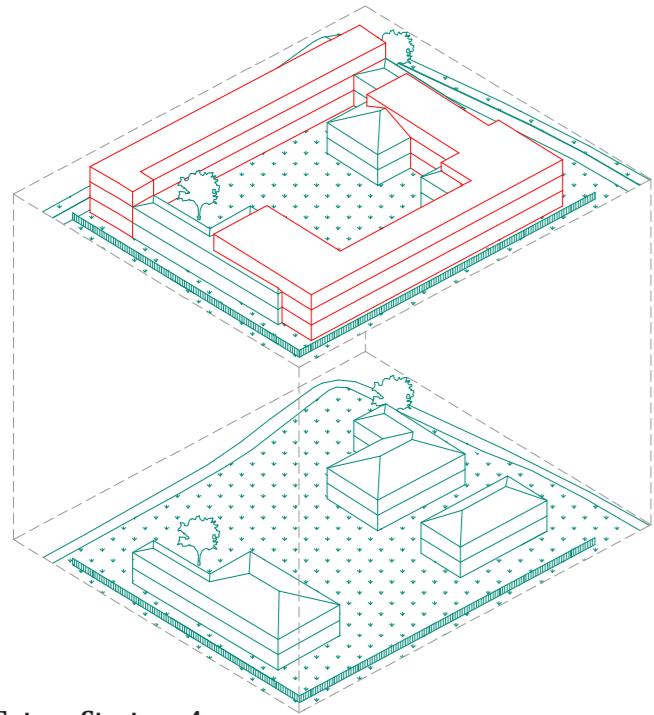


#### 9.13 Middle Future Strategy 3

In some cases, the backyard of existing single detached family houses is too large for the use of just one family, and the existing house is not new or strong enough to support the load of the new structure, or there is another issue, such as the owner's demand, a suggestion is to build a new detached residential house in the backyard.

Aside from the obvious benefits of increasing the density of the neighborhood and the obvious economic benefits of the owner or investors, this strategy will increase social and economic sustainability by bringing daily interaction between neighbors and dividing responsibility for the maintenance and expenses of the plot greeneries.

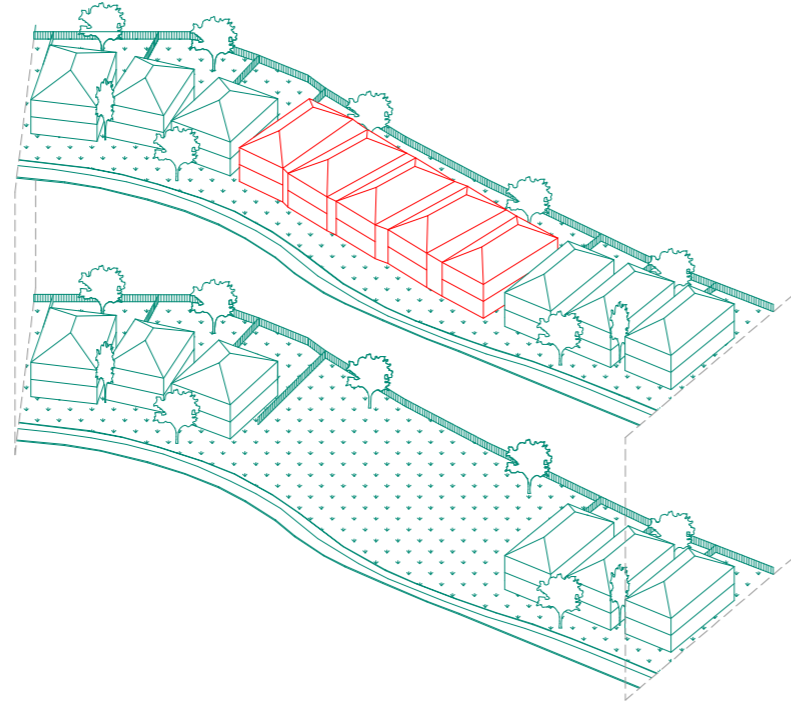
Transforming several single detached family houses into dense clusters with common yard for newer houses which have adequate structure resistant.



**9.14 Middle Future Strategy 4**

In some conditions inside the neighborhood, A number of single-family detached houses have the potential to become a residential cluster in the future. This potential is determined by a variety of factors, including the size of their backyards, their proximity to one another, and the age of the existing structures. Making new residential units in these cases in such a way that they connect to the existing houses and create a common central yard. Aside from the incredible profit for the owners, there will be significant improvements in social and environmental views on both a small and large scale. Because of the existing structure and infrastructure, the cost of the new residential units will be quite low, and the common yard will be a daily social interaction place for neighbors, with all of the benefits of increasing the population density of the neighborhood.

Adding town homes on vacant land in the middle of a row of single-family detached houses, with similar dimensions and appearance but higher density and less exposed walls.

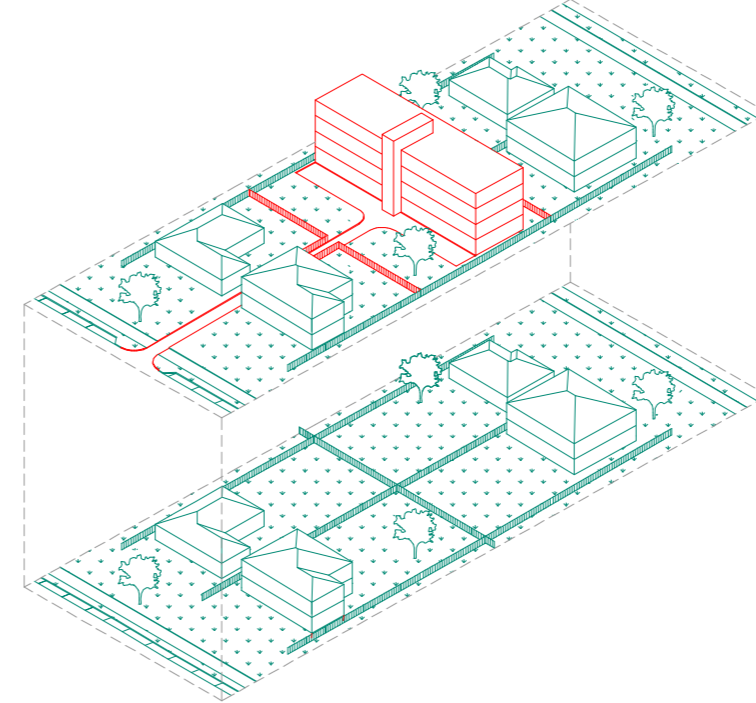


**9.15 Middle Future Strategy 5**

The reaction to this condition will be limited in some cases where a free plot is surrounded by a significant type of housing. Even if the existing dominant typology, for example, single detached family housing, is not the best solution, it is necessary to maintain the existing form and shape and not add a ten-story apartment in the middle, which does not belong here.

However, it is critical to improve the quality of new houses while maintaining their appearance. For example, adding new houses to the facade with very similar dimensions (especially height) and materials, but not detached from each other. By combining them as a single project, future structural costs and energy consumption will be significantly reduced.

Adding residential apartments in the integrated backyards of several single detached family houses.

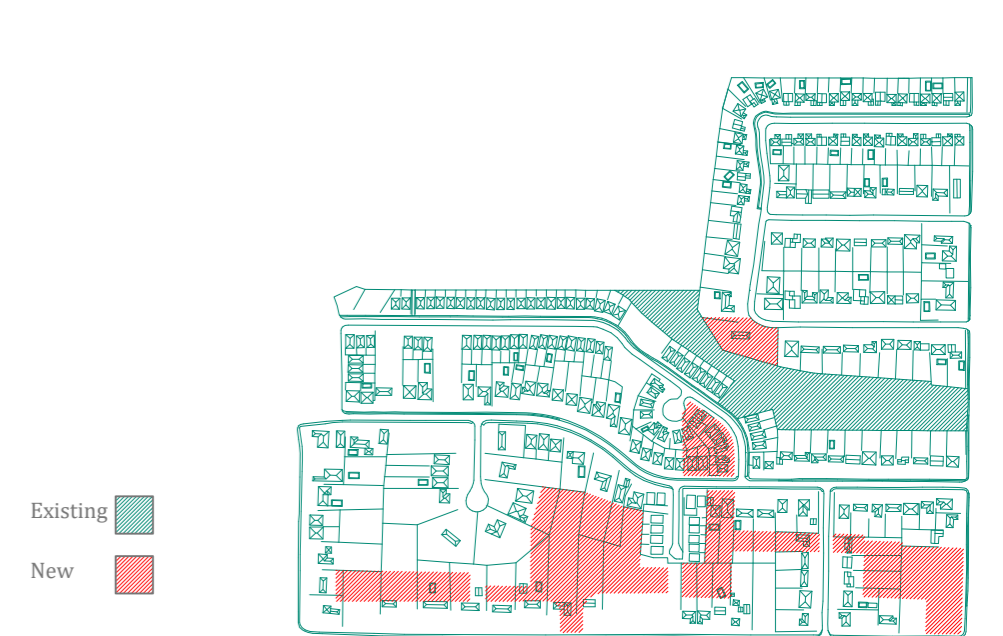


**9.16 Middle Future Strategy 6**

Several single detached family houses in the neighborhood have the potential to integrate their backyards and create a new plot for the construction of an apartment.

This possibility is dependent on a variety of factors, including the size of their backyard and the possibility of relocating cars to the new apartment. This strategy will significantly increase the social value of the neighborhood, in addition to increasing population density and economic profit for the owners and investors. Although this strategy requires all of the previously mentioned small strategies as infrastructure and motivation for investment in order to be feasible.

Creating a network of new and diverse types of public greeneries.

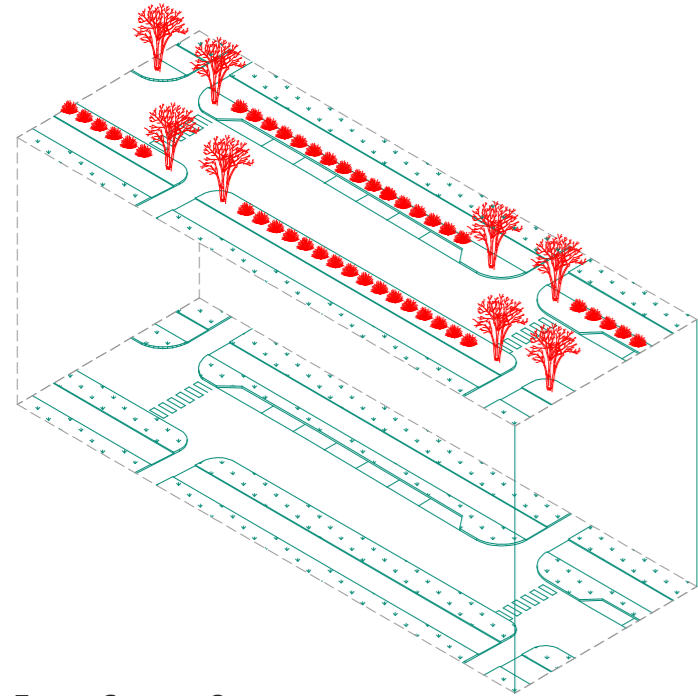


**9.17 Middle Future Strategy 7**

Following a series of small strategies that would increase population density and neighborhood quality in a variety of ways, the need for various types of greeneries will be felt in the area.

Adding new types of public greeneries to the neighborhood, such as parks, community gardens, children’s play grounds, and sports courts, will improve the area’s quality by providing social gathering nodes for residents of all ages, and will also act as motivation for future development in these and other parts of the neighborhood.

Adding more sustainable types of plants that require less water and maintenance, such as trees and bushes, instead of grass, as public greeneries along neighborhood corridors.

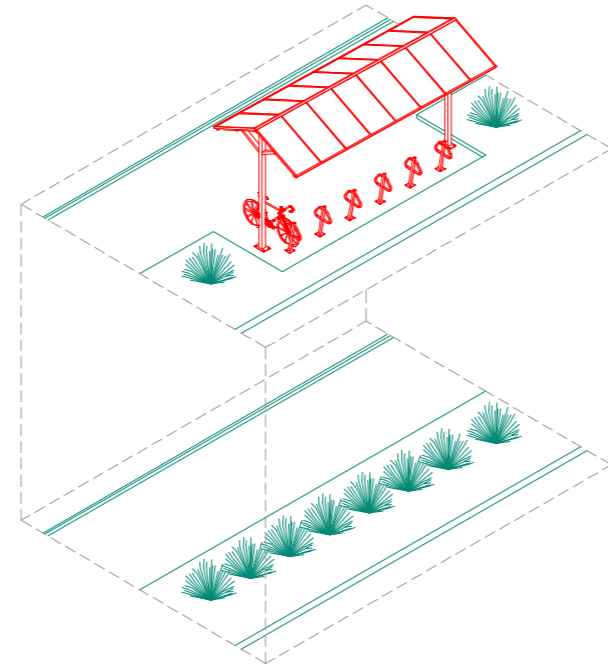


**9.18 Middle Future Strategy 8**

After adding public green gardens along the neighborhood's corridors and properly defining the existing ones, it is critical to pay close attention to the plant species used in public greeneries. Most greeneries, both private and public, are currently covered in grass, which can be replaced by more sustainable plants such as trees and bushes.

Grass is a natural waste of water and energy, and it is not beneficial to the environment on a large scale when compared to many other types of plants. The use of trees and bushes will increase sustainability, reduce water pollution, and directly help the global warming issue, which is a critical issue.

Adding supporting facilities for using bicycle and electric cycles such as parking and solar panel chargers to the neighborhood



**9.19 Middle Future Strategy 9**

Adding bicycle parking lots covered with solar panels for charging electric bikes is one suggestion for a facility to improve the neighborhood's quality. The investment can come from either the neighbors or the municipality. This strategy or any other similar strategy which will increase the number of facilities related to bicycles, and adding electric cycles is very important to motivate the neighbors to bike instead of driving their personal cars.

This strategy, besides being low cost and possible to apply in a short time, will be considered as an infrastructure to increase the sustainability in small scale of the neighborhood and big scale by motivating other neighborhoods.

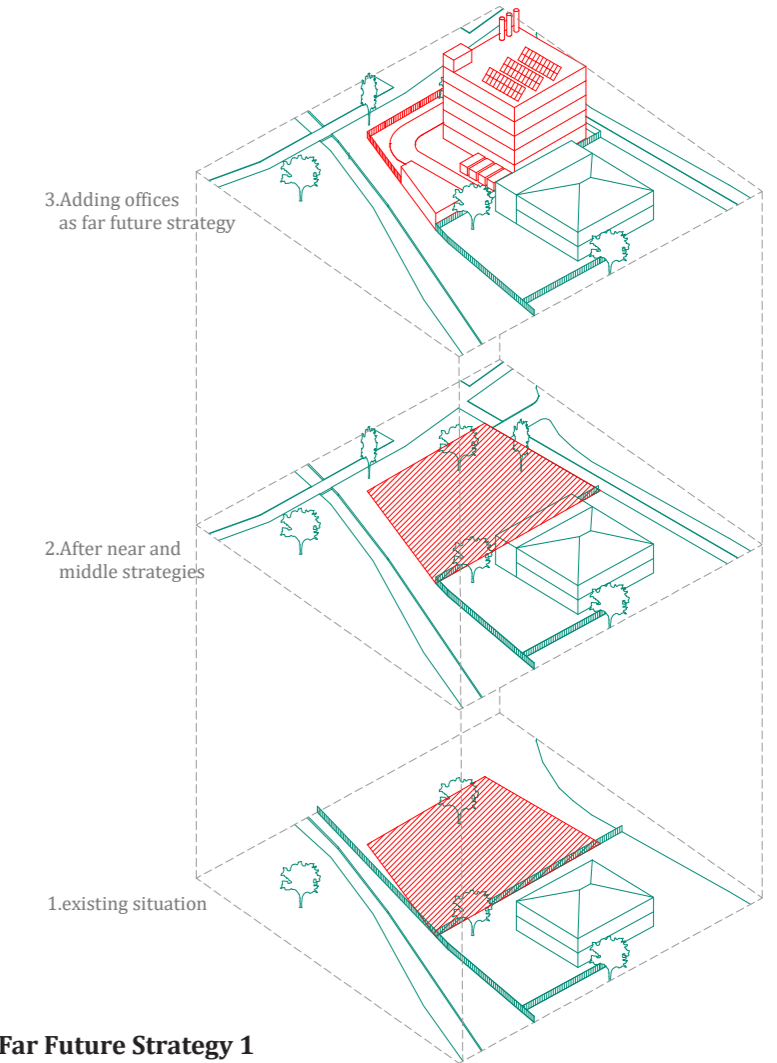
**9.4 Far Future Strategies**

Far future strategies are essential to achieve a high quality ideal sustainable neighborhood. These strategies will include adding large projects and functions to the neighborhood which did not exist before starting the revitalization process.

It is obvious that adding these new large projects will improve the quality of neighborhoods affected by sprawl, but the important point is that the huge investment required for these types of projects will never be funded in areas affected by sprawl, owing to low density, a lack of infrastructure, a lack of quality, and a lack of potential.

And the only way to attract investment is to provide the necessary motivation and infrastructure in the first steps by increasing density, improving quality, and enhancing the potentials in the neighborhood, as clarified in near future and middle future strategies.

Introducing a waste-burning and recycling center to the neighborhood

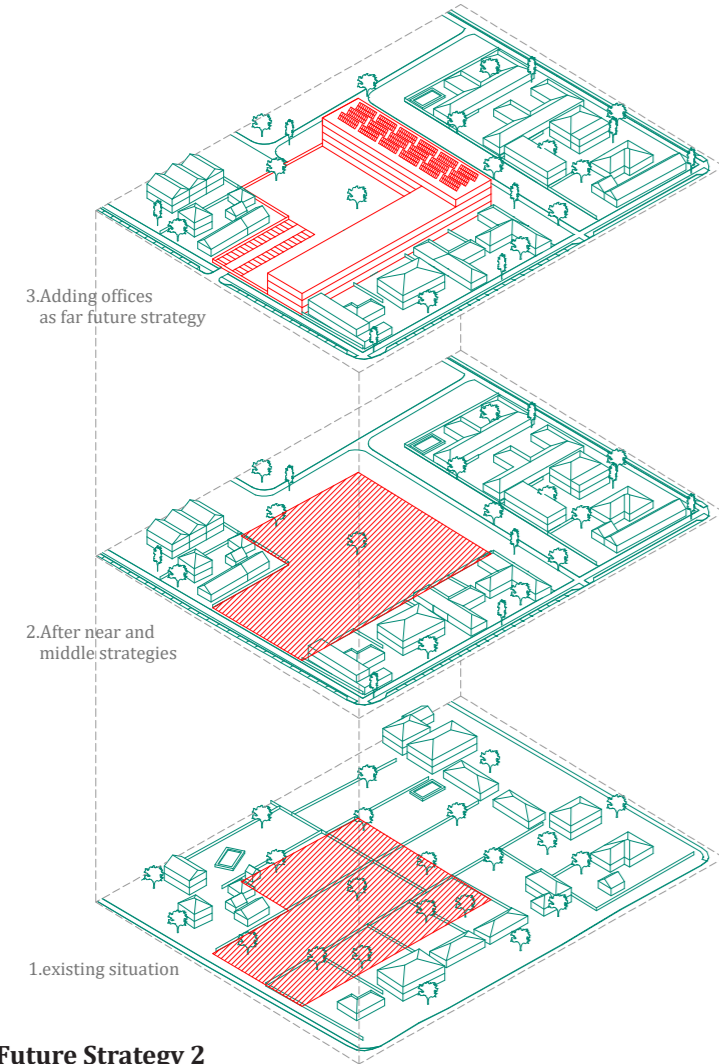


**9.20 Far Future Strategy 1**

As a prerequisite for this strategy, small facility boxes, which were previously mentioned as a small near future strategy, are absolutely necessary. Adding a waste burn and recycle center to the neighborhood, as well as a clear improvement in environmental sustainability, will have long-term economic benefits for the neighbors, as well as improve the visual quality of the neighborhood.



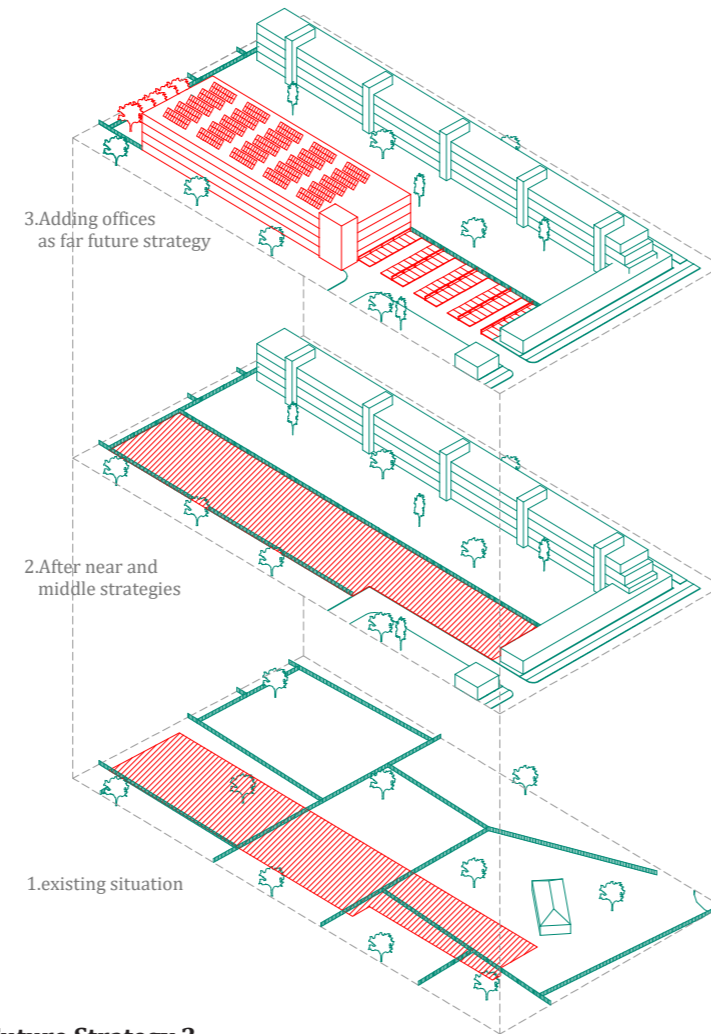
Adding a school to the neighborhood



**9.21 Far Future Strategy 2**

Adding a school as a far future strategy to the neighborhood besides providing educational opportunities for the neighbors in their close distance has plenty of other benefits for the neighborhood, such as increasing social daily interaction, providing job opportunities, reducing commuting costs, increasing safety, and bringing even more population to the neighborhood from outside every day.

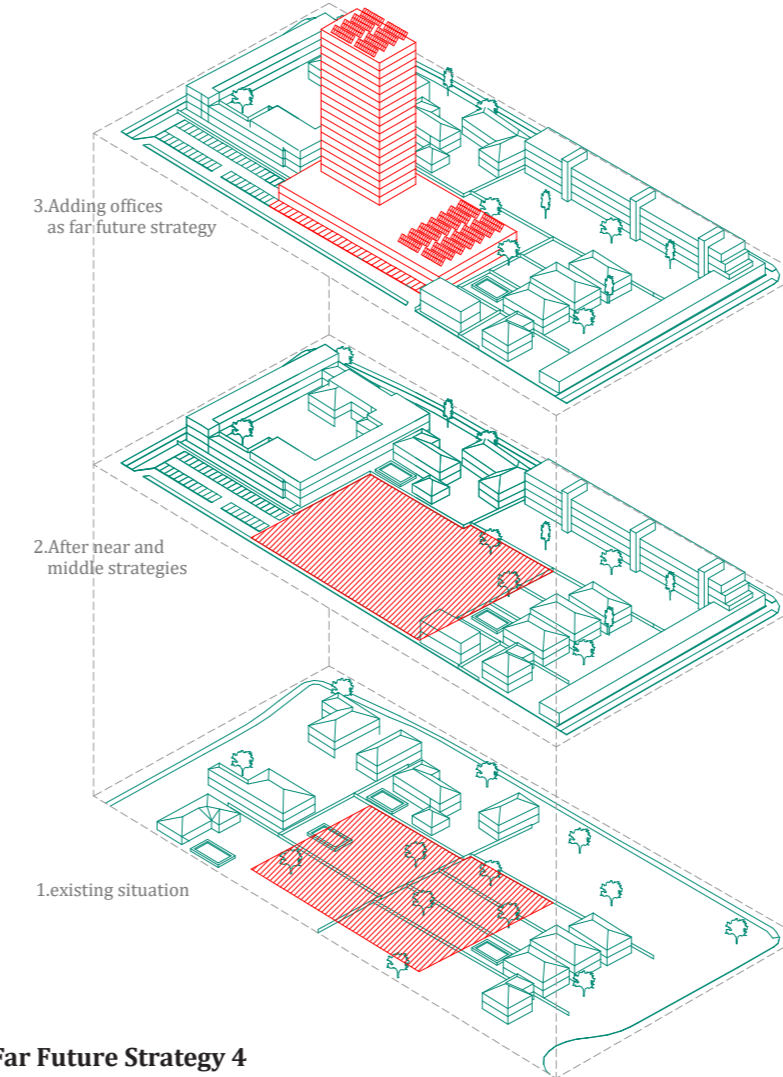
Adding vertical parking with electric car chargers to the neighborhood



**9.22 Far Future Strategy 3**

After implementing near future and middle future strategies, the need for a large parking space will be clear; a vertical parking, in addition to providing parking spaces for neighbors, can provide electrical chargers for electric cars as a motivation for using green energies; and the presence of a vertical parking will increase the neighborhood's potential for future economic projects such as shopping centers.

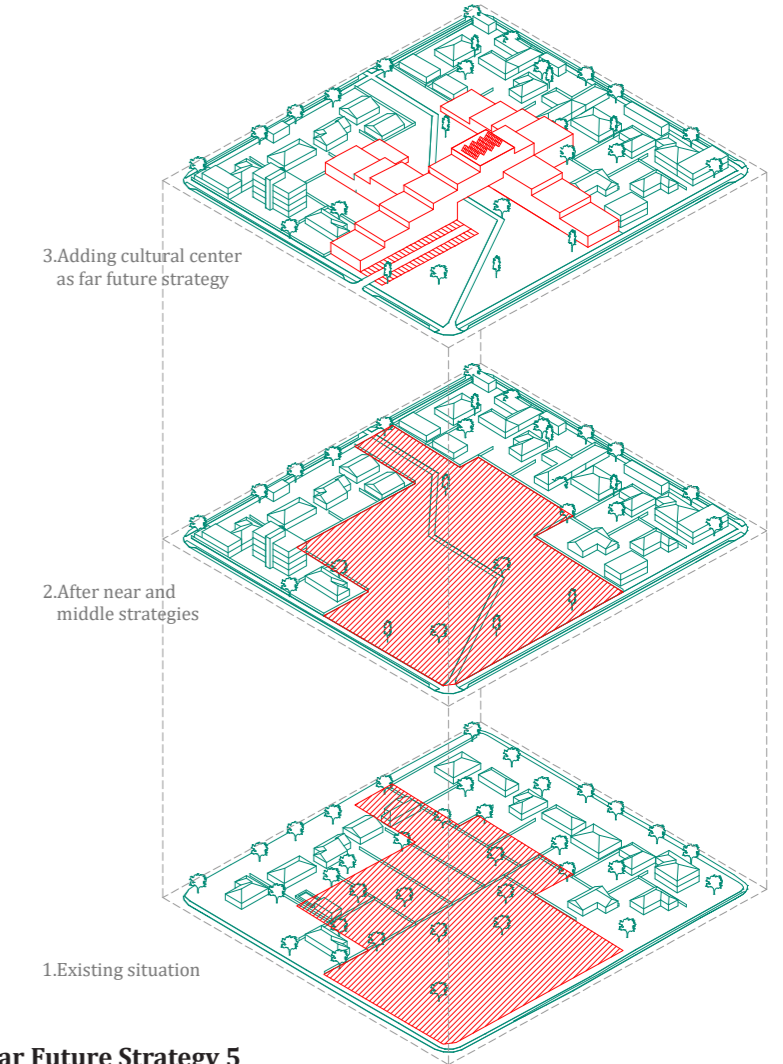
Adding high rise office building to the neighborhood



**9.23 Far Future Strategy 4**

A suggestion as a far future strategy can be a high rise office building which can belong to a single company or be used by several offices, beside many economical profits such as increasing job opportunities in walking distance, enhance the value of the neighborhood, and increase the potential of commercial activities around it, these projects will improve the social sustainability by being an architectural element.

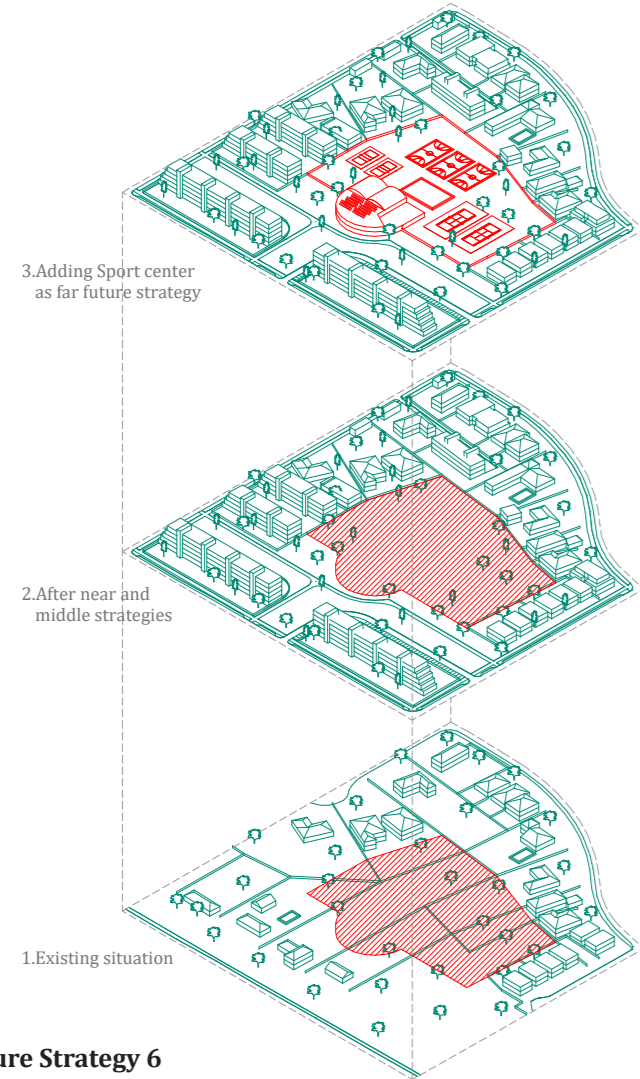
Adding a cultural center to the neighborhood



**9.24 Far Future Strategy 5**

A high-density neighborhood with a high level of daily interaction and diversity in terms of age, income, and nationality has enormous potential to host a cultural center. Adding a cultural center to the neighborhood will not only improve cultural sustainability, but will also attract people from outside and increase social interaction between neighboring neighborhoods.

### Adding a sports complex to the neighborhood

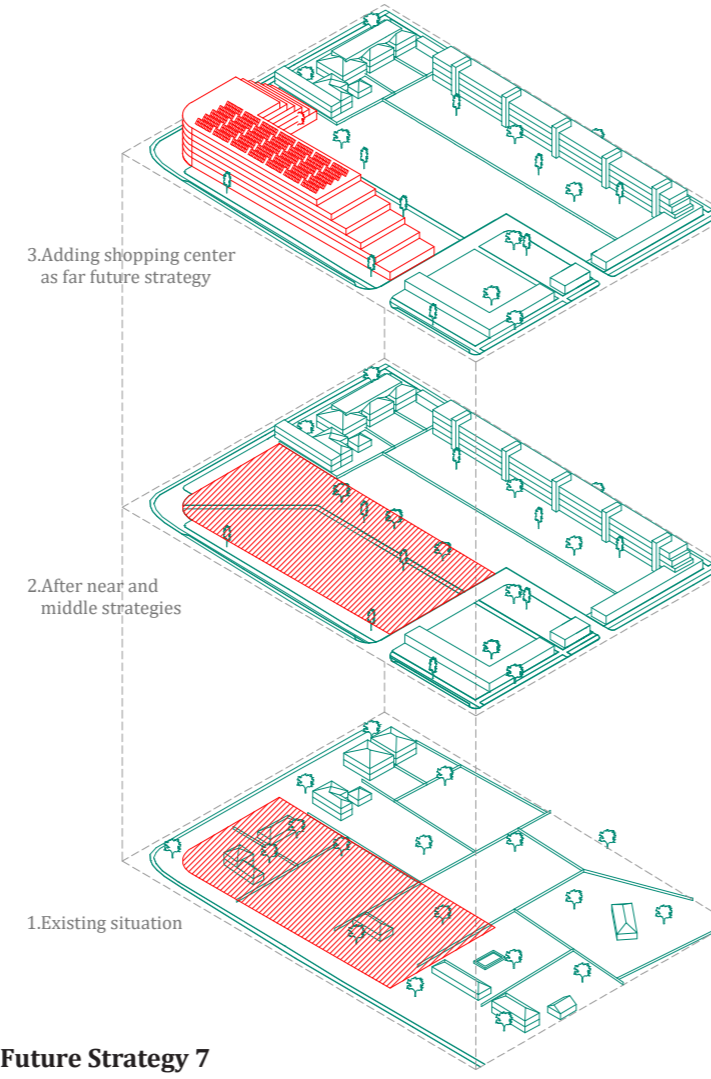


#### 9.25 Far Future Strategy 6

A high density neighborhood which improved in different terms during the near and middle strategies will host a sports center as a necessary function for every neighborhood. In this situation, the investment needed for the sports center will make sense due to the high density of the neighborhood, and besides the clear social impacts can also bring economic profits to the neighborhood.

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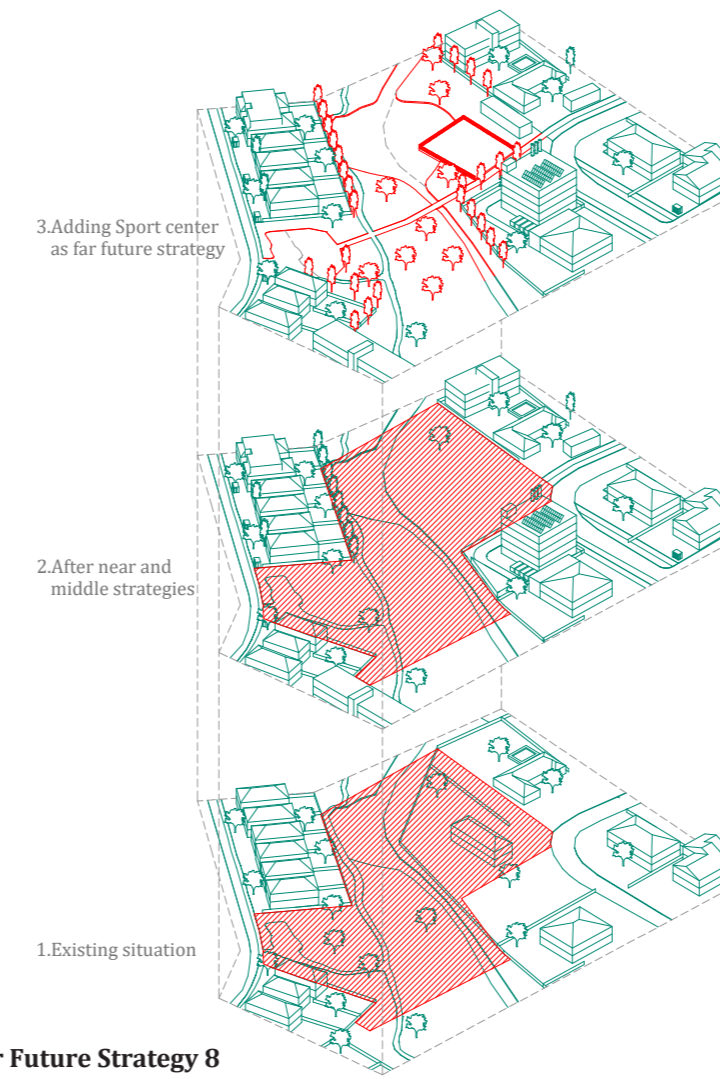
### Adding a shopping center to the neighborhood



#### 9.26 Far Future Strategy 7

A shopping center is a very important and necessary function to add to any neighborhood. The main impacts include creating numerous job opportunities for locals, reducing daily commuting distances, and increasing the value of the neighborhood. This strategy will also have many indirect positive effects on the neighborhood, such as reducing car usage and increasing the cost of land in the neighborhood.

### Revitalization of the existing natural park



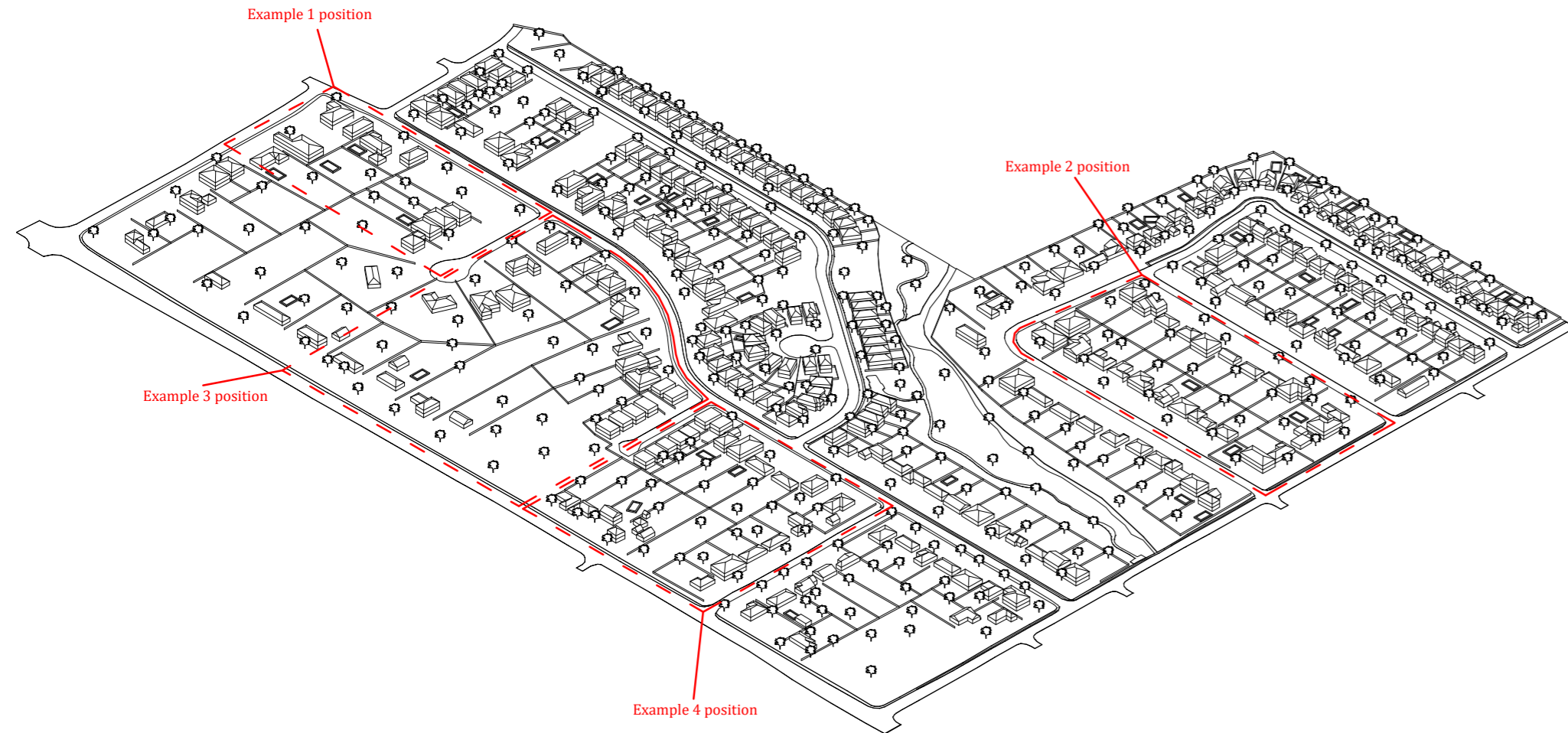
#### 9.27 Far Future Strategy 8

Besides adding different kinds of public green spaces which were mentioned as near future and long future strategies, revitalization of the existing natural park in the neighborhood to a proper social gathering place. Because this park is already an identifiable node for the locals and has great potential to host neighbors every day of different ages.

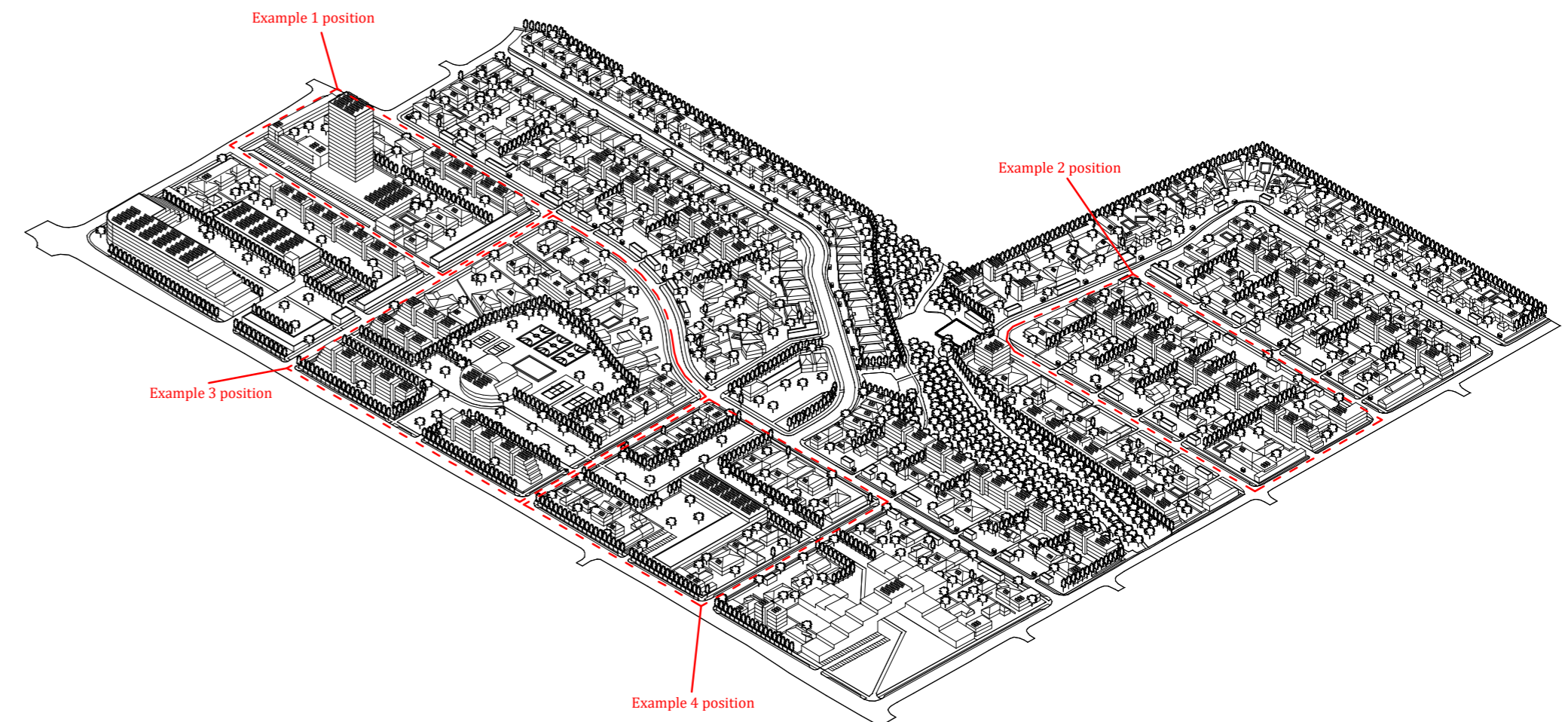


## 9.5 From Sprawl to Sustainability

Several blocks within the intervention area has been chosen, in order to visually compare the current situation of the intervention area and its future after applying our strategies for design.



9.28 comparison blocks position within current situation model



9.29 comparison blocks position within future situation model



- **From sprawl to sustainability-example 1**

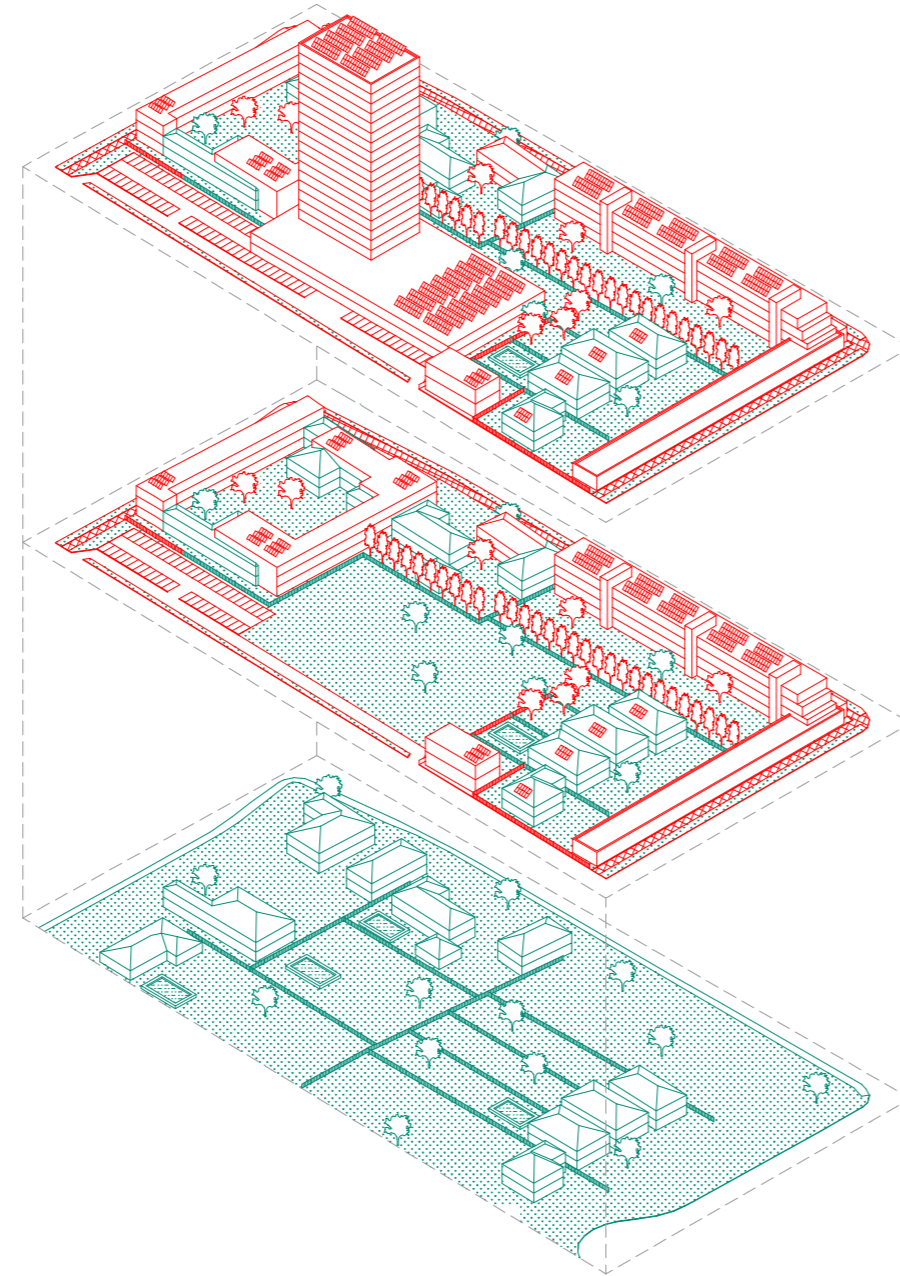
This is the first example of a block within our intervention area which we visually compare the three states of existing situation, intermediate state, and final situation, to see the process of transforming a block affected with sprawl consequences, to a sustainable block.

Few number of single detached family houses, with huge long and thin backyards, exist in the block. We are facing a fully residential block, with low density, poor access, out of shape plots, and generally a waste of land, water, and energy as a consequence.(Fig 9.31)

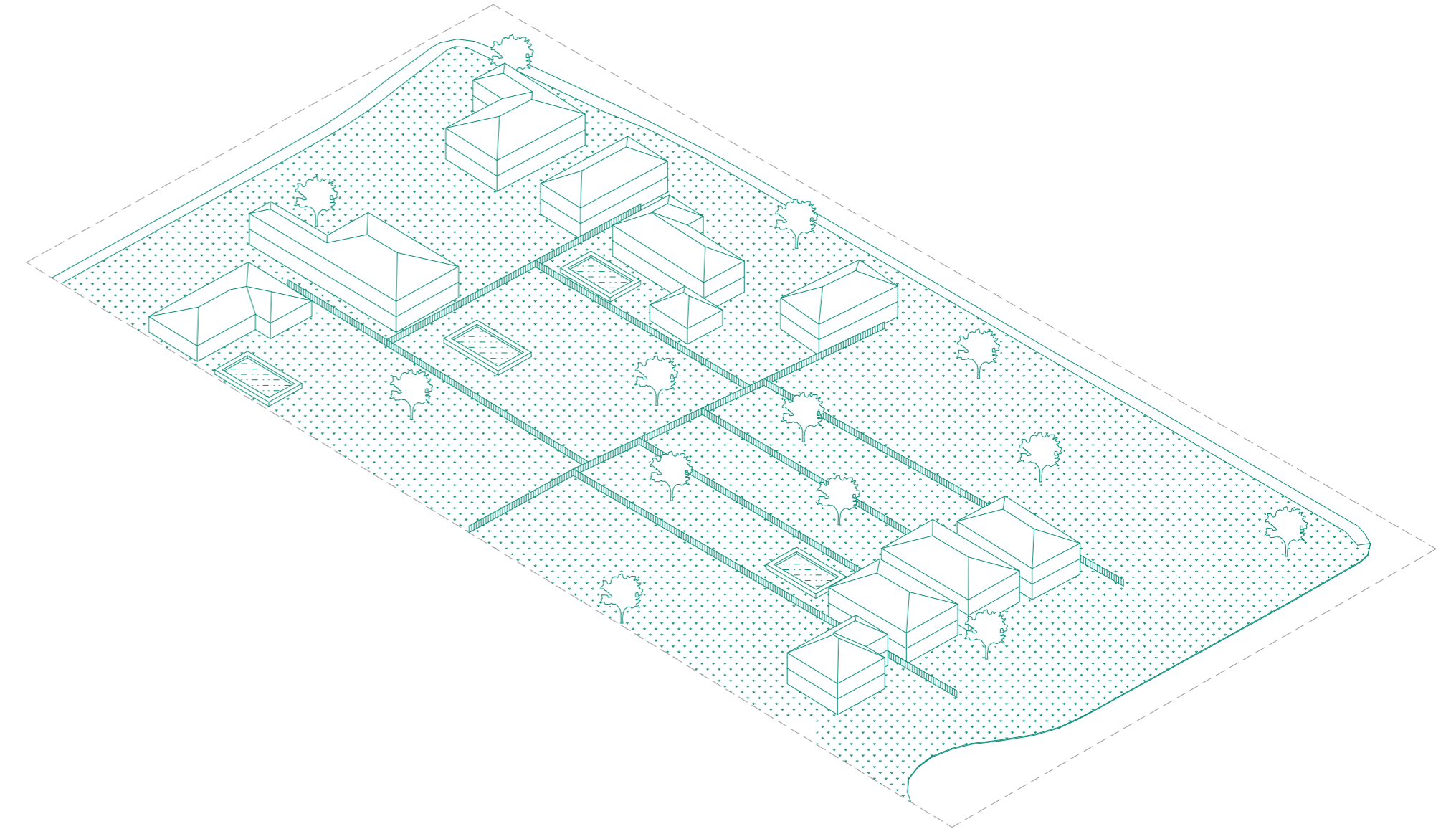
By implementing our near future and middle future strategies, which are specifically correction of streets, attaching new units to existing houses, adding commercial shops, transforming several single detached family houses into a cluster, repairing greeneries, adding new apartments, and increasing the usage of renewable energies, beside increasing the quality of the block, the needed motivation, and infrastructure for a big and expensive project in the block, has been provided.(Fig 9.32)

And after implementing near future and middle future strategies, which are providing prerequisites for our far future strategies, a high rise office building can be built in the block as the far future strategy. To enhance the value of the block, increase the number of job opportunities, increase the daily commutation in the neighborhood, and increase the social value of the area as its consequence.(Fig 9.33)

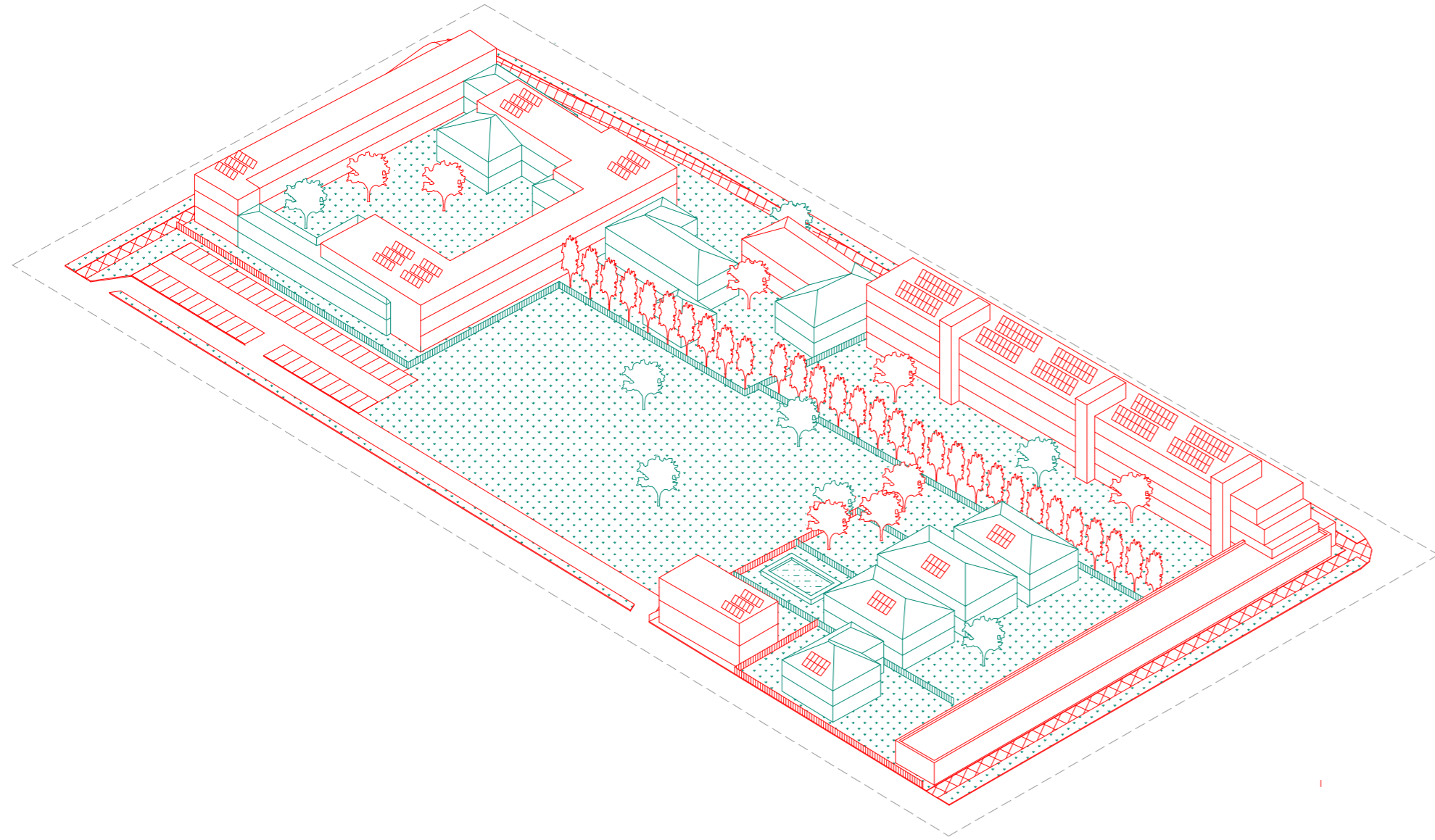
This was the first example of how from sprawl we can reach sustainability, without demolishing existing buildings, in a realistic and doable process.



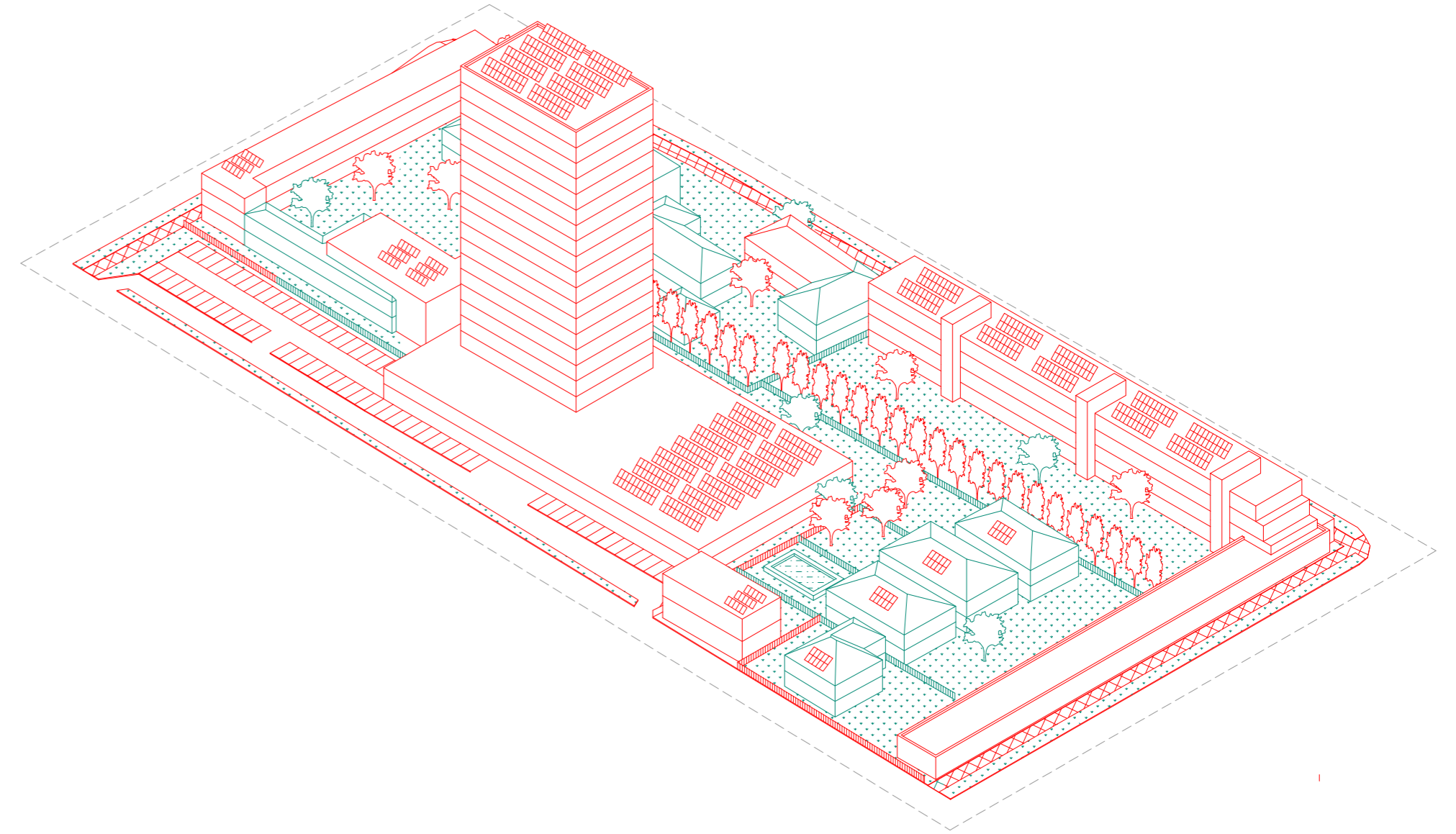
9.30 From sprawl to sustainability, example 1



9.31 From sprawl to sustainability, example 1, current situation



9.32 From sprawl to sustainability, example 1, intermediate situation



9.33 From sprawl to sustainability, example 1, Final situation



- **From sprawl to sustainability-example 2**

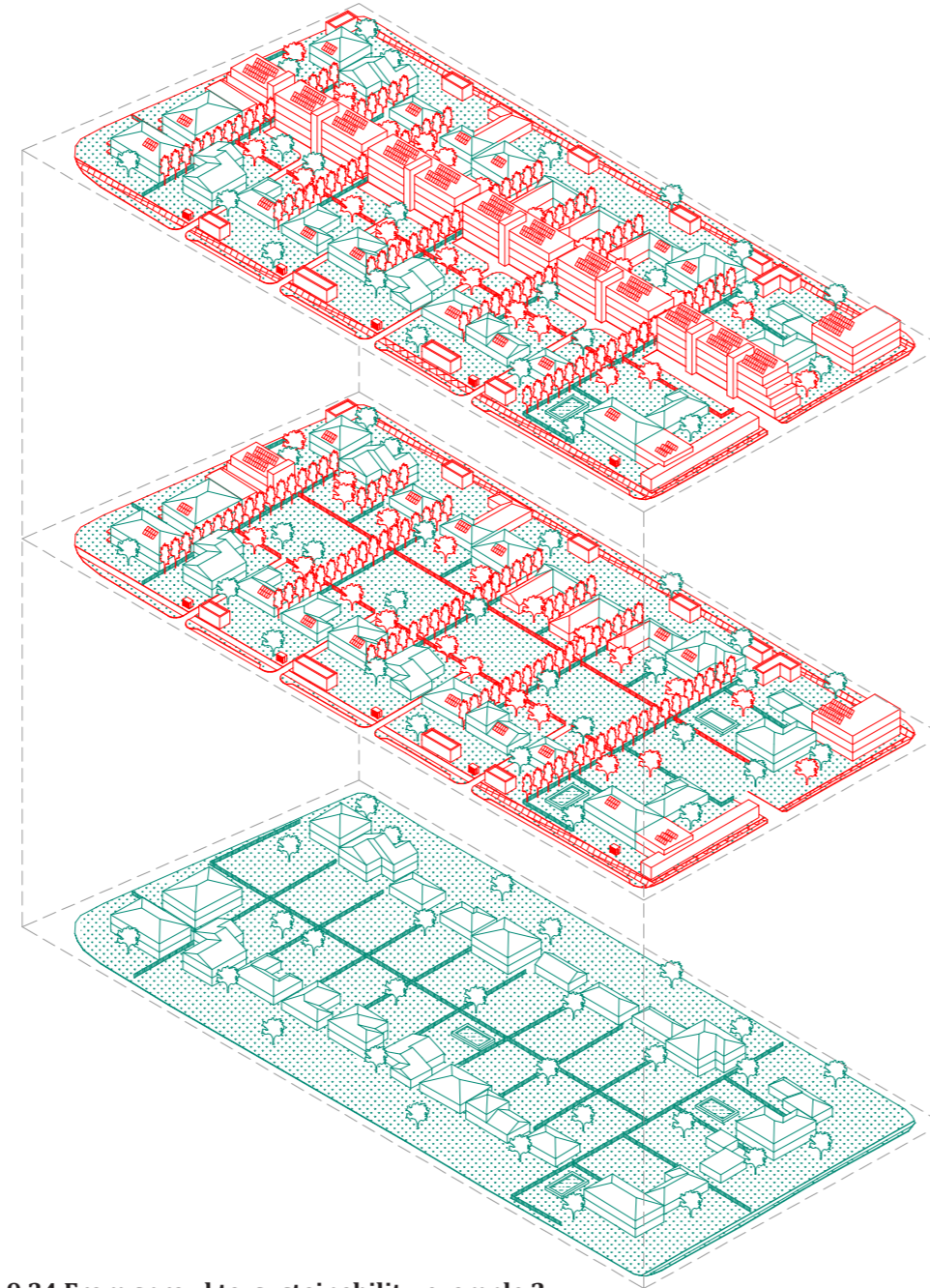
In the second example, which is another block within our intervention area, the footprint of sprawl development is again completely visible, but the conditions are different from the first example, which will lead to different strategies.

The existing situation of the block is again a fully residential block with a small number of houses, a large area of front gardens and backyards, and a large amount of energy and water usage, for maintenance of the private greeneries and hitting of the houses comparing to the number of families living in the block. There is no need to mention the waste of time and energy of commutation of the residents to do their daily activity which has to be done by private vehicles.(Fig 9.35)

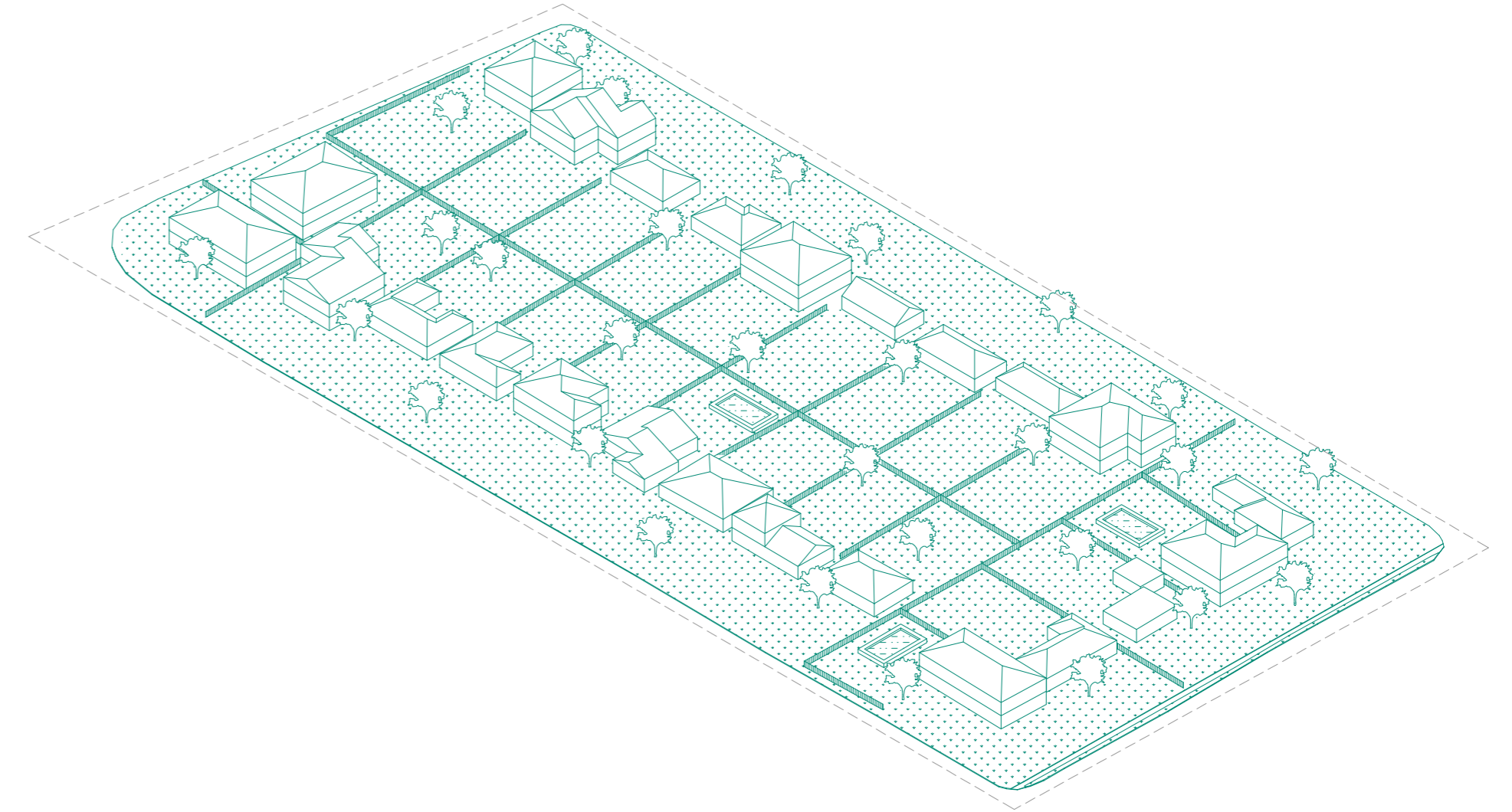
By implementing the near future and far future strategies, the quality of the block will increase economically, and environmentally, by adding new attached units to the old ones, repairing the greeneries, adding facility boxes and commercial shops, correction of the corridors and adding new alleys for future developments. These strategies, besides increasing the quality of the block, are considered as a needed basis for future development.(Fig 9.36)

According to the final situation of the block, by adding new apartments which can be invested by locals, municipalities, or even investor companies, the population density of the block will increase, which will increase the social, economic, and also environmental value of the block, consequently. This step can only be done after implementing smaller strategies which invite more investors to invest here, and invite more people to live here.(Fig 9.37)

This comparison also shows how we can reach a sustainable dense neighborhood with high daily interaction of residents, from a fragmented block with the footprint of sprawl development.

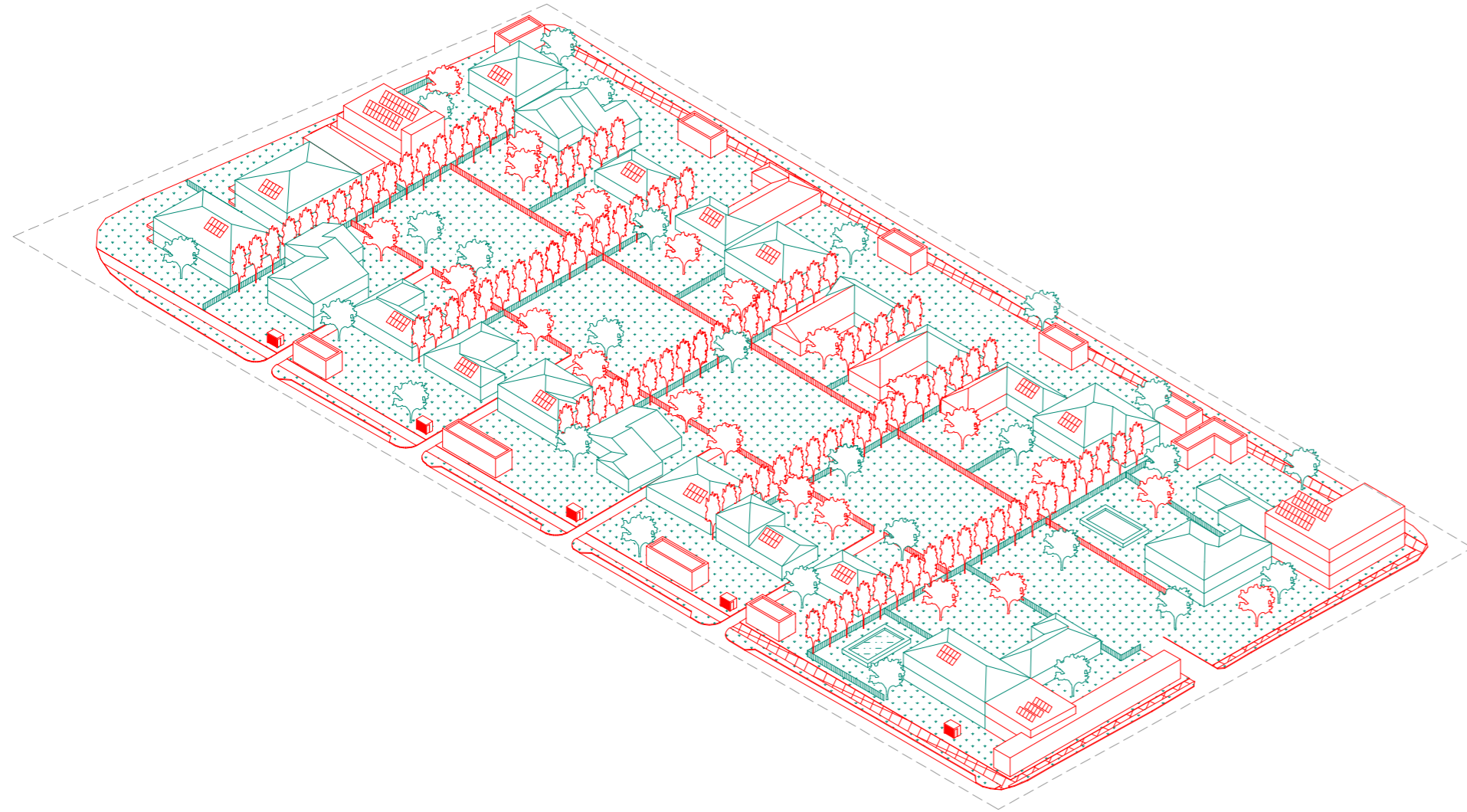


9.34 From sprawl to sustainability, example 2

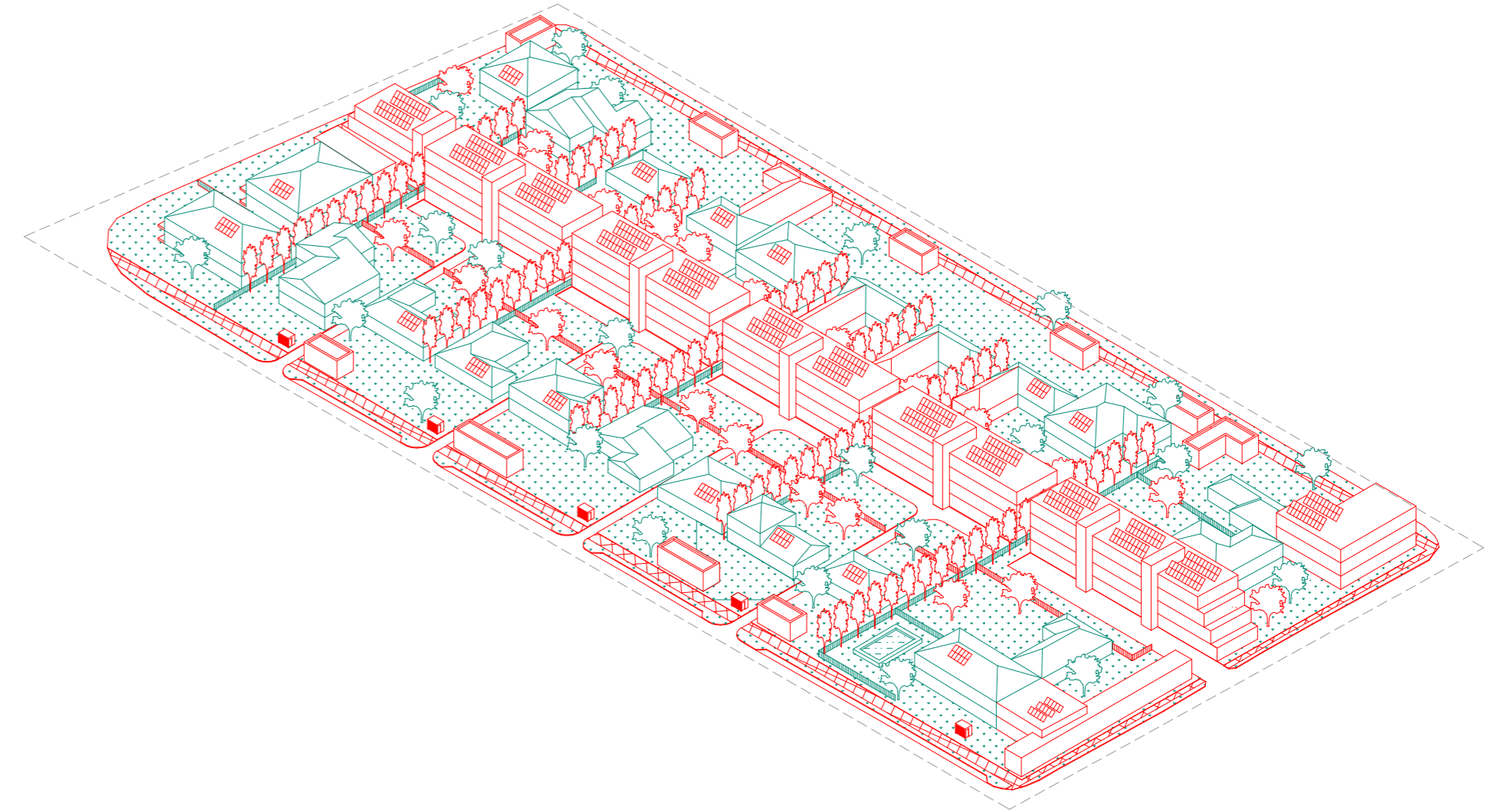


9.35 From sprawl to sustainability, example 2, Current situation





9.36 From sprawl to sustainability, example 2, Intermediate situation



9.37 From sprawl to sustainability, example 2, Final situation

- **From sprawl to sustainability-example 3**

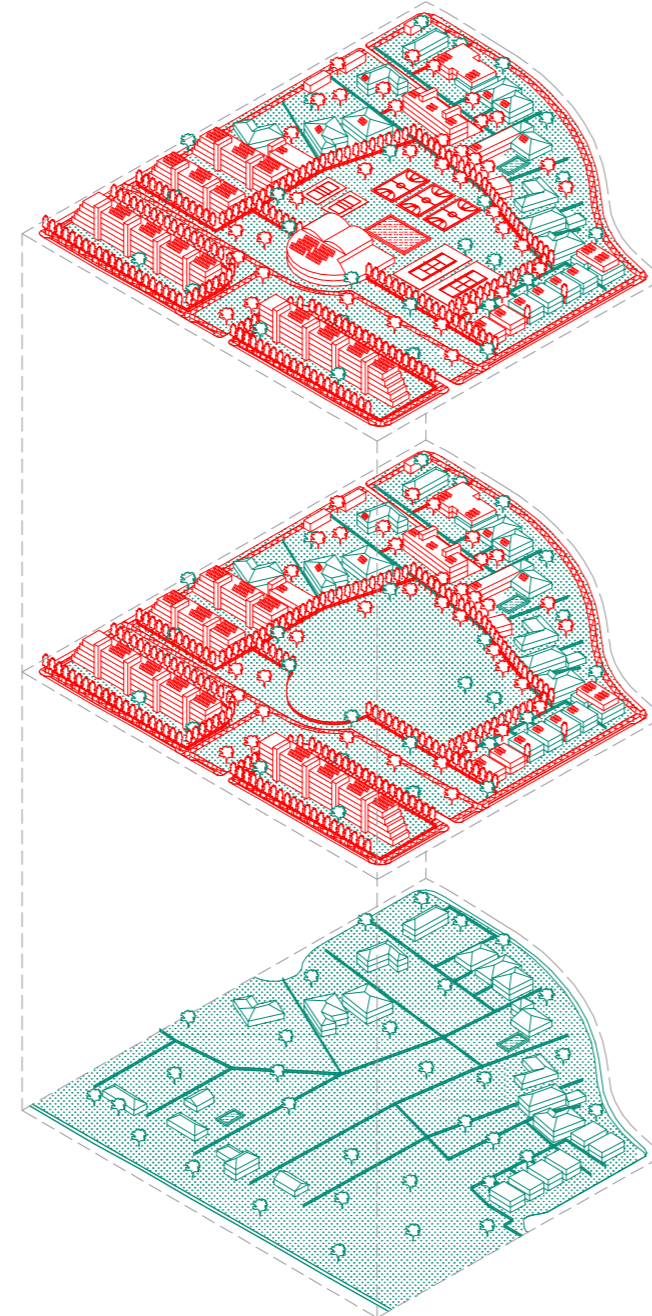
In the third example of a block within our intervention area, we have relatively the same situation as previous examples, but the most important difference in this block is its position, which is near a main street. That means this block has the potential to host an activity that can attract people from other neighborhoods, for its economic and social profit.

The existing situation of the block has a small number of single detached family houses within it, with big and long backyards, and some empty land. One of the conditions inside this block is very old houses that cannot be renovated for reuse or any development and can demolish, and another condition is the huge area of integrable large backyards in the middle of the block.(Fig 9.39)

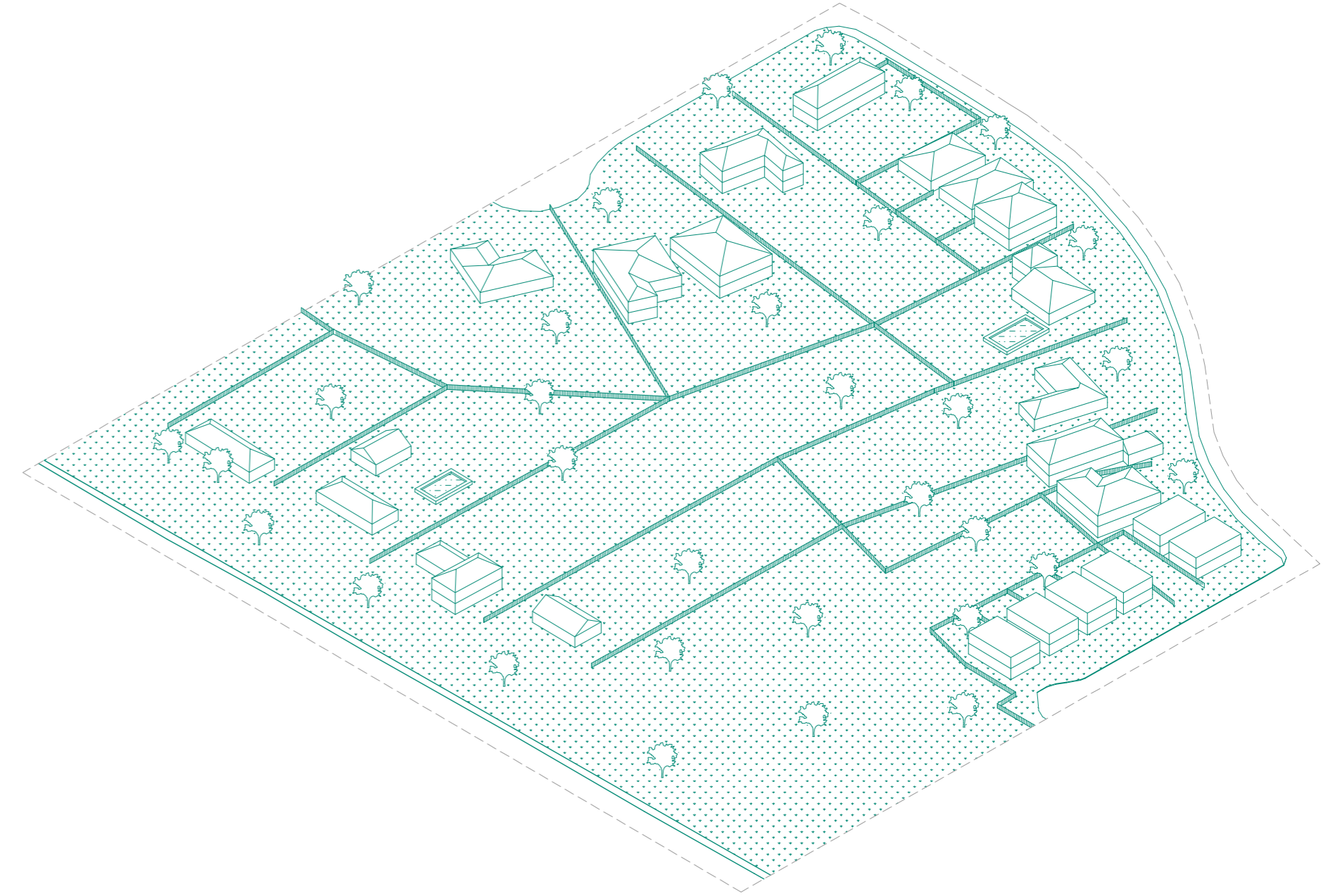
By knowing the potential of a big future development in this block, due to its position, and the free area in the middle of it, our near future strategies, and middle future strategies, besides improving the quality of the block, have to move in that direction. Adding new corridors, increasing the density, implementing new parks, and completing the circulation, are all done in the direction of providing prerequisites for a future development. (Fig 9.40)

In the final step, as far future strategy, after providing prerequisites, a sports complex can be implemented, to serve the locals and bring economic and social profit to the area, by attracting people from other neighborhoods every day.(Fig 9.41)

Every aspect needed for a community has to be considered in order to achieve sustainability from sprawl. Providing the basic needs of residents in a public way is a big save for land, energy, and investment, due to making residents needles of provide their needs privately.

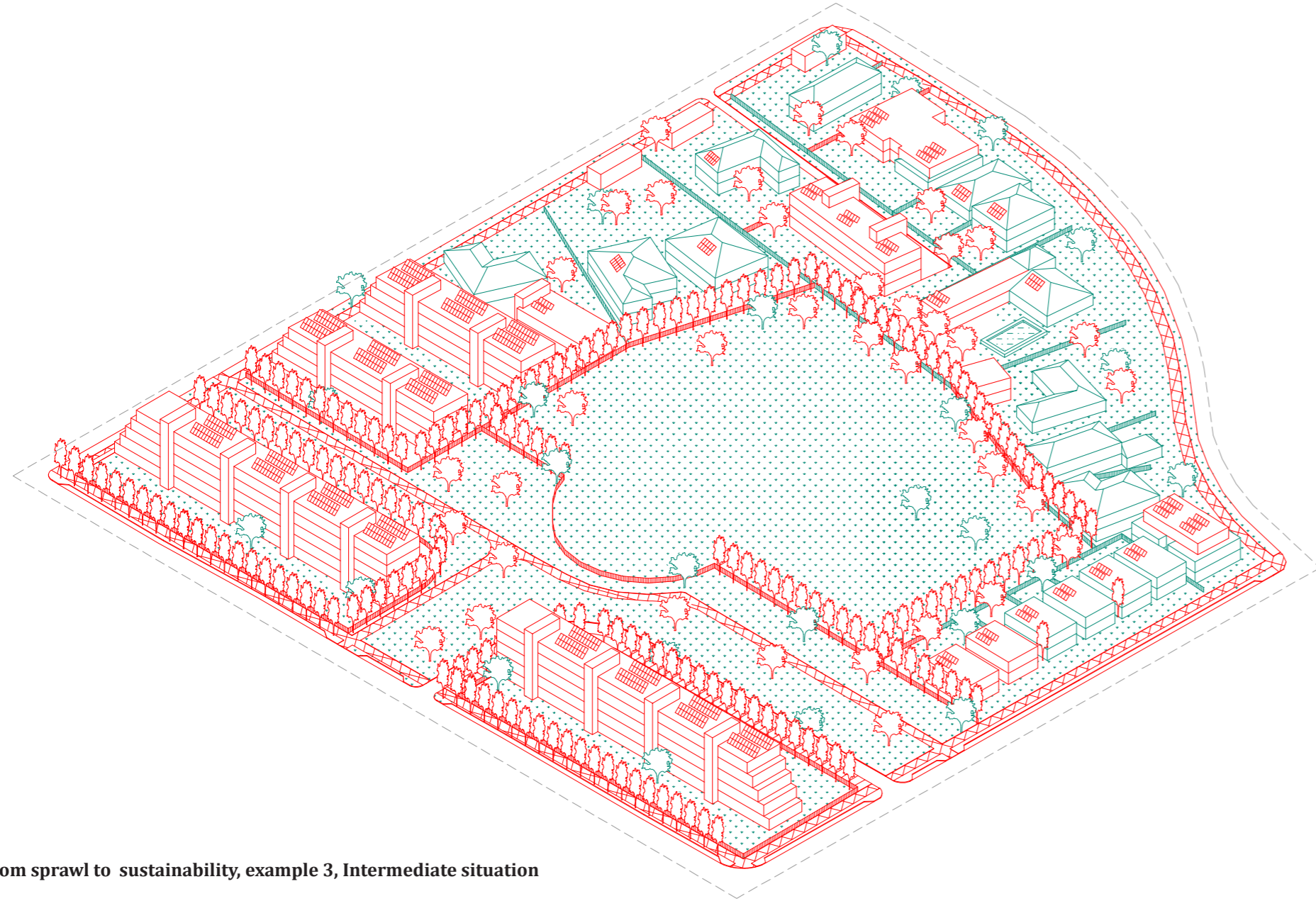


9.38 From sprawl to sustainability, example 3

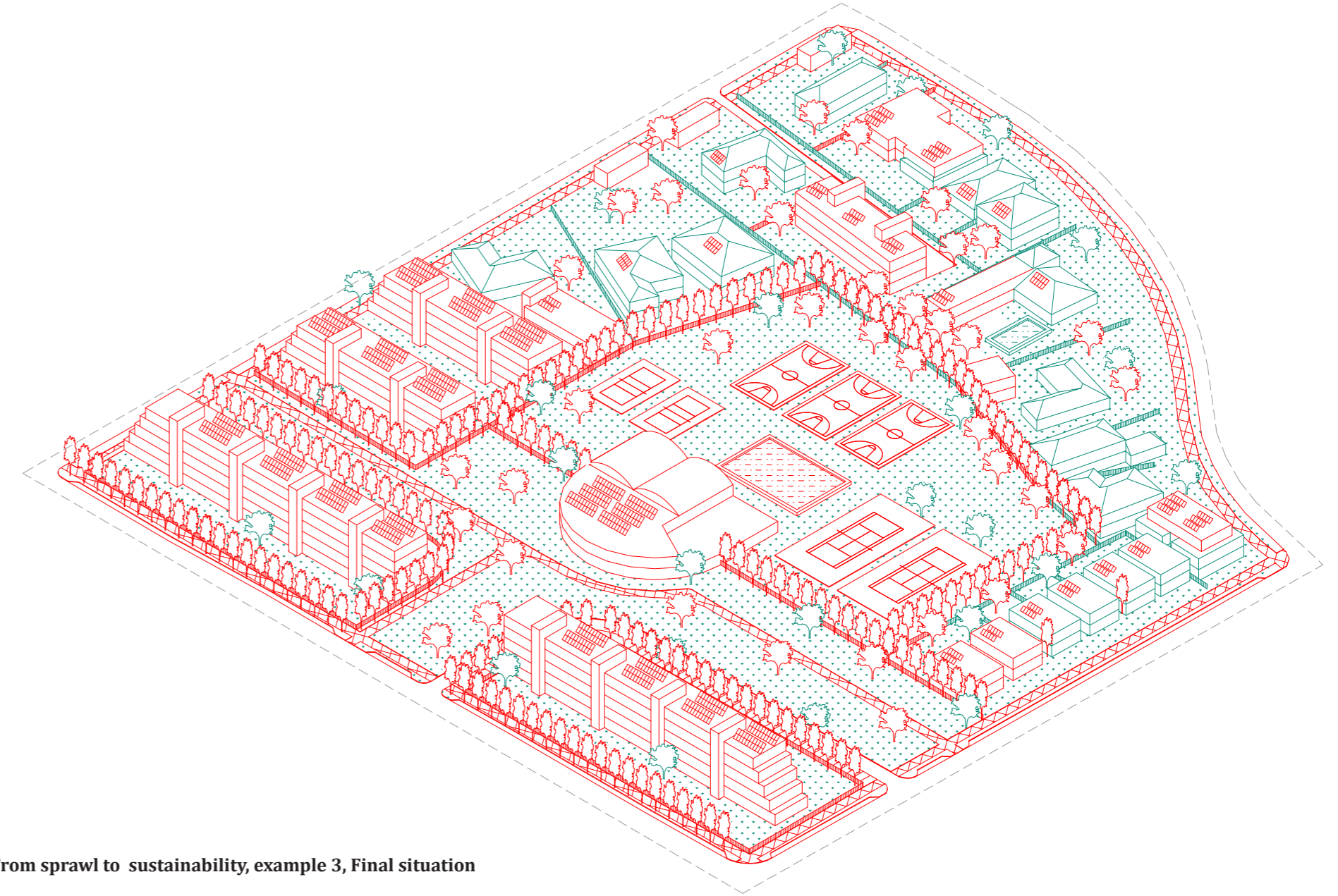


9.39 From sprawl to sustainability, example 3, Current situation





9.40 From sprawl to sustainability, example 3, Intermediate situation



9.41 From sprawl to sustainability, example 3, Final situation



- **From sprawl to sustainability-example 4**

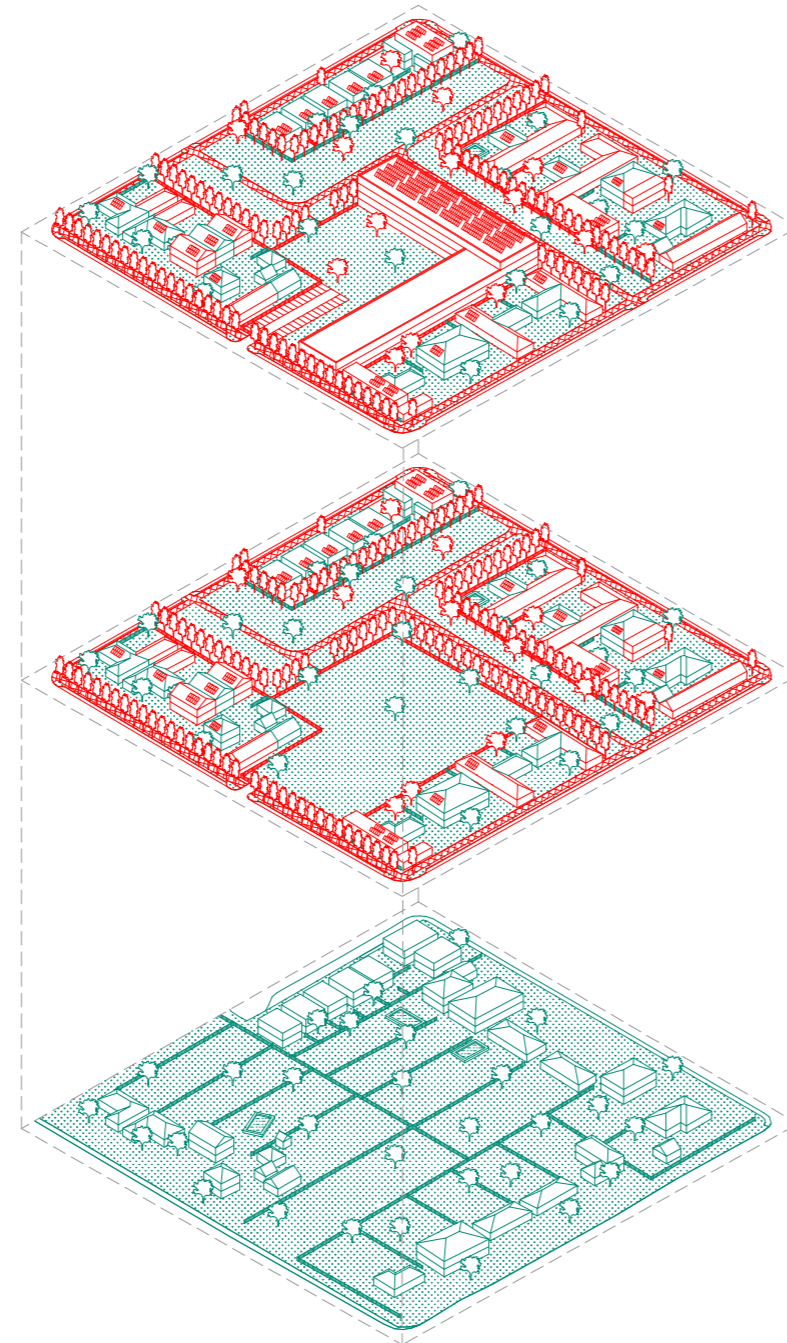
The last block, which is another example inside our intervention area, has many similarities with other previous examples, including low density, big useless backyards, and special positioning. But an important condition of this block is the good ratio of its dimension, and good access from every side, which we have to take advantage of.

In the existing situation of the block, even if some new development has been done, we can still see a few number of units, a big wasted land, as the extra parts of backyards, and very good access all around the block, which is just serving a few families. All the cost of these infrastructures has to be divided to more number of residents to be logic and provide the motivation for more investments.(Fig 9.43)

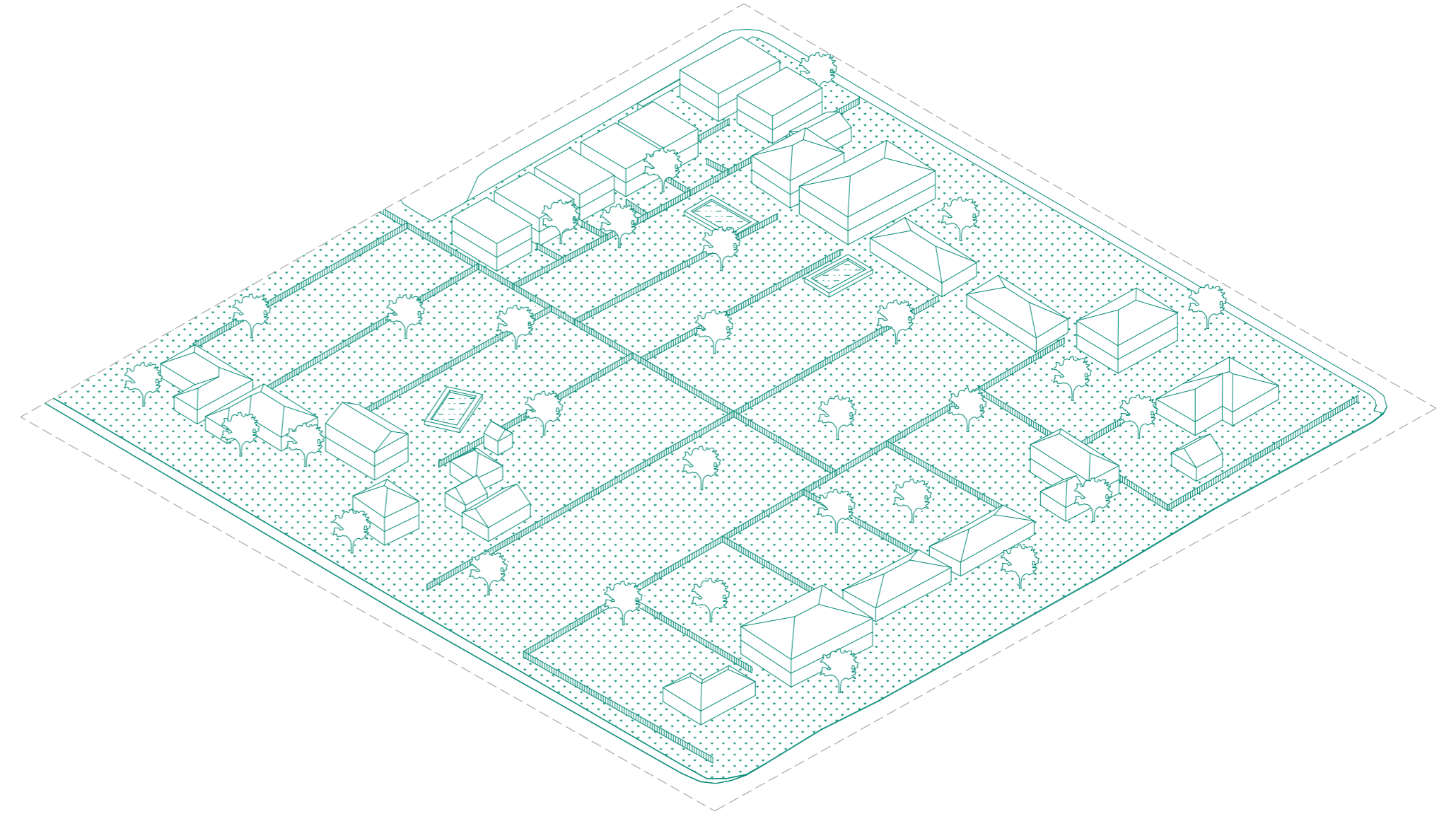
After near future, and middle future strategies, the block has been transformed to a pedestrian friendly block with access from every side, with higher density and better appearance, in this stage the block has the possibility to take advantage of its potential, by doing a bigger project in it.(Fig 9.44).

As the far future strategy and last step of revitalization in this block, a school has been added to the block, to take advantage of its great potential in terms of access and position. Besides economic and cultural profit, by adding a school to the neighborhood, parents do not need to use their car to take their children to school every day, and they can commute by walking safely.(Fig 9.45)

Many other economical, environmental, and social profits can be mentioned, as the result of this process, to the block itself and to the neighborhood. Showing that reaching sustainability in a neighborhood with sprawl development is completely possible, but needs strategies to be done in a defined order, and a defined period of time.

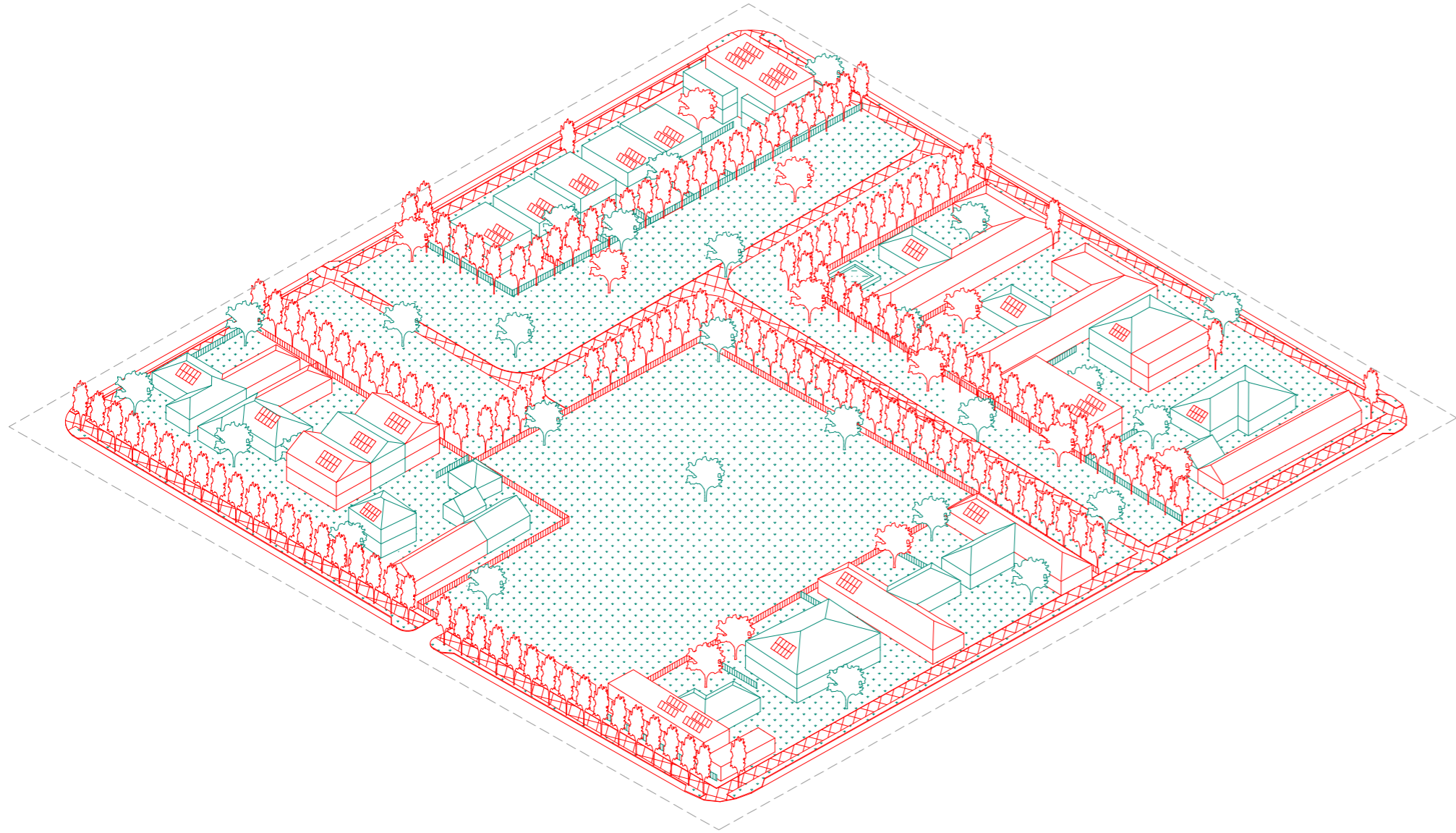


9.42 From sprawl to sustainability, example 4

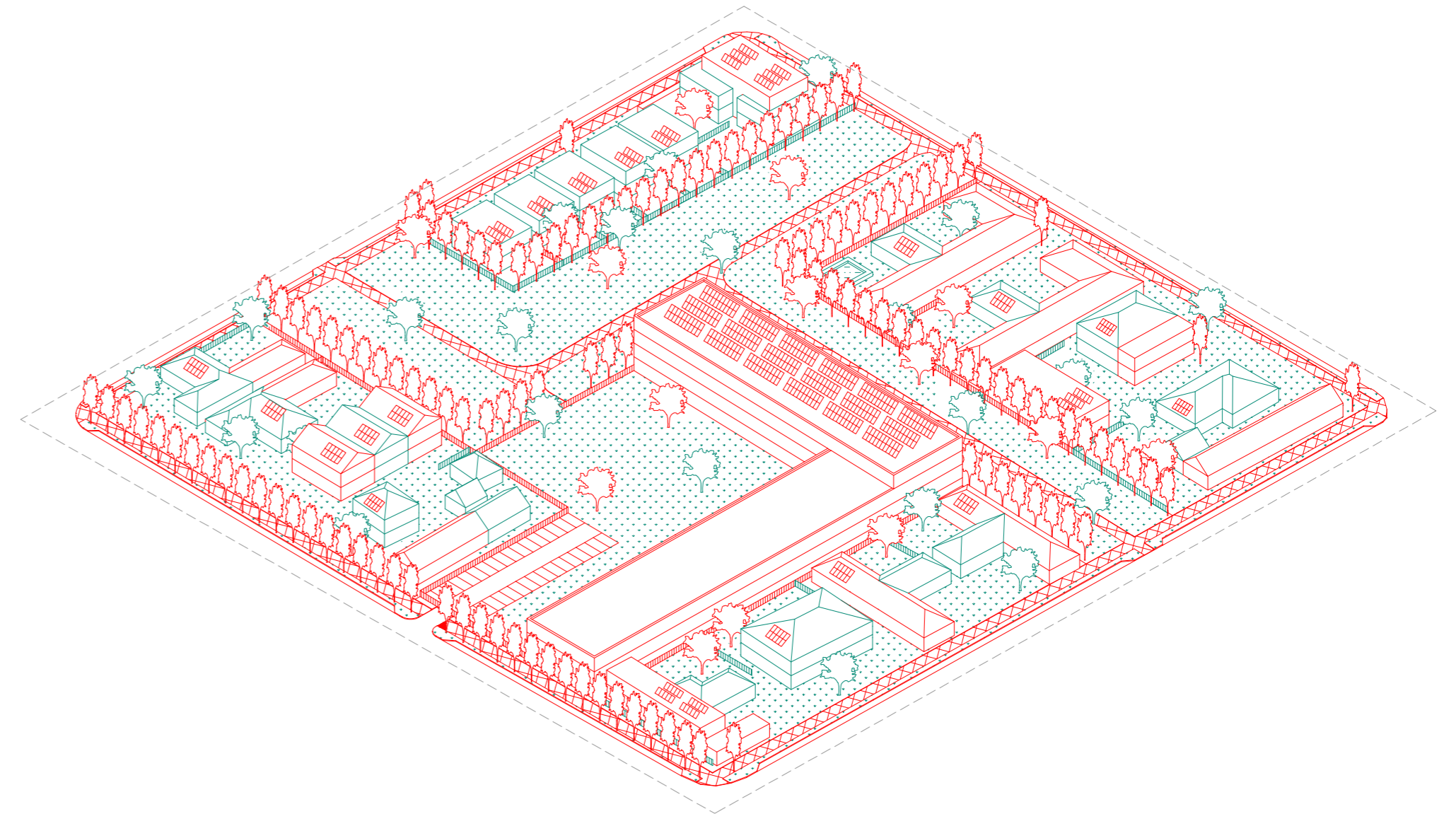


9.43 From sprawl to sustainability, example 4, Current situation





9.44 From sprawl to sustainability, example 4, Intermediate situation



9.45 From sprawl to sustainability, example 4, Final situation



## 9.6 Visual and Statistical Results

After comparing the existing situation and final situation in several blocks within our intervention area, we got visual and statistical results on the bigger scale of the intervention area.

By comparing the existing situation and final situation statistics of the intervention area, the improvements in the sustainability in our area after implementing our 3 steps of strategies will be clear.

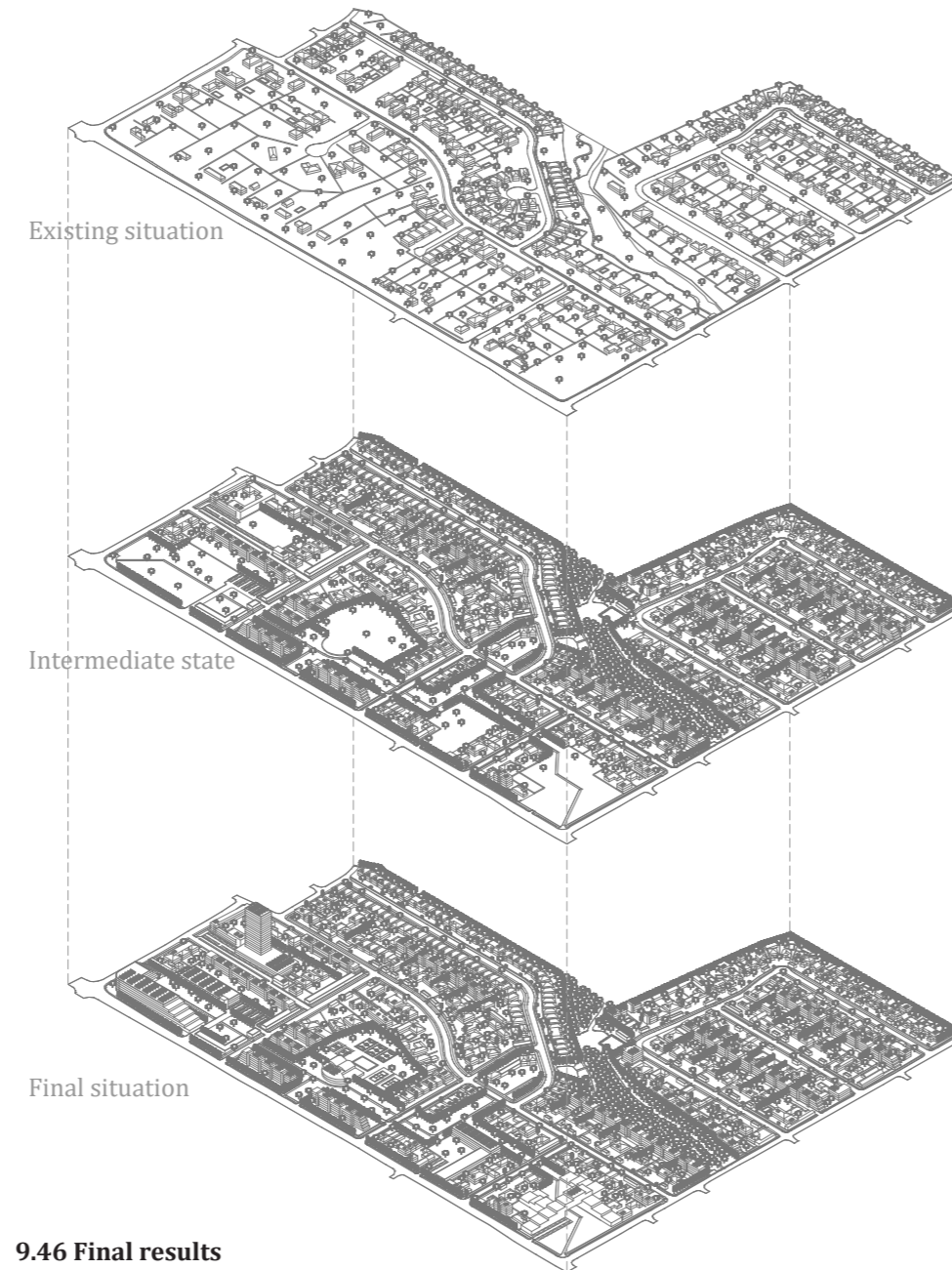
The total number of dwelling units increased from 240 to 860, which means the density increased from 4.5 dwelling units per hectare to 16.1 dwelling units per hectare. We reached approximately 380 different kinds of job opportunities in our area from 0 in this period.

The number of units that have access to public transportation with a distance less than 500 meters increased from 110 to 860, which is equal to the total number of units within the area.

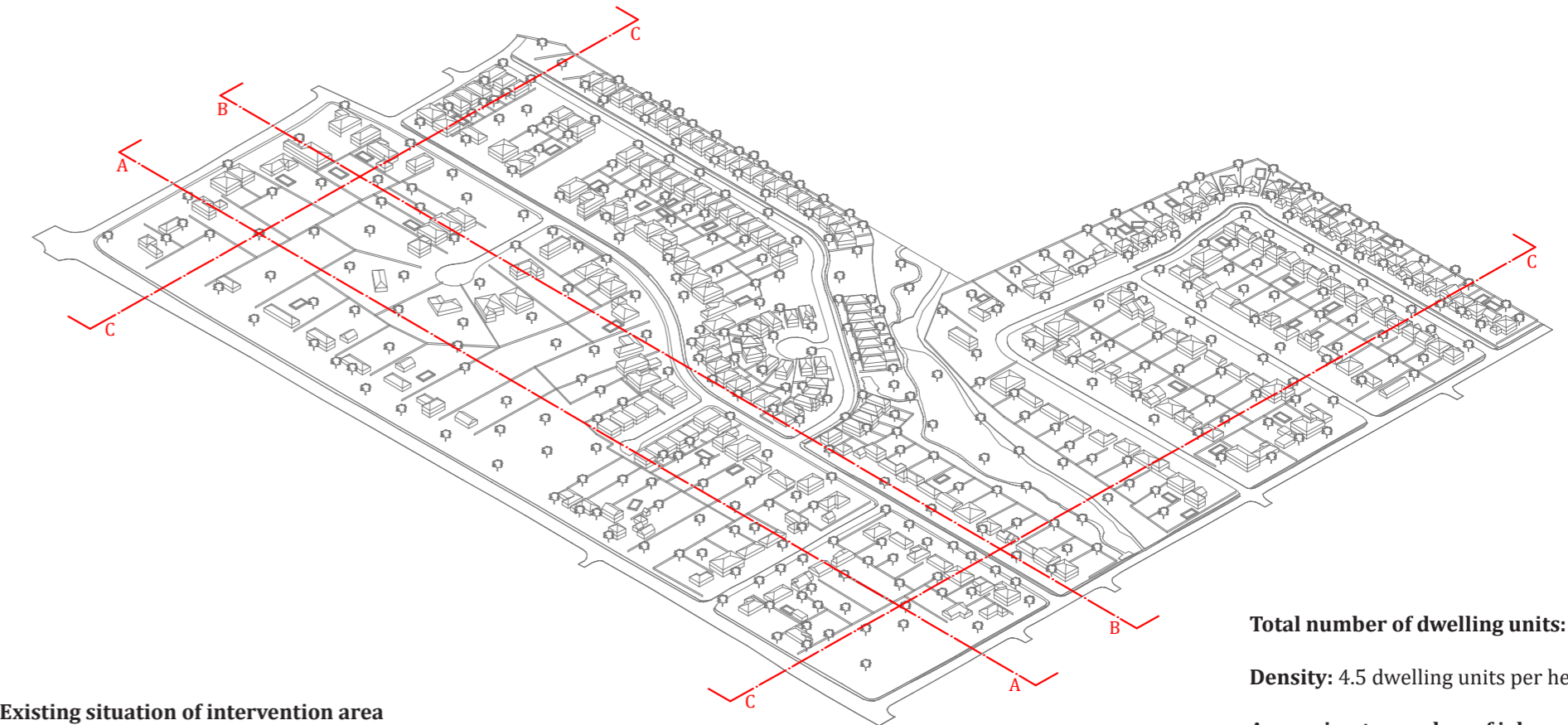
The existing housing typology was only single detached family housing, but now we have apartments, clusters, tiny homes, multi family houses, and studios, which invite a broad range of diversity and age with different incomes to the area.

The area of public reentries enhances 3 times, and an absolute residential neighborhood became a multi functional neighborhood with, commercial, educational, economical, social, and cultural daily activities.

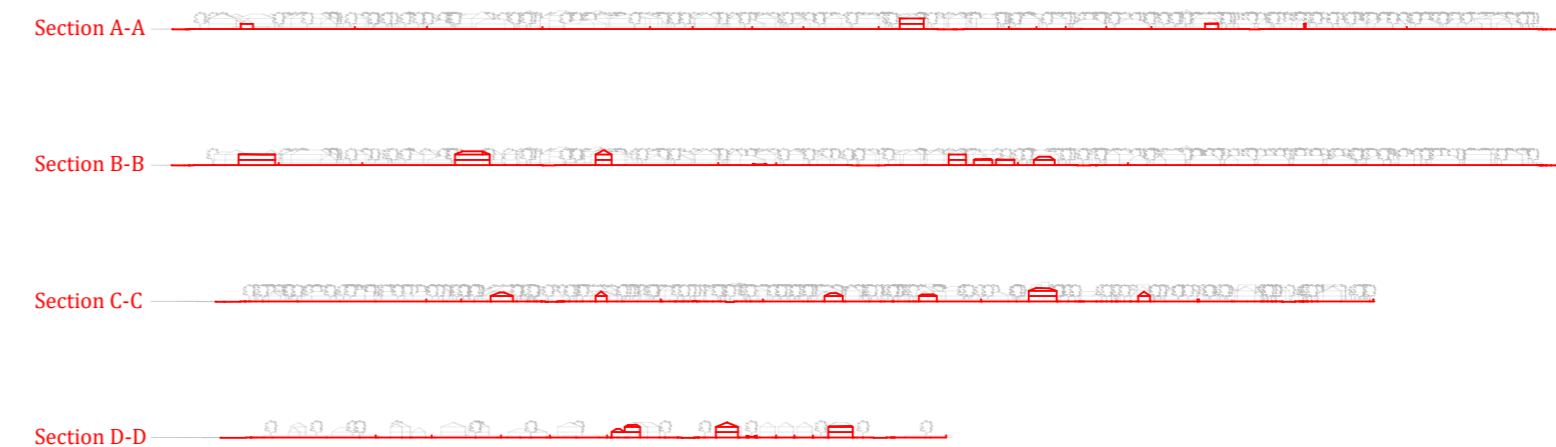
These visual and statistical comparisons demonstrate that by understanding the context and developing appropriate strategies, we can transform a poor neighborhood affected by sprawl development consequences into a sustainable neighborhood in all of its environmental, economic, social, and cultural dimensions.



9.46 Final results



9.47 Existing situation of intervention area



**Total number of dwelling units:** 240

**Density:** 4.5 dwelling units per hectare

**Approximate number of job Opportunities:** 0

**Units with distance less than 500m to public transit stops:** 110

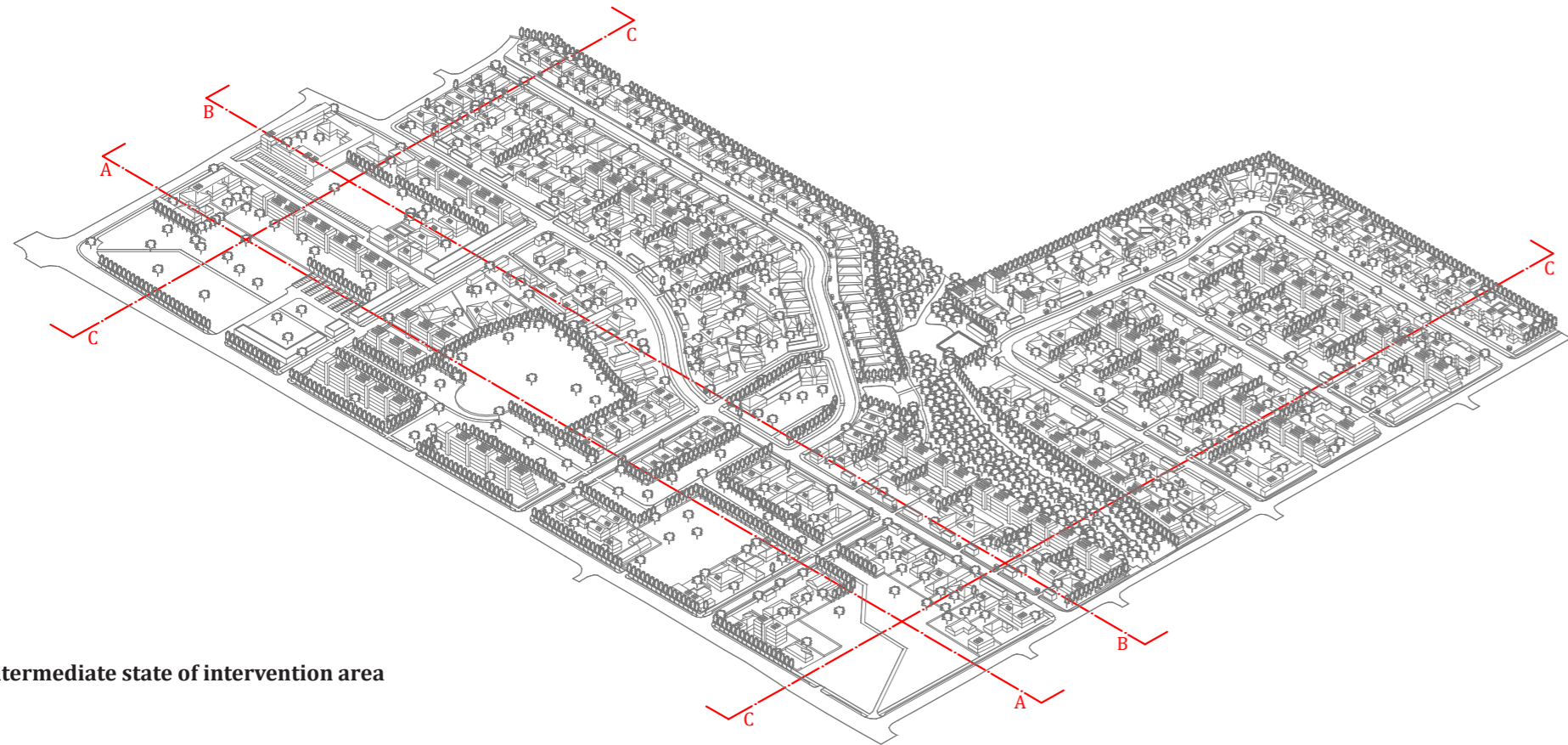
**Functions:** Residential

**Housing typologies:** single detached family houses

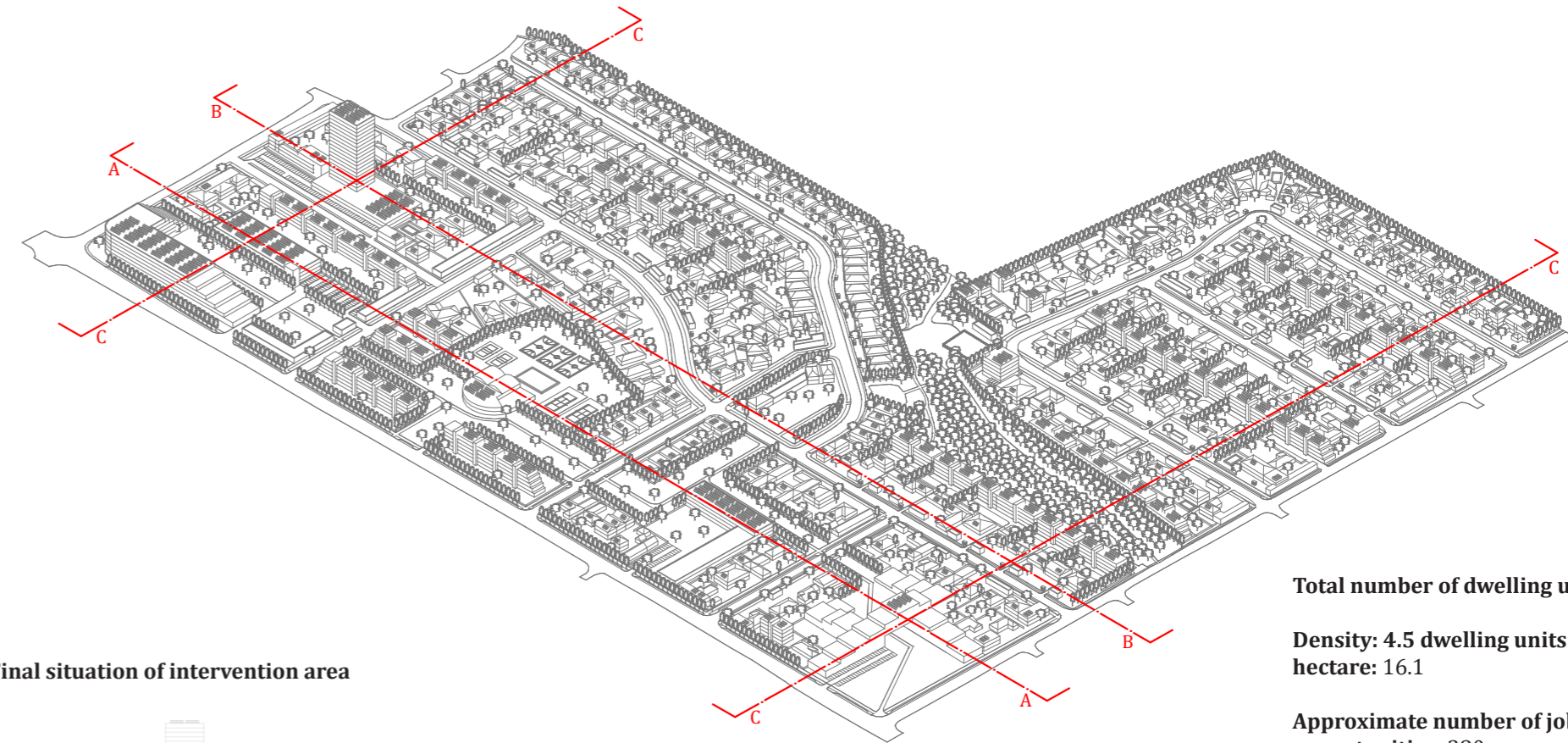
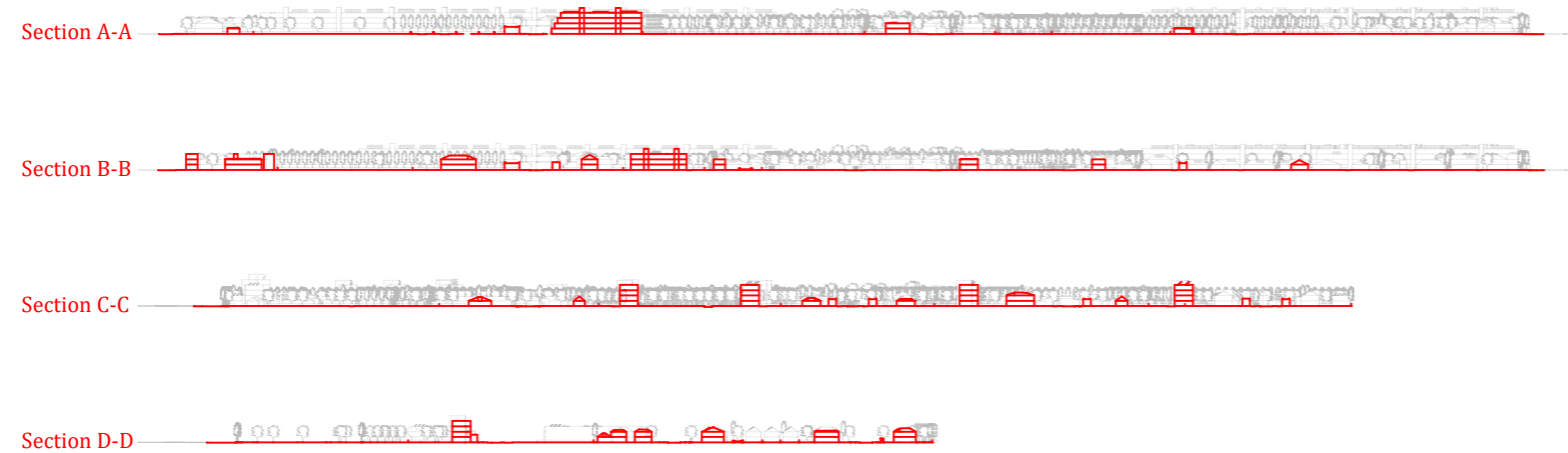
**Public greeneries area:** 3.6 hectare

**Private greeneries area:** 45,9 hectare

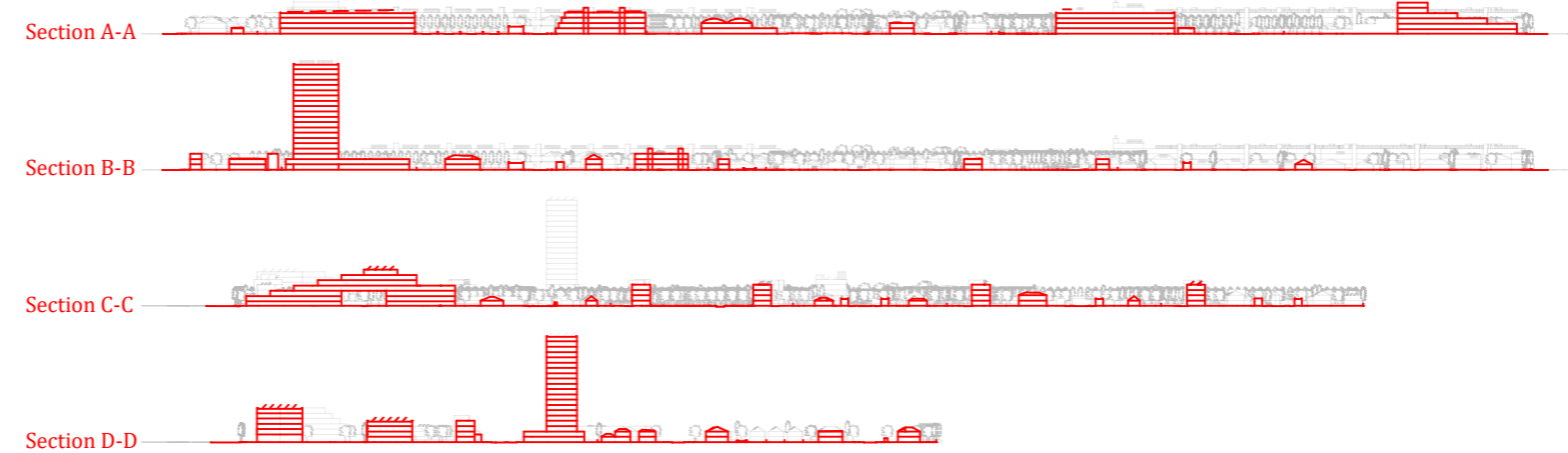




**9.48 Intermediate state of intervention area**



**9.49 Final situation of intervention area**



**Total number of dwelling units: 860**

**Density: 4.5 dwelling units per hectare: 16.1**

**Approximate number of job opportunities: 380**

**Units with distance less than 500m to public transit stops: 860**

**Functions:** Residential, Commercial, Educational, Cultural, Offices, Entertainment, sports.

**Housing typologies:** Apartment, Cluster, tiny home, Town home, Multi family houses, single detached family houses.

**Public greeneries area: 9.1 hectare**

### 9.7 Matrix comparison

A random sample has been chosen within our intervention area to be compared by using a matrix. By comparing the mentioned indicators in the matrix, in before and after implementing suggested strategies, the improvements will be clear in smaller scale of a neighborhood.

Several indicators have been compared separately, to understand how our strategies will affect the quality and the sustainability of a neighborhood, directly and indirectly. Indicators include: Solid & void, streets & pedestrians, private hard pavements, greeneries, trees, and walls or fences.

For example, by comparing A2 and B2, we can see that the ratio of solid volumes increased, which will lead to higher density, and increase the number of functions happening in this small sample such as commercial.

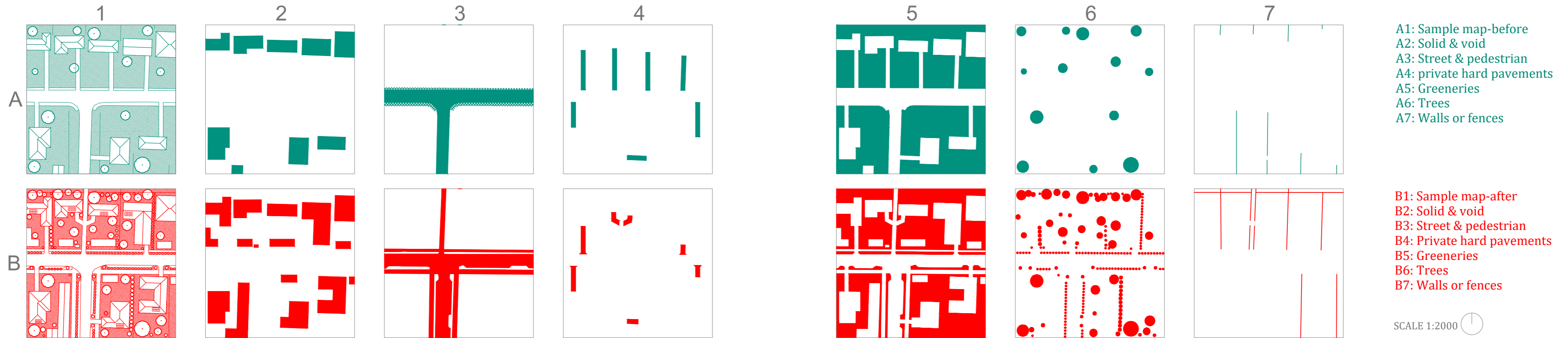
By comparing the A3 and B3, the improvement in the safety and security of the neighborhood is visible. After applying our strategies, there is a row of public greeneries along the streets which create a distance between cars in the street and pedestrians. Public parkings is provided to give the potential and possibility of other activities, not just residential. And another narrow street is added which improves the circulation, reduces the distances, and provides the opportunity for future developments.

Due to attachments of new units to existing buildings, correction of streets, adding new paths, the area of land which is wasted for usage of car circulation inside the plots reduces which is visible by comparing A4 and B4.

By comparing A5 and B5, we can see that the area of greeneries reduced after applying our strategies, but the removed areas where just covered by grass and have to be considered a huge waste of energy and water. By using the areas covered by grass, more important functions can be reached in neighborhoods affected by sprawl as a good trade.

The important point in this comparison is to consider that although we reduce the area of greeneries, the number of trees and bushes has increased, which are more sustainable types of plants, with less water and energy needed for maintenance, and more profits economically and environmentally. See A6 and B6

And In the end, by comparing A7 and B7, we can see that the division of plots and private areas has improved and become clearer, which leads to more security and privacy, without reducing the quality of the house view.



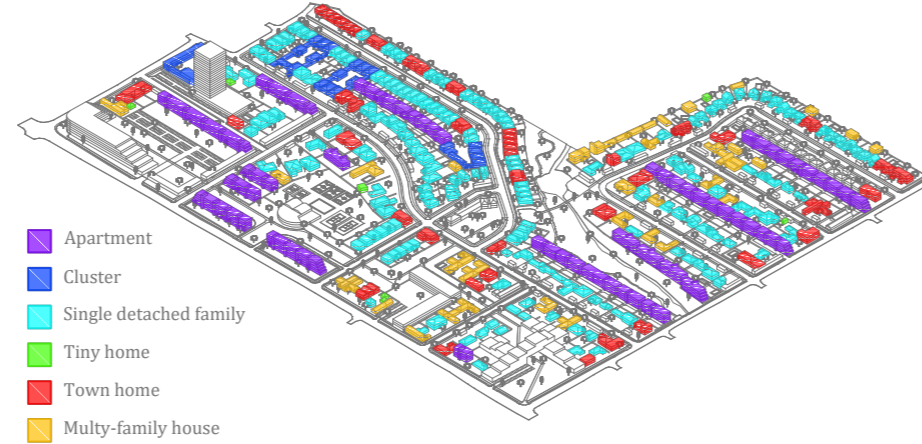


### 9.8 Future visions achievements

Back to future visions which we have provided before generating our strategies for design, several diagrammatic and visual documents of our intervention area after implementing strategies, is provided to represent the achievement of our future visions for our intervention area.

These documents indicate that every 14 future visions we had before generating our strategies, has been achieved within our intervention area, after applying the 3 steps of strategies, and we reached to a sustainable high quality neighborhood in a sprawl suburban area, with a doable and realistic way of intervention.

1. A neighborhood with an available broad range of housing types and price levels to bring people of different ages, races, and income into daily interaction for a diverse community



9.51 Future vision 1 achievement document

2. A neighborhood with a concentration of civic, institutional, and commercial activities in important sites To increase the value of the neighborhood and reduce distances



9.52 Future vision 2 achievement document

3. A neighborhood with various kinds of job opportunities within walking distance of residents of every strength and ability level of the community



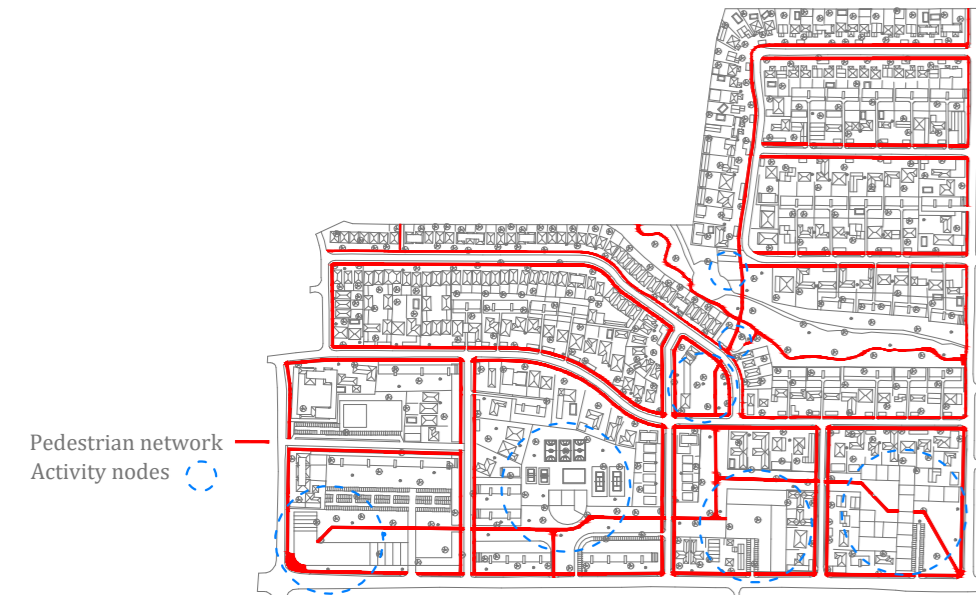
9.53 Future vision 3 achievement document

4. A pedestrian friendly neighborhood where daily activities occur within walking distance Especially for children and elderly

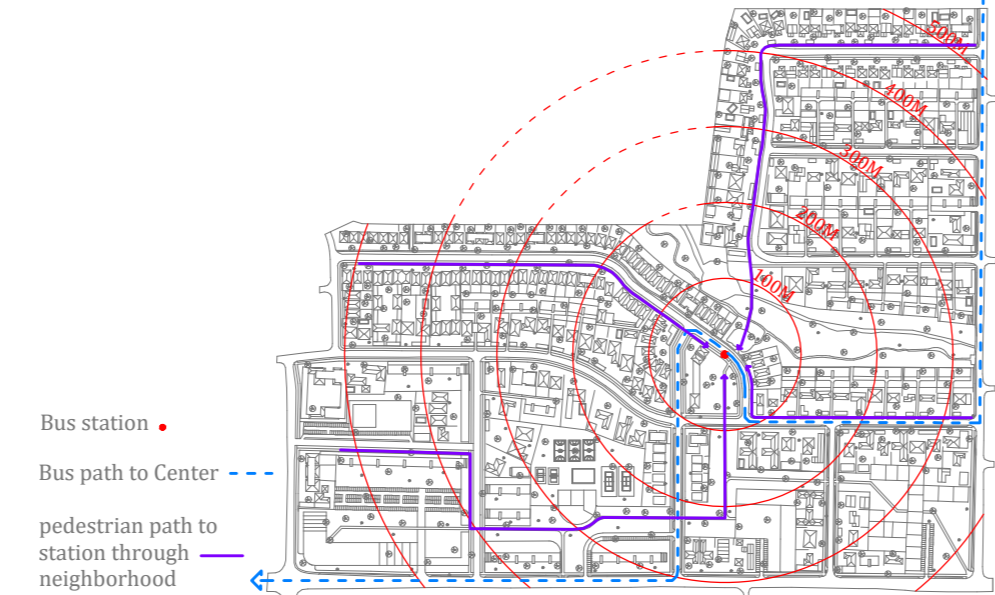
5. A neighborhood with available transit stops within walking range To be an alternative to personal vehicles

6. A neighborhood with a various range of greeneries from parks, to play grounds, to community gardens, to be accessed by walking or cycling for residents

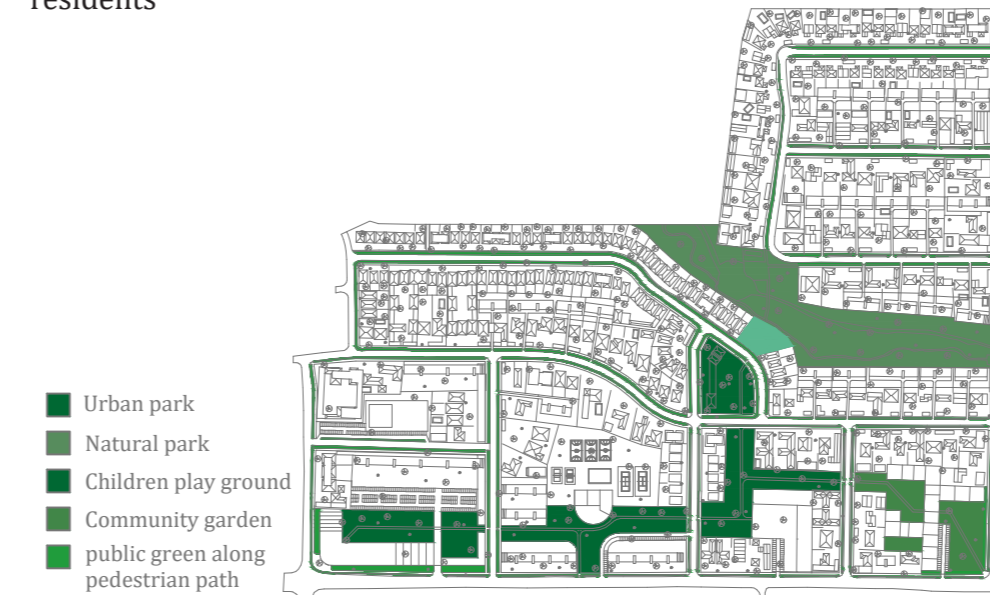
7. A neighborhood with various public places for gathering neighbors from every age to improve community identity and social reinforcement



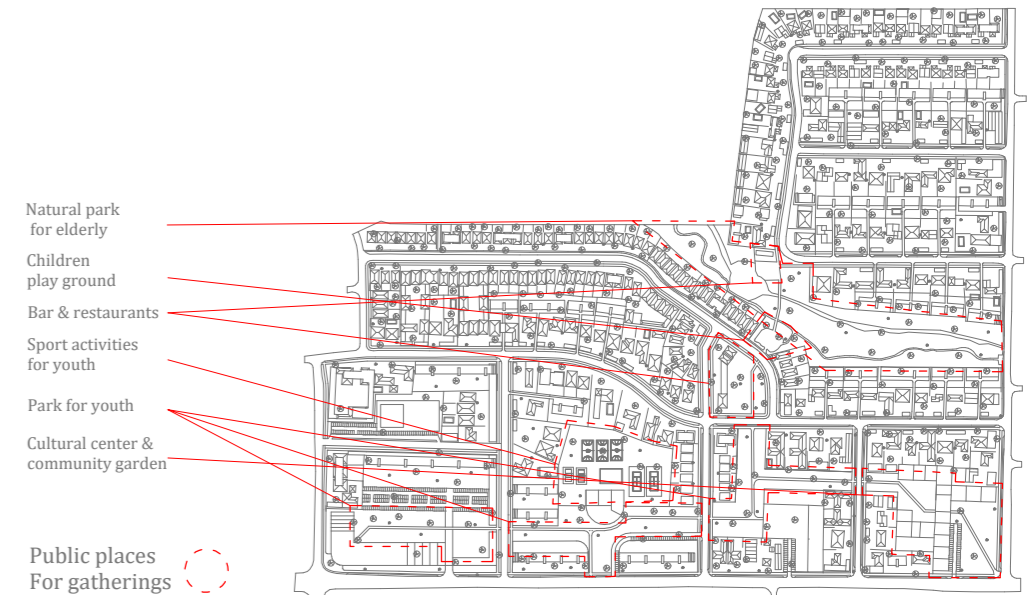
9.54 Future vision 4 achievement document



9.55 Future vision 4 achievement document



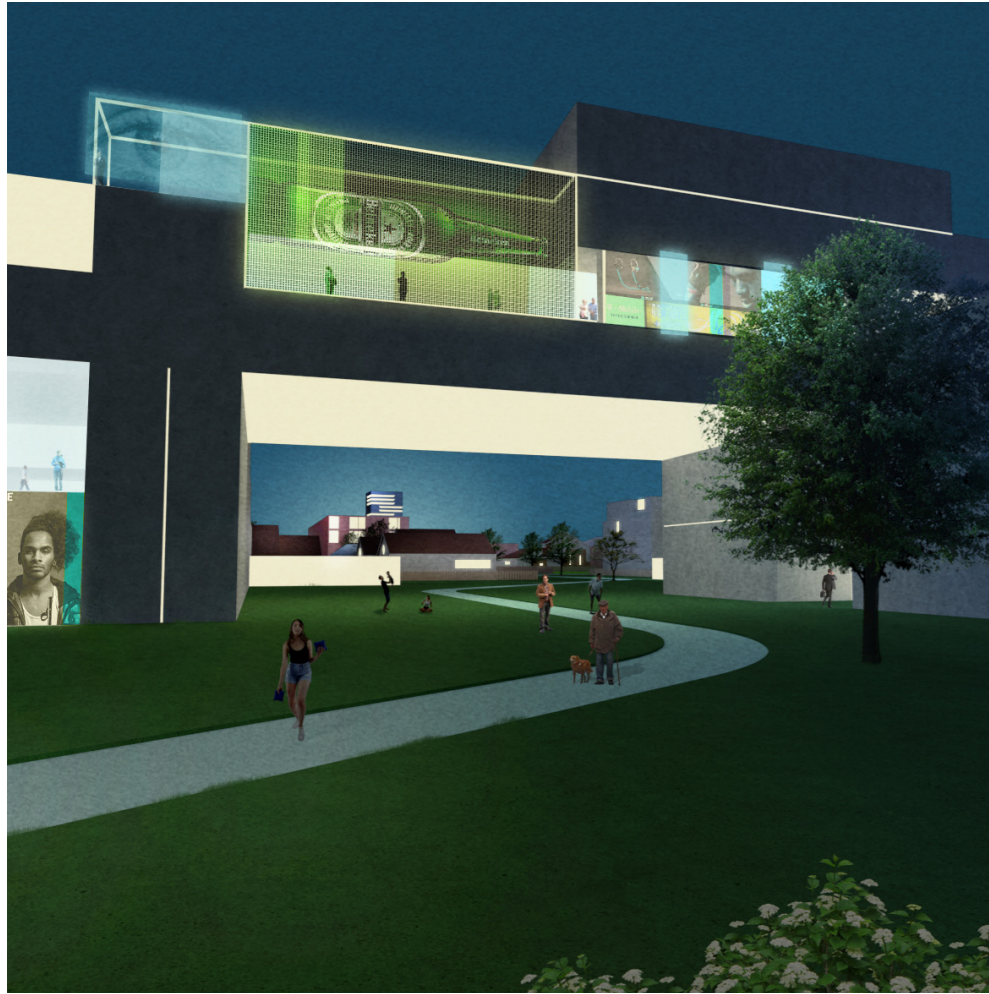
9.56 Future vision 6 achievement document



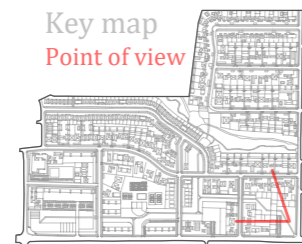
9.57 Future vision 7 achievement document



8. An Identifiable neighborhood To motivate locals to take responsibility Of their maintenance and evolution



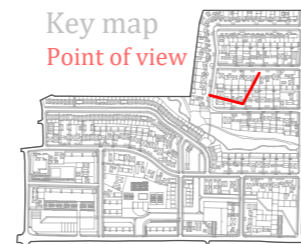
9.58 Future vision 8 achievement document



9. A neighborhood with usage of renewable energies and energy saving architectural elements



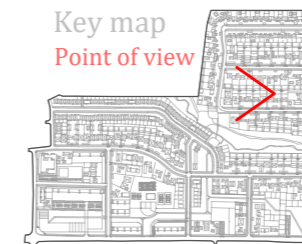
9.59 Future vision 9 achievement document



10. A dense and compact neighborhood with strong social bonds and daily interaction between neighbors



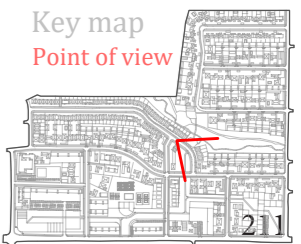
9.60 Future vision 10 achievement document



11. A neighborhood with interesting and comfortable squares and streets For pedestrians to know each other and protect their community



9.61 Future vision 11 achievement document

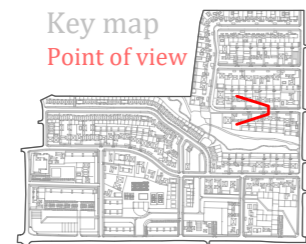




12. A neighborhood with a precise design of streets and corridors  
For a safe and secure community



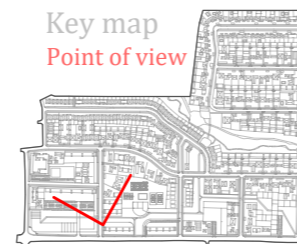
9.62 Future vision 12 achievement document



13. A neighborhood with corridors and passages with close relation to nature,  
in everyday commuting of residence to improve mental health



9.63 Future vision 13 achievement document





## 9.9 Achievement of the Project

Revitalization of any neighborhood needs precise research and analysis on it before deciding what to do with it, and suburban neighborhood are not exception. Many factors and indicators were involved in the story behind an urbanized area in its history, which has to be studied well to understand the characteristics of the neighborhood and where they came from, and for what reason. Many indicators play important roles in understanding the characteristics of an area's urban scale, neighborhood scale, and architectural scale, including history, economic issues, cultural issues, density, diversity, and so on.

Understanding the characteristics of an area by studying every factor that had an impact on the area during its history will help us to understand the current situation of the area, why this situation happened and how, and also how to solve its problem and take advantage of its potential. For example, in our case, due to researches, we saw the footprint of sprawl development in our case study city, which was the greater Toronto area, and after getting familiar with what sprawl is, what are its general causes, why it happened in Toronto, and what are the consequences of sprawl development due to analysis phase, we understood that the sprawl developments inside Toronto is very different in each neighborhood. These differences are both in terms of intensity and in terms of reasons for the existence of its footprint in each generation of the city.

Understanding the exact characteristics of sprawl in each generation and its reason clarified the fact, why usually architects and urbanism cannot confront sprawl after half a century of effort in the best possible way.

We define three main problems considering our research and analysis and several previous recent studies.

1. The majority of studies take a broad view of sprawl, and all studies in America, Canada, or Europe are similar in different contexts. However, the characteristics of sprawl in any city, or even in its various neighborhoods, differ due to the economy, environment, culture, and diversity of the city.

The sprawl that occurred in each city or neighborhood of each city may have been different as a result of these factors, and the answer to them will be different as well. As a result, the term "sprawl" is very broad and may have multiple definitions in each area. Then we won't be able to answer multiple questions with a single answer.

2. Aside from the fact that we cannot solve all of the world's sprawling developments with a single similar tool, it is also because we are not using a significant manifesto about what the characteristics of a good neighborhood are, which causes us to be confused about what the goals are to achieve before we get to our tools.

3. The final issue is that most of the suggested tools and strategies are more likely a pipe dream, namely that sprawl in a neighborhood can be solved in one year with one program, a design program to demolish every house and its infrastructure and build a new high density beautiful neighborhood with a high rate of sustainability.

The answer to the first problem could be all of the research and analysis done in previous phases to understand why sprawl occurs in each area of the GTA and what type of sprawl it is. Finally, these differences highlight the fact that the strategy and tools for dealing with sprawl must be tailored to each neighborhood based on the reasons for the sprawl's occurrence.

The answer to the second problem can be to use "THE NEW URBANISM" manifesto as the definition of a well design and sustainable neighborhood. We will use its principles as our base and reframe it considering context characteristics and local demands.

The solution to the third problem can be a more realistic point of view, attempting to define a step-by-step strategy to be implemented over time, understanding that it is not possible to demolish everything and design whatever we believe is good, and having plans for the near future, middle future, and far future to remove sprawl consequences of an area of intervention and achieve sustainability slowly.

We defined some principles in order to have an ideal sustainable neighborhood after understanding the main problems in confronting sprawl and defining solutions to them. As previously stated, the foundation of these principles was derived from "THE NEW URBANISM," which was reframed in light of the significant characteristics of the context and the demand of the locals.

According to the reframed principle, several visions for the intervention area are defined considering the present conditions within the intervention area, their problems, and their potential. In order to reach this vision of an ideal and sustainable neighborhood, some strategies have to define, and according to the answer to one of the main problems of confronting sprawl, the strategies have to be defined in a planned order with a precise schedule to be realistic and doable.

After applying defined strategies in the correct order, starting from small and low cost strategies as near future strategies in the first year, and continuing the revitalization by medium size and more expensive strategies as middle future strategies, and finalized by big strategies such as adding shopping center and cultural center to the neighborhood, which is possible only after existence of needed motivation and infrastructure, The quality of the neighborhood will clearly change in all environmental, economical, social, and cultural terms.

Simple statistics can testify to the improvement of the quality of the neighborhood by implementation of these strategies. For example: The total number of dwelling units will increase from 240 to approximately 860 during this ten years of strategies in the neighborhood, and according to the area of the neighborhood, which is equal to 53.4 hectares, the population density will increase from 4.5 dwelling units per hectare to 16.1 dwelling units per hectare.

The job opportunities that exist inside the neighborhood will increase from zero to about 400 jobs in different fields, and the number of units that can access public transit by walking in less than 5 minutes will increase from 110 to 860 (every units of the neighborhood).

Another important change that will happen during the 10 years of revitalization of the neighborhood is the versatility of housing types which is only single detached family housing at the moment that will also include apartments, clusters, town homes, multi family houses, and tiny homes for every age and classification of the society, and many other statistics that shows the improvement.

The important point is that the timing and order of the strategies is very crucial. Reaching these qualities is not possible in one year, and the risk of any future global incident does not let plans to be logic for more than 10 years. A global incident is similar to the global pandemic which we are struggling with today and it was not forecast in any plan before it happened and affected human life.

The project's achievement is not just this ideal sustainable neighborhood as the project's outcome; the outcome of this neighborhood must be considered only a small example of how to revisit sprawl. The defined strategies that we propose for this neighborhood can be applied to any other neighborhood with similar characteristics, with some minor adjustments based on the conditions in that neighborhood.

The main achievement of the project is to define the correct process of revisiting sprawl, how to deal with it, and how to offer strategic design for revitalization of suburban neighborhoods, which are affected by sprawl development, and its consequences.



### 9.10 Architectural Scale Example

In this step, we will design an architectural scale project as an example of our strategies within our intervention area.

This project will directly follow the main strategies we have generated on a bigger scale and will be just a hypothetical example of understanding the achievements of the projects also on a smaller scale.

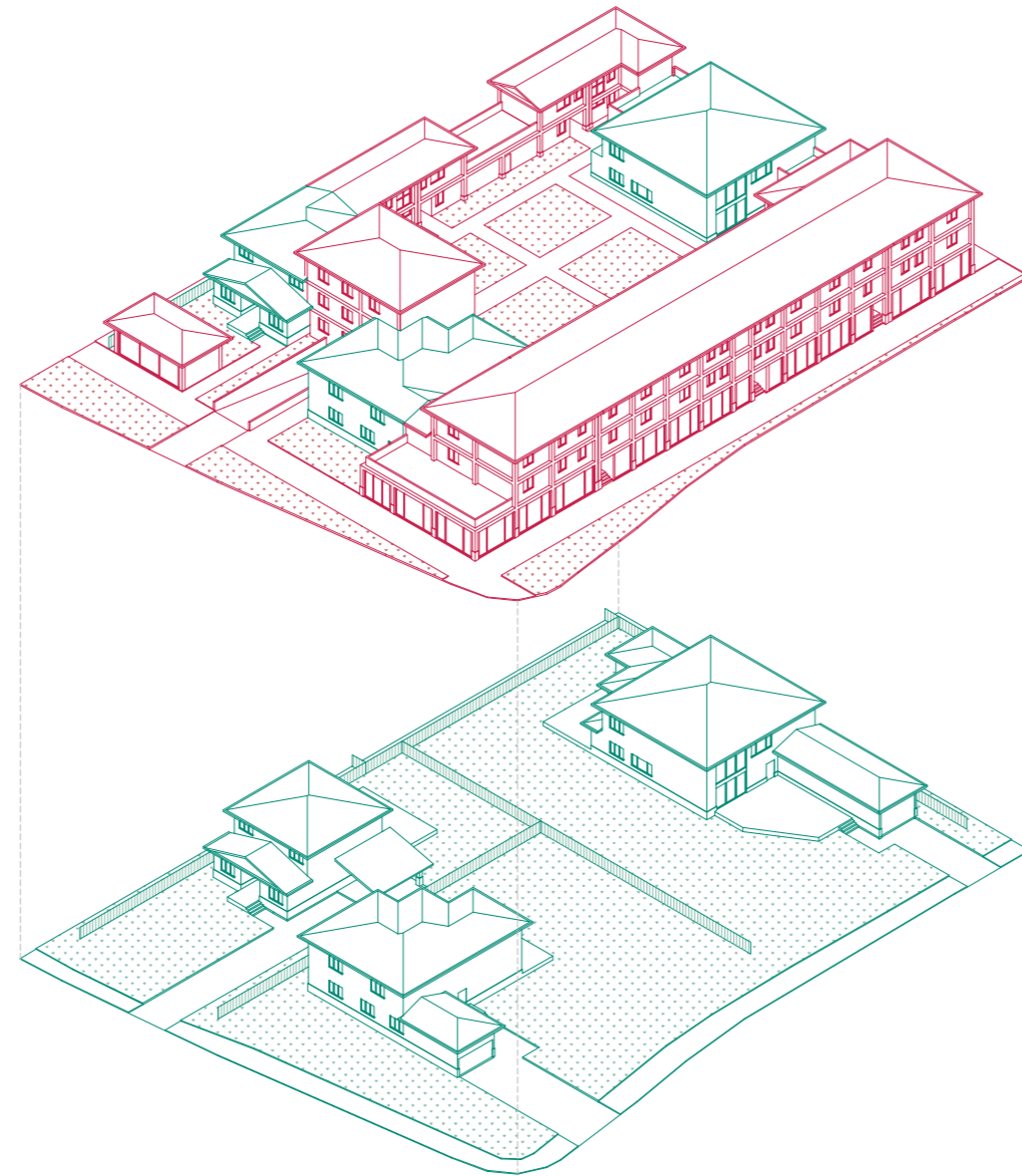
By designing a project on an architectural scale, besides proving that these strategies are doable in terms of construction, we can see the Improvements after implementing our strategies on a smaller scale, both visually and statistically.

Before going to project, we generate 3 main construction practice including: adding top attached unit(s), adding side attached unit(s), and adding independent detached units. Every built up interventions in our project will be one of these constructions types or a more complex combination of them.

After generating the main practical construction, and redrawing Technical documents of the existing situation of our site, we divide our intervention into 6 phases, which besides reducing the disturbance for neighbors will make the project more doable and more realistic to be done step by step.

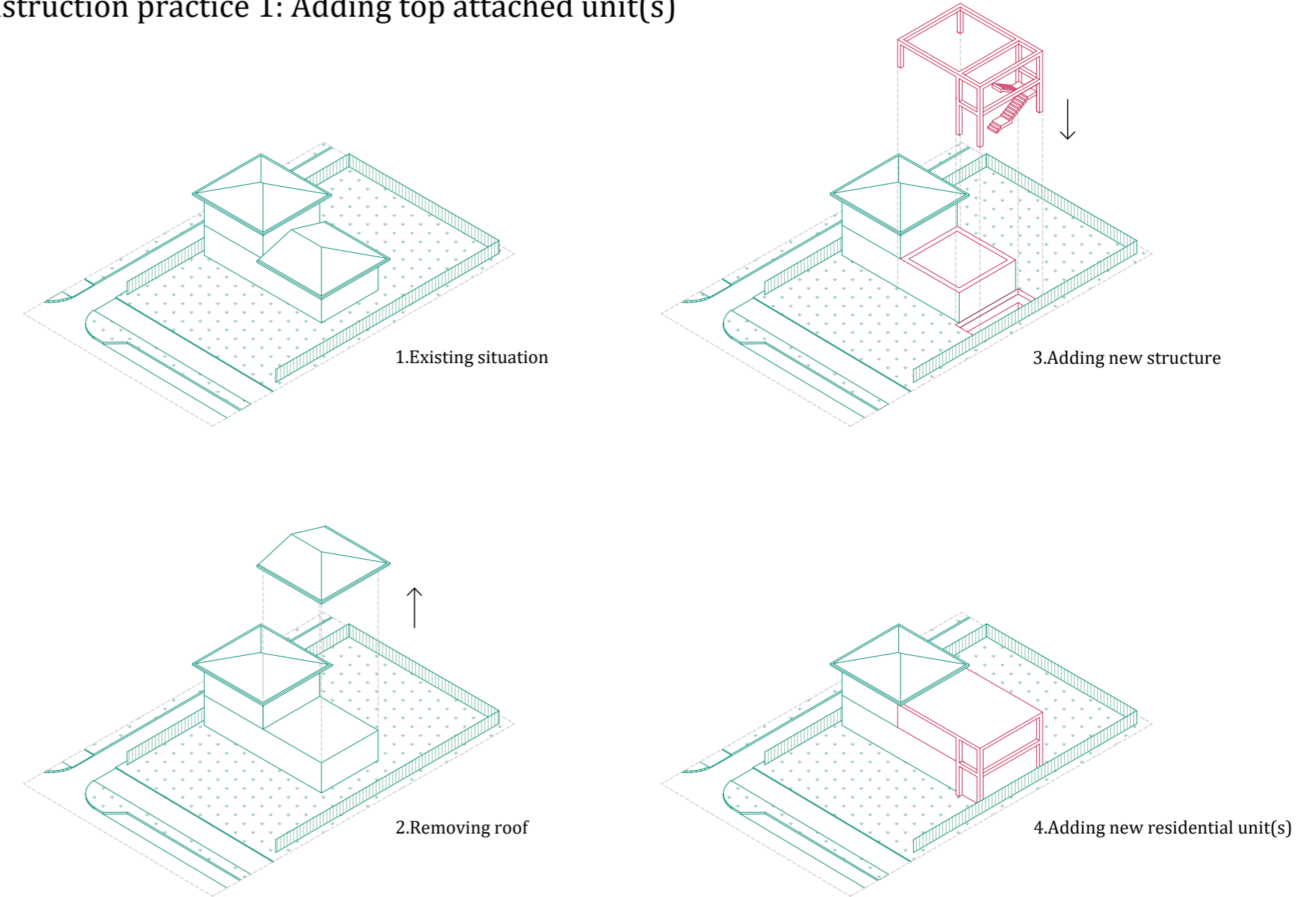
And In the end, technical documents of the outcome of the project have been provided, and by comparing the visual and statistical Characteristics of the existing situation and the outcome, the improvements and changes after implementing our strategies will become clear in architectural scale.

The new project will follow the architectural style of the neighborhood in terms of dimensions, structure, materials, and appearance, because of its close relationship with existing buildings.



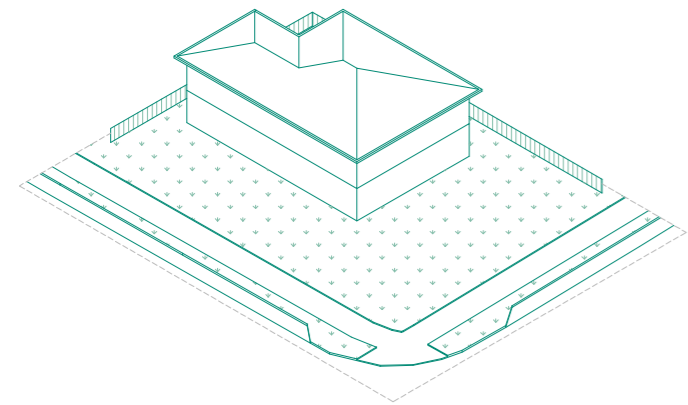
9.64 Architectural scale example, Introduction to the project

### Construction practice 1: Adding top attached unit(s)

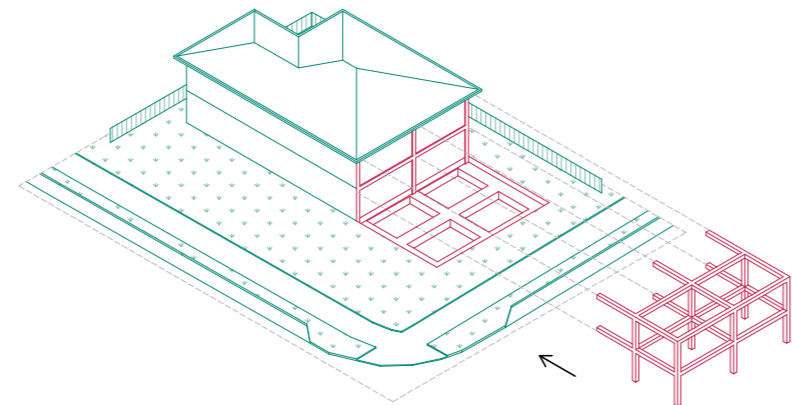


9.65 Construction practice 1: adding top attached unit(s)

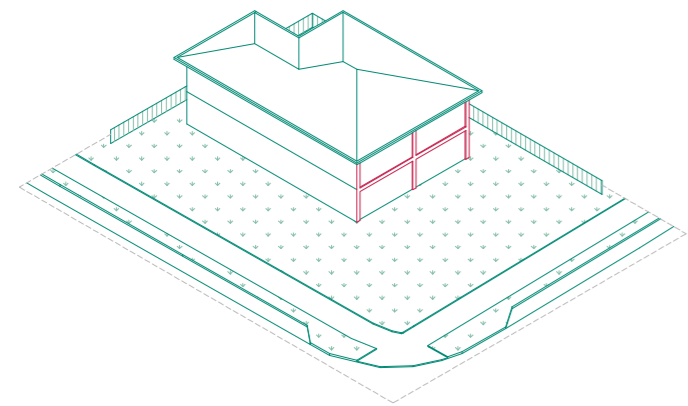
## Construction practice 2: Adding side attached unit(s)



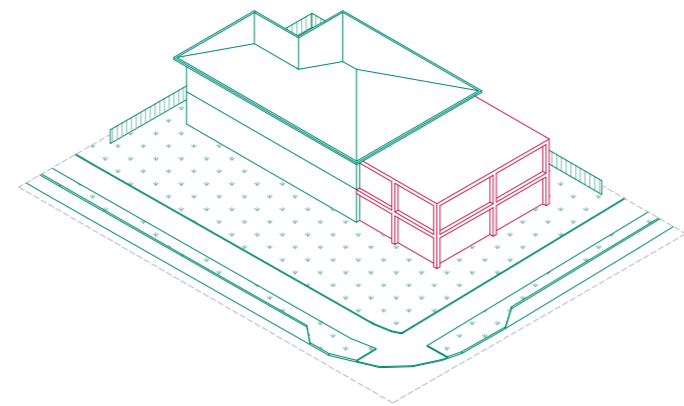
1.Existing situation



3.Adding new structure

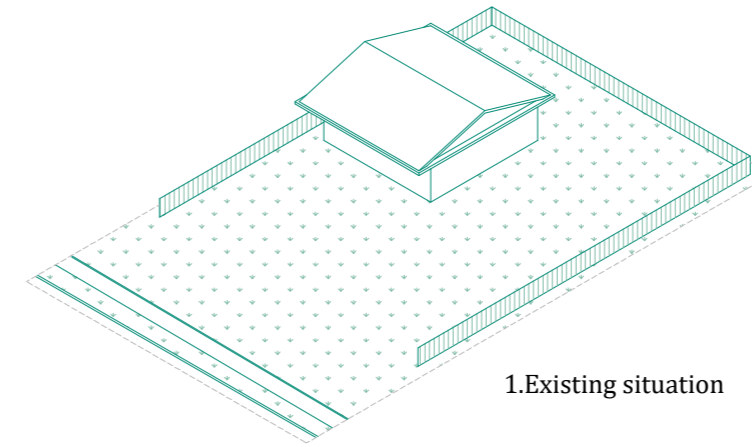


2.Removing Facade material from existing structure

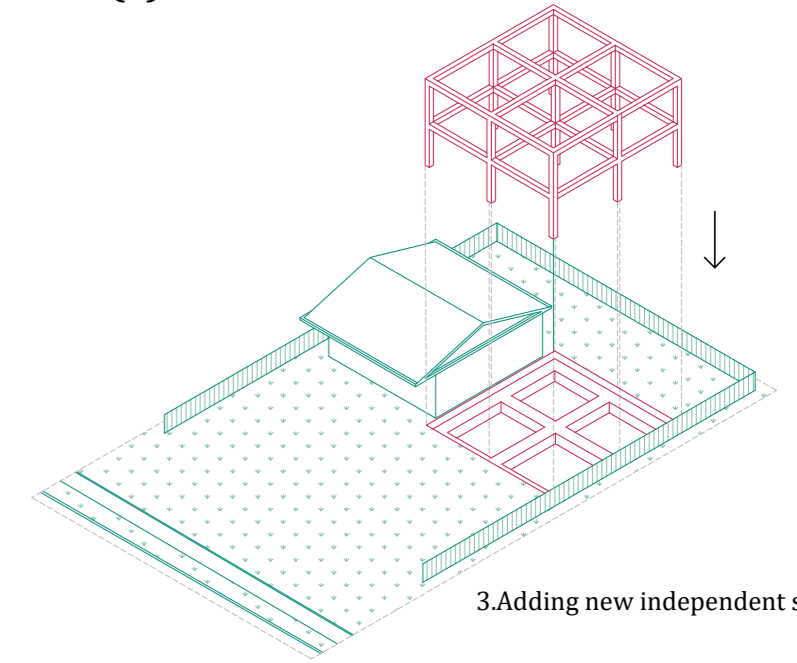


4.Adding new residential unit(s)

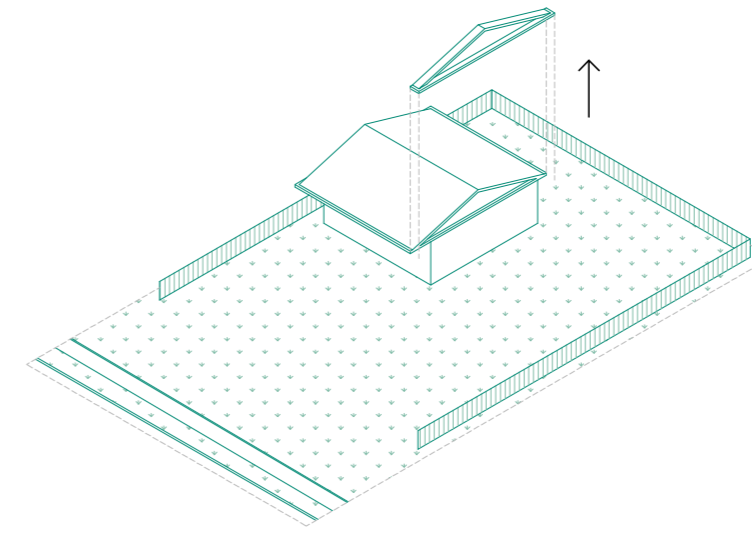
## Construction practice 3: Adding independent detached unit(s)



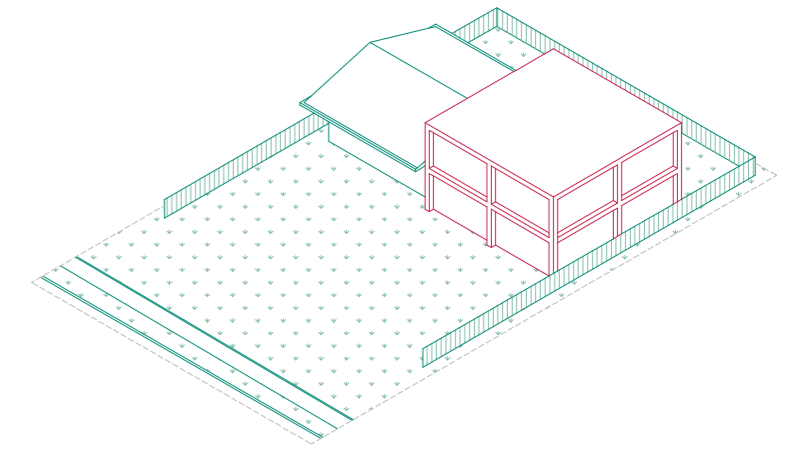
1.Existing situation



3.Adding new independent structure



2.Removing Extra part of the roof



4.Adding new residential unit(s)

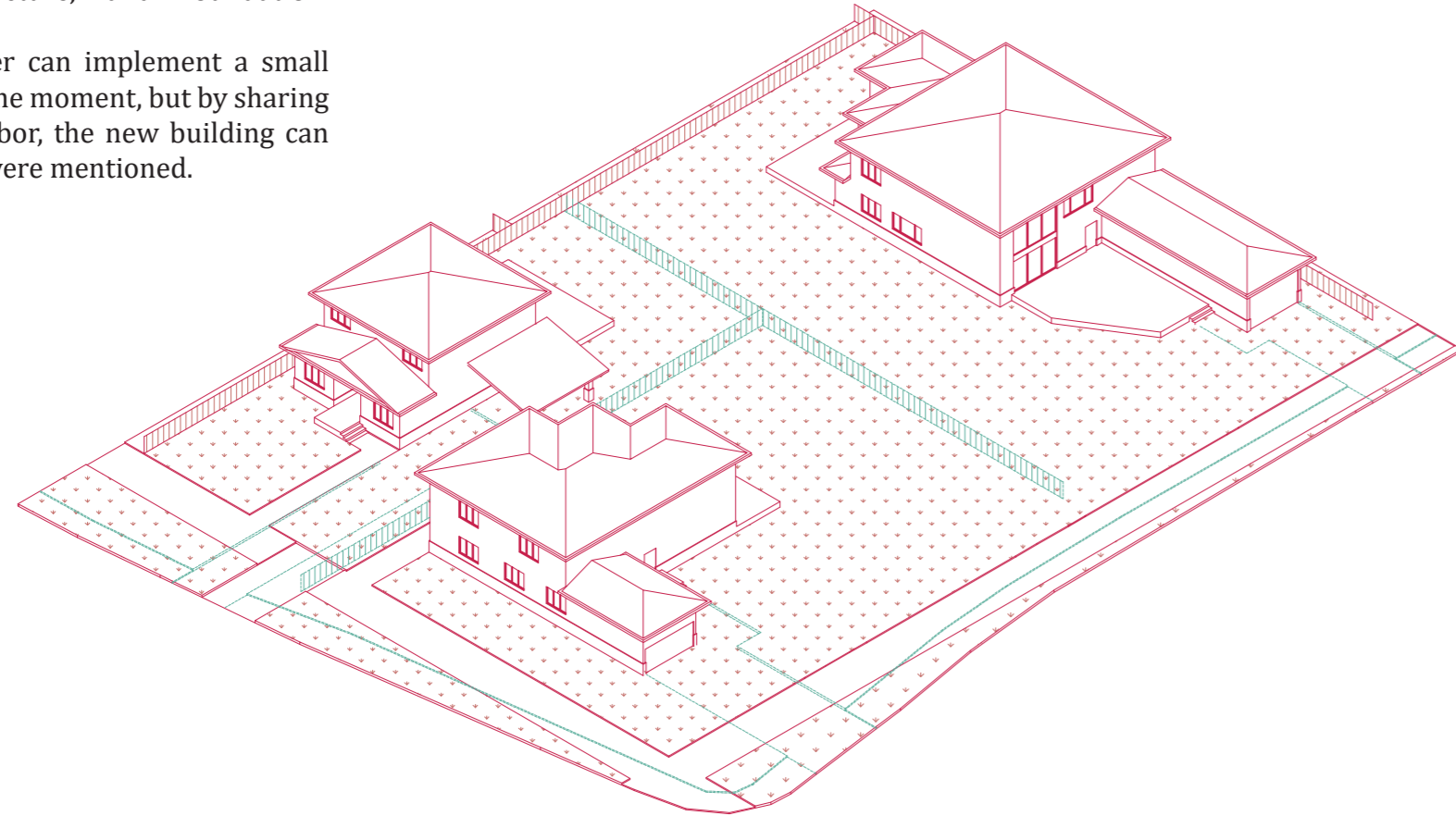


## Phase 1: Correction of site

In the first phase of intervention, the divisions within the site have to be removed, to reach a bigger plot for future development.

This removing division will also bring considerable economic benefit for the owners, because it provides the opportunity of future development with shared expenses of fixed cost of construction, including: parkings, staircases, structure, and foundation.

In other words, each owner can implement a small building in his backyard at the moment, but by sharing his/her land with its neighbor, the new building can use shared services which were mentioned.



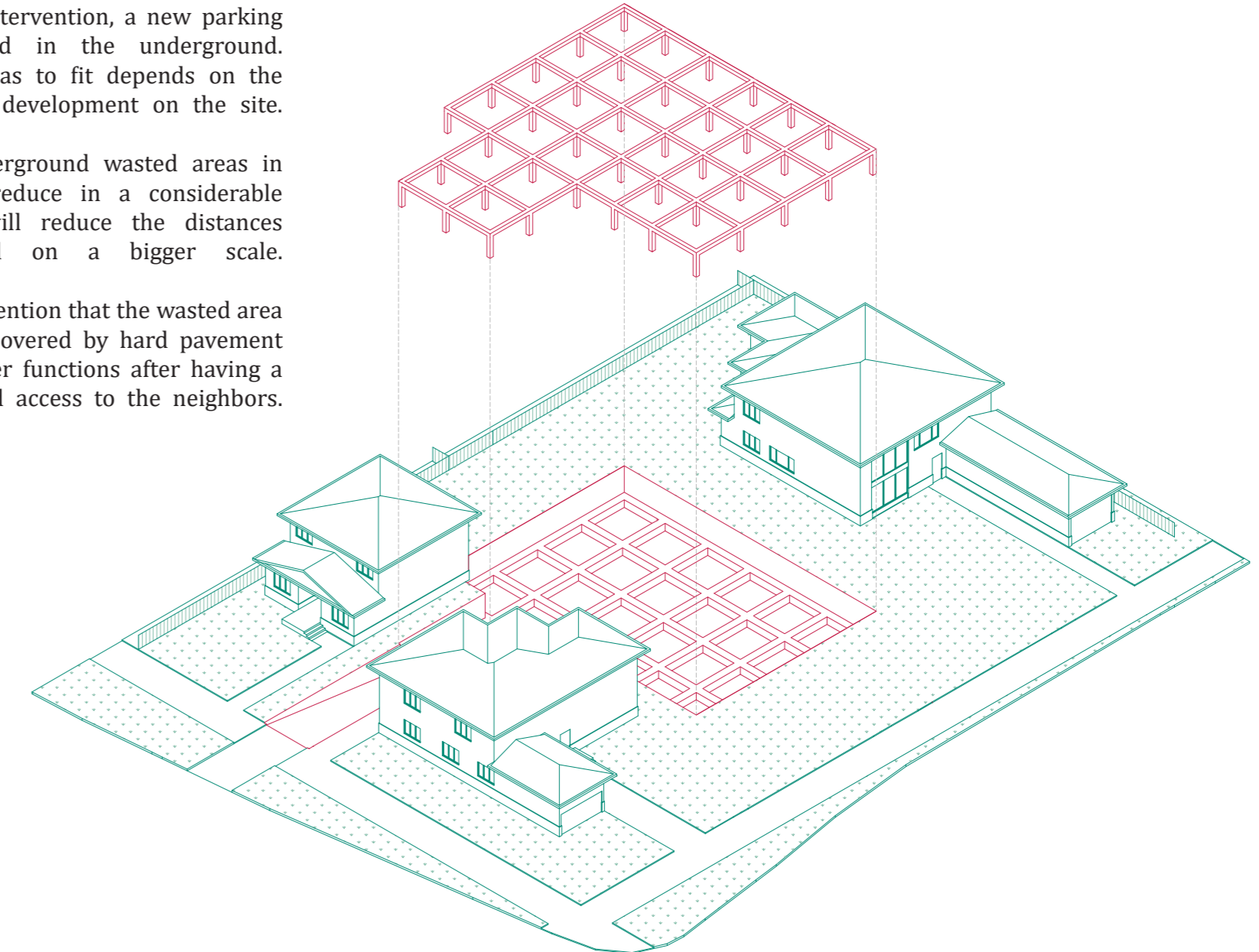
9.68 Intervention phases, phase 1: Correction of site

## Phase 2: Construction of parking in basement

In the second phase of intervention, a new parking has to be implemented in the underground. The number of cars it has to fit depends on the estimation of the future development on the site.

Moving the parking underground wasted areas in the neighborhood will reduce in a considerable way, and this action will reduce the distances in every neighborhood on a bigger scale.

There is also no need to mention that the wasted area for circulation, which is covered by hard pavement now can be used for other functions after having a shared parking with good access to the neighbors.

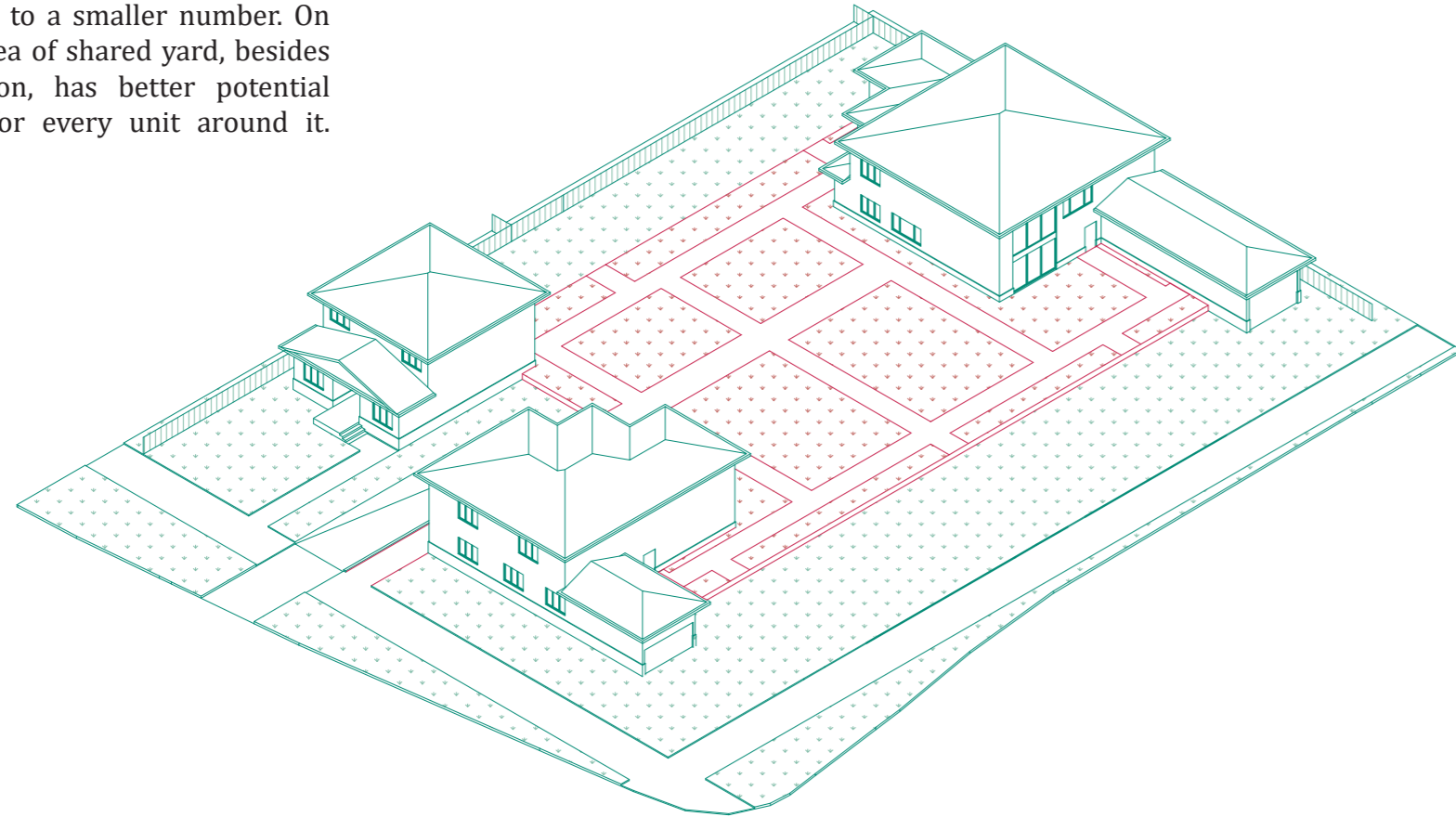


9.69 Intervention phases, phase 2: Construction of parking under ground

### Phase 3: Reorganize circulation and greeneries

The backyards of the houses at the moment are not in good condition in terms of appearance and usage. This situation is because the time, energy, water, and expenses needed for maintenance of such a big backyard cannot be provided by just one family in a suburban area.

After building new units on the site, this area will be used by much more number of families and all the prices will break down to a smaller number. On the other hand, a bigger area of shared yard, besides increasing social interaction, has better potential to provide a good view for every unit around it.

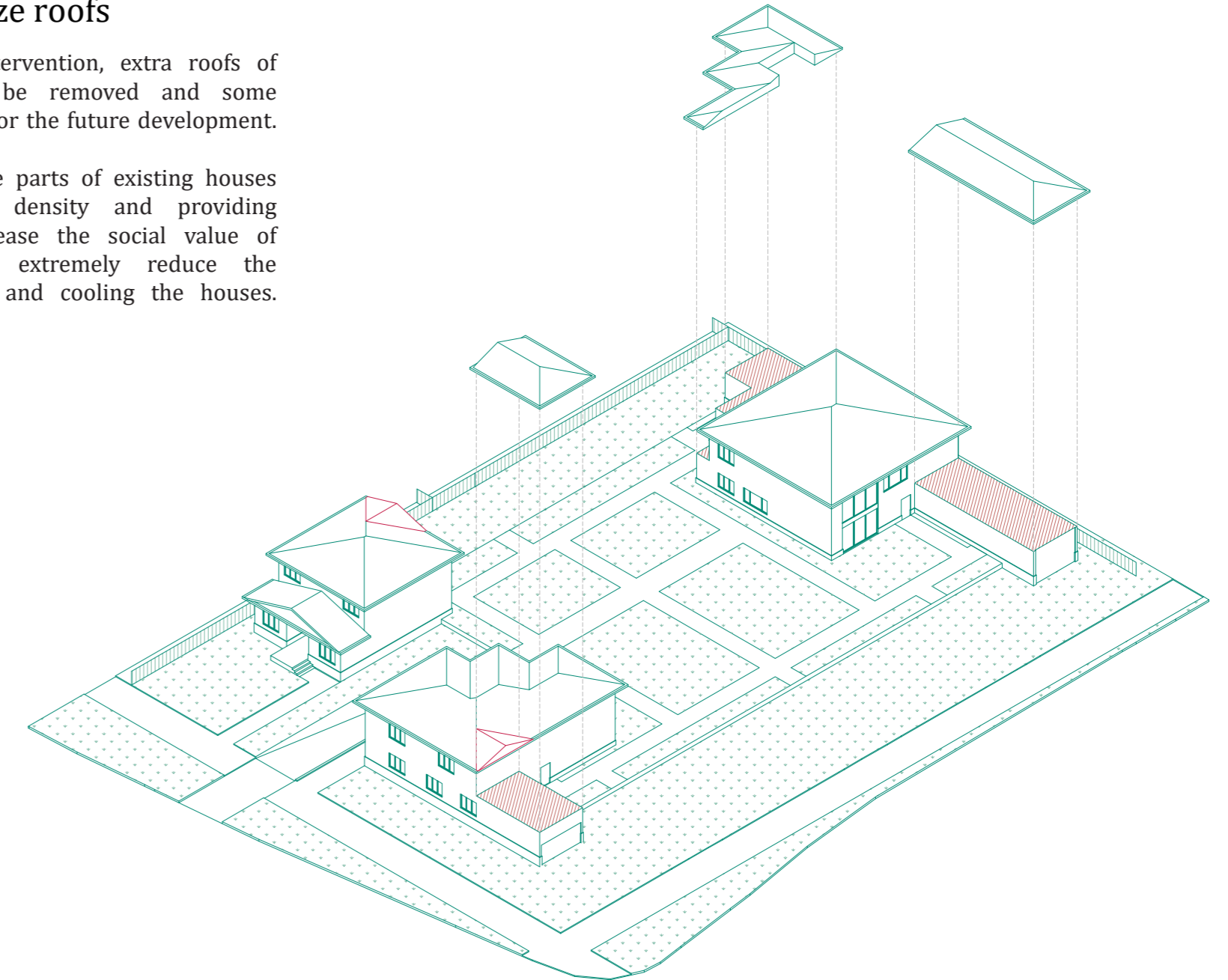


9.70 Intervention phases, phase 3: Reorganize Circulation and greeneries

### Phase 4: Reorganize roofs

In the 4th phase of intervention, extra roofs of existing buildings will be removed and some extensions will be added for the future development.

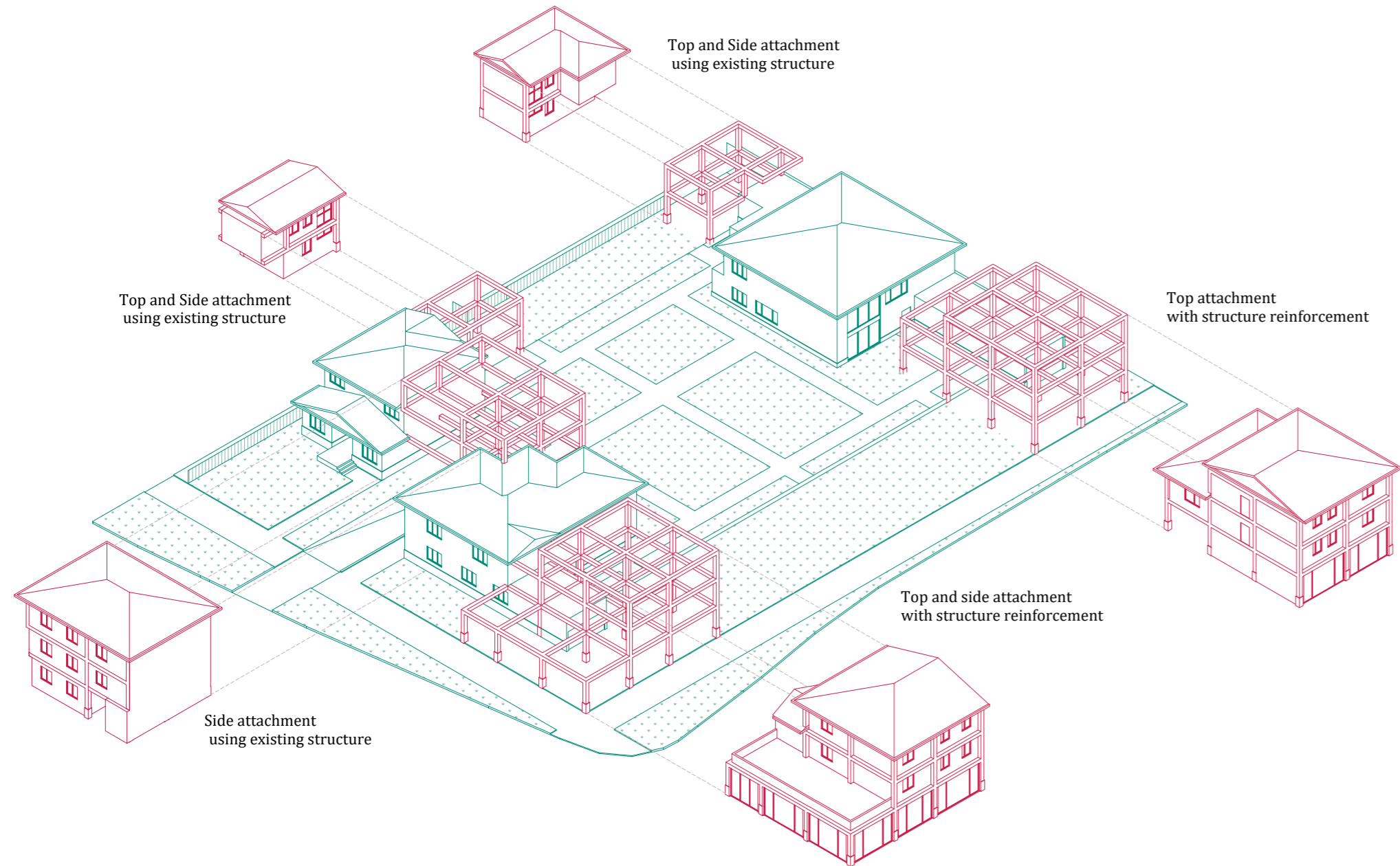
Covering the top of some parts of existing houses besides increasing the density and providing the opportunity to increase the social value of the neighborhood will extremely reduce the energy usage of heating and cooling the houses.



9.71 Intervention phases, phase 4: Reorganize existing roofs

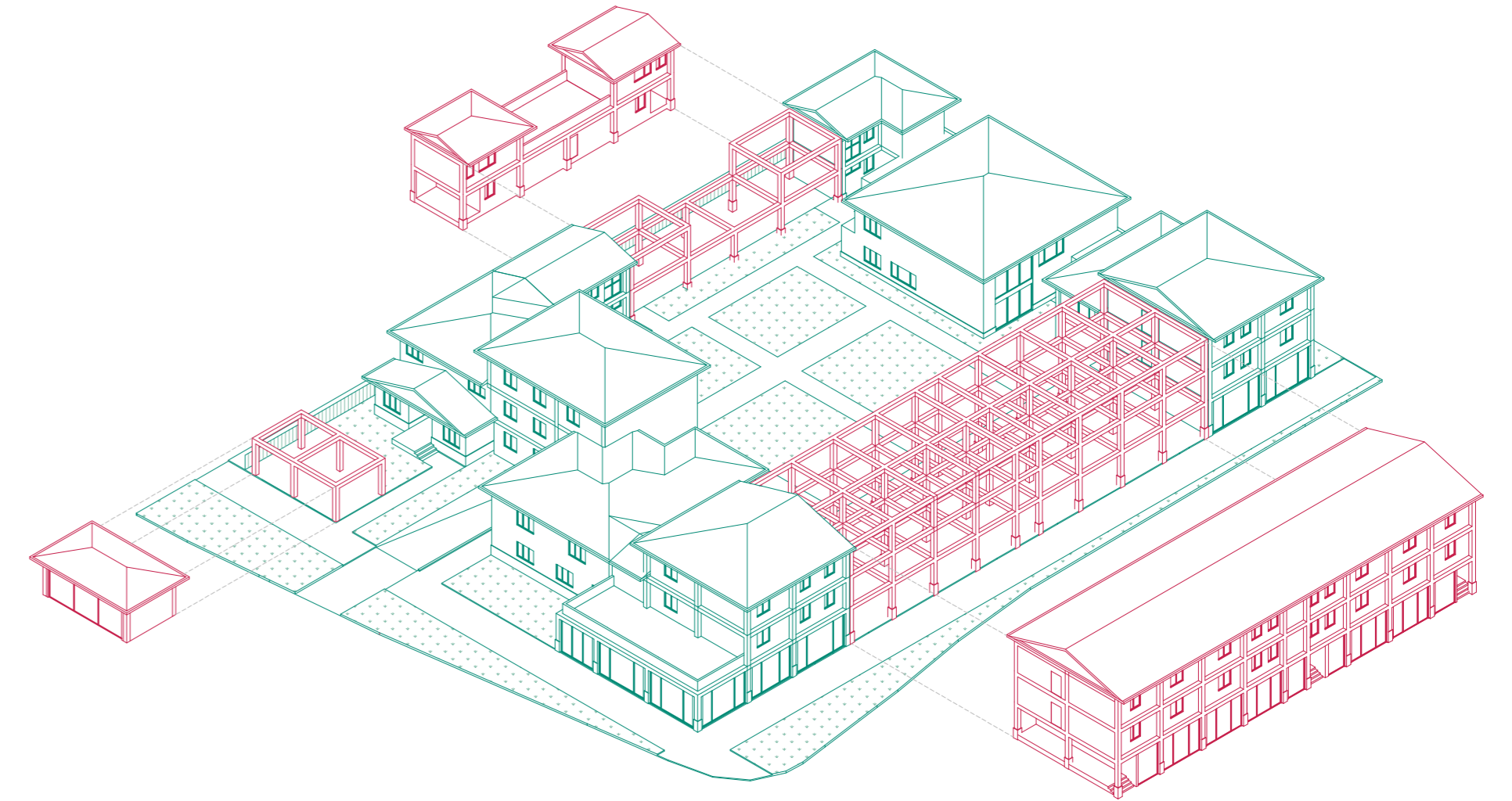


## Phase 5: Construction of attached buildings



9.72 Intervention phases, phase 5: Construction of attached buildings

## Phase 6: Construction of detached buildings



9.73 Intervention phases, phase 6: Construction of detached buildings



### Architectural Scale Sample

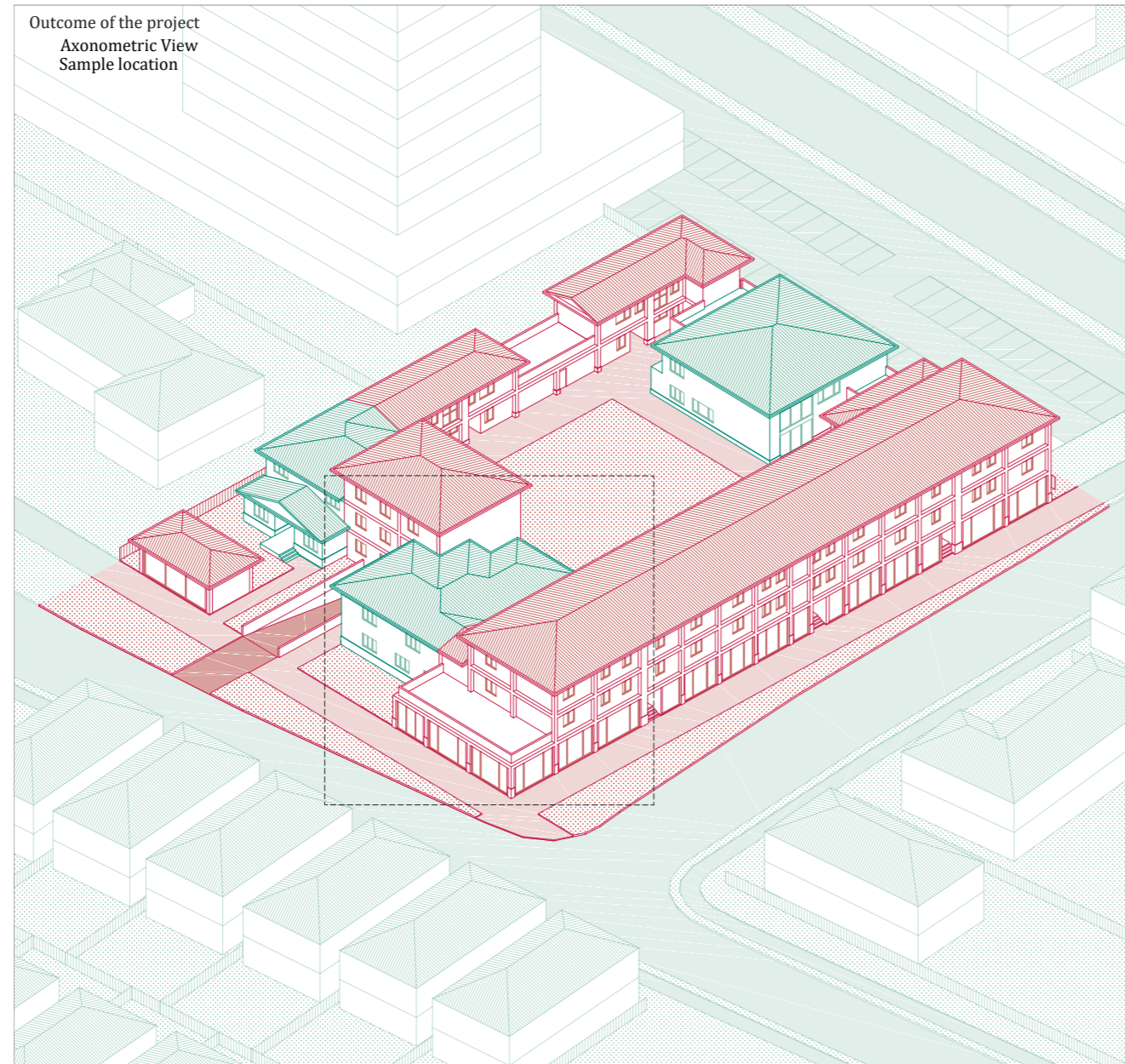
A small sample within our architectural scale example was chosen to show precisely the result of architectural intervention into a plot with existing buildings.

The sample has been chosen in a corner of the project with the most interaction with existing buildings, and with 2 types of our construction ways which are: adding side attached building, and adding independent detached building.

The main goal of these drawings is to indicate the critical relations between new buildings and existing buildings, and also the relation of new buildings with each other.

The drawings indicate the fact, by following the mentioned strategies, for revitalization sprawl neighborhoods, there is no need to demolish existing houses, and we can also take advantage of them to reach a dense, multi-functional sustainable neighborhood, even with fewer expenses.

There is no need to mention that using the existing structure and geometry of the neighborhood, besides reducing the cost of the new development, will also reduce the energy consumption of existing buildings and new developments in the future.

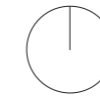


9.74 Outcome of the project, Axonometric view, sample location

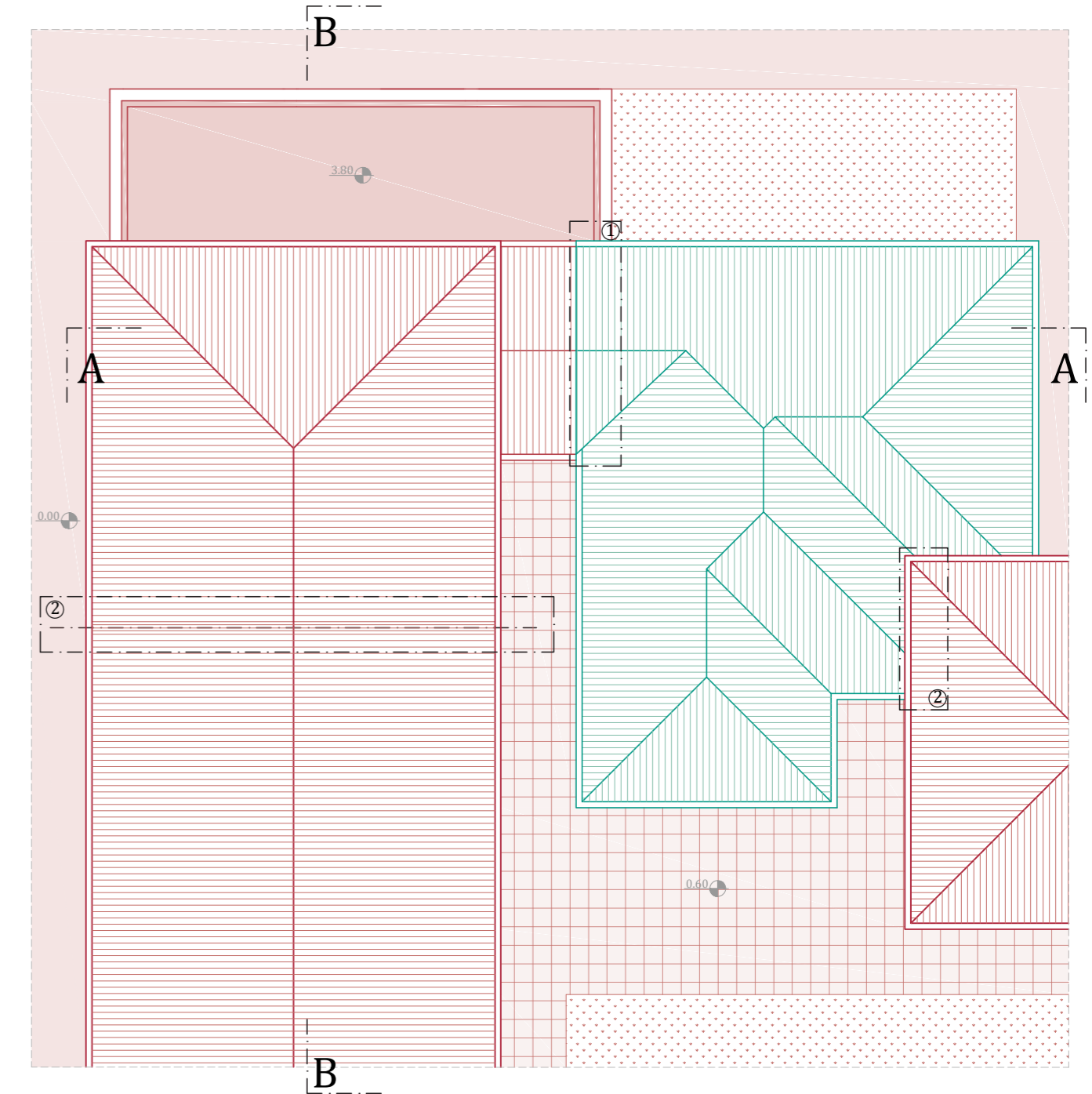
### Architectural scale sample

Site plan

Sc 1:200



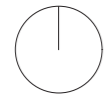
- 1: side attached buildings with structural reinforcement
- 2: Independent detached buildings with shared stair case



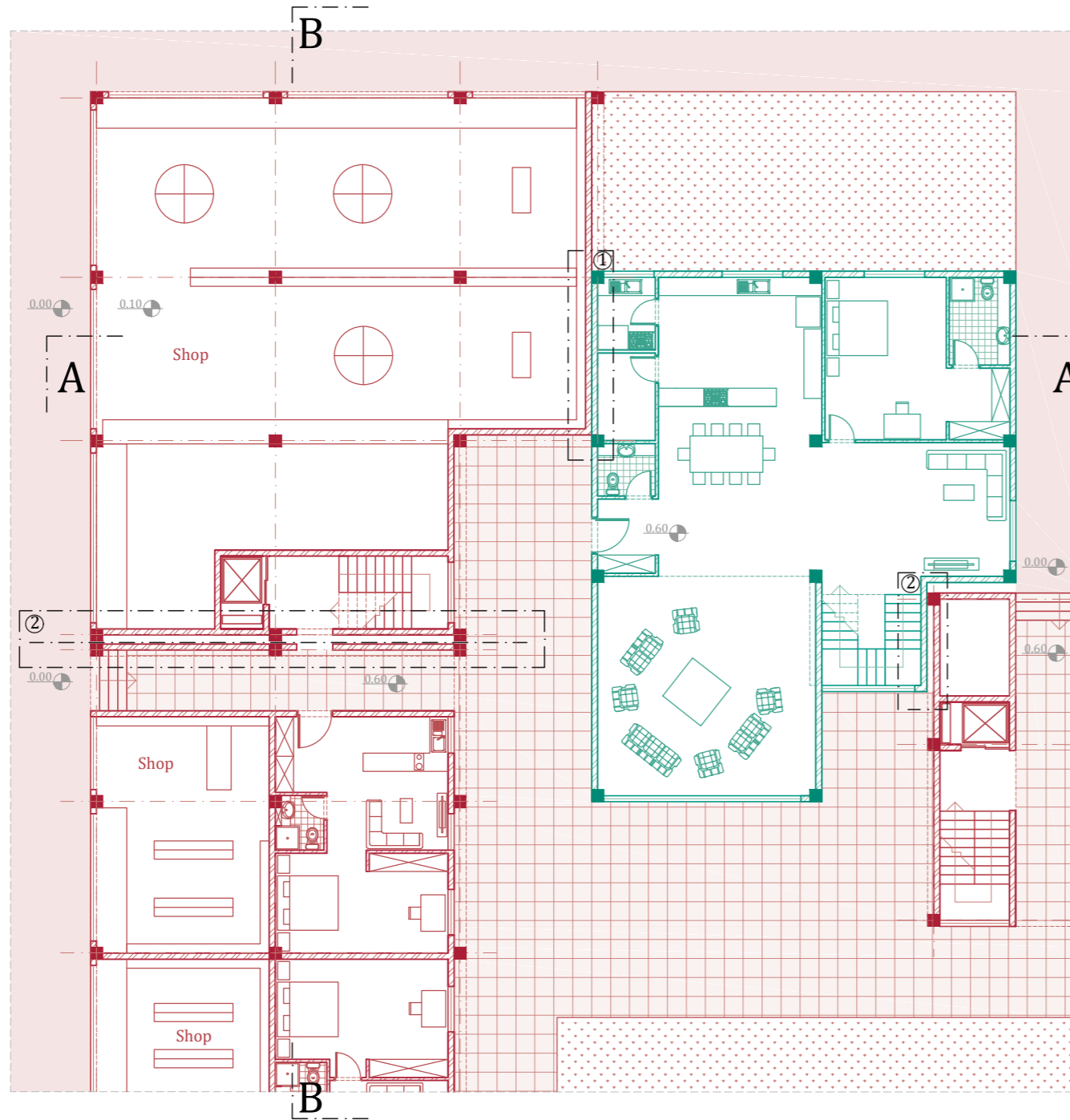
9.75 Architectural scale sample, site plan



Architectural scale sample  
 Ground floor plan  
 Sc 1:200



- 1: side attached buildings with structural reinforcement
- 2: Independent detached buildings with shared stair case

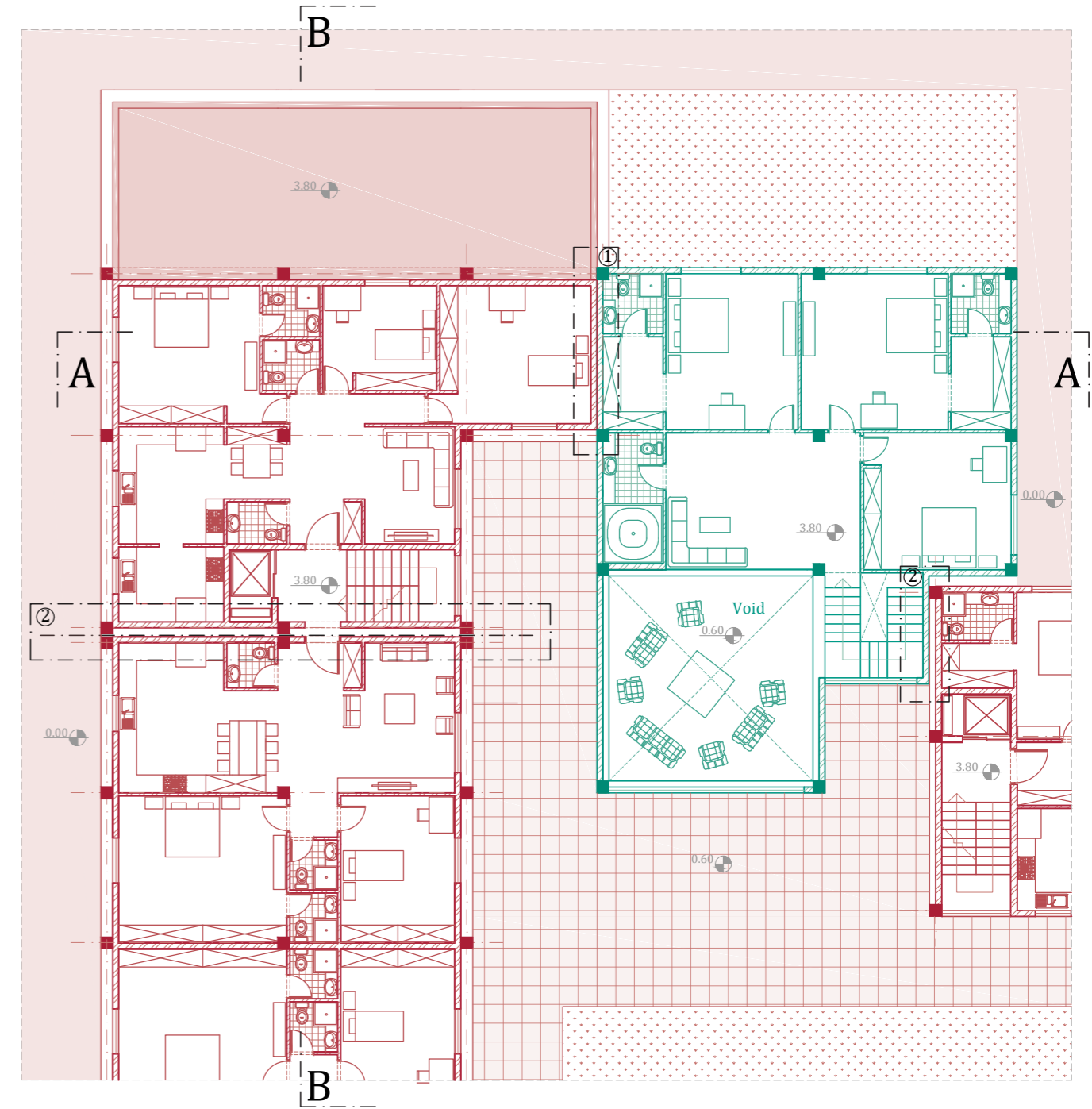


9.76 Architectural scale sample, Ground floor plan  
 228

Architectural scale sample  
 First floor plan  
 Sc 1:200

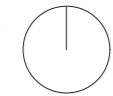


- 1: side attached buildings with structural reinforcement
- 2: Independent detached buildings with shared stair case



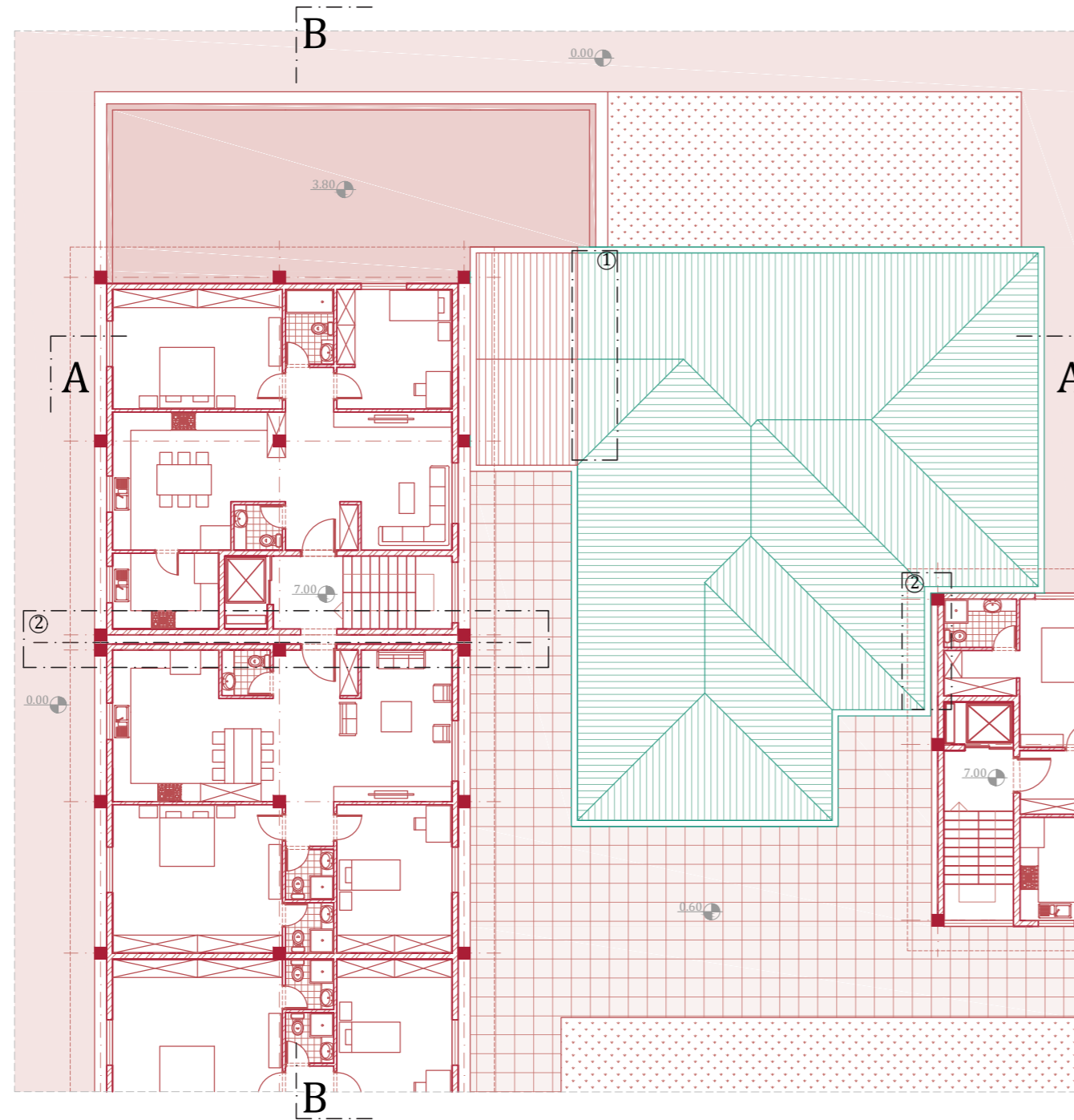
9.77 Architectural scale sample, First floor plan

Architectural scale sample  
second floor plan  
Sc 1:200



1: side attached buildings  
with structural reinforcement

2: Independent detached buildings  
with shared stair case



9.78 Architectural scale sample, Second floor plan

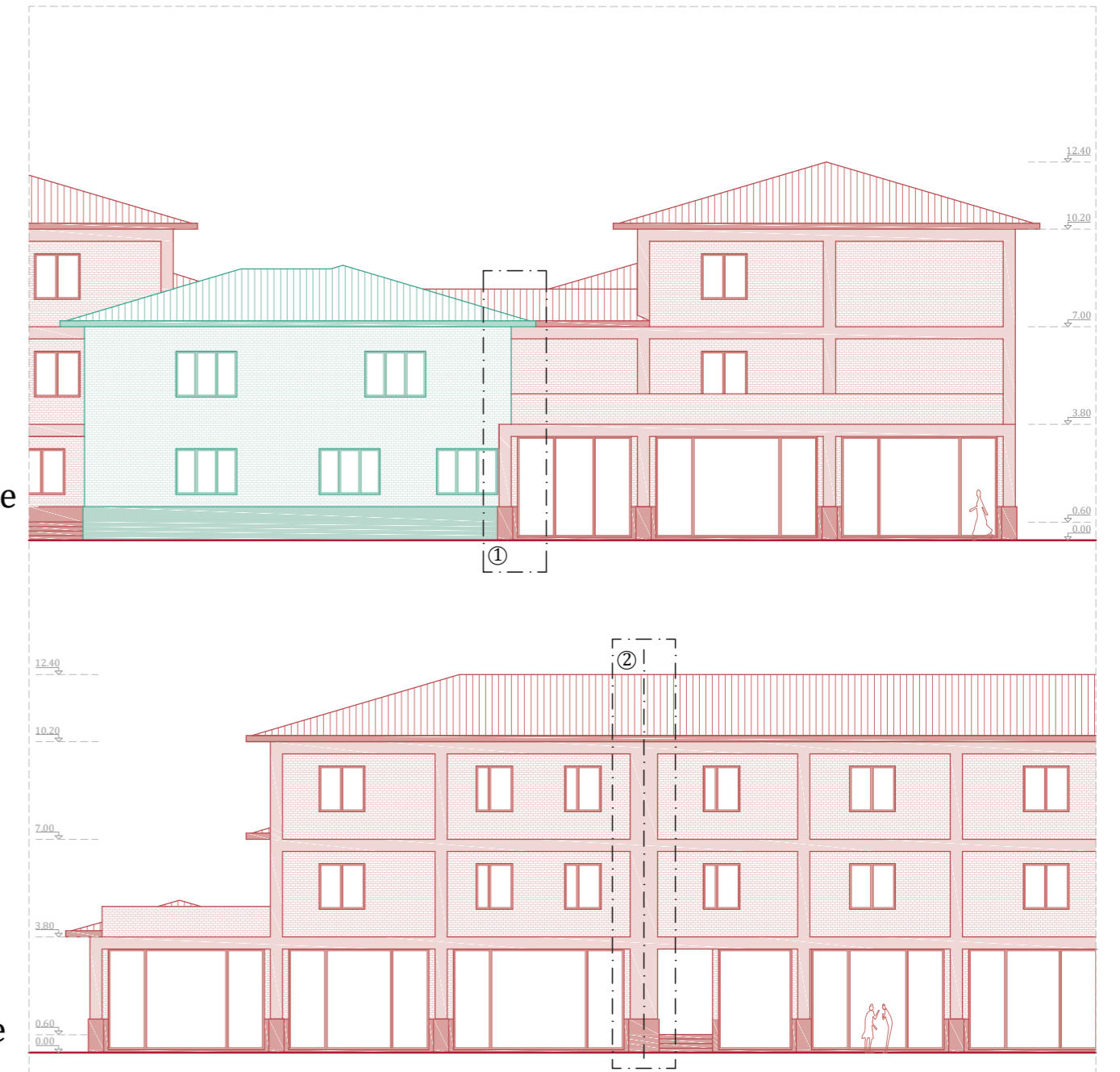
Architectural scale sample  
Facades  
Sc 1:200

1: side attached buildings  
with structural reinforcement

2: Independent detached buildings  
with shared stair case

North facade

West facade



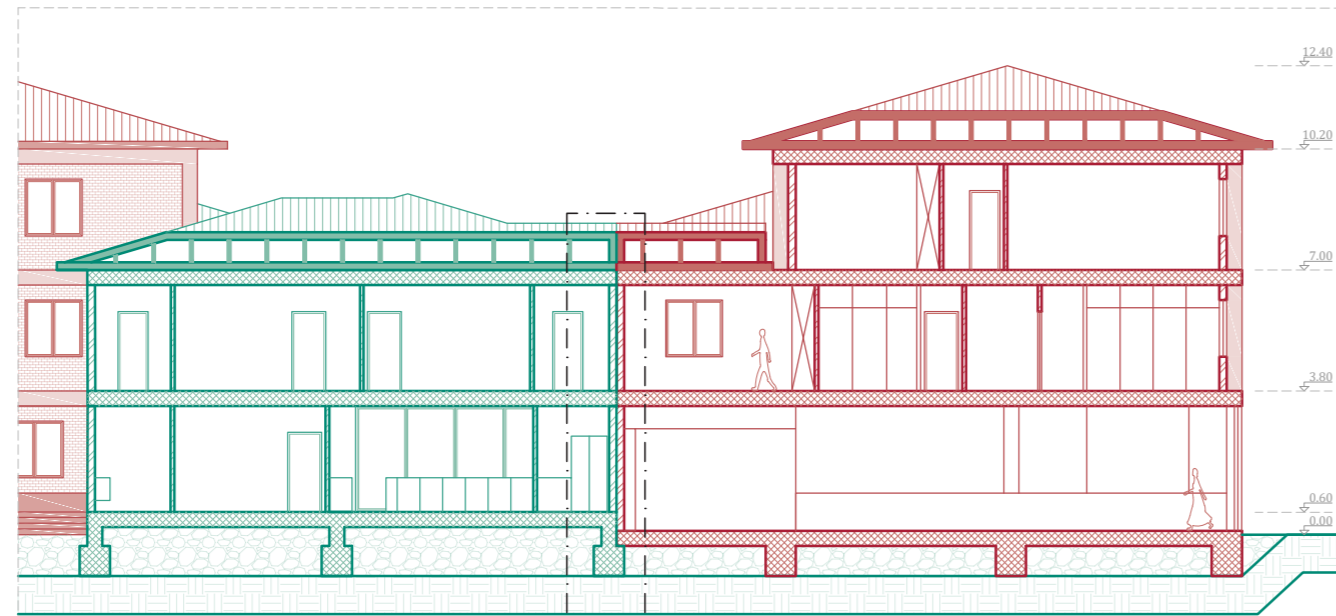
9.79 Architectural scale sample, Facades



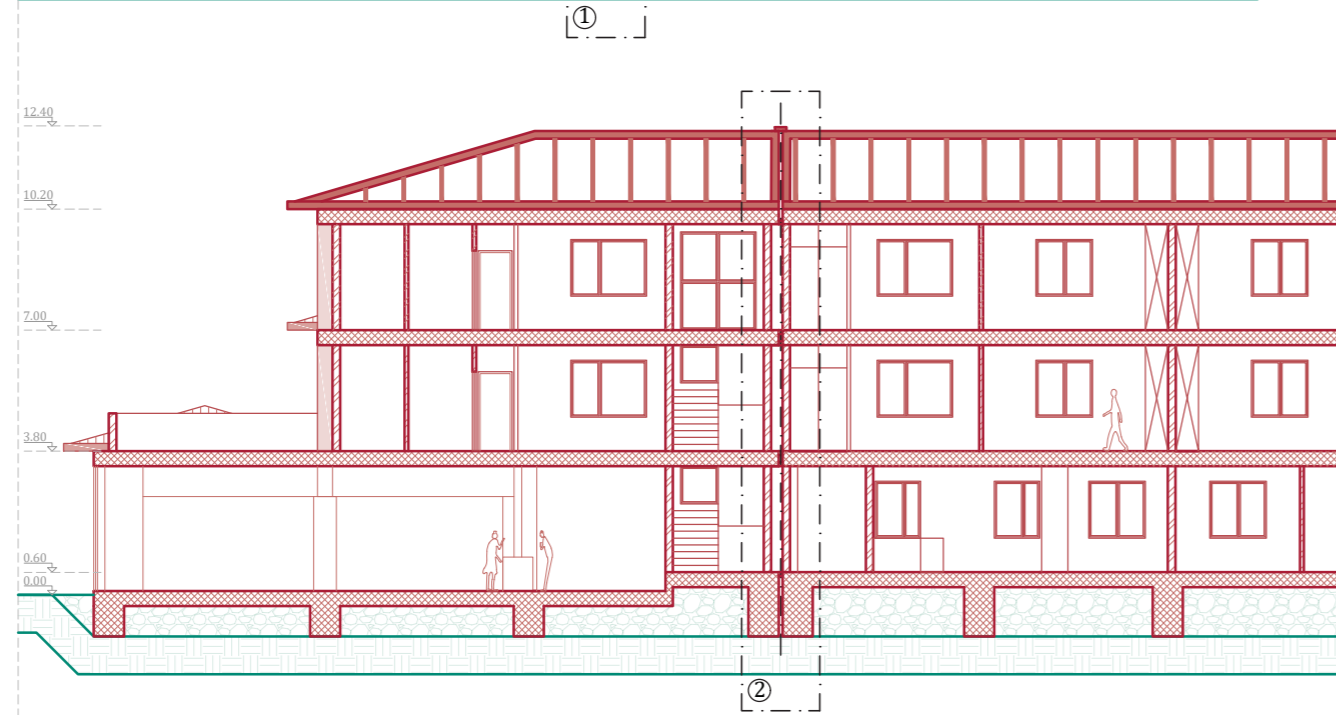
Architectural scale sample  
sections  
Sc 1:200

- 1: side attached buildings with structural reinforcement
- 2: Independent detached buildings with shared stair case

Section A-A



Section B-B



Architectural scale example  
Outcome of the project

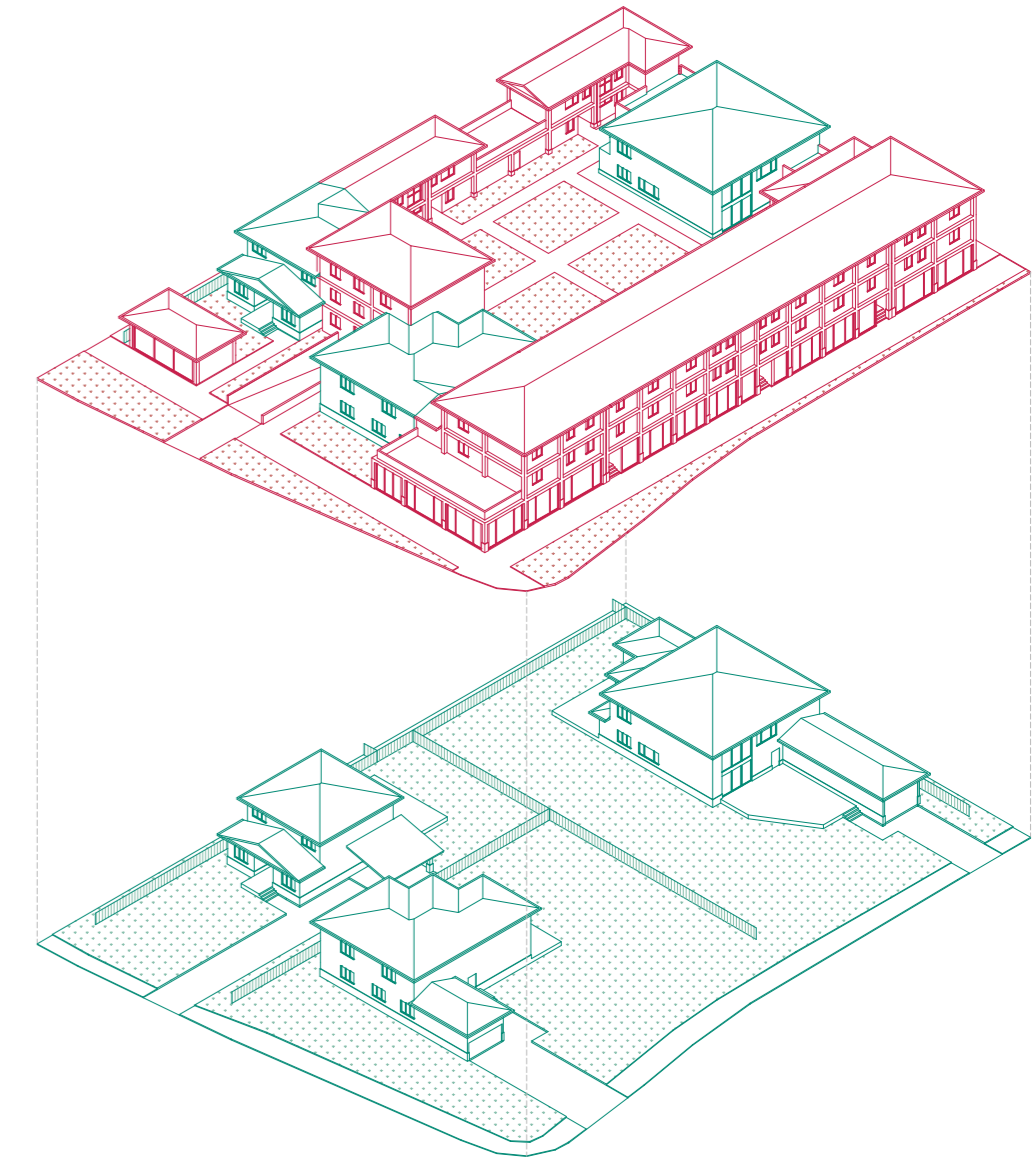
By comparing the existing situation of our site and the outcome of a project, its visible that by the less possible expenses and less possible demolishing, and less possible disturbing for the neighbors, we reached to a cluster with 32 different kinds of residential units, including studios, one bedroom, two bedroom, and 3 bedroom from just 3 single detached family houses.

Besides increasing the density and the number of dwelling units, several shops have been added to the street side, near new sidewalk which increase the economic value of the area, and increase daily commuting by making the area more pedestrian friendly.

By moving the parking to the basement, we provide a covered parking area for every 32 units without wasting the land of our site or increasing the distances.

And a common central yard with correct dimensions has been provided to be used by 32 families instead of 3, which, besides increasing social daily interaction, will reduce the expenses and time needed for preserving public areas by dividing them into more number of families.

We kept the dimensions of the buildings and architectural style of the neighborhood, and reached a low rise high density site by respecting the existing atmosphere and improving it.



9.81 Outcome of the project, Axonometric comparison

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Fig. 1.4 Toronto skyline 1970, City of Toronto Archives

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Fig. 1.6 Toronto statistics map, drawn by author, according to statistics Canada

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