Re-Urbanizing Ismailia

By Implementing an Urban Infill Housing Strategy

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ABSTRACT

Ismailia is a modern Egyptian city located midway along the Suez Canal, the renowned waterway linking the Red Sea to the Mediterranean Sea. The city was developed in 1983 following a French archetype, in collaboration with the French, who were in charge of the operation of the Suez Canal, to serve as the headquarters of the Suez Canal Authority and to house its mainly French and European staff.

During the ensuing years, Ismailia remained compact and respected a dense and well-organized urban fabric, following its original plan. However, the city was evacuated in 1967 for six years during the Arab-Israeli war (1948-1973). It was in the latter half of the twentieth century, that Ismailia was re-planned and re-inhabited but with many undefined spaces between and within neighborhoods and that didn't have any clear identity. These neighborhoods lie within a district called Al- Sheikh Zayed, which occupies the whole eastern half of Ismailia. Rather than develop existing vacant plots in the district, the government plans to expand outside the city peripheries towards the desert, essentially creating an extensive, unsustainable urban sprawl.

This thesis proposes an alternative plan that creates a legible structure and a recognizable identity within one neighborhood at the heart of the Sheikh Zayed district. Using an urban infill strategy, this proposed plan is based on the premise that compact cities are more sustainable because dense areas share the same infrastructure and public services, are more walkable and bikable, and therefore they save energy and reduce pollution. Through site analysis, I identify an optimal solution for this district that can serve as a model development within Ismailia and can be applied in underdeveloped urban areas within other Egyptian cities. Through my design I introduce a better programming for the neighborhood, provision adequate street network and public and green spaces. The outcome of the thesis is then an urban design proposal for the Sheikh Zayed neighborhood with a block design and a general landscape scheme.

Thesis Supervisor: Michael Dennis
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Figure 1: Ismailia in the 1900s

Figure 2: Ismailia today

Acknowledgments

I would like to thank my parents who gave me this great opportunity to come study here at MIT and who encouraged and supported me. Mom and Dad, thank you for always being there for me, especially during my hardest times.

During my second semester at MIT when I was asked what keeps me at MIT my immediate response was Michael Dennis. Michael, thank you for your utmost support to me. I learned from you the most during my course of study here from theory to design courses. You were always the main reason that made me like being at this school.
I would also like to express my gratitude to Jim Wescoat who provided me with guidance and very useful feedback during all my thesis stages and who showed interest in my work. Thank you Jim for being so patient, clear and compassionate.
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Finally, this thesis would have not been accomplished without the help and support of my boyfriend and future husband Mohamed Aly. Mohamed I can't thank you enough. Thank you for everything. I love you.

Contents

Introduction to the thesis

As architects and urban designers our role is to design and develop better living communities that are suitable and custom made for different cultures and countries. Since Ismailia is my hometown and very few development projects were done in it, I decided to try to create a model to enhance the living condition and urbanize neighborhood that was designed and built without any consideration or respect to the existing colonial city and without following the guidelines initiated by the original planners and designers of the city, the French.

My aim in this thesis is to provide a model of an adequately designed neighborhood having all the urban design elements that can be replicated or applied in different areas and on different neighborhoods in Ismailia and elsewhere in Egypt.

The proposed design acknowledges the history, culture and social conditions of the city and tries to solve some of the housing problems within Ismailia by providing more adequate private and public spaces and more services. It also encourages the use of more environmentally friendly means of transport, which is also common in Ismailia, such as the motorcycles and the bicycles.

In order to reach my final design intervention I had to go through several steps and conduct some analyses on the city, its history and its current situation.

In the background I'll give a background and an overview about the city of Ismailia, how and why it was founded and its original design and layout. Chapter one will be a historical Timeline of the urban development of the city since its foundation till today relying on text and historical maps. In chapter three I will start by the general urban analysis of the whole city, the different districts, the figure ground and the land use and then will zoom in on the neighborhood scale and analyze the urban design elements of eight neighborhoods where one of them will be the one on which I will implement my design urban infill strategy. Chapter four is the design chapter where I will present text and drawings of my design intervention and concept and some diagrams and studies that illustrate my design strategy. The last chapter will be my conclusion in which I will address how my design will improve the state of the neighborhood and the city as a whole, whether this design strategy can be implemented on other neighborhood and what the design failed to accomplish.

The outcome of this thesis as it deals not only with design but also with historical and urban analysis, is to help architects and urban designers in the future to understand one of the Egyptian cities on which little has been done in terms of urban research and analysis and to help as a reference and guide for future projects done in Ismailia or Egypt.

1.1 Literature Review

There hasn't been much written about Ismailia as a city or its architecture and urban design composition. A French dissertation was written in 1999 about the social, urban and architectural transformations that took place in the city since its foundation in 1862 till 1993. In this dissertation, which is my main reference to the historic evolution of the city, especially in the period following the colonial era, Darwis Khudori presents to us a very thorough overview about the foundation of the city and its evolution and the transformations that occurred in it following the war.[1] He concentrates more on the social changes and transformation rather than the urban and architectural changes and he relies mostly on text and historical references. He also examines how the city has transformed from a French colonial city to what he calls a 'Muslim' city.[2] I argue that Ismailia hasn't transformed to a Muslim city, but to a normal Egyptian city that lost some of its urban features by the interventions of the Egyptians who built various settlements on it without a nuanced planning. Darwis also refer to some of the historical maps of the city, which helped understanding how the city reached its current plan and form. As for the book about Nineteenth and Twentieth century Ismailia by Raouf Abbas, it's a wonderful book that gives a chronological history about Ismailia and its foundation and structure. However, it only focuses on the colonial city with all its details relying on archival photos and maps. This book also talks about the colonial architecture of the city and shows some of the pictures and plans of earlier buildings. Thus, it helps in understanding how Ismailia started and how it looked like which helps in establishing a comparison between the early colonial city and the current city of Ismailia. There are also few Arabic books written on the history of the city socially and politically, one about the war and many books about the Suez Canal that mention Ismailia since it's the headquarters of the Suez Canal Authority.[3] GIS maps extracted from the urban planning authority of the city also helped in tracking the changes and future plans envisioned for Ismailia. The only references that deals explicitly from an architectural and urban aspect of the city is the demonstration project references that aimed at upgrading two slum areas in Ismailia following the war. The demonstration projects, especially the one done at the heart of Ismailia 'Hai Al-Salam', were planned and implemented successfully and had a positive constructive impact on the residents living in these neighborhoods. Moreover, the project won an Aga Khan Award for Architecture since it addressed and tackled vital problems in the third world housing projects. A series of publications followed the project in which some were about the master plan of Ismailia and the details of the projects themselves and others were about learning from these projects, such as 'The Urban Projects Manual' based on the Ismailia Demonstration Projects and other environmental projects.[4] These are all the main and almost only references available in Arabic, English and French about the history of Ismailia and its planning, urban design and architecture.

Background

Around 7000 BC settlement of Nile Valley had begun. Since that time, the Timeline of Egypt had gone through different developments and alterations that shaped the urban structure of Egypt and its cities. For the purpose of this thesis, the start will be from 19th Century Egypt, or should we call it modern Egypt.

Mostly referred to as 'the French expedition', the French invasion of Egypt led by Napoleon Bonaparte in 1798 is considered to be the first direct confrontation between Egypt and the modern civilization of France, which effected fundamental changes later in the urban structure and planning of Egypt and particularly of Cairo.[5] Although the so-called 'expedition' only lasted for a brief three years, it left a lasting impact on Egypt, particularly on its urban planning and architecture. The French introduced the concept of organized and well structured wide streets and squares that enhanced circulation, security and sanitation. Therefore, they subtly initiated the idea of *Tanzim* or order, later implemented in modern Cairo. The idea of *Tanzim*, which in this period referred to as 'Modernization', literally means organization or regulation that aimed at embellishing and developing the streets and open spaces of the Egyptian cities besides ordering what the French perceived as chaotic and illegible old Islamic urban planning.[6]

This Tanzim principle not only focused on urban revitalization, but also included education and discipline.
Mohamed Ali, the founder of modern Egypt, is the ruler who laid out the principles of modernization, implemented later by his successors. The evolution and appropriation of public space was a fundamental part of Mohamed Ali's project and vision for modern Egypt. This vision was emphasized and applied later by his grandson Khedive Ismail, who introduced new categories of urban spaces to Egypt, such as the zoo and other thematic types of gardens and parks, and made some private spaces open to the public.[7] Ismail's occidental image of modern Egypt was significantly influenced by Europe where he received his education. Thus, when he came to power in Egypt and with all the available resources he had, it was his chance to realize his dream to transform Cairo and its urban spaces into Parisian styled spaces.

One of the modern cities that were founded and developed during the nineteenth century to convey this modern image was Ismailia. Ismailia not only acted as a backdrop for Ismail's European visitors during the Suez Canal inauguration, but it was and remains a strategic port for Egypt and a meeting point

1.2 Regional Context
Egypt

Throughout history, the location of Egypt has always been strategic in relation to the rest of the world. Egypt acted as a vital median for trade, religious purposes and connections between the East and the west since it is located on the Mediterranean Sea, which gave it tremendous significance.[8]

Not only is Egypt bounded by two vital seas from the north and the East, but it is also located around the Nile Valley, upon which the whole Egyptian Civilization was based. The Nile is not only the major source of water in Egypt, but also the reason for its fertile land and rich source of agriculture.

Ismailia

Ismailia is an Egyptian modern city located midway along the Suez Canal, the renowned waterway linking the Red Sea to the Mediterranean Sea. It's considered to be the eastern gateway of Egypt connecting the African and the Asian continents.[9] It lies 130 kilometers east of Cairo and is separated from Sinai, in the Asian continent, by the Suez Canal

Being located at the isthmus of the Suez, which acts as the east edge of Egypt, Ismailia was the passageway and the entrance gate of many civilizations and different eras that Egypt witnessed.

Figure 3. Egypt, Africa

Ismailia's main supply of potable water is through the water canal which comes from one of the Nile Delta branches.

Located on the Canal, halfway between Port Said and Suez, Ismailia was a convenient median for transportation, communication and trade.

In addition, the city enjoys moderate temperatures eleven months a year, with various water features, such as the Suez Canal, the Lake Timsah and the Nile water canal, which makes it a fertile land for agriculture too.

Figure 4. Ismailia, Egypt

Figure 5. Ismailia, Suez Canal, Bitter lakes & Timsah Lake

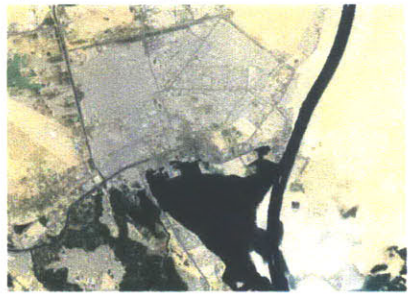


Figure 6. Ismailia

The Suez Canal

According to some scholars, the idea of digging a Canal linking the Red Sea to the Mediterranean Sea was not a modern one. It was proposed and studied by several rulers of Egypt since ancient civilizations. On the other hand, it was believed that there existed a canal during the ancient Egyptian times dug by the Pharaohs in 1400 B.C. that linked the Red Sea, but this time to the Nile.[10]

It wasn't until the French Expedition to Egypt, that a crude proposal and plan for constructing a waterway linking the Red to the Mediterranean seas was proposed by Bonaparte. Bonaparte asked his engineers and experts to study the possibility of digging the Canal; nevertheless, the engineers did a mistake in their studies, which indicated that the levels of the two seas weren't equal, which could have caused flooding and an imbalance in the ecological system.
Since that time, the idea of constructing the Suez isthmus didn't cease to entertain in the minds of the French experts and engineers.[11]

Later during the mid nineteenth century, the Suez Canal project was re-proposed by the French engineer, Ferdinand De Lesseps who was commissioned and was given privileges by the Khedive of Egypt at that time, Said Pasha. The construction of the project started in 1859, and De Lesseps, along with his team, were allowed to occupy any piece of land where they could build camps leveraging the Suez Canal construction.[12]

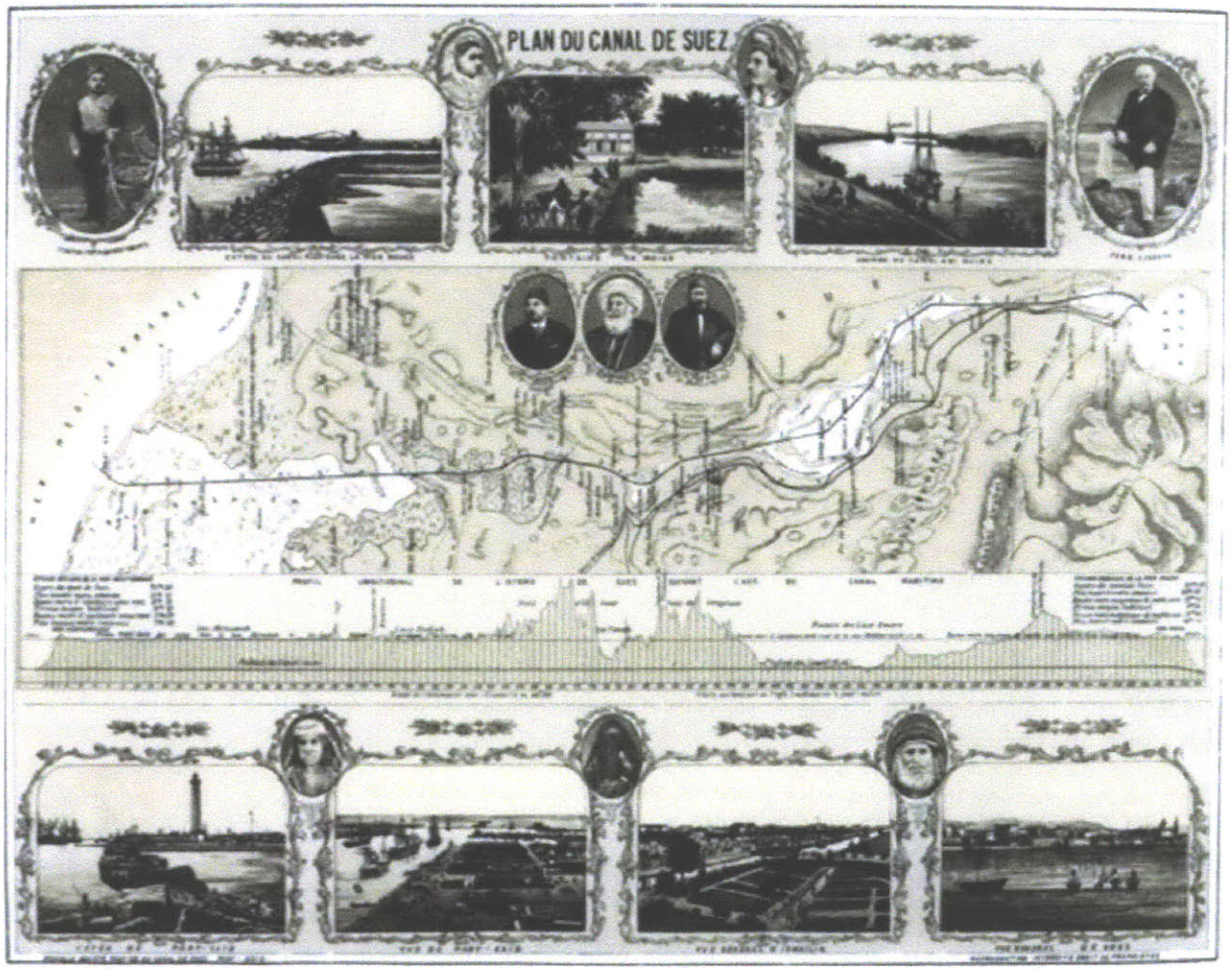


Figure 7. A plan of the Suez Canal featuring De Lesseps, upper right, and Khedive Said or Ismail, upper left, the main Canal cities (Suez, Ismailia & Port Said) and depicting Mohamed Aly Pasha in between Khedives Ismail and Said

The Suez Canal & The Foundation of Ismailia

De Lesseps then laid his feet on a plot of land, which he found ideal as a base for the Suez Canal construction since it was located midway along the proposed waterway. Moreover, this plot not only overlooked one of the historic bitter lakes (later the Lake Timsah) located along the canal scheme and which was a good start for the construction, but also it had a source of water for drinking and agriculture, which was located near Timsah Lake.

As the new founded land started with an engineers' and workers' camp and temporary structures, there was a need later to build more enduring and lasting buildings for the employees' accommodation. Services also were provided and the camp was gradually transformed to be a small city.[13]

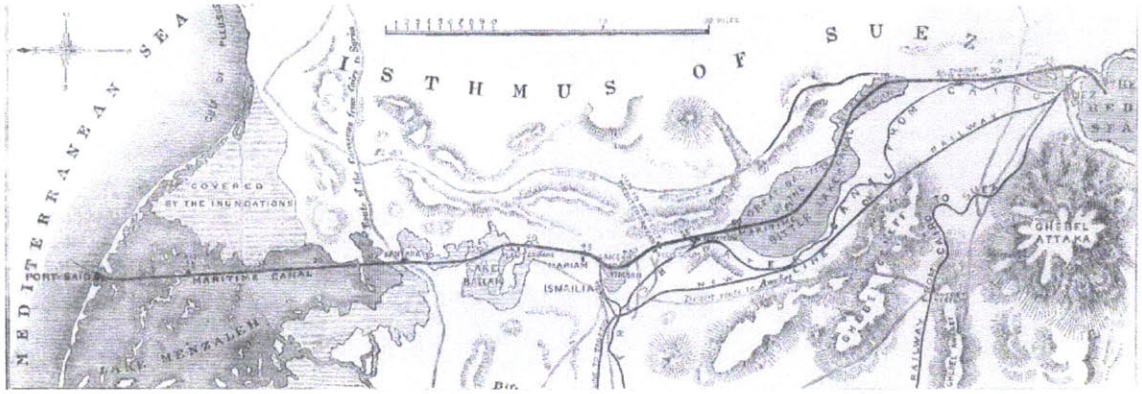


Figure 8. A plan of the Suez Isthmus where Ismailia is located in middle, source: Google

Figure 9. The French & workers encampment in Ismailia during the early Canal construction
Source: Google images

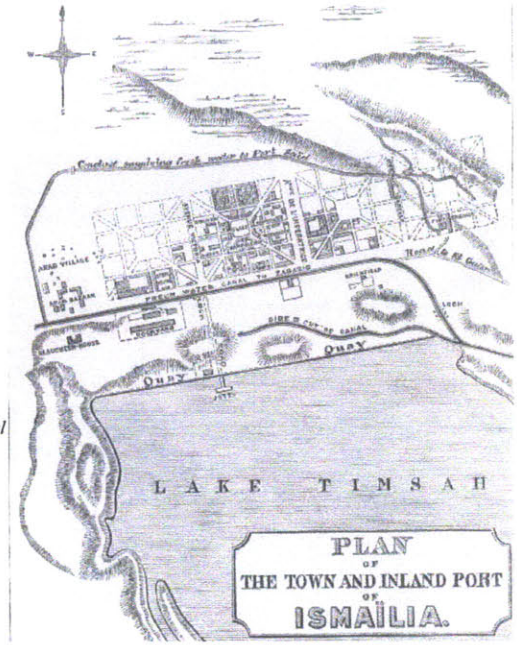


Figure 10. A map of Ismailia during 1869, Source: Google images

1.3 Timeline

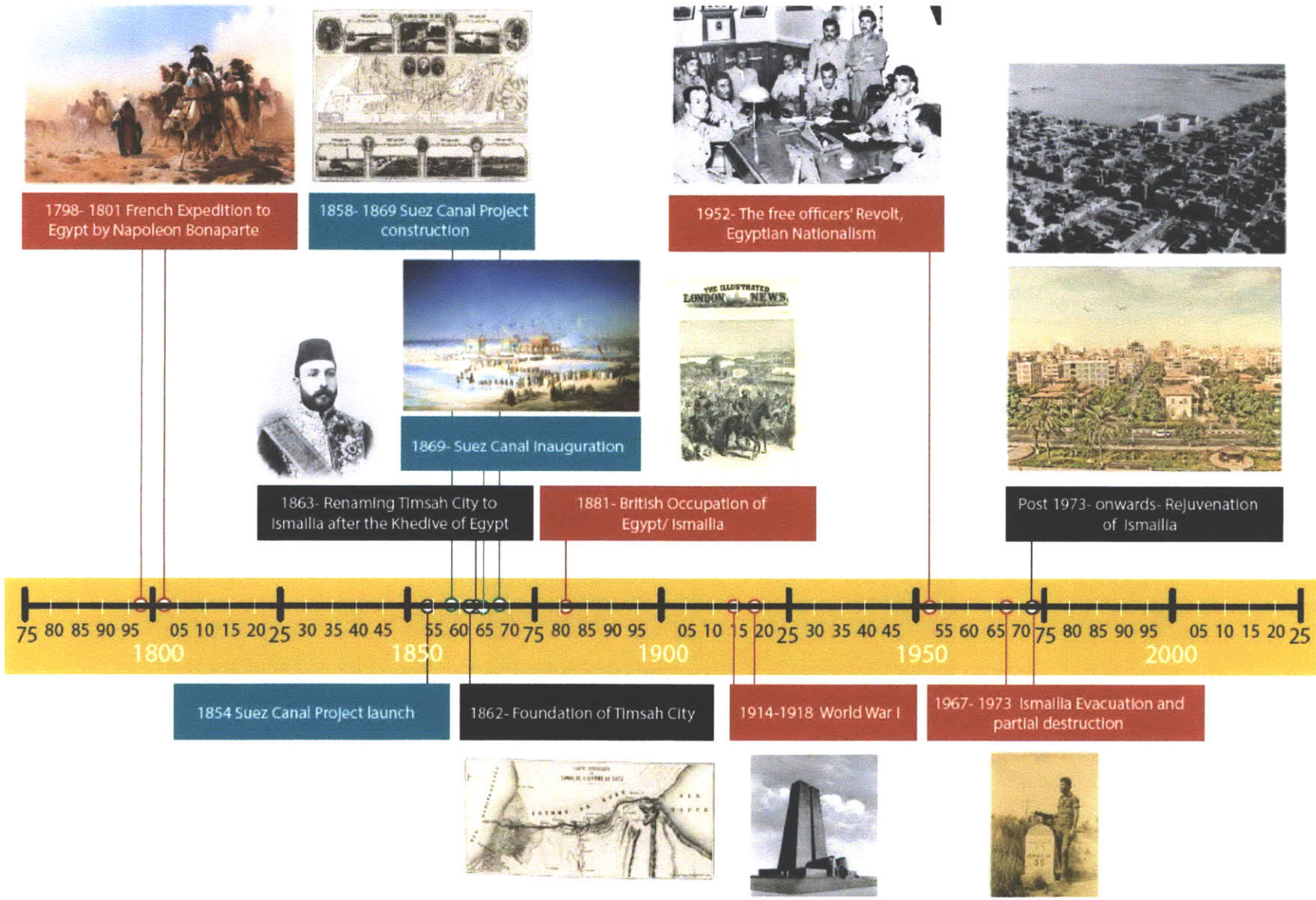


Figure 11. A timeline of Ismailia

The City of Ismailia

Tusun was the first name the city was called by in the memory of Mohamed Aly's son who was a great conquerer. In 1862, the city was renamed as Timsah City after the lake it was adjacent to --Timsah Lake. During 1863, when Khedive Ismail followed Khedive Said in ruling Egypt, Timsah City was lastly renamed Ismailia, honoring the new viceroy.[14]

Since then, Ismailia kept its name, which refers to the name of the actual physical founder of modern Egypt and that goes perfectly with this modern city that acted as a model or more precisely a mock-up for Khedive Ismail's aspiration to create a modern Egypt.

After the inauguration of the Suez Canal in 1869, Ismailia became the headquarter of the Suez Canal administration, and since then, the city flourished with residents to whom it provided job opportunities in the Suez Canal authority as well as in agriculture and fishing, which remain the three main sources of income in Ismailia until today.[15]

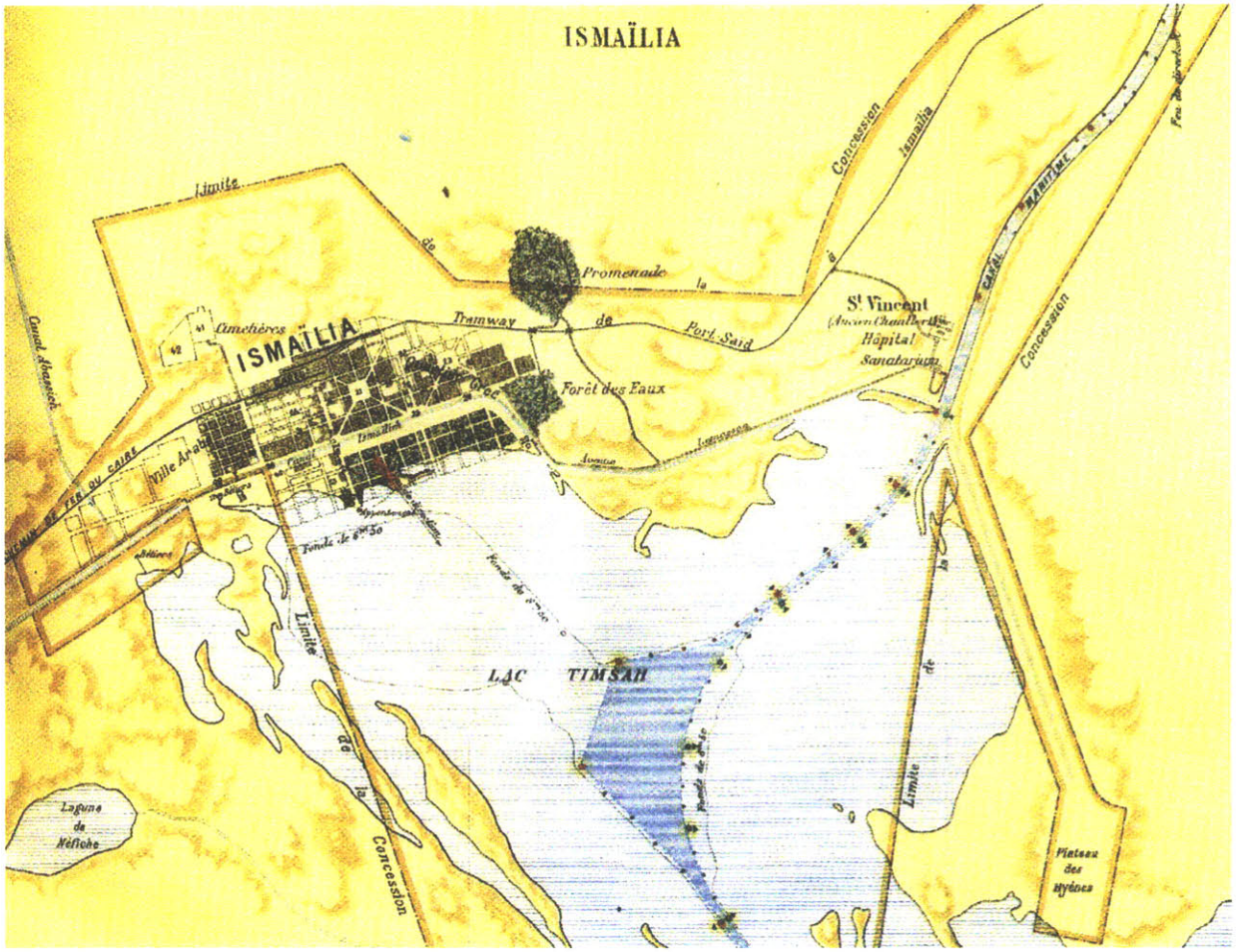


Figure 12. A map of Ismailia during the early 1870s Source: Abbās, Ismaïlia, 15.

'This internal port was constructed in a region where solitude and tranquility were dominating and then it was transformed into a vital city and one of the major international commercial centers, which is Ismailia. It has a unique location and a moderate temperature at the heart of Egypt, a very fertile land and the first port for recreation and supply in the world.'[16]

- Celine Fremaux, an art historian

Chapter 2

The Historic Urban Development of Ismailia

After giving a brief introduction about the foundation of the city of Ismailia and its raison d'etre, the aim of this chapter is to narrate and track how the urban form and structure of the city has changed over time by focusing on key milestones in the history of the city.
The chapter will start by the year during which the city was founded and designed by the French in 1862 passing by the British occupation of Egypt in 1881 and then the nationalization of the Suez Canal Company in 1956 which preceded the Arab-Israeli war. The war resulted in a partial destruction and evacuation of the city for seven years from 1967 to 1973 and was followed by a re-inhabitation of the city and a significant growth in its population and the development of new neighborhoods and district.

Tracing the urban history and the key changes and development that had taken place is vital in order to have an understanding of how Ismailia reached the urban form and structure that it has today and how the historical events affected the formation and evolution of the city.

As I mentioned earlier, there are some studies and books written on the general history of Ismailia by Egyptian and French historians. The one person that addressed the urban development and transformation of the city is Darwis Kudori in his dissertation. He provided some maps and text, but the historic urban development that he wrote about focused more on the historical and political events rather that the urban transformation. In this chapter I will rely on historical maps and text and track the urban transformation of Ismailia throughout history in a form of a historical Timeline.

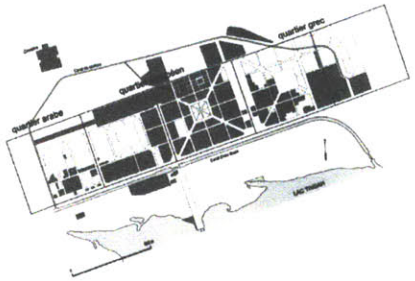
The French Colonial City (1862)

In 1862 when the chief Suez Canal engineer Ferdinand De Lesseps founded Ismailia it started as a camp, as mentioned earlier, and a base for the Suez Canal Construction since it was located midway along the Canal. As there was a need for a sweet-water source for drinking, a water canal was dug later from the Nile River along the shore of lake Timsah, which served the city which was developed later.

The water and the moderate weather of the city contributed to the formation of an urban French city, especially when the Suez Canal was about to be inaugurated and when the viceroy of Egypt give the French full authority to design, inhabit and own the city as well as prepare and embellish it for the Suez Canal inauguration ceremony.[17]

The French then designed the new headquarter of the Suez Canal starting by five identical axial neighborhood, each with a square public spaces, square or garden in its core.

The city was composed of two European quarter for mainly the French and European engineers working on the construction and operation of the Canal, two Greek Quarters for the Greeks, who were many also working on the Canal and one tiny quarter for the Arabs or mainly Egyptians or construction workers of the Suez Canal. The central public space for the Arabian Quarter was never built, instead a small mosque with a square were constructed. As for the other European and Greek quarters, all the services were included along with churches and gardens.[18]



1862 Foundation of Ismailia as a colonial city by the French

The Colonial City
During the British occupation

Since its foundation in 1862, Ismailia continued to develop following its French archetype and layout. It was still also mainly inhabited by the European and French who were granted a significant percentage of the Suez Canal shares and who were responsible for the operation of the Suez Canal Company.
The British occupied Egypt in 1881, since their route to India was interrupted by the new constructed canal which was controlled by the French and the Khedive. The British then took advantage of the unstable economic condition of Egypt and occupied it. However, they had minor influence on the urban development of Egypt, especially Ismailia which was considered back then a French property. The British had only two campuses the edges of the Suez Canal in Ismailia since they gained some of its shares from the Khedive of Egypt.[19]
Between its foundation and 1912, Ismailia expanded above the railway following the same axial plan. As for the Arabian quarter, it also expanded to the west with small blocks and barely any public space.
A spacious garden, for the French and European residents, was designed and constructed bordering the lake, and a botanical garden and a golf club were also cultivated to cater the European inhabitants.[20]

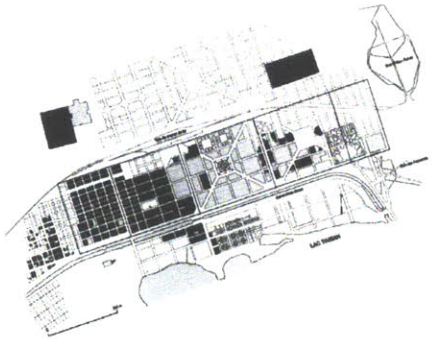


Figure 14. Ismailia in 1912

The National City (1952- 1956)

In 1952, the free officers movement, which was composed of a number of Egyptian military officers, stroke a revolution that resulted in the evacuation of the British troupes and the initiation of the National era in Egypt. The monarchy terminated and Egypt was ruled by an Egyptian officer who made significant reform, politically, socially and economically.[21]

As for Ismailia and the Suez Canal Company, in 1956 the company was nationalized and French and European workers were forced to move out of Ismailia and be replaced with Egyptian workers and engineer who took over the administration of the nationalized company.
Until the evacuation of the Europeans from Ismailia, the urban form of the garden city hasn't changed or evolved much and it was still concentrated around the lake Timsah on both sides of the railroad which kind of divided the city into two halves but at the same time it still maintained a coherent urban structure since its followed its original axial plan.
On the far west of the city, a condensed and a fine urban fabric emerged due to the Egyptians' encroachment and we start to notice the increase in the number of Egyptians inhabiting the city, but they were still bound on the western side.
After 1956, the situation has changed and the Egyptians took over the entire city and the population of the city surged significantly.[22]

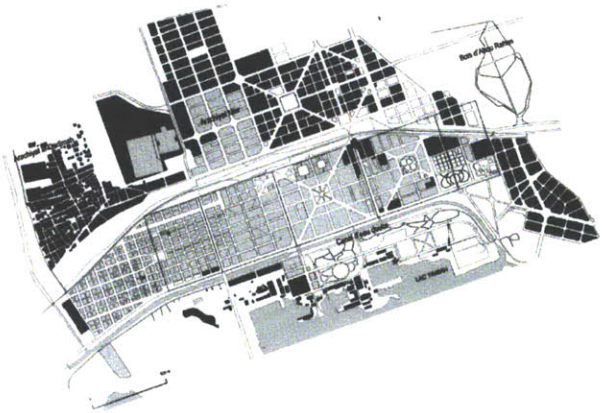


Figure 15. Ismailia in 1956

1952 End of British Occupation **1956** Nationalization of the Suez Canal Company

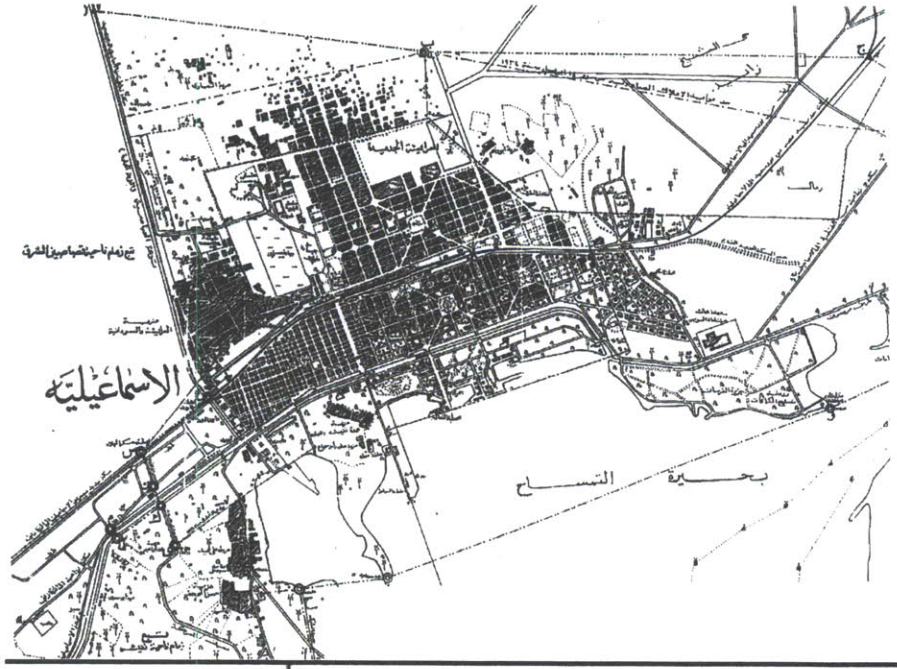


Figure 16. Ismailia in 1961

1961 Ismailia during Nationalism

The National City (after 1956)

During nationalism various job opportunities were available for Egyptians to occupy. Consequently, a decent number of Egyptians from other governorates moved to Ismailia. There were also a significant number of low income workers moving to the city, which resulted in several unplanned and arbitrary developments in the city to the north and the west of the urbanized areas.[23]

The nationalization of the Suez Canal Company marks a changing milestone in the urban history of Ismailia as it transformed from a European city planned, constructed and inhabited by the French to an Egyptian city altered, occupied and further developed by the Egyptian. Since then, it started to become a mixture of different plans and developments without following or respecting certain rules or guidelines.

After the occupation of the Egyptians of Ismailia, the colonial city still existed with some modifications in the wooden buildings which had plenty of terraces that were closed or turned to windows by the Egyptians. The landscape and gardens were maintained and besides having the Suez Canal Company as the main source of income for the city, fishing and agriculture were also considered other sources of income.[24]

In this map an extended street network starts to emerge to the east of the city with a triangular shape starting to appear in the planning (which will be later the studied Sheikh Zayed neighborhood). It's not clear why this triangular shape in particular appears or who planned it.

Ismailia as an Evacuated War Zone (1967)

In 1948 the Arab-Israeli war started between the state of Israel and a number of Arab countries supporting Palestine, one of which was Egypt.
In 1967, Israel, Britain and France invaded Egypt resulting in Israel taking over Sinai which shared borders with the Suez Canal cities. That resulted of the declaration of the Suez Canal cities as war zones that had to be evacuated. The three Canal cities, Port-Said, Ismailia and Suez were evacuated and partially destructed due to the war. Ismailia remained an evacuated war zone for seven years during which it was the venue for the war operation and Egyptian military camps and units.[25] The city remained urbanistically stagnant for seven years and the Suez Canal ceased all its operations.

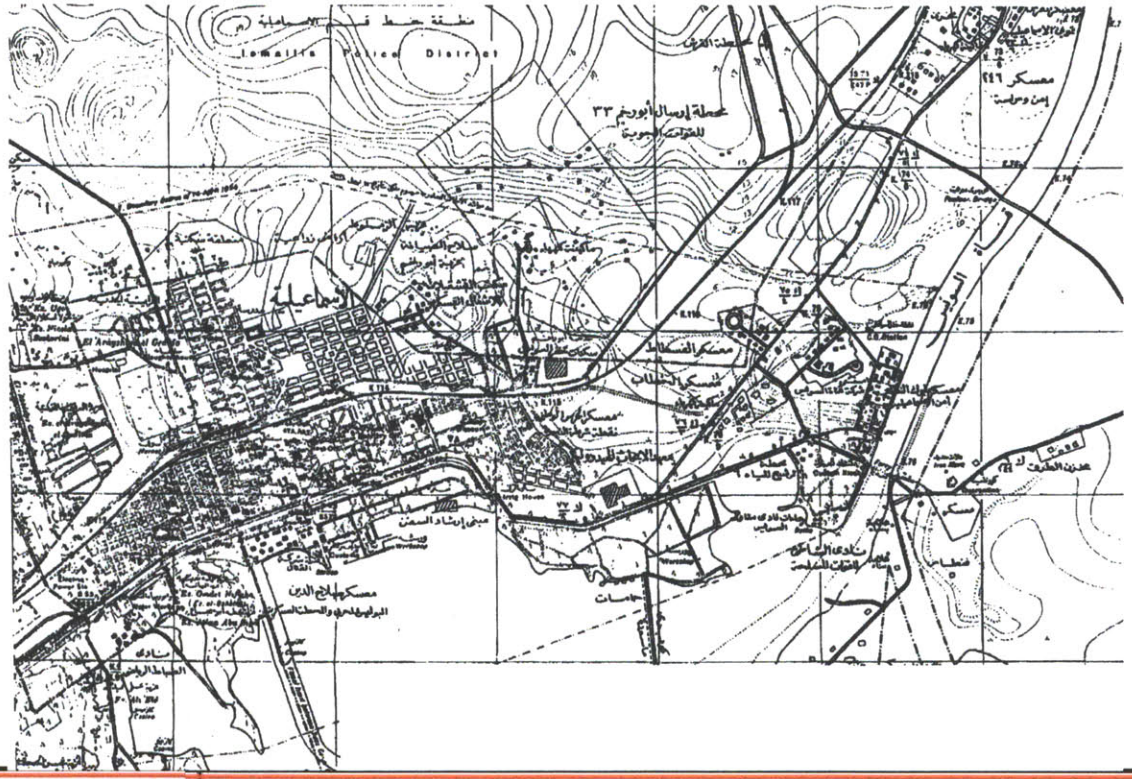


Figure 17. Ismailia in 1969

1967 Evacuation of Ismailia (Seven Years War) **1969** Ismailia during the Seven Years War

The Post-War City (1973)

By the end of the hostilities in 1973, Egypt regained Sinai and the war with Israel ended. The Egyptian president then took responsive decisions to bring the Canal cities to life again. Therefore, restoration and re-inhabitation programs were planned and executed with funds from the United Nations and the United Arab Emirates.[26]

The amount of damage that occurred in Ismailia didn't exceed 30% of the total damages, so the city wasn't significantly damaged and fortunately it still maintained it's French character in terms of architecture and landscape. However, several restoration work were necessary to repair the damages. Also the president want the Canal cities to be a major attraction for Egyptians not only to redevelop them, but also to make them contribute in relieving the population from major Egyptian cities, such as Cairo and Alexandria.[27]

With the generous fund of several international organizations, Ismailia was able to regain its prosperity and to attract more inhabitants who once lived in it and who moved to inhabit the repaired city.

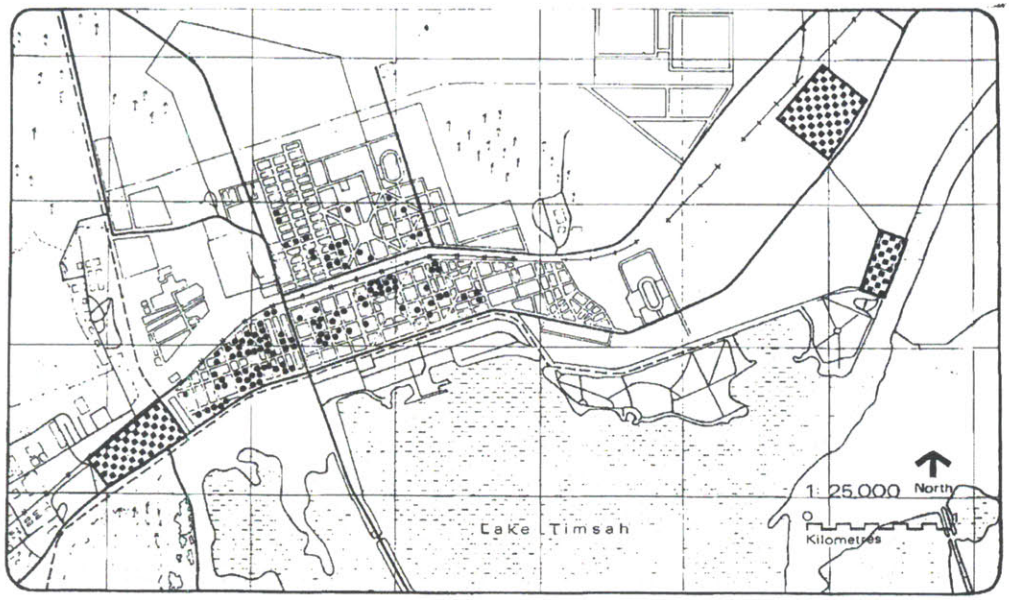


Figure 18. Ismailia in 1973

1973 The Damaged city after the war

The Post-War City (1978)

With the fund from the Sheikh Zayed of the United Arab Emirates, a social housing project to accommodate the indigenous inhabitants of Ismailia was built and finished in two years and the neighborhood was named after Sheikh Zayed (The Eastern part of the city).[28] As for the fund provided by the United Nations, two demonstration projects were undertaken aiming at re-urbanizing and upgrading two low income housing project. One of them is in the neighborhood north of the colonial city called 'Hai Al- Salam'. This neighborhood originally started by low income Egyptians who moved to Ismailia after its nationalization and occupied this area since the land was cheap and there were no regulations for construction. The demonstration projects which started in 1976 by commissioning a British consultant were meant to upgrade these areas and provide services and infrastructure. The Hai Al-Salam project was a successful contribution to the community. The project also won the Aga Khan Award for architecture in the year 1986.[29] Sheikh Zayed Project to the east was already finished prior to the master plan proposal and implementation; therefore, it was accommodated and considered by the British firm while proposing the new Ismailia master plan.

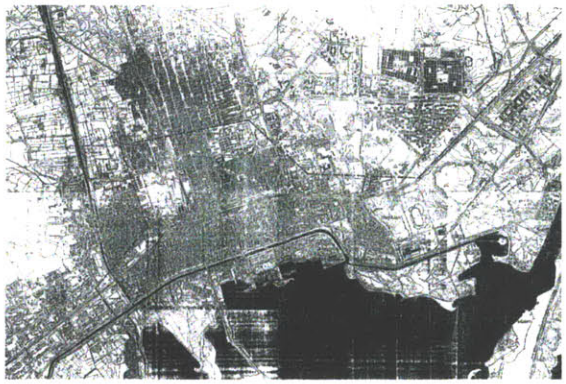


Figure 19. Ismailia in 1978

1978 Ismailia re-inhabited

Figure 20. Ismailia in 2011

The Current City

Since the main objective was to develop the city and make it a major residents attraction, several lands were provided to many local organization and communities to construct housing projects. These lands and new developments took place in the eastern side of the city, the area or district that we call 'Sheikh Zayed.' There are also two universities built, one outside the city periphery to the north and the other south-east of the city next to the vacant lands which are mainly owned by the military.[30]

The current city of Ismailia that we see in this map is a result of layers of historical events and interventions that shaped its fabric and form. It started with a French organized plan overlooking the Lake Timsah and expanded into a mix of upgraded slums and a collage of distributed lands and housing projects.
The city borders, besides the university, are agricultural lands and lands owned by the military which are used as military encampments for trainings and camping.

Historical Urban Development

From studying and analyzing historical maps of Ismailia, a clear observation is that the city maintained a steady slow urban development that respected and conformed to its original axial plan and maintained its landscape and greenery. Ensuing the nationalization of the Suez Canal company, the city form and rate of development started to change. French and European residents were replaced by Egyptians, and since a lot of job opportunities were available a large number of people moved to the city ; thus, it undergone sporadic developments and new neighborhoods and districts started to emerge. After the evacuation and re-inhabitation of the city following the war, the population even doubled as the aim was to make Ismailia one of the cities that will relief population densities from Cairo and Alexandria. This resulted in a lot of unplanned neighborhoods that didn't followed any design regulations.

Figure 21. A representation of the Historical Urban Development of Ismailia

Chapter 3

Ismailia Urban Analysis

This chapter will study in depth the urban division of the city and its different neighborhood and their urban fabric. It will look at the Google earth and the figure ground of the city and analyze the different urban design components of the city.
First, I will look at a general layout of the city, the main elements, the circulation, the landscape, the land uses, the administrative districts division and will conclude with my neighborhood divisions which are based on the urban fabric, the history and year of development, and the ownership and name of each neighborhood.
I will then conclude by the main urban issues and problems within the city as a whole.

Second, I will zoom in and look at eight different neighborhood that are representative of the city four of which are Prewar neighborhoods and the other four are post-war neighborhoods.
The urban elements that I am going to look at and analyze are: the urban fabric, the neighborhoods, the blocks and the open spaces. I will compare the different pre and post war neighborhoods in order to understand the urban composition of the city and how this can inform any urban or design intervention within any of the neighborhoods.

Ismailia Satellite Layout View

As explained earlier, the city of Ismailia is a result of several layers of urban developments by the French who planned it and lived in it first then by the Egyptians who further settled in it. The Google earth plan shows the different levels of densities and concentrations within the city and how the city has transformed from a French town to a dense urban city mainly composed of low to middle income housing neighborhoods.

From the south, the city is bounded by the sweet-water canal provided from the Nile as well as the bitter Lake Timsah. The west boundary of the city is also the sweet water canal while the East side is the Suez Canal that is enclosing the city and the North side is vacant lands which are being prepared for future expansions as well as lands owned by th military.

Figure 22. A Google Earth View of Ismailia

Ismailia Figure Ground

From the figure ground of the base map of the city of Ismailia a better reading of the city structure and composition can be deduced. The Prewar, mainly French, settlements had a more legible city structure with clear pattern of streets, blocks and open spaces. However, the post-war developments (on the east half side of the city) are more arbitrary and planned more as separate neighborhoods that are not strongly connected to each other and barely forming a coherent city.
It is also obvious that in the Prewar city not only a clear street structure can be read but also a dense coherent urban fabric is dominating the area, while in the post-war area the urban fabric is less denser and spacious vacant lands can be identified.

Since there is a source of sweet-water coming from the Nile through the canal dug adjacent to the Lake Timsah waterfront, Ismailia is considered one of the few Egyptian cities that possesses plenty of green areas and has spacious agricultural lands. Thus, the city has a spacious French planned public garden as well as a botanical garden and also smaller gardens that serve the colonial neighborhoods. As for later developments, Ismailia depended more on private sporting clubs in terms of green spaces and less on well-maintained public gardens.

Figure 23. Ismailia Figure Ground

Circulation & Street Network

Ismailia has one main street which is Mohamed Ali street the one which separates the edge of the city from Lake Timsah. This street has been always the city's first and main street which was designed and constructed by the Europeans. Connected to this street is the ring road wrapping the city and bounding it. The ring road is the road connecting the whole city together and is also connected to major highways to Cairo, Port-Said and Suez.

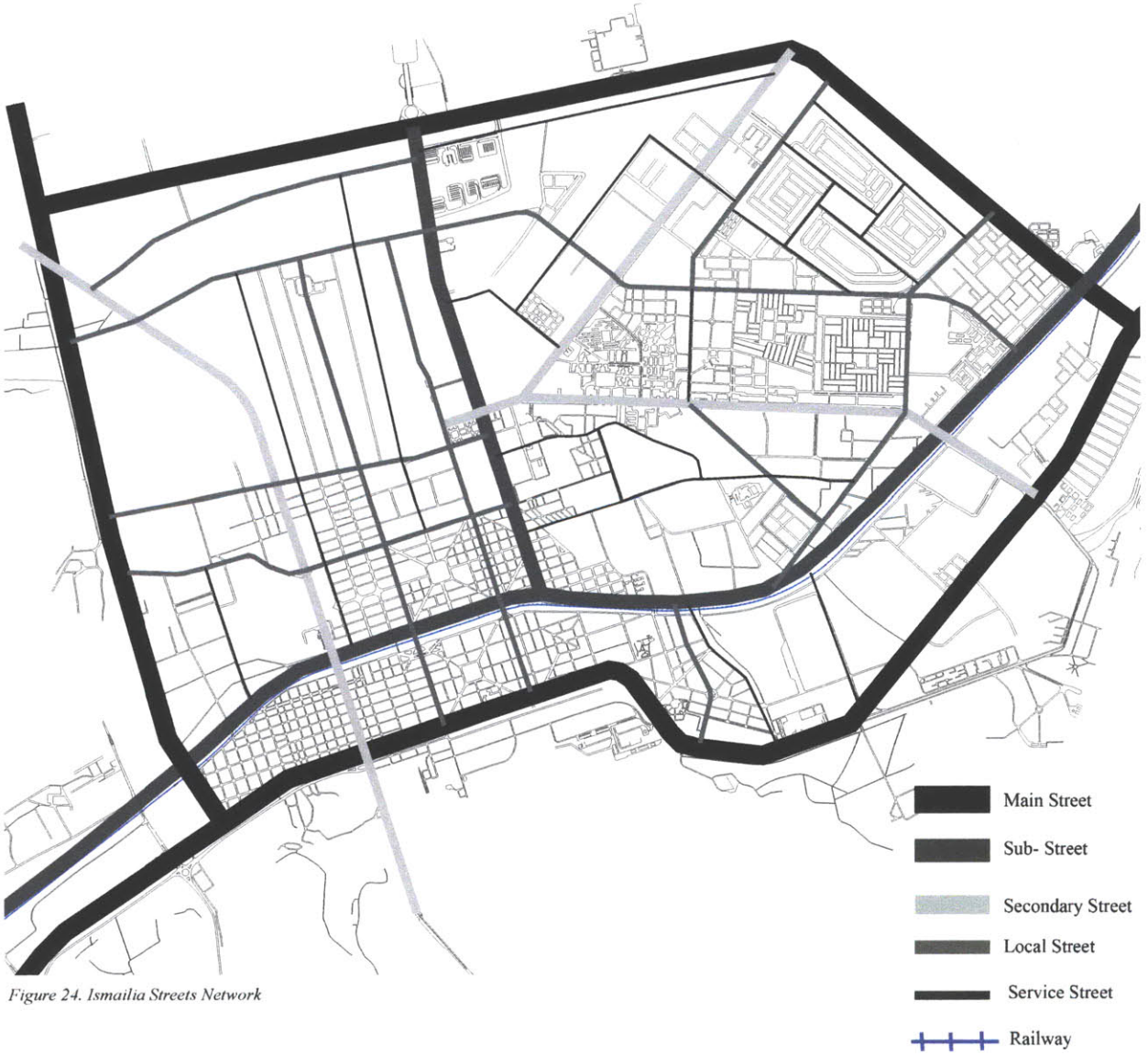


Figure 24. Ismailia Streets Network

Land Use

The city is mainly formed of housing and mixed used buildings which are denoted in pink (residential with a commercial ground floor). A wide part of the land is dedicated to the military other parts colored in blue are of the two major universities which serve the other canal cities and many other schools all around the city. The areas denoted in Grey are vacant lands.[31]

Ismailia is considered to be one of the few Egyptian cities that possesses a decent number of public spaces and greenery and this is because of the sweat water canal which feeds it from the Nile as well as its moderate weather.

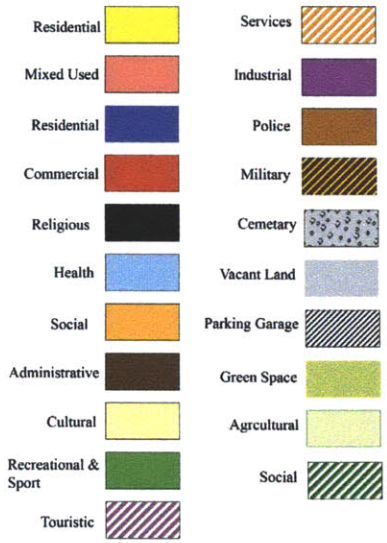


Figure 25. Ismailia Land Use

Neighborhoods Divisions

The following plan shows the administrative divisions of Ismailia.[32] The orange highlighted area is the colonial city which was first developed and designed by the French. Following it is the pink area which is called today Arayshia and which now mainly accommodates middle income to low income housing. The red area on the western part of the city was developed later and is called today 'El-Mahatta AL Gadida' and is composed mainly of low income housing and commercial areas. The yellow are is composed of also low income housing and called 'Al Sohada' district. Hai Al-Salam, which is the slum project that was upgraded, occupies a large area of the city and is considered one of the denser neighborhoods in Ismailia. The green area is Al Timsah and is mainly composed of housing for people working for the Suez Canal Company and military. The blue area, which was developed after the war, is called 'Al-Sheikh Zayed' and is composed of a collage of different neighborhoods.

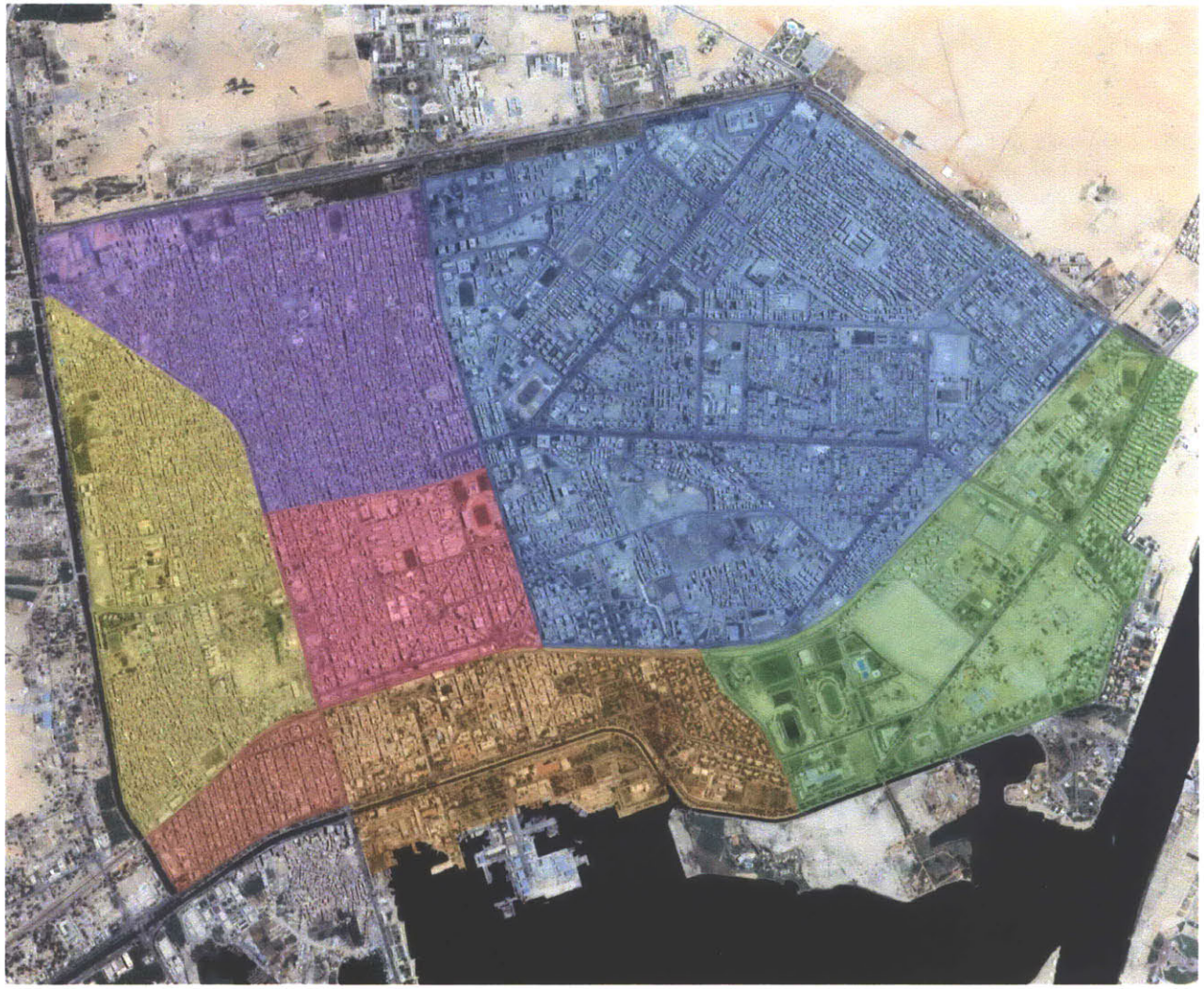


Figure 26. Google Earth View with Administrative Divisions

Post-War Neighborhoods Divisions

Since the administrative division of Ismailia are not accurate enough, I did my own neighborhoods division according to history and year of development, the urban fabric and the land ownership.
The further divisions were mainly implemented in the post-war district of Sheikh Zayed. Each divided neighborhood in the Sheikh Zayed district has its own unique urban fabric and density. Most of the neighborhoods have plenty of vacant spaces with a sparse urban grain. The different neighborhoods within the district have barely any relationship or connection to each other.

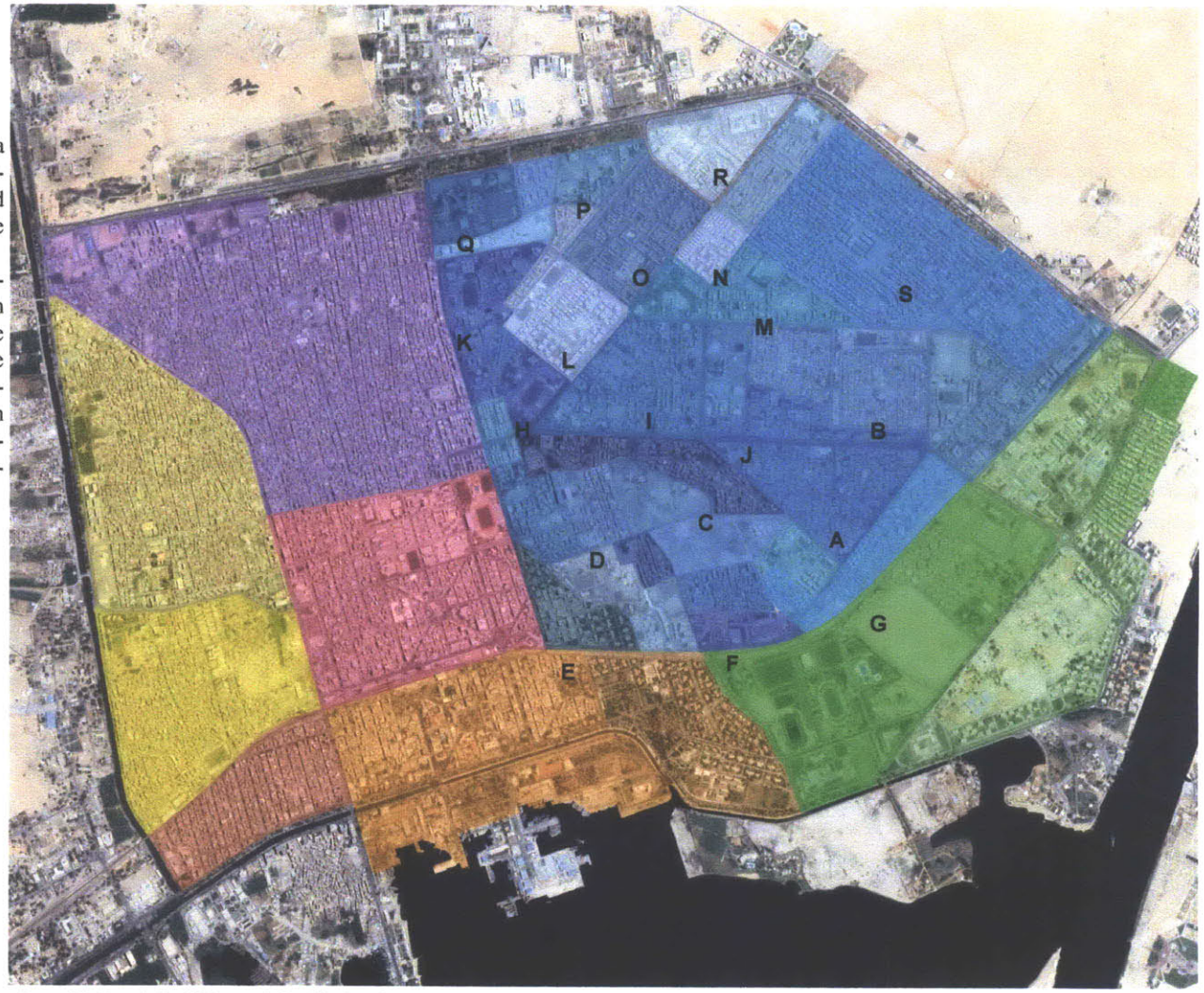


Figure 27. Google Earth View with Neighborhoods Divisions

Urban Issues

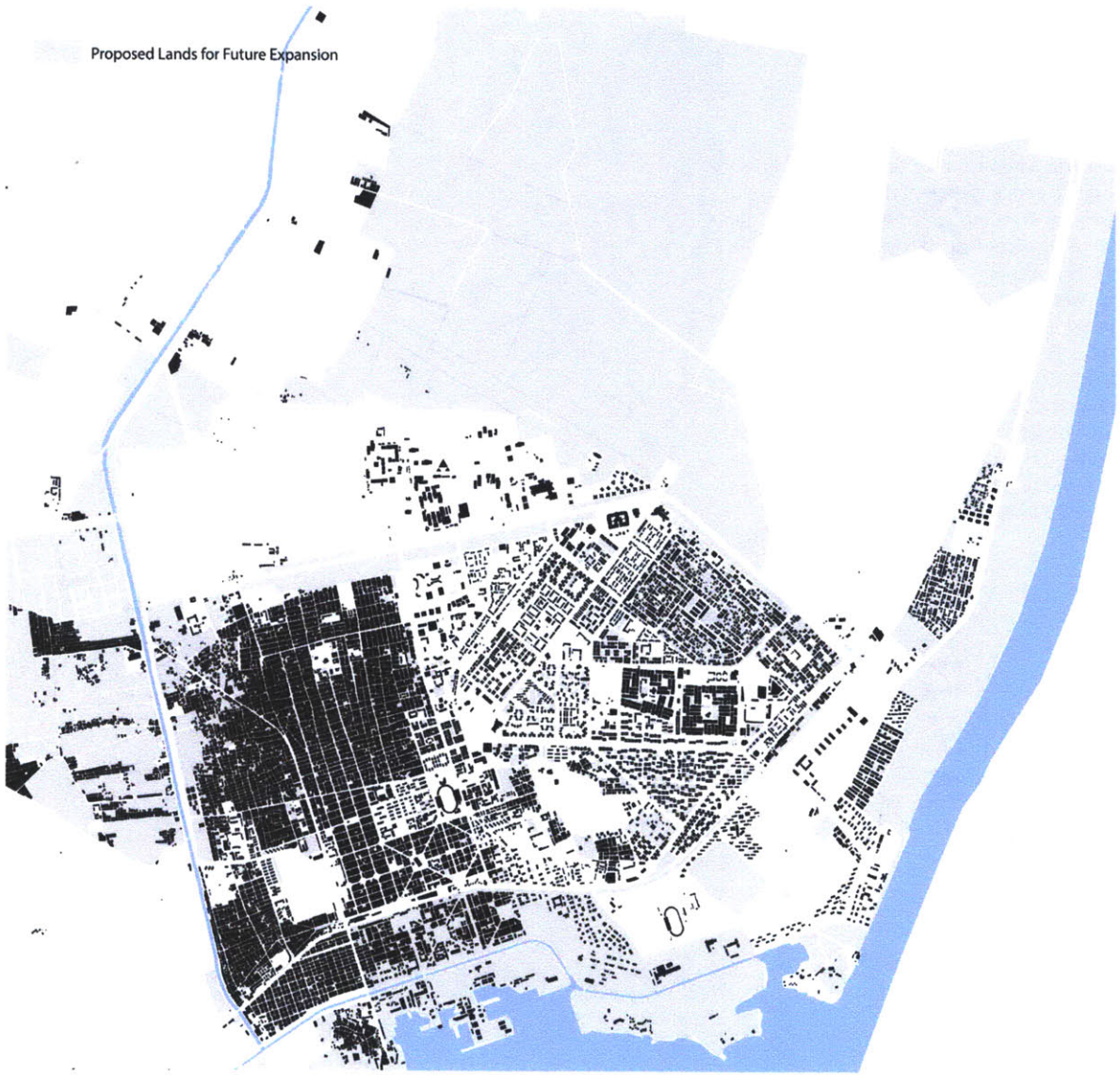
1. The Urban Segregation and disintegration between the western part of the city (mainly Prewar development) and the eastern part of the city (post war development)

2. The lack of structure, coherence and legibility in the post-war development of the city and the very low density and abundance of vacant lands

3. The mis-integration of the water front within the city

4. The separation between the colonial city (bordering the Lake Timsah waterfront) and the northern part of the city by the railroad

5. Future Expansion Plan: while the post war development of the city possesses spacious vacant underdeveloped lands, the future plan of the authorities is to expand to the desert creating an unsustainable and uneconomical urban sprawl



Chapter 3

Neighborhoods Analysis

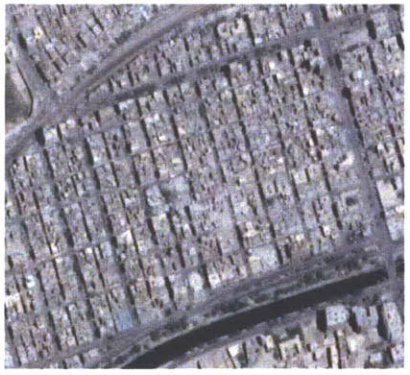
From the general city analysis it's concluded that many of the urban problems that exists within the city are concentrated in the post war area or what we call the Sheikh Zayed District. In order to understand more the configuration of the different neighborhoods in the city, their fabric, blocks and open spaces, a sample of eight different neighborhoods was selected as they represent the different urban structure of the city. Four of which are prewar neighborhoods and the other four are post-war neighborhood that one of which (the last neighborhood presented) will be the focus of the study and the design intervention in the design chapter

Pre- War Neighborhoods (1983-1967)

The European Quarter (Completed in 1868)

This is the first designed and built neighborhood by the French who inhabited the city first. The block acted like a small city with all the elements and services included. The neighborhood has a typical axial colonial plan where all the streets intersect in the main central square or public space. The neighborhood has a medium size of 480 by 480 meters.

The Arabian Quarter (Completed in 1868)



This neighborhood was planned originally like the other axial neighborhoods with a central public square but it was never built following this prototype. Instead it was built as a very tight neighborhood for the Egyptians and Syrians who worked in the Suez Canal Construction. This neighborhood, built with tight streets and small blocks, had more commercial services and workshops. It also acted as a small city contained within itself.

The European Quarter

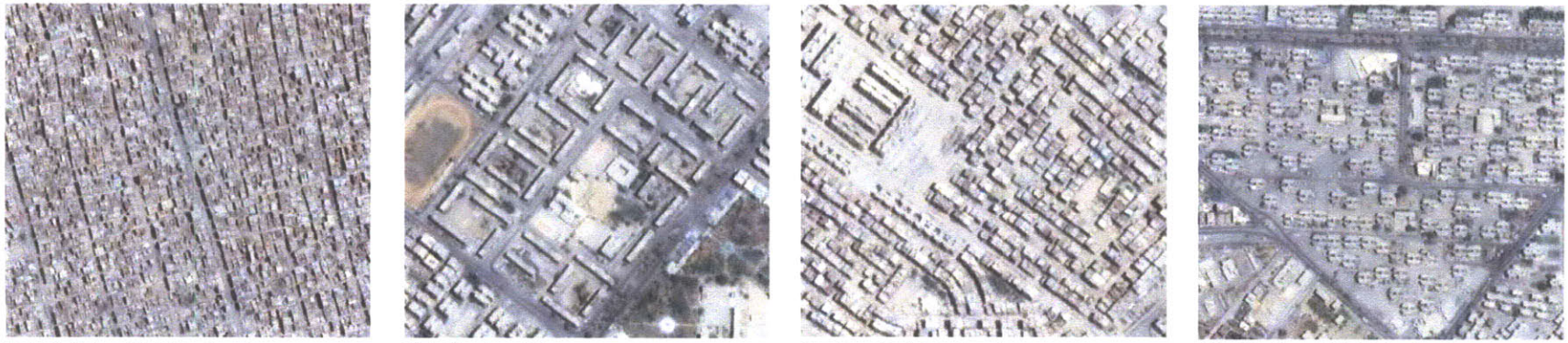
This neighborhood was developed later in the early twentieth century following the prototype of the colonial planned neighborhood. It's the first to be constructed above the railroad. However, it's much more different architecturally with higher buildings and larger blocks. Later, a large mosque was added in the middle of the central square of the neighborhood, which was a typical element that the Egyptians added later to a lot of the areas within the city.

The European Quarter (British)

This quarter was developed during the British occupation that's why it's usually refereed to as the British quarter although it was also designed and developed by the French. The neighborhood is considered one of the most beautiful and well maintained areas which is composed of free standing urban villas of two or three floors with a large private gardens. These villas are owned by high ranking positions working for the Suez Canal Authority.

Post- War Neighborhoods (1973- 2011)

Figure 28 Ismailia Neighborhoods Google Earth



Hai Al-Salam Neighborhood

Hai Al-Salam is to be considered the mot renowned neighborhood in Ismailia since it's undergone a successful upgrading and site and services project. It's a slum area that was developed right before the war as few unorganized encroachments without any proper infrastructure or services. The neighborhood was developed and upgraded later by a British design firm funded by the UN. It is considered one of the most dense and large neighborhoods within Ismailia.[33]

Neighborhood 5

This neighborhood was developed later after the war serving higher income residents. The density is very low within the area and the built up area is lower than the open spaces. It is composed of clusters of apartment buildings enclosing an open space.

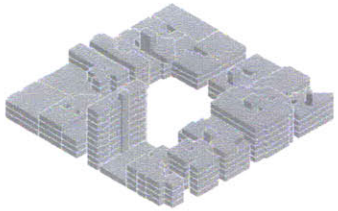
Gam'yat Neighborhood

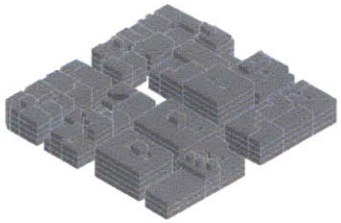
Gam'yat was developed much later by private organizations who were provided with the land and made there own layout for this residential area. It's a middle income housing areas composed of small high-rise apartment buildings. There are no clearly defined blocks within the neighborhood and the streets are in a bad condition. The area is still undergoing construction since it still possesses some vacant plots.

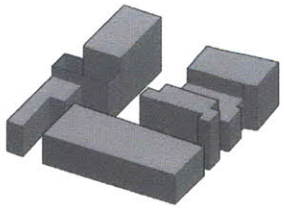
Sheikh Zayed Neighborhood

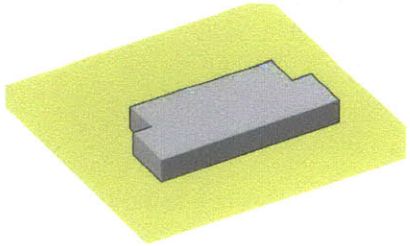
This quarter was developed during the British occupation that's why it's usually refereed to as the British quarter although it was also designed and developed by the French. The neighborhood is considered one of the most beautiful and well maintained areas which is composed of free standing urban villas of two or three floors with a large private gardens. These villas are owned by high ranking positions working for the Suez Canal Authority.

Pre- War Neighborhoods (1983-1967)









The European Quarter

The European Quarter block is the first to be designed, built and inhabited by the Europeans. It's a square block with the size of 100* 100 meters, almost double the size of the Arabian Quarter block. Some the blocks have an open space or a courtyard in at the center. A lot of the buildings within the block remained the same as well as the shape and configuration of the block. However, some of the buildings were demolished and replaced by apartment buildings of 10 stories or more.

The Arabian Quarter

The Arabian Quarter block is considered to be one of the smallest blocks in Ismailia. The neighborhood is composed of uniform square blocks of 45 * 45 meters. The checkerboard blocks form orthogonal parallel and perpendicular streets forming a clear grid of narrow intersecting streets.[34]

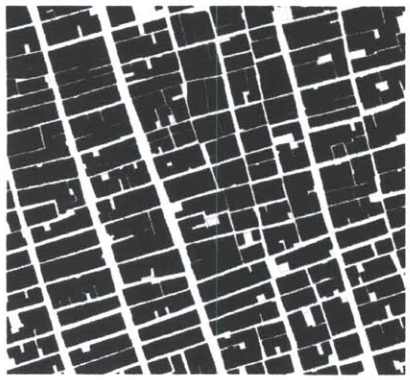
The European Quarter

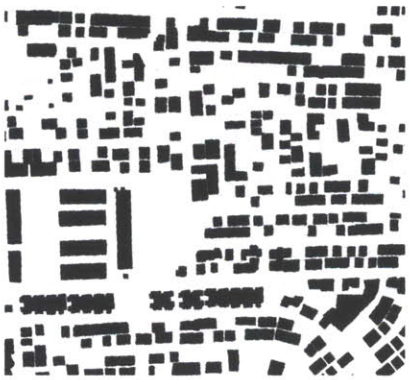
Although the European Quarter extension followed the same prototype of the first built quarter, its blocks division is different as it is divided into smaller blocks of 45*45 meters similar to the Arabian Quarter. The blocks are more dense and compact and the buildings are higher.

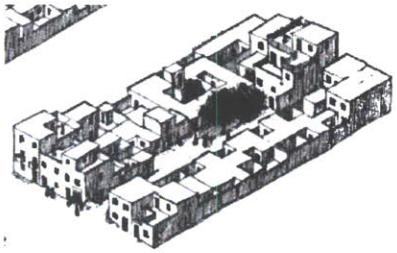
The European Quarter (British)

The British Quarter, which is composed of private villas with gardens, where each villa with its garden occupying one block, is one of the unique and most beautiful quarters in Ismailia. The block size is approximately 60*40 meters. The blocks are almost all standardized with two villas prototypes.

Post- War Neighborhoods (1973- 2011)

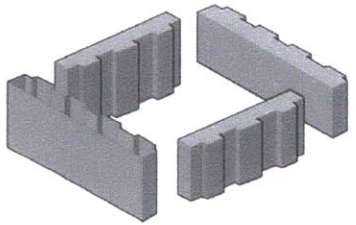






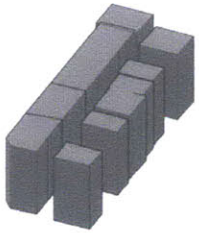
Hai Al-Salam Neighborhood

Before the war, Hai- al Salam was an informal settlement that didn't have an adequate street network nor clearly defined blocks. After the war and with the upgrading of this neighborhood, the main purpose is to formalize the are by creating unified blocks bounded by streets and forming a continuous facade.



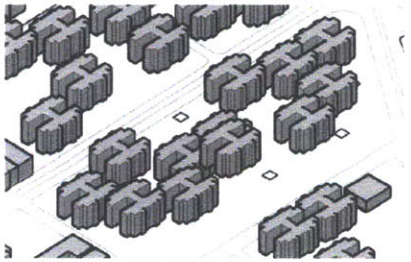
Neighborhood 5

A very low density neighborhood with rectilinear blocks where each four deattached apartment buildings form a block. The blocks are relatively defined and also defining the streets around them with a large open space in the center.



Gam'yat Neighborhood

Gam'eyat is composed of very small linear blocks with attached back to back small buildings and some vacant plots in between. The neighborhood has generally a clear street network.

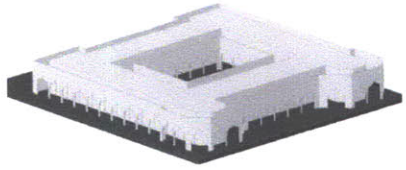


Sheikh Zayed Neighborhood

Sheikh Zayed neighborhood is one of the areas within Ismailia, and especially postwar Ismailia, with no obvious blocks or streets definition. The selected block, as shown, is not defining the streets around it or having a clear layout of the buildings where the architectural type is more dominant than the urban feature.

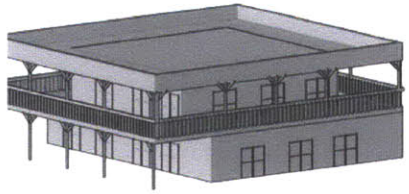
Courtyard Colonial House

Urban Colonial Villa



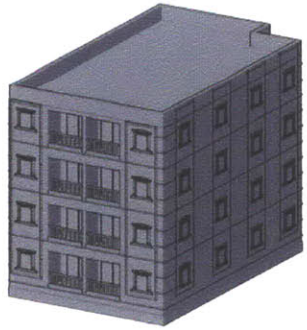
The European Quarter

The buildings are of different types in the oldest neighborhood, but they are mainly free standing courtyard large building. Some of them were administrative and others were residential houses owned by the major personnel managing the Suez Canal Company. Some of the buildings were inspired by the elements of Islamic Architecture like the pointed arches and the decoration and others were of the colonial style made mainly out of wood.



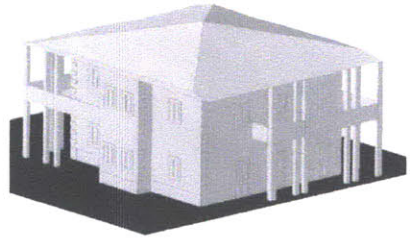
The Arabian Quarter

The Arabian quarter still reserves many of its beautiful wooden buildings with extruded terraces that shade the ground floor sidewalks.



The European Quarter

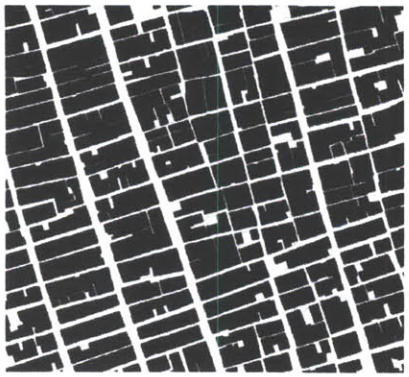
The second European quarter is composed of eclectic apartment buildings that vary in their architectural style. The old buildings that used to be their are partially demolished and replaced by higher apartment buildings.



The European Quarter (British)

The urban villas are free standing large two or three stories colonial style villas. They are made out of wood and bricks and have spacious terraces overlooking their private gardens. The all have pitched roof, which is only common within the French planned part of Ismailia. The villas were designed by the French architects and engineers who inhabited the city.

Post- War Neighborhoods (1973- 2011)



Party Wall Apartment Building

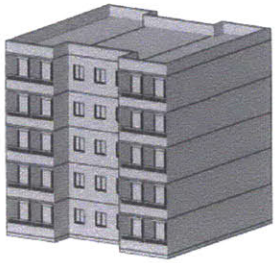
Attached Apartment Buildings

Attached Apartment Buildings

Free Standing Apartment Building

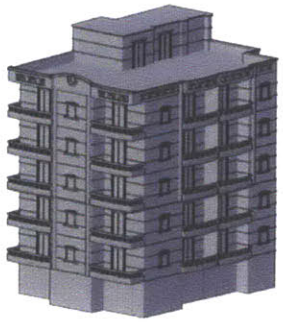
Hai Al-Salam Neighborhood

Hai Al Salam buildings were originally informal buildings which were upgraded later after the war and were converted to courtyard buildings reaching three floors with each floor hosting one family. Later the courtyards within the buildings were covered and converted into rooms.[35]



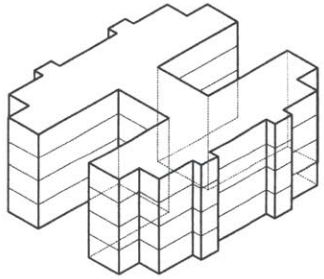
Neighborhood 5

It is composed of four stories long apartment buildings that are attached to each other to form a spacious enclosure at the center of each block



Gam'yat Neighborhood

Gam'yat is composed of small attached apartment buildings that vary in their architectural styles and color and do not follow any specific design guidelines. The buildings are normally high ranging from six to twelve or more floors.



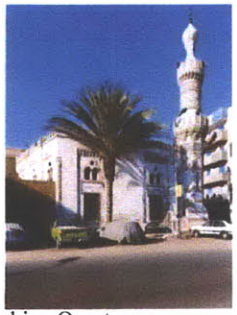
Sheikh Zayed Neighborhood

The buildings in Sheikh Zayed are all the same since it's a standardized neighborhood. The are all four stories buildings with four identical units on each floor. The material used is yellow stone which is only used in this neighborhood in the whole city.

Pre- War Neighborhoods (1983-1967)

The European Quarter

The first neighborhoods design was all the same with a large central public park in each neighborhood. The public space remained to our current day and is being used by surrounding residents and many couples. The one thing that was unique about Ismailia is that it was and still one of the few Egyptian cities that have green and open spaces.



The Arabian Quarter

Although it was designed similar to the other quarters with a main garden or square in the middle it was never built in the Arabian quarter. Instead, the quarter is very dense with barely any gardens or public spaces. Only the mosque which is the oldest in the city is considered the only public space and it even doesn't have a *Saha* or an open space or courtyard which usually surrounds the mosques.

The European Quarter

As for the neighborhood developed over the railroad following the same plan of the old quarters, the public park in the middle replaced by a huge mosque in which the garden surrounding it is the mosque property. It is the case in many Egyptian cities to build mosques over open or public spaces.

The European Quarter (British)

The urban villas quarter open spaces are those private spacious gardens surrounding each villa and fenced by a wooden fence. The British quarter overlooked a spacious public and botanical gardens, one of which today is closed and the other one is abandoned.

Post- War Neighborhoods (1973- 2011)

Figure 29. Ismailia Neighborhoods

Hai Al-Salam Neighborhood

Hai al-Salam neighborhood had only one spacious open public space serving the whole large neighborhood which occupies a big area of the city. The public space located in the center to the north of the neighborhood has a mosque, a school, a community building, small gardens and a playground.

Neighborhood 5

Within each block there is a central garden or open space that serves the block. One block has a mosque and in the center of the neighborhood there is a main school and a spacious garden that has been misused and is sometimes used as a garbage dump.

Gam'yat Neighborhood

There are very few open spaces or public spaces that serves the Gam'yat neighborhood although is has alot of vacant plots. The few open spaces that exist are the ones accommodating the mosques serving the area. The sahas of the mosques are usually surrounded by fences.

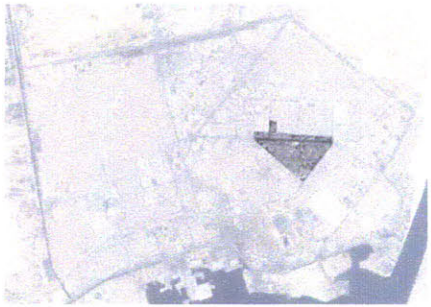
Sheikh Zayed Neighborhood

Sheikh Zayed has two main open spaces although they are not planned. Both are areas surrounding the two main mosques in the neighborhood; one is at the entrance of the neighborhood to the north and the other one is south of the neighborhood. There are also alot of vacant areas that are used by the residents and playing and recreational areas.

Chapter 4

Urban Site Analysis & Design

This chapter is a demonstration that aims at solving some of the urban problems within Ismailia by focusing of developing one neighborhood in the post-war city.
The chapter will start by analyzing the existing conditions of the neighborhood, explore the challenges and potential in it and identify the main problems. The analysis will be demonstrated through site photos, layout plans and figure ground and diagrams.
It will then indicate a design strategy which solves some of the problem within the neighborhood and propose an alternative design for the area.
The design components will be composed of a general master plan and layout for the neighborhood, perspective shots that show the design concept and implementation, and a street section that demonstrates also the design concept and how the neighborhood is being enhanced and developed.
I will then look closely to one of the blocks within the neighborhood and design it in more details showing the circulation, the public and private spaces and the landscape.



Sheikh Zayed neighborhood was a social housing quarter that was developed right after the evacuation of the city of Ismailia in 1967 and its re-inhabitation after 1973. It was built by the Ministry of Housing and Reconstruction and funded by Sheikh Zayed, the sultan of the United Arab Emirates, who donated 100 million dollars for the construction of this project.
The neighborhood, which is composed of 4000 standardized housing units on an area of 106 acres, was built in almost two years to accommodate the indigenous inhabitants of Ismailia following the end of the war. The whole neighborhood was built using yellow stone that was criticized by the construction engineer and the professor in Cairo University Milad Hanna, who refereed the architecture of the area 'Style Cheops' and who criticized the material for increasing the housing prices because it require a lot of workers. Thus, it was never repeated and the material haven't been used since then in Ismailia. Moreover, the British firm that was responsible for the Ismailia Master Plan and the Demonstration Projects saw that the Sheikh Zayed Project is a waste and that this fund should have been invested in a more productive investment instead of a housing project.[36]

Existing Housing Conditions

Year of Development: First phase Completed in 1974

Type of Housing: Middle Class

Residential Units: 4000 units

Population: ~13,824 person

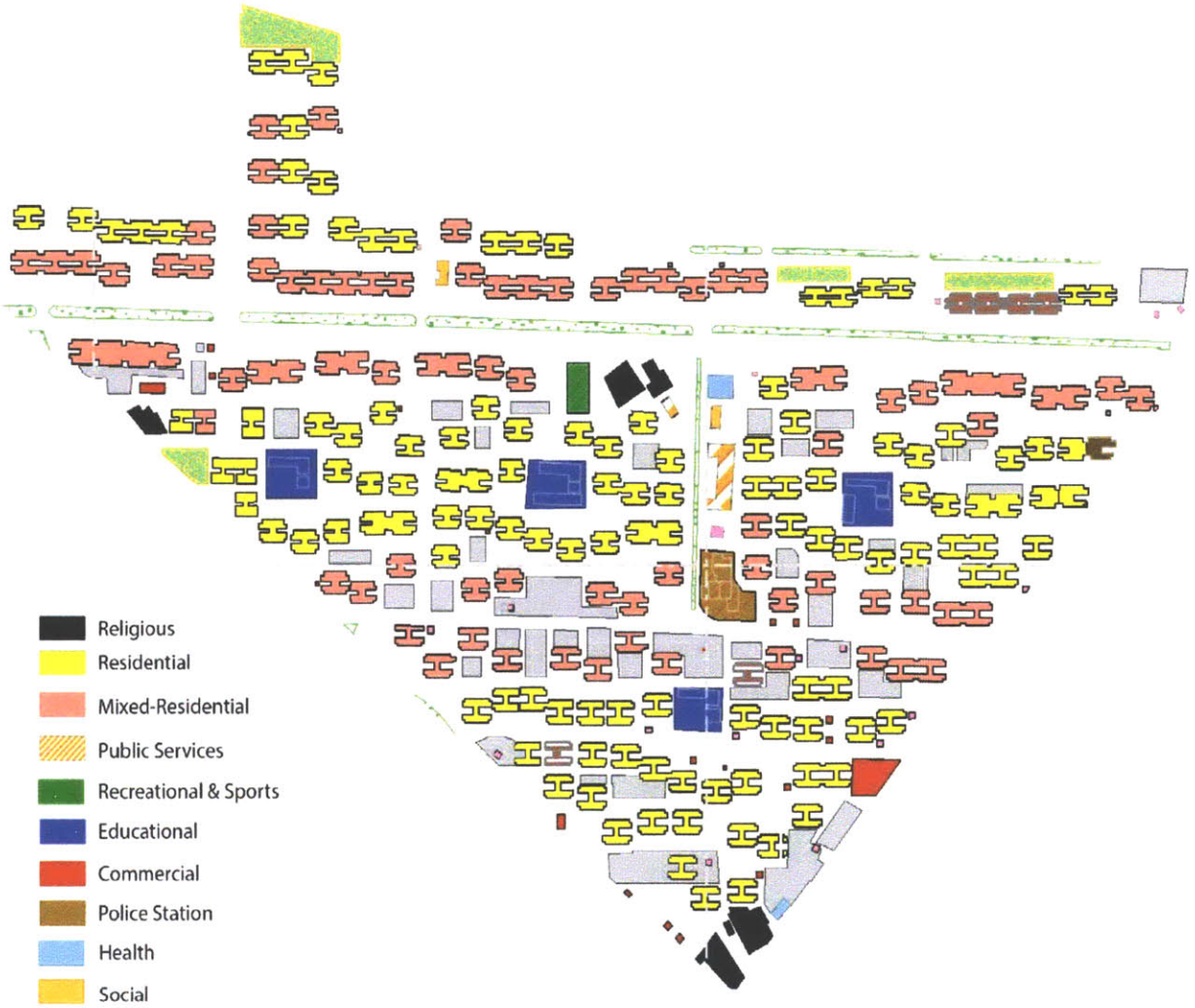
Neighborhood Area: ~ 430,000 m2
106 acres

FAR: ~0.8

Percentage of Built up area: ~ 25 %

Sheikh Zayed Land Use

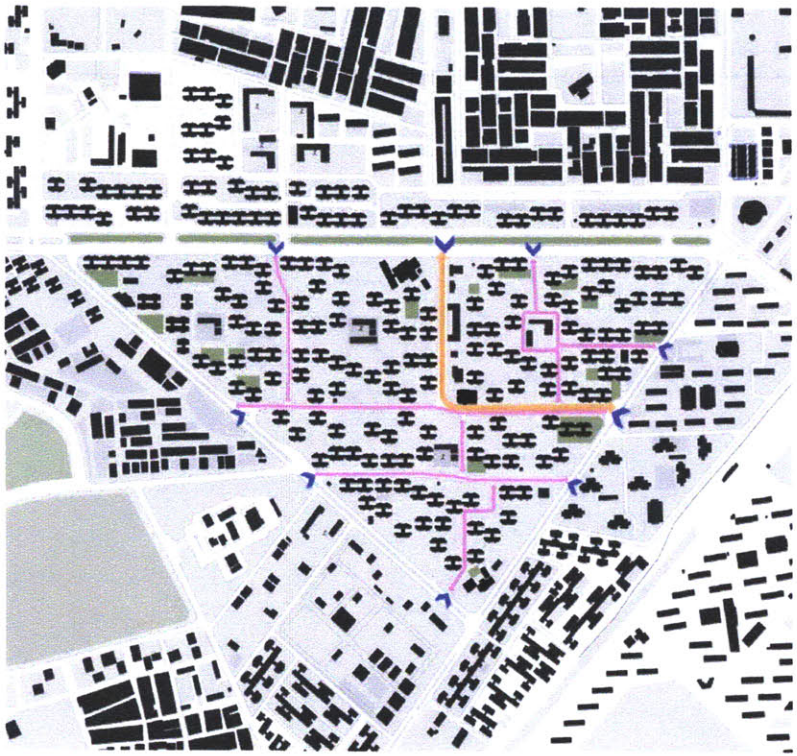
Sheikh Zayed Neighborhood is mainly a residential social housing neighborhood. However, the neighborhood still provides public services to the whole city. It has one of the main commercial streets of Ismailia bounding it from the north side where various commercial activities take place and there are a lot of mixed used buildings. The area also has many public school mainly serving the Sheikh Zayed neighborhood and other surrounding areas. There is a police station and medical clinics that also serves the neighborhood and the adjacent areas. There is also an administrative building for official paper work and contracts extractions which serves the city as a whole. Mosques and other services are also provided in the neighborhood. However, there is seldom any public garden or designated open space for public and neighborhood use. There are a lot of vacant spaces that are used by the public as recreational spaces but are not well equipped to accommodate the public and children activities.



Accessibility and Circulation (roads)

The neighborhood has many access points. The main one is from the main commercial street which passes through the public services and the main mosque within the area. Other secondary access points are through the side edges of the neighborhood. There is a main defined street within the area (noted in orange) which passes through the main entry to the neighborhood.

However, there is no clear and legible street structure that one can identify and that defines the blocks within the neighborhood. The conditions of the existing streets are also very poor with low maintenance and the streets are not defined by clear sidewalks or a tree line.



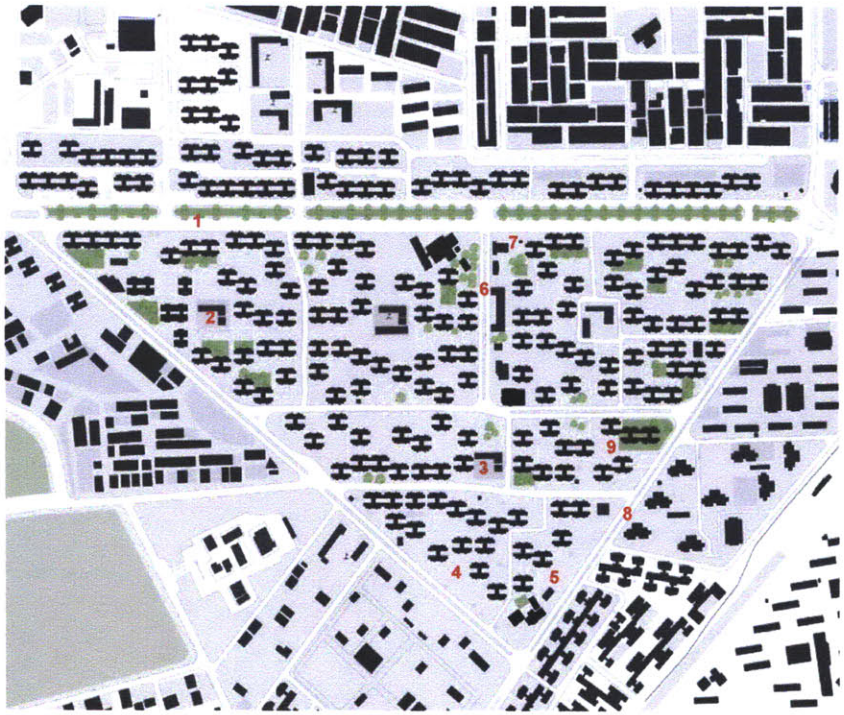
Site Edges

The site is bounded from the north side by a main commercial boulevard, which is one of the most vital lively boulevards for the whole city. This boulevard has a central spacious green island that is usually used as a public recreational space for residents in the Sheikh Zayed neighborhood.

As for the other two edges of the site, they are less lively edges connected to other residential neighborhoods the east side is more permeable and connected to its adjacent area since there is a gas station and a large supermarket within the adjacent neighborhood to the east side.

Figure 30. Sheihk Zayed

Neighborhood Overview



1 Main Commercial Boulevard

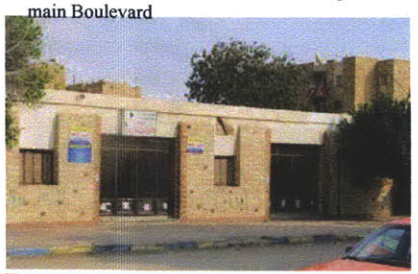
2 Boys School

3 Sheikh Zayed Primary School

4 Standardized Housing Units

5 Mosque and Vacant Areas Overview

6 View from the Central Street overlooking the main Boulevard



7 Medical Clinic

8 East Site Edge View

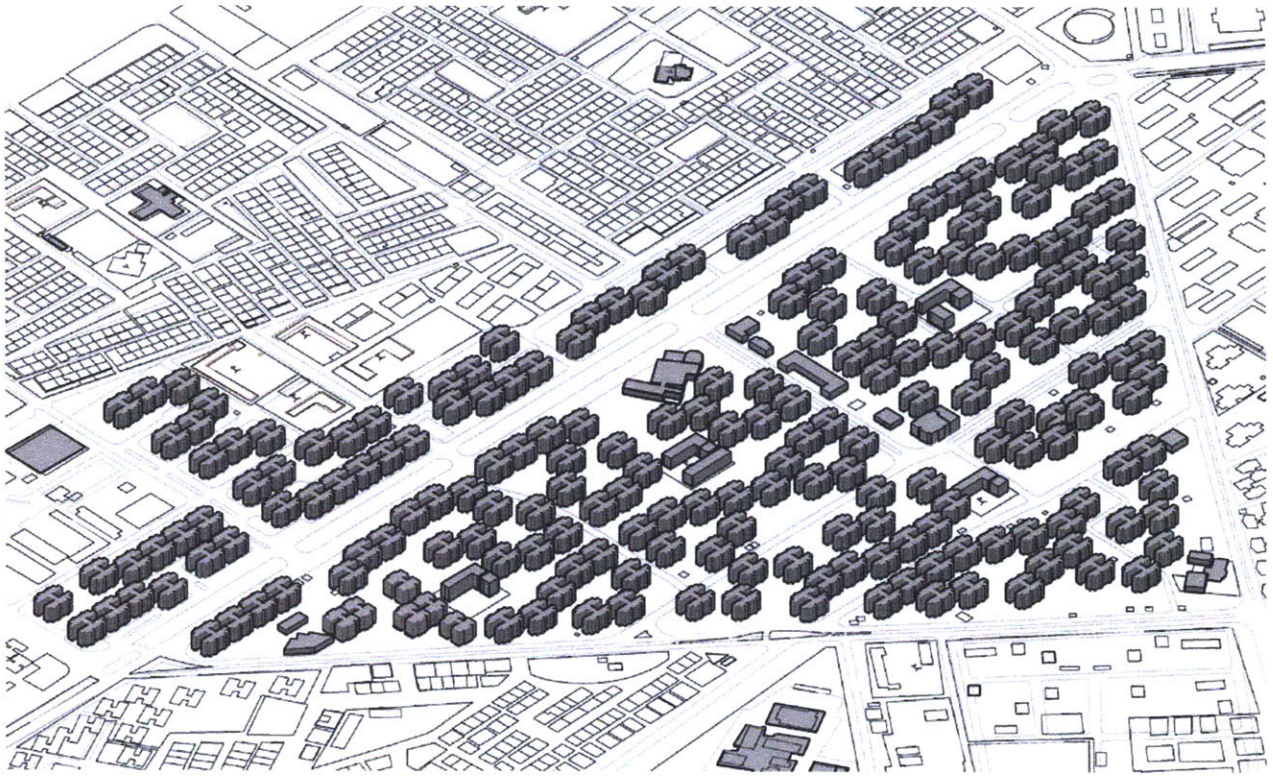
9 Neighborhood Inner Street

Existing Site 3 Dimensional

A perspective view of the neighborhood gives a clearer view on the layout and the architectural characteristic that is more dominant than the urban character of the area. There is no clear block definition or defined streets structure. Open spaces are a production of an arbitrary development and aren't clearly defined or identified.
The very low density of the neighborhood can also be noted from this perspective view

Unlike Prewar Ismailia, the Sheikh Zayed neighborhood was designed without following any urban or architectural design guidelines.
Some of the urban problems within the neighborhood are as follows:

1. The lack of legibility due to the lack of an urban structure which is defined by a clear streets network, blocks and open spaces
2. The lack of open spaces and a hierarchy of spaces from public to semi-public and private
3. The abundance of unused vacant spaces which resulted in a low FAR within the neighborhood



Al- Sabbah or Kuwait Neighborhood in Port-Said

Al- Sabbah or Kuwait Neighborhood was also developed at the same time after the 1973 war using the same materials, prototypes and construction method by the Ministry of Housing and Reconstruction in Port-Said and funded by Sultan Sabbah of Kuwait who also donated 100 million dollars for the realization of this project.

The layout of Kuwait Neighborhood is different than Sheikh Zayed as the rectilinear form is more structured and the streets are more identifiable and the blocks are more legible, especially on the western side that is composed of standardized units on a checkerboard layout which clearly defines the street network. However, the eastern part is less dense with a less defined layout but with a clearly defined square accommodating the main mosque within the city.[37]

Faisal City in Suez

Faisal City in Suez is a large neighborhood also developed post 1973 following the same prototype and funded by Sheikh Faisal of Saudi Arabia. The main neighborhood is the one to the right hand side of the page and is composed of several low density blocks formed by an ensemble of attached standardized units. The area is better defined than Sheikh Zayed, but still has alot of problems and urban issues, such as the lack of structure and legibility and the randomness of the streets network.
The part shown on the left hand side of the page is south to the main neighborhood and is called Mini- Faisal. It has a public square in the middle with a mosque and a more defined patterns of streets.[38]

The three neighborhoods in the Canal Cities, Sheikh Zayed in Ismailia, Sabbah in Port-Said and Faisal in Suez were constructed for the same purpose and following the same style and prototype to accommodate the indigenous post-war immigrants who were returning to re-inhabit the three cities.

Design Concept

The purpose of this thesis is to densify and urbanize this neighborhood by implementing an urban infill approach. First a series of hierarchical streets were constructed, which enabled the generation of blocks that surround a central public space. Each block is defined buy its surrounding streets by having an urban façade enclosing the block from the peripheries and a picturesque open semi-public space inside the block.

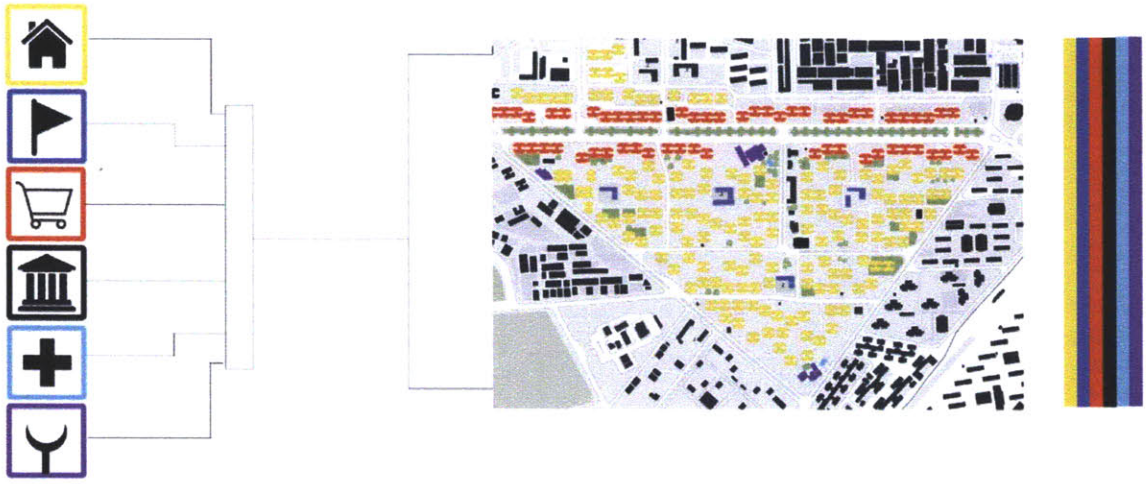
The purpose of the new design is to:

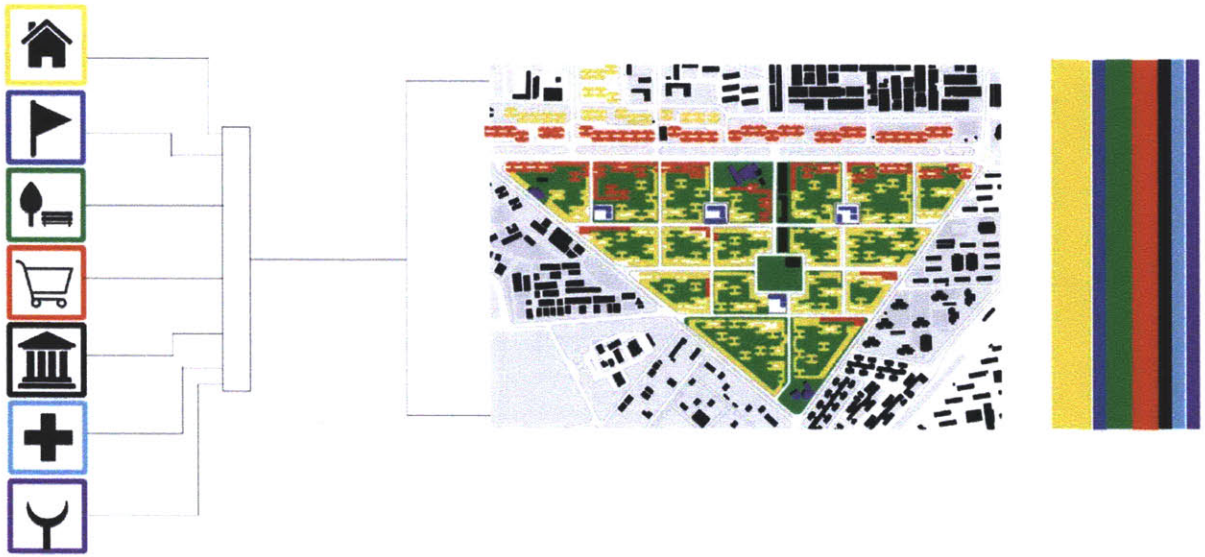
1. Create an urban dense neighborhood with a higher FAR informed by the colonial French plan of Ismailia
2. Generate a series of hierarchical streets that enhances the legibility and way-finding of the place
3. Create a distinction and clear definition of private versus semi-public versus public spaces and services
4. Add a value to this neighborhood by enhancing the quality of green and open spaces
5. Enhancing the program and services in the neighborhood

Programming

Sheikh Zayed neighborhood provides many public services to its residence and to the inhabitants of Ismailia as a whole and this is due to its central location within the cities. However, few important services are not generously provided within the area, such as adequate public and green spaces, supermarkets and grocery and food outlets. Also few commercial services are missing.
The current neighborhood program is shown in the above figure. The area is composed of residential buildings and some commercial, public, health, religious and educational services are also provided.

The proposed program adds to the neighborhood more public and green spaces and also more necessary commercial services. Needless to say that the main addition to the neighborhood will be through the housing infill; therefore, the proposed design will add more flexible residential units.





Existing Units Plans

In order to come up with a suitable infill prototype, the current units and their floor plans had to be studied to make sure the privacy of those units is not invaded and that the final design will be appropriate and will have a positive impact and contribution on each block. The suggested prototypes are of simple rectilinear design that aim at connecting the existing units together. So the connection is created through either the side edge of the existing unit or the front side of it. The main purpose of the introduced prototypes is to create an enclosure within the block without blocking the ventilation or the view of the existing units.

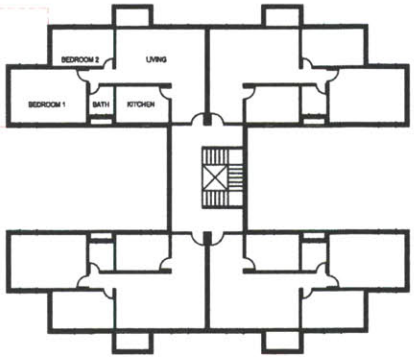
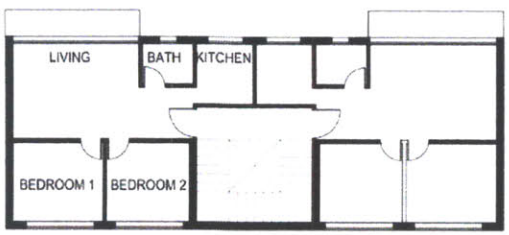
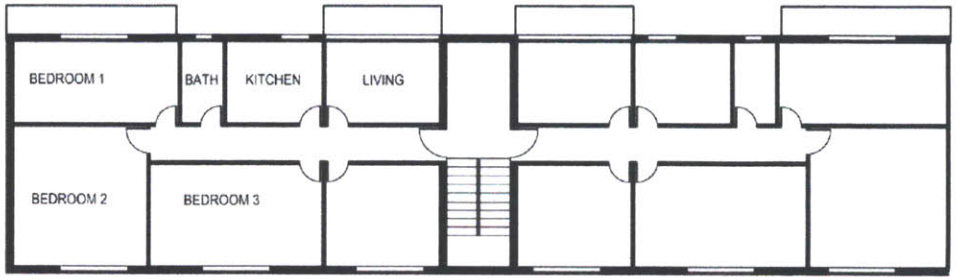


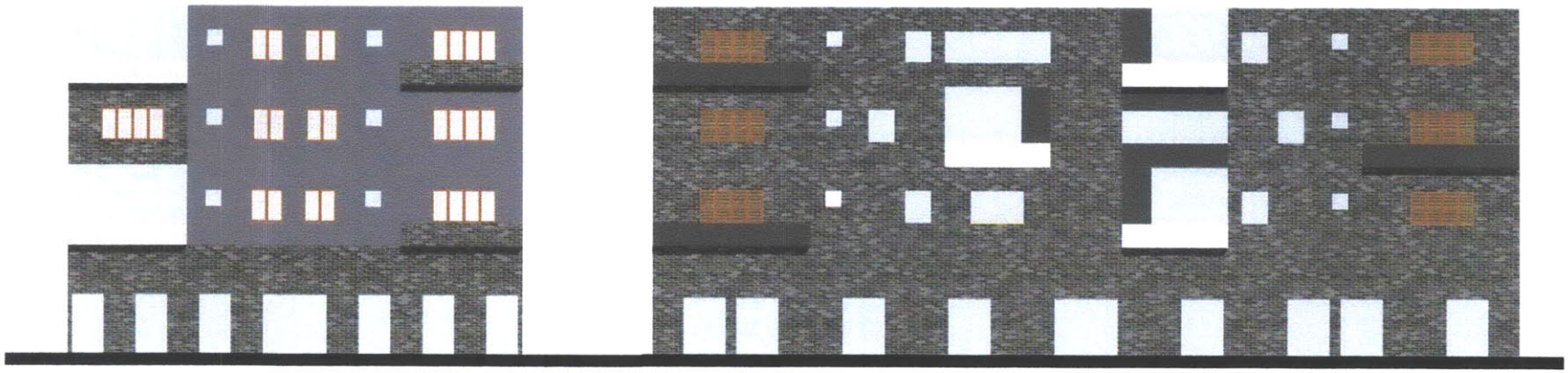
Figure 31. Sheikh Zayed

Proposed Units

Two similar prototypes are designed for the urban infill approach: both with wide frontage and narrow side that can accommodate more units or be connected to them from the side. Each apartment building is composed of four floors and each floor contains two residential units. The units within the different prototypes have different areas unlike the existing standardized units where all the units areas are the same.







Design Objective

Enhancing the legibility and urban structure that creates a coherent dense urban fabric of the neighborhood and ameliorates its identity

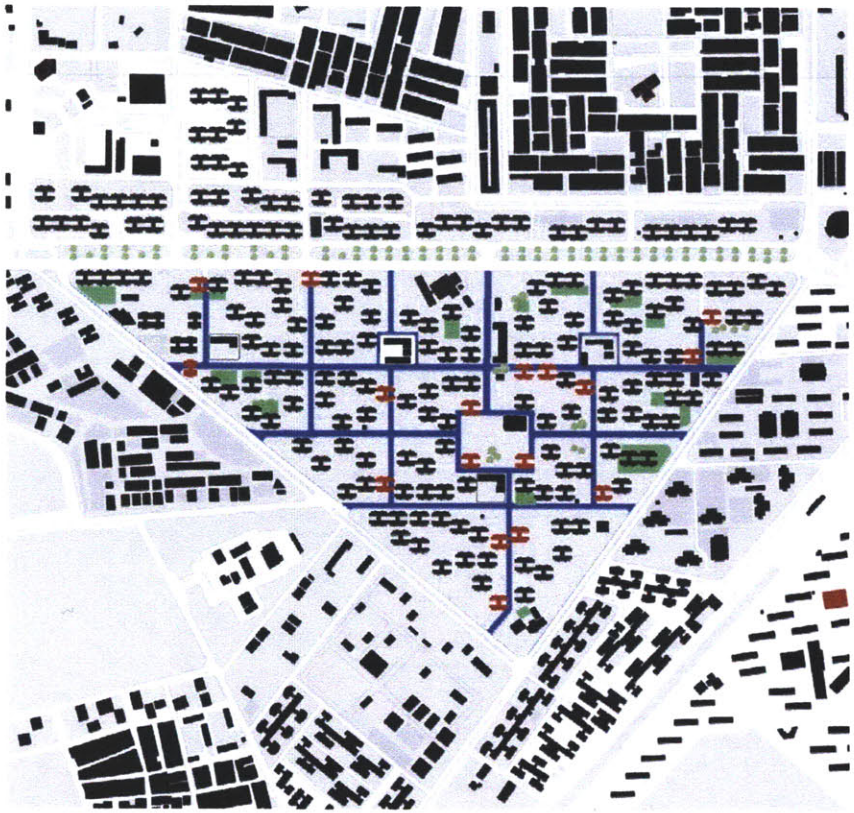
Methodology

1. Creating a network of hierarchical streets (ranging from 10 meters wide to 6 meters wide)

2. Generating well-defined urban blocks, defined by this street network, and which link the housing units together by creating a continuous urban facade that surrounds each block leaving a picturesque open space at the core of each block

3. Creating a variety of public open spaces, from public (illustrated in the central space), to semi public, withing each block and to private open spaces (illustrated in the inner small courtyards within the apartment buildings)

Proposed Streets Network



The proposed street network has three main major 10 meters wide streets. One is cutting through the middle of the neighborhood and the main public space, the other one is parallel to it passing through the schools, and the third one is the one perpendicular to them passing by all the public services available within the neighborhood.

Hierarchy of Open Spaces

Public Spaces

The proposed open spaces (highlighted in green) vary from public spaces, adjacent to the main public street and which include the main central proposed space and the two other spaces surrounding the main mosques in the neighborhood.

Semi-Public Spaces

The semi-public spaces are those within each block and the private spaces are the ones within the existing units acting like private courtyard for some of the existing apartment buildings.

Private Spaces

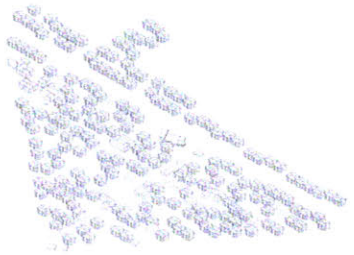
Public Building & Main Streets

The buildings highlighted in red are all the public buildings existing within the neighborhood ranging from a medical clinic to mosques and schools to a police station and a governmental office. The purpose of the new street network in creating a hierarchy of streets is to distinguish between the main streets with heavy circulation and that are larger in width and the more private street in which the circulation is limited to the neighborhood residents. Thus the two main streets within the neighborhood and that intersect in a public node are the one passing through the public services in the area.

Design Strategy

Three different layers were introduced to the existing neighborhood. First the street network and then the buildings or urban infill layer and finally the landscape and public space layer.

Existing Condition



Proposed Streets Network

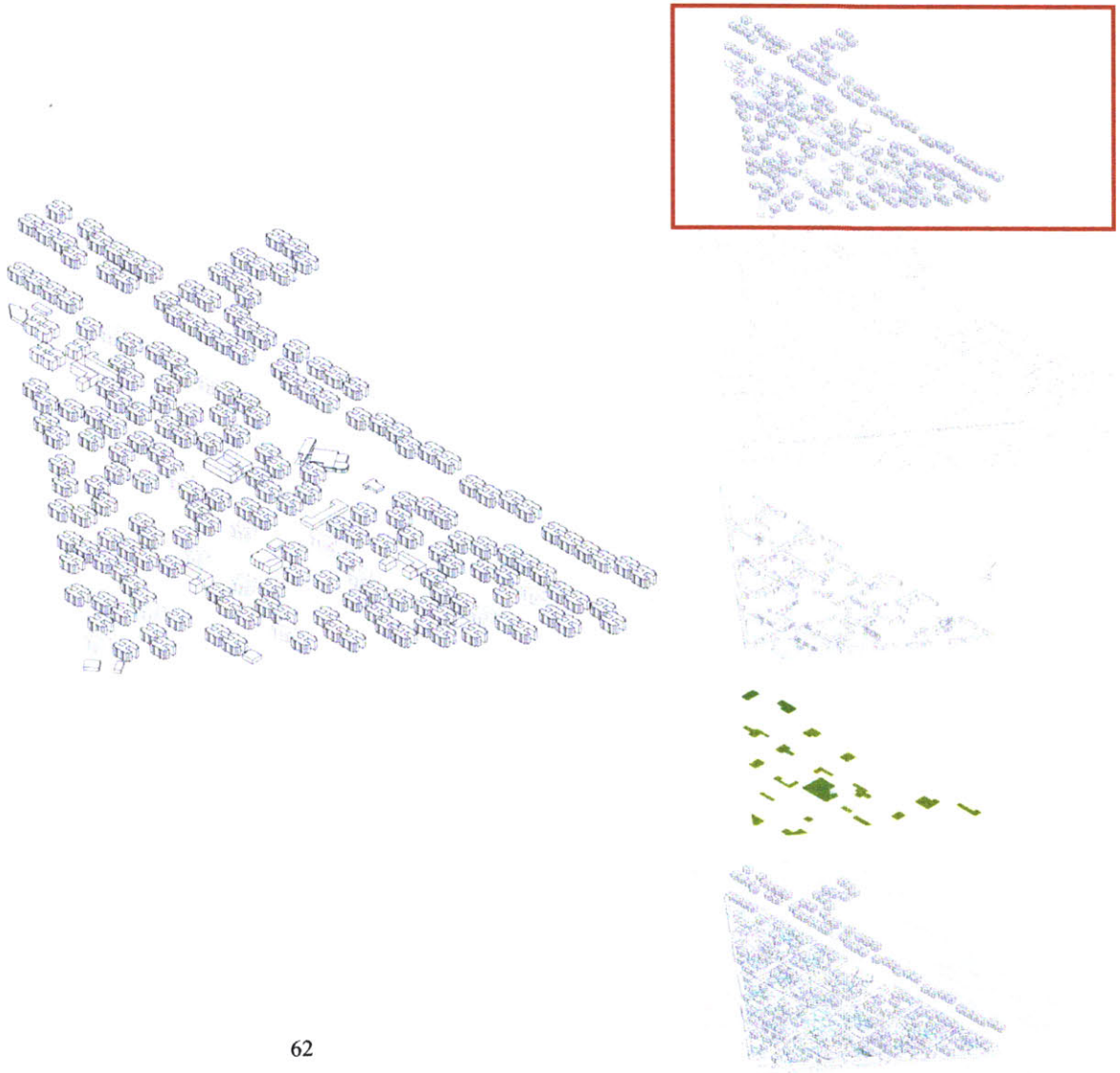
Proposed Infill Buildings

Proposed Public Spaces

Proposed Design

Existing Condition

As illustrated in the 3D view shown, most of the existing units are not aligned or built following a certain grid. What I did first is to try to find alignments and a certain grid that ties the units together so I can implement my design proposal which I began by designing a street network which is a fundamental urban design element that will help in later defining blocks and open spaces. In order to find this consistent grid, I had to demolish very few of the existing buildings (highlighted with a lighter line-weight and dashed lines) and sometimes only parts of the units and not one complete unit.

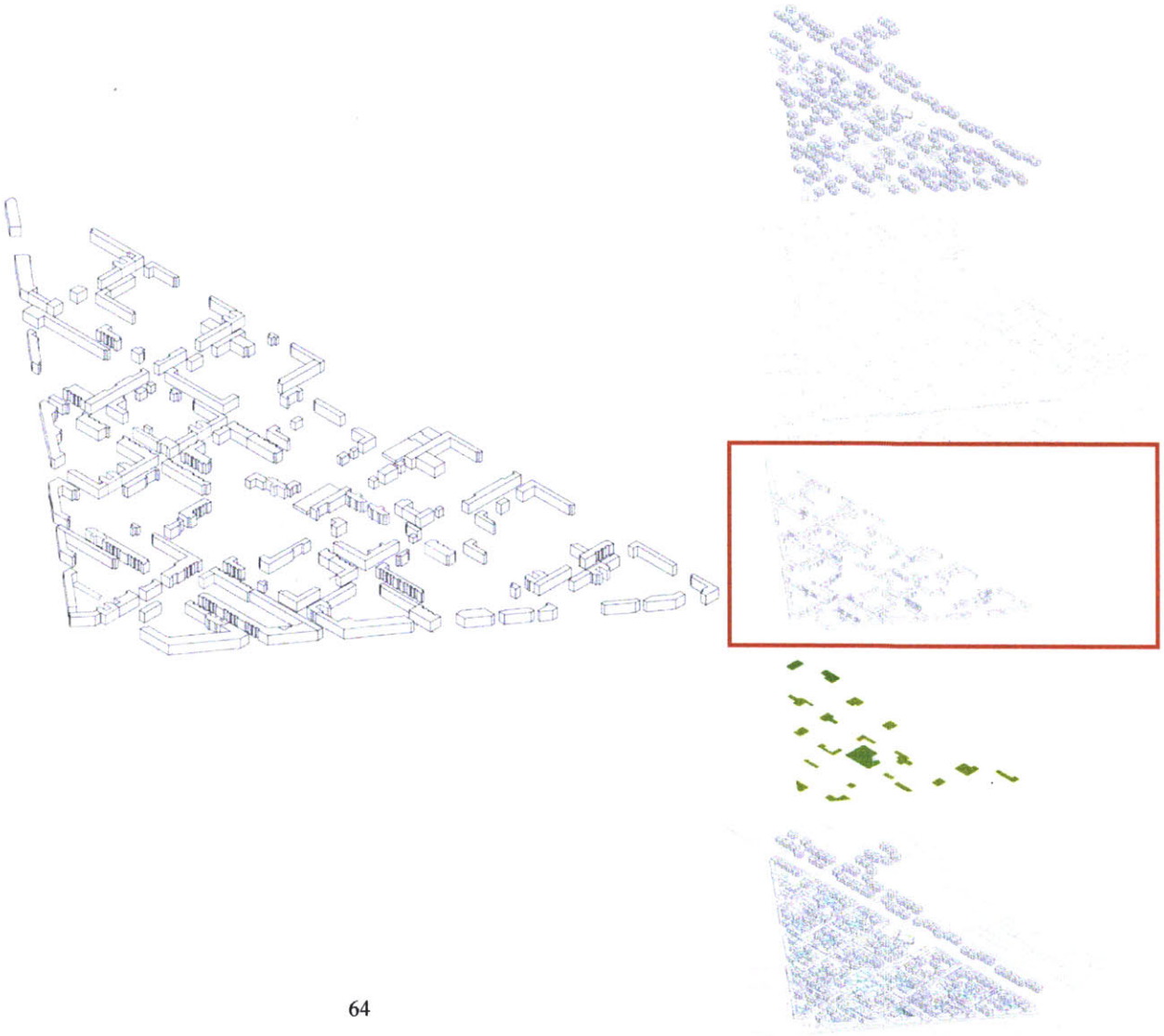


Proposed Street Network

After planning and finding or figuring out a consistent grid for the existing buildings, I proposed a street network that allows the formation of blocks that are close in size and are well defined by the streets. At the center of the neighborhood, the main two streets intersect in a large public space or garden that serves the whole neighborhood. The streets vary in width ranging from 10 to 8 meters. The main two public streets which gives you access to public services and schools are larger in width, while the other more local or private streets are smaller which creates a hierarchy of streets within the neighborhood.

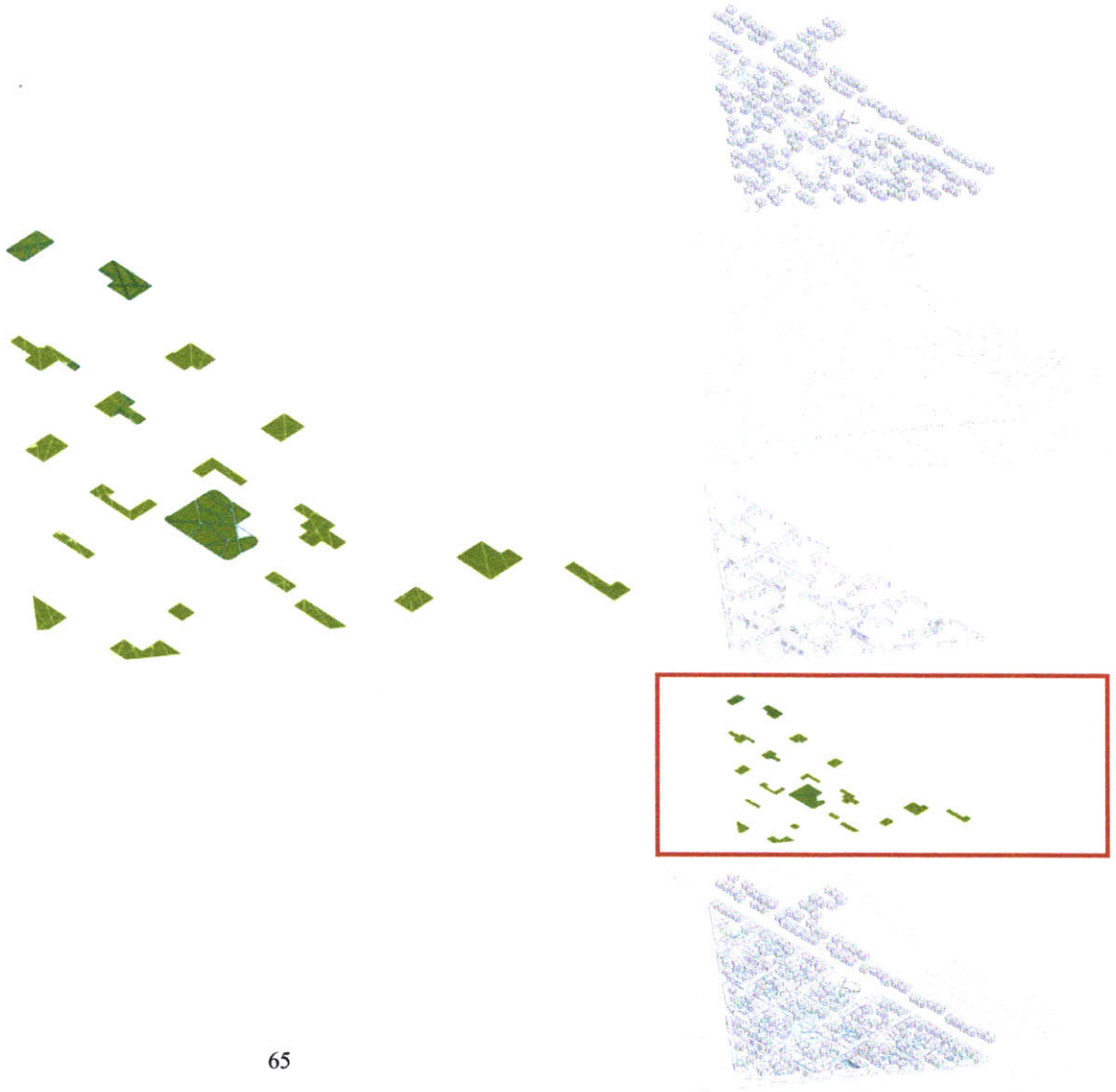
Proposed Infill Buildings

After designing and setting up the streets that helped in defining the blocks and the major open space, the layer of the buildings comes next. The purpose of the urban infill building is to connect the existing building to find a well defined boundary or continuous facade to the existing scattered buildings. Therefore simple buildings, their details are to be shown later in the thesis, were proposed to connect the existing units and form clear boundaries for each block.



Proposed Public Spaces

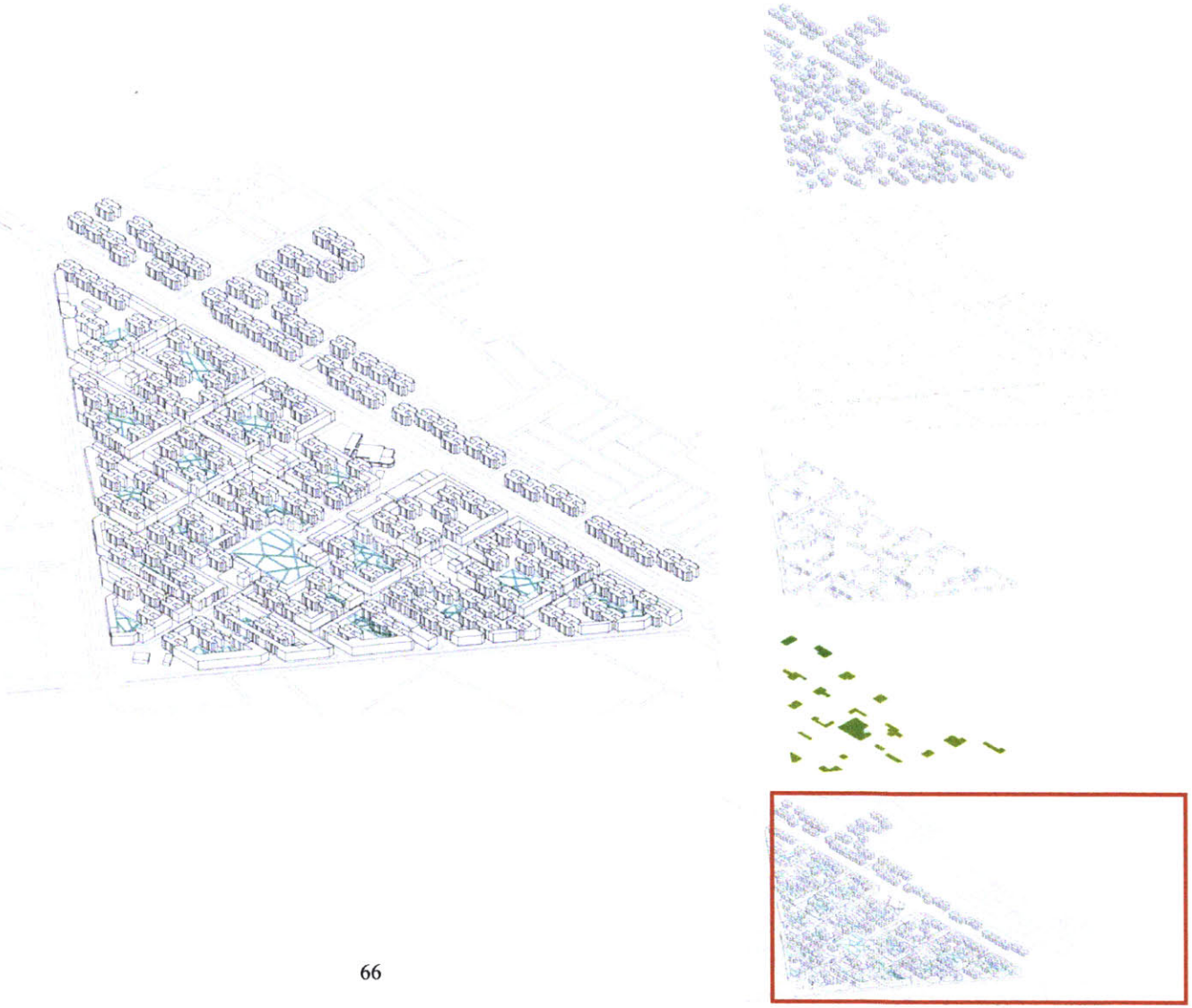
After laying out the streets and the buildings comes the landscape or open space layer. As stated before, the street network formed a main central large public space shared with all residents of the neighborhood. Other areas highlighted in green are semi public spaces that serves each block and that can be accessed by the units within this block. The main idea behind the proposal is to form a well defined block from the outside which is defined by the streets and the infill buildings while having a picturesque open space within each block.

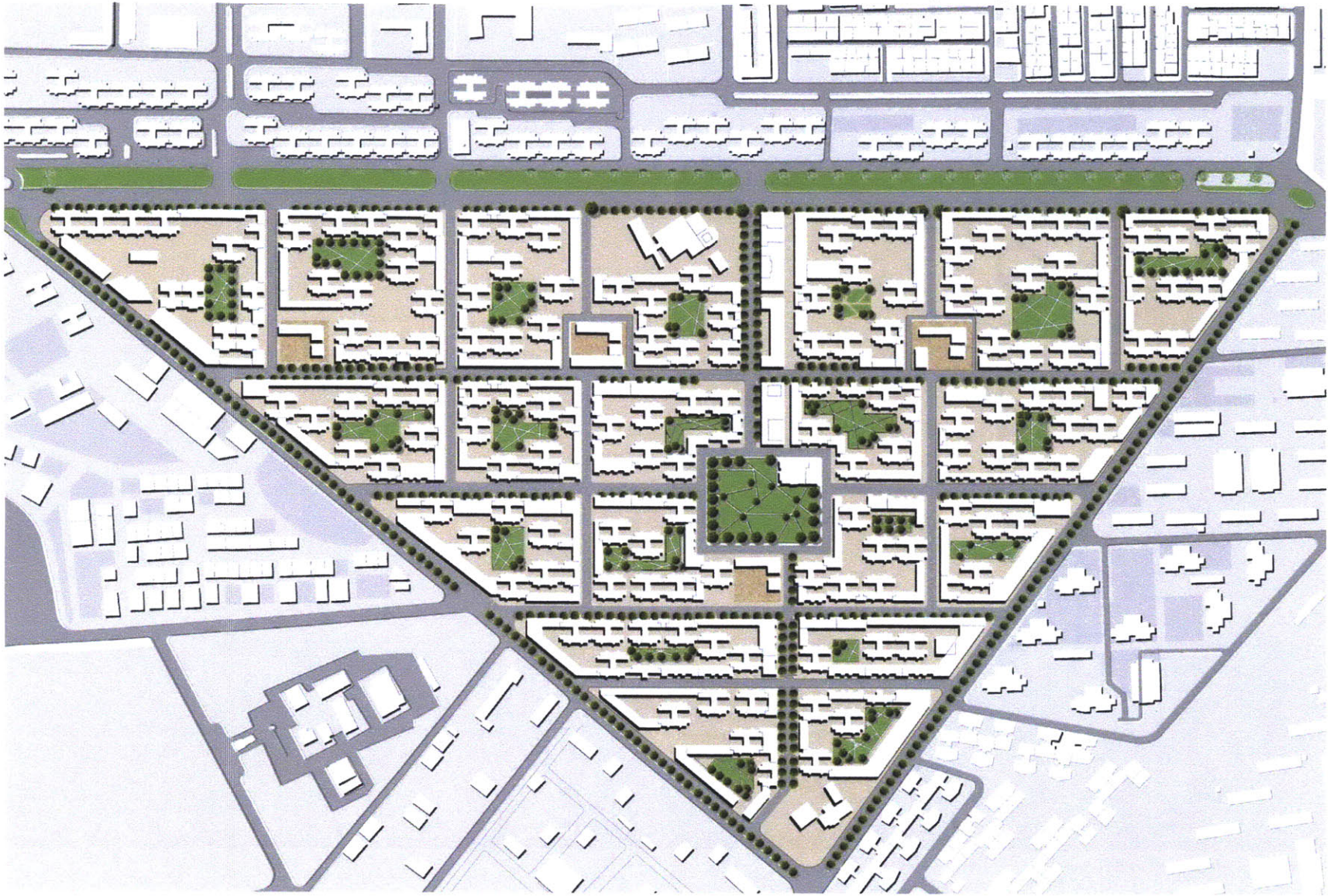


Proposed Design

This last drawing shows how the final design after the implementation looks like with all the proposed layers. The new design is more coherent, dense, legible and provides a variety of public spaces as well as increasing the services since it provisions more commercial spaces that are located in some of the ground floors of the proposed buildings. The final design is then a product of layers of urban strategies that aimed at enhancing the structure and quality of the neighborhood.

The proposed design increased the FAR of the neighborhood from 0.8 to 1.56 and the percentage of the built up area from 25% to 40%





3D of the Neighborhood

Section through the main Boulevard

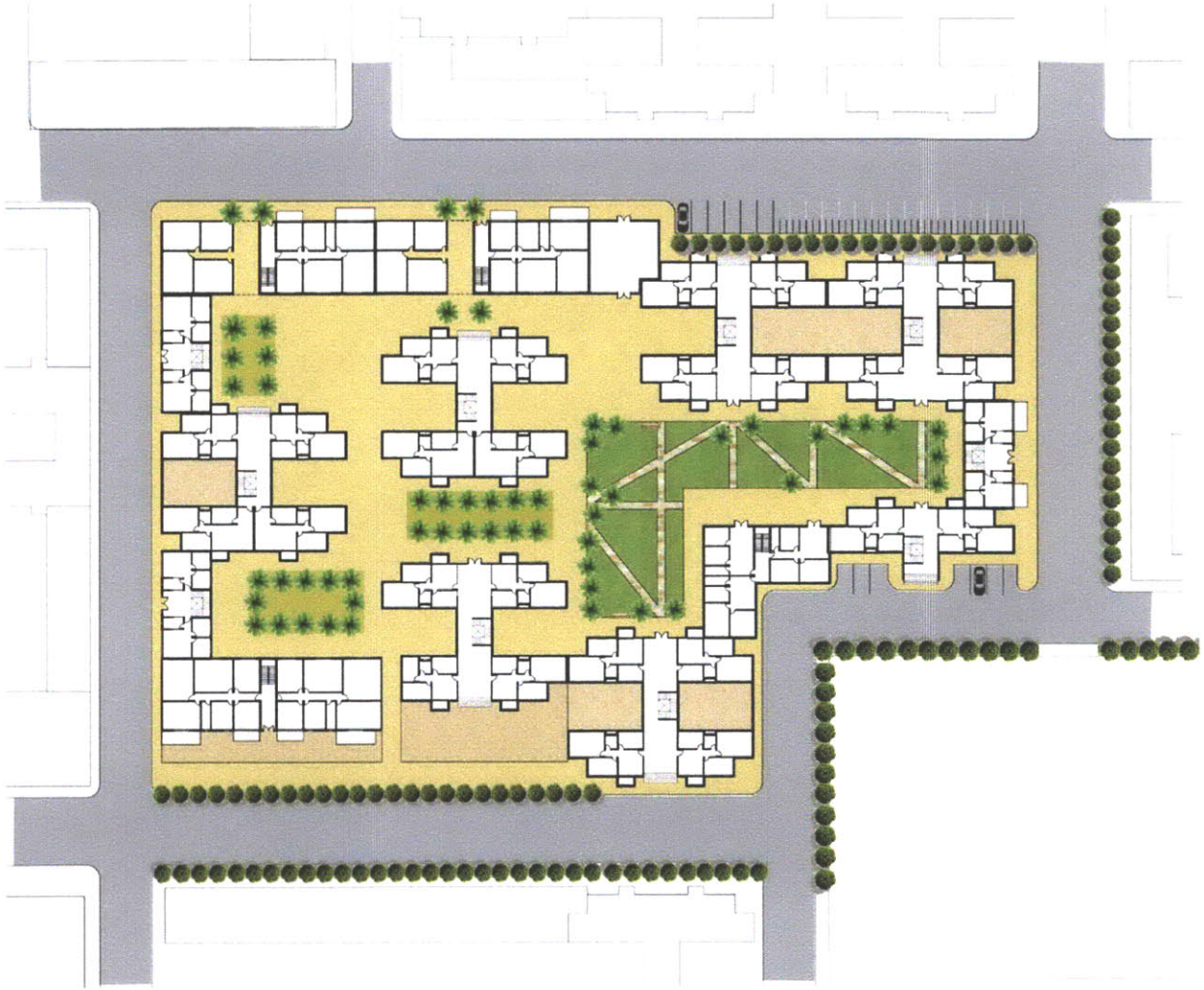
3D Shots of the Neighborhood

Shot showing the main neighborhood entrance, the mosque and the commercial boulevard

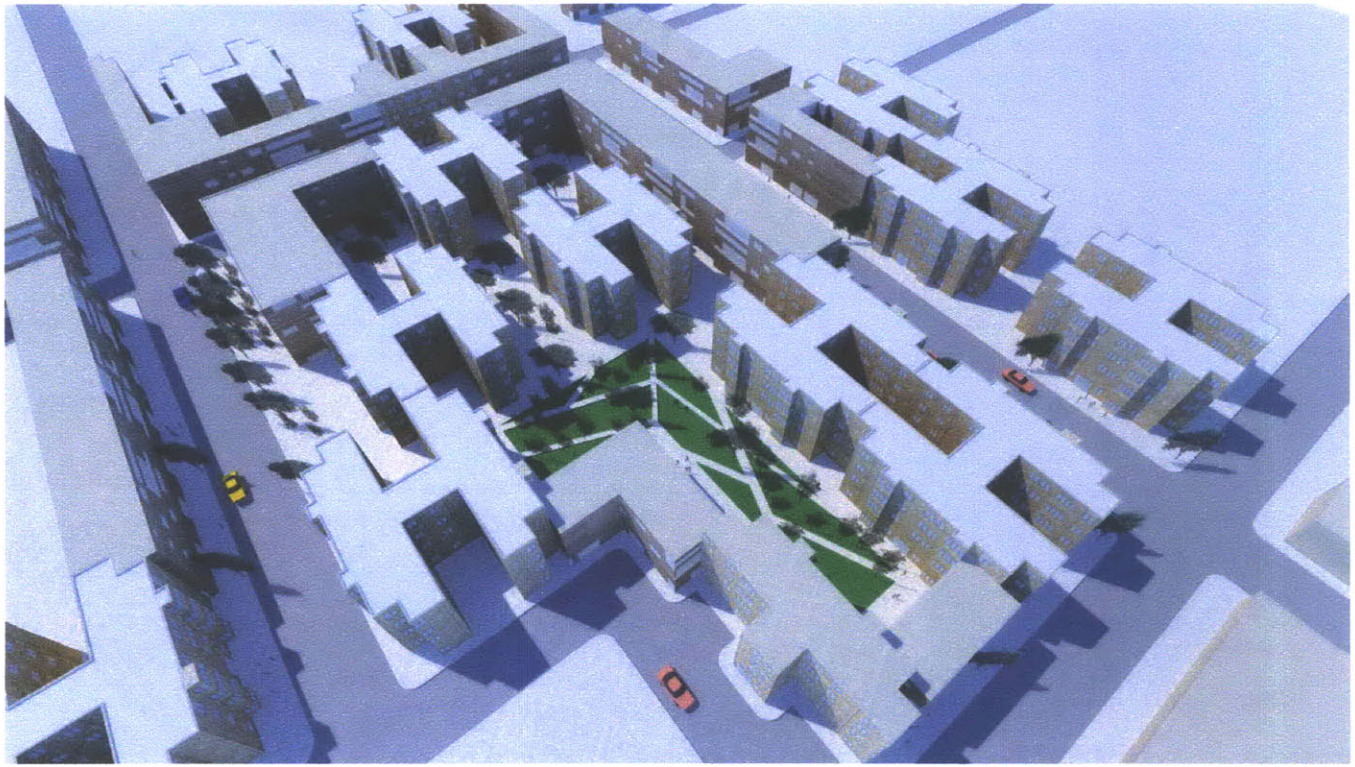
Shot overlooking the main Boulevard

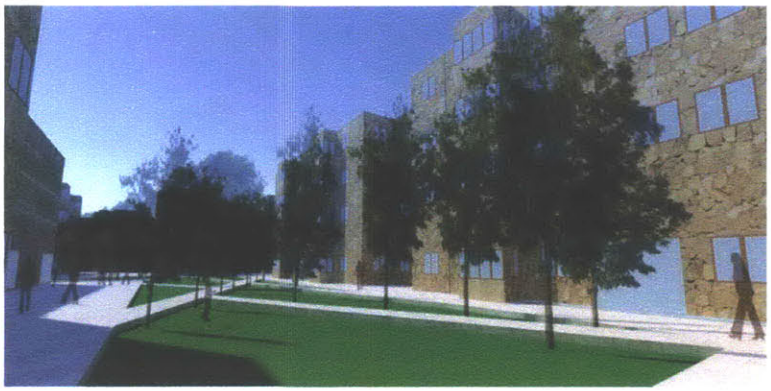
Block Design

The process of choosing a block for a detailed design to show how the proposed design works on a bigger scale was challenging as each block was solved differently since all the blocks are not of the same size or shape. The chosen block is connected to the central public space from the North- Western size and it shows some of the similar design elements and solutions that are implemented in other blocks. The block is enclosed by the proposed infill that creates a coherent block. Within the block there is smaller paved public spaces and a garden for the block residents which can be accessed through the ground floor of the residential building to the north east of the block as shown in the drawing. Therefore the strategy used to improve the legibility of the neighborhood and increase public space is implemented within the block scale through connecting the existing units with the proposed urban infill units and by providing an internal public space and garden that serves the residents of the block. Parking for motorcycles and cars is also provided.



Perspective Shots of the Block





RE-URBANIZING ISMAILIA

The Massachusetts Institute of Technology

ISMAILIA

The Massachusetts Institute of Technology

Conclusion

In many instances, urban density connotes a negative meaning as some architects and urban designers argue that it depreciates the living conditions of the residents because density and concentrated population cause pollution, crowd concentration and accumulation of waste and smoke coming from cars. However, dense cities are considered more sustainable because dense areas don't require more infrastructure, they share services and they consume less energy. Dense cities are also more walkable and bikable and they promote social interaction.[39]
Therefore urban densification creates better sustainable communities and that's why I chose it as a strategy to enhance and urbanize a low density neighborhood in Ismailia. The aim of my design intervention was to solve some of the existing urban and architectural problems within the neighborhood and also the city. Through the identification of these problems I could come up with some design solutions that would embellish the Sheikh Zayed neighborhood by providing well defined blocks that create more legible streets and by adding a layer of public spaces within each block and a large main public space for the neighborhood.

The proposed design not only tried to accommodate the cultural and social need of the area based on the analysis but also aimed at capturing the essence of the old colonial city of Ismailia, which created from each neighborhood a small city providing the elements that generate a successful neighborhood.

It is also important to note that Sheikh Zayed is considered one of the challenging neighborhoods to work with because of its arbitrary plan and the triangular shape of its layout, which makes it hard to work with the edges. However, it can work as a good example to learn from to ameliorate some of the existing neighborhoods within the city as the proposed design solution dealt with many of the urban and architectural problems that exist within many of the other neighborhoods. For instance, creating a clearly defined block and a series of connected hierarchical streets are main problems within the city. Thus, the same design principles can be applied on many neighborhoods in Ismailia or Egypt.

ISMAILIA
The Massachusetts Institute of Technology

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