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Architecture for the sustainability design

Master's Degree Thesis

URBAN FACILITIES FOR ENHANCING MULTI-PURPOSE OPEN SPACE AND WELFARE IN SHAHRAK-E-GHARB NEIGHBORHOOD: TEHRAN DISTRICT 2

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Deddicated to
my father, who taught me the value of hard work,
to my mother, who emboied resilience and grace in the face of hardship,
to my brother,who showed me the maening of unconditional support,
And to all the brave sons and daughters who laid down their lives
for the freedom and prosperity of Iran—may this humble effort of mine
serve as a small step toward the enduring hope of a flourishing and free Iran.

Abstract

This thesis examines the design of a multifunctional and sustainable urban space in the Shahrak-e-Gharb neighborhood of Tehran. Considering the existing challenges in urban design and infrastructure, this research aims to improve social welfare and the quality of life for residents by identifying their needs and current issues.

One of the key aspects of this project is the design of cycling paths, which are recognized as an important factor in achieving a sustainable city. These paths not only help reduce traffic and air pollution but also contribute to the health and well-being of residents.

The methodology of this study includes the use of field analyses, surveys, and library research to gather the necessary data and information. This research addresses the key components of a multifunctional urban space, the impact of urban facilities on residents' welfare, and the benefits and challenges of implementing cycling paths in this neighborhood.

The main findings of this study indicate that appropriate design of urban open spaces, especially in creating social areas and recreational facilities, can significantly impact residents' quality of life. These results can assist urban planners and architects in responding to the real needs of the community with a sustainable approach, designing spaces that are not only efficient and beautiful but also contribute to the improvement of residents' welfare.

Keywords: Urban Facilities; Multifunctional Spaces; Sustainability; Welfare; Cycling Paths; Shahrak-e-Gharb; Tehran; Urban Design; Quality of Life; Open Spaces; Social Welfare; Environmental Impact; Urban Planning; Sustainable Cities.

Introduction

The rapid urbanization and population growth in cities around the world have created significant challenges in urban planning and environmentally sustainable development. The Shahrak-e-Gharb neighborhood, located in western Tehran, has developed as one of the relatively new areas of the city, driven by an influx of migrants. Despite its rapid growth, this neighborhood lacks the facilities and infrastructure found in older neighborhoods of Tehran, facing severe issues related to urban design, infrastructure, and the overall quality of life for its residents.

This study aims to address these challenges by designing a multifunctional and environmentally sustainable urban space that not only meets the needs of the community but also promotes environmental sustainability, preserves Iranian identity in a completely modern neighborhood, and enhances social culture.

Motivation and Context

The motivation for this research stems from the increasing necessity of utilizing environmentally sustainable urban design practices that can meet the dynamic needs of urban populations. Previous studies have emphasized the importance of integrating green spaces, recreational facilities, and efficient transportation systems into urban environments to improve the well-being of residents. However, there are still significant gaps in research specifically focused on the Shahrak-e-Gharb neighborhood, which has unique socio-economic and cultural characteristics that require tailored solutions.

Research Objectives

The primary objective of this research is to design a multifunctional and environmentally sustainable urban space within the Piroozan site of Shahrak-e-Gharb. This study seeks to enhance welfare through the development of urban facilities and the implementation of cycling paths that promote alternative modes of transportation. Additionally, one of the main objectives of this project is to preserve Iranian identity in a completely modern neighborhood in Tehran and to enhance social culture. This research examines the interactions between urban design elements and the social dynamics of the neighborhood.

Research Methodology

This study employs a mixed-methods approach, utilizing both qualitative and quantitative research methodologies. Data collection methods include surveys, field observations, and literature reviews to gather insights into the needs and preferences of residents. This comprehensive approach allows for a nuanced understanding of the specific challenges and opportunities within the Shahrak-e-Gharb neighborhood.

Structure of the Thesis

The thesis is structured into several chapters, each focusing on different aspects of the research:

Chapter 1: Provides an overview of the history of urban planning and local management in Iran and Tehran, setting the contextual foundation for the study.

Chapter 2: Delves into the Shahrak-e-Gharb neighborhood, exploring its historical background, geographical context, demographic profile, and existing urban structures.

Chapter 3: Focuses on the Piroozan site, analyzing its location, current land use, and environmental characteristics.

Chapter 4: Identifies urban planning challenges specific to Shahrak-e-Gharb and assesses the needs and aspirations of the community.

Chapter 5: This chapter outlines the proposed design interventions for the Piroozan site, focusing on environmentally sustainable strategies, the incorporation of cycling infrastructure, and integrated urban planning approaches to enhance functionality and connectivity. The chapter combines conceptual frameworks and practical solutions, aiming to create a harmonious balance between cultural preservation and modern urban needs.

Chapter 6: This chapter summarizes key findings and their impact on residents' welfare while emphasizing the importance of local needs. It also suggests directions for future research.

Chapter 7: This chapter lists all sources used in the research, providing essential validation for the information presented.

Expected Outcome

In summary, this research aims to provide valuable insights into urban design and its impacts on improving the welfare of residents in the Shahrak-e-Gharb neighborhood. The findings will offer a framework for urban planners and policymakers, emphasizing the importance of addressing local needs while promoting environmentally sustainable development practices and enhancing social culture.

Table of contents

Main chapters

Detailed contents

List of Figures

List of Tables

Chapter 1

Urban Planning History and Local Management in Iran and Tehran

Introduction

This chapter aims to provide a comprehensive analysis of the history of urban planning in Iran, with a particular emphasis on Tehran's evolution into the nation's capital. It examines the transformation of local governance and urban policies over time, shedding light on the factors that have shaped Tehran's current urban landscape. By exploring historical practices and policies, the chapter identifies the cultural, political, and environmental forces that have influenced the city's growth and development trajectory.

Understanding the historical context of urban planning is essential for addressing contemporary urban challenges, particularly in achieving sustainable urban development. Insights from the past offer urban planners and policymakers a foundation for making informed decisions that balance the preservation of historical and cultural identity with the pressing demands for modern infrastructure and sustainable growth. Moreover, this chapter highlights how the interplay of political, cultural, and environmental dynamics has driven Tehran's expansion, setting the stage for future development strategies that prioritize equity, functionality, and resilience.

Urban Planning History of Iran

Ancient and Medieval Periods (Tenth Millennium B.C. to 7th Century A.D.)

Urbanization in Iran dates back to the tenth millennium B.C. when humans began transitioning from temporary shelters to agricultural settlements, eventually forming villages and towns. Evidence of early settlements, such as in Tepe Zagheh (7th millennium B.C.), Tepe-Sialk (6th millennium B.C.), and Shahr-e-Sukhteh (3rd millennium B.C.), has been uncovered. The economy

of these early settlements was based on handcrafts and agriculture. Shahr-e-Sukhteh, for example, had a population of about 5,500 people, considered a large population for its time. It also had advanced handcraft industries and business relationships with neighboring civilizations. (Behnam, I.,1972,89), (Negahban, E.,1986).

Figure 1: Shahr-e-sukhte is a remnant of an ancient urban state in Iran. (Baranjkar, A.,2016)

The Elamite civilization, which dominated the southwestern part of Iran, displayed advanced urbanization, particularly in cities like Susa (modern-day Shush). The remains of wide, straight streets suggest a well-organized city structure, reflecting the urban planning sophistication of the time. (Houshmand Ebrahimpour Masoumi, H.,2011)

In the Medean era, which coincided with the influence of Mesopotamian cultures, cities like Hegmataneh (modern-day Hamadan) followed a layout where the central fortress was surrounded

by residential areas, a pattern that emphasized both power and religion as central elements of urban life. (Habibi, M.2009)

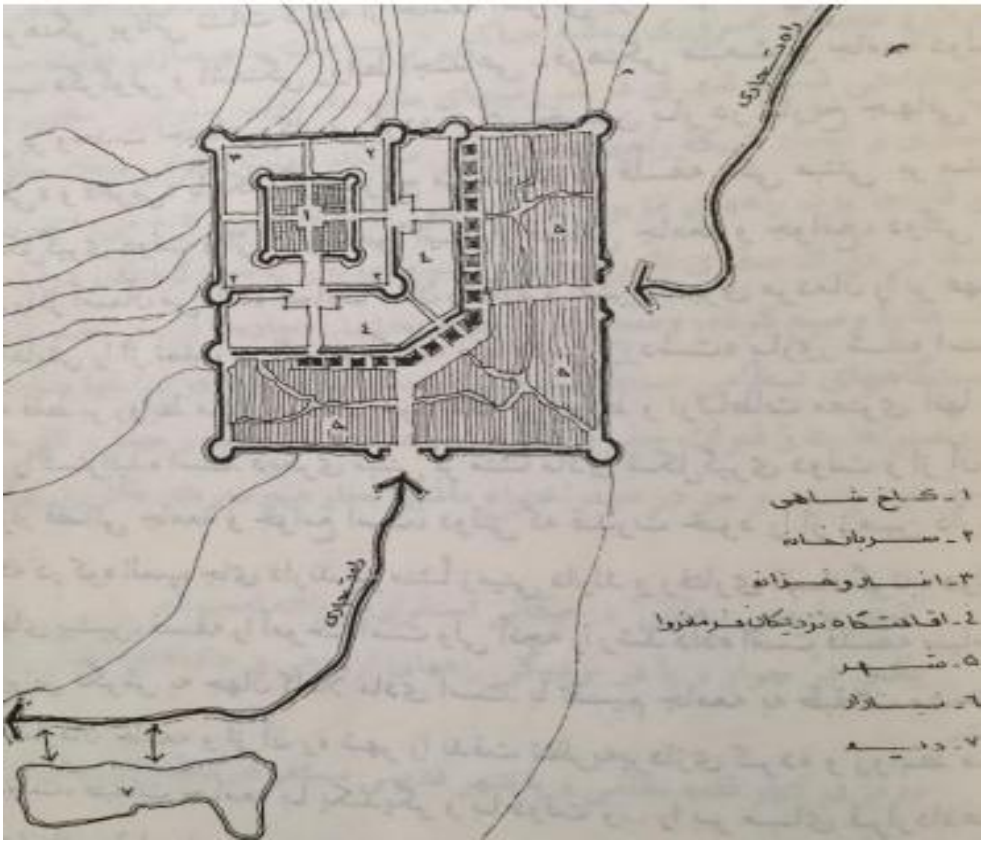


Figure 2: Construction of the Urban Fabric in the Achaemenid Period. (Baranjkar, A.,2016)

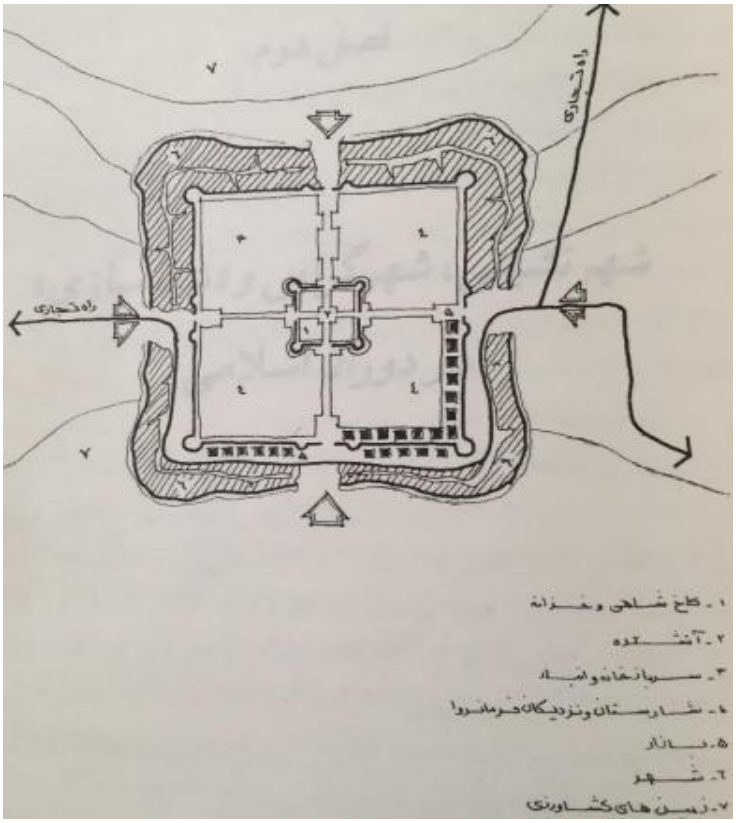


Figure 3: Construction of the Urban Fabric in the Sassanid Period. (Qajari, M..2015)

Islamic Period (7th to 19th Century A.D.)

With the advent of Islam, Iran's urban landscapes witnessed significant transformations. During this period, mosques, bazaars, and neighborhoods became the core components of Islamic cities. The role of religion and social cohesion was increasingly emphasized in urban planning. During the reign of the Samanids, Safavids, and Buyids, significant urban infrastructure was developed, including the use of qanats (underground water channels) and the establishment of central public spaces like bazaars and mosques. These spaces served as focal points for community life and commerce**.**(Habibi,M.,2009)

In this period, cities evolved to include a castle (Kohan-Dej), a city (Sharestan), and suburbs (Rabaz). The centrality of religion and trade, represented by mosques and bazaars, was central to urban organization. During the Samanid period, the population of cities expanded beyond the walls of the Sharestan, and infrastructure began to develop further.

Figure 4: The extent of the area of the ancient city of Shush and the depth of this seven-thousand-year-old city, tarikhema website,2019

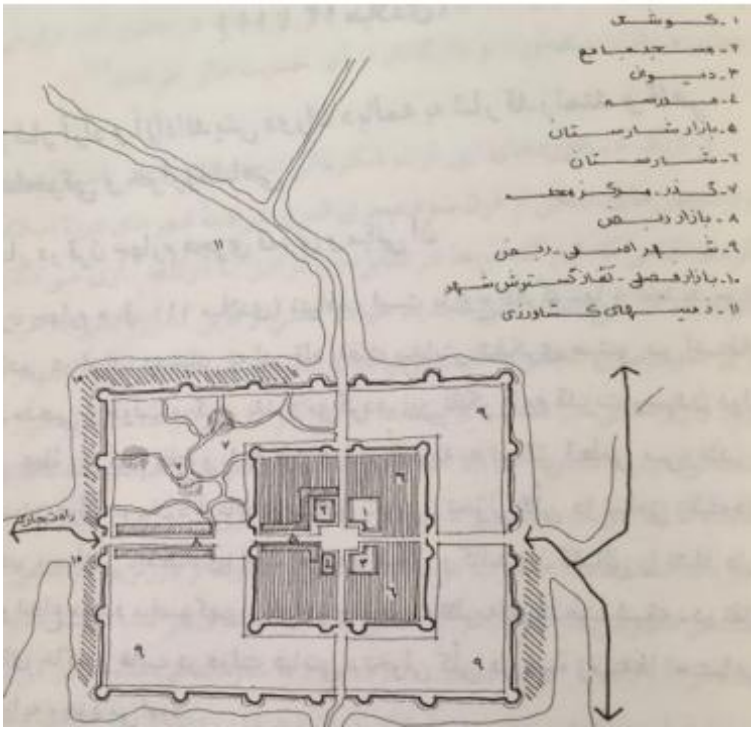


Figure 5: Construction of the Urban Fabric in the Early Period of Arab Domination over Iran. (Qajari, M..2015).

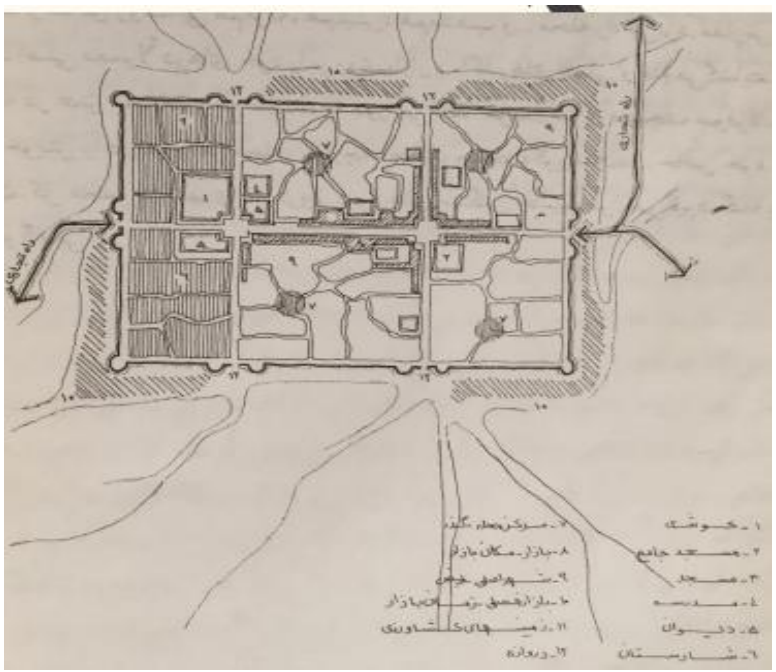


Figure 6: Construction of the Urban Fabric in the Seljuk Period. (Qajari, M..2015)

Urban Planning Features in the Safavid Period (1501–1736 A.D.)

Under the Safavids, particularly during the reign of Shah Abbas I, urban planning in Iran reached its zenith. Isfahan, as the capital, became a prime example of coordinated urban and cultural planning. Key features of Safavid urban planning include:

- Naghsh-e-Jahan Square: This square, with its surrounding mosques, palaces, and grand bazaar, symbolized the integration of religious, governmental, and commercial spaces. It became the center of social interaction and urban life.

- Chaharbagh Avenue: Serving as the city's main axis, this avenue, with its surrounding gardens and palaces, created an ideal urban space and served as a model for other cities in Iran.

- Urban Bazaars: The Safavid bazaars served as the economic and social heart of cities, with Isfahan's bazaar being one of the largest and most prominent of its time. (Kharazmi,2021)

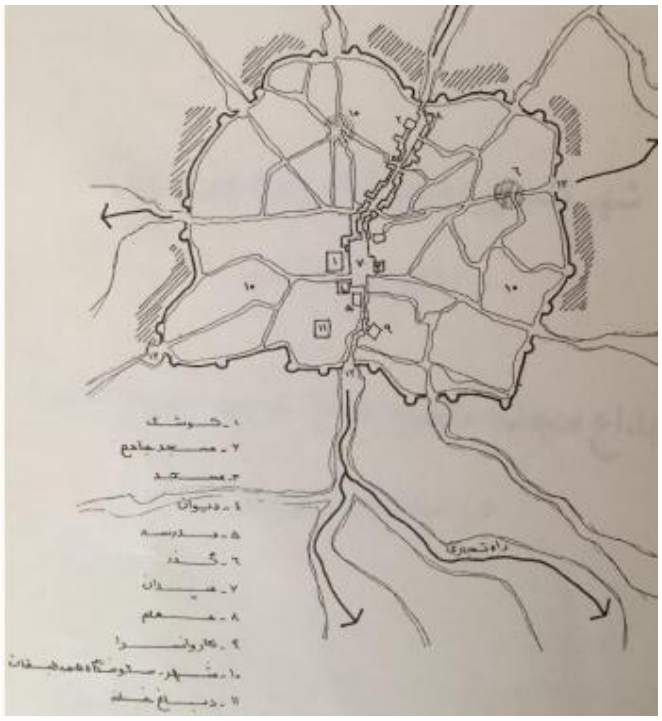


Figure 7: Construction of the Urban Fabric in the Safavid Period. (Qajari, M..2015)

Urban Planning Features in the Qajar Period (1789–1925 A.D.)

In the Qajar period, Iranian urban planning underwent significant changes due to the influence of European architectural styles. These changes included the development of new neighborhoods, wider streets, and public squares:

- European Architectural Influence: The construction of streets like Lalehzar in Tehran, modeled after Parisian boulevards, is a prime example of European influence on Qajar urban planning. These streets were not only commercial hubs but also cultural and social centers.

- New Public Squares: Squares, designed in the European style, were created as spaces for public gatherings and ceremonies. These squares added a sense of modernization and development to Iranian cities.

- Self-Sufficient Neighborhoods: Each neighborhood in Qajar cities developed its own infrastructure and facilities, allowing it to function as a self-contained unit. Tehran's bazaar, still central to the city, continued to play a pivotal role in the city's economy. (Qajari, M..2015)

Influence of Persian garden design on urban planning

The Iranian gardens are among the prominent cultural and architectural symbols of Iran, significantly influencing Iranian urban planning, especially during various historical periods like the Qajar era. These gardens are recognized not only for their aesthetic aspects but also for their therapeutic qualities and positive effects on mental and physical health. The architecture of Iranian gardens is fundamentally based on a symmetrical geometric system, often featuring primary and

secondary axes. These elements provide an environment where people can feel a sense of peace and security in a natural setting.

Key Features of Iranian Gardens and Their Impact on Urban Planning:

- Use of Natural Elements Such as Water, Plants, and Land

Water is a central element in Iranian gardens, used in various forms like fountains, streams, and pools. The flow of water not only cools the atmosphere but also produces a soothing sound that has a positive effect in reducing stress and fostering a sense of freshness and vitality. The clarity of water also brings a feeling of renewal and calmness.

Plants in Iranian gardens contribute to a calming ambiance with their shade and pleasant scent. Different types of plants are arranged to provide both shade and beauty, creating a space for rest and mental relaxation. Fragrant flowers such as jasmine and orange blossoms enhance focus and enrich the sensory experience in the garden.

- Garden Structure and Geometric Order

The primary and secondary axes in Iranian gardens guide visitors in a systematic, organized way. This structure creates a sense of order and peace, allowing people to relax in an intentionally designed environment. The main longitudinal axis, dividing the garden into two parts, is designed to lead the viewer's gaze to a particular focal point, further enhancing a sense of mental tranquility.

- Gardens as Therapeutic and Healing Spaces

During the Qajar period, gardens were also considered therapeutic spaces. According to psychologists and researchers, natural environments that include water, plants, and other natural elements have a positive impact on mental and physical health. Iranian gardens, due to their tranquil and natural settings, help reduce stress and emotional pressures, providing a space to rejuvenate and relieve mental fatigue. The use of water and plants in these gardens makes them a place for psychological and physical healing.

- Social and Cultural Impacts

Iranian gardens are designed not only for individual relaxation but also for social and cultural interactions. These spaces were traditionally used for gatherings and discussions within communities, becoming an integral part of the cultural and social identity of cities over time. Local communities see these gardens as spaces to unwind and enjoy nature, strengthening social bonds.

- Influence on Contemporary Urban Design

Iranian gardens serve as a successful model for urban design, with many of their principles applied in modern parks and green urban spaces. Given their therapeutic and calming effects, contemporary urban design has drawn from the elements of water, plants, and geometric structure seen in these gardens, providing city dwellers with a refuge from urban chaos. In many urban parks, principles from Iranian garden design, such as longitudinal axes and spatial divisions for visual order, are utilized to promote relaxation and enhance visual flow. (Nili, R., Nili, R., & Aminzadeh, B.,2014).

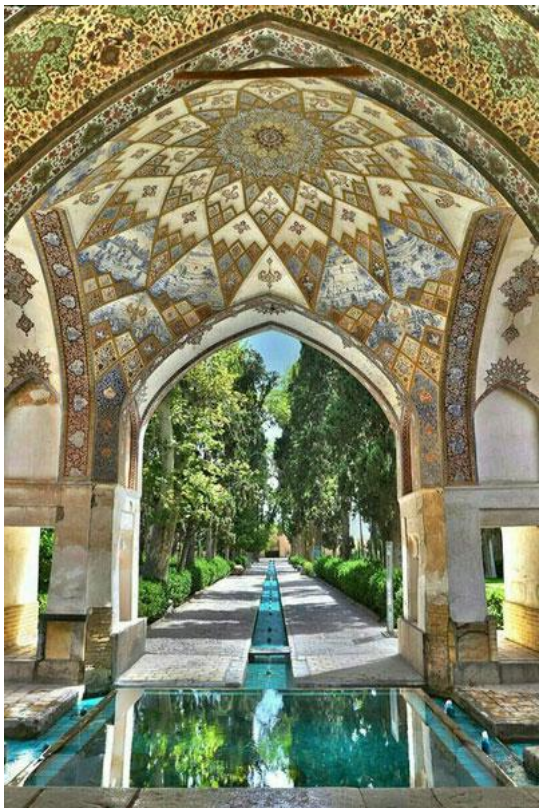


Figure 8 : 5 famous Iranian gardens and their architectural features, Fin Garden in Kashan, which is related to the Safavid era, is one of the largest Iranian gardens registered in UNESCO, and its architectural structure is of great value.(Taramid,n.d.)

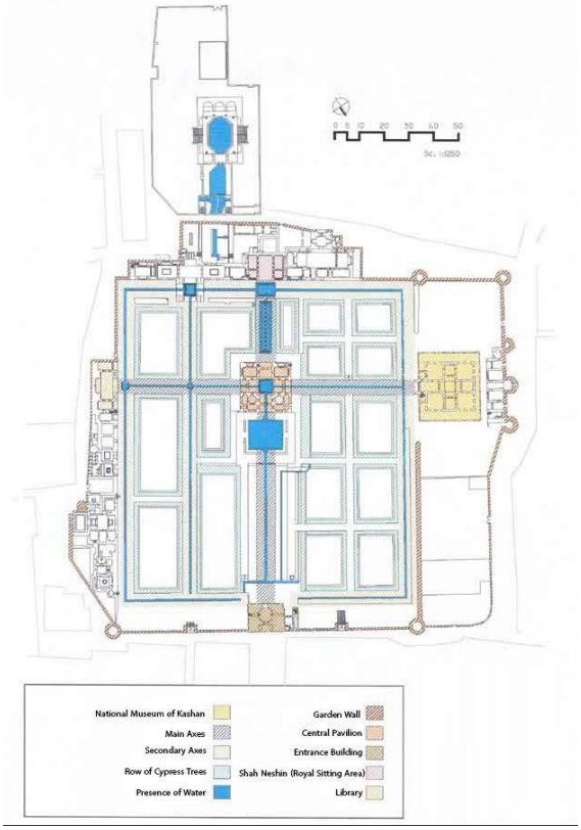


Figure 9 : Fin garden's plan,(Rahaei,O.,2015)

The First Public Urban Parks in Iran

In the Pahlavi I era, Tehran's National Garden was established as Iran's first urban public park, showcasing significant Western influence in Iranian park design. Created in 1928 on the grounds of the former military drill square known as "Meydan-e-Mashq," the park marked a departure from traditional Persian gardens. Key features included curved and circular lines, central symmetry, and a kiosk in the center. Unlike traditional Iranian gardens, the National Garden did not include fountains or water features; instead, it incorporated statues, benches, and gas lamps for lighting.

The National Garden is also noted for its openness and accessibility, designed as a public space for all. The famous "Sardar-e Bagh-e Melli" gate, built between 1922 and 1925 by architect Jafar Khan Kashani and others, still stands as a reminder of this historic area.

Due to structural changes over time, a complete layout of the original park is no longer available, as the space was converted into a government compound surrounded by ministries and museums. The park's Western influences are evident in its use of ornamental plants, open landscapes, and complex geometric designs.

In addition to Western influences, the construction of such parks also reflected cultural shifts and societal needs for recreational green spaces. (Habib, F., Etesami, I., & Ghodosifar, S. H.,2014)

Figure 10 : Head to the National Garden, Photographer:Alireza Kikha,baghe meli (National Park) Ministry of Foreign Affairs Gate is a historical and governmental compound in Tehran, Iran. (Kojaro. ,n.d.)

Pahlavi Era(1925–1941)

During the first Pahlavi era, extensive urban transformations took place in Tehran and other cities across Iran, which had profound impacts on the design language of urban spaces, particularly squares. These transformations were largely driven by the need to align with global trends and modernity, leading to urban modernization. In other words, the first Pahlavi period was marked by a strong influence of modernism on various political, social, cultural, and economic aspects, with cities becoming symbols of social and cultural change.

The first factor contributing to these transformations was the influence of modernity on lifestyle and urban renovation, which led to fundamental changes in the structure and form of urban spaces. These changes necessitated the redesign of public spaces, including squares, to meet the needs of

the modern era. Additionally, during this period, economic and social transformations, especially those related to the central government's reforms in various sectors, redefined the role of urban spaces in daily life.

On the other hand, the first Pahlavi era was also influenced by earlier architectural and urban planning traditions. These influences were particularly evident in the shaping of squares and urban spaces, which drew on ideas from previous architectural styles such as Qajar architecture and even some elements of ancient Iranian architecture. This period represented a connection between the past and the present, but with a design that also conveyed new, modern messages.

Morphologically, the squares of this era were characterized by centralization and symmetry, creating a sense of power and authority. These spaces were designed to reflect political control, with the centrality of squares symbolizing the dominance of the government. Visually, the squares featured harmonious skylines, transparent facades, and a strong focus on the aesthetic experience, reflecting the political and cultural ideologies of the government. The design of these squares not only focused on functionality but also conveyed the governing powers' messages.

From a social perspective, the urban transformations of the first Pahlavi period were primarily designed to serve the elite and educated classes. Public spaces were tailored more for the needs of the wealthy and urban upper classes, while less attention was given to the general population. One notable change during this period was the encouragement of women's presence in public spaces, a shift that was more acceptable in modern spaces compared to traditional ones.

Overall, the urban transformations during the first Pahlavi period were significant steps toward modernization and aligned with the global trends of the time. These changes not only impacted the

form and function of urban spaces but also helped define a new urban identity that continued to influence urban design in Iran long after the period. The squares designed during this time were not just functional spaces; they were symbolic expressions of political power and modernity**.** Mirmozafari, H., & Abdollahzadeh Taraf, A. ,2018).

Figure 11 : Traffic jam on a street in Tehran, 1964, What Tehran looked like in the 1960s: A Photographic Journey of Streets, Landmarks and Everyday Life. (Clark, K. ,n.d.).

Figure 12: The best traditional markets of Iran; In a journey of several hundred years, Bazaar of Kashan city. (Haqi, A.2021).

After revolution

After the victory of the Iranian Islamic Revolution, urban development and planning underwent significant changes, influenced by the new political and ideological context. The revolution, which was rooted in opposition to Western influence and the Pahlavi regime, led to changes in how cities were viewed and how urban growth was managed.

- Contrasting Perspectives on the Role of the City

The revolution introduced two contrasting views on the role of the city in the new social and political landscape. On one hand, cities, especially the capital Tehran, gained more importance and became the main centers for national decision-making and governance. Urban centers thus became symbols of power and political administration in the Islamic Republic of Iran. On the other hand, due to the revolutionary ideology that sought to distance the country from foreign influence,

development programs shifted towards rural areas. These rural areas were seen as symbols of traditional relationships and indigenous Iranian values, while urban centers, especially large cities, became associated with Westernization and foreign dominance.

- Impact of the Revolution on Urban and Rural Dynamics

Migration from rural areas to cities in the 1960s, driven by land reforms and industrialization, continued after the revolution. Rapid urbanization, which had started under the Pahlavi regime, intensified after the revolution as many rural residents migrated to cities in search of better opportunities. Despite the ideological emphasis on rural development, cities became increasingly overcrowded, and their growth continued without adequate infrastructure or proper planning.

-Abolition of the Urban Zoning System

One of the key changes after the revolution was the abolition of the urban zoning system, which had been used during the Pahlavi era to guide city growth in an organized and planned manner. The new revolutionary government, which emphasized decentralization of power and promoting equality, viewed urban zoning as a tool of elitism and a symbol of the old regime. As a result, urban planning and the formulation of master plans were abandoned, leading to unregulated urban sprawl. This lack of planning resulted in chaotic urban growth, particularly in large cities like Tehran, where informal settlements (known as "shantytowns") rapidly expanded on the outskirts.

- Resurgence of Urban Planning in the Late 1980s

By the late 1980s, the consequences of unplanned urban growth became evident, including a lack of basic services, housing shortages, and severe traffic congestion. In response to these challenges,

the government reestablished a formal approach to urban planning. In 1989, the Ministry of Housing and Urban Development was tasked with overseeing urban planning and development. This marked a turning point in urban development, with renewed emphasis on structured urban growth, improving infrastructure, and addressing the needs of the rapidly expanding urban population.

- Influence of Islamic Ideology on Urban Development

The revolution also influenced urban planning by incorporating Islamic principles into the design and function of urban spaces. In the post-revolution period, urban development sought to align with Islamic values, which included creating spaces that emphasized community, social justice, and equitable access to resources. Public spaces, including parks and plazas, were designed to promote social interaction and facilitate communal activities. Additionally, the focus on Islamic architecture and the inclusion of religious symbols in public buildings and urban landscapes became more prominent.

- Urban Challenges and Responses

The rapid growth of informal settlements and the lack of urban planning created a host of challenges, including inadequate infrastructure, lack of public services, and environmental degradation. The government began to focus on addressing these issues through urban renewal projects and the construction of new housing developments on the outskirts of cities. Efforts were made to integrate these informal settlements into the formal urban system, with an emphasis on providing affordable housing and basic services such as water, electricity, and sewage systems**.** (Habibi, S. M. ,1996).

Urban Planning History of Tehran : an overview

The History of Tehran: From Its Origins to Its Formation as the Capital of Iran

Tehran is located in the southern region of the Alborz Mountains. In the past, Tehran was known as a village on the outskirts of the city of Rey. The climate of Tehran is generally characterized by low rainfall and a semi- arid climate. During the time when Tehran was still a small village, its development and expansion gradually occurred through the influence and decisions of various individuals and monarchs over different periods.

The history of Tehran is closely associated with many kings. The city saw significant growth over time under the reign of monarchs such as Shah Tahmasp, Shah Abbas I of the Safavid dynasty, Karim Khan Zand of the Zand dynasty, and later during the Qajar period under Agha Mohammad Khan Qajar and Nasser al-Din Shah Qajar.

These monarchs, along with other kings of Iran throughout different historical periods, greatly valued the development and progress of Tehran. (Mashayekhi, A..2018)

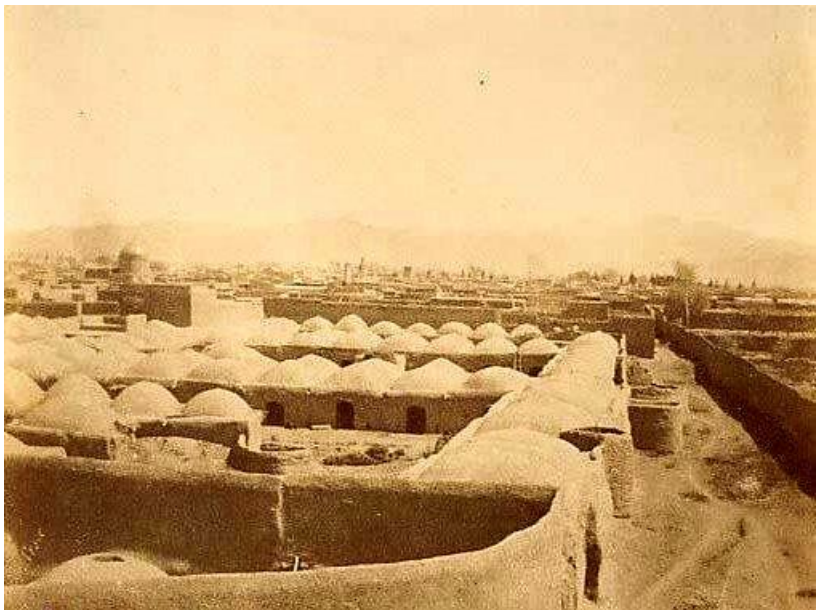


Figure 13: The oldest photo from Tehran. This photo was taken by an Italian photographer and consultant 150 years ago. (Donyaye Eqtesad.,2024)

The Influence of Iranian Monarchs on the History of Tehran

In the past, Tehran was considered a recreational spot for ancient kings. However, over time, Tehran transformed from a recreational area into the capital of the country. Below, we examine various aspects of the history of Tehran.

Tehran's Development during the Safavi Era (1501–1736 A.D.)

Shah Tahmasp Safavid, after a war with the Uzbeks, visited Tehran during his journey to the then capital, Qazvin. He became interested in Tehran due to the praises and stories he had heard about the city. The presence of the tomb of "Seyyed Hamzeh," the ancestor of the Safavids, in Rey was one of the main reasons for his interest in the city.

Due to frequent attacks by bandits in the region, Shah Tahmasp ordered the construction of a wall with four gates named the Qazvin Gate, Shemiran Gate, Abdolazim Gate, and Dolab Gate, which remained intact until the time of Nasser al-Din Shah Qajar.

The construction of Tehran's bazaar was another of Shah Tahmasp's initiatives, which remains one of Tehran's famous shopping centers.

Shah Abbas Safavid ordered the planting of plane trees in Tehran, which became known as the "Chahar Bagh" (Four Gardens). This action led to Tehran being referred to as "Plane Tree City."

By planting these plane trees, Shah Abbas Safavid undertook a significant initiative to beautify the city and create a green, tranquil environment. These large, green trees added a natural beauty to the city and gave Tehran a unique and distinctive character. (Mashayekhi, A..2018)

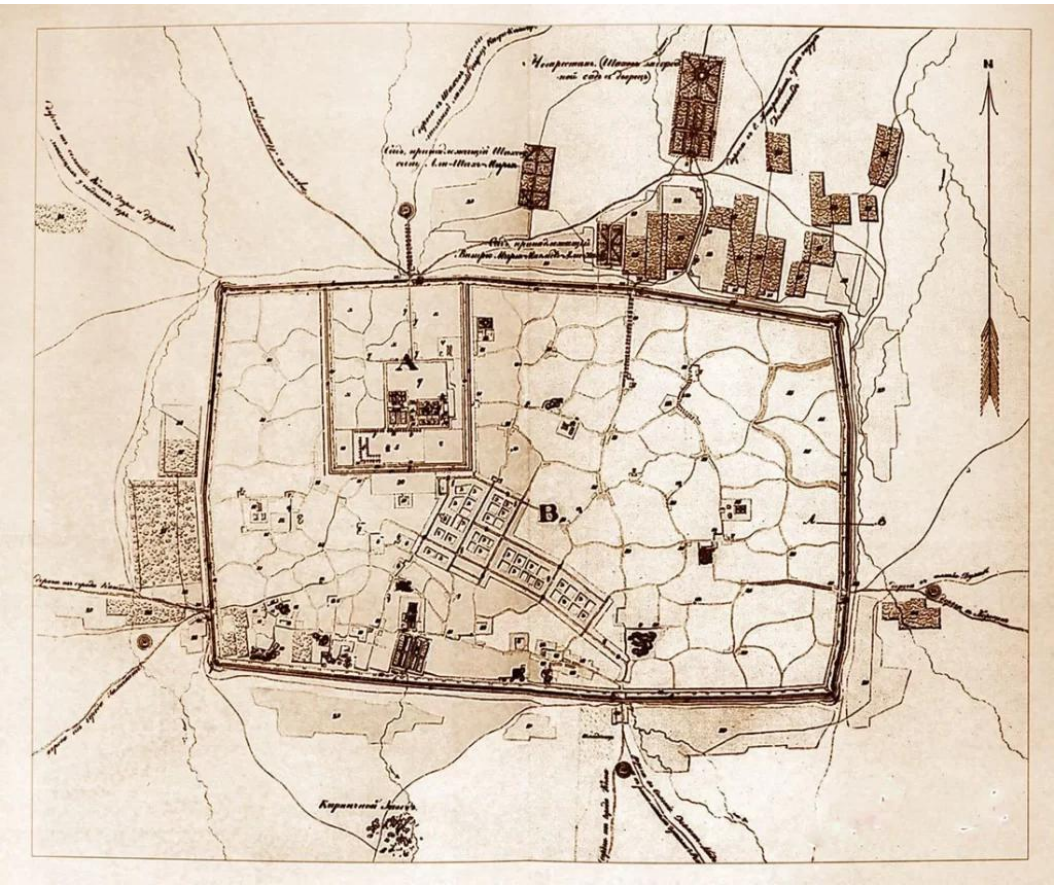


Figure 14 : The Tahmasbi Wall on the 200-year-old Nazikof map | 1820 | the oldest map of Tehran, which was secretly drawn during the reign of Fath Ali Shah,Tehranica website

Tehran's Development during the Qajar Era (1789–1925 A.D.)

Agha Mohammad Khan Qajar, while ruling Iran, dedicated some of his attention to the development and beautification of Tehran. However, due to his involvement in wars and other issues, his contributions to public buildings and infrastructure in Tehran were limited.

During Fath Ali Shah Qajar's reign, Napoleon's envoys traveled to Iran and provided descriptions of their visit. For example, they estimated the population of Iran to be about thirty thousand people. They also paid special attention to the "Masjid Shah" (now known as the Tehran Grand Mosque).

Several buildings from Fath Ali Shah's era have had a lasting impact on Tehran’s history. These include the Nush Tower, the Tatoos Church (in southern Maku), the Lalezar Palace, and Aghashah.

During Nasser al-Din Shah Qajar’s reign, Tehran witnessed the construction of many significant buildings. This remarkable development was facilitated by figures such as Amir Kabir and the establishment of government hospitals, the Dar ul-Funun school, and the Sahebqaranieh Palace.

Additionally, during this period, the Nasserieh and Lalezar streets, which are among the oldest and most famous streets in Tehran's history, were constructed. The first skyscraper in Tehran, known as “Shams al- Ma’areh,” was also built during this time. Moreover, the municipal administration, which was responsible for city organization, was established for the first time**.** (Mashayekhi, A..2018)

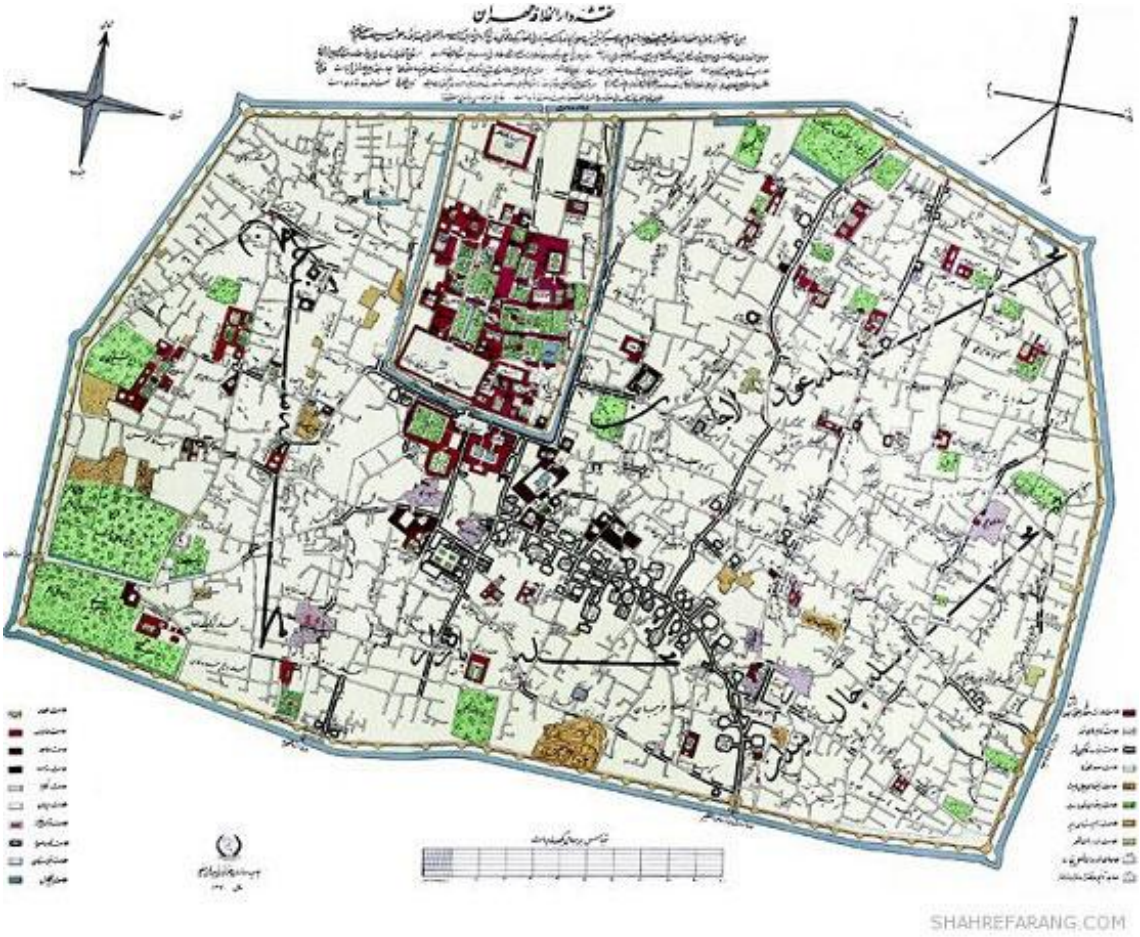


Figure 15: Map of Tehran, during the reign of Naser al-Din Shah Qajar, Created by: Abd al-Ghaffar Khan Najm al-Mulk - Date of publication: Muharram ,1892. (Asr Iran News Analysis Site. ,2014)

Tehran's Development during the Pahlavi Era (1925-1979 A.D.)

During the first Pahlavi period, Tehran's development continued, and under Reza Khan's orders, the city's geography expanded. As a result, the gates built during Shah Tahmasp's era were demolished, and the city's area increased.

Tehran city has passed different stages of development and evolution. In 1922, Tehran's population was 210,000, with the average density of 85 individuals in each hectare, residing in the 10 regions. With demolishing the old wall surrounding the city, the population reached 310,000. Between 1932–1937, with the direct intervention of the government, the whole wall surrounding the city was destroyed and Tehran's land area was 46 square kilometers. The population reached 540.000 in 1939 and 600,000 in 1941. In 20 years, the population was tripled. With the socio-economic changes, considerable changes were occurred in ecology and geography of Tehran**.** (Mashayekhi, A..2018)

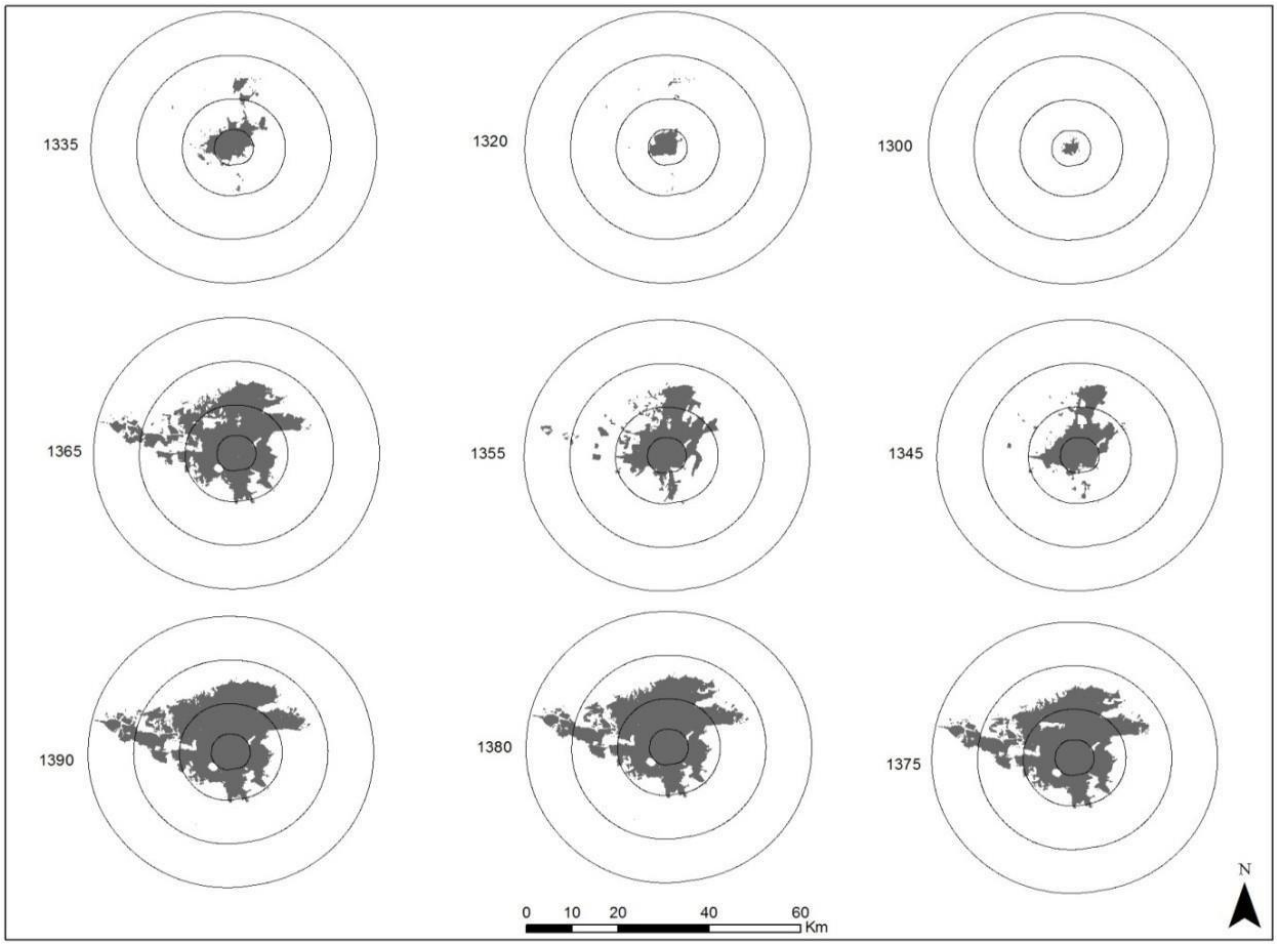


Figure 16 : Tehran's urban growth 1921-2011. (Mashayekhi, A..2018)

figure 16 cvisualizes the dramatic urban expansion of Tehran over nine decades, corresponding to the period from 1300 SH (1921) to 1390 SH (2011). The concentric rings represent different stages of growth, with the urban area spreading outward from the historic core. The maps clearly depict three distinct phases of development:

- Pre-1950s: A small, centralized urban core with limited outward expansion, reflecting the traditional structure of the city during the early Pahlavi period.
- 1950-1979: A period of rapid industrialization and modernization, with Tehran's urban area expanding significantly due to migration and economic growth during the late Pahlavi era.
- Post-1979 to 2011: Uncontrolled urban sprawl became evident, driven by population growth, increased housing demands, and urban planning challenges after the Islamic Revolution.

This visualization highlights the transformation of Tehran from a compact city into a sprawling metropolis, emphasizing the need for sustainable urban planning to address challenges such as transportation, infrastructure, and environmental impacts.

Traditional agricultural production system was replaced with industrial production and capitalist system. New social classes such as administrative employees, employees in army, labors and new unions were established. New commercial, service and cultural centers were developed out of bazaar. New industrial centers were established along roads around the city, providing the base and direction of future development. With the fall of Reza Shah (king) in 1941, changes in socio-economic conditions in Iran and city planning were governed by a centralized government. In 1953, with the support of United States of America, Reza Shah's son (second king) and capitalist system,

investment in industrial sections were increased. New industrial areas were developed in west and southwest of Tehran. In 1962, land reform law was implemented and rural population migration to the cities occurred. With the increase in the level of oil income, rapid growth of economic infrastructure and communication system, increase in industrial production, assembling industry, rapid increase in the number of government and administrative organizations were occurred. Role and functions of Tehran as capital was increased. Tehran became the largest center for attracting population, capital, jobs, income and services. In 1960, many surrounding villages were annexed to the city. Suburban areas were expanded. Fast physical expansion of Tehran during two decades, 1960s, and 1970s, and complexity of its problems justified the necessity of planning and supervision of its development. In 1968, first comprehensive plan was prepared. In 1973, an organization was established to monitor and supervise Tehran's expansion. After revolution, all the regulations issued to monitor Tehran's development were considered not credible and growth continued in all directions.

These characteristics collectively lead to the conclusion that, in the final analysis, the entire country can be considered under the influence of Tehran, with all regions being directly or indirectly dependent on it. In this context, major provincial centers act as intermediaries between Tehran and other parts of the country.

According to statistics from 1980, 59.5% of the value of products, 43% of workshops, and 56.5% of employees in large industrial workshops were concentrated in Tehran at the end of the Pahlavi era.

The Pahlavi era (1925-1979) marks the transition from the moderate and eclectic European influence of the Qajar era to the European imitation of the first Pahlavi period and the Americanization of the second Pahlavi period. (Mashayekhi, A.,2018)

Tehran in the First Pahlavi Period:

The era of Reza Shah (reign: 1925-1941) was, from a social and political perspective, a period of transition from a feudal system with multiple sovereignties to a centralized government. From a cultural and religious perspective, it was a period of confrontation between traditional and religious values and imported Western and secular culture. From an economic perspective, it was a period of the formation of new industries based on Western technology. Each of these aspects created its own unique atmosphere in Tehran.

The initial actions of Reza Shah included:

-The construction of royal palaces and government buildings, including the Sa'dabad Palace complex, the Marble Palace, and the Pahlavi princes' palace complexes surrounding it.

-The creation of an administrative, political, and economic complex known as Reza Shah's architecture.

-The design and expansion of Tehran in a Western style.

-The construction of new cultural complexes (University of Tehran, primary schools, high schools, teacher training centers, and similar institutions).

-During this period, two major actions were taken to modernize the appearance of the city of Tehran:

The modernization period of Tehran’s urban planning

The introduction of the first automobile to Tehran in 1918 for Mozaffar ad-Din Shah marked the beginning of the city's modernization, highlighting the need for urban planning and the establishment of regulations related to vehicle movement. With the increasing number of automobiles and the establishment of the Tehran Municipality in 1928, the necessity for changes in the urban structure was keenly felt.

The number of automobiles increased dramatically during this period, with the number of repair shops rising from 27 at the beginning of 1929 to 233 by the end of the same year. This change indicated a significant shift in urban transportation demand, emphasizing the need for the development of streets and the urban

transportation network. The initial urban development plans focused on creating a network of streets, designed particularly with the transportation needs of automobiles in mind. In 1930, a "Street Map" was introduced, leading to significant alterations in the old urban fabric. New streets such as Buzarjomehri and Khayyam were constructed, demolishing parts of the old city fabric. These streets were symbols of modernity, and Haussmann's urban planning style in Paris served as a model for this modernization.

The passage of the "Law of Widening and Development of Passages and Streets" in 1933 also indicated the formalization of this type of planning. Unlike most newly established dynasties in Iran,

Reza Shah did not choose a new capital but instead created a new capital by demolishing the city's walls, gates, and several Qajar-era buildings based on his vision. (Mashayekhi, A.,2018)

New Construction

The modernization of Tehran involved the construction of new buildings that displayed a blend of traditional Persian and Western architectural styles. These changes stemmed from the need to strengthen governmental functions and create a new cultural landscape, known as Reza Shah's architectural style.

Under Reza Shah's rule, Tehran experienced rapid modernization, characterized by the construction of buildings that blended ancient Persian architectural traditions with Western styles. The Malik National Museum is an example of such architectural endeavors, showcasing the distinctive style of this era. These changes not only transformed Tehran's appearance but also set the foundation for future urban development and highlighted the importance of architectural integration in urban planning**.** (Mashayekhi, A.,2018)

Wide Streets and Squares

One of the major urban planning initiatives involved the creation of wide streets and squares, such as Ferdowsi Square and Hasan Abad Square, which were modeled after European urban designs. These developments facilitated traffic flow and symbolized modernity, reflecting a significant shift in Tehran's urban planning approach.

Figure 17: Ferdowsi square, 193012 IRAN TEHRAN Ferdowsi square old photo postcard. Postcardsworld.,2017)

Educational and Scientific Centers

Reza Shah's cultural policies emphasized expanding European knowledge and education. This period saw the establishment of various educational institutions, including primary schools, high schools, teacher training centers, and the **University of Tehran**. In 1935, the Academy of Persian Language was also founded. Despite these modern influences, the Iranian-Islamic spirit remained prevalent among the people and in the cultural landscape of Tehran.(Mashayekhi, A.,2018)

Tehran in the Second Pahlavi Period

During Mohammad Reza Shah’s reign, Tehran faced numerous challenges, including political and economic turmoil during World War II. The city's population surged due to migration from other

parts of the country, reaching over 880,000 by 1946. This influx led to unplanned urban expansion, stretching the municipality's resources beyond its limits.

Governmental and Private Organizations

In response to these challenges, the government prioritized urban planning and development. The establishment of the Plan and Budget Organization and its High Council in 1948 marked the beginning of structured planning efforts. This initiative concentrated governmental and private sector activities in Tehran, driving the city's rapid growth and development.

Post-1941 Urban Development

The post-1941 urban development era saw significant urbanization, increasing the demand for housing and infrastructure. This period was marked by the construction of residential complexes and organizational buildings, which catered to the growing population and workforce.

Residential Complexes

With the rise of urbanization, housing became a social issue, leading to the construction of the first residential complexes outside Tehran's urban boundaries. Notable examples include Nazi Abad,Farah Abad (Sadd Device and Chaharsad Device), and the Narmak residential complex. Among these, the Chaharsad Device complex in Farah Abad (now Pirouzi) stood out as a well-planned urban development with appropriate urban spaces. (Mashayekhi, A.,2018)

Organizational Buildings

The early 1950s saw Tehran's growth accelerate, fueled by the economic surplus from oil revenues and increased migration. The population reached 1,512,082 by the 1956 national census. This growth led to the establishment of new ministries, urban planning initiatives, and the construction of governmental and private buildings, catering to the upper and middle classes.

Zoning and Urban Expansion

By the 1950s, Tehran's urban landscape was distinctly zoned, with various social classes and functions spread across different areas:

-Working-Class Areas: Located on the outskirts, forming a semi-circle from the northeast to the southwest.

-Middle-Class Neighborhoods: Situated in the city center, between Sepah and Cyrus and Molavi and Amiriyeh streets.

-Affluent Areas: Occupied by wealthy professionals, located in the northern and northwestern streets.

-Commercial Centers: Concentrated between Saadi, Ferdowsi, Shah (now Islamic Republic), and Buzarjomehri streets up to the bazaar.

-Administrative and Governmental Region: Spanning from Baharestan to Toopkhaneh Square.

-Industrial Areas: Located in the south, southwest, and later in the northeast of Tehran.

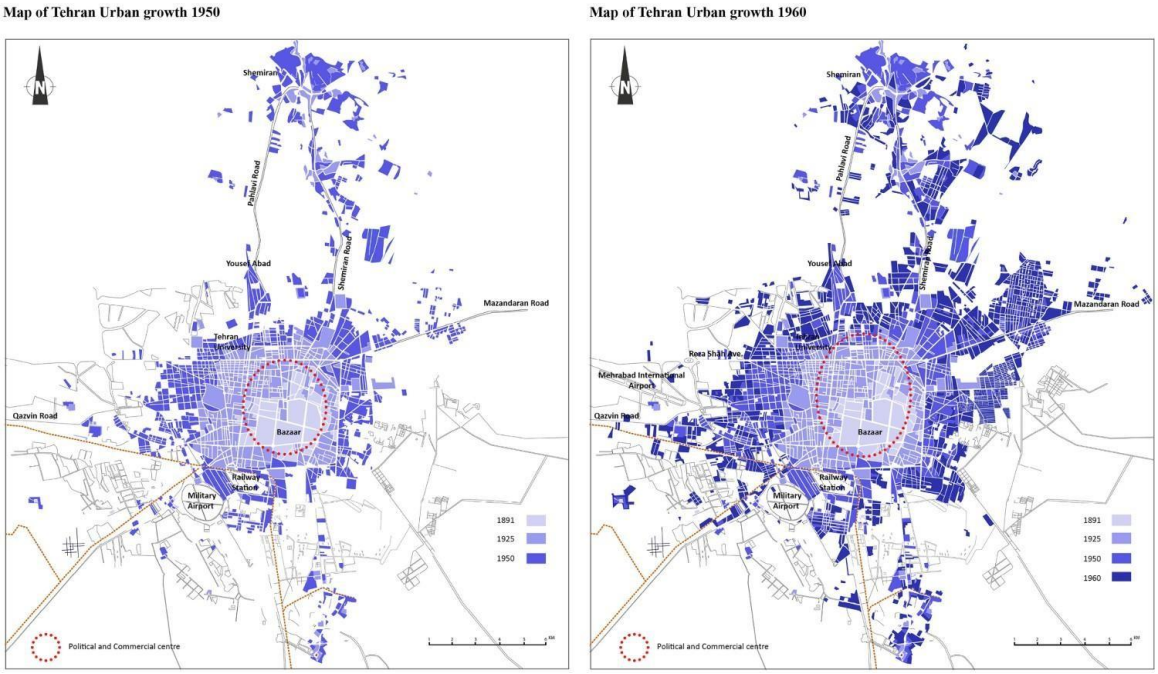


Figure 18: Shows the rapid urban expansion of Tehran from 1950 to 1960. (Mashayekhi, A.,2018)

The expansion of residential, administrative, and industrial areas continued in the subsequent decades, particularly towards the west. New residential neighborhoods, like "Yousefabad",were developed, often without comprehensive urban planning, reflecting the rapid and sometimes haphazard growth of the city. The"Narmak"and "Nazi Abad" neighborhoods were also allocated during the early 1950s, further illustrating the city's ongoing expansion. (Mashayekhi, A.,2018)

Impact of the white Revolution [1](1963-1979 A.D.)

The White Revolution, initiated in the early 1960s, marked a transformative era in Iran's socio-economic landscape, significantly impacting Tehran's urban development. Key reforms, such as land redistribution, and the implementation of the third economic-social development plan (1962-1967), accelerated the city's expansion in multiple directions. These changes intensified class disparities and reinforced social stratification, embedding urban spatial inequalities within Tehran's fabric.

From the 1960s onward, affluent families began relocating from the city center to the newly developed northern areas, resulting in a pronounced duality in the city's structure. By the 1970s, Tehran's once- seasonally deserted landscape due to summer heat became permanently connected to the summer resorts of Shemiran. This transition highlighted a distinct shift in urban dynamics, fostering social separation and political fragmentation between the city center and its periphery—a trend that traces its roots back to the Naseri era and was amplified during the second Pahlavi period. (Mashayekhi, A. ,2018).

Demographic Growth and Urban Spread

Tehran's annual population growth rate from 1956 to 1966 was an impressive 6.1%, bringing the total population to 2,719,730 by 1966. During this period, the city's area expanded to encompass

[1] *The White Revolution was a series of social, political, and economic reforms initiated by Mohammad Reza Shah Pahlavi in 1963. These reforms aimed to modernize Iran through measures such as land redistribution to farmers, the expansion of women's rights, the establishment of literacy corps, and the nationalization of forests and pastures. While these reforms sought to address rural poverty and accelerate modernization, they also faced significant criticism for disrupting traditional structures and contributing to growing social and economic inequalities.*

180 square kilometers. This rapid demographic expansion posed significant challenges and opportunities for urban planners and architects aiming to create a sustainable urban environment.

Table 1 : Historical Population Growth and Urban Development of Tehran. This table highlights the demographic changes in Tehran from the 16th to the mid-20th century. The rapid population growth and urban expansion were influenced by various political, economic, and social conditions during the Safavid, Qajar, and Pahlavi dynasties. These data illustrate Tehran's significant role as the capital and administrative center of Iran throughout history. (Wikipedia Contributors.,2024, November 9)

Ruler	Growth Rate (%)	Population	Year(Gregorian)
Shah Tahmasb	-	1,000	1527
Shah Abbas Safavid	1.4	3,000	1596
Agha Mohammad Khan Qajar	5.2	15,000	1762
Fath Ali Shah Qajar	12.03	50,000	1772
Fath Ali Shah Qajar	3.6	60,000	1777
End of Fath Ali Shah’s region and start of Mohammad Shah Qajar	2.8	80,000	1799
Naser al-Din Shah Qajar	2.9	147,256	1869
Reza Shah Pahlavi	2.4	250,000	1930
Reza Shah Pahlavi	6.6	540,087	1940
Mohammadreza Shah Pahlavi	5.5	1,560,934	1956
Mohammadreza Shah Pahlavi	5.1	2,719,730	1966

Comprehensive Urban Plan of Tehran

The 1960s and 1970s marked a transformative era for Tehran's urban development. These decades witnessed significant shifts driven by the city's role as the political, economic, and cultural hub of Iran, which necessitated organized urban planning to accommodate its rapid growth and evolving needs.

Approval and Objectives of the Comprehensive Plan

During this period, the Comprehensive Urban Plan of Tehran was introduced and approved. The plan aimed to:

- Establish coordination in urban development processes.
- Address the challenges of uncontrolled urban expansion.
- Promote systematic and sustainable growth for the city.

The comprehensive plan included detailed maps and zoning guidelines, clearly defining the roles and functions of different areas, pathways, and buildings. These measures were pivotal in setting the groundwork for Tehran's structured urbanization.

Key Impacts of the Comprehensive Urban Plan :

Physical Expansion of the City

The plan catalyzed Tehran's rapid spatial growth, transforming it into one of the first cities globally to implement a comprehensive urban development strategy.

Expansion occurred in multiple directions, resulting in:

- The creation of new residential zones to address population pressures.
- Changes in land use patterns to accommodate growing commercial and industrial needs.
- Development of essential infrastructure to sustain urban growth, including roads, water supply systems, and public amenities.

Transition from Disorganized to Organized Development

Prior to the plan, Tehran faced unregulated and haphazard urban sprawl, which strained its resources and infrastructure.

The implementation of the comprehensive plan ended this disorganization by:

- Enforcing zoning laws that regulated construction and land use.
- Preventing uncontrolled city growth and ensuring a more cohesive urban layout.

Infrastructure Improvements

One of the most critical outcomes of the plan was the enhancement of urban infrastructure. The city saw significant advancements in:

- Road Networks: Development of arterial roads and highways to improve connectivity.
- Public Transportation: Expansion of bus and rail systems to meet the demands of a growing population.
- Urban Services: Upgrades in waste management, water supply, and energy distribution systems.

Significance and Legacy

The approval and implementation of Tehran's Comprehensive Urban Plan represented a turning point in the city's history. This plan not only addressed the immediate challenges of urban sprawl but also laid the foundation for Tehran's future as a structured and organized metropolis. By emphasizing sustainable urban planning, the comprehensive plan contributed to:

- The city's economic vitality through well-defined commercial zones.
- Environmental considerations, including the integration of green spaces in urban design.
- Social equity by ensuring access to essential services and amenities across different parts of the city.

This period remains a significant milestone in Tehran’s urban history, shaping its growth trajectory for decades to come. The impact of the Comprehensive Urban Plan continues to resonate in the city’s current urban fabric, demonstrating the importance of forward-thinking and coordinated urban policies. (Mashayekhi, 2018)

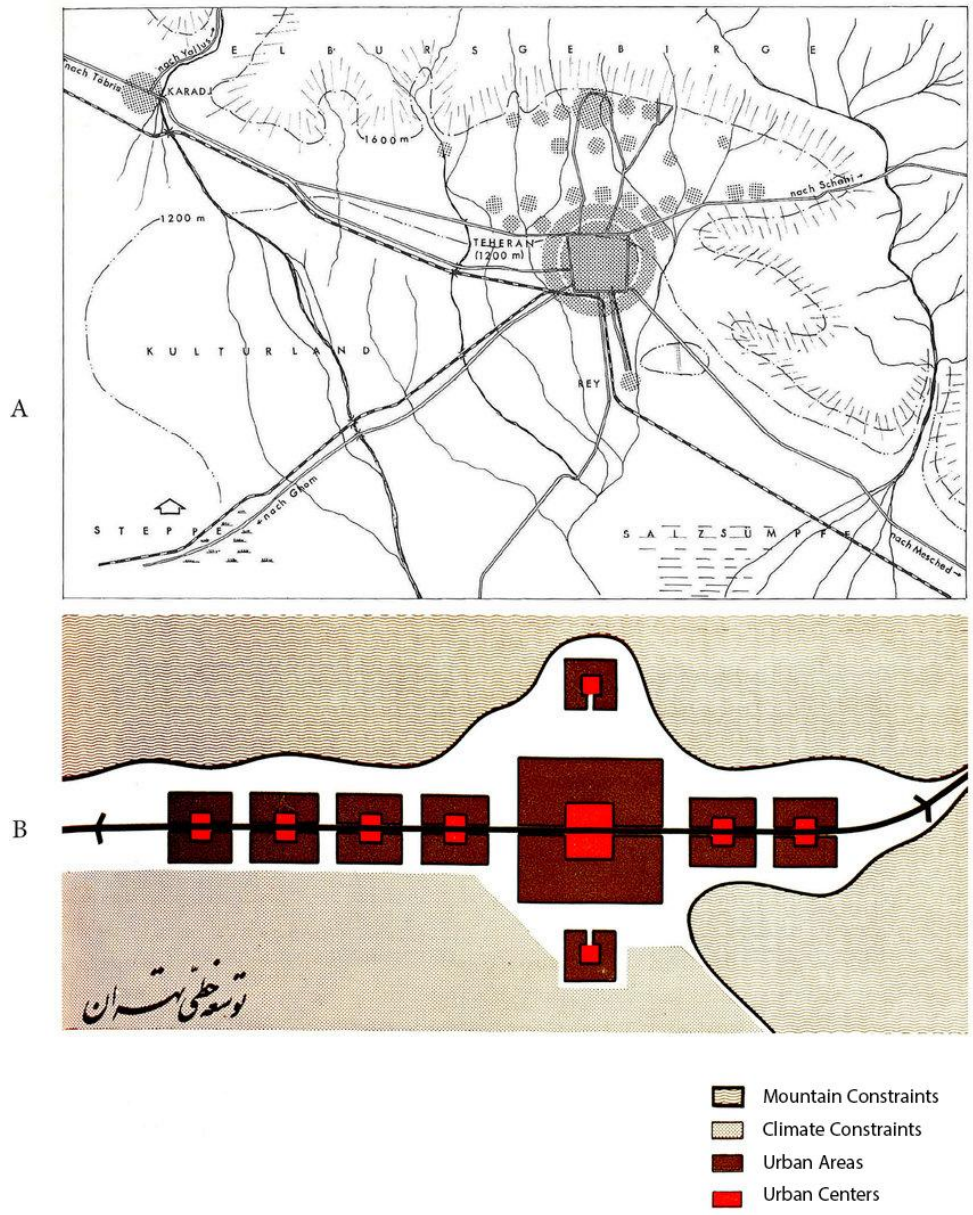


Figure 19: This figure illustrates the growth and development strategy of Tehran as outlined in the 1966 Comprehensive Urban Plan. Diagram A represents the existing unstructured growth pattern of Tehran in 1960, influenced by natural and geographical constraints. Diagram B proposes a structured, linear expansion strategy aimed at optimizing urban growth along major corridors, addressing population pressures, and ensuring balanced development of urban and regional facilities.(Sedighi, M. ,2018)

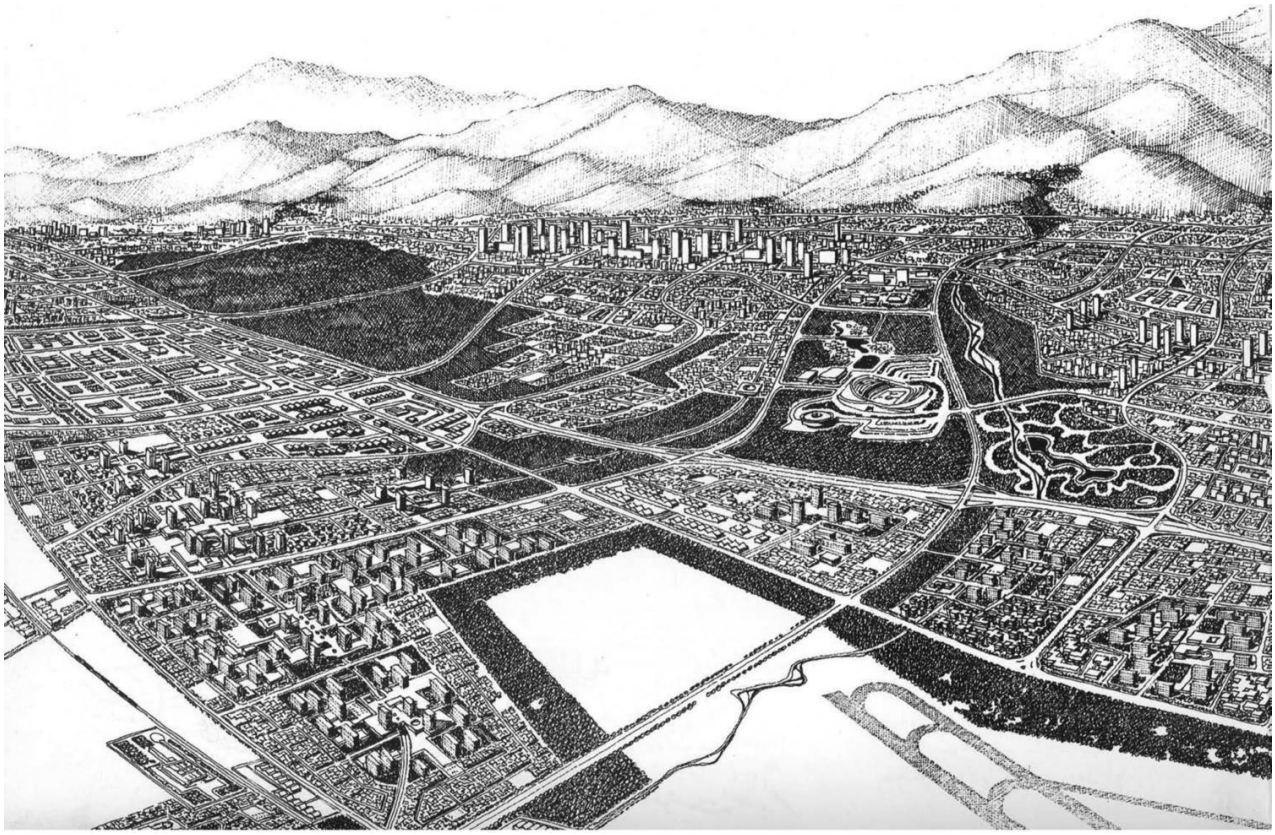


Figure 20: This figure illustrates the proposed ideal expansion model for Tehran according to the Comprehensive Urban Plan of 1966. The plan emphasizes structured urban growth towards the west of the city, aiming to control rapid urban sprawl and improve infrastructure. This model reflects an effort to address the challenges of increasing population density and to create balanced urban development (Mashayekhi, 2018).

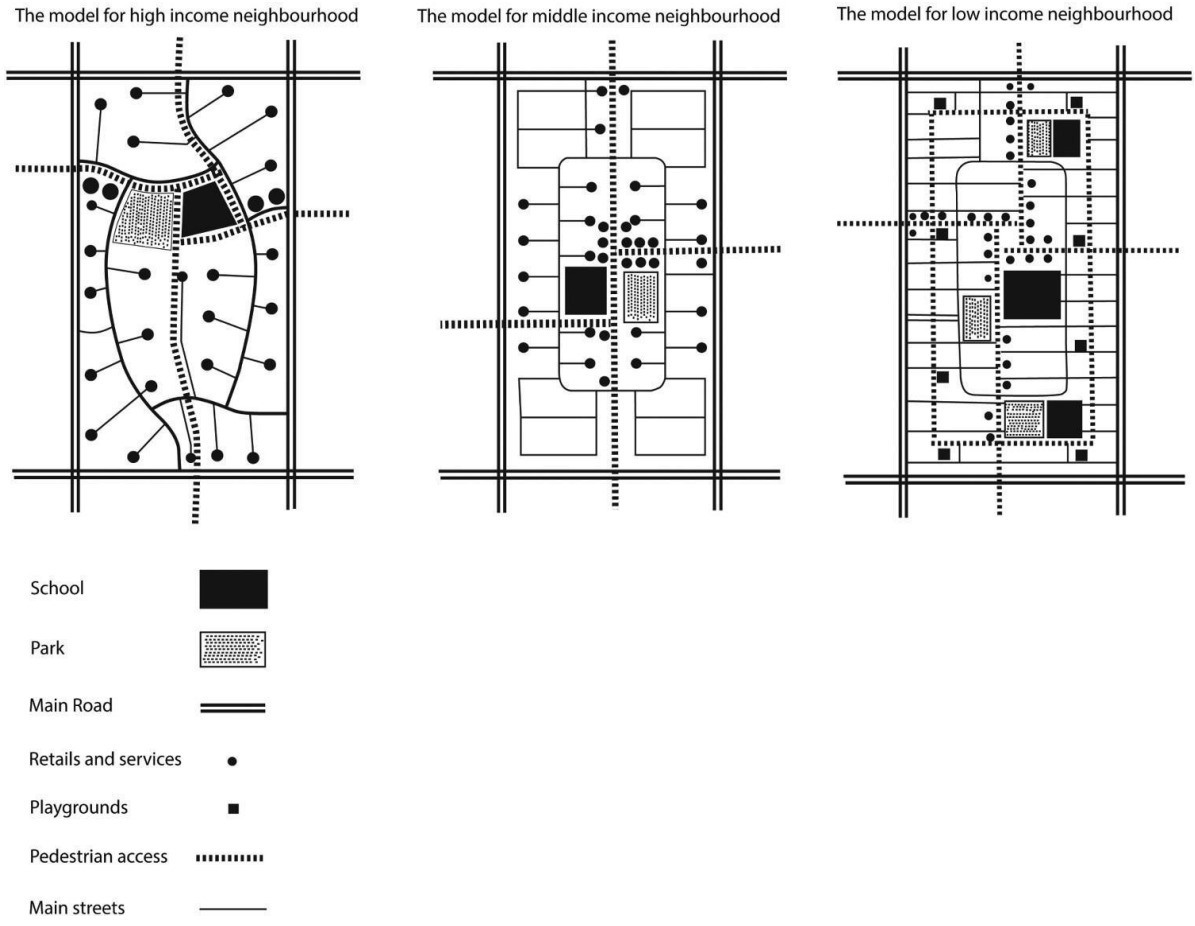


Figure 21: different neighborhood unit schemes proposed in the Tehran Comprehensive Plan of 1966, designed for various income groups. These schemes aim to create equitable living conditions by integrating residential, commercial, and recreational facilities in each neighborhood. The design reflects the influence of modern urban planning theories adapted to the local socio-economic context of Tehran (Mashayekhi, 2018).

Problems Arising from Tehran Municipality's Planning

In the 1960s and 1970s, Tehran faced significant issues due to unplanned growth. These problems included a housing shortage, lack of educational and welfare facilities, uneven distribution of urban services like electricity and water, and transportation issues. To address these problems, in

February 1966, the Plan and Budget Organization appointed consultants to prepare a comprehensive development plan for Tehran over the next 25 years. (Mashayekhi, A. ,2018).

Proposed Urban Changes

Linear Development of Tehran: Planning for Tehran's expansion with a projected population of 5.5 million by 1991 and implementing restrictive measures to control the population.

Creating Laws and Oversight: Establishing laws and regulations to implement the comprehensive plan and creating an organization to oversee its execution.

Short-Term Reforms: Addressing existing structural deficiencies and improving the urban environment. (Mashayekhi, A. ,2018).

Objectives of the Comprehensive Plan

The comprehensive plan aimed to improve transportation, provide urban facilities, increase the diversity of amenities, and enhance the quality of life. The plan projected Tehran's area for 1992 to be 600 square kilometers. (Mashayekhi, A. ,2018).

Unplanned Expansion and Subsequent Actions

The rapid expansion of Tehran and non-compliance with the comprehensive plan led to the failure of implementing significant portions of the plan. In 1973, the government established the "Organization for Supervision of Tehran's Urban Expansion" to control the city's growth, and the following year, the Ministry of Reconstruction and Housing was renamed the Ministry of Housing and Urban Development. (Mashayekhi, A. ,2018)

Figure 22: The 1966 map of Tehran, created by the Sahab Institute, provides a detailed depiction of the city's rapid urban development during the 1960s. Titled "Detailed Guide to Tehran," it includes areas such as Shemiranat, Yousefabad, Narmak, Tehran-No, Abbasabad, Vanak, and their surroundings. The map highlights the connection of two prominent north-south streets in the Tajrish area, illustrating the city's expanding road network. It also showcases the newly developed urban zones of the time, reflecting Tehran's fast-paced growth, and identifies key neighborhoods that became central residential hubs for its increasing population. This map serves as a vital resource for understanding the trajectory of Tehran's expansion and urban planning transformations leading up to the 1970s. (Rostamipour, E. ,2024, October 6).

Economic Impacts and New Priorities

The rise in oil prices and associated economic changes made Tehran the primary destination for the country's economic resources. The population of Tehran grew from 1966 to 1976 at a rate of 6.1%, reaching 4,530,223 people. (Mashayekhi, A. ,2018)

Tehran Municipality Plans in the 1970s

During the 1970s, Tehran experienced significant and rapid growth, leading to frequent revisions of the comprehensive plan. Between 1968 and 1978, the plan was updated more than forty times. Key approved plans included:

- Tehran Development Revision Plan (1971): A comprehensive revision of Tehran's development strategy.

- Resettlement Plan for South Tehran Depressions (March 6, 1974): Focused on relocating residents from the Dowlatabad area.

- Construction of 2,271 Residential Units for the Oil Company Cooperative (June 6, 1976):Addressed housing needs for employees of the oil sector.

- Establishment of Lavizan Township (January 25, 1976): Aimed at creating a new residential area.

Figure 23: Lavizan Township, (Melkana.,2019, February 9)

- Additional plans included the construction of ASP apartments on a 58,000-square-meter plot in the Vanak area. However, these projects led to discrepancies with restrictive programs and caused issues with incompatible developments, such as those in the Kan residential complex and Soleimanieh lands.

Figure 24: The A.S.P. Towers, located in the Vanak neighborhood of Tehran, are iconic high-rise residential buildings constructed during the 1970s. Designed with a modernist architectural style, they were built to provide luxury housing for Tehran's growing urban elite during a period of rapid urbanization. The complex consists of three towers and is recognized for its prominent architectural design and its role in reflecting the modernization efforts of pre-revolutionary Iran. (Afkham, M.,2007, February 24)

- By November 15, 1978, expansion east of the Kan River was authorized, and on July 17, 1979, permission was granted for land development in the Vanak public park area. . (Mashayekhi, A. ,2018)

Figure 25 : The Vanak Park Residential Complex is a prominent architectural project located in Tehran. Designed as a modern residential space, it exemplifies urban development trends in the city. The complex is situated in the Vanak area and reflects Tehran's mid-20th-century push toward modernity and planned urban growth. It serves as a notable example of blending residential functionality with urban planning initiatives. (Center for Architecture and Urban Innovation. ,n.d.)

Eckart Ehlers characterized Tehran as a metropolis due to its:

- Administrative and governmental centralization: Serving as the country's primary administrative, governmental, and military center.

- Residential hub for elites:Housing the nation's and region's prominent figures, including major landowners and tribal leaders.

- Main commercial center: Dominating commercial activities with traditional capitalist methods.

- Largest industrial hub:Leading in industrial production and distribution.

- Concentration of large companies and financial institutions:Hosting major corporations, insurance firms, and central bank branches.

From 1971 to 1978, increased investment in housing and infrastructure projects (such as the metro) shifted focus to urban development. The Shahestan Pahlavi project, aimed at creating a new prestigious urban center in northern Tehran, was never realized due to the Islamic Revolution**.** (Mashayekhi, A. ,2018)

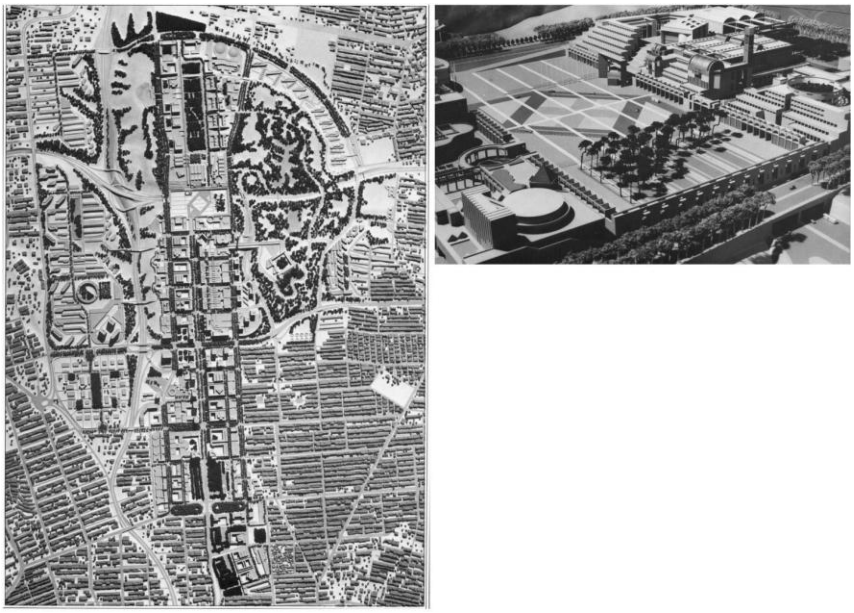


Figure 26: This image represents the Shahestan Pahlavi project, a proposed new urban center for northern Tehran in the 1970s. Designed by Llewelyn-Davies International, the project aimed to create a prestigious and modern urban hub reflecting Iran's economic and political aspirations during the second Pahlavi era. The highlighted central square, referred to as the 'Shah and Nation Square,' was intended to symbolize the unity between governance and society. Unfortunately, the project was never realized due to the 1979 Iranian Revolution, marking a shift in Tehran's urban development priorities (Mashayekhi, 2018).

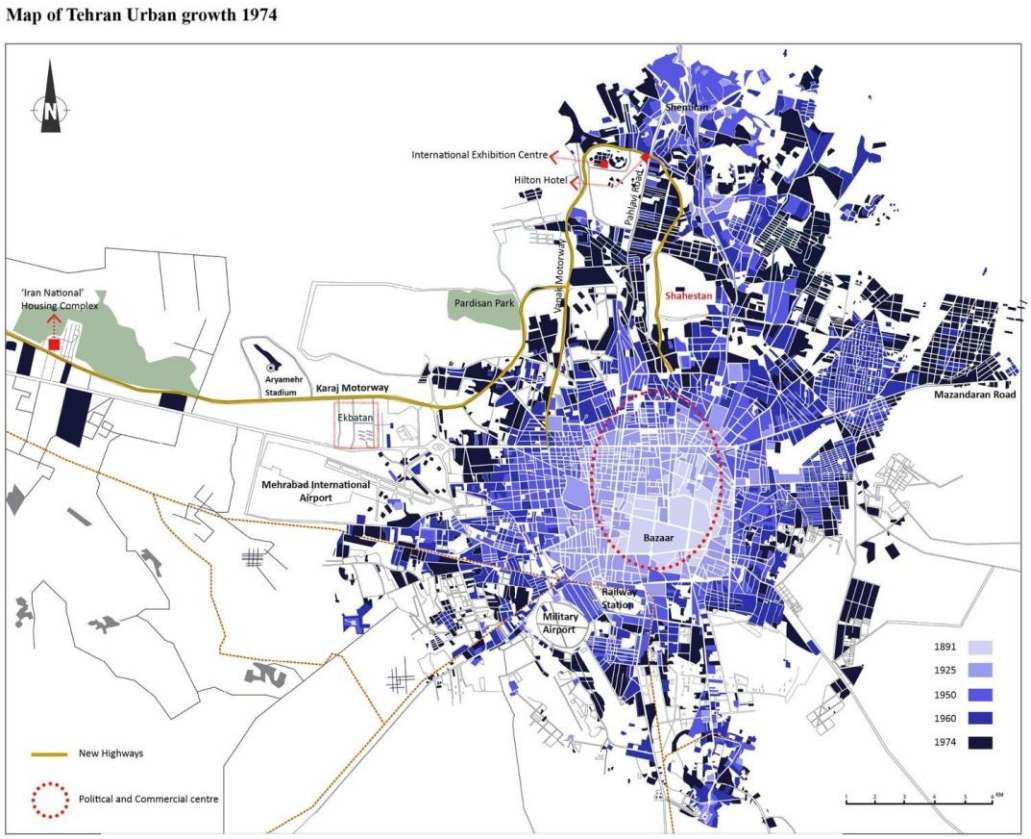


Figure 27: This image illustrates Tehran's urban expansion plan from 1974, highlighting the city's rapid growth and transformation during the second Pahlavi period. The plan reflects the government's efforts to manage population growth, improve infrastructure, and integrate new residential, industrial, and commercial areas into the urban fabric. This growth was driven by economic prosperity from increased oil revenues, but it also contributed to challenges such as social stratification and environmental concerns (Mashayekhi, 2018).

The Iranian Revolution (1979)

After the revolution, new policies were adopted to manage urban problems, which included the construction of new cities to absorb excess population and provide housing for low-income groups. These new cities were designed to reduce population and industrial concentration, support low-income classes, and decrease rural-to-urban migration.Compared to other countries such as the

United Kingdom, the Soviet Union, and Japan, Iran has also utilized similar models for the development of new cities.

The 1979 Iranian Revolution is one of the most significant events in Iran's history, which has altered spatial policies and engaged social action with urban space and architecture.Based on this point, the 1979 Revolution can be considered an urban revolution.Everyday interactions in the city include various spatial experiences—experiences that shape and are shaped by spaces. (Tarkavian, A., & Nouri, S. ,2014).

Post-Revolution Perceptions and Urban Shifts:

After the 1979 Iranian Revolution, Tehran's role and perception transformed significantly. The city was no longer viewed as a symbol of foreign influence and government control. The prior village-city divide, exacerbated by land reforms, began to diminish. Urban focus shifted towards managing migration and housing issues.

Migration and Housing Policies

In the early years post-revolution, Tehran experienced rapid changes due to migration and the government's focus on housing. The Ministry of Interior categorized cities as immigrant-receiving or immigrant-sending, exacerbating urban disparities and reinforcing Tehran's economic dominance.

Housing Initiatives and Challenges

Housing Priorities: The new government prioritized housing for the underprivileged by establishing the Housing Foundation and Account 100. Housing production surged in 1979 and 1980.

Cancellation of Previous Plans:The revolution led to the discontinuation of prior urban plans and boundary systems, viewed as Western and outdated. This lack of regulation allowed uncontrolled city expansion and increased migration to Tehran's outskirts.

Housing Cooperatives:Residential complexes and cooperatives became the primary method for urban development. The saturation of Tehran’s natural capacity resulted in rapid, fragmented growth in surrounding villages and suburbs.

Post-War Urban Development

After the Iran-Iraq War, reconstruction efforts redefined Tehran's urban spaces. New developments included highways, parks, and the initiation of the Tehran Metro project in 1986, which remains unfinished. Despite these efforts, spatial and class divisions within the city persisted.

Modern Urban Planning and Social Movements

The transformation of Tehran's urban spaces reflects both the legacy of the Pahlavi era and the revolutionary changes. The city's rapid development during the Pahlavi era, influenced by global practices, created a homogeneous urban experience devoid of local elements. Post-revolution, the city saw significant alterations, including demolitions and changes to spaces that did not align with revolutionary ideologies.

Urban Experience and Social Fragmentation

The revolution's impact on urban spaces involved both the removal and addition of elements, leading to a fragmented cityscape. Post-war urban planning focused on rapid development and filling voids rather than addressing previous demolitions. The rise of consumerism and chain stores transformed daily interactions with the city, reducing the role of public spaces and increasing private sphere significance.

Contemporary Urban Structure

Today's urban spaces in Iran exhibit a mix of uncertainty and eclecticism, blending Greek-inspired ornamentation with ancient Aryan influences and informal settlements. This eclectic mix reflects the ongoing challenges and complexities in Tehran's urban development. (Tarkavian, A., & Nouri, S. ,2014).

Current Land Use Patterns

According to the detailed plan for Tehran, land is divided into various uses such as residential, commercial, industrial, green space, and public areas. In District 2 of Tehran, residential areas occupy the largest portion, with some allocated for commercial use and green spaces. This area covers approximately 4,763 hectares, divided into these various uses.(Saravand Consulting Engineers,2016)

In District 2, projects such as the development of residential complexes alongside the protection of green spaces, particularly in neighborhoods like Saadat Abad and Shahrak-e Gharb, have been implemented to improve the quality of life for residents.(Saravand Consulting Engineers,2016).The

detailed plan for this area emphasizes the importance of appropriate distribution of land uses and the preservation of green spaces like Pardisan Park, as these areas play a crucial role in sustainable urban development. The precise classification of areas into various uses, including residential, commercial, and service sectors, has significantly contributed to the economic and social development of the region. (Saravand Consulting Engineers,2016)

- **Transportation Networks and Infrastructure**

Tehran has an extensive transportation network that includes a subway, bus services, and major highways. The Tehran Metro, especially in District 2, plays a significant role in reducing traffic and improving access to various parts of the city, with important stations like the Industry Square and Shariati stations. The development of the metro is one of the largest public transportation infrastructure projects in the country, facilitating citizens' movement and alleviating traffic pressure. (Sheikhi, A., Hataminezhad, H., Zanganeh Shahraki, S., Pour Ahmad, A., & Mirzaei, H. (2024) (Saravand Consulting Engineers,2016)

District 2 is also equipped with a bus network and important highways like Chamran and Yadegar Imam, which serve as main communication routes in this part of the city. Additionally, plans are underway to improve transportation by expanding bicycle paths and pedestrian walkways, especially in the northern and western areas of the city. These actions aim to promote non-motorized and sustainable transportation, which plays a vital role in reducing air pollution and urban traffic. (Saravand Consulting Engineers,2016)

In recent years, Tehran has focused on expanding public transportation infrastructure for sustainable transport. New metro projects and smart highways recently implemented in Tehran

have contributed to reducing traffic and improving transportation conditions. One of the most important recent projects is the smart transportation development plan, which utilizes information technology systems to provide more efficient and smoother transport services to citizens. (United Nations Development Programmer (UNDP).,2020).

- **Administrative Structure of Tehran**

Tehran is divided into 22 municipal districts, each further divided into various neighborhoods. The Tehran Municipality, as the primary management body, is responsible for executing urban programs such as development and planning, overseeing infrastructure, and crisis management. Organizations like the "Tehran Urban Studies and Planning Center"

(TUPRC) play a crucial role in formulating urban development policies and strategies. (Bahrambeygui, H.,1972).

In District 2 of Tehran, which is divided into several neighborhoods, local management plays a vital role in daily operations and monitoring construction and social projects. The neighborhood-focused management projects of the Tehran Municipality, where local councils and neighborhood management actively participate in decision-making, have been effective in developing and overseeing projects in this area. This district division system has significantly improved resource management and urban services, playing a key role in enhancing service efficiency and monitoring regional development.(Saravand Consulting Engineers,2016)

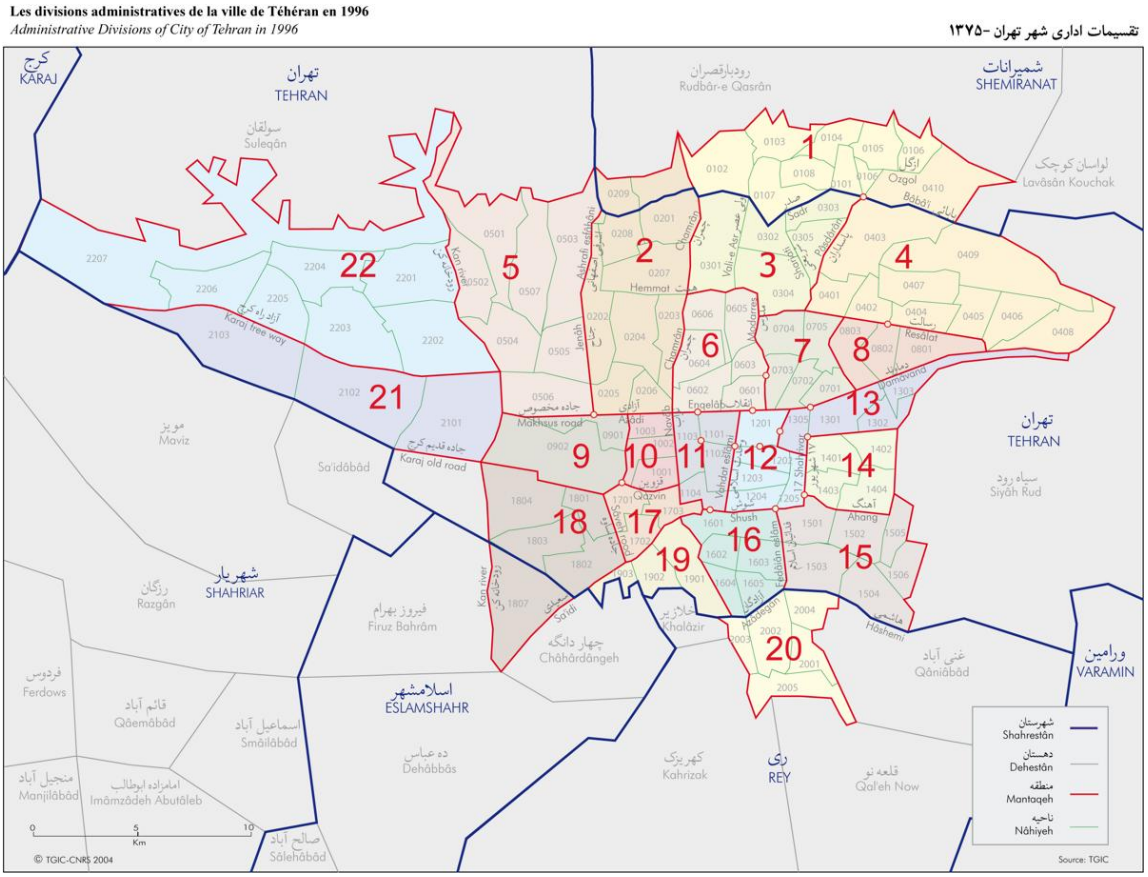


Figure 28: Administrative Divisions of Tehran in 1996. This map illustrates the administrative divisions of Tehran in 1996, showcasing the city's 22 districts along with their respective boundaries and neighboring areas. It provides a clear overview of the spatial organization of the city, supporting urban planning and management efforts. (TGIC-CNRS. ,2004)

- Key Local Government Bodies Involved in Urban Planning

The Tehran Municipality, as the main body in urban management, oversees and implements urban development projects. The Tehran Urban Studies and Planning Center (TUPRC) also plays an important role in planning and researching urban issues. These entities collaborate with other organizations, such as local councils, to better manage the regions. (Saravand Consulting Engineers,2016)

Sustainable Development Policies

Among the most important sustainable policies in District 2 of Tehran are air pollution reduction, waste management, and green space development. Public transportation projects and green construction have been designed to improve the quality of life for citizens. (Saravand Consulting Engineers,2016)

Recent sustainable development projects include energy-efficient buildings initiated by the United Nations Development Programmer (UNDP) and the Tehran Municipality. This project aims to reduce energy consumption by 25% in existing buildings and by 60% in new buildings, thereby contributing to carbon emission reduction. The implementation of monitoring and smart control systems in these buildings has been among the key innovations of this plan. (United Nations Development Programmer (UNDP).,2020).

Transportation and Traffic Policies

In recent years, the development of the metro network and improving citizens' access to public transport has been a priority for the Tehran Municipality. Projects such as transit-oriented development (TOD) systems, which improve connections between land use and transportation networks, are examples of Tehran's efforts to reduce personal vehicle use and traffic**.** (Motieyan, H., & Saadi Asgari, M.,2017)

Local Urban Policies in Tehran

In the realm of sustainable urban development, the government has implemented numerous projects to improve public transportation and waste management to reduce air pollution.

Specifically, the electric motor initiative aimed at reducing air pollution and bicycle paths in District 2 of Tehran are successful examples of these policies. (Sheikhi, A., Hataminezhad, H., Zanganeh Shahraki, S., Pour Ahmad, A., & Mirzaei, H.,2024).

Transportation and Traffic Policies

Traffic is one of the fundamental issues in Tehran, and the government has implemented a series of programs to reduce traffic congestion. These programs include the development of the metro network, the establishment of Bus Rapid Transit (BRT) lines, and the expansion of bicycle paths. The Tehran traffic plan has also been executed as one of the largest traffic management projects to reduce congestion in the city center. (Sheikhi, A., Hataminezhad, H., Zanganeh Shahraki, S., Pour Ahmad, A., & Mirzaei, H. (2024).

In District 2 of Tehran, significant measures have been taken to reduce traffic and air pollution. These actions include developing metro lines and dedicated routes for BRT buses, which play a significant role in reducing traffic congestion. (Saravand Consulting Engineers,2016)

Traffic management programs in this area have been developed and implemented to facilitate mobility and improve the quality of life for citizens. Furthermore, since the revolution, the government has focused on developing transportation infrastructure, and the Tehran metro development project commenced in 1986 with the aim of reducing traffic and improving public transportation. These projects are part of the government's broader strategy to enhance the quality of life in the capital, particularly in District 2, playing a significant role in reducing traffic and increasing the efficiency of public transport. (Tarkavian, A., & Nouri, S. ,2014).

Housing and Urban Development Policies

Urban development plans for Tehran, especially after 2020, indicate increased attention to improving urban infrastructure and sustainable development. One of the government's most important programs in this area is urban regeneration projects and the renewal of dilapidated areas. These policies aim to renovate and improve old neighborhoods, especially in densely populated areas like District 2. Housing renewal projects in this district focus on rebuilding dilapidated neighborhoods and improving living conditions for residents. (Saravand Consulting Engineers,2016).

Additionally, the government seeks to address the housing shortage in various parts of Tehran through the implementation of social housing projects. In District 2, housing renewal and development policies have been implemented specifically, with several projects aimed at creating balance in the distribution of housing resources and improving living conditions for residents. These efforts align with the government’s overall plans to enhance quality of life and sustainable development in the capital. (Saravand Consulting Engineers,2016)

Housing and Urban Development Policies

Following the Islamic Revolution of 1979, the Iranian government focused on providing housing for low-income groups by establishing the Foundation for Housing Revolution and the

100 Imam Fund. Housing policies after the revolution included the creation of housing cooperatives, which enabled low-income groups to access suitable housing. These projects led to rapid urban expansion in the suburbs of Tehran and contributed to the formation of new towns

and residential complexes. Additionally, after the Iran-Iraq War, urban reconstruction became a major priority, and projects such as the development of highways and parks were undertaken during this period. (Tarkavian, A., & Nouri, S. ,2014).

Cultural and Social Policies

The development of cultural and social spaces is one of the key objectives of the government to improve the quality of life for Tehran's citizens, especially in District 2. In this area, special attention has been given to the development of recreational, cultural, and sports facilities, with numerous projects executed to create cultural centers and public spaces. These projects aim to enhance social welfare and citizens' access to cultural and sports facilities.

Additionally, under the social policies of District 2, supportive programs for vulnerable groups have been designed and implemented. (Sheikhi, A., Hataminezhad, H., Zanganeh Shahraki, S., Pour Ahmad, A., & Mirzaei, H. (2024).These programs, alongside efforts to increase public participation in urban decision-making processes, help promote social justice and strengthen citizen involvement in local governance. The development of parks, social centers, and green spaces is among the key actions taken in this area to enhance quality of life and create a healthy and sustainable environment for residents.(Saravand Consulting Engineers,2016)

Crisis Management and Urban Resilience Policies

Due to its seismic activity, Tehran requires precise planning for crisis management. Crisis management policies in this city include developing preparedness programs, enhancing resilient infrastructure, and establishing rapid response mechanisms for natural disasters like earthquakes.

In District 2 of Tehran, specific programs have been implemented to increase urban resilience and improve crisis management infrastructure. These programs include enhancing safety infrastructure and designing earthquake-resistant structures. (Sheikhi, A., Hataminezhad, H., Zanganeh Shahraki, S., Pour Ahmad, A., & Mirzaei, H. (2024).

In addition to improving infrastructure, raising public awareness and educating citizens on how to deal with crises are important measures in this area. The goal of these programs is to create greater community preparedness and reduce the damage caused by natural disasters. These policies are designed and implemented to improve safety and strengthen citizens' preparedness for potential crises. (Saravand Consulting Engineers,2016)

Cultural Heritage Protection Policies

Protecting historical and cultural monuments in Tehran is a priority for urban policies. In Tehran, historical fabrics and valuable buildings are protected as part of the urban identity. In District 2, some historical buildings have been restored, and programs have been implemented to promote local culture and protect the region's history. (Saravand Consulting Engineers,2016)

Figure 29 : A view of Tehran from the top of Milad tower. In the lower right corner, a part of Hakim Highway is visible, in the middle of the left is Kuye Nasr Street, on the right of the image is a part of Sheikh Fazlullah Highway, and in the middle of the image Geisha neighborhood can be seen.(Delso, D.,2016).

The development of the Geisha neighborhood, as shown in the image, reflects significant patterns of urban growth in Tehran over recent decades. This area has undergone notable transformations due to its strategic location and accessibility to key infrastructural elements, including Hakim Highway, Sheikh Fazlullah Highway, and Kuye Nasr Street.

Urban Expansion and Spatial Growth:

The Geisha neighborhood, initially established as a residential area, has experienced substantial densification. This densification is evident in the high-rise buildings and compact urban form visible in the image.

The neighborhood's proximity to key urban landmarks, such as Milad Tower, and its connection to major thoroughfares have catalyzed its rapid growth, making it a highly sought-after area for both residential and commercial purposes.

- Infrastructure and Accessibility:

The construction of major highways, including Hakim and Sheikh Fazlullah, has played a pivotal role in integrating this neighborhood into the broader urban network of Tehran. These connections have facilitated mobility and increased accessibility, driving both population growth and land value in the area.

Kuye Nasr Street, seen in the middle of the image, serves as one of the central axes for local transportation, further supporting the neighborhood’s development.

- Challenges of Urban Density:

The intensification of development in Geisha has brought about challenges such as traffic congestion, reduced open spaces, and increased pressure on public services. These issues highlight the importance of sustainable urban planning in accommodating growth while maintaining the quality of life for residents.

- Green Spaces and Urban Livability:

Despite its dense urban fabric, efforts to preserve and enhance green spaces are visible in certain parts of the neighborhood, as seen in the lower right corner of the image. These green spaces contribute to the environmental and social well-being of the area, mitigating some of the negative effects of high-density development.

In summary, the evolution of the Geisha neighborhood exemplifies the dynamic interplay between urban planning, infrastructure development, and population growth in Tehran, showcasing both the opportunities and challenges of modern urbanization in the city.

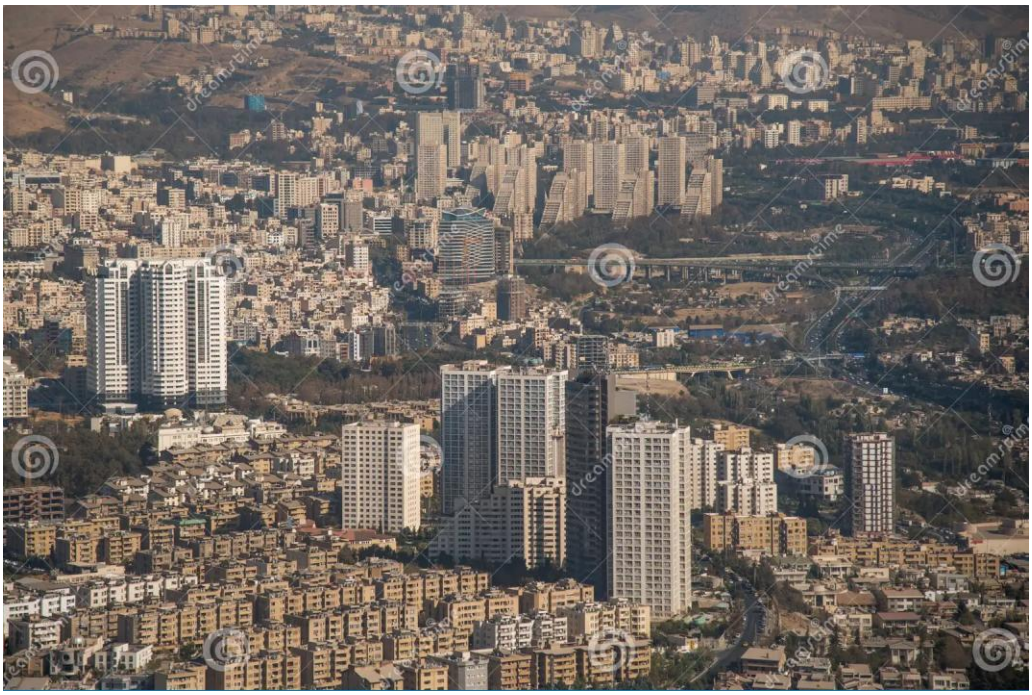


Figure 30 : Aerial view of Tehran city, Iran. Aerial view of skyline building and urban street in Tehran, capital city of Iran.(Sittidech, B. n.d.).

Figure 31 : Tehran's American-designed master plan envisioned a network of interconnected residential and commercial areas linked by major highways. This plan, which emerged during the Pahlavi era, aimed to modernize the city's infrastructure and accommodate its rapidly growing population. The design focused on creating efficient transportation corridors to connect various urban zones, reflecting contemporary international urban planning trends. However, this approach also led to increased urban sprawl and socio-economic segregation, challenges that persist in Tehran's urban fabric today.(Mehan, A.,2017)

Conclusion

Chapter 1 explored the historical evolution of urban planning in Iran, tracing its roots from pre-Islamic times through the Islamic era and into the post-revolutionary period. This analysis revealed significant shifts in governance, urban design philosophies, and the socio-cultural factors shaping Iranian cities over time. Below is a summary of the key findings:

- Pre-Islamic Urban Planning:

Finding: Cities were planned with strong central authorities and emphasized symmetry, monumental architecture, and spatial hierarchy, reflecting the socio-political dominance of centralized governance.

Comment: These principles of order and structure can inspire modern urban planning practices, particularly in designing cohesive and functional cities.

- Islamic Era Urbanization:

Finding: The introduction of Islamic principles led to a transformation in urban layouts, prioritizing community-centric spaces like bazaars, mosques, and courtyards.

Comment: Integrating these features into modern urban designs can preserve cultural identity and enhance social cohesion in Iranian cities.

- Post-Islamic Revolution Changes:

Finding: Rapid urbanization and population growth post-revolution brought significant challenges, including housing shortages, environmental degradation, and socio-spatial inequality.

Comment: Addressing these issues requires a balance between modern infrastructure needs and the preservation of cultural and historical heritage.

Chapter 2

District 2 and Shahrak-e-Gharb Neighborhood Background knowledge.

Introduction

Shahrak-e Gharb, located in District 2 of northwestern Tehran, is one of the capital's most prominent and well-planned neighborhoods. Developed during the Pahlavi era as part of Tehran's expansion strategy, this neighborhood is renowned for its modern urban planning, spacious streets, and upscale villas. It embodies a unique blend of Western architectural influences and Iranian urban identity, reflecting a harmonious integration of modernity and tradition. Its proximity to central Tehran and major highways, such as Chamran Highway and Yadegar-e-Emam Highway, has made it one of the most desirable residential areas in the city.

This chapter explores the historical development, geographical significance, and socio-economic characteristics of Shahrak-e Gharb, highlighting its role as a model for urban planning during Tehran's modernization efforts. By examining the interplay of cultural, political, and environmental factors that shaped its growth, the chapter provides insights into the neighborhood's transformation and the challenges it faces today. The analysis underscores the importance of maintaining a balance between the preservation of urban identity and meeting the demands of modern urban development.

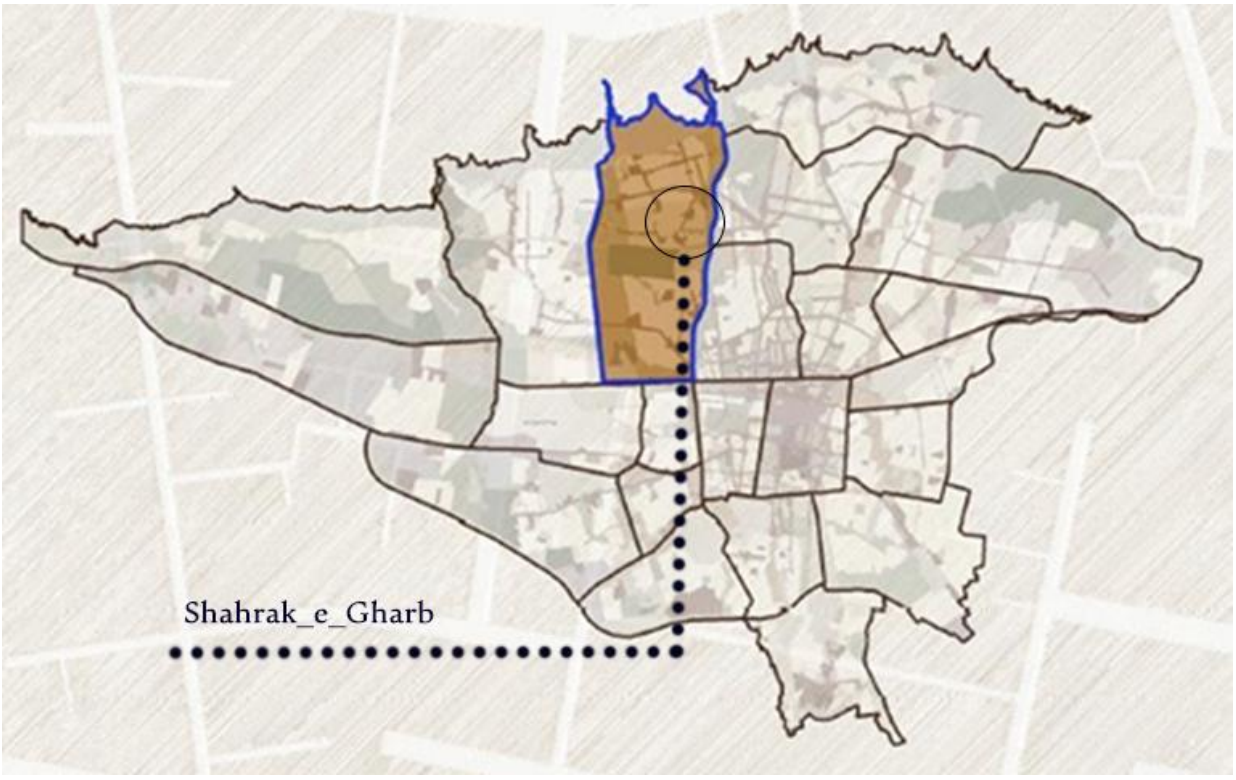


Figure 32: This image provides an aerial view of Shahrak-e Gharb, showcasing its structured layout, wide streets, and green spaces, which reflect modern urban planning principles. (Saravand Consulting Engineers,2016)

Figure 33 : This map illustrates the division of neighborhoods within District 2 of Tehran. Shahrak-e-Gharb, as one of the most notable neighborhoods in the district, is located in Neighborhood 11. District 2 plays a crucial role in Tehran's urban development due to its accessibility to major highways and modern infrastructure (Saravand Consulting Engineers, 2016).

Historical Background (1969)

- Origins and Development of Shahrak-e Gharb

Shahrak-e Gharb, located in the northwestern part of Tehran, is one of the capital's most affluent and prestigious neighborhoods. Positioned in District 2 under postal area 14 of Greater Tehran Municipality, this area is widely recognized for its beautifully designed villas, often reflecting Western, particularly American, architectural styles. These homes, built with high-quality materials, are arranged in a concentrated manner, further enhancing the elegance of the neighborhood. (Melkonline,2021)

The streets in Shahrak-e Gharb are broad, and the alleyways are designed according to modern urban planning standards. The area boasts excellent amenities, including healthcare services and efficient infrastructure. Low population density and convenient access to major highways have made this predominantly residential area highly desirable. Security is relatively good, adding to the appeal for residents. However, to understand the origins of this notable neighborhood, it is essential to begin with its roots in the village of Khordin. (Melkonline,2021)

Khordin was a lush and green village that, during the reign of Naser al-Din Shah Qajar, belonged to Mostowfi ol-Mamalek's estates. At that time, the village was overseen by a local headman (Kadkhoda), and village elders played a key role in resolving disputes. There are two interpretations of the village's name: one suggests that it refers to "hill or elevation," while another connects it to the "sun." Khordin was located six kilometers southeast of Emamzadeh Saleh in Farahzad and two kilometers from Deh-e Vanak. The village had a small Christian population of fewer than 100 people.

There are two historical accounts regarding the establishment and development of Shahrak-e Gharb, both of which offer insights into the area's transformation, though no primary sources are available to definitively verify the accuracy of either version. (Melkonline,2021)

First Account

After the Allied forces occupied Iran during World War II and Mohammad Reza Pahlavi began his reign in September 1941, foreign experts and advisors began arriving in the country to assist in its modernization. Americans, in particular, played a significant role, and by the early 1960s, they initiated a project to build a town in Tehran based on American architectural and urban planning standards. After extensive searches, Khordin village was chosen as the ideal location for this ambitious endeavor. (Melkonline,2021)

The village's lands were subdivided, and large domestic and international construction companies, supervised by American engineers, commenced the construction of villas and multi-story residential buildings, modeled after U.S. urban designs. The project aimed to create an environment that would ease the homesickness of expatriates, particularly Americans, while also serving as a prototype for the broader modernization of Tehran.

Initially named Farahzad Town, the neighborhood was built following Western architectural and planning principles. The Americans implemented most of the significant aspects of this project and quickly became the dominant residents. This association with Western culture led to the neighborhood’s current name, "Shahrak-e Gharb" (Western Town). It is important to clarify that the name does not derive from its geographic location in the west of Tehran but rather from its Western influence. (Melkonline,2021)

Figure 34 : This image depicts the initial stages of construction in Shahrak-e-Gharb, highlighting the introduction of modern urban planning principles in the neighborhood. The emphasis on structured layouts and villa designs reflects Western architectural influences.(Melkonline,2021)

During the early stages of construction, the Americans planned to erect four high-rise residential buildings: the Hafez, Saadi, Khayyam, and Nezami towers on Hormozan Street. These were the first residential towers in Tehran to incorporate steel in their construction and adopt Western designs and materials. Before this project, the tallest building in Iran was the 30-meter-high Shams-ol Emareh, constructed during Naser al-Din Shah's era.

The new construction methods, which included the introduction of kitchens and bathrooms within the houses, marked a significant shift in Iranian urban life. Traditionally, it was uncommon for homes to have such features, as they were considered improper. The Americans, leveraging their influence in the Pahlavi court, worked to improve the welfare of Shahrak-e Gharb's residents by

building an American school, sports complexes, cinemas, and even a branch of Harvard University (now Imam Sadeq University), which was funded by oil company revenues.

Other projects initiated by the Americans included the construction of the Shahanshahi Highway (now Chamran Highway) to enhance access to urban amenities. However, after the Islamic Revolution in 1979, the American presence in Iran ended, and the area's name was changed to "Shahrak-e Qods." Despite the change, the neighborhood is still commonly known as Shahrak-e Gharb. (Melkonline,2021)

Second Account

In the second account, Iranian architect Sirous Bozorg Grelly, educated in England, played a significant role in the development of Shahrak-e Gharb. After returning to Iran, he became a senior advisor to the mayor of Tehran and one of the key engineers involved in the Shahrak-e Gharb project.

According to Grelly, by 1972, the rising global oil prices had improved the financial standing of Iran's middle class, though they still lacked suitable urban housing. To address this need, Bank Omran purchased the hilly lands of what is now Shahrak-e Qods with the goal of establishing Farahzad Town. Aerial photographs taken by the National Aviation Organization showed that an area of approximately 11 million square meters, centered around the Khordin Garden, was designated for this project. The area extended from Deh Vanak in the east to Hemmat Highway in the south and Deh Farahzad in the west, with a green space in the south that later became Pardisan Park.

Despite facing significant challenges, Bank Omran secured the necessary permits, and the neighborhood's design was overseen by Engineer Grelly's office. The urban plan emphasized two main principles: preserving the natural terrain of the hills and creating internal roads that followed the land's contours. The neighborhood's layout also aimed to provide scenic views of the Alborz Mountains from various vantage points.

These two historical accounts highlight different aspects of Shahrak-e Gharb's development. The first emphasizes the critical role of foreign, particularly American, involvement in shaping the area's urban infrastructure. The second focuses on the contributions of Iranian engineers like Sirous Bozorg Grelly and the efforts of institutions such as Bank Omran to address Tehran's growing housing needs.

The development of Shahrak-e Gharb was a product of both foreign and domestic influences. Foreign expertise and Western urban technologies contributed significantly to the modernization of the area, while local engineers and financial institutions played a crucial role in adapting these modern methods to Tehran's unique landscape and social needs.

Both historical narratives have fundamentally shaped the identity of Shahrak-e Gharb. The influence of foreign modernization efforts, alongside the initiatives of local developers, resulted in the area becoming one of Tehran's most successful examples of modern urban planning. Understanding these historical influences is key to appreciating how internal and external forces have combined to shape Tehran's urban future and guide its sustainable development. (Melkonline,2021)

Construction and Development of Shahrak-e Gharb

Shahrak-e Gharb's original design was heavily influenced by international urban planning principles, with a strong emphasis on classic planning models that aimed to create a harmonious balance between human activity and the natural landscape. One of the key features of the design was the clear separation of vehicular and pedestrian pathways, a concept that prioritized safety and functionality in urban spaces. The urban plan was rooted in two primary objectives: preserving the natural topography of the existing hills and creating a network of internal roads that circled and intersected these elevated areas. This not only maintained the natural terrain but also provided residents with scenic views of the Alborz Mountains as they navigated the neighborhood.

The layout of Shahrak-e Gharb reflects a commitment to international urban planning standards. This is evident in the neighborhood's structural arrangement, which balances residential needs with access to natural beauty. The neighborhood was originally designed to accommodate a population of 55,000 people, with shopping and educational centers strategically positioned to ensure ease of access for residents. Additionally, to preserve the overall aesthetics and landscape, high-rise buildings were placed atop hills, providing panoramic views, while smaller residential units were constructed along the slopes.

Despite the meticulous planning and adherence to urban design standards, Shahrak-e Gharb has experienced significant deviations from its original layout over time. These changes have been attributed to urban expansion and population growth, which have exceeded the neighborhood's initially planned capacity. As noted by Engineer Grelly, the current state of the neighborhood contrasts sharply with its original design intent. He remarked that "the face of Shahrak-e Gharb is

like that of an elderly person who seems to have been beautiful in their youth" (Melkonline,2021). This reflects the natural aging and evolution of the urban fabric, which often struggles to maintain its original form amid modern demands.

In this context, the neighborhood's welfare and service centers, while originally well-designed according to urban standards, now face challenges in meeting the increased demands of a growing population. This deviation from the initial plan raises important considerations for future urban development, particularly in relation to maintaining functional, aesthetic, and sustainable urban spaces in cities like Tehran. The integration of open spaces, pedestrian pathways, and the promotion of cycling infrastructure are potential areas for enhancing the quality of life in Shahrak-e Gharb, aligning with the overarching goals of your thesis. (Melkonline,2021)

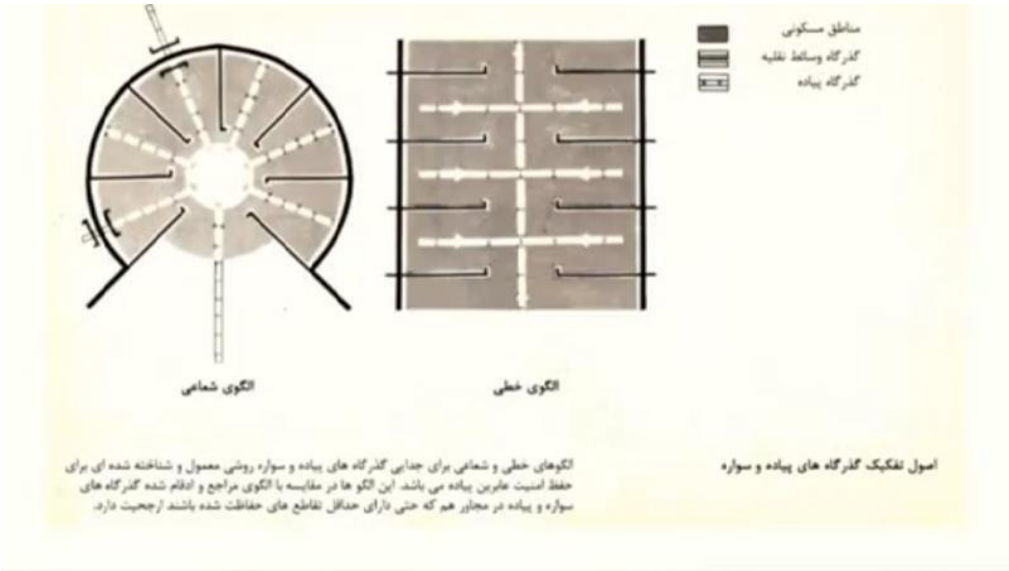


Figure 35 : This figure illustrates the separation of pedestrian and vehicle pathways in Shahrak-e-Gharb, designed based on linear and radial patterns. This approach is a well-recognized method to ensure pedestrian safety. The design prioritizes distinct zoning for residential areas, vehicle pathways, and pedestrian walkways , emphasizing the superiority of such patterns over integrated pathways with minimal protected intersections. (Melkonline,2021)

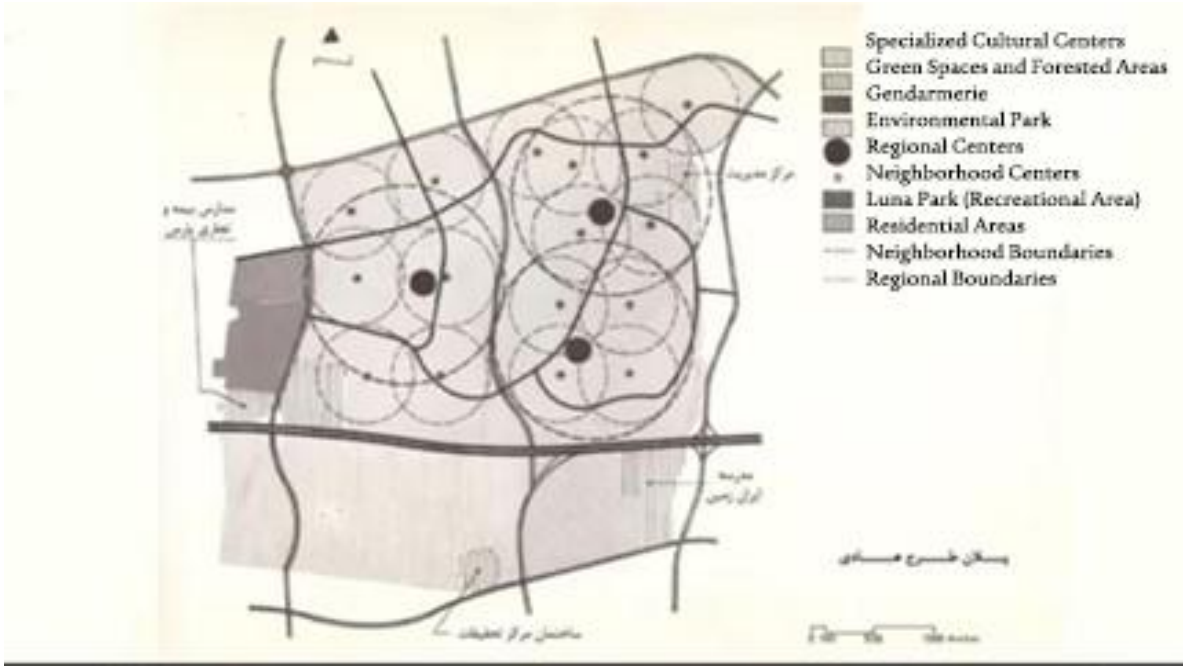


Figure 36: This map illustrates the distribution of welfare and service centers in Shahrak-e-Gharb, designed in accordance with urban planning standards. The areas are strategically organized to provide accessibility and meet the needs of the community, enhancing the quality of life for its residents Key locations include Specialized Cultural Centers, Green Spaces and Forested Areas, Gendarmerie, Environmental Park, Regional Centers, Neighborhood Centers, Luna Park (Recreational Area), Residential Areas, Neighborhood Boundaries, and Regional Boundaries." (Melkonline,2021)

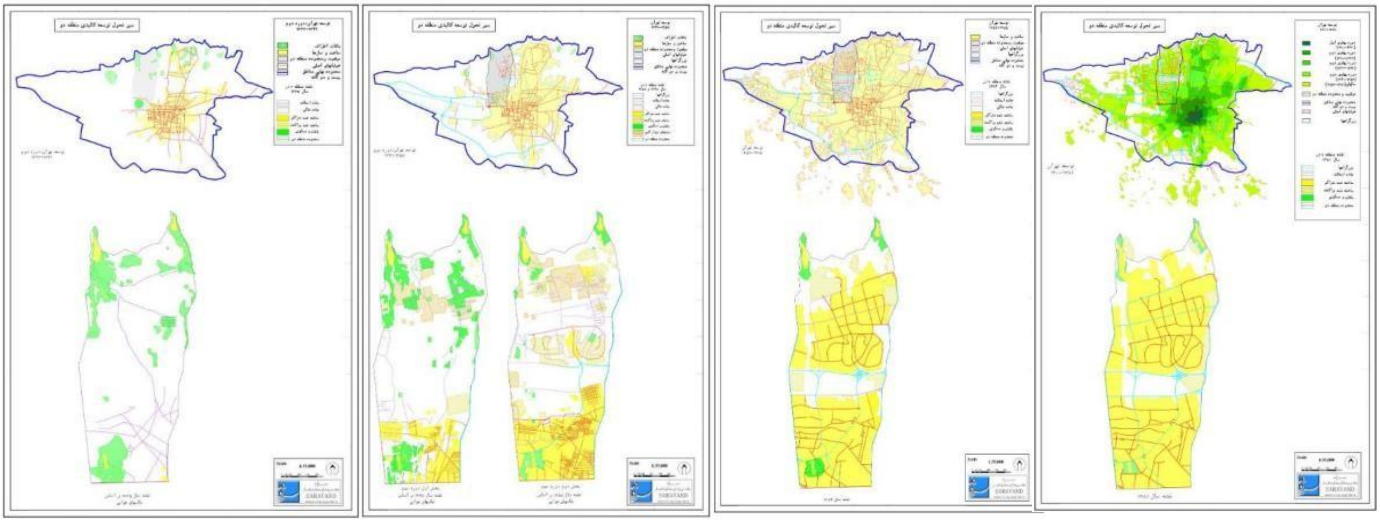


Figure 37 : It shows the evolution of the physical development of the District 2 from 1953-2002. (Saravand Consulting Engineers,2016)

Geographical Context

-Location within Tehran

Shahrak-e-Gharb is situated in District 2 of the Tehran Municipality and is composed of six residential phases. This neighborhood is bordered by Darya to the north, Hemmat Highway to the south, Punak River to the west, and Darkeh River alongside Chamran Highway and Vanak neighborhood (including Molla Sadra and Deh Vanak) to the east. These geographical markers define the extent of Shahrak-e-Gharb within Tehran’s urban landscape.

District 2 itself is one of Tehran's well-developed areas, located in the central-northern region of the city. The district is strategically placed between several major highways and adjacent districts,

with the Alborz Mountains forming its northern boundary. To the west, the district is bordered by Ayatollah Ashrafi Esfahani Highway in District 5, while to the south, it meets Azadi Street and Districts 9 and 10. Chamran Highway and Districts 1, 3, and 6 form its eastern boundary. District 2 is subdivided into 9 sub-districts, with Shahrak-e-Gharb located in Sub-district 7, specifically within Neighborhood 12**.** (Saravand Consulting Engineers,2016)

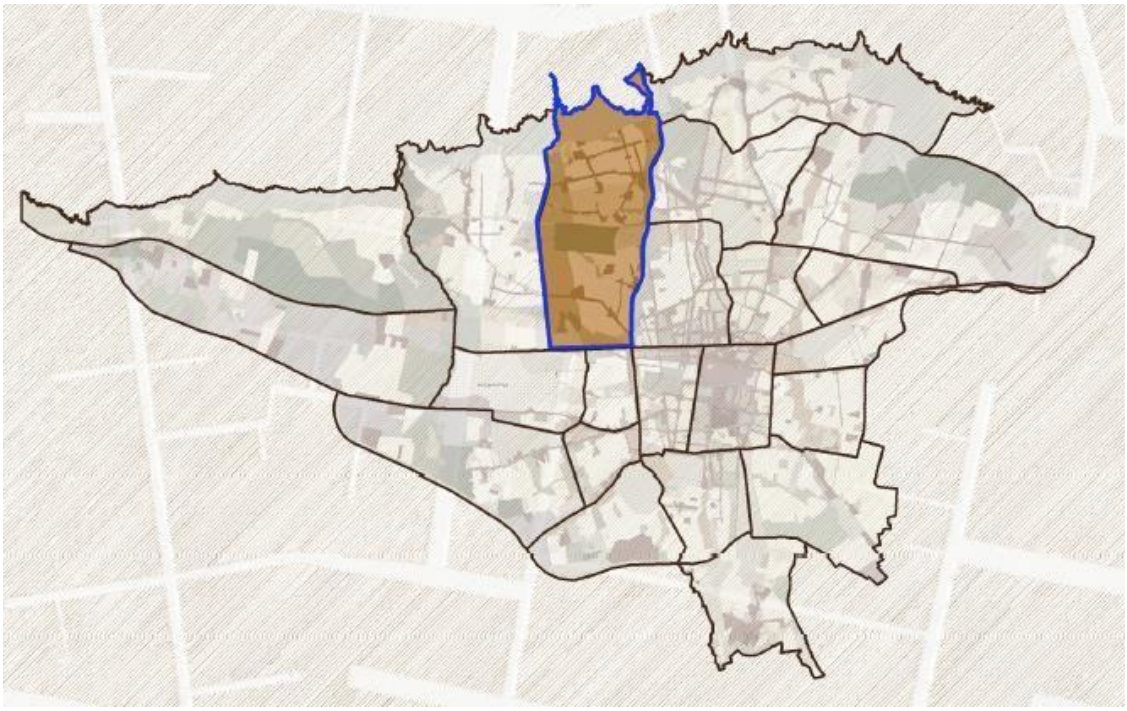


Figure 38: This image provides an aerial view of Shahrak-e Gharb, showcasing its structured layout, wide streets, and green spaces, which reflect modern urban planning principles. (Saravand Consulting Engineers,2016)

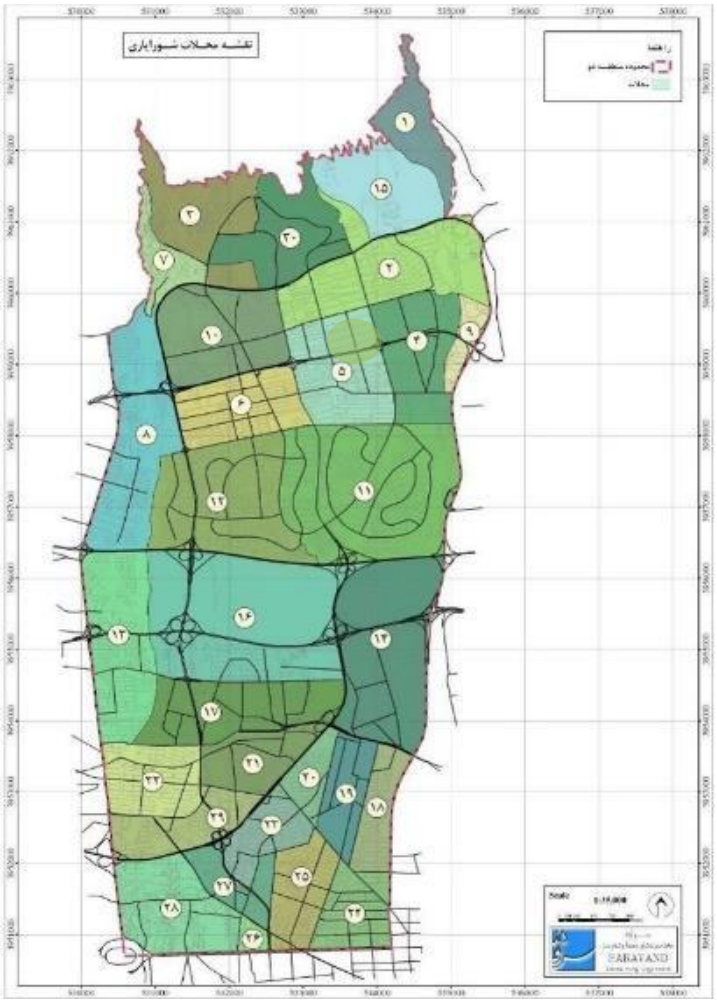


Figure 39 : This map illustrates the division of neighborhoods within District 2 of Tehran. Shahrak-e-Gharb, as one of the most notable neighborhoods in the district, is located in Neighborhood 11. District 2 plays a crucial role in Tehran's urban development due to its accessibility to major highways and modern infrastructure (Saravand Consulting Engineers, 2016).

- Topography and Natural Features

District 2 of Tehran is shaped by its proximity to the Alborz mountain range in the north, resulting in a varied terrain with elevations ranging from 1,374 to 1,530 meters. These elevation differences lead to notable variations in temperature and environmental features compared to the lower-lying areas of Tehran. Natural valleys, such as Farahzad Valley, play a crucial role in defining the

landscape and local microclimate, influencing wind patterns and pollution levels, particularly those related to traffic. (District 2 topographic map., n.d.)

From a geographical and geological perspective, Tehran's location at the intersection of a mountainous region and a vast plain makes the city prone to seismic activity due to several active fault lines. Three key natural factors shape the climate and environmental conditions in Tehran: the Alborz mountain range, the moisture-carrying western winds, and the province's expansive geography.

Additionally, District 2 features green spaces that are integrated into its urban environment, influenced by the natural contours and elevation changes of the area. Shahrak-e-Gharb, one of the prominent neighborhoods in District 2, exemplifies how the district blends urban development with its natural topography. (Nasehi, S., & Imanpour, A. ,2020).

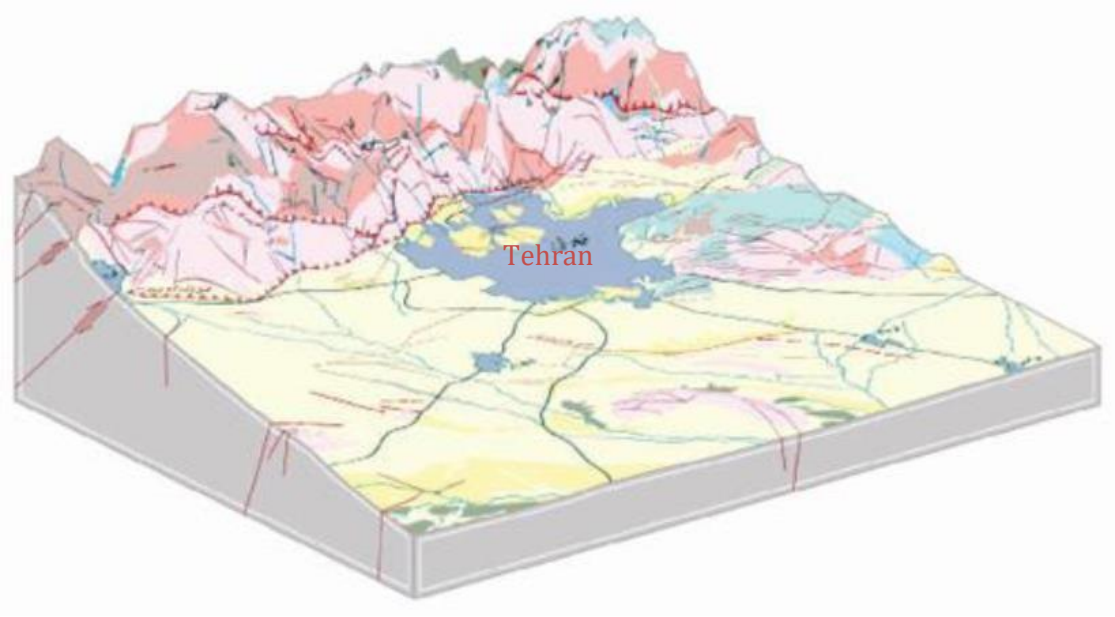
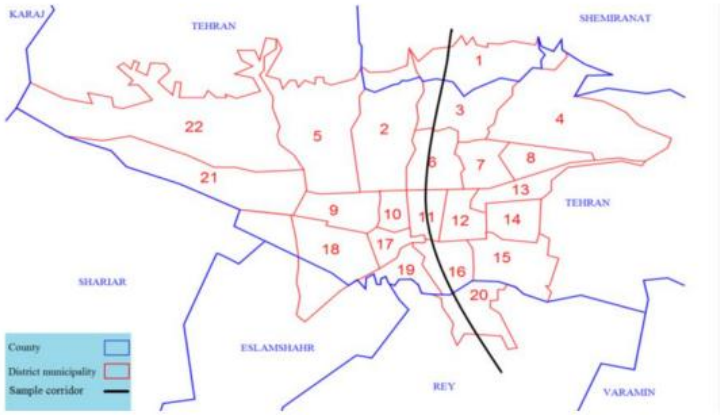


Figure 40: Geomorphology Diagram of Tehran. (Khosravi, M. J., Shahiriparsa, A., Sabouri, D. S., & Sadeghian, A. ,2018).



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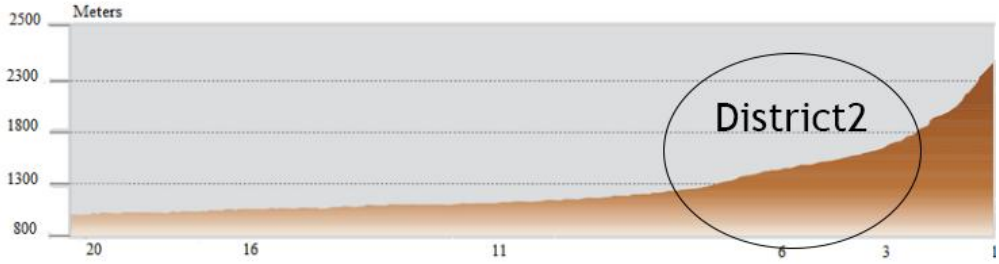

Figure 41: (a) Municipal Districts of Tehran City and the Surrounding Counties (b) The Elevation of Sample Route Crossing from South to North of Tehran: This figure highlights the municipal divisions of Tehran alongside the elevation profile of a route traversing the city from its southern plains to the northern highlands. Shahrak-e-Gharb is strategically located on the gentle slopes of the northern districts, emphasizing its position in a region of higher elevation, providing a favorable climate and distinctive urban planning advantages (Mamdoohi, A., Axhausen, K. W., Mahpour, A., Rashidi, T. H., & Saffarzadeh, M., 2016).

Climate and Environmental Conditions

Shahrak-e-Gharb, due to its unique geographical location near the Alborz Mountain range and its higher elevation compared to other parts of Tehran, has distinctive climate and environmental features. The neighborhood, with elevations ranging from 1,374 to 1,530 meters, enjoys cooler and

more pleasant weather than the central and southern parts of the city, and typically experiences less air pollution.

Prevailing western winds and nighttime breezes from the northern mountains play a crucial role in improving air quality and regulating the temperature of Shahrak-e-Gharb. During the day, light breezes from the southern deserts flow into the area, with these dual wind patterns helping to moderate the climate of the neighborhood.

In terms of precipitation, Shahrak-e-Gharb receives an average annual rainfall of 405 millimeters, which is higher than in southern Tehran. This rainfall primarily occurs during the colder months, influenced by the elevation of the Alborz mountains. The annual relative humidity averages around 45%, which is higher compared to the drier areas of Tehran.

This combination of elevation, topography, wind patterns, and rainfall makes Shahrak-e-Gharb one of the most desirable and pleasant areas for living in Tehran. Due to its proximity to parks and green spaces, especially the Farahzad Valley, the area benefits from better air quality than other parts of the city and offers a more favorable environmental condition**.** (Wikipedia. ,2024)

- Geographical Position

- Shahrak-e-Gharb is located at approximately 51 degrees and 21 minutes east longitude and 35 degrees and 46 minutes north latitude.

- Population Size and Density

Shahrak-e-Gharb is home to a population of 33,141 residents, spread across a total area of 4,402,258 square meters. The neighborhood has an average plot area of approximately 500 square meters per residential unit, contributing to its relatively low population density compared to other parts of Tehran. This spacious urban layout reflects the neighborhood's origins as a planned residential area, designed to accommodate a specific number of residents with ample living space. Shahrak-e-Gharb, due to its unique geographical location near the Alborz mountain range and its higher elevation compared to other parts of Tehran, has distinctive climate and environmental features. The neighborhood, with elevations ranging from 1,374 to 1,530 meters, enjoys cooler and more pleasant weather than the central and southern parts of the city, and typically experiences less air pollution.

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spaces, especially the Farahzad Valley, the area benefits from better air quality than other parts of the city and offers a more favorable environmental condition. (Saravand Consulting Engineers,2016)

Table 2: The population trend of the district 2 from 1986 (1365) to 2006 (1385) is presented. (Saravand Consulting Engineers,2016)

Area and Population of the District 2 (Current Status)					
General Characteristics-years	1986	1996	2001	2006	Notes
Population	269500	485100	559000	606735	The population in the year 2001 (1381) is an estimate provided by this consulting engineering firm. The population in the year 2006 (1385) is based on the preliminary results of the 2006 Census of Population and Housing.
Area	-	4957	4957	4957	The information regarding the area of the district for the year 1986 (1365) is not available.
Population Density of the District		92	113	122	

Socio-Economic and Physical Indicators of District 2 Compared to Tehran

In order to better understand the socio-economic and physical characteristics of Shahrak-e-Gharb and its position within District 2 of Tehran, the following table outlines a comparison between key indicators for the city of Tehran and District 2. The comparison highlights how District 2 fares in

terms of population, household characteristics, housing density, and building sizes, as well as socio-economic factors such as income levels and employment.

Table 3 : This table presents comparative data between Tehran city and District 2 based on various urban and socio-economic indicators. It highlights the differences in population density, residential characteristics, and economic conditions, offering insights into the development patterns of District 2 as compared to the broader Tehran metropolitan area (Saravand Consulting Engineers, 2016).

Indicator	Tehran City	District 2
Population (Census 2005)	7,738,000	445,505
Average Household Size (Census 2005)	3.81	3.36
Number of Employed Individuals (Census 2001)	1,926,000	126,854
Housing Units (Estimated for 2005)	1,487,688	118,022
Residential Building Density (Audit 2003)	164%	160%
Average Residential Floors (Audit 2003)	2.24	3.06
Average Plot Size (Audit 2003)	214 m²	321 m²
Household Density per Housing Unit	1.02	1.02
Gross Population Density (persons/ha)	96	127
Net Population Density (persons/ha)	276	378
Average Household Income (Estimate for 2005)	5,287,642 IRR	Higher than Tehran city average
Residential Floor Area Density (Audit 2003)	119%	160%
Average Residential Floors (Audit 2003)	2.7	3.06
Average Plot Size (Audit 2003)	323 m²	450 m²
Resident-to-Employed Ratio	10.66	7.0

Interpretation of Key Indicators

-Population : While District 2 houses fewer people than the city of Tehran overall, its population density is relatively higher due to a concentrated residential area, particularly in neighborhoods like Shahrak-e-Gharb.

- Household Size: The average household size in District 2 is slightly smaller than that of Tehran, which may indicate fewer family members per household, a reflection of the socio-economic affluence of the area.

- Housing Density and Plot Size: The average residential building density and plot sizes in District 2 are larger than the city average, which points to more spacious and higher-end residential developments. Shahrak-e-Gharb, as a well-planned neighborhood, exemplifies this with larger plot sizes and fewer people per household compared to other parts of Tehran.

- Building Characteristics: District 2 tends to have taller residential buildings on average, with about 3.06 floors per building, compared to the 2.24 average in Tehran. This contributes to better land utilization while maintaining comfortable living standards.

- Income Levels : Residents of District 2, including Shahrak-e-Gharb, generally enjoy higher household incomes compared to the broader city of Tehran, reflecting the affluence and the high socio-economic status of the area.

- Employment and Resident Ratio : The resident-to-employed ratio is more balanced in District 2 compared to Tehran, signifying a healthy workforce participation rate among residents.

This data indicates that Shahrak-e-Gharb and District 2 maintain higher living standards than much of Tehran, with better housing conditions, lower household densities, and higher socio-economic

indicators. These characteristics contribute to the overall quality of life in the neighborhood and align with the original planning goals of Shahrak-e-Gharb as an affluent, well-organized residential area. (Saravand Consulting Engineers,2016)(Melkonline,2021)

Cultural and Ethnic Diversity

Western Tehran, including areas such as Shahrak-e-Gharb, has developed relatively recently compared to the historically rich central and southern parts of the city. The rapid expansion and modernization of this area reflect Tehran's broader urban growth, which has been driven by a significant influx of immigrants from various provinces across Iran. This migration has led to a highly diverse population, shaping the cultural and ethnic makeup of the region. Unlike older districts of Tehran, where centuries-old traditions and architectural styles are prominent, Western Tehran has been designed to meet the immediate demands of its new residents, resulting in an urban landscape that prioritizes functionality over cultural heritage.

The rapid pace of development in Western Tehran, coupled with the diverse backgrounds of its inhabitants, has created an environment where cultural cohesion is less pronounced. Traditional Iranian elements, which are deeply embedded in the architecture and urban design of older districts, are often overshadowed by contemporary and global influences. This has led to a homogenized urban environment, where modern apartment complexes and commercial centers dominate, and historical depth or cultural uniqueness is more difficult to identify. Consequently, Western Tehran, including Shahrak-e-Gharb, lacks the distinct cultural identity found in Tehran's older neighborhoods, which are steeped in Persian history and traditions.

Despite this, the area's residents are typically well-educated, with approximately 92% of the population being literate. The socio-economic composition of the neighborhood is largely middle class, including professionals such as educators, academics, managers, government employees, and industrialists. This educated and economically stable demographic contributes to the neighborhood's relatively high standard of living and its status as one of Tehran's more affluent areas.

However, the absence of historical continuity and cultural originality in the urban design of Western Tehran results in a cityscape that struggles to convey a unique identity. This phenomenon is reflective of broader urban trends in rapidly growing cities, where the need for housing and infrastructure often outweighs efforts to preserve cultural and historical elements. As noted by Ali Rahnama in Tehran: The City of the Future (Iran Chamber Society, 2019), this lack of a deeply rooted cultural identity has been one of the defining features of Western Tehran's urban fabric. (Saravand Consulting Engineers,2016) (Melkonline,2021)

Urban Structure and Land Use

- Overview of Land Use Patterns

Shahrak-e-Gharb, designed as a planned residential neighborhood, follows a well-organized urban structure that incorporates a balance of residential, commercial, and public spaces. The land use pattern is characterized by large plots, wide streets, and ample green spaces, reflecting the neighborhood's initial design intent to provide a high quality of life. The layout emphasizes separation between residential areas, commercial centers, and public facilities, contributing to the neighborhood's functionality and appeal.

Originally, Shahrak-e-Gharb was designed to accommodate a moderate population density, with large residential plots and high-rise buildings strategically placed on elevated land, while smaller housing units were located along the slopes. The use of green corridors and parks further enhances the neighborhood's environment, offering residents access to recreational areas that are integrated into the urban fabric. (Melkonline,2021)

Figure 42: Hormozan Residential Towers in Shahrak-e-Gharb.This image depicts the Hormozan Residential Towers, one of the iconic high-rise developments in Shahrak-e-Gharb. These towers highlight the area's planned urban structure, combining modern architectural design with functionality and scenic views of the surrounding environment. (Homtick., n.d.).

- Residential, Commercial, and Public Spaces

Residential Spaces:

Shahrak-e-Gharb is primarily a residential neighborhood with a mix of high-rise apartments and smaller, single-family homes. The residential areas are designed to provide spacious living conditions with a focus on privacy and comfort. The large plot sizes allow for relatively low residential density compared to other parts of Tehran, with houses set back from the streets, creating a suburban feel within the urban environment. High-rise buildings are concentrated on higher terrain to offer scenic views of the Alborz Mountains, while smaller homes are located in the flatter areas. (Melkonline,2021)

Commercial Spaces:

Commercial zones in Shahrak-e-Gharb are strategically placed to ensure easy access for residents. Shopping centers, supermarkets, and smaller retail outlets are located near main roads and intersections, providing essential services within walking distance of most residential areas. These commercial spaces not only serve the local population but also attract visitors from other parts of Tehran due to their modern amenities and diverse offerings. The presence of shopping malls and upscale retail establishments reflects the neighborhood's affluent status. (Melkonline,2021) (Map Tehran., n.d.).

Public Spaces:

Public spaces in Shahrak-e-Gharb include parks, recreational areas, and cultural centers. The neighborhood was planned with a significant amount of green space, including parks and tree-lined

streets, which contribute to its reputation as one of Tehran's more environmentally conscious areas. Public services such as schools, healthcare facilities, and cultural centers are also well-distributed throughout the neighborhood, ensuring that residents have easy access to essential services and community amenities. (Melkonline,2021)

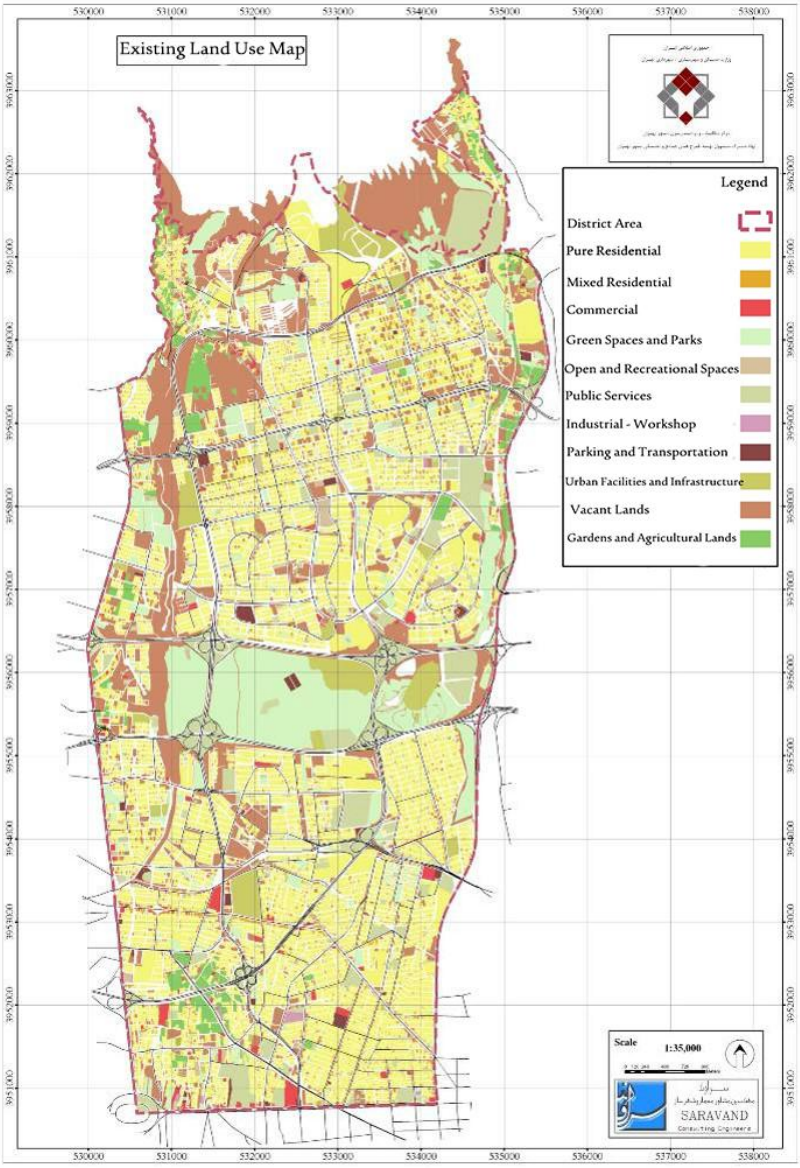

Figure 43: Existing Land Use Map of District 2The map illustrates the distribution of various land uses, including residential, commercial, green spaces, and public services, showcasing the functional organization of the district. (Saravand Consulting Engineers, 2016)

Infrastructure and Transportation Networks

Shahrak-e-Gharb benefits from a well-developed infrastructure and transportation network, making it one of the most accessible neighborhoods in Tehran. The area is connected to major highways, such as Hemmat Highway to the south and Chamran Highway to the east, which provide easy access to other parts of the city. While this extensive road network is suitable for private vehicles and public transportation, there is significant potential to improve the integration of alternative transportation options like cycling paths and pedestrian-friendly spaces. Developing these features could not only reduce traffic but also promote sustainability and improve residents' well-being, which aligns with the goals of enhancing multi-functional urban spaces in this thesis.

Additionally, although the wide streets of Shahrak-e-Gharb have the potential to offer various public amenities, they are currently limited to vehicle lanes, pedestrian walkways, and parking spaces. This underutilization of public space presents an opportunity to rethink street design, incorporating more diverse functions such as dedicated bike lanes, outdoor seating areas, and green spaces. Such improvements could significantly enhance the urban experience for residents and visitors, transforming the neighborhood into a more dynamic, people-centered environment. (Melkonline,2021)

Figure 44: Hormozan street, The wide streets of shahrak-e-Gharb, which lack significant urban facilities. (Granmehr, S.,2011).

- Road Infrastructure:

The road network in Shahrak-e-Gharb is organized in a grid pattern with wide streets that accommodate heavy traffic. This is crucial for managing the neighborhood's daily flow of vehicles, as many residents rely on private cars. The separation of vehicular and pedestrian traffic was a central feature of the neighborhood's original design, which remains largely intact. However, increasing traffic due to population growth has put pressure on this infrastructure. (Melkonline,2021)

- Cycling and Pedestrian Infrastructure:

Although Shahrak-e-Gharb was designed with pedestrian walkways, the neighborhood lacks comprehensive cycling infrastructure. While there are a few bicycle rental stations available, the bike paths are mostly limited to green spaces and parks, leaving the rest of the neighborhood under-equipped for cyclists. Promoting bicycle use through dedicated bike lanes and expanding pedestrian zones would align with modern urban planning trends, particularly in promoting sustainable and multi-functional urban open spaces. These initiatives would reduce traffic congestion, improve air quality, and promote a healthier lifestyle among residents**.** (Melkonline,2021) (Map Tehran., n.d.).

Figure 45: Bicycle Pathways in Shahrak-e-Gharb.This map illustrates the designated bicycle pathways in Shahrak-e-Gharb. The red dashed lines highlight the cycling routes, with one located in Fadak Park and the other along Dadman Boulevard. These routes promote alternative transportation and provide a recreational opportunity for residents. (Map Tehran., n.d.).

Architectural and Urban Design Characteristics

- Architectural Styles and Significant Buildings

The architectural style in Shahrak-e Gharb predominantly follows modern and functional design principles, reflecting the neighborhood's origins as a planned community that caters to a growing urban population. Residential buildings in the area vary in size and form, ranging from high-rise apartment blocks to smaller single-family homes, yet they all maintain a sleek and contemporary aesthetic. This modernity is characterized by clean lines, minimal ornamentation, and the use of materials like glass, steel, and concrete.

The integration of green spaces within the architectural design plays a vital role in enhancing the quality of life for residents. The presence of parks, tree-lined streets, and landscaped gardens not only offers aesthetic value but also provides natural ventilation and cooling, which is important in Tehran's climate. These open spaces are part of a broader urban design strategy that seeks to harmonize the built environment with nature, creating a balanced and livable neighborhood.

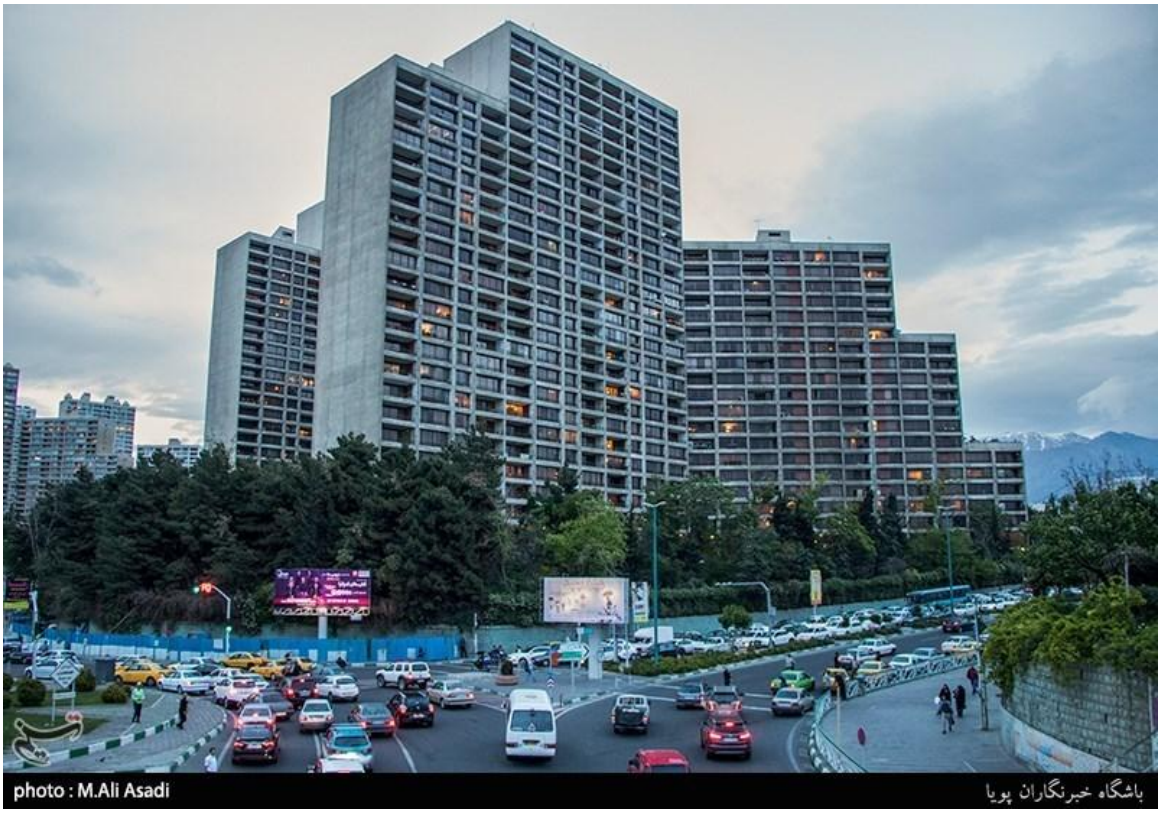

Figure 46: Residential Towers in Shahrak-e-Gharb.This image showcases one of the iconic residential towers located near San'at Square in Shahrak-e-Gharb. The square, inaugurated on July 1, 1996, coinciding with Iran's National Industry Day, is situated in the southern part of the neighborhood. These high-rise buildings exemplify the area's modern urban planning, combining residential living with proximity to green spaces and key urban nodes. (Tasnim News Agency.,2018, May 19).

Milad Tower, one of Tehran’s most iconic structures, is located just south of Shahrak-e Gharb and serves as a key landmark in the city’s skyline. Completed in 2007, Milad Tower stands as one of the tallest structures in Iran and has become a symbol of Tehran’s modernization. Architecturally, the tower features a sleek, futuristic design, with a tapered concrete base leading to a multi-functional observation deck. Its height and unique structure make it visible from most parts of Tehran, including Shahrak-e Gharb.

Milad Tower is not just a telecommunications and broadcast tower; it also functions as a cultural hub, offering a variety of facilities that contribute to the cultural and recreational life of Tehran's residents. The tower includes exhibition halls, a convention center, restaurants, and an open-air observation deck, where visitors can enjoy panoramic views of the city and the surrounding Alborz Mountains. The presence of Milad Tower nearby adds a significant architectural and cultural dimension to the area, attracting both locals and tourists alike.

In addition to Milad Tower, Shahrak-e Gharb is home to several other significant buildings, such as modern shopping malls, educational institutions, and public facilities. These buildings, while functional in design, contribute to the neighborhood's identity as a contemporary urban area with a focus on convenience, accessibility, and quality of life. (Melkonline,2021)

Figure 47: Milad Tower in Tehran.This image showcases Milad Tower, one of Tehran's most iconic landmarks. Situated prominently against the backdrop of the Alborz Mountains, the tower reflects modern architectural design and serves as a major cultural and recreational hub in the city. (Tavana, E.,2024, May 15)

- **Green Spaces and Parks**

Shahrak-e Gharb boasts an abundance of green spaces, with 26 parks spread throughout the neighborhood. These parks offer residents recreational opportunities, fresh air, and a pleasant environment, reducing the need to travel to other parts of the city for outdoor activities. The parks are equipped with walking paths, benches, public furniture, and areas for outdoor exercise, making them ideal for both leisure and fitness activities.

Figure 48: This image depicts the number of green spaces in the Shahrak-e-Gharb neighborhood, most of which are small local parks. Compared to other areas in Tehran, Shahrak-e-Gharb has relatively fewer green spaces, highlighting a potential area for improvement in urban planning. (Map Tehran., n.d.).

All of these parks are located along ‘Iran Zamin Street’, a major thoroughfare in the neighborhood. Additionally, ‘Fadak Park’, one of the most well-known parks in Shahrak-e Gharb, stands out as a popular destination for residents. (Melkonline,2021)

However, despite the large number of green spaces and parks, they lack significant facilities that would further enhance their functionality. While the parks provide basic amenities such as walking paths and seating areas, they are often missing more advanced recreational infrastructure or community-focused services. This limits the potential of these spaces to serve as fully multifunctional urban areas where residents can engage in a wider range of activities. Improving these facilities could help realize the parks' potential to better support the community and enhance the quality of life in Shahrak-e Gharb. (Map Tehran., n.d.).

Figure 49 : Pedestrian road in Fadak park,One of big Parks in Shahrak-e-Gharb Neighborhood(. Touristgah. ,n.d.)

Community and Lifestyle

- Social Dynamics and Community Life

The residents of Western Tehran, including Shahrak-e Gharb, are actively engaged in community activities, which are facilitated by the many parks and recreational facilities available throughout the neighborhood. Social events, neighborhood gatherings, and community programs are common, fostering a sense of local belonging and participation. The modern urban design and rapid development of this area have shaped its community dynamics, encouraging residents to interact within well-designed public spaces.

Shahrak-e Gharb's community life is further enhanced by the presence of contemporary shopping centers, restaurants, and recreational facilities, which reflect the residents' preference for modern conveniences and amenities. These commercial and social hubs serve as meeting points for residents, contributing to a vibrant lifestyle centered around comfort and leisure. The availability of such amenities elevates the overall quality of life, attracting a diverse population that values urban sophistication.

The influx of immigrants from various provinces of Iran has introduced a wide range of cultural practices and traditions to the area. This cultural integration has resulted in a dynamic and evolving community, where traditional Iranian customs are often blended with new influences from different regions. This fusion creates a vibrant and unique cultural atmosphere, which contributes to a rich social fabric within Shahrak-e Gharb. Residents can experience a variety of cultural expressions through local events, food, and festivals, which foster a sense of diversity and inclusivity

Despite the general middle-class composition of the neighborhood, there are varying levels of economic status and lifestyle preferences that create social stratification within Western Tehran. Differences in wealth and social standing sometimes result in distinct social groups, which can affect interactions and community cohesion. These groups may have different access to resources or varying lifestyle choices, leading to a diverse but occasionally fragmented social landscape.

However, efforts to maintain a sense of community through shared public spaces, recreational activities, and neighborhood events help mitigate these differences, promoting a more cohesive social environment. The mix of traditional and modern elements within the community lifestyle reflects the broader evolution of Tehran's urban identity, making Shahrak-e Gharb a key example of how rapid urban development influences social dynamics in contemporary Iran**.** (Melkonline,2021)

Local Amenities and Services

Shahrak-e Gharb is a vibrant, well-planned neighborhood that offers residents a comprehensive range of amenities and services, making it one of the most desirable areas in Tehran. From shopping and dining to education and healthcare, the community is designed to meet the diverse needs of its residents. This combination of convenience and quality contributes significantly to the neighborhood's high standard of living**.** (Melkonline,2021)

Shopping Centers and Markets:

- Golestan Shopping Center: As one of the most prominent shopping centers in Shahrak-e Gharb, Golestan offers a wide selection of international and local brands, fashion boutiques, cafes, and restaurants. It is a hub for social activity and a popular destination for both shopping and dining.

- Milad Noor Shopping Center: Known for its diverse range of shops, Milad Noor offers everything from clothing and electronics to home goods, making it a convenient one-stop destination for residents. (Melkonline,2021)

Local Markets:

Unlike other neighborhoods, Shahrak-e Gharb has relatively few local markets and grocery stores. While larger shopping centers are available, the limited number of smaller, local shops means that residents may not always have immediate access to fresh produce, meats, and daily necessities close to home. This scarcity of local markets creates a reliance on larger commercial centers for essential goods.

Figure 50: Local Markets and Shopping Centers in Shahrak-e-Gharb.This image shows that there are a limited number of shopping centers in Shahrak-e-Gharb, all concentrated in specific locations. Additionally, the neighborhood has only one local market, indicating a lack of widespread retail facilities within the area. (Map Tehran., n.d.).

Educational Institutions

- International Schools: Shahrak-e Gharb hosts several international schools that offer curriculums in English and other languages. These schools cater to both expatriates and local families seeking international educational opportunities for their children.

- Public and Private Schools: The neighborhood is home to numerous high-quality public and private schools, offering excellent education from kindergarten through high school. This ensures that families have access to a broad range of educational options. (Melkonline,2021)(Map Tehran., n.d.).

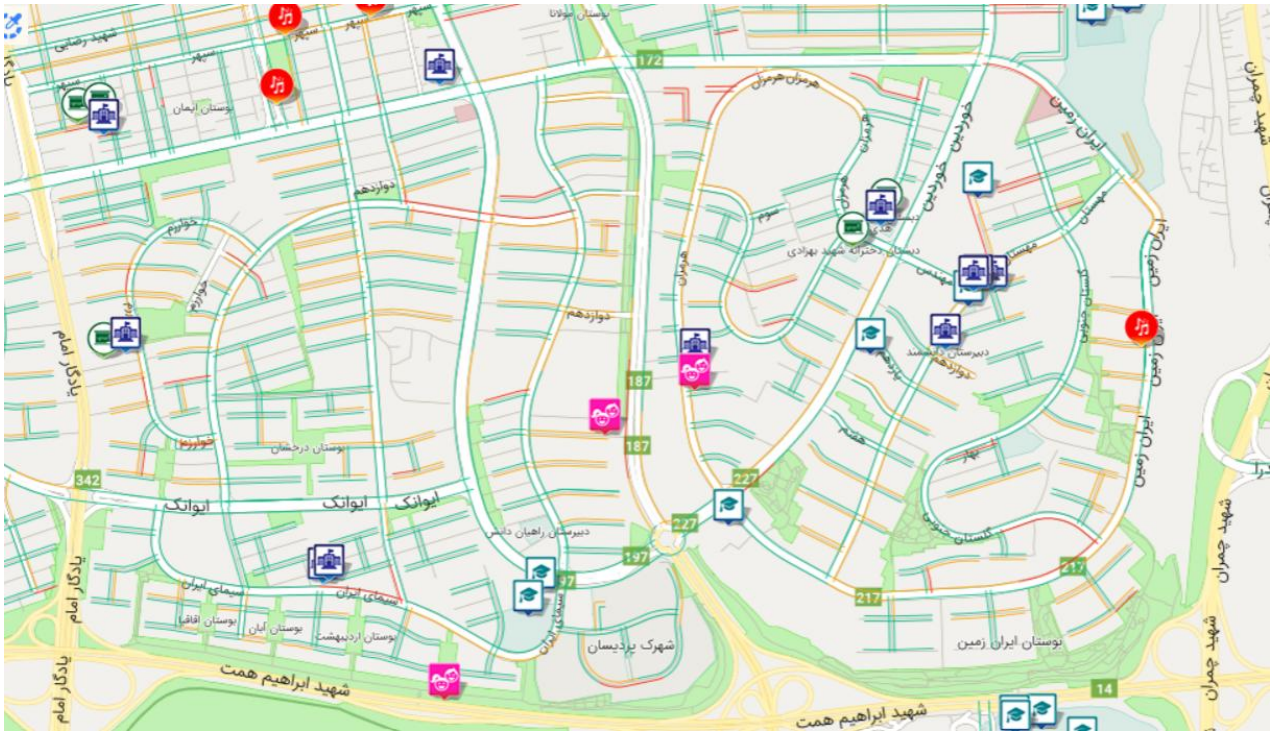

Figure 51 : Figure 40: Educational Institutions in Shahrak-e-Gharb.This image highlights the numerous educational institutions in Shahrak-e-Gharb, which are concentrated in specific locations within the neighborhood. (Melkonline,2021)

- Healthcare Facilities

- Specialized Clinics: A variety of specialized medical clinics in the neighborhood offer services ranging from dental and dermatology care to pediatric services. This ensures that residents have access to expert medical care within the community.

- Hospitals: Shahrak-e Gharb is also conveniently located near major hospitals in Tehran, providing residents with access to comprehensive healthcare services.

- Pharmacies: Numerous pharmacies are spread throughout the neighborhood, offering both prescription and over-the-counter medications, making healthcare easily accessible. (Melkonline,2021)(Map Tehran., n.d.).

Figure 52: Shahrak-e-Gharb neighborhood Healthcare Facilities . (Melkonline,2021)

- Public Transportation and Accessibility

Public transportation in Shahrak-e-Gharb is primarily served by buses and taxis, with several bus routes connecting the neighborhood to key locations in Tehran. While the area does not currently have a metro station within its boundaries, nearby metro stations in other parts of District 2 provide residents with alternative transport options. There is potential for improving public transportation,

especially with the introduction of more efficient bus networks or even plans for a future metro expansion. (Melkonline,2021)

- Bus Services: The neighborhood is well-served by regular bus routes that connect it to other parts of Tehran, providing a convenient and cost-effective public transportation option.

- Taxi Services: Readily available taxis offer quick access to different parts of the city, making it easy for residents to commute.

- Metro Stations: While Shahrak-e Gharb does not have a metro station within its boundaries, nearby stations provide efficient transportation options, enabling quick travel across Tehran. (Melkonline,2021)

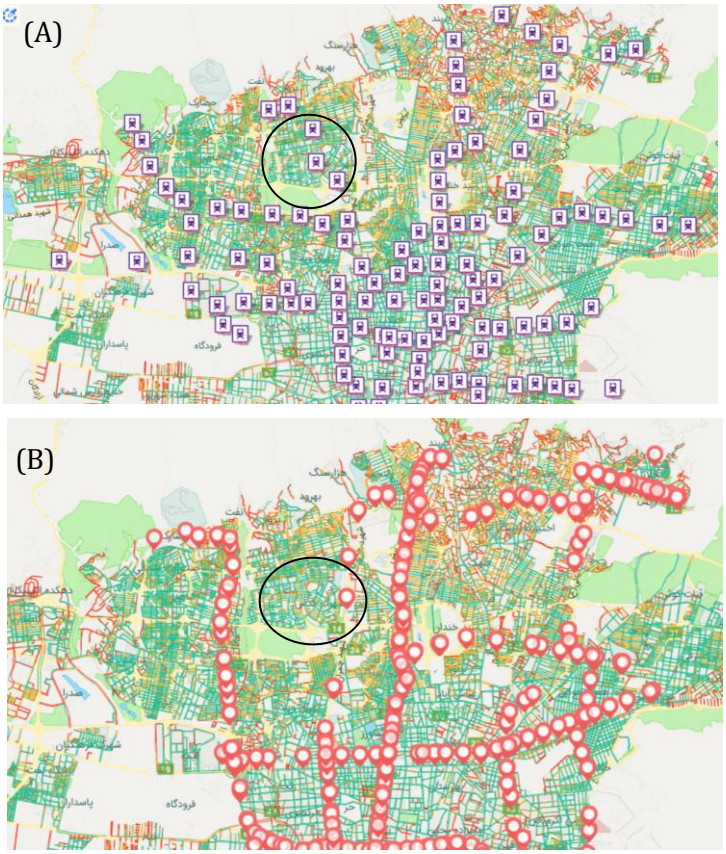

Figure 53: This image compares the number of public transit stations in Shahrak-e-Gharb to other neighborhoods in Tehran. (A) The ratio of Shahrak-e-Gharb metro stations is significantly lower compared to other areas in Tehran. (B) Similarly, the ratio of Shahrak-e-Gharb BRT stations is also minimal, reflecting limited public transit accessibility in the neighborhood (Map Tehran, n.d.)

Figure 54: Placement of Public Transportation Stations in Shahrak-e-Gharb.This image illustrates the placement of public transportation stations in Shahrak-e-Gharb. The neighborhood has a noticeably limited number of public transit stations, highlighting inadequate accessibility compared to other areas in Tehran (Map Tehran, n.d.).

- Community Services

- Community Centers:

Shahrak-e Gharb features several community centers offering programs and activities for all age groups. These centers foster a strong sense of community by providing spaces for socializing, learning, and recreational activities.

- Sports Facilities:

The neighborhood is well-equipped with gyms, swimming pools, and sports clubs, promoting an active and healthy lifestyle among residents.

- Religious Facilities:

Mosques and other religious centers are available for worship and community gatherings, serving as important focal points for religious and social life. (Melkonline,2021)(Map Tehran., n.d.).

Recreational and Cultural Activities

- Urban Design and Infrastructure

The thoughtful design of these parks includes walking paths, children's play areas, and picnic spots, all aimed at promoting the well-being and healthy lifestyle of the community. However, while the parks offer open green spaces, the recreational amenities available within them are relatively basic, lacking more advanced facilities that could further enhance their role as multifunctional public spaces.

Despite the large number of young residents in Shahrak-e Gharb, the neighborhood has a noticeable shortage of cultural spaces such as workshops, galleries, and amphitheaters, especially compared to other parts of Tehran. This lack of cultural infrastructure not only limits opportunities for creative and social engagement, but also hinders the preservation and promotion of Iranian culture. These spaces could be used to keep Iranian culture alive and encourage the community to preserve it, playing an important role in the cultural development of the neighborhood**.** (Melkonline,2021)(Map Tehran., n.d.).

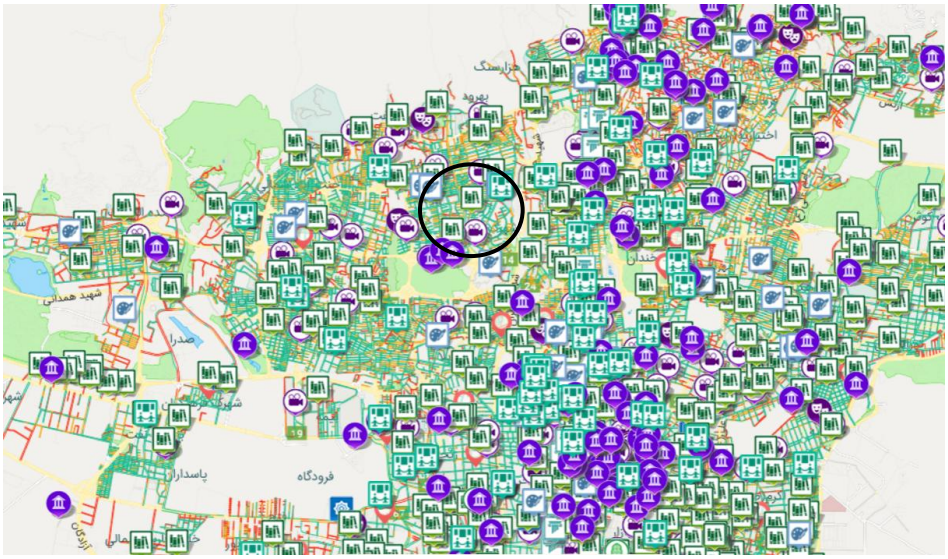

Figure 55 : The Ratio of Shahrak-e-Gharb Cultural Places to Other Neighborhoods in Tehran.This image illustrates the ratio of cultural places in Shahrak-e-Gharb compared to other neighborhoods in Tehran. The neighborhood has a significantly lower number of cultural facilities, emphasizing the need for enhanced cultural infrastructure. (Map Tehran., n.d.)

Figure 56 : This image illustrates the limited number of cultural places in Shahrak-e-Gharb. The neighborhood has noticeably fewer cultural facilities compared to other areas in Tehran, highlighting a significant gap in cultural infrastructure (Map Tehran, n.d.).

- Social Impact and Community Life

The abundance of recreational facilities in Shahrak-e Gharb has a positive impact on the quality of life for its residents. Gyms, fitness centers, and sports clubs provide ample opportunities for physical activity, which is essential for fostering a healthy community. These facilities not only cater to individual fitness goals but also act as social hubs, helping to build a sense of belonging and encouraging interaction among residents.

The availability of such spaces contributes to social cohesion by offering common areas where individuals from different social and economic backgrounds can come together. This, in turn, strengthens the community fabric and promotes a more connected and engaged population**.** (Melkonline,2021)(Map Tehran., n.d.).

- Cultural Dynamics

In addition to its recreational offerings, Shahrak-e Gharb plays a significant role in promoting cultural expression through venues like the Ra'ad Cultural Center** and the Daryabegi Gallery. These centers host various cultural activities, including art exhibitions, performances, and workshops, providing platforms for both established and emerging artists. Such venues contribute to the enrichment of the neighborhood’s cultural landscape and help cultivate a vibrant arts scene.

However, much like recreational facilities, cultural amenities in Shahrak-e Gharb are often concentrated in specific areas of the neighborhood. This uneven distribution can limit accessibility for some residents, especially those living farther from these cultural hubs. Expanding cultural programs and ensuring a more even distribution of such venues throughout the neighborhood

would help address these disparities, making cultural participation more inclusive for all residents. (Melkonline,2021)

Conclusion

Chapter 2 provided an overview of Shahrak-e-Gharb, highlighting its origins, historical evolution, and current socio-economic and environmental characteristics. The chapter identified key strengths and challenges in the neighborhood's urban framework. Below is a summary of the key findings:

Historical Context:

Finding: Shahrak-e-Gharb was developed during the Pahlavi era as a modern, Western-influenced residential neighborhood, designed with wide streets, green spaces, and luxurious villas.

Comment: While this vision provided a strong foundation, the neighborhood has struggled to retain its original identity amidst rapid urbanization.

Socio-Economic and Physical Characteristics:

Finding: The area boasts a high standard of living, supported by spacious housing and modern amenities, but suffers from an uneven distribution of green and cultural spaces.

Comment: Future urban planning initiatives should aim to balance high-density development with equitable access to recreational and cultural facilities.

Environmental and Infrastructure Challenges:

Finding: Despite its modern planning, Shahrak-e-Gharb faces challenges such as air pollution, limited public transportation, and inadequate waste management systems.

Comment: Prioritizing sustainable development strategies, including green infrastructure and improved public transit, can address these issues effectively**.**

Chapter 3

Piroozan site : an urban area of district 2 , Shahrak-e-Gharb

Introduction

The Piroozan site, situated in Shahrak-e-Gharb within District 2 of Tehran, offers a unique opportunity to address pressing urban challenges and fulfill unmet community needs in one of Tehran's most modern neighborhoods. This area, renowned for its planned urban design, proximity to major highways, and access to high-end amenities, suffers from a noticeable lack of cultural and recreational facilities. The site's development is not only a chance to create functional spaces but also an opportunity to reintroduce Iranian cultural and architectural identity into a neighborhood shaped predominantly by Western planning principles.

The site's physical characteristics, including its 19,832 square meters of vacant land, natural slope, and elevation variations, provide a fertile ground for innovative and sustainable design. The integration of green spaces, cultural amenities, and modern facilities will allow for the creation of a multi-functional space that reflects the socio-cultural fabric of Tehran while addressing environmental and urban needs.

This chapter focuses on the rationale for selecting the Piroozan site, analyzing its current physical, environmental, and social context. It highlights the importance of leveraging the site's potential to enhance community life, decentralize amenities, and promote sustainable urban growth. By understanding the challenges and opportunities presented by this location, the groundwork is laid for designing a project that aligns with both local identity and contemporary urban needs.

Rationale for Selecting the Piroozan Site and Its Physical Features

The selection of the Piroozan site, located in Shahrak-e-Gharb, District 2 of Tehran Municipality, is based on its strategic potential to address cultural and social deficiencies while supporting sustainable development. This neighborhood, known for its modern urban planning and excellent infrastructure, lacks Iranian cultural and architectural identity. The site offers a unique opportunity to design a project that reconnects Shahrak-e-Gharb with Iran's rich cultural and architectural heritage. Furthermore, the physical and environmental characteristics of the site make it a highly suitable candidate for development that aligns with contemporary urban needs.

Lack of Cultural and Recreational Facilities Around the Site

Despite the presence of numerous schools and educational centers in the vicinity of the Piroozan site, the area lacks adequate cultural and recreational amenities for adolescents and young adults. There are no designated spaces for social, cultural, or leisure activities nearby, leaving a critical gap in addressing the needs of the community, particularly for younger age groups.

Additionally, most of the recreational and welfare services in Shahrak-e-Gharb are concentrated in Sanat Square. This centralization has made access to these facilities challenging for a significant portion of the residents, particularly those living farther away from the square. The development of the Piroozan site provides an opportunity to decentralize these services, making them more accessible and equitable for all residents in the area.

Physical Features of the Site and Their Importance for Design

The Piroozan site, with its unique physical features and topography, is an ideal candidate for designing multi-functional open spaces. Spanning approximately 19,832 square meters, the site's dimensions and layout offer sufficient space to incorporate various functions, such as cultural, recreational, social, and sports facilities.

The natural slope of the site, descending from northwest to southwest, and its elevation variations provide opportunities for creative and innovative design. Features like terraced landscaping and stepped architecture can be utilized to make optimal use of the site's topography. These characteristics also enhance the aesthetic appeal of the area and create opportunities for diverse public spaces that cater to multiple user groups.

Reintroducing Iranian Identity to Shahrak-e-Gharb

One of the key objectives of selecting this site is to revive Iranian cultural and architectural identity in a neighborhood heavily influenced by modernist and Western planning concepts. The project can incorporate traditional Iranian design principles, such as geometric patterns, shaded open spaces, and water features, to create an environment that fosters a sense of place and cultural connection. This approach not only addresses the cultural and social needs of the community but also enhances the neighborhood's overall identity and character.

Site Location and Boundaries

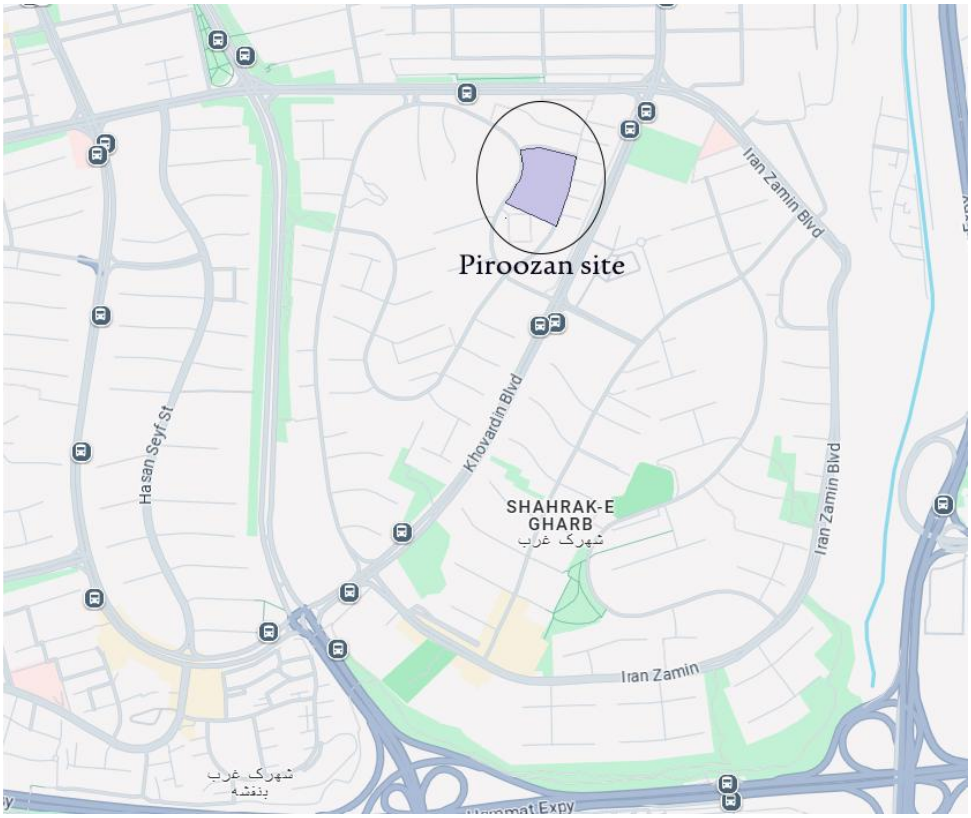

Figure 57: Location of PiroozaN site in Shahrk-e-Gharb neighborhood. (Map Tehran., n.d.)

- Precise Location of the Piroozan Site within Shahrak-e-Gharb.

The geographical location of the Piroozan site is precisely situated in Shahrak-e-Gharb, District 2 of Tehran Municipality, at coordinates 35.764843° N latitude and 51.375325° E longitude. This site is located in the northwest part of Tehran, within one of the city's modern and developed areas.

Shahrak-e-Gharb is recognized as one of the prominent and modern neighborhoods of Tehran, known for its well-planned urban design and convenient access. The area offers an excellent

location for urban development projects and various infrastructure improvements. Given its geographical position, the Piroozan site holds significant potential for future urban expansion and development initiatives.

- Site boundaries and surrounding areas

The Piroozan site is located in District 2 of Tehran Municipality, within the Shahrak-e Gharb neighborhood. The site is surrounded by various urban uses. On the eastern side, there are several schools and educational centers that serve the area's educational needs. To the south, the Tehran Towers residential complex is located, one of the most prominent residential buildings in the area. The western side of the site connects to Hormozan Street, which includes commercial and service buildings such as Tejarat Bank. To the north, Piroozan Street and several multi-story residential buildings are located, linking the site to the residential section of Shahrak-e Gharb.

The Piroozan site is connected to Tehran’s major highways via several main streets. Peiroozan Street and Hormozan Street are the primary streets surrounding the site, facilitating access to residential and commercial areas. Additionally, the site is in close proximity Highway and Hakim Highway, which offer rapid access to other parts of Tehran and significantly enhance the site's connectivity and accessibility.

The Piroozan site has direct access to the only square and the main square of Shahrak-e Gharb. This square is a hub for many service and commercial establishments, the most notable being Milad-e-Noor Shopping Center, one of the largest and most significant malls in the area. Additionally, this square hosts a taxi station, providing residents and visitors with easy access to various parts of Tehran.

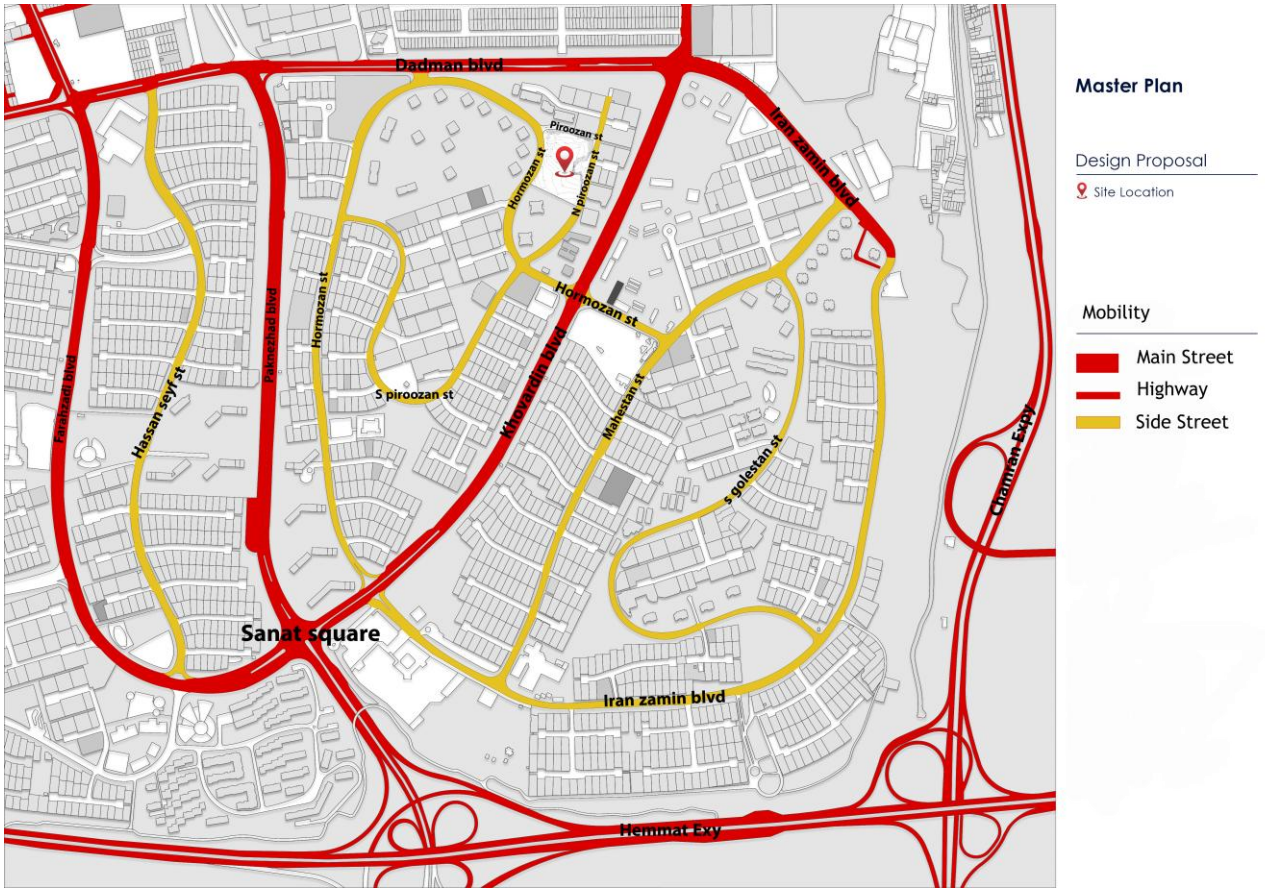

Figure 58: This map illustrates the master plan of the Shahrak-e-Gharb neighborhood, highlighting the road network and site location. It categorizes the mobility infrastructure into highways, main streets, and side streets. The red lines represent highways, ensuring connectivity to major parts of Tehran, including Hemmat Expressway and Iran Zamin Boulevard. Yellow lines denote side streets that provide internal access within the neighborhood, while bold red lines indicate main streets facilitating movement between residential, commercial, and service areas. The map also marks key landmarks such as Sanat Square and the precise location of the Piroozan site.(Source :Author)

Current Land Use and Zoning

- Existing land use and zoning regulations

The Piroozan site, located in District 2 of Tehran, within the Shahrak-e Gharb neighborhood, has garnered attention due to its strategic position and development potential. Currently, this site is

vacant, with no existing structures or constructions. This situation presents a valuable opportunity for planning and designing new projects that meet local needs.

In terms of land use, District 2 of Tehran is designed to include residential, commercial, and service sub-zones. The zoning regulations in this area allow for mixed-use developments, which means that land can be utilized for both residential and commercial purposes. Such policies enhance the quality of life for residents and improve spatial efficiency.

Given that the land is currently empty, there are ample opportunities to establish infrastructure, green spaces, and public services. This potential can contribute to creating a sustainable and appealing environment for new residents and users. Additionally, the ability to develop residential and commercial projects in line with local needs and sustainable development goals is facilitated in this area.

It is anticipated that in the near future, due to the site's proximity to urban amenities and service centers, this land will transform into a key location for new developments. Urban development plans emphasize the creation of public spaces and improved access to recreational facilities, which will help attract new residents and investors

In conclusion, considering the existing potentials and development policies in the area, the Piroozan site could serve as a successful model for sustainable urban development in Tehran, particularly as the land is currently vacant and devoid of any construction.

- Types of buildings and facilities currently on-site

Figure 59: The image depicts the current state of the Piroozan site, located in Shahrak-e-Gharb, District 2 of Tehran. The site is currently vacant, with no existing structures, highlighting its potential for future urban development projects. The surrounding buildings, including residential towers and green spaces, emphasize the site's strategic position within a modern and well-connected neighborhood. (Source :Author)

Currently, the Piroozan site is recognized as a vacant plot of land with varied elevation levels. To the east of the site, several single-story houses have been constructed for the purpose of guarding the land.

Additionally, to the south of the site, there is a small green space covered with trees. These trees serve as a boundary between the open space of the Tehran residential complex and the Piroozan site, contributing to a natural buffer and visual appeal in the area.

These features highlight the developmental potential of the Piroozan site, which could be considered in future plans for enhancing infrastructure and public spaces.

Figure 60: This map illustrates the surrounding land uses of the Piroozan site in Shahrak-e-Gharb. Key functions and facilities in the vicinity include health services, local markets, shopping malls, cultural buildings, educational institutions, mosques, and green spaces. The well-distributed services and infrastructure highlight the strategic position of the site, making it suitable for urban development. The map also shows the accessibility of public transportation, including bus and subway stations, which enhances connectivity within the neighborhood. (Source :Author)

Physical and Environmental Characteristics

Topography and Natural Features of the Site

The Piroozan site exhibits distinct physical and environmental characteristics that are critical for its development planning. The topography, slope direction, elevation differences, and land dimensions are key defining features of the site, as depicted in Figures 47 and 48.

Figure 61: Displays the topography, slope direction, and elevation differences, offering a detailed view of the natural layout of the site (Novin Shahrsaz, 2020).

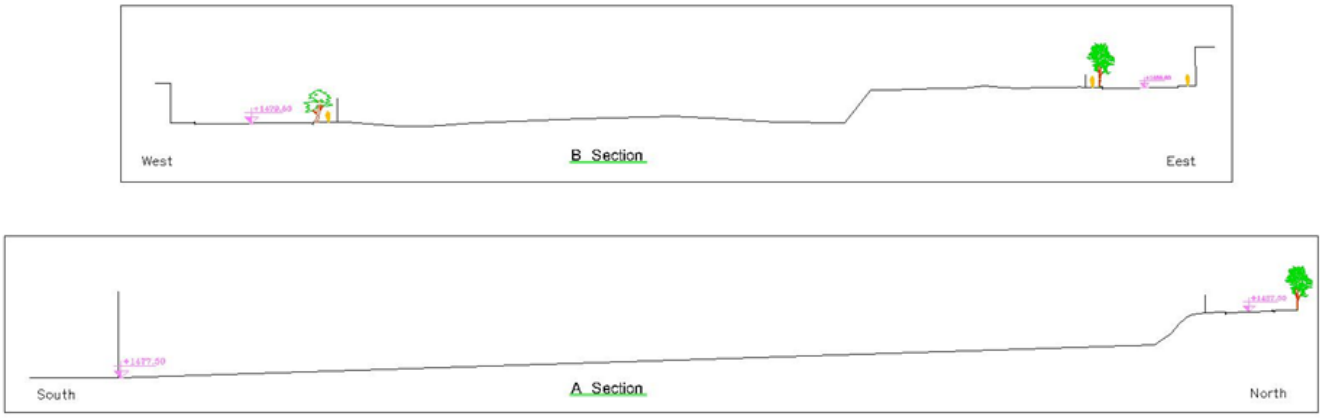

Figure 62: A vertical and B horizontal cross-section of the site that highlights the terrain's slope and variations in elevation (Novin Shahrsaz, 2020).

The site slopes from the northwest to the southwest, resulting in significant elevation differences across its edges. The western side of the site aligns with Hormozan Street, which provides straightforward access. However, other edges, particularly the northern and southern sides, show more pronounced elevation changes, influencing the design and placement of infrastructure.

Land Dimensions

The dimensions of the site are as follows:

- Northern Side: 130.65 meters
- Western Side: 141.38 meters
- Southern Side: 128.88 meters
- Eastern Side: 164.28 meters
- Total Area: Approximately 19,832 square meters

Elevation Differences

The elevations of the site's boundaries highlight its topographical complexity:

- Eastern Side Elevation: 1485 meters
- Western Side Elevation: 1479.50 meters (aligned with Hormozan Street)
- Northern Side Elevation: 1487.50 meters
- Southern Side Elevation: 1477.50 meters
- Center of the Site Elevation: 1480 meters (aligned with the western side and Hormozan Street)

The significant variation in elevation demands careful design considerations. Higher elevations on the northern side provide opportunities for green spaces or recreational areas, while lower points, such as the southern side, necessitate robust stormwater management solutions.

Environmental Considerations

Given the site's natural slope and elevation differences:

- Drainage Planning: Effective systems are essential to manage stormwater and prevent soil erosion, particularly in lower-lying areas.
- Adaptive Design: Buildings may adopt terraced or stepped designs to minimize excavation and align with the natural terrain.
- Green Space Allocation: Vegetation should be strategically placed in steeper areas to enhance soil stability and aesthetics.

Environmental conditions and considerations

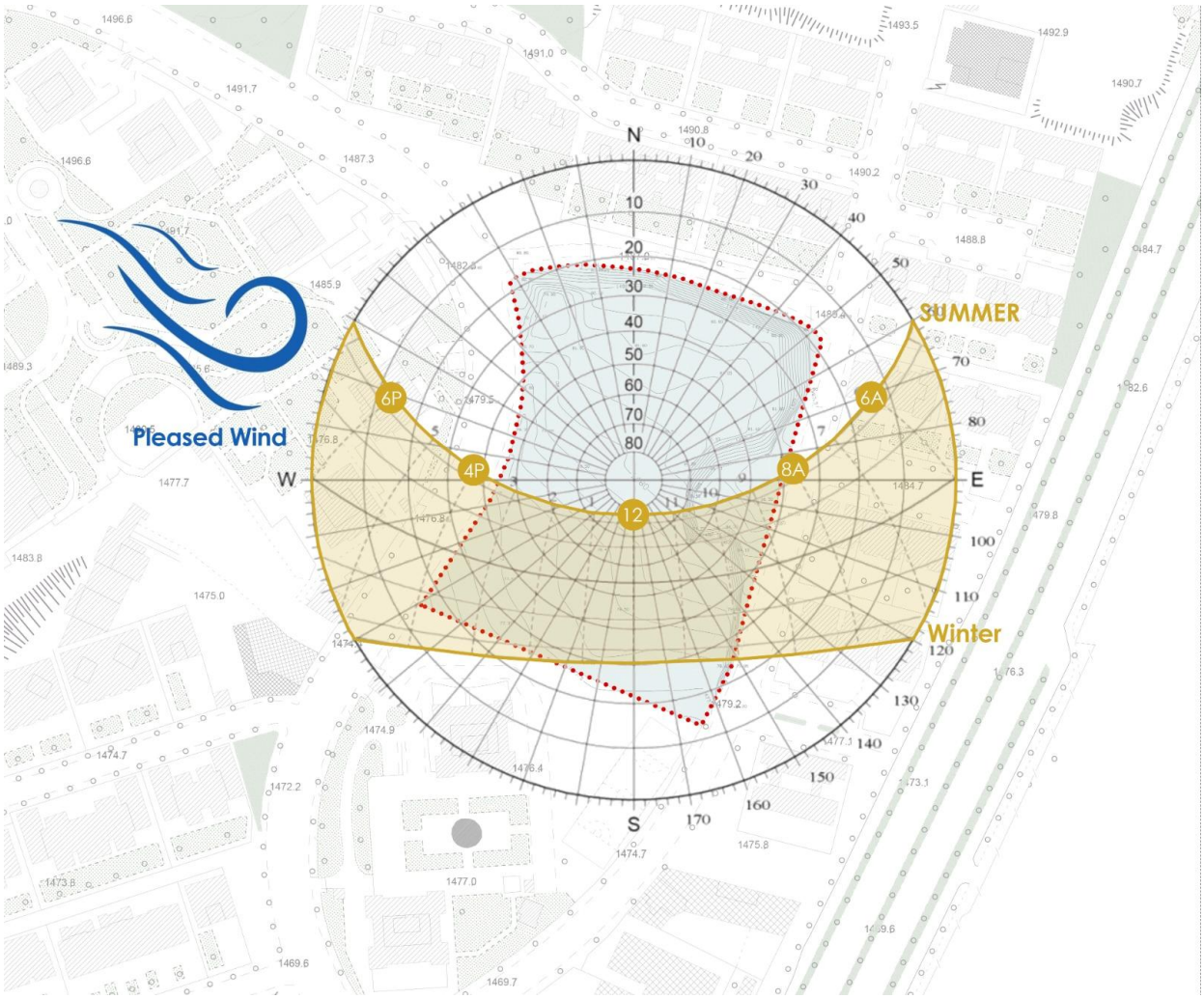

Figure 63: This diagram represents the wind rose and solar angles for the Piroozan site. It highlights the direction and intensity of prevailing winds as well as seasonal variations in sunlight exposure. The summer wind, predominantly from the northwest, provides natural cooling, while the winter wind, coming from the east and south, contributes to lower temperatures. The solar path demonstrates the higher sun angle during summer, maximizing light and heat, and the lower sun angle in winter, reducing sunlight intensity. These environmental factors play a critical role in shaping the site's design to optimize natural ventilation and solar energy. (Source :Author)

The Piroozan site has specific climate characteristics that significantly impact the design and use of spaces in the area:

Climate Type: The site is influenced by a semi-arid and Mediterranean climate, characterized by hot, dry summers and mild, wet winters.

Summer: During the summer season, temperatures may rise above 30 degrees Celsius, accompanied by abundant sunlight and minimal precipitation.

Winter: In winter, temperatures may drop below freezing, with precipitation primarily in the form of snow and rain.

Winds: Prevailing winds typically come from the north and northwest, which help reduce temperatures during the summer.

Humidity: Relative humidity at the site is generally low, especially during the summer, which can increase the perception of heat.

Sunlight Conditions :

The sunlight conditions at the Piroozan site are as follows:

Sunrise and Sunset: Sunrise occurs in the east, and sunset occurs in the west.

Sun Angle: Throughout the day, sunlight tends to angle toward the south, which directly influences temperature and sunlight exposure on the site.

Seasonal Changes: In summer, the sun is at a higher angle, allowing more sunlight to enter the site. In winter, the sun's angle is lower, which can affect the natural light in both indoor and outdoor spaces.

These climate and sunlight conditions can aid decision-making regarding the design and construction at the Piroozan site and impact how spaces are utilized.

Table 4 : SWOT Analysis for Environmental and Physical Conditions: This table provides a SWOT analysis of the environmental and physical conditions of the Piroozan site, focusing on its natural topography, climate, and elevation variations. Strengths and opportunities emphasize the potential for sustainable development, such as utilizing natural slopes for drainage and innovative architectural designs. Weaknesses and threats identify challenges like erosion, climate extremes, and flooding risks, underscoring the need for careful environmental and engineering solutions. This analysis supports environmentally conscious planning

S	W	O	T
Natural slope from northwest to southwest aids in effective drainage planning.	Significant elevation differences pose challenges for construction and drainage management.	Integration of green spaces and vegetation to stabilize soil and enhance visual appeal.	Flooding risks in lower-lying areas during heavy rains.
Elevated areas (e.g., northern edge) ideal for green spaces or public viewpoints.	Low relative humidity in summer increases heat perception, affecting comfort.	Development of energy-efficient buildings that leverage sunlight and wind patterns.	Increased reliance on advanced engineering solutions to address soil stability.
Diverse topography offers opportunities for creative architectural designs.	Potential erosion risk in steeper areas without adequate vegetation or stabilization.	Innovative designs using elevation variations for terraced or stepped structures.	Seasonal climate extremes necessitate additional planning for thermal comfort.
Abundance of sunlight in summer provides potential for solar energy utilization.	The semi-arid climate with hot summers and cold winters requires careful design considerations.	Potential to utilize wind direction for natural cooling and ventilation in buildings.	Risk of overdevelopment leading to strain on local infrastructure and resources.

Accessibility and Connectivity

The Piroozan site features various accessibility and connectivity characteristics that enhance its development potential:

- Transportation Access

Public Transportation: Bus stops are located on Khovardin Boulevard near the site, providing convenient access to various public transportation lines. This facilitates easy movement for residents and users of the site.

Figure 64: This master plan illustrates the transportation network and functional zoning of the Shahrak-e-Gharb neighborhood, with a focus on the Piroozan siteIt also emphasizes mobility infrastructure, such as bus stations, a subway station, and bike paths, ensuring accessibility to and within the neighborhood. The diverse land uses and well-connected transportation systems make the area suitable for mixed-use urban development. (Source :Author)

- Pedestrian Circulation

Sidewalks and Pathways: Existing sidewalks and pedestrian pathways around the site enable safe movement for pedestrians, promoting walking and cycling.

Proximity to Amenities: The site is close to essential amenities such as schools, parks, and commercial areas, allowing residents to access daily services without relying solely on vehicles.

Figure 65**:** Street view of the Piroozan site, Shahrak-e-Gharb, Tehran.(Hamed Zarepour.,2023)

- Vehicle Access

Parking Facilities: All surrounding complexes have access to parking. Due to the secondary nature of the surrounding streets, vehicular congestion is less, and there is sufficient parking space available in adjacent streets. However, attention to parking design in future plans is important for better accessibility to the site.

- Connectivity to Key Locations

Nearby Amenities: The site's proximity to the main square of Shahrak-e Gharb, where many commercial and service establishments are concentrated, enhances its connectivity and attractiveness for development.

- Access to Green Spaces

Connectivity to nearby parks and recreational areas contributes to the overall livability of the site, providing residents with outdoor spaces for leisure and recreation

Strengths and opportunities of the site Constraints and limitations

Table 5 : SWOT Analysis for Development Potential: This table presents a SWOT analysis of the Piroozan site’s development potential, focusing on its strategic location, accessibility, and mixed-use zoning advantages. Strengths and opportunities highlight the site’s suitability for creating a vibrant and sustainable community, while weaknesses and threats identify areas requiring careful planning, such as traffic management, infrastructure investment, and competition for land use. The analysis aims to guide effective urban planning strategies.

S	W	O	T
Strategic location in Shahrak-e-Gharb, a modern and developed area in northwest Tehran.	High initial investment required for infrastructure and amenities due to the site's vacant status.	Development of a sustainable and vibrant community through thoughtful urban planning.	Traffic and accessibility challenges if not effectively managed.
Proximity to essential amenities such as schools, parks, commercial establishments, and Milad-e-Noor Shopping Center.	Potential traffic congestion during peak hours, affecting accessibility.	Integration of green spaces to enhance livability and environmental sustainability.	Increased strain on local resources due to potential urban density.
Accessibility to public transportation with bus stops on Khovardin Boulevard.	Limited existing facilities on-site requiring significant development efforts.	Utilization of mixed-use zoning to create a cohesive community with diverse functions.	Competition for land use in a highly developed area.
Mixed-use zoning allowing the integration of residential, commercial, and recreational spaces.		Architectural innovations leveraging the site's location and characteristics.	Risk of inadequate integration of sustainable solutions in planning and design.
Vacant land providing opportunities for tailored urban planning without constraints from existing structures.			

Strengths and Opportunities

- Strategic Location: The Piroozan site is situated in the northwest of Tehran, within Shahrak-e-Gharb, a modern and developed area. This prime location enhances its visibility and accessibility for urban development projects.

- Proximity to Amenities: The site is close to essential amenities, including schools, parks, and commercial establishments, which increases its appeal for potential residents and businesses. The nearby Milad-e-Noor Shopping Center further adds to the attractiveness of the location.

- Public Transportation Access: The availability of public transportation, with bus stops on Khovardin Boulevard, provides convenient access for residents and visitors, facilitating mobility and reducing reliance on personal vehicles.

- Vacant Land: The current status of the site as vacant land presents a valuable opportunity for new development. This allows for tailored urban planning that meets the needs of the community without the constraints of existing structures.

- Mixed-Use Zoning: The zoning regulations in District 2 allow for mixed-use developments, enabling the integration of residential, commercial, and recreational spaces. This flexibility can enhance the quality of life for residents and promote a vibrant community.

- Environmental Features: The site has diverse topography and natural features, including elevation variations and nearby green spaces. These characteristics can be leveraged to create unique architectural designs and sustainable landscaping.

Constraints and Limitations

- Current Vacant Status: While the vacancy of the site presents opportunities, it also means that initial investments in infrastructure, utilities, and amenities will be required to make the site functional and attractive for development.

- Traffic and Congestion: Although the site is accessible via major roads, potential traffic congestion during peak hours could impact the convenience of access, particularly for residents and visitors. Careful traffic management strategies will need to be implemented.

- Environmental Challenges: The site's varied elevation levels may pose challenges for construction and drainage management. Addressing these issues will require careful planning and engineering solutions to ensure stability and prevent flooding.

- Climate Considerations: The semi-arid climate, with hot summers and cold winters, necessitates careful consideration in the design of buildings and outdoor spaces to ensure comfort and energy efficiency throughout the year.

- Potential for Urban Density: The site's location in a developed area may lead to increased competition for land use and higher demand for infrastructure, which could strain local resources if not managed effectively.

By addressing these strengths and opportunities while considering the constraints and limitations, the development of the Piroozan site can be optimized to create a sustainable and vibrant community that meets the needs of its future residents.

Conclusion

Chapter 3 focused on the Piroozan site within Shahrak-e-Gharb, evaluating its strategic potential for sustainable development. The chapter examined the site's physical features, environmental conditions, and accessibility, presenting a foundation for designing multi-functional, community-oriented spaces. Below is a summary of the key findings:

Strategic Location:

Finding: The Piroozan site is strategically situated in a modern, well-connected area of Shahrak-e-Gharb, offering proximity to amenities, transportation networks, and green spaces.

Comment: This location makes it an ideal candidate for urban development projects aimed at enhancing community access to social, cultural, and recreational facilities.

Environmental and Physical Characteristics:

Finding: The site's natural slope, varied elevation, and vacant status present both opportunities for creative architectural designs and challenges in stormwater management.

Comment: Leveraging these physical features can result in innovative designs that integrate sustainable technologies and align with the natural topography.

Cultural and Recreational Deficiencies:

Finding: The area lacks sufficient cultural and recreational spaces to meet the needs of a diverse and growing population.

Comment: Developing the Piroozan site with multi-functional spaces that prioritize cultural preservation and recreational amenities can address these gaps and strengthen the community's identity.

Opportunities for Sustainable Development:

Finding: The vacant status of the site provides a rare opportunity for tailored, sustainable urban planning without the constraints of existing structures.

Comment: Integrating mixed-use zoning, innovative designs, and community-centric facilities can transform the Piroozan site into a model of sustainable urban development.

Chapter 4

Urban Planning in Shahrak-e-Gharb

Introduction

Shahrak-e-Gharb, one of Tehran's most prominent neighborhoods in District 2, embodies modern urban planning but faces critical challenges requiring immediate attention. This chapter delves into the intricate aspects of urban planning in the area, analyzing environmental, social, infrastructural, and architectural issues. Despite its strategic location and relatively advanced infrastructure, Shahrak-e-Gharb struggles with problems such as air pollution, insufficient cultural spaces, inadequate transportation infrastructure, and the erosion of its architectural identity.

The aim is to evaluate these issues comprehensively, leveraging insights from previous chapters, field studies, and surveys to identify actionable solutions. By addressing these challenges through sustainable urban planning, Shahrak-e-Gharb has the potential to evolve into a neighborhood that balances modernity with cultural heritage, ultimately improving the quality of life for its residents and setting an example for urban development in Tehran.

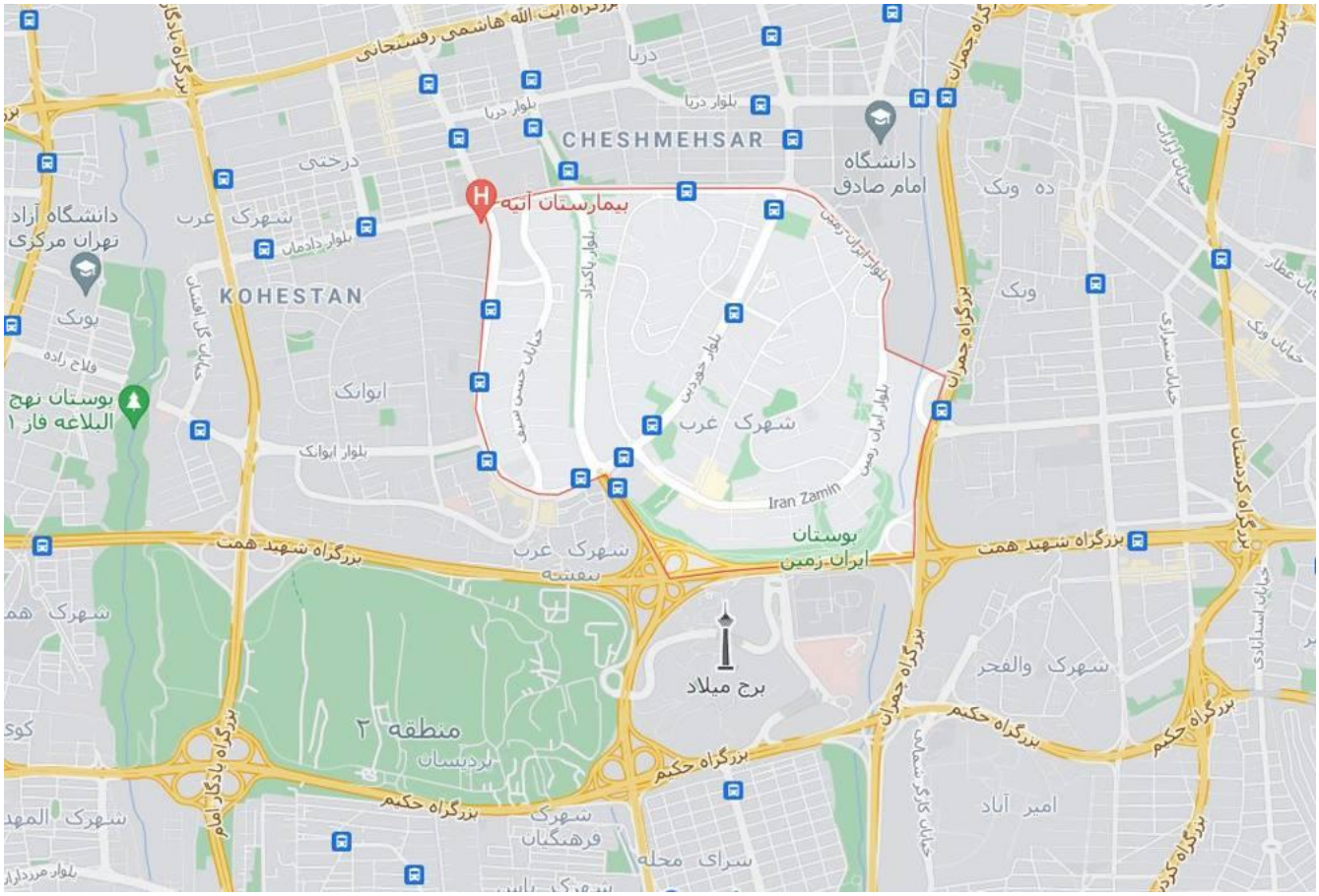

Figure 66: Map of Shahrak-e-Gharb and Surrounding Areas.This map provides a detailed view of the Shahrak-e-Gharb neighborhood and its surrounding areas in District 2 of Tehran. Key landmarks include Imam Sadegh University to the north, Milad Tower to the south, and important highways such as Hemmat Expressway and Sheikh Fazlollah Highway connecting the area to other parts of Tehran. The map highlights the residential, commercial, and green spaces within the neighborhood, emphasizing its strategic location and accessibility. The Piroozan site is situated within this area, benefiting from proximity to urban amenities and major transportation routes.(Google map)

Figure 67: This aerial view of Shahrak-e Gharb, captured from Milad Tower, highlights the area's proximity to key highways such as Hemmat and Sheikh Fazlollah. The image also beautifully showcases the residential and commercial architecture of Shahrak-e Gharb, emphasizing its well-planned urban layout and strategic location. (Mfarexx.,2017)

Figure 68: A taxi station located south of Sanat Square, providing convenient access to various destinations across Tehran. The image showcases the efficient transportation network in the area, with Milad Tower visible in the background, further emphasizing the centrality of this location. (Eghtesadnews.,2024)

Figure 69: This image showcases significant buildings in Shahrak-e Gharb along Farahzadi Boulevard, located to the west of Sanat Square. The street is home to key landmarks, including a mosque, commercial complexes, and medical centers, highlighting its central role in providing essential services to the residents of the area. The modern architecture and urban planning of Shahrak-e Gharb are evident in this vibrant scene. (Alborzagros.,2011)

Tools of Urban Planning in Shahrak-e-Gharb

Urban planning tools in this neighborhood are designed to manage the integration of residential, commercial, and green spaces effectively. Key authorities include Tehran Municipality's District 2 Office, which enforces zoning laws and urban development plans .

- Environmental Concerns

Current Situation

Air pollution is one of the biggest challenges in Shahrak-e-Gharb. According to data from the Environmental Protection Organization, air quality in this area frequently exceeds standard levels. Heavy traffic, especially during peak hours, and industrial activities in nearby areas are the main factors contributing to this pollution.

The existing green spaces in Shahrak-e-Gharb are not well-maintained and do not provide adequate quality. Some parks and green areas are poorly cared for, which reduces their attractiveness and use by residents. Despite having 26 parks, these spaces mainly serve as areas for walking, cycling, and food stalls.

For example, Fadak Park primarily focuses on water elements, which is a significant feature in Iranian gardens. While water elements are important for the beauty and appeal of the space, other social and recreational needs are not adequately addressed in this park.

Proposals

- Development and Improvement of Green Spaces: Create and enhance parks and green spaces focusing on the social and recreational needs of residents while utilizing native plants and trees with therapeutic properties to reduce maintenance costs and promote residents' mental well-being.

- Pollution Reduction: Encourage the use of public transportation, create dedicated bicycle and walking paths, and monitor industrial activities to reduce air pollution.

- Creative Design of Green Spaces: Design parks in a way that includes areas for social activities, children's play, and pets, and fosters the creativity of young residents.

- Social Issues

Current Situation

Shahrak-e-Gharb has fewer cultural and social spaces compared to other neighborhoods. Given the large number of young residents in this neighborhood, the number of educational and artistic workshops is significantly low. These workshops can help enhance the creativity of young people and serve as a means to preserve and promote Iranian culture. Additionally, these social interactions can improve their social culture.

Currently, very few people in Tehran pay attention to waste separation. This issue contributes to environmental pollution and the decline of residents' quality of life. If cultural and social venues

address this issue, and if designated places for waste separation and reminders exist throughout the city, it can help promote a culture of waste separation.

Solutions

- Creation of Social Spaces: Establish cultural centers, educational workshops, and art venues to enhance interactions among residents and promote Iranian culture.

- Hosting Social Events: Organize cultural and social programs to strengthen social ties and create a sense of belonging to the community.

- Waste Separation Education: Launch educational programs in public and cultural venues to raise awareness about the importance of waste separation and proper practices.

- Waste Management

Current Situation

The lack of waste separation bins and public awareness about waste separation poses serious challenges to waste management. This issue leads to environmental pollution and reduced quality of life for residents. If cultural and social venues address this issue and designated areas for waste separation are established throughout the city, it can significantly aid in promoting a culture of waste separation.

Solutions

- Increasing Waste Separation Bins: Install waste separation bins in various locations throughout the neighborhood, particularly in parks, to encourage residents to separate their waste.

- Awareness Programs:Launch educational campaigns in schools and communities to enhance understanding of waste management and proper waste separation techniques.

- Transportation and Infrastructure

Current Situation

Shahrak-e-Gharb has fewer metro stations and bus stops compared to other neighborhoods. This situation reduces residents' access to public transportation and sustainable transport options. Additionally, the quality of roads and pathways in some areas is not well-maintained, leading to increased traffic and safety hazards.

In addition to walking and cycling paths in parks, residents need similar facilities throughout the city to contribute to sustainable urban development. Without these amenities, efforts to promote public transportation culture will have minimal impact.

Solutions

- Public Transportation Development:Create new metro stations and improve public transportation services to enhance accessibility and convenience for residents.

- Increasing Bus Stops: Expand the number of bus stops and improve their services to facilitate public transport access.

- Improving Road Infrastructure: Enhance the quality of roads and pathways, as well as create bicycle and walking paths to encourage the use of sustainable transportation options.

- Structural Analysis

Shahrak-e-Gharb is characterized by wide streets that are well-structured and have safe pathways for pedestrians. However, these streets could have been designed more creatively and equipped with more amenities. For example:

- Bicycle Stations and Cycling Paths: Provide bicycle stations and design safe and extensive cycling paths.

- Shelters and Rest Areas: Create shelters and resting spaces for residents and those using public transport.

- Facilities for the Disabled and Animals: Design public spaces considering the needs of individuals with disabilities and also create spaces for pets.

- Utilizing Solar Panels: Install solar panels to illuminate pathways and reduce energy costs.

-Architectural Identity in Shahrak-e-Gharb

The History of Shahrak-e-Gharb and the Evolution of Changes

Shahrak-e-Gharb was developed during the 1960s and 1970s as a modern and affluent neighborhood inspired by Western urban planning. The area was designed with wide streets, ample green spaces, and luxurious villas, reflecting modern architectural principles emphasizing simplicity and spaciousness (Author, Year). At the time, the neighborhood stood as a symbol of contemporary urban development tailored to meet the lifestyle of upper-class residents.

Following the Islamic Revolution in 1979 and the rapid population growth in Tehran during subsequent decades, the demand for housing surged dramatically (Author, Year). As a result, the luxurious villas and unique architectural identity of Shahrak-e-Gharb were replaced by high-rise residential apartments. These changes aimed to accommodate increasing housing demands but came at the expense of the area's architectural integrity and cultural distinctiveness. Mousavi Zadeh, H.,2020, June 28) (Melkonline,2021)

Figure 70: This image clearly illustrates the transformation of Shahrak-e-Gharb from a neighborhood characterized by luxurious villas and vast green spaces to a densely populated area dominated by high-rise residential towers. The architectural identity of Shahrak-e-Gharb, originally inspired by Western modernist designs emphasizing tranquility and quality of life, has significantly shifted due to rapid population growth and unbalanced urban development. These changes have resulted in the loss of the area's original architectural essence, highlighting the urgent need for revitalization through the integration of traditional and modern design elements. (Sadeghpour, M.,2022, September 15)

Current Situation:

Currently, Shahrak-e-Gharb is characterized by modern yet identity-less buildings that serve primarily as functional residences. This transformation has overshadowed the original vision of the neighborhood, turning it into a place with limited cultural and architectural significance (Author, Year). In comparison, central and northern Tehran neighborhoods have preserved elements of Iranian architectural identity alongside modern designs, offering dynamic, authentic, and culturally

enriched environments. These areas also attract recreational and cultural amenities, enhancing residents' experiences and quality of life.

Solutions:

Combining Modern and Traditional Architecture and Creating Cultural Spaces

A viable solution to restore the architectural identity of Shahrak-e-Gharb lies in integrating traditional Iranian architectural features with modern designs while simultaneously developing cultural spaces. This dual approach can revive the area's sense of character and strengthen residents' connection to their environment. Key strategies include:

Integrating Traditional Features into Modern Buildings

- Incorporating traditional architectural elements such as arches, domes, colorful tilework, and geometric patterns into contemporary designs can reintroduce Iranian cultural essence into the urban fabric.
- Designing residential complexes with courtyards and gardens, reminiscent of traditional Iranian homes, fosters both aesthetic appeal and functional harmony.
-

  Using Local and Natural Materials

- Employing materials like brick, wood, and local stone, commonly associated with Iranian architecture, harmonizes buildings with the environment while reflecting cultural values.
-

Designing Multipurpose Cultural Spaces

- Establishing multipurpose spaces that blend modern functionality with cultural heritage, such as bazaars inspired by traditional markets, art galleries, and community centers, can foster cultural development in the area.

Creating Public Spaces for Cultural Interaction

- Public spaces such as cultural centers and parks, designed with Iranian motifs and traditional features, can act as hubs for social and cultural engagement (Author, Year). These venues can host exhibitions, workshops, and other activities to pass down Iranian heritage to future generations.

Emphasizing Natural Lighting and Ventilation

- Following principles of traditional Iranian architecture that optimize natural lighting and airflow, modern designs can integrate sustainable technologies, such as smart windows and eco-friendly building systems, to enhance both functionality and cultural relevance.

Promoting Human-Centered Architecture

- Traditional Iranian architecture emphasizes human needs and emotional connection to spaces. Modern architecture inspired by these values can create environments that support social interaction and cultural exchange while maintaining modern comfort and practicality

- Through these measures, Shahrak-e-Gharb can reclaim its identity as a culturally and architecturally significant neighborhood that accommodates both the functional needs of its residents and the preservation of Iranian heritage.- Evaluation and Needs

Community Needs

Residents of Shahrak-e-Gharb are seeking more recreational and cultural spaces, improved health and educational services, and the establishment of adequate infrastructure for transportation. These needs should be considered in urban planning to enhance residents' quality of life.

Conclusion

Chapter 4 presented an in-depth exploration of the urban planning challenges in Shahrak-e-Gharb, uncovering pressing environmental, social, and infrastructural issues that require immediate and long-term attention. This analysis not only identified areas for improvement but also highlighted opportunities for sustainable and community-focused urban development. Below is a summary of the critical findings and their implications:

Environmental Concerns:

Finding: Air pollution and insufficient maintenance of green spaces are significant challenges, adversely impacting residents' health and quality of life.

Comment: Addressing these issues requires enhancing green spaces, creating urban forestry projects, and incorporating pollution-mitigating initiatives. Strategically planned green corridors could also reduce the urban heat island effect while improving air quality.

Social Issues:

Finding: The shortage of cultural and social spaces limits residents' access to creative and cultural activities, especially for the younger demographic.

Comment: Establishing multifunctional cultural and educational hubs can encourage social interactions, preserve cultural heritage, and foster community engagement. These spaces can be designed to host art exhibitions, educational workshops, and youth-focused programs, contributing to a vibrant community life.

Waste Management:

Finding: Ineffective waste management systems and a lack of public awareness contribute to environmental degradation.

Comment: Introducing a comprehensive waste management system with clearly marked bins for waste separation, alongside community education initiatives, could promote sustainable practices. Partnering with schools and local organizations to raise awareness can further embed these practices into daily life.

Transportation and Infrastructure:

Finding: Insufficient public transportation facilities, including limited metro stations and bus stops, exacerbate traffic congestion and reduce accessibility.

Comment: Expanding and improving public transportation networks, such as adding metro stations and bus routes, can ease congestion and reduce reliance on personal vehicles. Additionally, incorporating cycling and pedestrian infrastructure can support sustainable urban mobility and enhance the quality of life.

Final Remarks

The challenges in Shahrak-e-Gharb highlight a critical need for a multidimensional approach to urban planning that prioritizes environmental sustainability, social inclusivity, and infrastructural development. By addressing these issues through thoughtful planning and innovative strategies, Shahrak-e-Gharb can evolve into a model neighborhood that balances modern urban living with cultural and environmental stewardship. The findings from this chapter serve as a foundation for future interventions aimed at transforming Shahrak-e-Gharb into a sustainable and thriving community.

Chapter 5

Designing Open Urban Spaces with a Focus on Welfare and Sustainability (Piroozan Site)

Introduction

Open urban spaces are integral to fostering sustainable, inclusive, and vibrant cities. In densely populated urban areas like Tehran, the role of multifunctional public spaces extends beyond recreation, addressing challenges such as environmental degradation, social disconnection, and lack of cultural identity. This chapter focuses on the Piroozan site in Shahrak-e-Gharb, highlighting its potential to become a model for sustainable urban design by integrating environmental, social, and cultural dimensions.

The Piroozan site offers a unique opportunity to redefine the role of open spaces in Tehran's urban fabric. With its strategic location, natural topography, and proximity to key urban amenities, it presents a fertile ground for developing a multifunctional, accessible, and culturally significant public space. By leveraging sustainable technologies, incorporating traditional Iranian design elements, and engaging with the local community, the site can address contemporary urban challenges while enhancing the quality of life for its residents.

This chapter explores the existing conditions of the Piroozan site, identifies its challenges and opportunities, and proposes innovative design interventions. Through an analysis of environmental considerations, urban design constraints, socio-economic factors, and case studies, the chapter lays the foundation for a project that aligns with broader urban planning goals. It emphasizes the importance of creating a space that not only meets the diverse needs of the community but also serves as a model for sustainable and inclusive urban development.

Assessment of Site-Specific Issues and Challenges

The Piroozan site, located in Shahrak-e-Gharb, stands out as an ideal choice for designing a multifunctional public space due to its strategic position within one of Tehran's modern neighborhoods. This area features a dynamic mix of residential and commercial uses, yet lacks inclusive, vibrant, and sustainable open spaces that can address the diverse needs of the community. The site's high potential for fulfilling the increasing demand for such spaces in a rapidly developing urban context is one of the primary reasons for its selection.

The site's unique characteristics, including its natural topography, allow for the implementation of terraced architectural designs inspired by the village of Masuleh. This approach harmonizes with the site's natural slopes, enhancing spatial dynamism and visual appeal. Furthermore, the site's excellent accessibility through public transportation networks, combined with its proximity to diverse land uses—including residential, commercial, and educational areas—makes it a central hub for social interactions.

The existing vegetation and the potential for incorporating green pathways and water features enable the recreation of traditional Persian garden patterns, creating a tranquil and culturally significant environment that strengthens users' sense of belonging. Additionally, the site's geographic and climatic conditions make it highly suitable for implementing sustainable technologies such as solar panels and stormwater management systems, which help reduce the project's environmental footprint.

Designing a public space on this site not only enhances the quality of life for local residents but also addresses broader urban objectives. These include reducing urban stress, fostering social

interactions, achieving environmental balance, and offering a model for integrating traditional architectural values with contemporary urban needs. These characteristics position the Piroozan site as an ideal platform for executing a unique and sustainable urban project.

Environmental Considerations

The Piroozan site in Shahrak-e-Gharb is influenced by various environmental factors that must be considered in the planning and design of a multi-purpose space. The natural resources available at the site, such as existing vegetation, soil quality, and water drainage patterns, play a crucial role in determining ecological impacts. A thorough environmental assessment will help identify ways to enhance the natural characteristics of the site while mitigating any adverse effects caused by urban development.

Additionally, the ecological impacts of the proposed development must be taken into account. Strategies for maintaining biodiversity, managing stormwater, and encouraging the use of native plant species can create a harmonious relationship between the urban space and its surrounding environment.

Urban Design Constraints

Urban design constraints at the Piroozan site include existing infrastructure and zoning regulations. The current infrastructure of the site, including transportation networks, public services, and facilities, will influence the design and accessibility of the proposed space. Understanding zoning regulations is essential to ensure compliance with local planning laws and to optimize land use

Socio-Economic Factors Affecting the Site

Socio-economic factors play a significant role in shaping the Piroozan site. Accessibility to public transport, proximity to residential areas, and the demographic profile of the neighborhood will impact how the space is utilized. Additionally, understanding community needs—such as recreational facilities, social interaction areas, and educational resources—will be vital in tailoring the design to foster inclusivity and meet the diverse requirements of residents. Engaging with the community to identify their needs will help ensure the new space becomes a valued asset in the neighborhood.

The Importance of Open Space Design in Urban Planning

Open space design is a fundamental aspect of urban planning, significantly influencing the quality of life in cities. These spaces act as essential hubs for social interaction, cultural and recreational activities, and overall public well-being. In densely populated cities like Tehran, facing challenges such as overcrowding, air pollution, and a lack of accessible public spaces, developing open spaces is a critical priority in urban development strategies.

Social and Cultural Role of Open Spaces

Urban open spaces, such as parks, squares, and pedestrian pathways, provide environments for community gatherings and social interactions. These spaces foster cultural and artistic activities, strengthen collective identity, and enhance a sense of belonging. Designing open spaces to be

inclusive and accessible to all segments of society can promote social equity and solidarity among citizens.

Health Benefits of Open Spaces

Open spaces positively impact physical and mental health by encouraging physical activities such as walking, jogging, and cycling while offering areas for relaxation and stress relief. Access to nature in urban environments has been shown to reduce anxiety and depression, contributing to overall mental well-being.

Environmental Benefits of Open Spaces

Urban open spaces contribute to environmental sustainability by mitigating the urban heat island effect, improving air quality, and managing stormwater. Integrating native vegetation and green infrastructure into these spaces helps preserve biodiversity and reduces maintenance costs, aligning with sustainable urban development goals.

Addressing Modern Urban Challenges

In today's rapidly urbanizing world, cities face challenges such as population growth, increasing density, and diminishing green spaces. Open spaces provide solutions to these issues by redistributing population pressure and offering multifunctional areas that accommodate diverse community needs. Designing flexible spaces that combine green pathways, recreational areas, and public amenities ensures that cities remain livable and resilient.

Enhancing Identity and Sense of Place

Beyond their functional value, open spaces play a vital role in preserving cultural and historical identity. Incorporating traditional architectural elements, such as Persian garden layouts and water features, into urban design strengthens the sense of place and connects communities to their cultural heritage. These thoughtful designs make open spaces meaningful, not just practical.

Specific Needs and Requirements

Identification of Specific Needs for the Piroozan Site

A comprehensive analysis of the specific needs for the Piroozan site should be conducted to inform design decisions. This includes evaluating the types of activities that residents would like to see accommodated in the new space, such as recreational areas, gathering spots, cultural programming, and educational facilities.

In this context, designing outdoor spaces and architecture using Iranian elements is essential to preserve the values of Iranian culture. This includes the use of plants and water pathways, which are important elements in Iranian garden design. The incorporation of traditional Iranian patterns for building facades and designing based on the slope of the land and differences in elevation will help maintain the dynamism and vibrancy of the site.

The Piroozan site also requires a skate park, as such facilities are rare in Tehran. Additionally, creating a playground accessible to all children, including those with special needs, can enhance social inclusion.

Designing a local market is another requirement to facilitate residents' access and meet their daily needs. The use of traditional architectural patterns in building design and incorporating traditional grid patterns into the overall design will further preserve cultural identity while addressing contemporary needs.

Case Studies and Inspirations

Introduction

The study of case examples provides valuable insights for designing the Piroozan site, offering practical solutions to urban design challenges. These case studies focus on integrating traditional Iranian architecture with modern sustainable practices to create multifunctional, dynamic, and inclusive spaces. By analyzing projects that balance cultural heritage with contemporary urban needs, this section demonstrates how historical elements such as Persian garden layouts, terraced architecture, and sustainable technologies can be harmonized to enhance urban quality of life.

Criteria for Selecting Case Studies

The case studies used for the Piroozan project were carefully selected based on their ability to balance traditional Iranian architecture with modern urban design principles. These examples not

only preserve cultural identity but also address contemporary demands for sustainability, inclusivity, and multifunctionality. Each project was chosen to provide direct inspiration for the specific needs and design goals of the Piroozan site.

Inspirations for Key Design Elements with Design Justifications

- Terraced Architecture (Masuleh Village):

Inspiration: The cascading design of Masuleh, where rooftops of lower houses serve as courtyards for upper houses, inspired the terraced layout of the Piroozan site. This feature seamlessly integrates the site with its natural topography while preserving harmony with the environment.

Justification for Use in Piroozan: The terraced design not only reflects the site's uneven terrain but also enhances spatial dynamism and cultural identity. By adopting Masuleh’s approach, the design achieves a balance between functional efficiency and aesthetic appeal, making the site a visually engaging and environmentally sensitive space.

Figure 71 : The front garden of each house sits on the rooftop of the house below it. (Abdolhamidi, Sh. ,2017)

- Geometric and Symbolic Window Design (Masuleh Village)

Case Study: The traditional windows of Masuleh, an Iranian village, are not only functional but also serve as a cultural and artistic expression. The windows feature intricate geometric patterns such as knotwork (gereh-chini), which symbolize order and balance in Iranian art. The combination of floral motifs like tulips and lotus flowers, which represent sacrifice and purity, reflects the deep connection between Iranian culture and nature. Additionally, these windows incorporate religious symbols such as the knot of the Four Quls (Chahar-Qul), which represents the religious and cultural beliefs of Iranians in their architecture. Shamseh designs (eight-pointed stars) are also used, symbolizing the unity of God and divine light.

Application to Piroozan Site: The symbolic and geometric elements of Masuleh's windows can be integrated into the design of the Piroozan site to reflect Iranian cultural identity and heritage. The use of knotwork and floral motifs can be incorporated into the building facades or in window designs to create a visually appealing and culturally significant space. These elements would contribute to the overall aesthetic of the site while fostering a deeper connection with Iranian architectural traditions. The inclusion of religious and spiritual symbols could also add layers of meaning to the design, reinforcing the site's cultural and spiritual significance.

Impact: The integration of these elements into the Piroozan site would not only enhance the architectural beauty and identity of the space but also serve to promote cultural continuity and reverence for Iranian artistic traditions. The blending of culture, art, and functionality in the windows of Masuleh provides a valuable reference for creating spaces that honor Iranian heritage while meeting the needs of modern urban design.

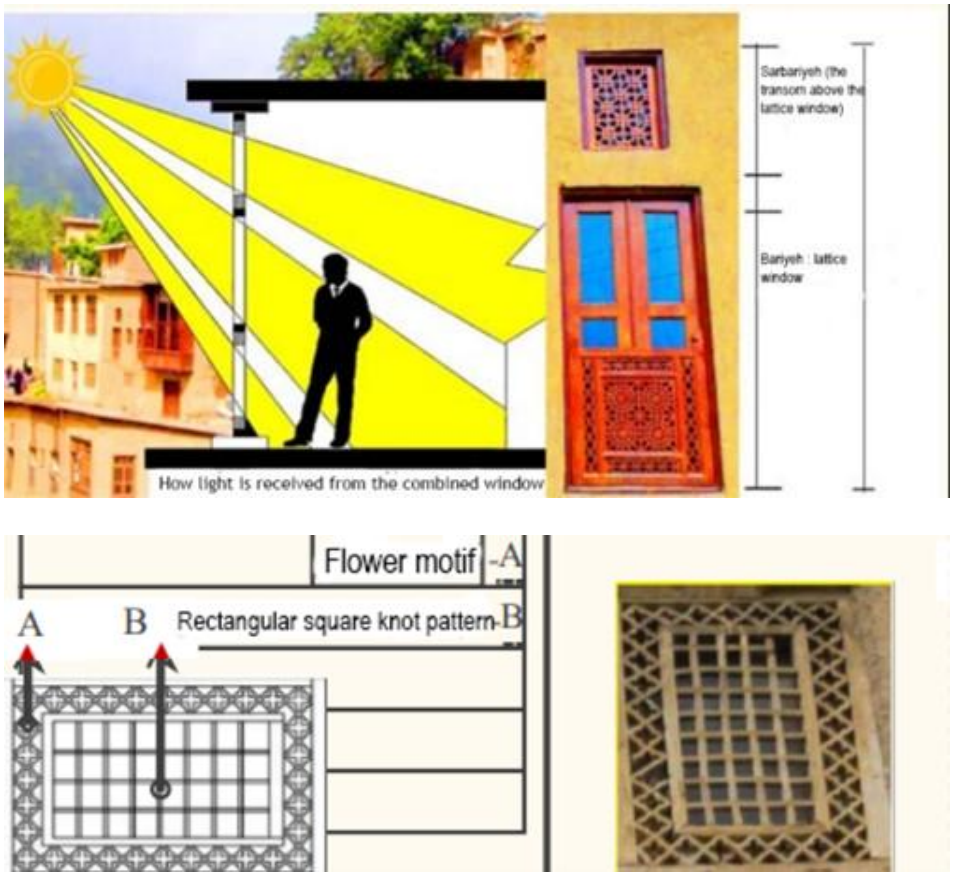

Figure 72: The functioning of light reception in the combined windows of the Masjidbar neighborhood in Masuleh. Hasanpour Loumer, S., Nejad Ebrahimi, A., Sattari Sarbangholi, H., & Vand Shoari, A.,2024).

- Persian Grid Design in Open Space Architecture

Case Study: The traditional layout of Persian gardens, also known as Chaharbagh (Four Gardens), serves as an exemplary case of grid-based open space design in Iranian architecture. This design concept is characterized by a symmetrical division of space into quadrants, often separated by water channels or pathways that converge at a central point.

Application to Piroozan: The grid system emphasizes order, balance, and harmony, principles that can be applied to the Piroozan site to create an organized and visually cohesive design. This

approach not only facilitates navigation and accessibility within the space but also integrates water pathways and vegetation, reminiscent of Persian gardens, to enhance both aesthetic appeal and cultural identity.

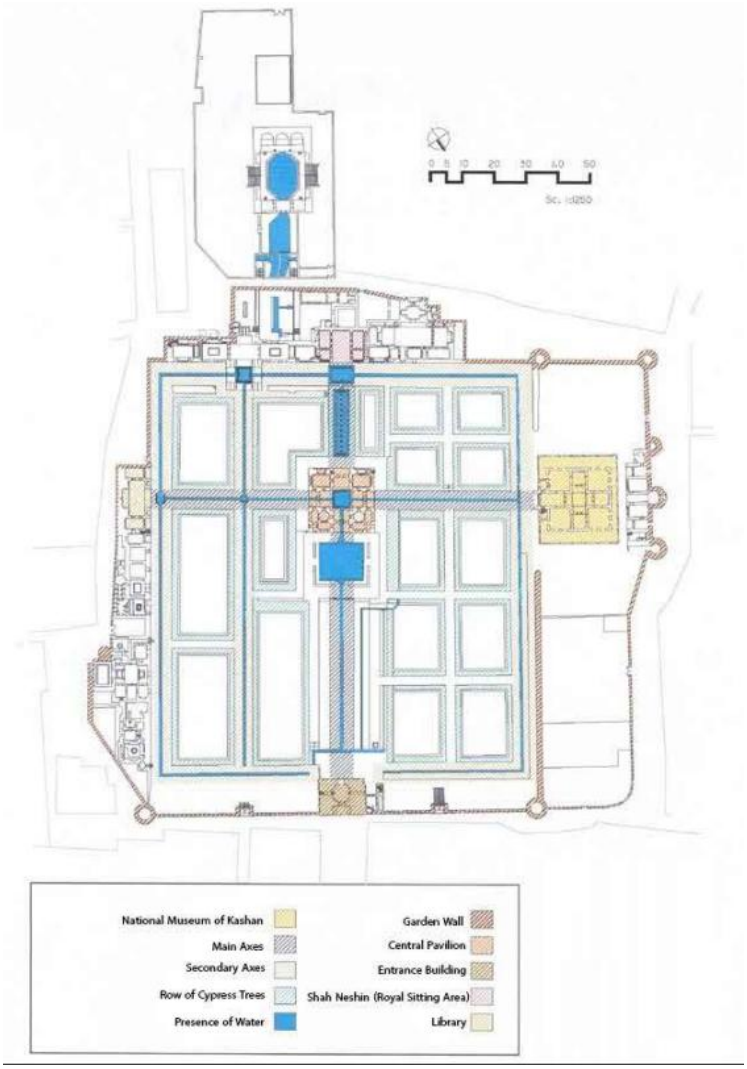

Figure 73: Fin garden's plan, (Rahaei, O.,2015)

Impact: By incorporating the Persian grid into the Piroozan site, the design promotes connectivity and symmetry while preserving the cultural essence of Iranian architecture. It also allows for the

division of the space into multifunctional zones that can accommodate various activities, such as social gatherings, recreational areas, and cultural events.

- Centralized Open Space Inspired by Iranian Architecture

Case Study: Traditional Iranian architecture often incorporates a central courtyard (hayat markazi), a key element in both residential and public spaces. This design is evident in historic structures like the Fin Garden in Kashan, where the central open space serves as the heart of activity, surrounded by symmetrically aligned pathways, water features, and vegetation.

Application to Piroozan: Adapting the concept of a centralized open space to the Piroozan site can create a focal point for social and cultural interactions. The central area can be designed as a multifunctional plaza with traditional water features, shaded seating, and spaces for cultural events. This area can also connect to other zones through green pathways and pedestrian routes.

Impact: A centralized open space fosters a sense of unity and community while providing a flexible area for diverse activities. This design pays homage to Iranian architectural traditions while meeting contemporary needs for vibrant and inclusive urban spaces.

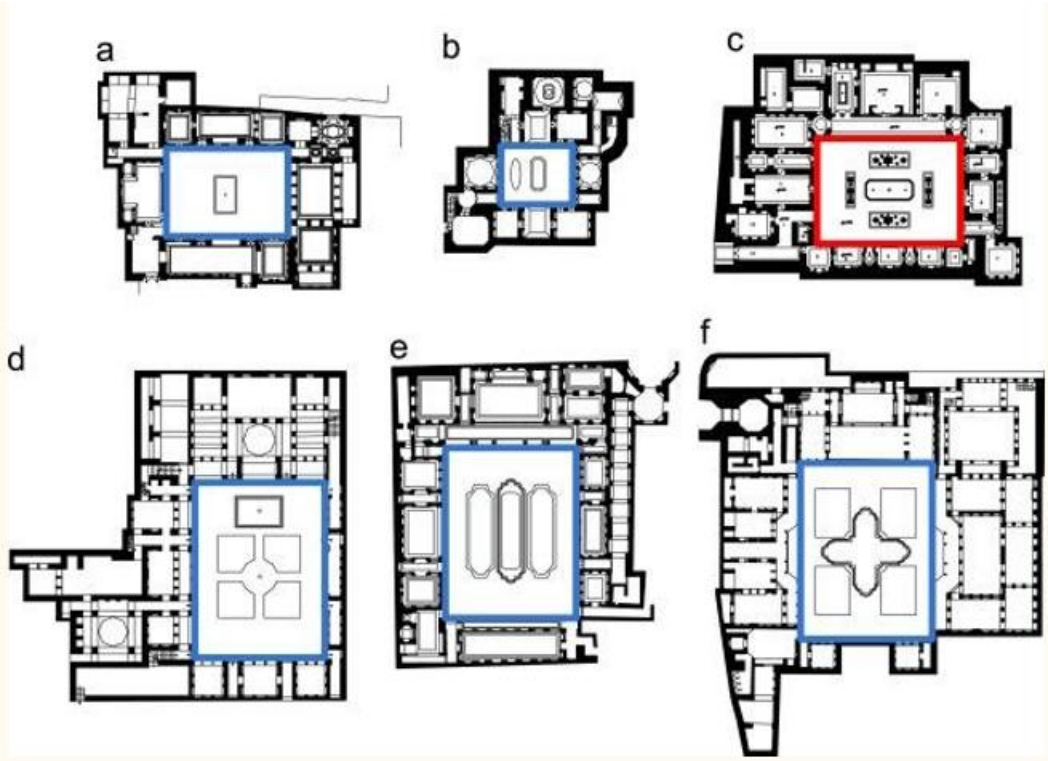

Figure 74: Givoni, B., & Shaviv, E. (2016). Traditional Iranian courtyards as microclimate modifiers by considering orientation.

- Inclusive Play Areas (Madison's Place):

Inspiration: Madison's Place provides an inclusive playground with equipment accessible to children with disabilities, promoting social interaction and equality.

Justification for Use in Piroozan: As inclusivity is a key goal of the Piroozan project, incorporating similar facilities ensures that all children, regardless of their physical abilities, can enjoy recreational activities. This fosters a sense of belonging and social integration while addressing the lack of accessible play areas in Tehran.

Figure 75 : Madison’s place playground,Woodbury,MN.(Playlsi. ,n.d.)

- Skate Park Design:

Inspiration: International skate parks with proper slopes, durable materials, and safety measures inspired the Piroozan skate park design.

Justification for Use in Piroozan: Skate parks are rare in Tehran, and their inclusion in Piroozan meets the recreational needs of the youth. By adhering to international standards, the design ensures a safe, functional, and engaging space for skaters, enriching the recreational diversity of the site.

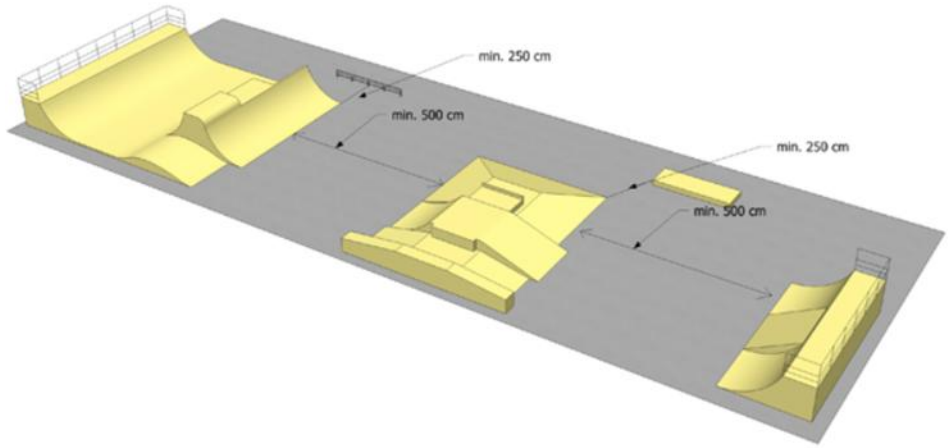

Figure 76 : Skate park,graphic indicating equipment and useful spaces. (Marco. ,n.d.).

- Mixed-Use Spaces (Shahsavar Park):

Inspiration: Shahsavar Park's integration of natural landscapes with social and recreational facilities informed the green space design in Piroozan.

Justification for Use in Piroozan: Inspired by Shahsavar's harmony with its environment, Piroozan's green spaces promote relaxation, social gatherings, and ecological awareness. The use of native plant species enhances biodiversity while reducing maintenance costs, aligning with sustainability goals.

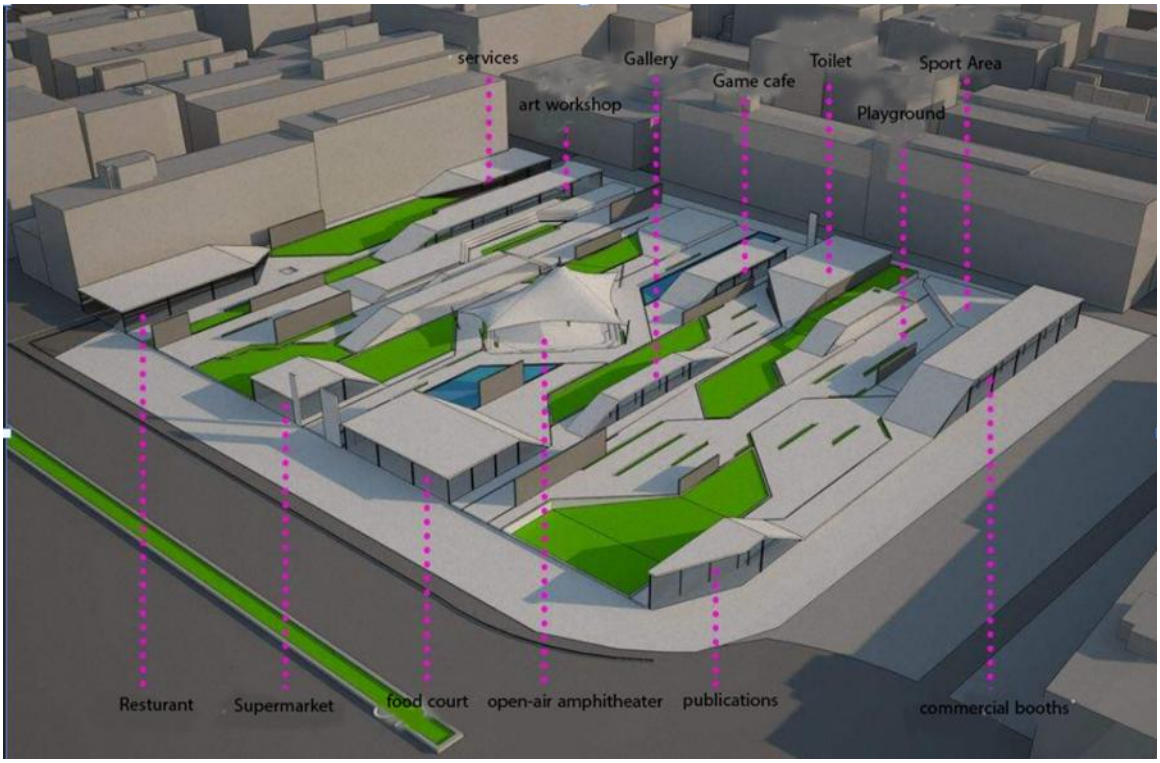

Figure 77: Land uses of the Shahsavar site. (MRK Office. ,2018).

- Ginkgo Biloba: A Therapeutic Tree for Urban Green Spaces

Case Study: Ginkgo Biloba, also known as the "maidenhair tree," is a therapeutic tree known for its numerous health benefits and distinct fan-shaped leaves. Beyond its ornamental beauty, Ginkgo has been widely used in traditional medicine to improve memory, blood circulation, and overall brain function. It is also known for its antioxidant properties and its ability to support cardiovascular health. In urban environments, Ginkgo trees have become popular not only for their aesthetic qualities but also for their role in enhancing public health. Their resilience to pollution and environmental stress makes them an ideal choice for city landscapes, contributing to a healthier urban ecosystem. (Asriran.,2021, July 5)

Application to Piroozan Site: Integrating Ginkgo Biloba trees into the Piroozan site would offer both aesthetic value and therapeutic benefits. These trees can be planted in areas where people gather for relaxation, walking, or social interaction, providing an environment that promotes health and well-being. The leaves of Ginkgo trees could be used in herbal products or therapies offered at the site, allowing visitors to benefit from their health-boosting properties. Additionally, the Ginkgo tree's resistance to pollution makes it particularly suitable for urban areas, helping to improve air quality and create a more sustainable environment.

- Impact: By incorporating Ginkgo Biloba trees into the Piroozan site, the design can offer not only a beautiful green space but also a functional one that promotes wellness and environmental health. The medicinal properties of Ginkgo trees would provide visitors with an opportunity to connect with nature in a meaningful way, enhancing their physical and mental well-being. Furthermore, the use of such therapeutic plants in urban design could raise awareness about the importance of natural health solutions and sustainability, making Piroozan a model for future urban green spaces**.**

Figure 78: The Ginkgo biloba, also known as the maidenhair tree. (Yona Garden.,n.d.)

- Multi-Use Shelters with Sustainable Design Features

Case Study: The concept of multi-use shelters with modern designs has become increasingly relevant in urban spaces. These shelters, such as those implemented in various smart city projects, combine functionality and sustainability. Not only do they include integrated benches and a digital clock, but they also feature solar panels that provide energy for lighting and other digital services. The shelter includes a dedicated section for individuals with disabilities, ensuring that all community members can access and use the space. Additionally, the shelter offers the ability to

charge electronic devices like mobile phones, giving pedestrians the opportunity to rest while staying connected. This multi-functional space addresses the increasing demands of urban life by offering essential services while promoting sustainability.

Application to Piroozan Site: The design of multi-use shelters could be integrated into the Piroozan site, especially in areas where people gather for social activities or rest. These shelters could serve as resting points along pedestrian pathways or in communal spaces, providing comfort, connectivity, and access to sustainable energy. Solar panels could be used to power lighting and charge stations, contributing to the site's overall sustainability goals. The inclusion of sections for individuals with disabilities ensures inclusivity, making the space accessible to a wider range of users.

Impact: Incorporating these shelters into the Piroozan site would address both practical and environmental needs. It would enhance the public space by offering functional, energy-efficient amenities while ensuring that it caters to a diverse range of users. The use of renewable energy and the inclusion of charging stations would also align with the broader goals of creating a sustainable and resilient urban environment. The design would improve the quality of the space, promoting social interactions and providing much-needed services in an environmentally responsible way.

Figure 79: Solar bench. (Mesut, S., 2017)

- Solar Panel Streetlights for Sustainable Urban Lighting

Case Study: Modern streetlights equipped with solar panels are an innovative solution for urban environments. These lights are designed to absorb sunlight during the day using solar panels located at the top of the pole, which then stores the energy to power the light at night. By incorporating LED technology, these streetlights provide sufficient illumination with low energy consumption, making them energy-efficient. The lights are typically between 3 to 5 meters tall, ideal for streets and public spaces, and are designed to complement the aesthetic of urban areas. Additionally, the use of renewable energy reduces carbon emissions, contributing to the protection of the environment and enhancing the sustainability of urban spaces.

Application to Piroozan Site: Solar-powered streetlights can be integrated into the Piroozan site to enhance public spaces while promoting sustainability. These lights can be strategically placed along pedestrian pathways, communal areas, and bike paths, providing energy-efficient illumination at night. The use of renewable energy through solar panels would contribute to the site's overall sustainability goals, reducing the reliance on non-renewable energy sources while providing an eco-friendly lighting solution.

Impact: Integrating solar-powered streetlights into the Piroozan design would not only enhance the safety and aesthetic appeal of the site but also contribute to reducing the environmental footprint of the space. By utilizing renewable energy, Piroozan would serve as an example of how urban spaces can embrace sustainable technologies. This initiative would help reduce energy consumption, lower carbon emissions, and foster environmental awareness, aligning with broader urban sustainability goals.

Figure 80: Decorative Street Lights. (OGK Opora. ,n.d.)

- Water for All: Inclusive and Eco-Friendly Public Water Fountains

Case Study: The modern design of public water fountains has evolved to meet the needs of a diverse urban population. This water fountain includes multiple taps, with one positioned lower for pets and a water bottle refill station to encourage the use of reusable bottles instead of single-use plastics. Made from durable stainless steel, the structure is weather-resistant and has a sleek, modern aesthetic. The taps are installed at various heights, including one designed specifically for wheelchair users, ensuring accessibility for all. This inclusive design, coupled with the pet-friendly feature, provides a comprehensive solution for public spaces such as parks, streets, and pedestrian pathways. By promoting the use of reusable water bottles, it also helps reduce plastic waste, making it an eco-friendly urban infrastructure.

Application to Piroozan Site: The Piroozan site can integrate similar public water fountains throughout its spaces, ensuring that they are accessible to all community members, including individuals with disabilities, pedestrians, cyclists, and pet owners. The fountain's design could be placed strategically along walking paths, near seating areas, and in recreational zones to provide easy access to drinking water. Additionally, installing refill stations would promote sustainability and encourage the use of reusable bottles, reducing plastic waste in the area.

Impact: Integrating inclusive, eco-friendly water fountains into the Piroozan design would not only improve the functionality of the space but also contribute to the health and well-being of its users. Access to clean, fresh water is essential for public health, especially in urban environments. This

design, with its focus on sustainability and inclusivity, would enhance the site's environmental responsibility while catering to the diverse needs of the community, supporting Piroozan's broader goals of sustainability and social inclusivity.

Figure 81: **Apollo450 (DFA450),** (Urban+ Company.,2023)

- Sidewalk Markings for People with Disabilities and the Visually Impaired

Case Study: Urban designs that focus on enhancing accessibility for individuals with disabilities play a crucial role in creating inclusive cities. Features such as ramps and tactile paving are specifically designed to improve mobility and ensure that public spaces are accessible to everyone. Ramps, often placed at intersections and building entrances, provide smooth transitions for people using wheelchairs, allowing them to access sidewalks and streets easily. Tactile paving, typically raised and yellow, assists individuals who are blind or visually impaired by providing tactile feedback through their walking sticks or feet. These surfaces help guide users safely through public spaces,

allowing them to identify safe paths and crossings. These design elements are central to "barrier-free" urban planning, promoting safety, independence, and ease of movement for people with disabilities.

Application to Piroozan Site: The Piroozan site can incorporate ramps and tactile paving along key pedestrian pathways, seating areas, and entrances to ensure that individuals with disabilities can navigate the site safely and independently. Ramps should be strategically placed to connect various levels of the space, such as entrances to communal areas or recreational zones. Tactile paving could be installed near crossings, along main paths, and in areas with high foot traffic, allowing individuals with visual impairments to navigate easily.

Impact: By integrating these accessibility features into the Piroozan site, the design would foster a more inclusive environment for individuals with mobility or visual impairments. These elements not only ensure the physical accessibility of the space but also promote social inclusion, allowing everyone to enjoy the public space equally. This approach aligns with the broader goals of creating a barrier-free environment and supports Piroozan’s commitment to inclusivity, improving the quality of life for all users, and enhancing the overall functionality and safety of the site.

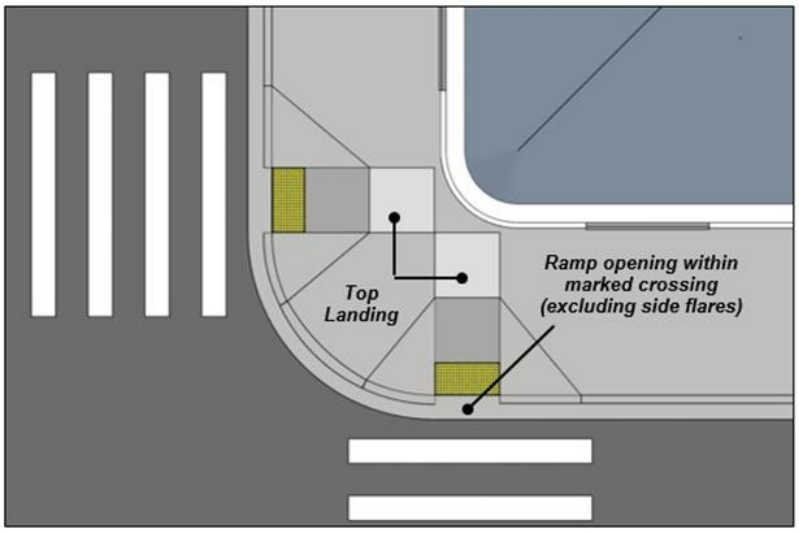

Figure 82: Curb Ramps at Intersections**.** (United States Access Board., n.d.).

Figure 83: Meanings of Tactile Paving: A Blessing for Persons with Visual Impairment. (Lalit, S. ,2018, March 18).

- Bicycle Path and Bike Hanger Design

Case Study: The design of bicycle paths and bike hangers in urban spaces focuses on creating a safe, continuous, and easily accessible environment for cyclists. Key factors include ensuring smooth path continuity, appropriate slope gradients, and clear route visibility. Infrastructure elements such as dedicated lighting, traffic signage, and designated lanes for cyclists are incorporated to enhance safety and promote cycling as a sustainable mode of transportation. These design principles aim to make cycling a comfortable and viable transportation option while integrating seamlessly into the urban landscape. The focus on safety and comfort ensures that cyclists can navigate urban environments with ease, reducing reliance on motorized transport and contributing to a greener, more sustainable city.

Application to Piroozan Site: The Piroozan site can integrate dedicated bicycle paths that prioritize safety and accessibility. The design should include clear signage, proper lighting, and well-maintained paths with gentle slopes to accommodate cyclists of all abilities. Additionally, bike hangers or secure bike storage stations can be placed along key areas within the site, encouraging cycling as a mode of transportation. By providing secure places to store bikes, Piroozan can cater to cyclists and promote the use of bicycles for commuting to the site and beyond.

Impact: The integration of bicycle paths and bike hangers in the Piroozan design would contribute to promoting sustainability by encouraging alternative, eco-friendly modes of transportation. This would not only reduce traffic congestion and air pollution but also enhance the mobility options available to the community. By providing safe and accessible paths, Piroozan would align with broader urban goals of creating a healthier, more sustainable, and connected city.

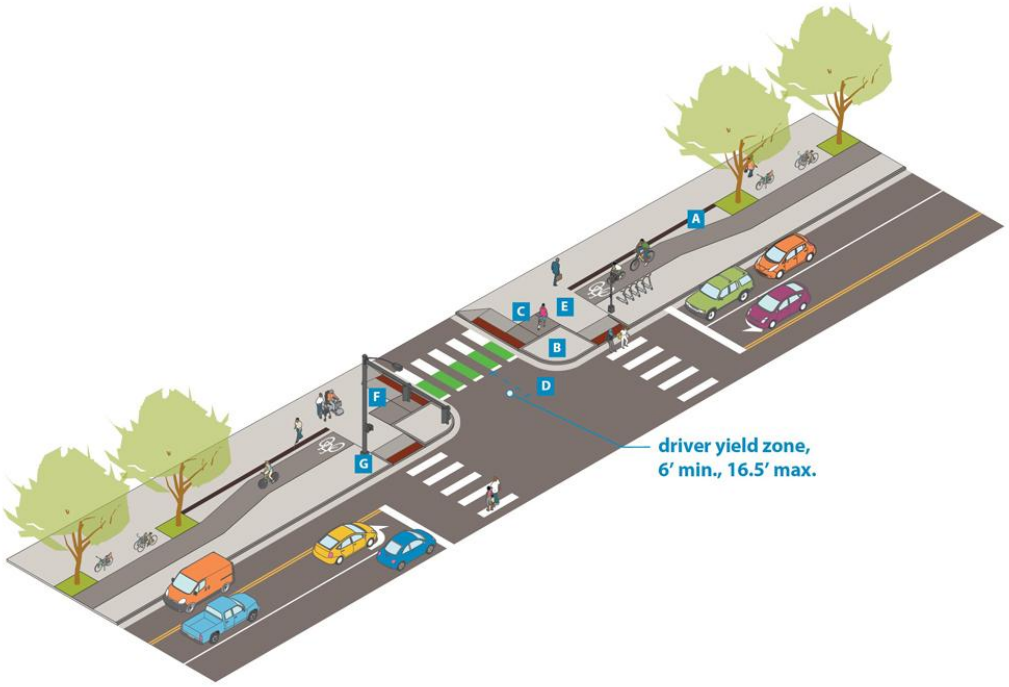

Figure 84: Street design guidance, protected intersections . (City of Minneapolis. ,n.d.)

Figure 85: Street design guidance, protected intersections (City of Minneapolis. ,n.d.)

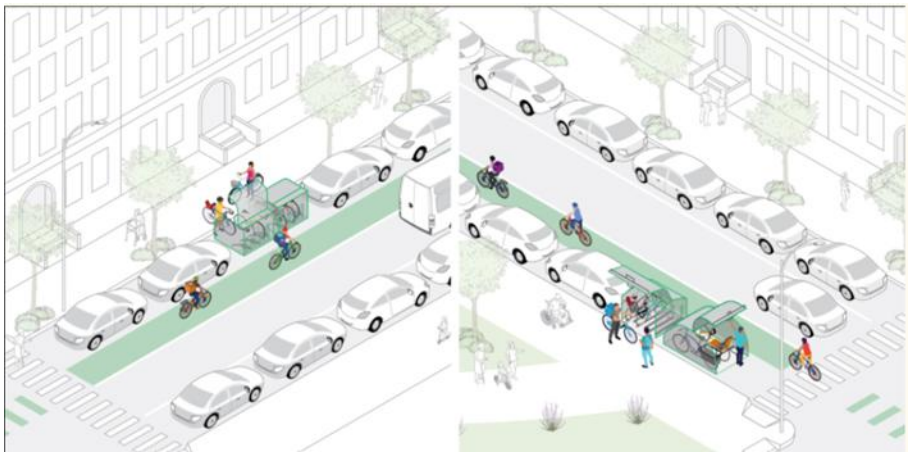

Figure 86 :An example of small-capacity secure bike parking in residential neighborhoods. (Streetsblog NYC. ,2024).

Figure 87 : Bike parking stations with roof over its head on city streets.(Streetsblog NYC. ,2024)

Stakeholder Engagement and Community Input on Site Improvements

Engaging stakeholders and incorporating community input is crucial for the success of the Piroozan project. Collaborating with local residents, business owners, and community organizations will

provide valuable insights into their preferences and expectations. Regular meetings, public forums, and interactive design charrettes can facilitate this engagement, ensuring that the development reflects the aspirations of those who will use it.

Proposed Sustainable Design Interventions

Design Principles for Creating Multi-Functional Open Urban Space

The design of the Piroozan site must be underpinned by sustainable principles and flexibility to ensure it can serve multiple functions and adapt to the evolving needs of the community. By incorporating sustainability, inclusivity, and ecological balance, the design aims to create a space that not only accommodates diverse activities but also fosters a sense of community and well-being.

Key design principles include:

- Multi-Functionality: The design should feature flexible spaces that can host a wide range of activities, from recreational use such as sports and play areas, to cultural events like performances, workshops, and festivals. This flexibility is essential in a densely populated urban environment where the needs of the community can shift over time. By integrating different functions, the space will be able to cater to various demographic groups and offer year-round usability. This will prevent the space from becoming underutilized or monotonous, fostering continuous engagement from the community. (Mofidi Shamirani, S. M., & Abbaschi, K.,2016)

- Inclusivity: A core principle in the design is accessibility for all community members, irrespective of age, ability, or background. The site should be designed with universal accessibility in mind, including ramps, wide pathways, sensory spaces, and designated areas for those with special needs. Providing spaces that are accessible to people with disabilities will enhance social equity, ensuring that no one is excluded from the benefits the space offers. Furthermore, the inclusion of facilities for different age groups—from playgrounds for children to quiet areas for the elderly—will create a more inclusive and intergenerational environment. (Tavakkol, M.,2016)

Connection to Nature: Incorporating natural elements such as gardens, water features, and green pathways is crucial for enhancing the user experience and promoting ecological health. These natural features not only create a serene and inviting atmosphere but also help to improve air quality, support local biodiversity, and contribute to the overall sustainability of the space. By blending natural elements with the urban fabric, the design encourages users to reconnect with nature, providing both environmental and psychological benefits. (Naghizadeh, M.,2010)

How these Interventions Fit into the Broader Urban Planning Framework

The proposed design interventions for the Piroozan site are not isolated from the broader urban planning framework but rather integrate seamlessly with it. Urban planning seeks to create cohesive, sustainable, and vibrant environments that improve the quality of life for all residents, and the Piroozan site's design aligns with these objectives.

- Urban Resilience: By incorporating sustainable design principles—such as water management systems, green infrastructure, and renewable energy sources—the site

contributes to urban resilience, helping the city better cope with climate challenges such as flooding, air pollution, and heat islands. (Hashemipour, F., & Khodadadi, M.,2019)

- Social Cohesion: The design promotes social cohesion by creating inclusive, multifunctional spaces where people from different backgrounds and abilities can interact. This aligns with the broader urban goal of enhancing social integration and community engagement through the creation of public spaces that encourage a sense of belonging. (Mofidi Shamirani, S. M., & Abbaschi, K.,2016)

- Sustainability and Ecological Urbanism: The Piroozan site's commitment to ecological sustainability, through the incorporation of green spaces and natural elements, supports the larger urban vision of creating a "green city." It aligns with urban planning trends that prioritize environmental responsibility and seek to balance urban development with the preservation of natural resources. (Tavakkol, M.,2016)

- Connectivity with Surrounding Infrastructure: The design also ensures that the site is well-connected to existing transportation networks, commercial zones, and residential areas, making it accessible and seamlessly integrated into the wider urban structure. This connectivity is essential for ensuring the space's success, as it encourages frequent use and interaction. (Naghizadeh, M.,2010)

By embedding these principles within the design, the Piroozan site becomes not just a local urban space but an integral part of a larger strategy for creating sustainable, inclusive, and vibrant cities.

It illustrates how thoughtful urban design can meet the diverse needs of a community while contributing to the overall goals of urban planning**.**

Integration of Sustainable Technologies and Practices

To maximize the sustainability of the Piroozan site, the integration of green infrastructure and sustainable technologies is essential. This includes:

- Solar Panels: Installing solar panels to provide lighting and energy for the space, reducing reliance on non-renewable resources.

- Plants with Therapeutic Properties:Utilizing native plants with therapeutic benefits that help reduce stress and improve quality of life.

- Waste Separation Areas: Designing and establishing appropriate locations for waste separation to promote environmental awareness and reduce pollution.

- Building Orientation for Optimal Light and Energy Use: Designing buildings to take advantage of natural light and orientation for optimal energy efficiency.

Conceptual Framework for Enhancing Welfare Through Design Interventions

The conceptual framework for enhancing welfare through design interventions at the Piroozan site should focus on creating a space that promotes health, well-being, and social interaction. This framework may include:

- Community Health Initiatives:Designing areas that encourage physical activity, such as walking paths, exercise stations, and playgrounds.

- Cultural and Educational Opportunities: Allocating spaces for workshops, performances, and community gatherings to foster cultural exchange and learning.

- Environmental Awareness Programs: Developing interpretive signage and programs that educate visitors about the local ecosystem and sustainability practices.

Conclusion

Chapter 5 provided an in-depth analysis of the Piroozan site in Shahrak-e-Gharb, highlighting its potential as a multifunctional urban space. This chapter emphasized the importance of integrating sustainable design principles, cultural preservation, and community engagement to create a space that enhances the well-being of residents. Below is a summary of the key findings and proposed interventions, as well as their alignment with the overarching objectives of this thesis.

Summary of Key Findings

Site-Specific Opportunities and Challenges:

Finding: The Piroozan site offers unique natural and geographical advantages, including its topography, central location, and proximity to diverse urban amenities, but faces challenges such as insufficient cultural and recreational spaces and zoning constraints.

Comment: The site's potential can be maximized through innovative design approaches that incorporate terraced architecture, native plants, and multifunctional spaces to address both its strengths and limitations.

Environmental Considerations:

Finding: The site's natural slope and environmental conditions present opportunities for sustainable practices such as stormwater management, solar energy integration, and the use of native vegetation.

Comment: By prioritizing ecological balance and environmental sustainability, the project can mitigate urban challenges like air pollution and heat islands while enhancing biodiversity and green coverage.

Social and Cultural Needs:

Finding: The site currently lacks inclusive spaces for recreation, social interaction, and cultural programming, limiting its potential to foster community engagement and well-being.

Comment: The integration of cultural elements such as Persian garden patterns and inclusive recreational facilities can preserve Iranian heritage and promote social cohesion while addressing contemporary urban needs.

Accessibility and Infrastructure:

Finding: The site is well-connected to transportation networks but requires enhancements such as bicycle paths, pedestrian-friendly zones, and inclusive amenities for individuals with disabilities.

Comment: Improving infrastructure and accessibility will ensure the site becomes a vibrant and inclusive space that caters to all demographics while reducing reliance on motorized transport.

Sustainable Design Interventions:

Finding: Incorporating renewable energy technologies, green infrastructure, and waste management systems into the site design aligns with global sustainability goals.

Comment: These interventions will position the Piroozan project as a model for environmentally conscious urban planning.

Alignment of Proposed Interventions with Overall Thesis Objectives

Sustainability and Resilience:

The proposed design integrates renewable energy sources, stormwater management, and native vegetation, contributing to a resilient urban environment. This aligns with the thesis objective of promoting sustainable urban development.

Cultural Preservation:

The incorporation of traditional Iranian architectural elements, such as Persian garden layouts and symbolic design motifs, ensures the preservation of cultural identity while meeting modern urban needs. This addresses the thesis goal of integrating heritage into urban planning.

Social Inclusivity:

Features such as inclusive playgrounds, multipurpose cultural spaces, and accessible pathways cater to diverse community needs, fostering social equity and engagement. This supports the thesis's emphasis on creating equitable and multifunctional urban spaces.

Community-Centered Approach:

Stakeholder engagement and community input are central to the project's design process, ensuring that the interventions reflect the aspirations of local residents. This aligns with the broader goal of fostering participatory urban development.

Final Remarks

The Piroozan project demonstrates how thoughtful urban design can address contemporary challenges while preserving cultural and environmental integrity. By integrating sustainable practices, fostering inclusivity, and prioritizing community engagement, the project creates a model for future urban spaces that enhance the quality of life for residents.

This project highlights the critical role of multifunctional public spaces in achieving sustainable urban development. It underscores the potential of such spaces to act as catalysts for environmental stewardship, social cohesion, and cultural preservation, ultimately contributing to the creation of resilient and vibrant cities. The lessons learned from the Piroozan project can inform similar initiatives in Tehran and other urban contexts, paving the way for a more sustainable and inclusive urban future.

Chapter 6

Piroozan site preliminary urban space proposal

Analysis of Land Uses in Shahrak-e Gharb and Their Impact on the Design of Piroozan Site

Master plan : The presented master plan provides an overview of the various land uses in Shahrak-e Gharb. This map is designed to analyze the surrounding context of the Piroozan site and examine the influence of adjacent land uses on its design and functionality.According to the presented master plan, the majority of social and welfare services are concentrated around Meydan-e San'at (San'at Square). This centralization has resulted in an uneven distribution of these services throughout the neighborhood, limiting easy access for all residents.

Figure 88 : Analysis of Land Uses in Shahrak-e Gharb.(Source:The Author)

Analysis of the Public Transportation Network in Shahrak-e Gharb

This map highlights the public transportation network in Shahrak-e Gharb. Bus routes are primarily located along Dadman Boulevard, Khordin Boulevard, and Farahzadi Boulevard. Additionally, there are only two metro stations in the neighborhood, which poses limitations on residents' access to fast and efficient transportation options.

Figure 89 : Analysis of the Public Transportation Network in Shahrak-e Gharb. (Source:The Author)

Analysis of Green Spaces in Shahrak-e Gharb

The inclusion of vegetation in urban sites and spaces offers numerous benefits. Vegetation improves air quality, reduces environmental pollution, and has a significant impact on lowering ambient temperatures and providing shade, especially in urban areas with high heat production. Moreover, integrating greenery with architecture fosters a culture of harmony between architecture and nature, encouraging people to strengthen their connection to the natural environment.To maximize the utility of green spaces, medicinal plants and trees with therapeutic properties can be incorporated. This approach not only enhances the aesthetic appeal but also provides additional health benefits, transforming the neighborhood into a space where residents can interact with nature while benefiting from the properties of these plants.

Figure 90 : Analysis of Green Spaces in Shahrak-e Gharb. (Source:The Author)

Analysis of Cultural Centers in Shahrak-e Gharb

This map illustrates the distribution of cultural centers in Shahrak-e Gharb and the surrounding area of the Piroozan site. The analysis highlights a significant lack of cultural spaces such as exhibition halls, art workshops, libraries, and amphitheaters in the neighborhood. This shortage is particularly evident in the vicinity of the Piroozan site, despite the abundance of educational centers nearby. Therefore, incorporating cultural spaces into the design of the Piroozan site is essential to address this need, providing an environment where students and young people can engage with cultural facilities and foster greater social and creative interactions.

Figure 91 : Analysis of Cultural Centers in Shahrak-e Gharb. (Source:The Author)

Analysis of Shopping Centers and Local Markets in Shahrak-e Gharb

This map shows the locations of shopping centers and local markets in Shahrak-e Gharb. As evident, most shopping centers are concentrated around Meydan-e San'at (San'at Square). This centralization limits access to shopping facilities for residents living in other parts of the neighborhood. Additionally, there is only one local market, which does not provide convenient access for all residents. This highlights the need for designing a complex that incorporates diverse shopping facilities, especially a local market, to ensure better access to shopping services for the entire community.

Figure 92 : Analysis of Shopping Centers and Local Markets in Shahrak-e Gharb. (Source:The Author)

Analysis of Educational Centers Around the Piroozan Site

This map shows the locations of educational centers around the Piroozan site. A significant number of educational facilities at all levels are present in this area, yet there are no recreational or cultural complexes to provide leisure opportunities for students. This highlights a strong case for designing and developing a multifunctional space. Proximity to these educational centers can encourage young people to visit cultural spaces such as art workshops, exhibitions, and libraries, fostering greater social interaction within the area.

Figure 93 : Analysis of Educational Centers Around the Piroozan Site. (Source:The Author)

Analysis of Cycling Routes and Opportunities for Sustainable Development in Shahrak-e Gharb

This map illustrates the cycling routes in Shahrak-e Gharb. Bicycle lane design is a relatively new initiative in Tehran, primarily focused on the city center and large open spaces. Across the city, cycling routes are very limited, and in Shahrak-e Gharb, only a small portion of two streets is dedicated to bicycle paths. Considering Tehran's severe air pollution, developing cycling routes should be a top urban planning priority to encourage the use of bicycles.

This lack highlights the necessity of promoting sustainable urban development through the design of bicycle lanes. Given the wide streets in Shahrak-e Gharb, all streets in this neighborhood have the potential to integrate bicycle paths. Such a route could pass through the Piroozan site, with bike stations positioned around the complex. Considering the abundance of educational centers in the area, this plan could encourage young people to commute to educational institutions and visit the Piroozan site without the need for personal vehicles.

Figure 94 : Analysis of Cycling Routes of Shahrak-E-Gharb. (Source:The Author)

Proposed Cycling Route for Sustainable Development in Shahrak-e Gharb

Figure 95 : Proposed Cycling Route for Shahrak-e-Gharb. (Source:The Author)

Climate ,Light and Wind Analysis at the Piroozan Site

This map not only analyzes wind patterns but also evaluates sunlight conditions at the Piroozan site and its surroundings. The direction of sunlight during different seasons significantly influences architectural design and the organization of open spaces. In summer, direct sunlight from the south and southwest can lead to excessive heat, emphasizing the need for shading and smart design strategies to reduce ambient temperatures. In winter, sunlight from the southeast serves as a desirable source of natural light and warmth.

Considering the interplay of wind direction and optimal sunlight, particularly for public spaces and buildings, can create environments with effective ventilation, efficient daylighting, and reduced energy consumption. Proper design can minimize overly exposed areas while maximizing the benefits of natural light.

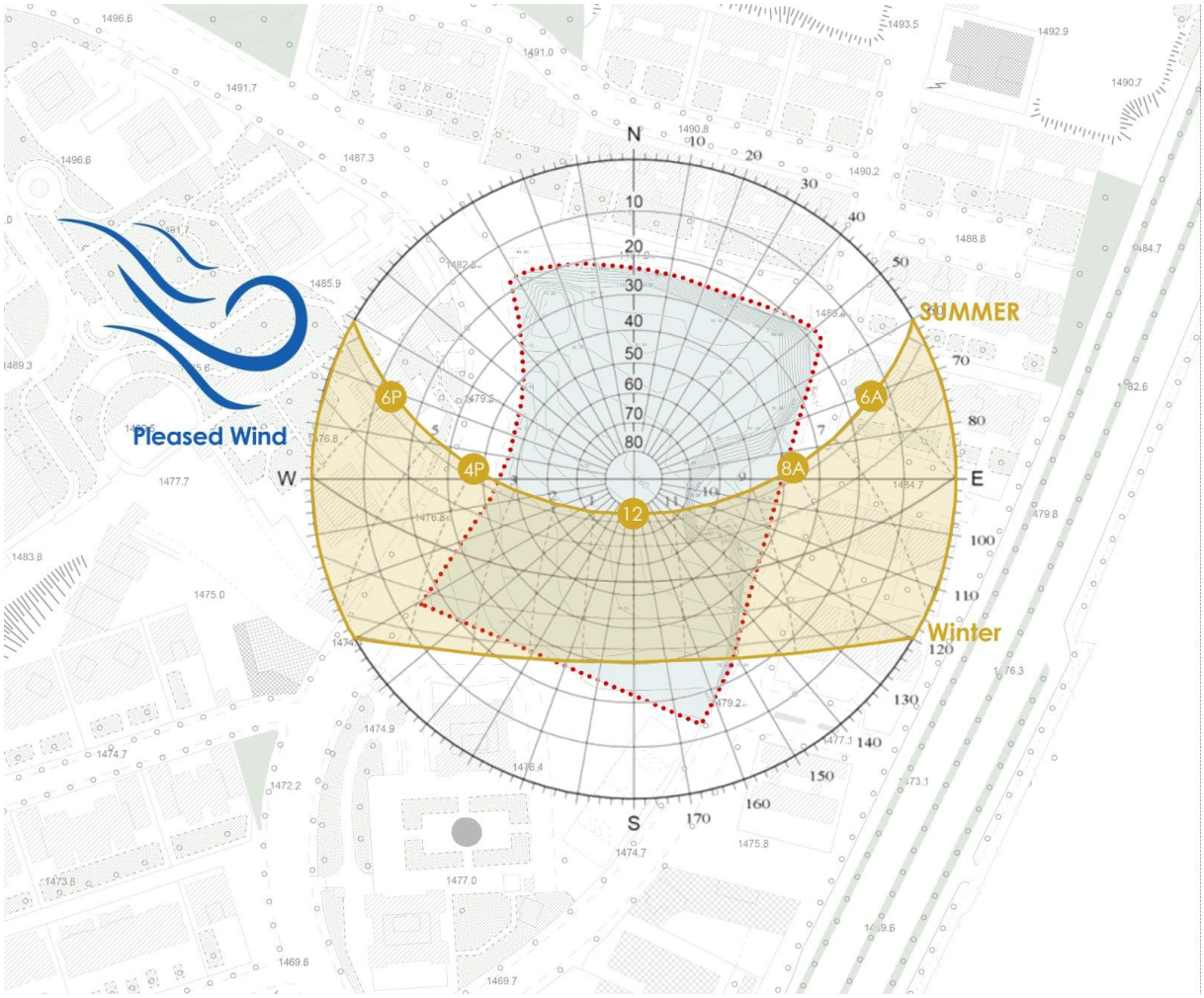

Figure 96 : Climate ,Light and Wind Analysis at the Piroozan Site. (Source:The Author)

Piroozan Site Design Process

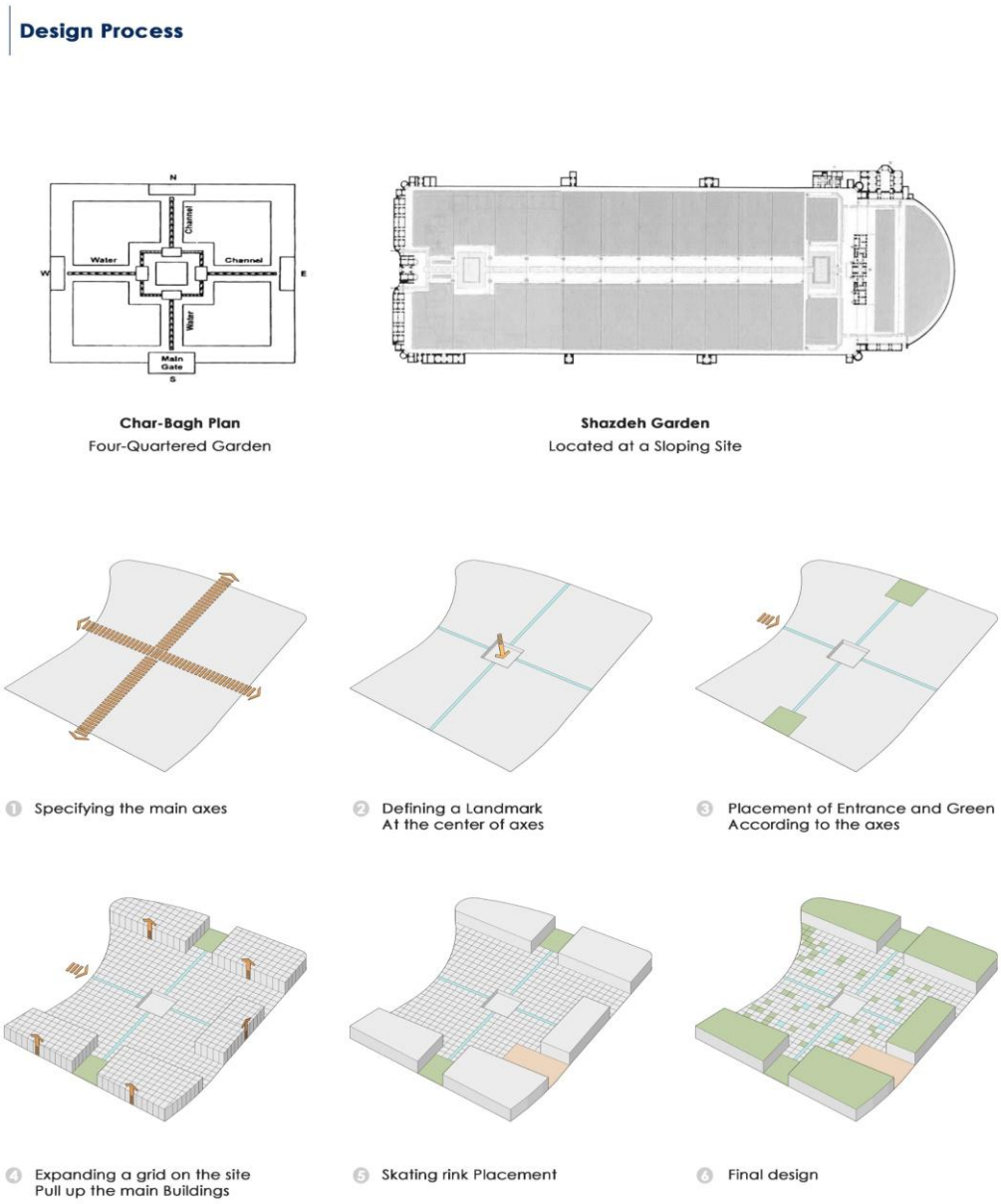

Figure 97 : Piroozan Site Design Process. (Source:The Author)

Step 1 : conceptualization and Initial Ideas

In the first stage of concept design, inspiration was drawn from traditional Iranian architecture, employing its grid system and open space divisions as the foundation of the design. The central area of the site was selected as the focal point and divided into four primary sections.

The primary spatial divider is a water pathway, a prominent feature of Iranian architecture. This pathway not only visually guides pedestrians along the main routes of the site but also establishes a symbolic connection with traditional Persian gardens. However, unlike traditional designs where a garden or a pool is typically placed at the center, the central area in this design has been replaced with an open-air amphitheater to align with the recreational and cultural function of the complex. This adaptation blends the spirit of Iranian architecture with contemporary functional needs.

Step 2: Defining Key Sections and Functional Focal Points

In the second stage of concept design, the four main sections of the site, located at the endpoints of the water pathways, were identified as key focal points. These sections were strategically designed to play significant and distinct roles within the site.

Each of these areas can be assigned different functions, such as cultural spaces (library, exhibition, or gallery), recreational areas (cafes, social interaction spaces), educational centers (workshops and learning facilities), and natural environments (green spaces or small gardens). The goal is to create a balance between open and enclosed spaces while enhancing social interaction throughout the

site. This division not only provides functional coherence to the complex but also connects the main movement pathways to the site's essential spaces

Step 3: Integration of Central Courtyards and Gardens

In the third stage of concept design, inspiration from Iranian architecture, with its emphasis on central courtyards, plays a pivotal role in organizing the spaces. In this phase, gardens are placed at the center of the northern and southern buildings of the site to reinforce the identity of Iranian architecture in the design. These gardens not only contribute to creating a sense of tranquility and connection with nature but also serve as visual and functional elements that balance the overall design.

The concept of central courtyards and gardens in Iranian architecture highlights the integration of nature with architecture. These gardens are designed as spaces for social interaction and relaxation and can enhance the site's environmental quality and appeal by incorporating native vegetation."

Step 4 : Strategic Placement of Primary and Secondary Spaces

In the fourth stage of concept design, the primary spaces, which define the key functions of the complex, are positioned at the endpoints of the water pathways to serve as focal points of the site. These primary spaces include cultural, recreational, or educational areas designed to facilitate user interaction and engagement.

Meanwhile, secondary structures that serve supportive and auxiliary roles are placed in the corners of the site. These spaces include a local market, restrooms, a children's playground, and a skate park. This strategic placement helps organize the site effectively, allowing optimal utilization of central and primary areas.

This design ensures that the secondary structures fulfill their functional roles without disrupting activities in the main pathways and focal areas. The combination of these elements enhances the cohesion and usability of the site while maintaining a balanced spatial distribution**.**

Step 5 : Determination of Main Entrance and Traffic Management

In the Fifth stage of concept design, the main entrance of the site is determined based on access analysis and environmental conditions. Due to the alignment of the site's western edge with the main street, the western edge is identified as the optimal location for the primary entrance. This placement facilitates user access to the site and ensures better traffic management.

The parking area is also positioned along the main street to provide direct and convenient access for users. Additionally, considering the presence of several schools along the eastern edge of the site, traffic in this area should be minimized to prevent congestion and ensure safety around the schools. This decision enhances accessibility, reduces environmental pollution, and improves the overall safety of the surrounding area.

Step 6 : Terraced Design and Topographical Adaptation

In the Sixth stage of concept design, the site's main structures are developed further, utilizing the terraced topography to create stepped layers for the buildings. This terraced design not only harmonizes with the site's natural features but also provides open spaces at each level.

The northern edge of the site, which has the greatest elevation difference from the ground, is identified as a key point in the design. Due to its panoramic view of the entire site, this area is an ideal location for creating a space where pedestrians and visitors can enjoy the overall view of the complex and its surroundings. Therefore, the rooftop of the northern building is designed to align with the level of Piroozan Street, offering an accessible and inviting space for social interaction and relaxation.

The building levels are composed of cubic and rectangular forms stacked in a stepped arrangement, inspired by the complexity and uniqueness of the stepped houses in the village of Masuleh. This design serves as a symbol of the fusion of tradition and modernity in the architecture of the Piroozan site.

Step 7 : Detailing and Facade Identity

In the sixth stage of design, additional details are incorporated to give the site a distinctive identity. The exterior facades of the buildings are inspired by the openings seen in Masuleh's architecture. These facades are oriented towards the sunlight to create dynamic and unique reflections of light.

Additionally, a signature facade is placed at the entrance of the complex, serving as a representation of the site's main concept and welcoming visitors with its symbolic design.

Staircases are introduced for each building to connect all levels seamlessly. Following the Masuleh model, each rooftop doubles as the courtyard for the building above it, and all the structures are interconnected via their roofs. This design fosters social interaction and reinforces the site's stepped, dynamic identity.

To unify the entire complex and eliminate any sense of disconnection, the ground surface is transformed into irregular rectangular prisms that align with the building forms. This approach ensures visual harmony and creates a cohesive relationship between the architecture and the landscape. Ultimately, the Piroozan site becomes a composition of numerous irregular cubes and rectangular prisms, presenting a unified yet dynamic design.

Step 8 : Nature Integration and Final Design Enhancements

In the final stage of design, the focus is on integrating nature with architecture while adding final details that enhance the site's identity and functionality. Vegetation is strategically placed across the site, including rooftops, courtyards, and open spaces, to strengthen the connection to nature. Seating areas are also thoughtfully designed throughout the site to create a welcoming and pleasant environment for social interaction and relaxation.

To promote sustainability, solar panels are installed in well-lit areas to harness renewable energy and support part of the site's energy needs. Additionally, turquoise-tiled water basins, inspired by

traditional elements of Iranian architecture, are incorporated into various parts of the site. These basins not only contribute to cooling the environment but also add an element of cultural and aesthetic value to the complex.

Flat pathways are also introduced to accommodate individuals with limited mobility and cyclists, ensuring accessibility for all users. These paths are designed with standard slopes and connect seamlessly to all areas of the site. The final stage, with its emphasis on the integration of nature, architecture, and functional and visual details, transforms the Piroozan site into a model of sustainable, inclusive, and culturally inspired design.

Representation of Functions and Design Details of Piroozan Site

In this section, the final plans of the Piroozan site are presented, illustrating all functions, design details, and the interconnections between various spaces of the complex. These plans include:

Figure 98 : Proposed Functional Layout Plan for Piroozan Site. Showcasing the placement of primary and secondary spaces, such as the cultural building, cafes and restaurants, fitness club, shopping centers, the open-air amphitheater, and the local market. (Source:The Author)

Figure 99 : Proposed Green and Water Feature Plan for Piroozan site. the designed green spaces and turquoise-tiled water features inspired by Iranian architecture. These elements not only enhance the visual appeal but also foster a sense of tranquility and connection with nature. (Source:The Author)

Figure 100 : Proposed Movement Pathways Plan for Piroozan site. Highlighting access routes, including pathways specifically designed for individuals with limited mobility and cyclists. These pathways ensure easy accessibility to all parts of the site. (Source:The Author)

These plans represent the harmony between architectural design, nature, and user needs, showcasing how functional spaces are seamlessly integrated with architectural forms and the surrounding environment.

3D Renders of the Piroozan Site: Overall View and Design Details

In this section, 3D renders of the Piroozan site are presented, showcasing the overall design and key details of the project. These renders highlight the integration of architecture, nature, and various functions within the site and include the following:

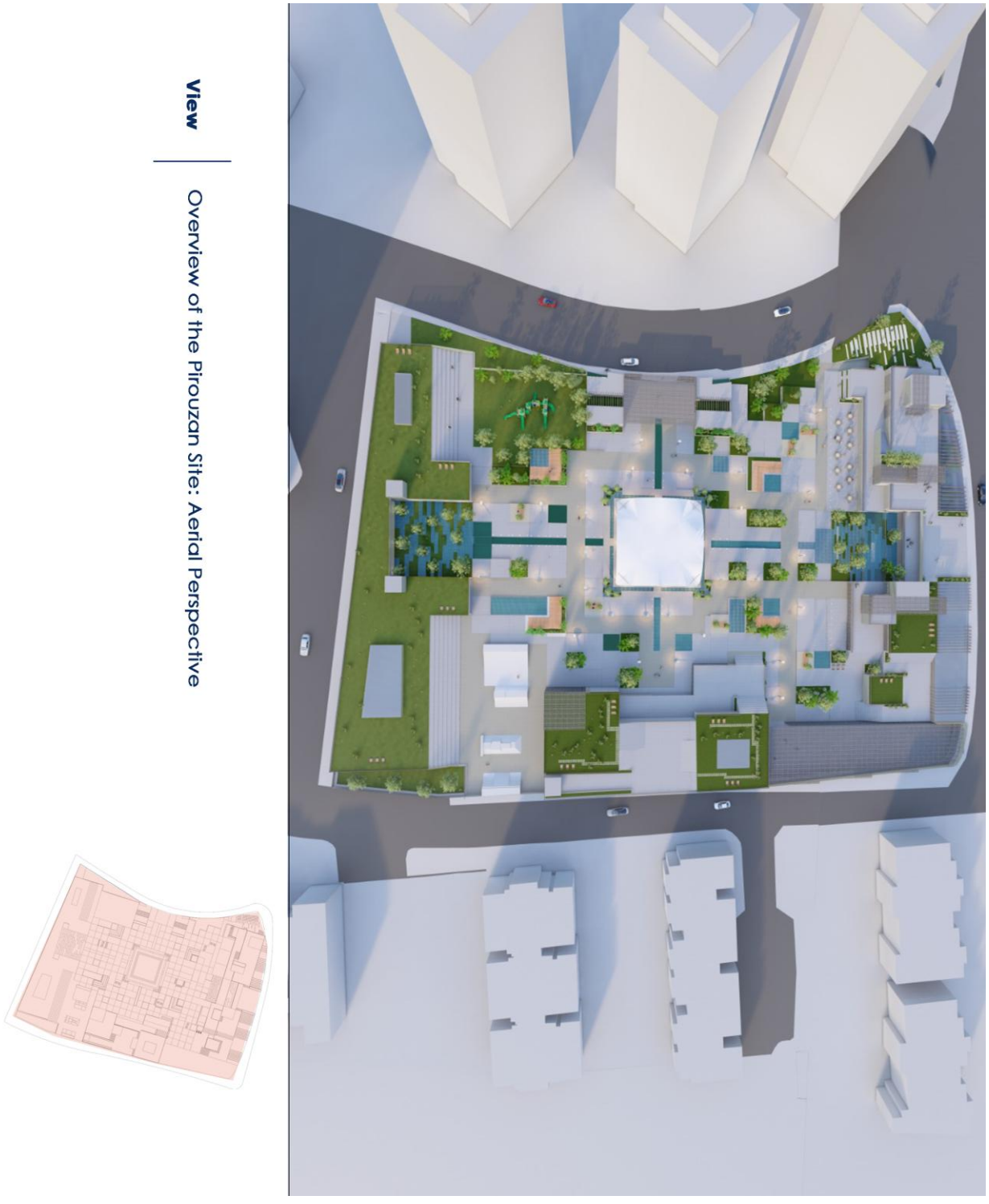

Figure 101 : Aerial perspective,A comprehensive image of the entire complex, illustrating the arrangement of buildings, open spaces, and pathways. The site courtyard is composed of irregular rectangular prisms, designed in alignment with the pattern of the main buildings. (Source:The Author)

View | North Buildings

Figure 102: View of the Designed Northen buildings. This image shows the northern buildings of the site. It includes a cafe, restaurant, gym, local market, restrooms, and the secondary entrance. Parts of the courtyard, the eastern building, the main entrance, and the open-air amphitheater are also visible. The Northern Buildings are Inspired by the Architecture of Masuleh Village, with all buildings connected via their rooftops. The main buildings are also linked by staircases that serve as connectors and provide seating areas. Additionally, each building is equipped with an elevator extending to the rooftop to ensure accessibility for individuals with limited mobility. The external facade shells of the northern building have been designed as it is oriented toward sunlight exposure. (Source:The Author)

Figure 103: View of the Designed South buildings. This image showcases the southern part of the site, featuring the cultural building. It also highlights part of the skate park, the children's playground, the courtyard, and the eastern building. The southern building, due to its orientation opposite to the optimal sunlight direction, features skylights on the rooftop and walls of the atrium area. (Source:The Author)

Figure 104 : This image showcases the eastern building of the site, which includes commercial spaces, a shopping center, a food court, and a cinema.Like other buildings, they are connected to each other via staircases, and their external facade is oriented to optimize sunlight exposure. (Source:The Author)

Figure 105: View of the Designed Local Market, A space designed to provide local services to residents and visitors. (Source:The Author)

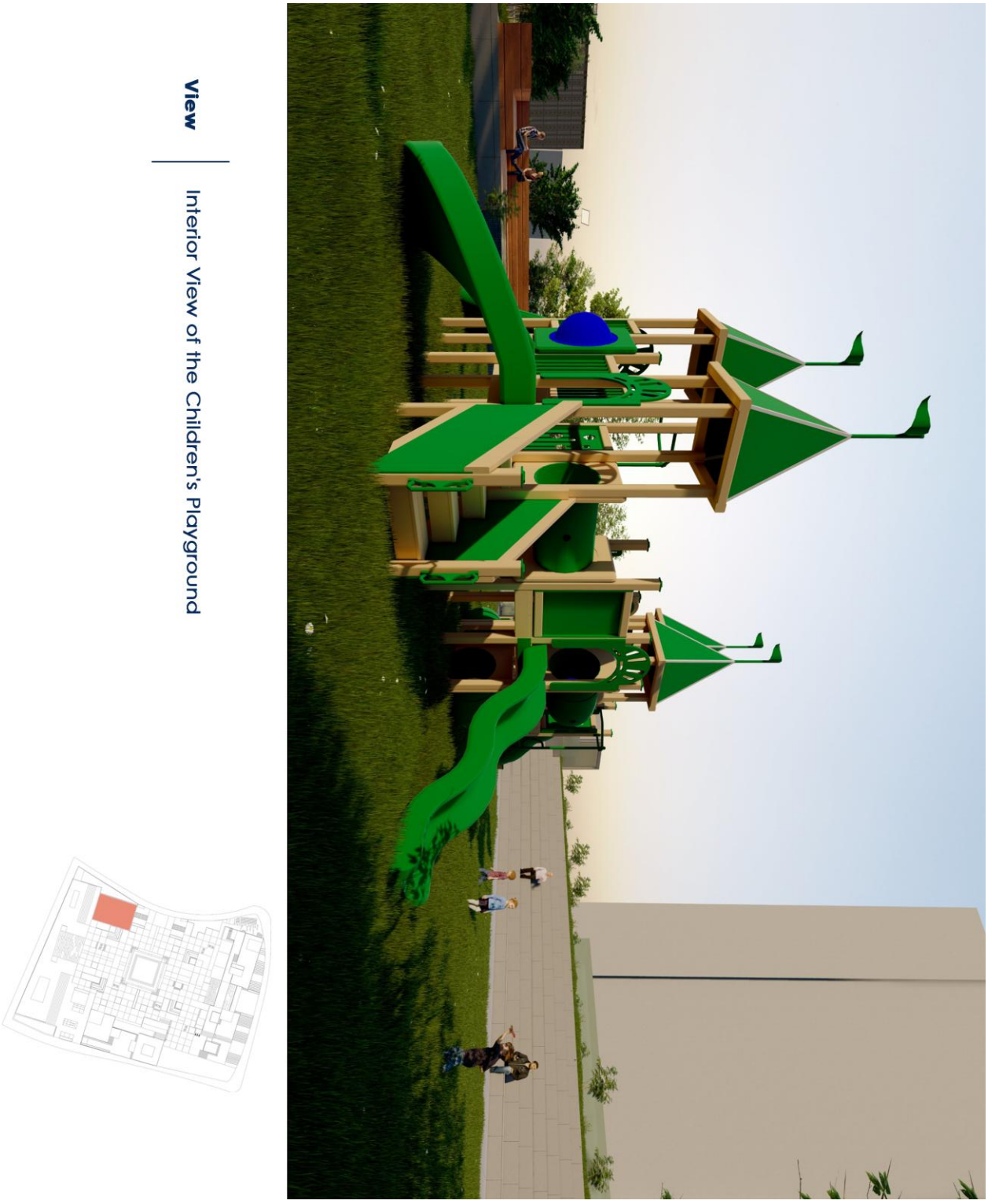

Figure 106: Interior view of the designed children’s play ground, An area dedicated to providing a safe and engaging environment for children. Children's Playground Accessible for Kids with Disabilities. (Source:The Author)

Figure 107 : View of the site from the children's playground, View from the Playground to the Site Courtyard, Featuring Seating Areas for Parents Overlooking Both the Playground and the Site. (Source:The Author)

Figure 108: Site entrance view from Hormozan street, Site Entrance: Detailed views of the main entrance, acting as the connection point between the site and its surroundings. Main Entrance of the Site Featuring Key Design Elements, Including Facades Inspired by Masuleh Openings, Water Flow in the Facade, and Vegetation. (Source:The Author)

Figure 109: View of the site from Hormozan street entrance. View from the Main Entrance into the Site, Showcasing Key Elements and a Tunnel of Light Reflection with Iranian Patterns, Creating a Stunning Visual Experience. (Source:The Author)

Figure 110: Open-Air amphitheater, South view of the Piroozan site, A cultural and social space located at the heart of the site, accommodating various events. (Source:The Author)

Figure 111: Social interaction Area in the North of the site with restroom place, Stepped Design of the Northern Building, Offering Social Interaction and Seating Areas, with an Open-Air Cafe and Restrooms Underneath One of the Steps. (Source:The Author)

Figure 112 : Site courtyard and seating area. View of the Site Courtyard Highlighting Design Details and Seating Areas Distributed Across the Site. (Source:The Author)

Figure 113: Secondary entrance with panoramic view, A perspective that offers a unique view of the entire site from above. "The Northern Building Offers Stunning Visuals of the Site, Including a Secondary Entrance Accessible from the Street, Providing Pedestrians with an Elevated View of the Site. Additionally, a Glass Bridge Connecting Two Buildings Passes Through Trees and Over Water, Creating a Unique Experience for Visitors. (Source:The Author)

Figure 114: View of Designed Central Courtyards of the Buildings, Central Courtyards of the Buildings: Inspired by Iranian architecture, these courtyards emphasize interaction with nature and open spaces. The Central Courtyard, Inspired by Iranian Architecture, Features Water Elements and Trees. This Atrium is Located in the Northern and Southern Buildings, with the Water Flow Across the Site Guiding Visitors to This Central Space. (Source:The Author)

Figure 115 : View of Designed roof tops, Green Rooftops: Incorporating vegetation on rooftops to create sustainable and eco-friendly spaces. "Rooftop with Vegetation and Seating Areas, Designed for All Main Buildings as a Model for Integrating Architecture and Nature. (Source:The Author)

Chapter 7

Final Conclusion

This research has thoroughly explored the challenges and opportunities of creating a multifunctional, sustainable urban space in Shahrak-e-Gharb, a modern but rapidly evolving neighborhood in Tehran. By integrating insights from Iran's rich urban planning history, cultural heritage, and contemporary needs, the study proposes actionable strategies to enhance the social welfare and quality of life for residents. The outcomes highlight the transformative potential of sustainable urban planning when deeply rooted in cultural and historical values.

Importance of the Research

The study underscores the pressing need for innovative and sustainable solutions in urban planning, especially in rapidly developing neighborhoods like Shahrak-e-Gharb. This research is significant not only for addressing local challenges but also for offering a replicable model for other urban areas in Tehran and beyond. By bridging the gap between tradition and modernity, the proposed design for the Piroozan site demonstrates how Iranian architectural heritage can be preserved while addressing contemporary urban issues such as social equity, environmental sustainability, and community cohesion.

Key Findings

Cultural Preservation in Urban Design:

The study highlights the importance of incorporating Iranian architectural elements—such as water features, Persian grid layouts, and symbolic design patterns—into modern urban spaces. These elements foster a sense of identity and cultural pride while enhancing the aesthetic appeal of the neighborhood.

Sustainability and Environmental Impact:

Addressing environmental concerns, such as air pollution and urban heat islands, is central to the proposed design. Features like green corridors, native vegetation, and solar-powered infrastructure align with global sustainable development goals and improve residents' quality of life.

Social and Recreational Spaces:

The lack of accessible cultural and social spaces in Shahrak-e-Gharb is a key issue. The research emphasizes creating inclusive environments, such as community hubs, youth-focused recreational areas, and spaces for people with disabilities, to enhance social interaction and community well-being.

Integration of Modern Infrastructure:

The proposed cycling paths, pedestrian-friendly designs, and public transportation improvements not only reduce traffic congestion and air pollution but also encourage healthier and more sustainable lifestyles.

Flexibility and Multifunctionality:

The design for the Piroozan site incorporates flexible spaces capable of adapting to diverse community needs, from cultural festivals to recreational activities. This ensures year-round usability and long-term relevance.

Recommendations

Based on these findings, the research proposes the following key interventions:

Sustainable Urban Spaces:

Design green corridors, incorporate renewable energy systems, and prioritize natural resource conservation to create resilient urban environments.

Cultural Integration:

Revive Iranian architectural heritage by integrating traditional design principles into modern urban structures.

Community-Centered Planning:

Engage residents in the planning process to ensure the proposed spaces meet their needs, fostering a sense of ownership and belonging.

Inclusive and Accessible Design:

Incorporate facilities for all demographics, including children, the elderly, and individuals with disabilities, to promote social equity.

Educational and Awareness Programs:

Develop community programs focused on sustainability, cultural preservation, and environmental awareness to instill long-term values among residents.

Broader Implications

This research holds broader implications for urban planning in Iran and other developing regions. It offers a comprehensive framework for balancing modern infrastructure demands with cultural preservation and sustainability. The lessons learned from the Piroozan project can guide policymakers, architects, and urban planners in shaping cities that are not only functional but also culturally meaningful and environmentally resilient.

Final Thoughts

The design and development of the Piroozan site represent a shift toward a new era of urban planning in Iran, where tradition and modernity converge. This research advocates for a human-centered approach, emphasizing the importance of public spaces as catalysts for social interaction, environmental health, and cultural continuity. By addressing the unique challenges of Shahrak-e-Gharb, this study contributes to a broader vision of creating inclusive, vibrant, and sustainable cities that honor their past while embracing the future.

In conclusion, this work offers a pathway to redefining urban spaces in Tehran and beyond, highlighting the potential of sustainable urban design as a tool for social, cultural, and environmental transformation.

Chapter 8

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