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Developing a Sustainable Urban Mobility Plan for Tehran

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1 Introduction

1.1 Summary of Tehran's Sustainable Urban Mobility Plan

Tehran, the dynamic capital of Iran, houses over 8 million people and is experiencing rapid urban growth, which presents significant transportation and environmental challenges. Despite advancements in public transportation, issues like traffic congestion and air pollution persist, exacerbated by the city's geographical constraints. Our Sustainable Urban Mobility Plan aims to transform Tehran's transportation landscape, focusing on sustainability, efficiency, and improving the quality of urban life.

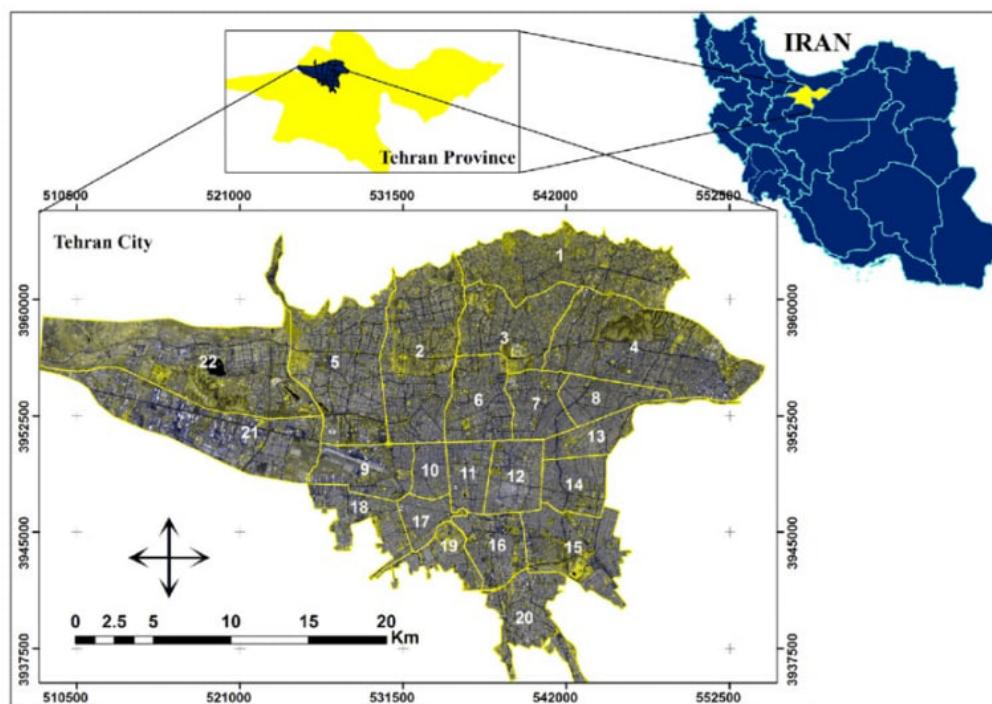


Figure 1: Map of the study area, Tehran, Iran.

1.2 Objectives of the SUMP

The plan is committed to ensuring universal mobility by creating an inclusive and accessible transport system. It emphasizes the integration of various transport modes to ensure seamless transit experiences. A key focus is on sustainability, aiming to balance economic viability with environmental and social equity. The plan also targets the optimization of the transport network's efficiency and cost-effectiveness. Improvements in urban spaces and infrastructure are vital, as is enhancing the attractiveness of the urban environment and public health. A significant aspect is the emphasis on traffic safety and

security, along with concerted efforts to reduce air and noise pollution, greenhouse gas emissions, and energy consumption.[7]



1.3 Methodology Overview



Figure 2: The 12 Steps of Sustainable Urban Mobility Planning

The methodology for the SUMP follows a structured and participatory approach, beginning with a preparatory analysis to assess Tehran's urban mobility situation and identify stakeholders. This phase establishes a comprehensive understanding of the city's transportation needs and challenges. Following this, the strategy development phase involves analyzing gathered information to pinpoint key mobility issues and opportunities, creating a vision and setting specific objectives. The subsequent measure planning phase involves selecting effective measures to meet these targets, which are then integrated into a cohesive action plan. The final phase focuses on implementing these measures, with mechanisms for continuous monitoring and adjustment to meet the evolving needs of the city.

The approach to developing the SUMP should be comprehensive, involving in-depth research, community collaboration, and strategic execution. It began with gathering critical data on Tehran's demographics, transportation infrastructure, and land use, considering broader socio-economic and environmental contexts. This was followed by identifying pressing mobility challenges and forming strategies through stakeholder input and critical analysis. The plan was brought to life through careful measure planning and

execution, ensuring practicality and effectiveness, and continuously adapted to align with Tehran's changing dynamics.

In summary, Tehran's Sustainable Urban Mobility Plan is a dynamic and adaptable framework, crafted to address the unique challenges of the city and enhance its urban mobility landscape. It represents a commitment to a sustainable, efficient, and vibrant urban environment, meeting the needs of its residents now and in the future.

2 Building Knowledge

2.1 General Information about Tehran

Tehran, Iran's bustling capital, is undergoing rapid growth and faces various urban and transportation-related challenges. With a burgeoning population exceeding 8 million, the city confronts issues like significant traffic jams and environmental concerns, primarily due to heavy reliance on personal vehicles and inadequate public transit systems. Additionally, Tehran's unique geographical setting, surrounded by mountains, poses further challenges to its urban development and expansion. These factors underscore the urgency for effective and sustainable urban mobility solutions to ensure balanced economic development, environmental preservation, and improved quality of life for its inhabitants.[7]

2.1.1 Modal share in Tehran

In Tehran, the shift towards private vehicle usage has intensified traffic congestion and environmental issues, despite the city's efforts to enhance its public transportation systems. The expansion of the metro and bus networks reflects Tehran's commitment to improving urban mobility and addressing the rising demand for efficient transport. However, the challenge remains in effectively balancing this growing reliance on personal vehicles with the need to promote sustainable, eco-friendly transportation options within the city's evolving urban landscape.[3]

1. Private car and Motorcycle: In the context of Tehran's transportation landscape, the predominant mode of travel is private transport. This mode of transportation exhibits the highest share among all travel options, surpassing other alternatives.[2]
2. Metro: Urban transportation, particularly public transit stations like metro stations, plays a pivotal role in shaping urban development and economic dynamics in cities. Access to public transportation not only enhances mobility and reduces transportation costs but also significantly impacts the quality and economic value of

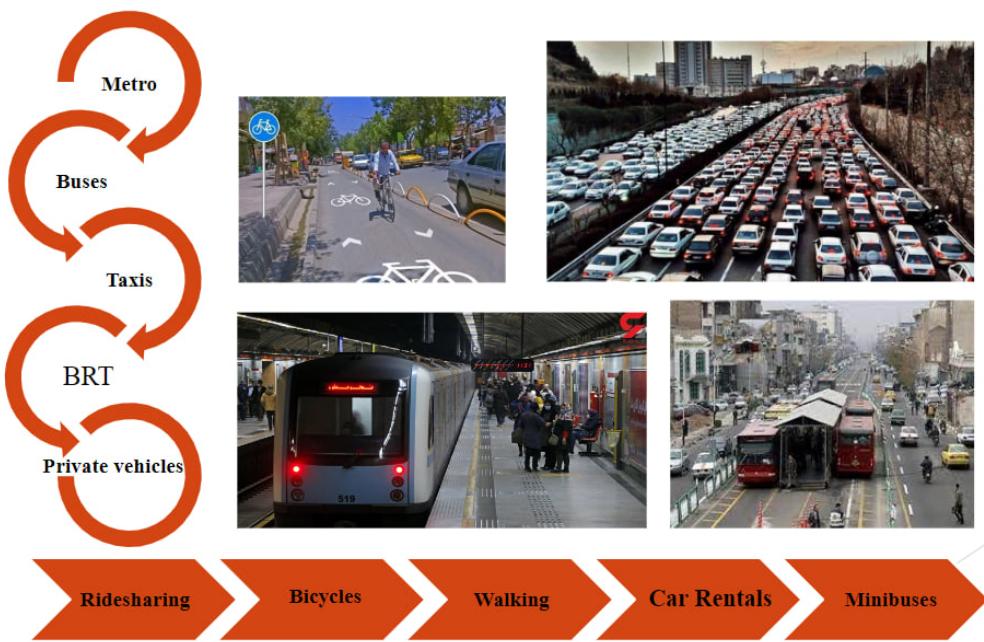


Figure 3: Modes of transport that supply in Tehran:



Figure 4: Private car and Motorcycle

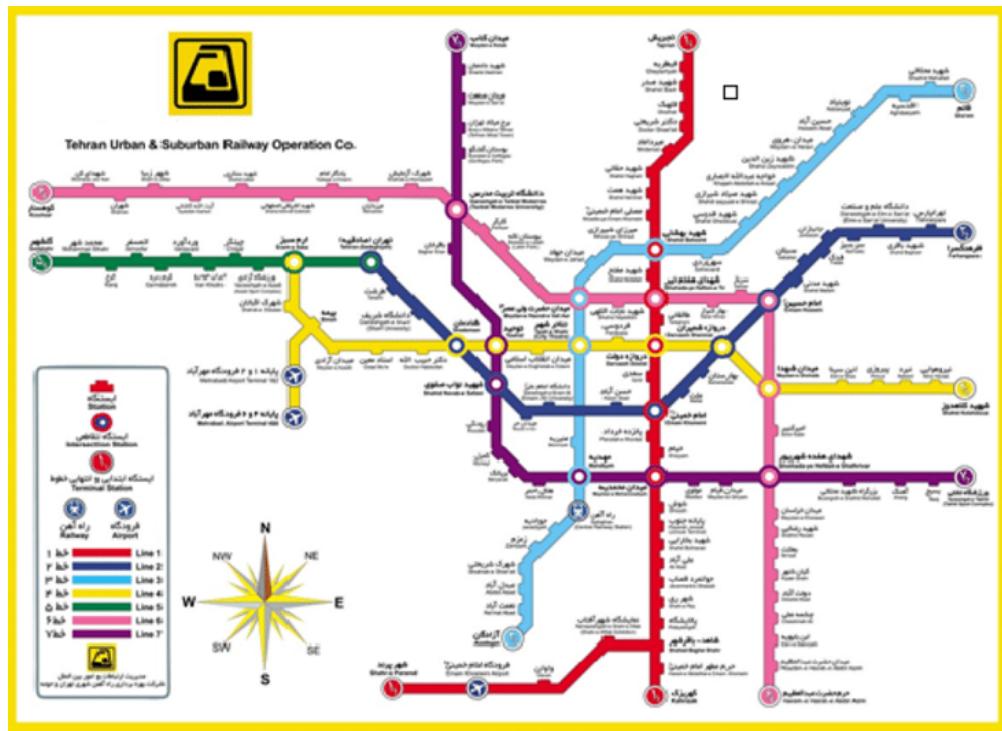


Figure 5: Metro map

adjacent areas. In the context of Tehran, where stark socio-economic disparities exist between affluent northern neighborhoods and economically challenged southern regions, the impact of metro stations becomes particularly relevant. A study conducted in Tehran aimed to assess how metro stations affect different areas, comparing the changes in property values, before and after the stations' opening. Surprisingly, the findings revealed that metro stations exert a more positive influence on property values in economically disadvantaged neighborhoods. This suggests a potential avenue for reducing socio-economic disparities in Tehran and promoting urban integration. This insight underscores the importance of public transportation in urban planning and development efforts, with the goal of addressing socio-economic gaps and enhancing urban quality.[8]

3. BRT and Urban Bus: Bus Rapid Transit (BRT) in Tehran is a robust and efficient public transportation system designed to alleviate the city's transportation challenges. This system, reminiscent of a light rail or metro system, primarily employs buses operating in dedicated lanes separated from regular traffic. Tehran's BRT system is characterized by its well-designed and enclosed stations, providing passengers with a comfortable waiting environment and equipped with modern amenities, including ticketing systems and real-time information displays. The use of high-capacity buses, prioritized intersections, and frequent service intervals

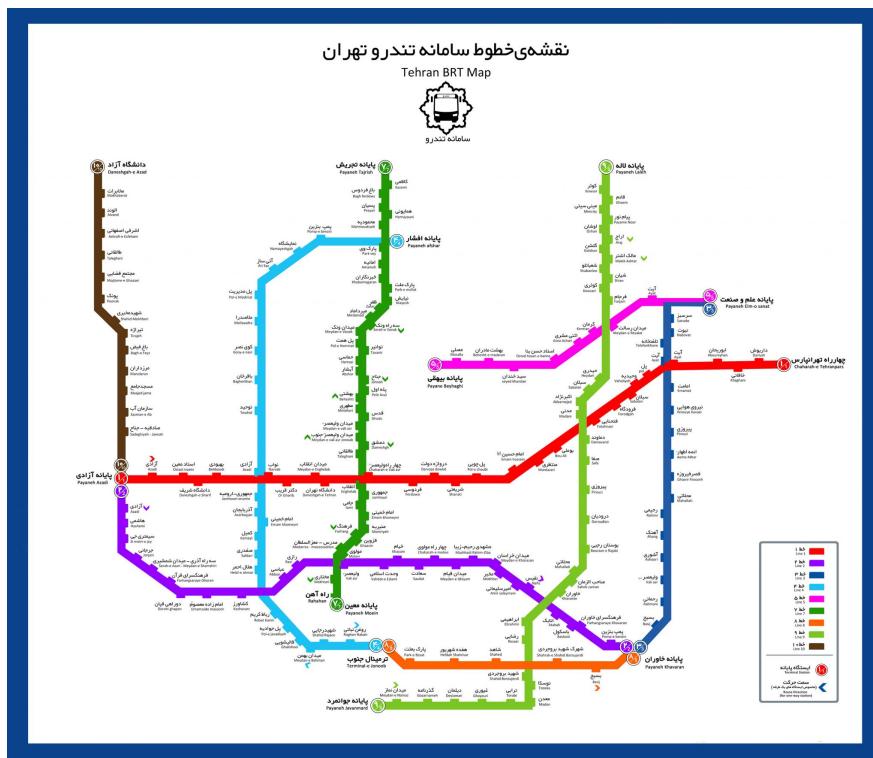


Figure 6: BRT map

distinguishes Tehran's BRT system. BRT buses in the city often benefit from priority at intersections, with traffic signals adjusted to expedite their passage. This prioritization significantly reduces congestion and improves the overall efficiency of the system. Moreover, passengers can expect reduced waiting times due to the high-frequency service provided by BRT, allowing buses to arrive at stations more frequently than traditional city bus routes. To further enhance efficiency, Tehran's BRT system employs modern fare collection methods, such as pre-paid tickets and smart cards, streamlining the boarding process. By offering these features and services, Tehran's BRT system aims to provide an effective and convenient public transportation option, ultimately contributing to reduced traffic congestion and improved air quality in the city. [1]

2.1.2 Sustainable mobility policies that apply in Tehran

Various policies, projects, and plans have been developed over time to illustrate the government's commitment to developing an effective and productive urban transportation system for the city. These actions have been carried out by several government departments and agencies in accordance with their responsibilities, with the help of stakeholders from the private sector (businesses and operators), civil society, and

international development agencies.

1. Traffic plan: There are two kinds of traffic plan to restrict private cars in Tehran:

First: traffic management plans like "pair and odd" or "even and odd" refer to rules that restrict vehicles from using the roads on certain days based on the last digit of their license plate numbers. For example, on odd days, cars with license plates ending in an odd number can use the roads, while on even days, cars with license plates ending in an even number can use the roads. These plans are often implemented to help reduce traffic congestion and pollution.

Second: Traffic Zones, Tehran had traffic zones with specific entry restrictions for vehicles without the necessary permits. These zones aimed to reduce traffic congestion in certain areas of the city, primarily during peak hours

2. walking path: Tehran has several areas that are popular for walking and recreational activities. While the availability of walking paths and specific areas for walking can vary, below there are some well-known places where people allowed walk in Tehran.

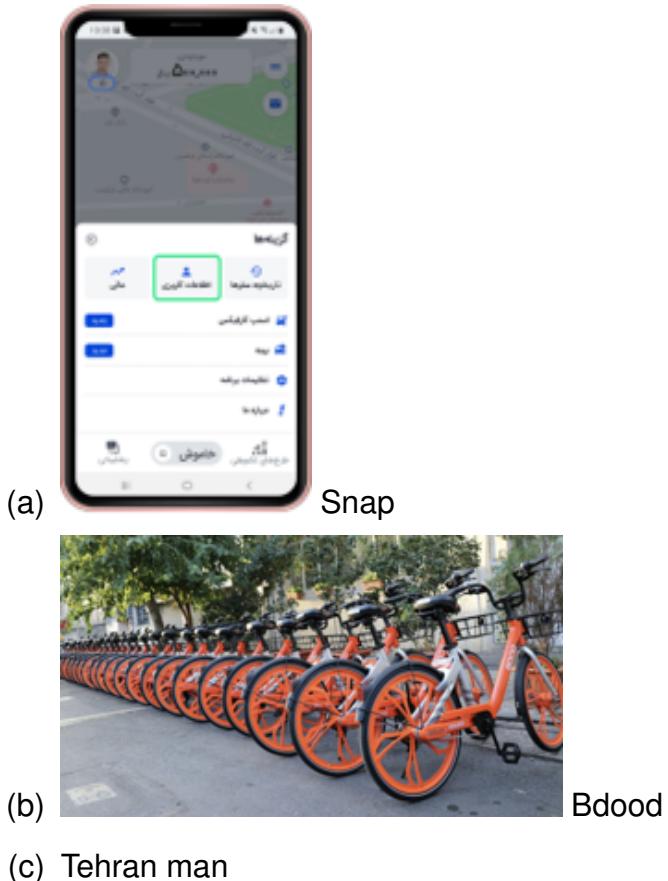
- **Grand Bazaar of Tehran (Bazaar-e Bozorg):** Tehran's Grand Bazaar is one of the oldest and most extensive bazaars in the Middle East. People can wander through street specific for walking around Grand bazar, admire the architecture, and explore the many shops and stalls. Be prepared for a bustling and lively atmosphere.
- **Tabiat bridge:** Tabiat bridge is a prominent modern architectural and pedestrian bridge that has become a popular landmark in the city. "Tabiat" means "Nature" in Persian, and the bridge was designed with a nature-inspired theme, offering a peaceful escape in the midst of the bustling city.

3. Bicycle path and possibility for bike sharing: In many streets of Tehran there are bicycle path and possibility to use bicycle-sharing programs.

4. Underground space: Tehran is one of the city's major thoroughfares, and it's known for its heavy traffic. To alleviate congestion and improve pedestrian safety, Tehran Municipality has worked on various projects, including the construction of underground passages at busy intersections. One such underground passage is located at the intersection of Valiasr Street and Taleghani Avenue. This underground passage allows pedestrians to safely cross Valiasr Street, which is a very busy and wide road with multiple lanes of traffic. These underground passages are equipped with ramps, stairs, and escalators, making it easier for pedestrians to

access the underground crossing. They are typically well-lit and provide a secure and efficient means for pedestrians to navigate the busy city streets.

5. Transportation applications:



2.1.3 land use in Tehran

Tehran's urban landscape is marked by a distinctive pattern of land use, reflective of its rapid urbanization and population growth. The city's expansion into surrounding areas has led to a blend of residential, commercial, and industrial zones, often resulting in dense urban development. This growth, while contributing to the economic vibrancy of the city, also poses challenges in urban planning and management, particularly in terms of sustainable land use and transportation integration. The effective utilization of land in Tehran is crucial for balancing urban development with environmental sustainability and quality of life.[3]

2.2 Challenges in Tehran

1. Traffic Congestion: A significant issue due to heavy reliance on private vehicles, leading to extended travel times and decreased urban mobility.

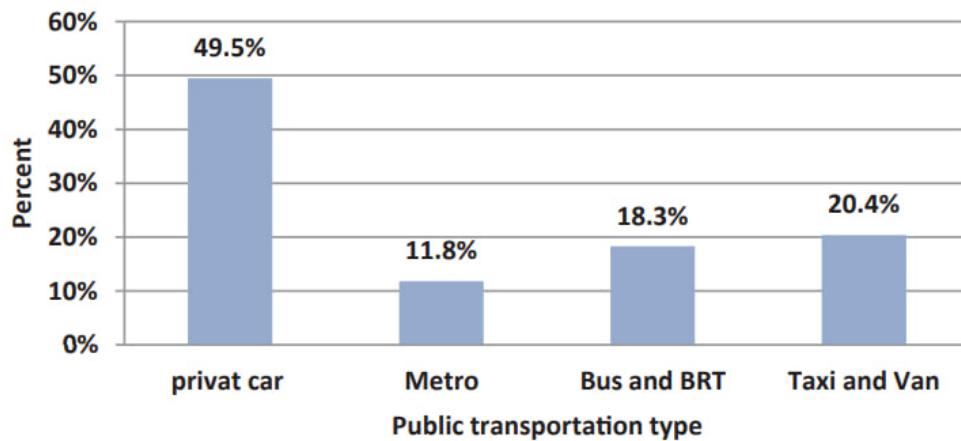


Figure 7: The distribution of daily trips of public transportation types in Tehran (2015)[11]

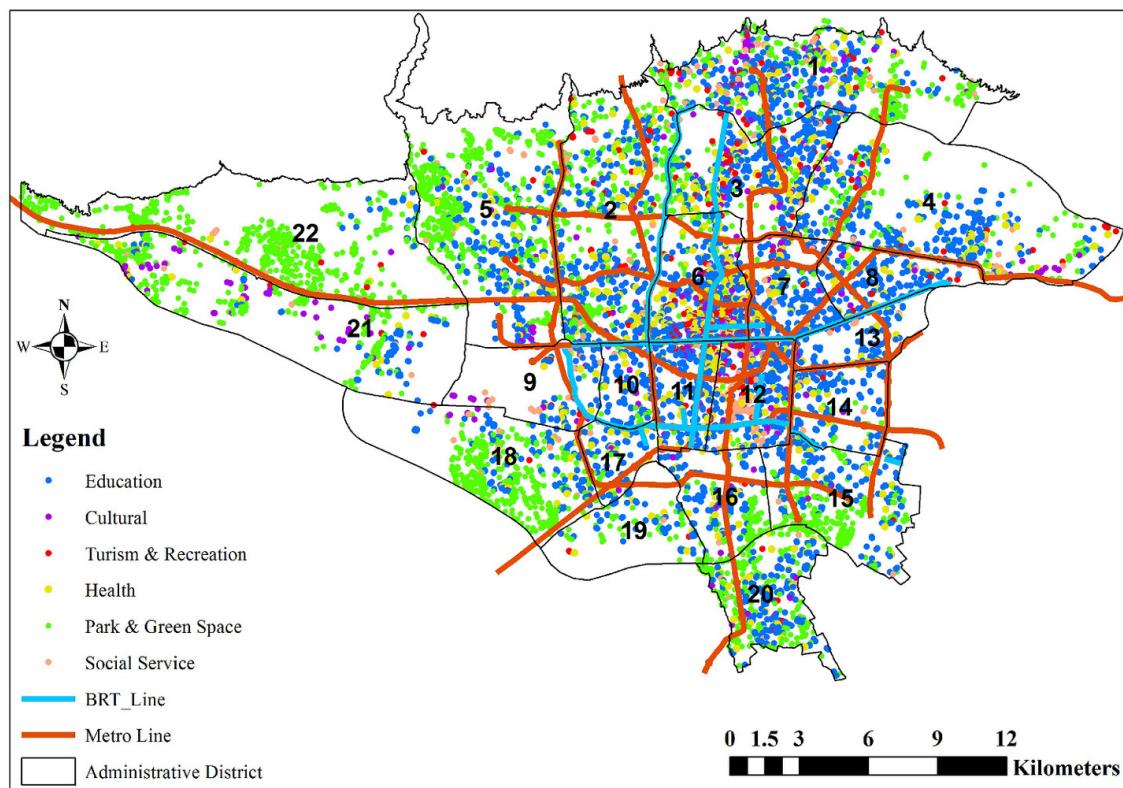


Figure 8: Spatial distribution of urban Services in Tehran (Tehran municipality database, land-use map information of Tehran's city current situation).

2. Air Pollution: Resulting from vehicular emissions and industrial activities, this challenge has serious health and environmental implications.
3. Inadequate Public Transportation: Despite improvements, the public transport system still struggles to meet the growing demand.
4. Urban Sprawl: Rapid expansion of the city into surrounding areas, causing strain on infrastructure and services.
5. Socio-Economic Disparities: These disparities lead to unequal access to transportation and urban resources.
6. Geographical Constraints: Tehran's location, surrounded by mountains, limits expansion options and contributes to high urban density.

[3]

3 Preparation and Analysis

Definitions:

Urban centers (UCs): Densely populated areas with at least 50,000 inhabitants and the density of 1,500 inhabitants per square kilometer.

Functional urban areas (FUAs): They are composed of urban centers and their surrounding areas of influence (Commuting zone). FUAs approximate the boundaries of the whole metropolitan areas around urban centers.

3.1 Physical indicators

3.1.1 Geographic information

Tehran is considered a functional urban area that consists of the main metropolitan area of Tehran and its commuting zone. In other words, Tehran is a densely populated city, and due to its labor market, some less densely populated zones are highly integrated with the city. There are some areas with travel attraction use around Tehran that are located in other policy domains but they have noticeable roles in increasing urban mobility of Tehran. The western part of Tehran, particularly the city of Karaj and its surrounding areas, has several industrial zones and sectors that attract people to work in the region. These industrial areas offer employment opportunities in various sectors, contributing to the population influx. The eastern part of Tehran offers unique opportunities and characteristics that make it an appealing destination for residents and commuters.



Figure 9: Map of Tehran and some towns around Tehran

3.2 Socio-Economic indicators

3.2.1 Population

For the past three decades, Iran has seen incredible urbanization and population increase, resulting in a lack of resources, damage to the environment, and unplanned landscape development [2]. The population of Tehran city and the Tehran Metropolitan Region (TMR) increased dramatically between 1976 and 2016 (so 1975-2015 includes), with Tehran city increasing from 2.7 to almost 8.73 million, Tehran periphery cities increasing from 417,000 to 7.24 million, and the TMR increasing from 3.13 to 15.98 million. These changes would be spatially manifested as urban sprawl and decline [10]. The population of Tehran is around 9.5 million people in 2023. According to the website of worldcitiespopulation.org population of Tehran from 1975 to 2015, there was an upward trend in urban centers and a downward trend in functional urban areas. The population rate and its trend during these years are illustrated in the figure 10.

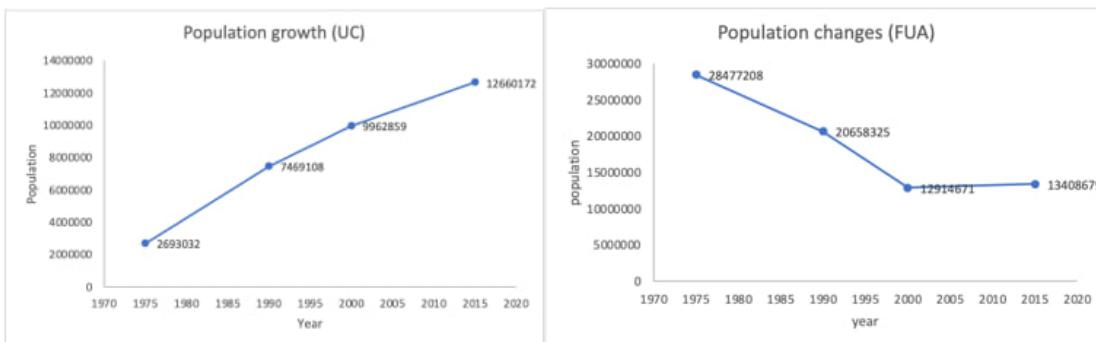


Figure 10: population growth 1975-2015

UC	UFA
3.95	-1.87

Table 1: population growth 1975-2015

3.2.2 Average Population Density (APD) (Inhabitants/km2)

The population density index measures the proportion of a district's population to its area. The occupation pattern of various regions of the city reflects their social and economic aspects. As a result, this indicator serves as the foundation for many decisions made by city planners and legislators. The population density index, particularly in the distribution of urban services, should be taken into account. According to the most recent census in Tehran, the average population density in 2006 was around 131 persons per hectare. The population density varies across Tehran's 22 districts. If I can't tell the difference between the city's northern and southern areas, please reassign me. The most heavily populated areas are located to the south and east of Tehran. The population density of the area is around 220-150 persons per hectare, with the least densely inhabited districts of Tehran lying to the north of the city. The most heavily inhabited areas are in Tehran's south-east. The density of these regions is around 220-150 persons per hectare, while the least densely inhabited districts of Tehran are found in the city's north. The most northern areas of the city have a population density of 10 to 70 persons per hectare. The largest population density is located in districts 10, 8, and 17, while the lowest density is found in districts 12 and 22 in the city's west. A vast number of the city's southern districts, such as 11, 12, 13, 16, 17, and 19, have populations of more than 200 thousand people while being less than 2000 hectares in size. As a result, the population distribution throughout Tehran's districts, as well as the area of distinct Tehran areas, is imbalanced and inconsistent.[6]

3.2.3 Built-Up Area

UC	UFA
1.64	1.8

Table 2: Built-up area growth rate 1975-2015

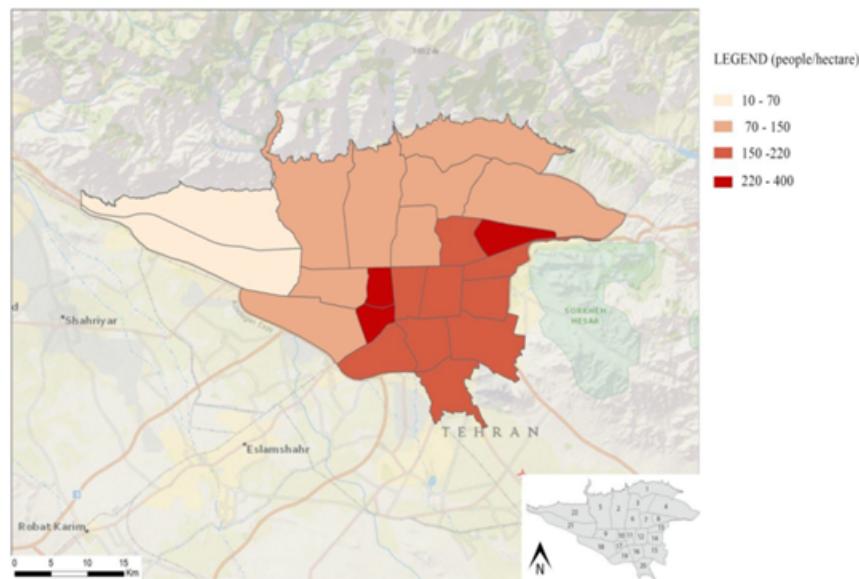


Figure 11: Spatial distribution of population density

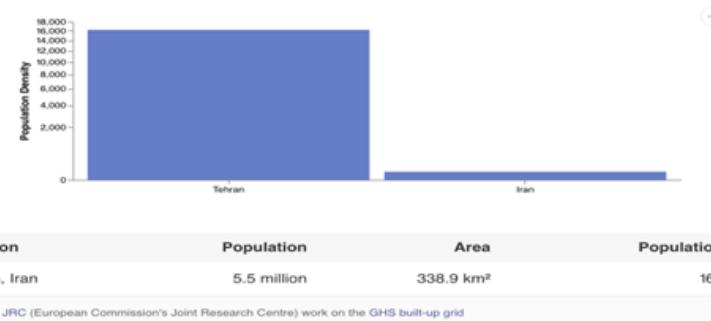
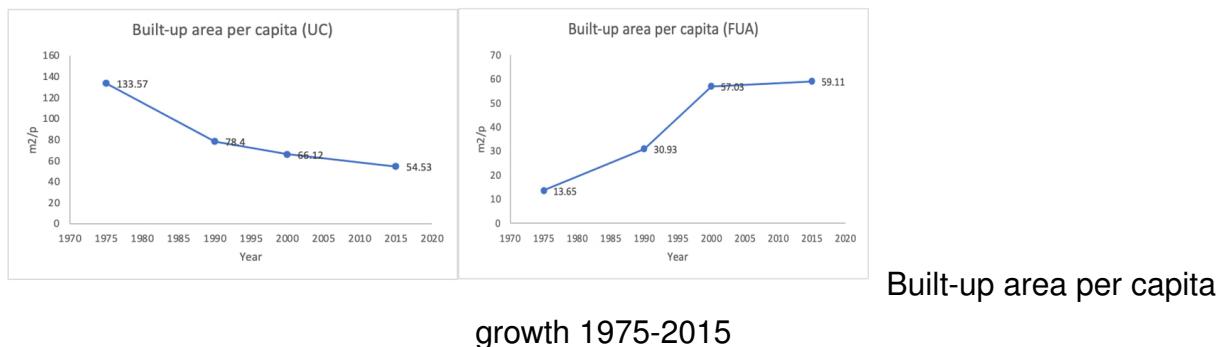


Figure 12: Distribution of population density

3.2.4 Built-Up/Capita



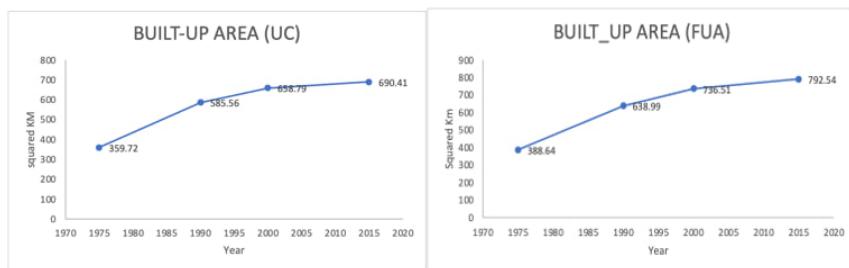
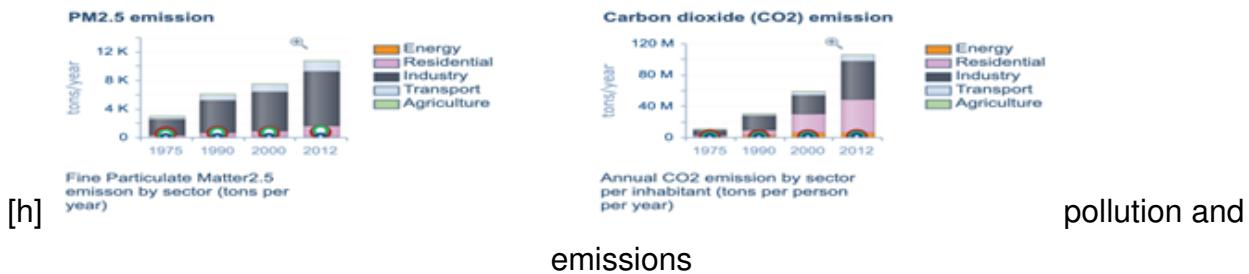


Figure 13: Built-up area growth rate 1975-2015

UC	UFA
-2.21	3.73

Table 3: Built-up area per capita growth 1975-2015

3.2.5 pollution and emissions



3.3 Land Transformations in Tehran since 1900

3.3.1 Definitions:

- **Sustainable Urban Mobility Plan**

a strategic plan designed to satisfy the mobility needs of people and businesses in cities and their surroundings for a better quality of life. It builds on existing planning practices and takes due consideration of integration, participation, and evaluation principles.

- **Local planning**

Local planning refers to the process of making decisions and setting goals for the development and management of a specific geographic area or locality, such as a city, town, or county. It involves creating strategies and policies to address various aspects of community life and infrastructure, including land use, transportation, housing, economic development, environmental protection, and public services. Local planning is typically carried out by local governments, such as city councils,

county commissions, or planning departments, and it plays a crucial role in shaping the future of a community.

- **Identify factors that have an important impact on land use**

1. Types of land transformation
2. Realms of spaces
3. Land transformation and use/rent/spaces/mobility relationships

3.3.2 Some land transformations in Tehran since 1900

1. Urban Expansion:

The expansion of Tehran's city limits to encompass surrounding rural areas, converting farmlands into urban developments, particularly in districts like Shahr-e Rey.

2. Infrastructure Development:

The construction of the Tehran Metro system, which has expanded over the years and now covers numerous lines and stations, greatly improving public transportation in the city.

3. Residential and Commercial Construction:

The construction of Milad Tower, one of the tallest freestanding towers in the world, housing both commercial spaces and a revolving restaurant, symbolizing the city's urban growth.

4. Green Spaces:

The creation of Mellat Park, a vast urban park in Tehran, with walking paths, gardens, and recreational areas, offering a green oasis in the heart of the city.

5. Cultural and Historical Preservation: The preservation and restoration of Golestan Palace, a UNESCO World Heritage Site, showcasing Tehran's historical and cultural heritage, which has been meticulously maintained. 2

6. Redevelopment:

The revitalization of older neighborhoods in central Tehran, such as the Grand Bazaar area, through the renovation of historic buildings and the creation of modern commercial spaces.

Type of Transformation	Name of the area	Main Intervention	Resulting dominant land use	Effects on mobility
Green Corridor Development	Mellat Park Area	Creation of a Pedestrian and Bicycle-Friendly Corridor, Planting Trees and Greenery, Installing Bike Lanes, Creating Seating Areas	Recreational and Green Space, Improved Pedestrian and Bicycle Connectivity	Enhanced Non-Motorized Mobility, Improved Air Quality

Name of the area	Space of circulation	Space of collective consumption	Pros and Cons
Melat park	Dedicated Bike Lanes, Pedestrian Paths, Green Spaces	Outdoor Cafes, Art Installations, Relaxation Zones	<p>Pros:</p> <ul style="list-style-type: none"> 1- Healthier Environment 2- Encourages Physical Activity . 3-cultural and recreational activity 4- easily accessible to residents and visitors (locate in central part of Tehran) <p>Cons</p> <ul style="list-style-type: none"> 1- Space Limitations for Vehicles

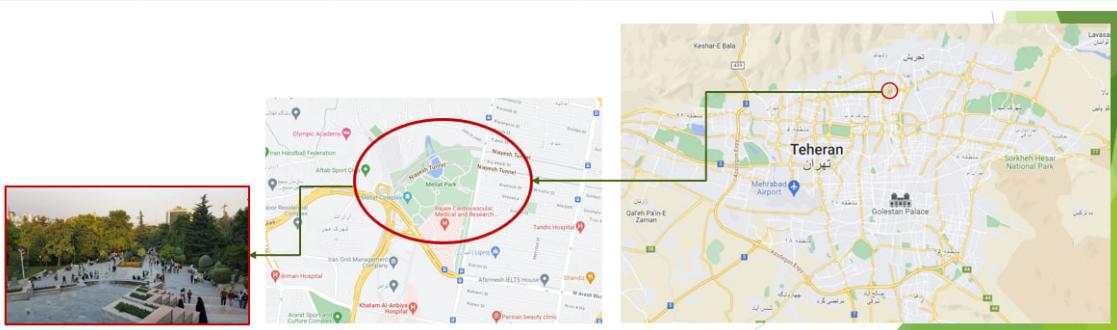


Figure 14: Park Melat

7. Reclamation:

Reclaiming land from Tehran's surrounding desert areas for agricultural use and the construction of satellite towns, such as Varamin and Pardis, which were previously arid regions.

8. Construction and Deconstruction of Urban Infrastructure: The ongoing development and renovation of Tehran's highways network and bridges, as well as the removal of old, inefficient infrastructure to accommodate the city's growth. one of the longest streets in the world, extending for over 17 kilometers Valiasr Street became a symbol of modernization and development during the 20th century (1925-1941) It witnessed various historical events and gatherings, including political protests.

Transportation: Main Artery and Traffic Flow, Public Transportation: bus rapid transit (BRT) line, Metro Stations, Pedestrian and Bicycle Infrastructure

Length of the tunnel: approximately 3.6 kilometers Open date: in 2014 The most

Type of Transformation	Name of the area	Main Intervention	Resulting dominant land use	Effects on mobility
Cultural and Recreational Hub Development	Tabiaat Bridge	Construction of Cultural and Recreational Facilities, Open-Air Amphitheater, Art Galleries, Restaurants	Cultural and Recreational Hub	Enhanced Pedestrian Accessibility, Increased Cultural and Social Activities



Figure 15: Tabiaat Bridge

expensive traffic project in Tehran

9. Slum Clearance:

The clearance and redevelopment of informal settlements in areas like the South Tehran region to provide improved living conditions and essential services for residents.

10. Institutionalization of Squatting:

The government's efforts to regularize informal settlements, such as Eslamshahr, by providing infrastructure and services to previously unauthorized dwellings.

11. New Settlements/Towns:

The establishment of planned satellite towns like Parand and Hashtgerd on Tehran's outskirts to alleviate urban congestion and promote controlled urbanization.

- **Space of circulation:**

Well-planned pathways for easy movement within the complex

- **Space of collective consumption:**

The complex included essential services and facilities like shopping, schools, healthcare, and sports

Type of Transformation	Name of the area	Main Intervention	Resulting dominant land use	Effects on mobility		
Construction and deconstruction of urban	Valiasr st	Traffic management, Landscaping, beautification, social life and commercial	Transportation	Improve connectivity and Traffic flow		
Name of the area	Space of circulation	Space of collective consumption	Pros and Cons			
Valiasr st	The expansion and renovation of Valiasr Street, enhanced its capacity as a major transportation route.	<ul style="list-style-type: none"> home to various cultural, social life, commercial, and historical landmarks, including theaters, cinemas, government buildings, and shops. Effect on traffic flow 	<p>Pros:</p> <ol style="list-style-type: none"> Improved traffic flow and accessibility in a key city artery Economic growth through increased business activity Enhanced urban aesthetics and quality of life for residents Improve Landscaping, and beautification <p>Cons:</p> <ol style="list-style-type: none"> Potential traffic congestion. Gentrification and potential displacement of lower-income residents. Environmental concerns related to increased urbanization. Air quality, and traffic volume all changed for the worse 			
						
						

Figure 16: Valiasr St

• Pros

Convenience, reduced traffic, and improved quality of life.

• Cons

Potential overcrowding, maintenance challenges, increased local traffic.

12. Gentrification:

The gentrification of older districts like Darband, where historic buildings have been restored and converted into trendy cafes, attracting a wealthier, more cosmopolitan demographic.

Type of Transformation	Name of the area	Main Intervention	Resulting dominant land use	Effects on mobility
Construction and deconstruction of urban	Niayesh tunnel	Construction a road tunnel to facilitate vehicular traffic flow and reduce congestion	Transportation	<ol style="list-style-type: none"> 1. Alleviating Traffic Congestion 2. Enhancing Connectivity 3. Urban Development 4. Safety and Environment

Name of the area	Space of circulation	Space of collective consumption	Pros and Cons
Niyayesh Tunnel	The construction of Niayesh Tunnel to facilitate the flow of traffic and reduce congestion in the area.	Adjacent commercial areas and services benefiting from increased accessibility due to the tunnel.	<p>Pros:</p> <ol style="list-style-type: none"> 1- Improved traffic efficiency and reduced travel time. 2- Economic development in the vicinity due to improved accessibility. 3- Enhanced urban planning and development possibilities <p>Cons</p> <ol style="list-style-type: none"> 1- Disruptions during construction. 2- Environmental impacts, particularly on the immediate surroundings. 3- Maintenance and operational costs of the tunnel.

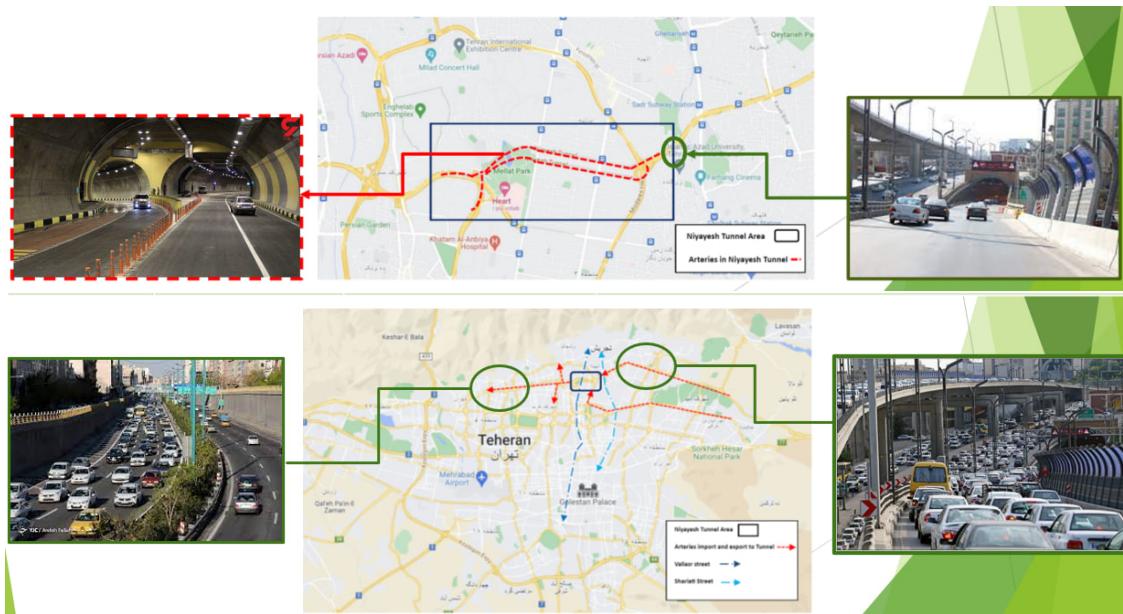


Figure 17: Niayesh Tunnel

13. Rehabilitation Due to Unsanitary Conditions: The rehabilitation and modernization of impoverished neighborhoods with substandard living conditions to improve residents' access to sanitation and public services.

14. Beautification:

The "Tehran, City of Beautification" campaign, which involved planting trees, creating green spaces, and enhancing the visual appeal of the city to make it more attractive for residents and visitors.

Type of Transformation	Name of the area	Main Intervention	Resulting dominant land use	Effects on mobility
Slum clearance	Farahzadi valley convert to Nahjolbalaghe park	park	Green space	Make a travel to west of Tehran for using the park

Name of the area	Space of circulation	Space of collective consumption	Pros and Cons
Farahzadi valley convert to Nahjolbalaghe park	The removal of informal settlements in Farahzadi Valley to make way for planned development and infrastructure, Yadeghare-Emam highway	The creation of organized housing and public facilities in the area formerly occupied by slums, Nahjol-balaghe	<p>Pros:</p> <ul style="list-style-type: none"> 1- Elimination of substandard living conditions 2- Improved access to essential services for residents. 3-Potential for long-term urban development. <p>Cons</p> <ul style="list-style-type: none"> 1- Displacement of the informal settlement's residents. 2- Environmental and social implications of transformation. 3- Balancing development with social and economic factors

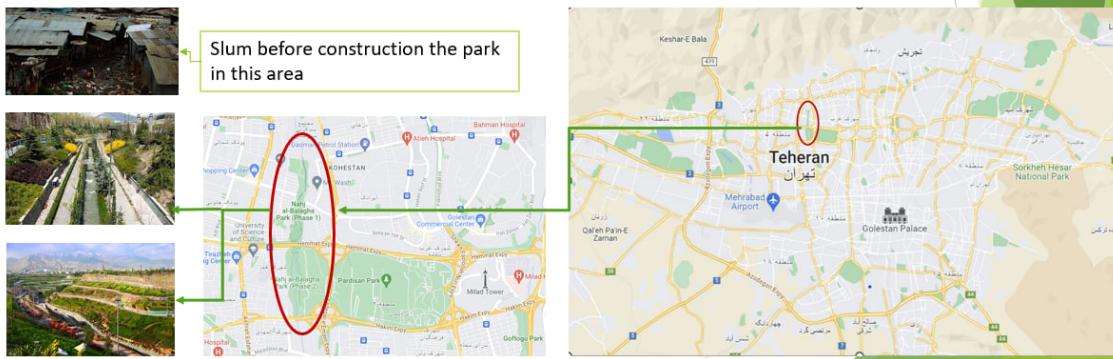


Figure 18: Farahzadi Valley converted to Nahjolbalaghe Park

4 Strategy development

4.1 Identification of problems

In the first step for strategy development, we will identify the transportation problems of Tehran as our case study. The below table lists all issues and describes them using some keywords and other characteristics.

4.2 Creation of Critical Matrix

In the criticalities matrix, we connect the problems from the criticalities list to the different modes of transportation in our city. The problems are arranged in columns, while the various transport modes are listed in rows. For each identified problem, we evaluate them by linking them to specific types regulatory, societal, infrastructural, energetic, operational, environmental, and economic. Then, we assign weights to each type based

Type of Transformation	Name of the area	Main Intervention	Resulting dominant land use	Effects on mobility
New settlements	Ekbatan high-rise complex	Designing and constructing modern high-rise apartments for middle-class families.	high-density residential housing	The project integrated vital services within the complex to reduce residents' need for extensive travel, addressing mobility-related concerns.

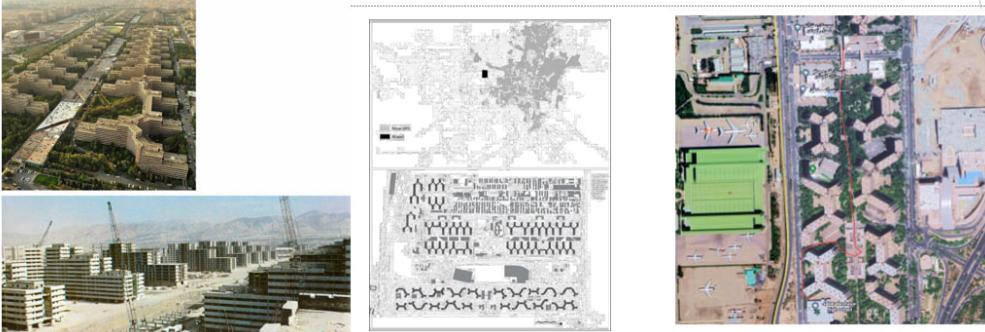


Figure 19: Ekbatan highrise complex

Type of Transformation	Name of the area	Main Intervention	Resulting dominant land use	Effects on mobility
Gentrification, Ecotourism and Preservation	Darband st.	Implementation of Ecotourism Initiatives, Reforestation Efforts, Visitor Education Centers	Ecotourism Destination, Nature Conservation Area	Improved Hiking and Nature Trails, Increased Environmental Awareness



Figure 20: Darband St

Type of Transformation	Name of the area	Main Intervention	Resulting dominant land use	Effects on mobility
Rehabilitation	Navvab st	implementation of a Bus Rapid Transit (BRT) system	Residential	Improve connectivity and accessibility

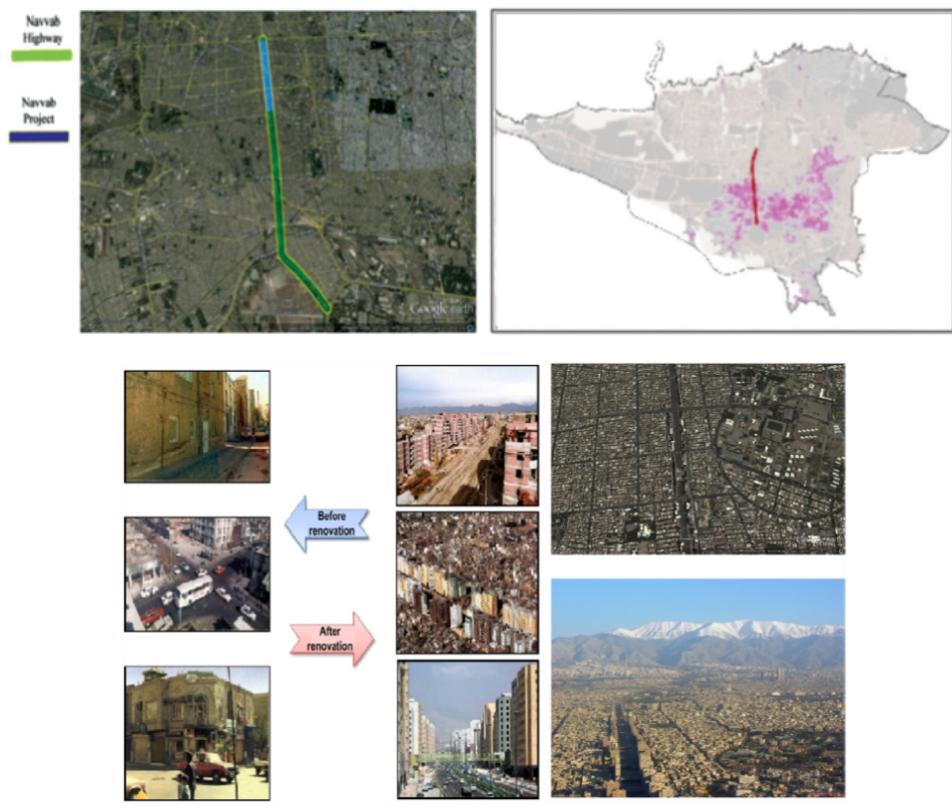


Figure 21: Navvab St

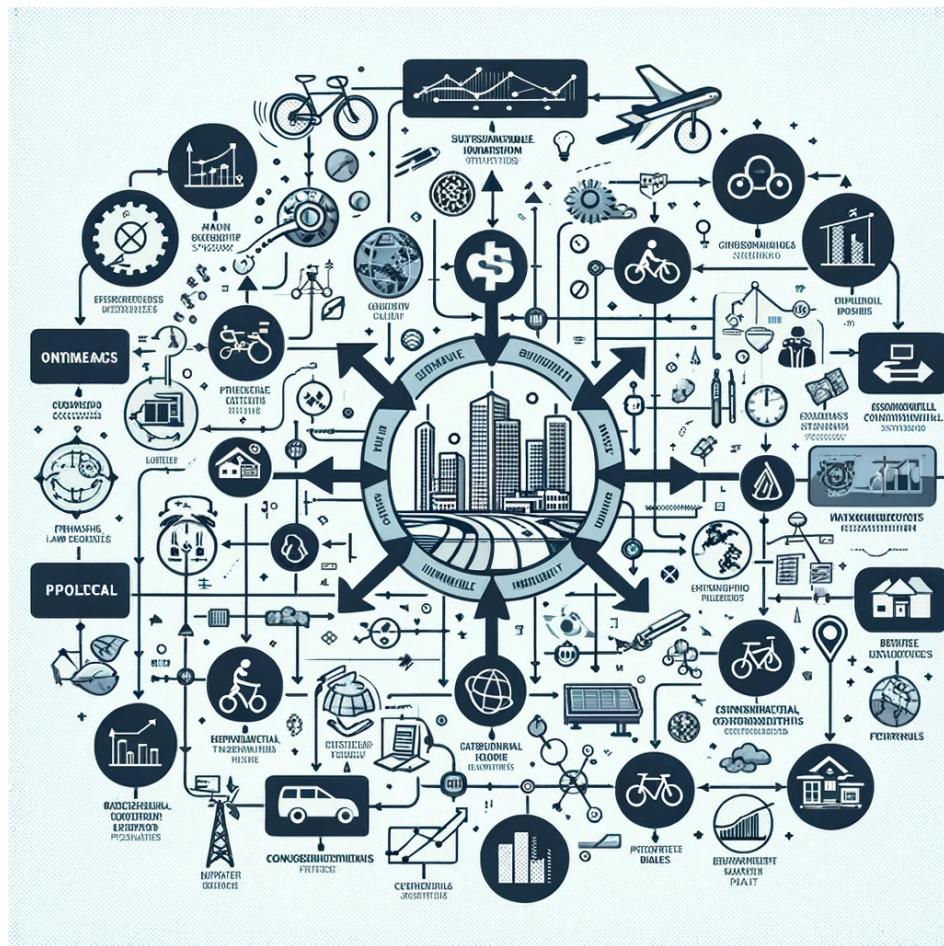


Figure 22: The context chart

ID	Description of Problem	Keywords	Type of land transformation	Land use	Scale
1	Inadequate Public Trans- portation Network	Public Transit, Inadequate, Network	Transit- Oriented Develop- ment	Transit Corridors, Residential Areas	City-wide
2	High num- ber of car accidents because of damaged roads, lack of education	Accidents, Safety, Ve- hicles	Transportation Infrastruc- ture	Roads, Intersections	City-wide
3	Inappropriate usage of fossil fuels and mislocated Highrise buildings can cause air pollution	Air Pollution Energy, Cli- mate	Industrial Activities	Industrial Areas	City-wide
4	Noise pol- lution and traffic from taxis Noise	Taxi, Con- gestion, honking	Commercial Activity	Urban Roads, Commercial Areas	High- density Areas
5	Insufficient parking spaces leading to traffic, lack of infrastruc- ture for building new par- kings, huge number of car owner- ship	Insufficient Parking Space, Traffic	Urban De- velopment	Commercial and Res- idential Areas	Central Business District, Commercial Areas

6	Worn-out public transportation fleet causing pollution and passenger discomfort	Worn-out fleet, Pollution, discomfort	Public Transportation System	Bus Routes, Metro Lines	City-wide
7	Lack of infrastructure for people with disabilities	Accessibility, Disabilities, Infrastructure	Urban Planning	Public Facilities, Transport Hubs	City-wide
8	Inadequate cycle lanes and EV charging facilities	Cycling, EV Charging, Infrastructure	Sustainable Transport	Roads, Parking Areas	City-wide
9	Traffic from industrial center expansion	Industrial Growth, Commute, Traffic	Industrial Expansion	Industrial Corridors, Roads	West Tehran
10	Low Fuel Prices Encouraging Private Car Usage	Fuel Price, Car Usage, Traffic	Economic Policy	Non-applicable	Metropolitan

Table 4: BRIEF DESCRIPTION OF PROBLEMS IN TEHRAN

Type	Significance (W)
Regulatory	3
Societal/Educational	6
Infrastructural	1
Energetic	4
Operational	2
Environmental	7
Economic	5

Figure 23: Type of problems and their urgencies

on their urgency, with 1 indicating less urgency and 7 indicating the most urgent. The severity of each primary cause of our problems is weighted as follows in the table. The last step is to decide which one has top priorities by correlating each type with weight (w), according to the following formula:

$$C_{i-\text{problem}} = \sum_{i=1}^m c_{fin} \times w \dots$$

In this case study, we have four affected modes **i) private (Passenger's cars, Powered two-wheelers) ii) transit (bus, Metro, BRT) iii) paratransit (Taxi, van) iv) non-motorized (Walk, Bikes)**

Then we associated the above causes and their weights to the problems for our affected modes. Finally, by adding the assigned weightings of each problem (columns), we can decide which one has to be on our agenda. Moreover, by adding the weights of each row, we can see which mode is most affected by the problems. Note that each of the affected modes encountered by the specific problem may be impacted due to different causes and not just one. Figure 24

4.3 Selecting objectives to start visioning

Now having the total score for each problem, we need to sort them by their score in a descending format.

Table 5 presents our problems ranked from the most critical one to the least.

Here in this step, we are going to associate the problems ranked in the above table with the major cases to create a possible and at the same time logical scheme. In this section,

Mode	Problems and Keywords										
	1	2	3	4	5	6	7	8	9	10	
Private	Private cars		Accidents, Safety, Vehicles	Air Pollution, Climate Energy	Noise, Honking	Insufficient, Parking slots		EV Charge	Industrial growth, commute	Fuel Prices, Car Usage, traffic	
	Motorcycle		Accidents, Safety, Vehicles	Air Pollution, Energy, Climate	Noise	Insufficient, Parking slots					
Transit	Bus	Public Transit, Inadequate, Network		Air Pollution, Energy, Climate			Worn-out, discomfort	Poor Accessibility	Industrial growth, commute		
	Metro	Public Transit, Inadequate, Network						Poor Accessibility			
Paratransit	BRT	Public Transit, Inadequate, Network						Poor Accessibility			
	Taxi	Network	Accidents, Safety, Vehicles	Air Pollution, Energy, Climate	Honking		Worn-out, discomfort	Poor Accessibility	Industrial growth, commute	Fuel Prices, Traffic	
Non-motorized	Van	Network	Accidents, Safety, Vehicles	Air Pollution, Energy, Climate			Worn-out, discomfort	Poor Accessibility	Industrial growth, commute	Fuel Prices, Traffic	
	Walk							Poor Accessibility			
Bicycle		Network							Inadequate lanes		
	Sum	30	16	37	18	6	21	6	20	24	21

Figure 24: Critical Matrix

ID	Problem Description	Score
3	Inappropriate usage of fossil fuels and mislocated Highrise buildings can cause air pollution	37
1	Inadequate Public Transportation Network	30
9	Traffic from industrial center expansion	24
6	Worn-out public transportation fleet causing pollution and passenger discomfort	21
10	Low Fuel Prices Encouraging Private Car Usage	21
8	Inadequate cycle lanes and EV charging facilities	20
4	Noise pollution and traffic from taxis	18
2	High number of car accidents because of damaged roads, lack of education	16
5	Insufficient parking spaces leading to traffic, lack of infrastructure for building new parkings, huge number of car ownership	6
7	Lack of infrastructure for people with disabilities	6

Table 5: Problems Ranked by Criticality

we are going to talk about the areas that need to be invested in to move forward and a step ahead for reaching the point of implementation of the SUMP.

4.4 List of objectives

- **Efficiency:** The rapid growth of the city, along with factors like rising housing costs and inadequate infrastructure in Tehran, doesn't align well with sustainable urban mobility planning. Public transportation, including metro stations, is not widespread enough, and existing options like the metro and buses face issues like overcrowding and delays, forcing people to rely more on private cars. This urbanization has resulted in traffic congestion and transportation inefficiencies. To address these challenges, it is important to invest in improving transportation infrastructure, expanding public transit, and implementing smarter traffic management to enhance

the city's efficiency and reduce commuting times.

- **Accessibility:** As the western part of Tehran grows, not enough number of buses and trains make it harder for people to get around the city. This makes more people use their cars, causing traffic jams. To fix this, Tehran needs to focus on making it easy for everyone to move around, especially for those with disabilities. This means improving sidewalks, ramps, and public transportation so that everyone can travel through the city without problems.
- **Protection of the Environment:** Too many people using their private cars has caused environmental issues like air and noise pollution in Tehran. The city is dealing with serious environmental problems, like air pollution and not having enough water. So, it's crucial to make protecting the environment the most important goal. Taking action to cut down pollution, add more green areas, and encourage sustainable habits is necessary to make life better in the city.
- **Livable streets:** Because of a lack of sufficient or maybe strict control over motorcycles, they sometimes act unlawfully, making people feel unsafe when walking on the streets. To improve the urban environment, it's important to make streets that focus more on pedestrians and cyclists than on cars. Tehran should spend resources on planning streets that make walking and biking easier and promote social interactions, making the city more enjoyable and livelier.
- **Social inclusion:** It's crucial to encourage social inclusion in a diverse and expanding city like Tehran. Taking steps to guarantee everyone has the same access to services, education, and job opportunities, particularly for marginalized groups, is vital for fairness and unity. Relying too much on private cars has disrupted social interactions and activities among people in society.
- **Safety:** A lot of accidents happen because the infrastructure lacks proper safety measures, like not managing dangerous spots such as intersections and highways or not having pedestrian bridges. Making sure residents and visitors are safe should be a top concern. It's important to take actions to lower traffic accidents, make walking safer, and improve how emergencies are handled to create a secure city environment
- **Economic Growth:** Tehran, being the economic hub of Iran, has seen notable economic progress, securing the top spot in terms of improvement. However, in the last decade, American sanctions against the Iranian government have taken a toll, causing a negative trend in GDP growth. Even though economic growth is

significant, it shouldn't harm the environment or people's well-being. Tehran needs to concentrate on sustainable economic development that not only generates jobs and supports local businesses but also generates revenue for public services.

- **Finance:** The handling of money in Tehran is imbalanced due to the high bank interest rates and loan application restrictions. Investing in various markets, like the stock exchange, comes with significant risk, as the government aims to strengthen its financial state through people's investments without much consideration for the people's benefit. Additionally, people are hesitant to keep money in their bank accounts due to concerns about housing prices and fluctuations in the Iranian currency. To fund the city's infrastructure projects and social programs, it's crucial to have proper financial management and resource allocation. Transparency, accountability, and efficiency in financial processes are essential for Tehran's sustainable long-term development.

5 Measure Planning

Measure planning is a essential component of the SUMP process, as it involves identifying, selecting, and prioritizing specific measures or actions to address urban mobility challenges. We are going to measure visioning in this Chapter. We have two options for making the best measure selection: 1) Objectives 2) Problems With using the KonSULT website, we identified Policy measures. This website help policymakers understand the challenges of achieving sustainability in urban transportation by providing information on relevant policy measures, in order to achieve the vision and objectives of the Sustainable Urban Mobility Plan.

5.1 Measure "Option Generator" and "Package generating" based on objectives:

In the first step to start using the Option Generator, we select our area type, which in our case is "Any area type" and then in the second step, we developing policy measures of objectives for Tehran, with consideration our priorities in last chapters of this project. Due to air pollution and traffic congestion in Tehran, we considered "Protection of the environment" and "safety" in the highest level of the importance. Then "efficiency" was in second level. "Equity and social Inclusion" have average importance in this project and other objectives have been low importance or we do not use them. In the table we are going to achieve SUMP objectives with consideration developing these policy measures of objectives.

		Impact Field						
Problem Macro Area		Regulatory	Societal /educational	Infrastructural	Energetic	Operational	Environmental	economic
Congestion	Congestion-related delay	10	10					
	Congestion-related unreliability	1		9		1		
Community Impacts	Community severance							
	Visual intrusion							
Environmental damages	Lack of amenity	1	5.8		6	1.5.8		6
	Global warming							
	Local air pollution	3	3				3	
	Noise			4			4	
Poor accessibility	Reduction of green space	3						
	Damage to environmentally sensitive sites	3						
	Poor accessibility for those without a car and those with mobility impairments	9		7.		7		9.7
Social and Geographical disadvantages	Disproportionate disadvantaging of particular social or geographic groups							
Safety	Number, severity and risk of accidents	2	2					
Economic growth	Suppression of the potential for economic activity in the area							

Figure 25: macro area problems

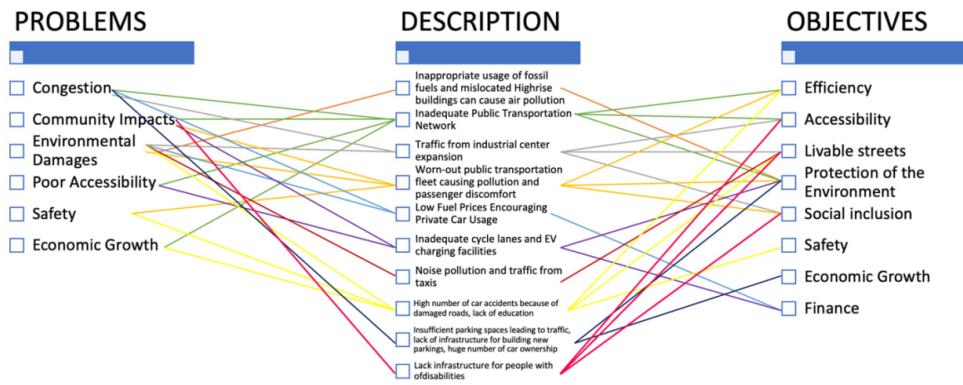


Figure 26: concept map

0 = do not use, 1 = low importance, 5 = high importance.

Objectives <input checked="" type="checkbox"/>	Problems <input type="checkbox"/>
4 ✓ Efficiency	0 ✓ Congestion
2 ✓ Liveable streets	0 ✓ Community Impacts
5 ✓ Protection of the environment	0 ✓ Environmental Damage
3 ✓ Equity and Social Inclusion	0 ✓ Poor Accessibility
5 ✓ Safety	0 ✓ Social and Geographic disadvantaging
1 ✓ Economic Growth	0 ✓ Accidents
0 ✓ Finance	0 ✓ Suppression of Economic Activity

Figure 27: Relative importance of Objectives considered for Tehran

In the third step, we could assign weights (0 to 5) to indicate the relative importance of each strategy we have selected. we considered some strategies despite SUMP that were aiming environment friendly and transit-oriented to decrease air pollution and traffic congestion of Tehran. The most relative importance strategies including “Improving the use of public Transport” , “Improving walking and cycling” then “ reducing the need to travel” and “ reducing car use”. In table there are strategies with considering their assigned weights.

In the fourth step, we have a list consist of the policy measures within KonSULT in rank order based on their ability to contribute to the context which we have specified. comparing the results helps us to comprehend and assess the relative significance of various measures. In the fifth step, the Option Generator allowed us to consider two ways of combining measures, consist of complementary and packages. The tool that we preferred was packages. Then we chose the method and size of the packages that could be between 2 to 5 measures to choose the best package of measures from a list. For this project we utilize the synergy approach for our packages, with the size of 5.

Figure 29 displays the packages with scores. Finally, between 4 high scores measures, we chose the second packages and earmark it with star. This measures are suitable for specific problems of Tehran to achieve SUMP for this city.

5.2 Measure "Option Generator“ and “Package generating“ based on problems:

The first step started with the Option Generator, we selected “Any area type” then, in the second step, we developing policy measures of problems for Tehran, with consideration our priorities in previous chapters of this project. Due to air pollution and traffic congestion in Tehran, we considered “congestion” and “ environmental damage” in the highest level of the importance. Then “ accident” was in second level. other problems have been low importance in this project. In the table we are going to achieve SUMP objectives with consideration developing these policy measures of problems.

In the third step, we could assign weights (0 to 5) to indicate the relative importance of each strategy we have selected. we considered some strategies despite SUMP that were aiming environment friendly and transit-oriented to decrease air pollution and traffic congestion of Tehran. The most relative importance strategies including “Improving the use of public Transport” , “Improving walking and cycling” then “ reducing the need to travel” and “ reducing car use”. Table displays the strategies and their weights.

In the fourth step, the policy measures presented are graded from greatest to lowest in terms of their capacity to contribute to the setting that we have described. Table depicts the policy measures.

In the fifth step, the Option Generator allowed us to consider two ways of combining

0 = do not use, 1 = low importance, 5 = high importance.

Any Strategy

- 4 Reducing the need to travel
- 4 Reducing Car Use
- 1 Improving the Use of Road Space
- 5 Improving the use of Public Transport
- 5 Improving walking and cycling
- 2 Improving Freight

Figure 28: Relative importance of strategies related to objectives for Tehran

Select	rank	code	category	cost	timescale	measure	score
<input checked="" type="checkbox"/>	1	102	Land Use Measures	neutral	long	Land use to support public transport	42
<input checked="" type="checkbox"/>	2	605	Pricing	neutral	medium	Road user charging	41
<input checked="" type="checkbox"/>	3	101	Land Use Measures	high	long	Development density and mix	33
<input checked="" type="checkbox"/>	4	209	Infrastructure	medium	medium	Pedestrian areas & routes	31
<input checked="" type="checkbox"/>	5	309	Management and service measures	low	short	Regulatory restrictions	28
<input checked="" type="checkbox"/>	6	305	Management and service measures	medium	short	Accident remedial measures	27
<input checked="" type="checkbox"/>	7	404	Attitudinal and behavioural measures	low	short	School travel plans	27
<input checked="" type="checkbox"/>	8	208	Infrastructure	medium	medium	Cycle networks	24
<input checked="" type="checkbox"/>	9	401	Attitudinal and behavioural measures	low	short	Promotional activities	23
<input checked="" type="checkbox"/>	10	403	Attitudinal and behavioural measures	low	short	Company travel plans	22

Figure 29: Packages according to synergy method for objectives

Rank	Measure1	Measure2	Measure3	Measure4	Measure5	Score
1	Development density and mix	Road user charging	Pedestrian areas & routes	Land use to support public transport	School travel plans	36
2	Development density and mix	Cycle networks	Road user charging	Pedestrian areas & routes	Land use to support public transport	36
3	Cycle networks	Road user charging	Pedestrian areas & routes	Land use to support public transport	School travel plans	36
4	Development density and mix	Road user charging	Pedestrian areas & routes	Land use to support public transport	Promotional activities	36
5	Development density and mix	Company travel plans	Road user charging	Pedestrian areas & routes	Land use to support public transport	35
6	Road user charging	Pedestrian areas & routes	Land use to support public transport	Promotional activities	School travel plans	35
7	Development density and mix	Accident remedial measures	Road user charging	Pedestrian areas & routes	Land use to support public transport	35
8	Company travel plans	Road user charging	Pedestrian areas & routes	Land use to support public transport	School travel plans	35
9	Development density and mix	Cycle networks	Road user charging	Land use to support public transport	School travel plans	35
10	Accident remedial measures	Road user charging	Pedestrian areas & routes	Land use to support public transport	School travel plans	35

Figure 30: Packages according to synergy method for objective

0 = do not use, 1 = low importance, 5 = high importance.

Objectives <input type="checkbox"/>	Problems <input checked="" type="checkbox"/>
0 ✓ Efficiency	5 ✓ Congestion
0 ✓ Liveable streets	1 ✓ Community Impacts
0 ✓ Protection of the environment	5 ✓ Environmental Damage
0 ✓ Equity and Social Inclusion	2 ✓ Poor Accessibility
0 ✓ Safety	2 ✓ Social and Geographic
0 ✓ Economic Growth	disadvantaging
0 ✓ Finance	4 ✓ Accidents
	2 ✓ Suppression of Economic Activity

Figure 31: Relative importance of problem in Tehran

0 = do not use, 1 = low importance, 5 = high importance.

Any Strategy <input type="checkbox"/>
4 ✓ Reducing the need to travel
4 ✓ Reducing Car Use
1 ✓ Improving the Use of Road Space
5 ✓ Improving the use of Public Transport
5 ✓ Improving walking and cycling
2 ✓ Improving Freight

Figure 32: Relative importance of strategies related to problems

measures, consist of complementary and packages. The tool that we preferred was packages. Then we chose the method and size of the packages that could be between 2 to 5 measures to choose the best package of measures from a list. For this project we utilize the synergy approach for our packages, with the size of 5. Figure 33 displays the packages with scores. Finally, between 4 high scores measures, we chose the second packages and earmark it with star. These measures are suitable for specific problems of Tehran to achieve SUMP for this city.

Table displays all of the packages for the measurements based on the problems we noted, ranked in order of their ability to contribute to the context we specified. After considering both packages for objectives and problems, we select the second rank of the first package of objective approach. This package, with a score of 36, appears to be the most realistic option for Tehran. Measures in this approach are including:

1. **Development density and mix** Density is frequently connected with other factors such as land use mix, the transportation system, and parking management, all of which together influence travel patterns. Increased density could increase the cost effectiveness of different services, such as sidewalks, streets, and public transportation[14]. Development density and mix are important factors in urban planning, impacting the physical form and social dynamics of communities.

Achieving the right balance between density and a well-planned mix of land uses helps to create sustainable, resilient, and livable urban environments. Tehran, as a rapidly growing and one of the populous city, faces significant challenges in terms of urban mobility and sustainability. Implementing development density and mix strategies can be crucial for achieving sustainable urban mobility in Tehran. Some of objectives with development density and mix strategies can promote SUMP are:

- Enhance public transportation networks
- Mix land use planning
- Manage traffic congestion
- Green space and parks

2. **cycle network** During this last decade, cycling has become an attractive alternative to automobiles. Despite the need to reduce CO2 emissions and the high cost of fuel, many people are seeking other modes of transportation [5]. Development of massive cycling infrastructure network and bike- sharing projects to promote cycling as a sustainable mode of transport, also integrate bike-friendly infrastructure with public transport to create a seamless transport between cycling and other modes of transport.

rank	measure	category	cost	timescale	score
1	Road user charging	Pricing	neutral	medium	40
2	Land use to support public transport	Land Use Measures	neutral	long	36
3	Development density and mix	Land Use Measures	high	long	32
4	Regulatory restrictions	Management and service measures	low	short	28
5	School travel plans	Attitudinal and behavioural measures	low	short	25
6	Pedestrian areas & routes	Infrastructure	medium	medium	24
7	Intelligent transport systems	Management and service measures	medium	medium	23
8	Accident remedial measures	Management and service measures	medium	short	23
9	Promotional activities	Attitudinal and behavioural measures	low	short	22
10	Parking controls	Management and service measures	low	short	22

Figure 33: Packages according to synergy method for problems

Rank	Measure1	Measure2	Measure3	Measure4	Measure5	Score
1	Development density and mix	Road user charging	Pedestrian areas & routes	Land use to support public transport	School travel plans	33
2	Development density and mix	Road user charging	Land use to support public transport	Promotional activities	School travel plans	33
3	Development density and mix	Company travel plans	Road user charging	Land use to support public transport	School travel plans	33
4	Development density and mix	Road user charging	Pedestrian areas & routes	Land use to support public transport	Promotional activities	32
5	Development density and mix	Cycle networks	Road user charging	Land use to support public transport	School travel plans	32
6	Development density and mix	Accident remedial measures	Road user charging	Land use to support public transport	School travel plans	32
7	Development density and mix	Company travel plans	Road user charging	Pedestrian areas & routes	Land use to support public transport	32
8	Development density and mix	Company travel plans	Road user charging	Land use to support public transport	Promotional activities	32
9	Development density and mix	Accident remedial measures	Road user charging	Pedestrian areas & routes	Land use to support public transport	32
10	Road user charging	Pedestrian areas & routes	Land use to support public transport	Promotional activities	School travel plans	32

Figure 34: . Packages according to synergy method for problem

3. **Road user charging** Road user charge (RUC) has a long history of recovering infrastructure maintenance and developing payments. The current RUC systems have challenges such as transparency, cross-subsidization, environmental concerns, and decreased income owing to fuel tax reductions as vehicles become more efficient. Road user charge (RUC) started as a gasoline tax to fund infrastructure maintenance and construction costs. Previously, tracking all vehicles to charge for road usage was not possible because of technical and administrative challenges. Therefore, taxing fuel was adopted as an indirect means of charging, as fuel is a valuable additional product connected with vehicle utilization. Technological developments and changes in road user behavior led to the introduction of additional taxes, including registration, licensing, and toll costs [13]. Implementing road user charging can be a strategic objective in achieving sustainable urban mobility in Tehran. This approach aims to manage traffic demand, reduce congestion, and encourage the use of alternative and more sustainable modes of transportation.
4. **Pedestrian areas and routes** By investigating many elements of pedestrian mobility, as well as their interaction and effect within the built environment, we will be able to better understand the regularities and patterns of behavior. The pedestrian activity patterns will be complicated as a result of the modeling procedure. Designers and planners are able to create useful pedestrian spaces inside protected urban areas[9] Pedestrian circulation networks are often undersized, with inadequate infrastructure and inconsistent layouts, particularly around junctions. Barriers on sidewalks, such as traffic signals and urban furniture, might cause pedestrians to stray from their path, increasing risk and requiring them to cross the road in unsafe or low-visibility areas. Pedestrians typically take the shortest, fastest, and easiest path. To improve road user safety, pedestrian crossings should be strategically constructed [4]. Creating accessible sidewalks, crosswalks and pedestrian zones. And encourage walking as a mode of transportation with design standard and safe pedestrian areas.
5. **Land use to support public transport** land use and public transport planning harmonization is necessary to create a viable alternative to vehicle transportation. The Transit-Oriented development (TOD) idea encourages development in locations with high-quality public transportation [12].

In general terms, the following distinctions are commonly used for planning:

Short Term: Duration: 0-5 years Focus: immediate and near-future actions.

Example: short-term policy adjustments

Medium Term: Duration: 5-15 years Focus: Implementing more substantial changes, infrastructure projects, and policy adjustments that require a moderate amount of time. Example: improving cycling and pedestrian infrastructure

Long Term: Duration: 15 years and more Focus: Implementing transformative changes, achieving comprehensive sustainability goals, and establishing a lasting impact on urban mobility Example: developing and adopting new technologies

In table 6 we considered the summary of cost and timescale about each chosen measures for Tehran. With this information we can achieve proper vison for planning

Encourage the development of high-density, mixed-use areas around key transit nodes, such as metro stations and bus terminals. Also invest in expanding and improving the efficiency of Tehran's public transportation system When considering sustainable urban mobility, the long-term perspective often involves fundamental shifts in urban planning, infrastructure development, and transportation systems. It may include changes in behavior and culture, as well as the adoption of innovative technologies and solutions.

Measures	Timescale	Cost
Development density and mix	Long	High
Cycle network	Medium	Medium
Road user charging	Medium	Neutral
Pedestrian areas and routes	Medium	Medium
Land use to support public transport	Long	Neutral

Table 6: Summary of Measures, Timescales, and Costs

6 Transferability

In this chapter we are going to understand how our final measures will be implemented. To assessing the results:

6.1 Areas of affect

Culture/Society (People and environment) Institution (Regulations and Political Commitment) Economy (Technical skills and the affordability of implementing the measure)

6.2 Provide score based on Likert Scale (S)

the least challenging (1) the most challenging (5)

6.3 Provide a weight according to weighs for each transport modes (W)

Cars (4) Two-wheelers (3) Bicycles (2) Pedestrians (1) Finally, the total of all scale products and weights generates a score that specifies transferability according to the formula below:

$$\sum_{j=1}^n w_j \cdot S_j \quad (1)$$

where Wj = weight of measure Sj = scale of the measure According result from table and formula : Culture/society: 100 Institution: 111 Economy: 141

That represent economic sector is the most challenging area. And it need more investment in development density and mix also land use to support public transport. Developing efficient public transport systems requires substantial initial investments in infrastructure such as buses, metro lines, tramways, and bike lanes. However, budget constraints or competing priorities often limit the amount of funding available for such projects. Addressing the economic challenges associated with public transport investment in Tehran requires a comprehensive approach that involves government leadership, private sector participation, community engagement, and strategic planning. Policymakers need to prioritize sustainable urban development strategies that prioritize public transportation, incentivize alternative modes of transport, and internalize the external costs associated with private vehicle usage. Additionally, exploring innovative financing mechanisms, such as public-private partnerships and value capture strategies, can help mobilize the necessary resources to fund public transport projects and create a more sustainable urban transportation system in Tehran.

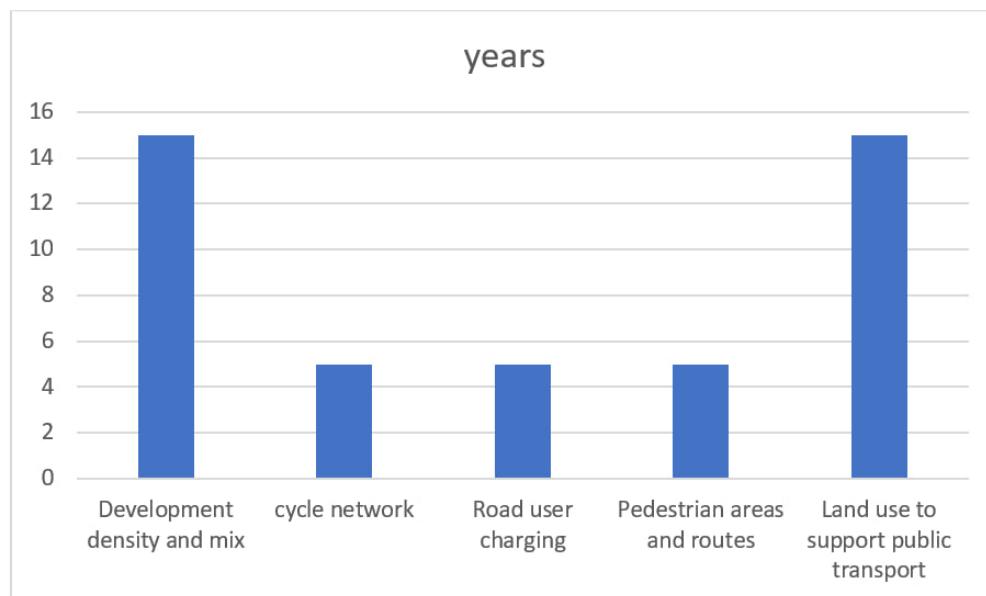


Figure 35: Time horizon of implementation of policy measures

	measures			Culture/Society				Institution				Economy				Total	Transferability Problems Score
		People	Environment	Regulation	Political Commitment												
Objectives, per priority	Development density and mix	5	W	12	S	W	12	S	W	12	S	W	20	S	W	88	
	Protection of the environment, climate equity and social inclusion and economic growth	4	4	20	1	4	4	12	4	12	5	4	20	5	4	84	
	Road user charging	0	0	0	0	0	0	16	2	4	0	4	16	4	4	16	
	Cycle networks	1	2	1	2	2	4	3	2	6	4	2	8	3	2	32	
	Pedestrian areas & routes	1	1	1	3	1	3	2	1	2	3	1	4	3	1	16	
Total		2	4	8	2	4	8	3	4	12	3	4	12	1	4	61	
				55			45			58			80			56	
				100						111						#REF!	
																352	

Key to scores and weights:
Scores: Likert Scale 1 to 5 - 1 least challenging; 5 most challenging

Figure 36: the transferability of the five policy measures in Tehran

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