An overview of Tehran Transportation Master Plan
(Revised in 2013)
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Prepared by
Tehran Traffic and Transportation Organization and Deputy
Deputy of Planning and Studies

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The growth of urban population, the effect of urbanization, the loss of public transportation, and the increase of demand for moving through the city lead to a great interest in the use of passenger cars at the metropolitan areas in recent decades. Tehran is one of the metropolitans in the Middle East with the several transportation issues, whose population is about 8.2 million. Since an increase in both the value of car ownership and the quality of life in Tehran, the trip rate has exceeded about 17 million trips made by vehicles in Tehran every day. These trips result in a variety of problems. For example, vehicles approximately consume 13 million liter per day; and it leads to a number of serious health problems because of increasing the air pollution emission.

For the time being, changing in the current transportation policies and considering the sustainable transportation are among the successful solutions to remedy the transportation issues in the recent years. Traffic and Transportation Deputy of Tehran Municipality in Tehran, called TDTMT, has changed the direction of the current trend and priority from the car-oriented approach to people-oriented one. This administration has been trying to develop the sustainable transportation and improve the quality of life with a variety of projects. Some of the importation projects in Tehran include: the construction of moving walkways, the increase in the rate of subway construction by 130% compared to the last year, the construction of 159 km of BRT lines, and the development of bicycle trails in twenty districts of Tehran with 230 km long.

There is a real need to have the transport planning framework to make a sustainable decision and prepare the practical long-term and mid-term solutions for the transportation issues in the future. Therefore, in 2007, the comprehensive transport planning framework was performed by Tehran Comprehensive Transportation and Traffic Studies Company with the supervision of Tehran Traffic and Transportation Organization and Deputy. In 2010, this framework was revisited and updated to consider the new challenges in Tehran. In this report, we will present the recent information and the new policies of transportation management in the eighteen subjects.

Seyed Jafar Tashakori Hashemi
Vice mayor & the Head of
Tehran Traffic and Transportation Organization and Deputy
Chapter 1
The Principles
At the same time of increasing in urbanization, the widespread aspects of metropolitan areas and inconsistent development of transportation have made the numerous challenges for the municipal managers. The current speed of urban development would require more traffic facilities which are not met by the existing infrastructures. The short-term decisions could be a potential solution to remedy the inefficiency of transportation infrastructures; however, it has been shown that short-term decisions and ignoring the long-term decisions not only solve the main problems, but also it will result in new issues in the future time. For example, increasing car-oriented traffic facilities and encourage people to use their cars for daily trips were among the short-term decision in the past. This policy is the main reason that we are now living in the city with low speed traffic, the large number of accidents and fatalities, and high level of air pollution.

A sustainable transportation system needs the controlling actions for air pollution issues by establishing more mandatory regulations for passenger cars, and any effort on increase average travel time in the road network. Reported that there is no concrete solution to solve the complicated problems in the sector of transportation; and there is a real need to follow comprehensive, dynamic, and reliable approach to deal with the issues in Tehran. The elimination of challenge ahead is essential before developing and applying the attitudes on urban sustainable transportation developments. The following list is the main challenges:

- Different point of view on urban sustainable transportation and consistent development of transportation infrastructures
- Multiple supervisory sectors on the process of proposing and implementing the polices on urban transportation
- Wrong measure of effectiveness to assess and monitor the current situation
- Finding an efficient energy use, and renewable energy sources
- Ignoring the multilateral urban development
- A lack of consistency in macro-polices of Iran with inner-city sustainable transportation such as budget allocations, fuel, subsidies, rail, and vehicle manufactures
1-2- A history of the studies of Tehran transportation master plan

The origin of the studies of Tehran transportation master plan came back in 1968. This study was carried out by Farmanfarmayan Consultant Engineers Company in 1966. The horizon of the plan was considered ten years, and both Tehran's population and the value of average car ownership had been estimated. In order to prevent on both radial development and dominance of central region of Tehran, ten important points, e.g. Shahr-e-ray, were proposed so that each center was connected to other ones with the use of urban highways, freeways, and public transportation system. Tehran's transportation network included 147 km long and three subway lines (totally 130 km long connecting Tehranpars to Karaj and Shemiranat to Shahr-e-ray.

After this plan, another study was performed by SOFRETU, French consulting and project development firm, in 1971. The mid-term and long-term were proposed for 1981 and 1991; respectively. The mid-term plan included: the change of a number of two-way streets to one-way one, and optimization of signalization for a number of traffic lights. In addition, the long-term plan included: the construction of some highways, and extending the subway system from three lines to seven lines.
In addition to the earlier studies, Freeman Fox and Partners in 1976 and Harvard University in 1977 performed the other transportation studies in Tehran. Another plan, i.e. Tehran’s Preservation and Maintenance, was doing from 1987 to 1991. Due to five-year time horizon of this plan, the application of the four-step model—trip generation, trip distribution, mode choice, traffic assignment—was impossible. As a result, vehicles were counted at any defined location of Tehran in order to analyze the present situation and then compare with a number of proposed scenarios. Observed that the linear development of the city had been distorted and the radial development toward the center of Tehran was dominated. This is mainly because; there was no desirable development in east and west Tehran.
Tehran Comprehensive Traffic and Transportation Studies company is the leading transportation center in Tehran, which did the complete transportation study in Tehran in 1994. This study included a survey of counting origin/destination trips, i.e. O/D trips, and integrated cordon-line surveys with the O/D survey. In this study, the four-step travel modeling method has been used to estimation the O/D demand until the horizon year, i.e. 2011. For the time being, this study, which was revised in 2004, built the foundation for any macro-decision made in the transportation sector of Tehran. Tehran transportation master plan has been categorized into the eighteen subjects. In the following, we briefly introduce the six subjects in the future.
1-3- The situation of Tehran transportation in basis year (2011) and present situation (2013)

Seven million trips and twenty million displacements were approximately made in Tehran in the regular day based on the forecasting study in 2011. The value of average speed for passenger car was estimated about 26.5 km/h in the rush hour. The major roads encompassed—freeways, highways, major arterials and collectors—with 2989 km long and also 172 km of bicycle trails were constructed from 2011. The bus trips had been 22 percent of total daily trips and it was reported that the average number of passengers used bus system 1.5 billion trips per year. Also, the subway system contributed 10 percent of the total daily trips being equal to 568 million passengers used this system each year. Because this report has been prepared in 2014, so it is tried to present the transportation information in basis years with the latest and revised information are presented in the charts.
Daily trip for different types of modes in 2013

A number of passengers used subway system in 2013
- The total length and a number of passengers in BRT system from 2007 to 2013.

The total length in the BRT system from 2007 to 2013

The Number of passengers in the BRT lines from 2007 to 2013.
- Total length and number of stations in the subway system in 2013.

Total length in the subway system in the term of year

The number of subway stations in the term of year.
Chapter 2
Prospective,
Objectives and approaches in the study of Tehran Transportation Master Plan
2-1- Prospective

The prospective of Tehran transportation master plan shows an appropriate specification of the city in 2005 and it can be stated as a road map for the sustainable development in Tehran. According to the prospective of the Islamic Republic of Iran, 2025 was recognized as the time horizon of these studies.

Transportation equity is trying to distribute the convenient and comfortable services for all users over the transport system. In order to improve and extend transportation equity with the emphasis on sustainable transportation, the transportation master plan was prepared in order to have a high quality and people-oriented transportation provided the constraints and resources.
2-2. General goals, strategies and the plans of Tehran transportation master plan

In order to satisfy the prospective of Tehran transportation master plan, it is necessary to clearly define the goals based on the sustainable transportation to avoid from any wrong way in the prospective. It should be mentioned that this plan ensures that we achieve to the goals of the perspective.

A view on general objectives, strategies and plans of Tehran traffic and transportation master plan
The target of Tehran transportation master plan in 2007 was to revise and complete the previous studies. Consequently, the above mentioned studies were revised once more in 2011. Therefore the studies themes of master plan which were defined in 18 topics were revised using 4 fundamental approaches.

The Studies Subjects of Tehran Traffic and Transportation Master Plan

- The Master Plan for Traffic System
- The Master Plan for Parking Spaces
- The Master Plan for Pedestrians
- The Master Plan for Cycling System
- The Master Plan for Urban Rail System
- The Master Plan for Roads Network
- The Master Plan for Privatization in Transportation System
- The Master Plan for Traffic Demand Management
- The Master Plan for Operation of Intelligent Transportation Systems
- The Master Plan for Passenger Terminals
- The Master Plan for Promotion in Traffic Culture
- The Master Plan to Optimize Fast / Congestion Free Route Options
- The Master Plan for Elderly and People with Disability
- The Master Plan for Safety and Efficiency Requirements for Urban Road Network
- The Master Plan for Improvement in the Safety of Transportation System
- The Master Plan for Motorcycles
- The Master Plan for Goods and Livestock Freight in Tehran

In addition to update the transportation system in Tehran, the revised demand models have the new features compared to the earlier studies. These features are stated as follows:

- Considering odd/even area based on the vehicle registration plate
- Updating the trip generation model, and revising the socio-economic variables based on the new information
- Updating the trip distribution models and considering the suburban areas
- Updating the structure of mode choice models
- Analyzing and validating the traffic flows obtained traffic assignment algorithm with the observed flow
Chapter 3

Outlines of the Revision of Tehran
Transportation Master Plan
(Objectives, Methodology and Achievements)
3-1- Outlines of master plan

Tehran City Council and Iranian Superior Council of Traffic approved eighteen subjects which came from the mater transportation plan in 2006. Since several changes have been taken place in the transport supply and demand from 2006 to present, we modify eighteen subjects with the aid of four major approaches. In the following, we state these approaches:

- Considering walking and biking: The car-oriented approach was replaced with the people-oriented one which also include walking and biking trend for the first time in Tehran.
- Changing the policy in demand for parking and supply: in order to provide the sufficient parking spaces, it is necessary to consider the transportation demand management and sustainable development.
- Changing point of view in the taxi system: Considering a taxi as a new mode in the transportation models and presenting the new mathematical programs to obtain the results in 2025.
- The method of development in the urban networks: Concentrating on the development of public transportation in order to meet 75% of total trips in Tehran

In the following subsections, we will describe the summary of results in the mentioned subjects.
3-1-1- The master plan for pedestrians

As increase the population of Tehran, there is a real need of developing a dynamic and responsive city with the various and effective transportation systems. This system should consist of pedestrian facilities which are safe, convenient, comfortable, and attractive. Several years after the last studies for pedestrians; there is a distinct tendency to consider the people-oriented transportation. Therefore, there is a great opportunity to prepare the long-term and consistent plan by considering the people-oriented transportation. It is worth mentioning that it should be possible to access from each location to any other location by foot; and sidewalks should provide the sufficient spaces for convenient, comfortable, and safe walks.

- Main achievements and outputs
  - The application of predicting model for pedestrian traffic flow in 2025
  - The introduction of a new guideline for constructing the sidewalk
  - Determination of level of service in sidewalk
  - Proposing the construction of sidewalk being about 28.9 km long in 2025
  - Proposing the construction of twenty-six walkways, i.e. 19.8 km long, in order to reach the people-oriented approach
  - Increasing the area associated with pedestrians by 317393 square meters until 2025

- Compare the results with the Master Plan for 2007

<table>
<thead>
<tr>
<th>Executive Results</th>
<th>Master Plan for 2007</th>
<th>Revised Master Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- To improve the condition of sidewalks along 555 km sidewalks in Tehran</td>
<td>- To consider 28.9 km of walkways by the horizon year of the project</td>
</tr>
<tr>
<td></td>
<td>- To set four points in the city</td>
<td>- Increase the area of walkways to 317393 square meters</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- To formulate the guidelines and operational regulations</td>
</tr>
</tbody>
</table>
Pedestrian flow in Tehran sidewalks in 2025

The final walkway to construct in 2025
3-1-2. The master plan for bicycle

There has been a huge change in the strategies and policies of urban transportation in Tehran. The municipal managers realize the importance of sustainable transportation and achieving a people-oriented transportation to have the convenient and comfortable movements through the network. Because Tehran absorbs a wide variety of activities and markets, a huge number of trips would be generated and the current infrastructures cannot meet the demand even though an extensive attempt to extend Tehran’s network. In order to develop people-oriented city, the bicycle master plan was defined in which bicycle trails were identified in two short-term and long-term horizons.

- The main achievements and outputs

  - Considering bicycle as a mode in four-step model for the first time
  - Integrating the road network and the bicycle trails
  - Proposing 919 km of bicycle trail, and 454 bicycle stations in 2025
  - In revised master plan, the bicycle model was proposed for the first time in Tehran. The bicycle model includes two models: travel demand model and assignment method.

- Results comparison over master plan for 2007

<table>
<thead>
<tr>
<th>Executive Results</th>
<th>Master Plan for 2007</th>
<th>Revised Master Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>- To recognize 368 km of potential corridors for cycling in Tehran</td>
<td>- Based on the achieved results, Tehran will have 919 km of bicycle trials in 2025.</td>
<td>- To consider 545 bicycle stations with a focus on the access to the main transfer points such as transit stations (Subway and BRT)</td>
</tr>
</tbody>
</table>
The proposed bicycle network of Tehran in the horizon year of the project

The locations of bicycle stations and parking for bicycles
3-1-3- The master plan for parking spaces

Providing the sufficient parking spaces based on the policies of demand management is among the important requirements for the large cities. The development of the public transportation and negative effects of using passenger cars, especially in the central districts, it is necessary to manage the demand to use the public transportation with the help of parking policies. In the following, we mention some achievements and outputs of the master plan related to parking policies.

- The main achievements and outputs

  - Calculate the loss of parking spaces in 2025
  - Propose the potential parking areas and recognize the sixteen locations with the first priority
  - Provide the pricing policy for parking areas
  - Propose the solution for no-parking areas
  - Compare the results with the master plan in 2007

The proposed roads of Tehran no-parking in 2025
The proposed strategy for the parking pricing in 2025

- Results comparison with master plan 2007

<table>
<thead>
<tr>
<th>Executive Results</th>
<th>Master Plan for 2007</th>
<th>Revised Master Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- To calculate the loss of parking spaces according to the supply</td>
<td>- To calculate the loss of parking spaces according to the maximum use of public transportation capacity</td>
</tr>
<tr>
<td></td>
<td>and demand</td>
<td></td>
</tr>
<tr>
<td></td>
<td>413169 parking spaces</td>
<td>167423 parking spaces</td>
</tr>
</tbody>
</table>
3-1-4- The master plan for taxi system

Taxi is recognized as a special Para-transit service having the signification contribution in the daily trips. This study intends to improve the performance of the taxi system, and changes the operating characteristic of this mode based up on the real definition of taxi in 2025. This approach would help to take into account the taxi as the formal mode in the process of the four-step model in 2025. The different items being considered in this study are: defining the standard taxi, minimizing of cost associated with taxi organizations, decreasing the delay time, optimizing energy consumption, and providing the maximum accessibility. In the following, we mention some achievements and outputs of the master plan related to the taxi system.

- **Main achievements and outputs**
  - Based on the revised master plan of taxi system, the portion of using taxis will be 20% of the total daily trips in 2025. Therefore, the portion of using standard taxis will reach to 12% and shuttle taxis to 8% of the total daily trips made in Tehran. According to this plan, the number of standard and shuttle taxis will be 80,000 and 60,000; respectively.
  - Establish the private companies in order to organize the dispatching systems for taxis as a unified system
  - Locating the standard taxi station

![The location of standard taxi stations in 2025](image)
An estimate on passenger car equivalence of shuttle taxis in peak hours in 2025

- Compare the achievements of master plan 2007

<table>
<thead>
<tr>
<th>Executive Results</th>
<th>Master Plan for 2007</th>
<th>Revised Master Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Taxi considered as an independent transportation mode</td>
<td>- Consider taxi as a transportation mode integrated with the other travel modes in Tehran transportation model</td>
<td>- Propose an integrated public transportation</td>
</tr>
</tbody>
</table>
3-1-5- The master plan for subway system

The urban rail transit results to the clean, cheap, and safe transportation in the modern cities. In the design of subway system, finding the optimal path having the highest utility is the primary objective. According to the policies and targets in the development of the subway, assessing the current options and presenting the new ones are the main tasks of the revision of Tehran subway master plan. The expected output of this process is to find the superior alternative for the urban rail network. In the following, we mention some achievements and outputs of the master plan related to subway system.

- The main achievements and outputs
  - To propose nine urban rail transit with 497 km long
  - To propose one light rail transit (LRT) with 17 kilometer long
  - To propose four express lines to access the suburb
  - In summary, 747 km of rail lines proposed for Tehran and its suburb

The urban and suburban rail network of Tehran in 2025
### Tehran rail lines specifications in 2025

<table>
<thead>
<tr>
<th>Line Number</th>
<th>Length (km)</th>
<th>Line Number</th>
<th>Length (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>42</td>
<td>South development of line 1 towards Imam Khomeini Airport</td>
<td>52</td>
</tr>
<tr>
<td>2</td>
<td>32</td>
<td>Express 1</td>
<td>28</td>
</tr>
<tr>
<td>3</td>
<td>35</td>
<td>Express 2</td>
<td>42</td>
</tr>
<tr>
<td>4</td>
<td>38</td>
<td>Express 3</td>
<td>45</td>
</tr>
<tr>
<td>6</td>
<td>33</td>
<td>Express 4</td>
<td>42</td>
</tr>
<tr>
<td>7</td>
<td>27</td>
<td>Total length of heavy rail lines</td>
<td>233</td>
</tr>
<tr>
<td>8</td>
<td>32</td>
<td>Total length of Tehran and suburban rail lines</td>
<td>747</td>
</tr>
<tr>
<td>9</td>
<td>27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Express 1</td>
<td>72</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Express 2</td>
<td>46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Express 3</td>
<td>36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Express 4</td>
<td>38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total length of heavy rail lines</td>
<td>497</td>
<td>Total Length of rail lines</td>
<td>514</td>
</tr>
<tr>
<td>Light Rail</td>
<td>17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Length of rail lines</td>
<td>514</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Results comparison with master plan 2007

<table>
<thead>
<tr>
<th></th>
<th>Master Plan for 2007</th>
<th>Revised Master Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of inner-city lines</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Number of express lines</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Number of complementary lines</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Total length (Tehran urban area)</td>
<td>461</td>
<td>514</td>
</tr>
<tr>
<td>Total</td>
<td>-</td>
<td>744</td>
</tr>
</tbody>
</table>
3-1-6- The master plan of bus system

Since incomplete coverage of the subway system and lack of other urban railway systems, most of the passengers have been using the bus system. In this plan, we initially investigate the present situation of the bus system, and then we proposed a master plan for bus system which is coordinated with the subway master plan. In the following, we mention some achievements and outputs of the master plan related to the bus system.

- Main achievements and outputs

- Tehran encompasses eleven BRT lines in 2025
- BRT lines are totally 202 km long in 2025
- Five inter-zonal lines proposed in Tehran
- Bus system contributes 25% of daily trips in 2025

The proposed bus network of Tehran (including coverage of bus system) in 2025
Results comparison over the master plan for 2007

<table>
<thead>
<tr>
<th>Executive Results</th>
<th>Master Plan for 2007</th>
<th>Revised Master Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- 152 km of BRT lines are proposed</td>
<td>- 202 km of BRT lines are proposed</td>
</tr>
<tr>
<td></td>
<td>- Proposed fleet: 11000 vehicles</td>
<td>- Proposed fleet: 11000 vehicles</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Proposing five inter zonal lines</td>
</tr>
</tbody>
</table>
As mentioned earlier, Tehran Transportation Master Plan was done in eighteen subjects. The objectives, frameworks and major outputs of the plan were mentioned in previous subsections. Since presenting all the plans are out of this reports, therefore the titles and main achievements of other subjects are presented briefly in the following table.

<table>
<thead>
<tr>
<th>No</th>
<th>Project title</th>
<th>Main achievements and outputs of the project</th>
</tr>
</thead>
</table>
| 1  | The master plan on formulation of theoretical and practical basis of privatization in the framework of traffic and transportation system | - The feasibility on applying privatization plans in Tehran transportation system  
- Deliver the proposals on privatization in the framework of urban transportation system  
- Deliver the proposals on how the privatization will be implemented in Tehran transportation system |
| 2  | The master plan on travel demand management | - To evaluate the effectiveness of applying travel demand management strategies with a focus on administrate or change the mandatory trip patterns, change the pattern of non-mandatory or eliminate the unnecessary trips  
- To evaluate the effectiveness of applying travel demand management strategies with a focus on policies consistent with land use system and change the transportation mode taken by citizens  
- Prioritize the various plans on travel demand management in order to operate in Tehran |
| 3  | The master plan on intelligent transportation systems | - Investigate ITS standards  
- Integrate the management, supervision and increase ITS systems productivity  
- Present the strategic plans to use ITS systems |
| 4  | The master plan on promotion of traffic culture | - Recognize the effective factors on decreasing the laws from the perspective of social, psychological and sociological theories  
- Recognize the causes and reasons on concerns the traffic laws and present the proposals in order to complete them  
- To offer operational solutions |
| 5  | The master plan on optimization of fuel consumption in inner-city transportation | - Anticipate the emissions in the model of Tehran transportation in 2025  
- Present the traffic indicators before and after the subsidies were determined based on the outputs of Tehran transportation model in 2025  
- Required activities to launch air quality management system |
| 6  | The master plan on design and formulating the convenient structure for disabled people traffic and transportation system | - Proposals on prioritizing the public transportation system for disabled people  
- Proposals on prioritizing the traffic in sidewalks and intersections for disabled people |
| 7  | The master plan on signs and road safety equipments | - Reform and complete the related instructions and introduce the available innovations  
- Present the indications and evaluate the efficiency of signs, boards and the safety equipment of Tehran road network in present situation  
- Present the operational plans related to the Traffic safety and control in Tehran |
| 8  | The master plan on promotion of transportation safety | - Calculates the accidents cost in 2025  
- Deliver the proposals to promote the culture in traffic and advertise continuously on transportation safety |
| 9  | The master plan on motorcycles | - Anticipate the mode share and the impact of motorcycles on Tehran daily trips in 2025  
- Formulate, consider and apply the effective laws about motorcycles  
- Apply restrictions and consider inhibiting factors to manage the motorcycles traffic |
| 10 | The master plan on inner-city goods and freight transportation | - Organize the conditions on goods and loads freight, manage and control the loading and unloading  
- Manage and control the various vehicles carrying the goods and loads to apply optimized and on time equipments in the basic time and wasted energy |
| 11 | The master plan on road network | - So finished development of roads network till the horizon year of the plan and focus on mass transit |
| 12 | The master plan on inter-city passenger terminals | - Locate the centralized, semi-centralized and decentralized terminals |
Chapter 4

The consequences of the revised studies on Transportation Master Plan
4-1: The introduction of effective projects on travel demand patterns and identify the scenarios

As stated earlier, in revision of Tehran transportation master plan, 18 subjects were revised and updated. Among these study subjects, some of the projects will affect the pattern and how to choose daily travel vehicle. These projects are as follows:

- Bus system master plan
- Urban subway master plan
- Roads network master plan
- Travel demand management master plan
- Parking master plan

According to the above mentioned projects and in order to assess their effectiveness on one another, 6 mixed scenarios in Tehran transportation were simulated for 2025. The simulated scenarios are as follows:

- **SCENARIO 1**: the best choice of travel demand management + subway best choice + promoted bus system + developed and completed roads network
- **SCENARIO 2**: the best choice of travel demand management + subway best choice + promoted bus system + undeveloped roads network
- **SCENARIO 3**: feasible travel management choice + subway best choice + promoted bus system + undeveloped roads network
- **SCENARIO 4**: feasible travel management choice + subway network approved by Supreme Council of Traffic + promoted bus system + developed and completed roads network
- **SCENARIO 5**: feasible travel management choice + subway best choice + promoted bus system + developed and completed roads network
- **SCENARIO 6**: feasible travel management choice + subway best choice + promoted bus system + semi-developed roads network

In each of the above scenarios, combination of different choices in each project was used. Each choice is defined briefly as follows:

**The best choice of travel demand management**: It is a choice in which travel demand will change as: decentralization of 40 percent of government employees from Tehran, 70 percent tele-working by government employees, 15 percent for e-learning, 30 percent reduction in referring to the organizations and 23 percent reduction in shopping
aimed trips. It is necessary to declare that the solutions to achieve the objectives of the mentioned travel management are presented in a report regarding travel demand management in Tehran transportation master plan.

**Feasible travel demand management choice:** It is a choice in which demand management changes as: decentralization of 20 percent of the government employees from Tehran, 35 percent tele-working by government employees, 15 percent of e-learning, 15 percent reduction in referring to the organizations and 12 percent reduction in shopping aimed trips.

**Subway best choice:** Including 8 subway lines, 5 express lines and a supplementary line totally 702.9 kilometer long.

**Subway network approved by the Supreme Council of Traffic:** Including 6 subway lines, 4 light rail lines and 2 express lines totally 341.6 kilometer long.

**Promoted bus system:** Bus lines were revised and designed according to mass transit development (subway and bus) and considering the complete coverage of roads network and achieve to an integrated public transportation.

**Developed and completed roads network:** Including a network in which urban roads network are developed based on the Detailed Plan and other delivered plans in the related report.

**Semi-developed roads network:** Including construction and completion of all short-term projects and highway supplementary projects.

**Undeveloped roads network:** Including construction and completion of all short-term projects and highway projects which their workhouse is still in operation.

After the six-fold scenarios were simulated, at last three choices were chosen as the superior in which the share of private vehicular trips was 40.6 percent and the rest will be carried out by public and semi-public vehicles.
4-2- Scenario on maximum use of public transportation capacity

Since the various scenarios were performed and the superior scenario was determined, it was recognized that the share of public transportation use will be about 59 percent in 2025 with complete development of subway system and without development of urban roads, development of public transportation and travel demand management. After the subway lines completed and developed in 2025, the capacity of public transportation has increased so that 75 percent of daily trips will be done by public transportation.

But what is definite, due to more utility in taking private vehicles and unequal competition in taking urban trips by public vehicles over private vehicles, despite having the 75 percent use capacity of public transportation in peak hours, this capacity will not be utilized completely. Therefore, in complementary studies done, it is necessary to apply restrictive policies in taking private vehicles consistent with implanting cultural and educational operations. So, to use more capacity of public transportation and achieve its share of 75 percent based on the approved regulations, other scenarios with a focus on implementing four policies on fuel pricing, parking pricing, pay toll while taking urban highways by private vehicles and construct HOV lines were studied and surveyed.

Among the investigated scenarios "feasible demand management choice + subway best choice + promoted bus system + undeveloped roads network + 120 percent increase in fuel price + 150 percent increase in parking price + set 4,500 Tomans to take the highways + construct 50 kilometer HOV lines long" was proposed as selected scenario aiming to achieve the maximum capacity of public transportation in morning peak hours.
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Various public transportation mode share (except walking) considering the selected scenario in one morning peak hour (Maximum utilization of public transportation capacity)
The revision and update studies on Tehran transportation master plan were done in 18 subjects. At the end, to evaluate the effectiveness of the effective projects on travel demand pattern and specify the interactions of implementing the effective projects on one another, six scenarios were performed. After the superior scenario was chosen and despite the increase in public transportation capacity to 75 percent in 2025, the utility and attractiveness of private vehicles is still high. With regard to this subject and necessity in considering the restrictive policies in applying private vehicles, other scenarios were defined and the impacts of reduced utility of taking private vehicles were assessed. The results of surveys done, indicated that by taking management tact in reduction of private vehicular trips demand, the share of public transportation has increase and reached to 72.4 percent. Also, the results indicated that it should be more attention paid to planning relevant to increase the cost of taking private vehicles (after the completion and development of public transportation and creating related capacity) in 2025.

No doubt, the authorities in charge of Tehran transportation network, will be able to create convenient transit infrastructures and sustainable development of the city, in addition to promote the life quality of the citizens, pave the way to take an integrated, available, safe, easy, comfortable and clean transportation which undoubtedly will lead to the reduction of air pollution in Tehran and more health for the citizens. The future of transportation in Tehran and the coverage of public transportation network will be presented in the following.
The passenger car equivalence in an hour of morning peak hours considering the selected scenario (The maximum use of public transportation)

The Prospective of the coverage of Tehran public transportation in 2025