Towards Regional Synergy

Potentials for polycentric development in Tehran Metropolitan Region (TMR)

Nazanin Hemmati

Delft, 2012
Cover Image:

Tehran Metropolitan Region
Photo by author, 2011
Towards Regional Synergy

Potentials for polycentric development in Tehran Metropolitan Region (TMR)

Master Thesis
Date: 29.06.2012
Delft University of Technology
Faculty of Architecture
Department of Urbanism
Chair of Spatial Planning & Strategy
Complex Cities Graduation Studio
September 2011 - June 2012

Contact:
Nazanin Babaee Hemmati
Student number: 4119959
n.b.hemmati@gmail.com
Mobile: 0614384173

Supervisors:
TU Delft, Faculty of Architecture, Department of Urbanism
Chair of Spatial Planning & Strategy
Dr. ir. Stephen Read
S.A.Read@tudelft.nl

TU Delft, OTB Research Institute for the Built Environment
Urban & Regional Development
Dr. Evert Meijers
E.J.Meijers@tudelft.nl

External Examiner
TU Delft, Faculty of Architecture, Department of Architecture
Chair of Building Typology
Steven Steenbruggen
S.Steenbruggen@tudelft.nl
“... Cities can be open or closed with regard to residents’ ability to access, occupy and use urban space, and even produce new spaces to meet their needs. Cities can also be open or closed in terms of residents’ ability to access decisions and participate in various types of interaction and exchange. Some residents find the city as the place where social and political life takes place, knowledge is created and shared, and various forms of creativity and art are developed; other residents find that the city denies them these opportunities. Cities can therefore be places of inclusion and participation, but they can be also places of exclusion and marginalization” (UN-Habitat, 2010).
Acknowledgment

This thesis is the result of my Masters Graduation project in the Architecture faculty of Delft University of Technology. In this short note, I would like to express my gratitude to all those who gave me the possibility for making this possible and turning my dreams to reality.

First, I would like to thank Delft city. Thanks for its amazing life and moments in the past two years, thanks to the beautiful city and its nice people.

My sincere gratitude to my supervisors Dr. Stephen Read and Dr. Evert Meijers for the trust and support they gave me in course of this project. I really appreciate the freedom I have been given, and the fact that I had the best team of supervisors. Thanks to Stephen for devoting lots of efforts in supervising my research. Thanks for giving me the opportunity to explore and learn from urbanism theories. As my first mentor, I have mostly appreciated thought-provoking discussions; during this year I have assigned a new meaning to the notion of ‘learning’. Thanks to Evert for sharing his incredible knowledge with me. His expertise helped me a lot in understanding the concept of polycentricity. Thanks for being patient with me, listening to me and supporting me in all steps of the project.

I would like to thank the enthusiastic and knowledgeable team of spatial Planning and Strategy for ideas, insights and encouraging academic environment. Special thanks to Roberto for helping on the first steps of academic research and offering valuable and useful advices. Thanks to Verena for her kindness, supports and constructive comments. During these two years beside the academic knowledge I gained, I also learned how to think and how to carry out an academic project.

Here I would like to thank my classmates and friends who made my two years of study in TU Delft full of unforgettable memories. I would like to add their names here in alphabetic order to keep their names and memories always alive for me: Amy, Ana, Andre, Angela, Cobien, Dion, Domenatas, Emilia, Hemma, Jasper, Karien, Laurens, Maaieke, Maarten, Marcel, Noor, Parisa, Robin, Ruud, Sara, Sladjana, Soudabeh, Tanja, Tim, Tridit, Vahid, Verena, Wieke and Ye Yu.

My huge appreciation goes to my boyfriend Mohammad reza, whose love has kept me going through good and bad times. Thanks for understanding, supporting and standing beside me. The last but not the least, thanks to my parents, Fariba and Behnam and, my dear sister Yasamin, whom without their unconditional supports this was not possible. Thanks for supporting me start a new life thousands kilometers away from my home and the loveliest family.
A metropolitan Region of the Third World countries like Tehran metropolitan region (TMR) in Iran, in consequence of unbalanced rapid urban growth, is facing with large set of unique social and demographic, cultural, economic, ecological, environmental and managerial problems. The entire problems are because of lack of effective regional plan and uncoordinated structure of the local authorities in concern to regional issues. Recently governments proposed a regional plan for the TMR which intends a polycentric development for the spatial configuration of the TMR. However, having the monocentric picture of the TMR in mind, this question rise that is it really possible to consider the TMR a polycentric urban region? What is the suitable regional strategy that provides synergy in the TMR?

In this thesis prominent literatures related to the Polycentric Urban Region (PUR) are reviewed. Two complimentary aspects of polycentricity namely, morphology and functional relationship are identified as essential elements for polycentric development. Governance structure of region is also considered as a third element for reaping the alleged benefits of polycentricity. These three factors together formed the analytical dimension of polycentricity. These three elements were studied in the TMR context and potential and deficiency of the region regarding to these elements are identified. The normative dimension of polycentricity is dedicated to reviewing the history of the region and studying the government’s plans in course of history to see how their plans promote or discourage the polycentric structure in the region.

Based on the findings it is concluded that the government’s plan for polycentric development of the region is ambitious and is not consistent with the current realities of the region. Therefore according to the analysis of the region a planning guideline in 5 aspects of centrality, mobility, low income settlements, land escape and governance is proposed. These sets of recommendations aim to provide balance development in the region and create social cohesion. Also by optimal alternation of the governments plan the TMR triangle is introduced and designed. Tehran, Karaj and International Imam Khomeini airport (IKIA) form the corners of this triangle. Three corridors connecting the three corners of this triangle is designed through Transit oriented Development.

The superiority of this proposal to the government’s proposal is, first it is based on the realities and potential of the region. Second, It also considers the regional administrative organization for coordination of local authorities. The proposed plan by taking advantage of the potentials in the region steers the government’s plan to the direction which is more feasible. The proposed plan leads to more urban cohesion and synergy in the region and improve the life quality of its residents.

In this thesis all the steps from literature review to planning, design and evaluation of the plan are explained extensively.
Table of Contents

Acknowledgement 2
Summery 4
1 Introduction 10
  1.1 Motivation 11
  1.2 Problem Statement 12
  1.3 Government’s Plan 15
  1.4 Aim 16
  1.5 Research Questions 16
  1.6 Relevance 17
  1.7 Ethical Issues 18
  1.8 Methodology 19
    1.8.1 Project Approach 19
    1.8.2 Framework and Methods of the Project 19
  1.9 Phasing and Time Schedule 22
2 Theoretical Framework 24
  2.1 Introduction 25
  2.2 The Demise of the Monocentric Model 25
  2.3 Towards Defining the Concept 26
    2.3.1 Polycentric Urban Region (PUR) 27
    2.3.2 Alternative Routs towards Polycentricity 28
  2.4 Measuring Polycentricity 30
  2.5 Advantages and Disadvantages of PUR 31
  2.6 Planning the PUR 32
  2.7 Conclusion 32
3 200 Years of Planning in the TMR 34
  3.1 Planning Through Infrastructure Design and Development 37
    3.1.1 1553-1797: Small Village in the Foot of Alborz Mountain 37
    3.1.2 1797-1920: A Twofold Renaissance for Tehran 37
    3.1.3 1920- 1940: Birth of the Metropolis 41
  3.2 Planning Through Land-use Regulation 45
    3.2.1 1940 - 1964: Expansion of the Capital in Course of Industrialization 45
    3.2.2 1965- 1979: Rapid Growth and the First Efforts to Control the Growth 49
  3.3 Planning Through Policy Development 54
    3.3.1 1979–1989: Revolution 54
    3.3.2 1989–1997: Reconstruction 57
    3.3.3 1997–2003: Reform 61
    3.3.4 From 2003 to Present: Present Strategy of Decentralization 63
  3.4 Conclusion 65
## 4 Analysis the Urban Structure of the TMR

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1 Introduction of location</td>
<td>69</td>
</tr>
<tr>
<td>4.1.1 Location</td>
<td>69</td>
</tr>
<tr>
<td>4.1.2 Geography</td>
<td>70</td>
</tr>
<tr>
<td>4.1.3 Comparing the scale</td>
<td>71</td>
</tr>
<tr>
<td>4.1.4 TMR in the bigger framework</td>
<td>71</td>
</tr>
<tr>
<td>4.2 Spatial Form of the TMR (Morphological Aspect of Polycentricity)</td>
<td>73</td>
</tr>
<tr>
<td>4.2.1 Concentration of Population</td>
<td>73</td>
</tr>
<tr>
<td>4.2.2 Concentration of Service Activities</td>
<td>75</td>
</tr>
<tr>
<td>4.2.3 Concentration of Industrial Activities</td>
<td>82</td>
</tr>
<tr>
<td>4.2.4 Mobility Nodes</td>
<td>85</td>
</tr>
<tr>
<td>4.2.5 Social Profile of the TMR</td>
<td>89</td>
</tr>
<tr>
<td>4.2.6 Conclusion</td>
<td>92</td>
</tr>
<tr>
<td>4.3 Functional Relationship between Urban Areas (Relational Aspect of Polycentricity)</td>
<td>95</td>
</tr>
<tr>
<td>4.3.1 Highway Networks</td>
<td>96</td>
</tr>
<tr>
<td>4.3.2 Bus Networks</td>
<td>98</td>
</tr>
<tr>
<td>4.3.3 Rail transportation Networks</td>
<td>99</td>
</tr>
<tr>
<td>4.3.4 Origin-Destiny</td>
<td>101</td>
</tr>
<tr>
<td>4.4 The Structure of the Urban Governance in TMR</td>
<td>107</td>
</tr>
<tr>
<td>4.4.1 Globalisation and Regional Restructuring</td>
<td>109</td>
</tr>
<tr>
<td>4.4.2 Identification of the Existing Urban Governance in TMR</td>
<td>109</td>
</tr>
<tr>
<td>4.4.3 Evaluation of the Existing Planning System in Iran</td>
<td>113</td>
</tr>
<tr>
<td>4.4.4 Evaluation of the Existing Management System in TMR</td>
<td>115</td>
</tr>
<tr>
<td>4.4.5 Conclusion</td>
<td>119</td>
</tr>
</tbody>
</table>

## 5 Research Conclusion, Planning & Spatial Strategy

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1 Research Conclusion</td>
<td>122</td>
</tr>
<tr>
<td>5.2 Regional Planning Guideline for the Tehran Metropolitan Region</td>
<td>123</td>
</tr>
<tr>
<td>5.3 Towards an Alternative Spatial Strategy</td>
<td>129</td>
</tr>
</tbody>
</table>

## 6 Regional Design & Institutional Recommendation

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1 The Concept the TMR Triangle</td>
<td>140</td>
</tr>
<tr>
<td>6.2 Identifying the components of Triangle Strategy</td>
<td>141</td>
</tr>
<tr>
<td>6.2.1 Karaj</td>
<td>142</td>
</tr>
<tr>
<td>6.2.2 Imam Khomeini International Airpot (IKIA)</td>
<td>143</td>
</tr>
<tr>
<td>6.2.3: Tehran - Karaj Corridor</td>
<td>149</td>
</tr>
<tr>
<td>6.2.4 Tehran - IKIA Corridor</td>
<td>152</td>
</tr>
<tr>
<td>6.3 Proposed Identity for the Elements of the Triangle Spatial Strategy</td>
<td>159</td>
</tr>
<tr>
<td>6.4 Regional Design</td>
<td>165</td>
</tr>
<tr>
<td>6.4.1 Regional Rail Transit Proposal</td>
<td>166</td>
</tr>
<tr>
<td>6.4.2 Spatial Development of Transit Nodes</td>
<td>166</td>
</tr>
<tr>
<td>6.4.3 Implementation of the Regional Design Proposal</td>
<td>171</td>
</tr>
<tr>
<td>6.5 From Building Regional Governance to Regional Development</td>
<td>186</td>
</tr>
<tr>
<td>6.5.1 The Necessity of the Regional Planning</td>
<td>193</td>
</tr>
<tr>
<td>6.5.2 Building Regional Governance</td>
<td>193</td>
</tr>
</tbody>
</table>
7 Conclusion

7.1 Synthesis

7.2 Evaluation
   7.2.1 Evaluating the Influences of the Proposed Spatial Strategy in Solving the Regional Problems
   7.2.2 Evaluating the Superiority of the Proposed Spatial Strategy to the Government proposal

7.3 Final Conclusion

Bibliography
Chapter 1

Introduction

This chapter begins with the motivation of the writer for this research. Then it will be followed by the problem statement. Moreover the aim of the project is explained. Based on the problem statement and the aim of the project the research questions which should be answered in course of this research are specified. In the methodology section, the chosen strategy for answering the research questions is explained. This section also motivates the content of future chapters of this thesis. Relevance of the thesis is discussed in two aspects of scientific and social. Finally the timeline of the research and the structure of the thesis is explained in the last section.
1.1 Motivation

As an urbanism student, I have been always fascinated by urban and regional developments, and the way that spatial arrangements of metropolitan regions influence their economic performance, environmental quality and consequently the comfort of their inhabitants. In the presence of the adequate regional planning, regions could develop towards increasing their attractiveness and competitiveness. However regional growth without any control will result to creation of urban areas with socio-spatial segregation and environmental inequality. Many developing countries still do not consider the importance of regional planning in creating sustainable living environments. Iran is an example of such countries. Extensive attention to Tehran resulted to the monocentric development of the region. Tehran Metropolitan Region was always associated with socio-spatial and environmental problems due to the unbalanced development of the regional territory. The core-periphery conceptualization of the region resulted to Tehran encompasses all the life opportunities and the inhabitants of other parts of the region do not have access to the urban facilities that Tehranis experience in their everyday life.

Coming from a city in north of Iran, the unfair distribution of the opportunities among the cities, has always prompted me to face with this deficiency. Now here I found this opportunity to pursue my master thesis in Complex Cities studio which helps me to broaden my knowledge in the realm of urban and regional planning. In this graduation project, I used Tehran Metropolitan region as a case study to test the theoretical inputs in a real urban context. My goal is by carrying out a multidisciplinary research on the urban and regional development try to understand the forces that leads to regional deficiencies and provide urban planning strategies that promote regional synergy and diminish disparity in the Iranian regional context. I hope this graduation project will help in developing a better future for the people of my country, with less segregation and more economic and environmental prosperity.

Image 1.1: View of Tehran in top and view of the other city in vicinity of Tehran in below (Source: Unknown).
1.2 Problem statement

Like many other Metropolitan Regions in the world, Tehran Metropolitan Region (TMR) has experienced rapid urbanization growth in the last decades. The focus of government’s investment and subsequently private sectors in 1940s, Tehran became an unprecedented economic pole in the country and its population in 15 years between 1940-1955 grew 3 times. As a result of the rapid population growth and migration from all over the country due to the better job opportunity and urban facilities, the rate of urbanization growth was tremendous in this region.

The explosion of Tehran in 1960s brought a massive fear about the future of the capital for the government. In early 60s, government pursued decentralization policy by exerting the restrictions on construction of the industries in 120 km radius of Tehran. The 40 years of decentralization policy in Tehran was associated with the neglect of the fundamental issues in the city and region. During these years beside rapid growth of population, development of the road network in the region, establishment of new industries out of Tehran and also considered restriction in Tehran’s master plans resulted to the many informal settlement of immigrants outside of Tehran city. Villages and small cities in south and west of Tehran and Karaj (the second biggest city of TMR) grew tremendously, therefore the new residential areas in short period formed in this region. The number of the cities in Tehran metropolitan region from 4 cities in 1955 increased to 15 cities in 1975, 25 cities in 1995 and 52 cities at present time (Ghamami, 2004).
In two recent decades the population growth rate of the Tehran city becomes less than the natural birth growth rate. Although the decentralization policy seems to be successful, birth of the informal residential areas near Tehran is a proof that still the city of Tehran is the unique economical pole in the region. The monocentric urban configuration of region toward Tehran, constraints the Tehranis to move on a "pendulous" manner between their residence and their place of activity (economic, social, cultural...). The inadequate and slow development of the urban public transport network does not facilitate these movements and it only absorbs one third of the daily urban travels (Araghi, 2004).

![Diagram 1.2: The demographic processes in the Tehran Metropolitan Region (TMR) during the past three decades of 1966-1996 reveal that the population of the TMR has grown from 3.13 million in 1966 to about 10.34 million in 1996. During this period, the share of the Tehran City population has decreased from 87% in 1966 to about 65.5% in 1996 while the population of the rest of the TMR has grown from 14.2 % in 1966 to about 34.67% in 1996.](image)

**Map 1.2: Formation of the TMR (Source: Esfandyar Zebardast).**

**Scattered urban structure in the metropolitan fringe with special concentration near the infrastructure!**
Introduction

Beside inefficiency of public transport system, the economic development of recent years has resulted in an increasing motorization rate among Iranian households. Therefore, the households who can afford financing their journeys on private modes and benefit from a better accessibility to urban amenities. As a result, every day more than 1.4 million vehicle trips into and out of the Central Business District (CBD), which creates tremendous Traffic congestion in the city centre (Image 1.8). The concentration of traffic in the central zones gives Tehran one of the highest levels of air pollution in the world (Gernett, 1980). The choked streets of Tehran are full with four million vehicle and air pollution (Images 1.9 and 1.10) which kills 3,600 inhabitants per month (Bayat, 2010). On the other hand, those who cannot afford these private modes are bound to borrow the public ones and have to face the dysfunctions of an under developed service.

Beside Tehran, the lack of efficient urban planning and management in regional level in course of decentralization process resulted to the marginalization and formation of informal settlements in the region. This non-cooperated structure of governance provoked an incoherent and fragmented urban structure, unfair life condition, unbalanced distribution of opportunities and facilities in the region, socio-spatial segregation, and illegal occupation of lands in the metropolitan fringe.

Nowadays TMR more than any time is suffering from lack of effective regional planning which can respond to the demands of the society in the 21th century. In recent years the government tries to find a solution regarding to this problem, and by preparing a vision for the TMR. The main goal of the Tehran regional plan is promoting polycentric urban structure as a physical development pattern by creating 9 centralities in the region. In first view this seems to be a good answer. But due to the existing physical structure, potentials in the region and governmental system it does not seem to be attainable. Therefore the goal of this research is to investigate the feasibility of government’s proposal.
1.3 Government’s Plan

The Tehran Metropolitan Region plan was approved by High Council of architecture and Urban planning (HCAUP). The goal of the plan is formed based on the situation of the TMR at that time and its future. As mentioned previously the main problems of the TMR can be stated as social, economic and environmental crisis. These problems are as result of irregularities in population and industries distribution and the way of land use. Lack of any coherent plan along with rapid population growth in this region, expansion of marginalization and informal settlements are the main source of the problem in the TMR. Therefore in the Tehran Metropolitan Region plan organization of the current disorders and prevention of their continuity depends on the realization of the following objective (Ghamami, 2010).

**General Goal:**
Meet the housing and employment demands of the different inhabitants of the region in the context of the sustainable socio-economic and environmental developments in the process of the spatial transformation.

**Specific Goals:**
- Organizing activities and accommodation of the future population.
- Managing and governing land uses.

**Strategies:**
The proposed spatial development pattern is polycentric, and the planned strategies to direct future development in desired trend include the following:
- Decentralization and De-concentration from the city of Tehran and devolution of responsibilities to lower level authorities.
- Investment in other existing and planned population hubs in order to prevent further dispersion.
- Mobilization and organization of the existing and planned major population and economical hub, and reinforcing their synergies to exploit their maximum capacity for acceptance of the future population and transferring appropriate roles in servicing the metropolitan region.
- Optimum exploitation of existing infrastructure and utilities.

According to multiplicity and inconsistency between components of management system in current situation and major part of the informal settlements in formation of the population distribution in TMR, it seems that the responsible authorities are facing two curtail issues: first, solving housing problem of low income people and informal settlements. Second, modification of urban management system.
1.4 Aim

As presented in problem statement the monocentric configuration of the TMR is not compatible with its twenty first century’s requirements, characterised by the decentralization of economic activities and increased mobility. The present structure of the region is the source of many social, economic and environmental problems, caused by the rapid urban growth of the last decades together with the lack of efficient planning and executive power for the urban development.

Diminishing the regional problems and developing a more competitive and attractive region, government had chosen polycentric development as suitable strategy to fulfil their goals and develop their desired spatial structure. However, developing polycentric structures in the TMR asks for an intensive review of the metropolitan dynamism to examine how it deals with the changes from monocentric configuration to polycentric one. Thus, the overall project aims to contribute in a comprehensive understanding of the urban condition of the TMR, in order to evaluate the possibility of the polycentric development in it. Furthermore, it aims to search for appropriate and innovative planning strategies in order to promote the polycentric development by promoting synergies between different parts of the region. These proper planning strategies can boost regional performance, facilitate more balance distribution of services and opportunities, and enhance the economic competitiveness of the region, while safeguarding the environmental sustainability. They can update the city towards the social and economic transformations resulted from the process of globalization, transformation of production modes and dispersion of activities. These planning strategies should takes into account the current reality of an urban system and promote polycentric development based on the opportunities of the existing urban structure.

In this research, the concept of polycentricity is used as a tool to analysis context of TMR from different perspectives. Since it in encompasses both analytical and normative aspects, facilitated a comprehensive understanding of complexity of the TMR which is only possible through intensive reviews of normative documents and careful observation of the urban structure of the TMR. In reality, commonly there is a gap between desired spatial structure (normative documents) and existing spatial structure. This research aims to generate a link between them and translate research findings into development strategies with focus on promoting more competitive and attractive urban regions which satisfy different interests in the society.

1.5 Research Questions

Main Research Question:
According to the aim of the graduation project mentioned in the previous section, the main research question that should be answered is the following:

*Is it possible to realize government polycentric development proposal? If not! What is the suitable regional strategy that provides synergy in the TMR?*

Sub Research Questions:
The thesis answers the main research question, based on 11 sub-research questions. These sub-research questions are organised in three dimensions: concept-related, context-related and planning. The methods for research will be addressed in section 8 ‘Methodology’.

Concept-related:
1. *What is the definition of the PUR based on the existing literature?*
2. *What are the advantages and disadvantages of developing PUR?*
3. *What are the fundamental elements for measuring polycentrism in a region?*

Context-related:
4. *How does the government encouraged or discouraged the polycentrism in the TMR, through urban plan and policies?*
5. *How the population and activities distributed over the TMR territory?*
6. *What is the level of functional interaction and interdependence between various centres in the TMR?*
7. *How can the existing governance of the TMR promote the PUR?*

Planning:
8. *Are the trends in TMR in the same direction with the vision of the government (Polycentric development)?*
9. *What are the urban planning recommendations to enhance the quality of life in the TMR?*
10. *What could be an alternative spatial strategy for the TMR based on the existing potentials in the region?*

Design:
11. *What are the design proposals and institutional recommendations to promote synergy in the TMR?*
1.6 Relevance

Scientific Relevance

Considering the origin of the polycentrism, there are extensive amount of scientific studies being done in this field in the context of European or American metropolitan area. Therefore, the concept of polycentrism which is proposed by the government of Iran as a suitable development pattern for Tehran Metropolitan Region (TMR) is an initiative proposal for Iranian Metropolitan region. Accordingly, there is crucial need for research on the feasibility of this concept within the TMR context, and evaluate how TMR will respond to the change from monocentric configuration to a polycentric structure. Hence, within spatial planning field, the foremost academic relevance of this research is to understand the possibility of translation of this western concept to Iranian metropolitan context with considering the demands and trends of the society.

Furthermore, regional disparity is one of the common problems in developing countries. Nowadays urban planners try to discover possible ways to diminish this problem and proceed towards a regional synergy. The result of this research could translate in other metropolitan regions of the Middle East, suffering from the same problem.

Societal Relevance

The world is undergoing the largest wave of urban growth in history. In 2008, it reached a momentous milestone; the world’s population was evenly split between urban and rural areas resulted to and 3.3 billion people lived in urban areas. More developed nations were about 74 percent urban, while 44 percent of residents of less developed countries lived in urban areas. However, urbanisation is occurring rapidly in many less developed countries. It is expected that 70 percent of the world population will be urban by 2050, with urban growth concentrated in Africa and Asia (UN-Habitat, 2008).

Since in most of the cases, the urban growth occurred in the big cities, mono-centric configuration of these cities cannot sufficiently meet the demands of their citizens and resulted to the urban problems. “The main evils arising would be seen as congested transport systems, particularly roads; rising land costs; longer travel-to-work times which quite apart from the time costs to individuals would result in productivity losses because of worker fatigue; decreased access to open space and the countryside; increased need for costly investments in new infrastructure; increasing pollution of air and water which worsening health problems” (Sorensen, 2001, p.1).

Map 1.4: Density of low income group in TMR. In this map the poor group of people are mostly live in small cities or villages in south and south-east of Tehran (Source: Atlas Tehran).
City and regional planning face an increasingly wide range of ethics-related challenges. Planning issues commonly involve a conflict of values and, the necessity for the highest standards of fairness and honesty among all participants. The ethical values derive both from the general values of society and from the planner’s special responsibility to serve the public interest (Ethical Principles in Planning, 1992). Although Plans and programs aim to balance divergent interests, it is possible that some sort of interests with minor priority neglected during the planning process, and resulted to the ethical problems for the specific group of people. Sometimes it is not possible to solve these ethical problems easily, but planners are responsible to think of these issues and find a feasible solution to improve the situation.

Like the other spatial planning strategy, promoting polycentric development may have some positive consequences on people’s life as well as some negative effects. The process of interaction between centres leading to the reallocation of activities between them as beneficial for the whole region, but sometimes the outcome is likely to be uneven with winners and losers. Some centres will lose particular types of employment and some may experience an overall decline in employment, with potentially severe impacts on particular social groups. On the opposite, some centres may receive benefits from the reallocation of activities and they increased they competitiveness in the region. Such impacts generate political tensions which undermine regional coherence and consensus. Although Polycentric Urban Regions (PUR) may promote competitiveness of the region, at the same time they may be a means of addressing polarization within a region. This problem can be addressed as one of the possible ethical problems that PURs may generate.

This section does not intend to present all the possible ethical problems may occur by development of PUR or introduce feasible solution for solving them. The intention of this section is just to keep on mind the possible adverse consequences of polycentric development.
1.8 Methodology

1.8.1 Project approach

Traditional approach of doing urban projects that is limited on fixing the problems not only gives limited solutions in a narrow period of time but also they are not strong enough to generate or impulse (spin off process) a short-long terms transformation process able to deal economic and political uncertainty. Although every problem represents a challenge, it is also an opportunity to generate a process of visioning the desirable future (short and long term perspective) that is able to generate the transformation of the dynamics of the city (Garcia and Sanchez, 2009, in: Liang, 2010). This project also, does not intend to find a fix solution for the problem, but desired to propose strategies which are flexible enough to deal with the economic and political uncertainty of the today’s Iranians society.

1.8.2 Framework and methods of the project

“...framing is a way of selecting, organizing, interpreting, and making sense of a complex reality to provide guideposts for knowing, analysing, persuading, and acting.” (Rein and Schön, 1993, p.146)

The thesis has a research-oriented approach, and aims to provide empirical findings of the urban condition in the Tehran Metropolitan Region related to polycentric development and to translate these findings into development strategies with a focus on promoting regional synergy and generating social cohesion. To do so, the research process is divided in five complementary and interrelated steps; project definition, concept-related research, context-related research, planning and design (Diagram 1.3).

Diagram 1.3: Framework diagram (Source: Diagram by author).
PROJECT DEFINITION

In the first phase of this project, location (TMR) and the main theme of the project (regional planning) are chosen according to the personal interest. Problem statement and aim of the project are originated by reviewing literatures and preliminary analysis of the TMR in order to make a starting point for the rest of the research. Based on the aim of the project, the main research question was proposed (chapter 1). In order to answer the main research question, 11 sub-research questions are defined to clarify different actions need to be done during the project. The methods used in this research are namely, literature review, data research, drawing and mapping (table 1.1). The main method used is literature review (LR), presented in all steps of the research, bringing lots of theoretical inputs to enrich the investigation. The data research (DR) relates to data, documents, policies, and plans developed by the national, provincial and municipal government. Drawing (D) is basically used for expressing the ideas, summarizing conclusions and conceptualizing principles, conditions. Finally Mapping (M) provides a good input by illustrating weaknesses and opportunities. Although due to the time limitation and the distance from the project destination, site observation was not possible during the graduation year, in the analysis of the TMR structure author used her experiences and familiarity with location.

CONCEPT-RELATED RESEARCH

This phase of the thesis dedicates to understanding of the key-term of the research: polycentrism (chapter 2). The result of this part of the research will form the theoretical framework for the research to build a research on, and provides criteria for measuring polycentricity in the TMR. Reviewing the literature regarding this subject helped the author to answer these sub-research questions:

1. What is the definition of the PUR based on the existing literature?
2. What are the advantages and disadvantages of developing PUR?
3. What are the fundamental elements for measuring polycentrism in a region?
4. How does the government encouraged or discouraged the polycentrism in the TMR during the history, through urban plan and policies?
5. How the population and activities distributed over the TMR territory?
6. What is the level of functional interaction and interdependence between various centres in the TMR?
7. How can the existing governance of the TMR promote the PUR?
8. Are the trends in TMR in the same direction with the vision of the government (Polycentric development)?
9. What are the urban planning recommendations to enhance the quality of life in the TMR?
10. What could be an alternative spatial strategy for the TMR based on the existing potentials in the region?
11. What are the design proposals and institutional recommendations to promote synergy in the TMR?

<table>
<thead>
<tr>
<th>RESEARCH QUESTIONS</th>
<th>METHODS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What is the definition of the PUR based on the existing literature?</td>
<td></td>
</tr>
<tr>
<td>2. What are the advantages and disadvantages of developing PUR?</td>
<td></td>
</tr>
<tr>
<td>3. What are the fundamental elements for measuring polycentrism in a region?</td>
<td></td>
</tr>
<tr>
<td>4. How does the government encouraged or discouraged the polycentrism in the TMR</td>
<td></td>
</tr>
<tr>
<td>during the history, through urban plan and policies?</td>
<td></td>
</tr>
<tr>
<td>5. How the population and activities distributed over the TMR territory?</td>
<td></td>
</tr>
<tr>
<td>6. What is the level of functional interaction and interdependence between various</td>
<td></td>
</tr>
<tr>
<td>centres in the TMR?</td>
<td></td>
</tr>
<tr>
<td>7. How can the existing governance of the TMR promote the PUR?</td>
<td></td>
</tr>
<tr>
<td>8. Are the trends in TMR in the same direction with the vision of the government</td>
<td></td>
</tr>
<tr>
<td>(Polycentric development)?</td>
<td></td>
</tr>
<tr>
<td>9. What are the urban planning recommendations to enhance the quality of life in</td>
<td></td>
</tr>
<tr>
<td>the TMR?</td>
<td></td>
</tr>
<tr>
<td>10. What could be an alternative spatial strategy for the TMR based on the existing</td>
<td></td>
</tr>
<tr>
<td>potentials in the region?</td>
<td></td>
</tr>
<tr>
<td>11. What are the design proposals and institutional recommendations to promote</td>
<td></td>
</tr>
<tr>
<td>synergy in the TMR?</td>
<td></td>
</tr>
</tbody>
</table>

Table 1.1: Research methods (Source: Table by author).
CONTEXT-RELATED RESEARCH

According to Davoudi (2003) Polycentrism has two dimensions: analytical and normative. Analytical dimension relates to a range of hypothesis, and polycentric concepts are used to analysis the spatial structure to explain the existing or emerging phenomenon. While in the normative dimension, it provides a metaphor for desirables spatial structures, and polycentric concepts are used as a guiding principle to achieve a policy goal. This research takes these two dimensions as a backbone of the context-related research, and represents them in two chapters. The first chapter (chapter 3) relates to normative dimension of polycentricity. This chapter dedicates to the analysis of the urban plans and policies which affected the urban development of the TMR. To do so, the author will review the history of TMR, from the moment Tehran selected as a capital to current situation. Furthermore by analysis the urban polices and plans of TMR, evaluates the relevance of polycentric development on those plans. This chapter tries to answer the fourth sub-research question of the research:

4. How does the government encouraged or discouraged the polycentrism in the TMR, through urban plan and policies?

In order to accomplish this part of the research, the author used literature review from Iranian or Western authors who reviewed historical evolution of the TMR during the last 200 years, and large amount of official data which includes all the governmental plans and policies from 1960. This section also uses mapping in order to illustrate the urban transformation and population growth in the region based on the official Data.

The second part of this step donates to the analytical dimension of the polycentricity (chapter 4). This part relates to analysis the current reality of the TMR, and based on the findings of the theoretical framework investigates the urban condition of the TMR in three aspects: morphology, functional relationships and governance. This part of the research evaluates the level of the polycentricity in the TMR based on the potential clusters, relation between urban areas and development trends. In this chapter the author tries to answer to these sub-research questions:

5. How the population and activities distributed over the TMR territory?
6. What is the level of functional interaction and interdependence between various centres in the TMR?
7. How can the existing governance of the TMR promote the PUR?

This part of the research needs reviewing official data which includes different census from 1956 and municipal documents for different parts of the region. This section also used large amount of mapping in order to illustrate the level polycentricity in TMR.

PLANNING

After extensive analysis of the urban conditions of the TMR in both analytical and normative dimensions, the planning part of the research will be started (chapter 5). This part has three phases. First phase relates to the evaluation of the government’s plan based on the results of the research and tries to answer the following sub-research question.

8. Are the trends in TMR in the same direction with the vision of the government (Polycentric development)?

For answering this question, the author will translate the trends in TMR in to diagrams to evaluates if they are in the same direction with government’s plan.

As it was mentioned in the aim of the project, in reality, commonly there is gap between desired spatial structure (normative documents) and existing spatial structure. Therefore, the author aims to generates a link between them by searching of potentials for polycentric development. The next step dedicates to the planning recommendations for improving the quality of life in the TMR. By improving the weaknesses found in the research process, the author aims to propose set of planning recommendations that diminish regional disparity and enhance the social cohesion. This part will answer the following sub-research question:

9. What are the urban planning recommendations to enhance the quality of life in the TMR?

The method used in this stage is literature review about planning the PUR, and how to the other metropolitan region deals with regional problems and manage the metropolitan growth.

After providing a general planning framework that controls the future developments. It is necessary to propose a new spatial strategy based on the existing potentials of the region that could work as an alternative for the government’s proposal. This part of the thesis tries to answer:

10. What could be an alternative spatial strategy for the TMR based on the existing potentials in the region?

This stage involves drawing and mapping to explain the proposal strategies.
Introduction

DESIGN
Design part (chapter 6) dedicates to proposing regional design and institutional recommendations, that illustrates how the proposed spatial strategy will be realized in the context of TMR. This stage used methods such as mapping and drawing. This part of the thesis tries to answer:

11. What are the design proposals and institutional recommendations to promote synergy in the TMR?

EVALUATION
Evaluation part is the last step of the graduation project (chapter 7), and will demonstrate that how the result of the research and the proposal will affect the TMR society. After that the author will explains the reasons for superiority of the spatial strategy of the graduation project to the government’s proposal.

1.9 Phasing and Time Schedule
The graduation project took one academic year, started at the beginning of September 2011 and finishing with the final presentation in June 2012. The following schedule will give an impression of the different phases, in-between products and milestones of this project.

The graduation project is accomplished in five interdependence phases that complete each other. Each phase also, divided in smaller steps, which illustrates the various action needs to be done to finish the phase. These five phases are problem definition, concept-related and context-related research, planning and design. The table below illustrates the detailed time planning of different phases in graduation project and the products should be accomplished within the mentioned time.
Polycentricity has become an important topic since 20th century, especially in two recent decades. Polycentric Urban Regions (PURs) are believed to offer a means for promoting regional economic competitiveness, while generating social cohesion (Bailley and Turok, 2001). In spite of widespread currency of the PUR, the concept is not supported by a clear dentition (Davoudi, 2003), and there are several characterizations amongst different author for the clusters of cities to be considered as a PUR. Therefore this chapter by considering the concept of polycentrism from different perspectives aims to find a comprehensive definition of the PUR, such that to be able to evaluate a whole variety of urban systems that represents a polycentric phenomenon. Moreover two complimentary aspects of polycentricity namely, morphology and functional relationship are introduced. In this research, governance is also considered as the elements for reaping the alleged benefits of polycentricity. Finally, the advantageous and disadvantageous of PUR model are discussed.
Chapter 2

2.1 Introduction

The concept of polycentricity, basically denoting the existence of multiple centres in one area (Kloosterman and Musterd, 2001) is becoming increasingly popular in spatial policies and planning on a variety of spatial scales. This popularity is rooted from this idea that "Regional planning for and in polycentric urban regions may entail certain competitive potentialities over a stand-alone development of their individual cities or city-regions. These potentialities relate to the pooling of resources, complementarities and spatial diversity" (Meijers and Romein, 2003, p.173).

It seems that planners are aware of these potentialities as in several European countries attempts are made to identify such polycentric regional systems of formerly independent and distinct cities that are located close to each other (Meijers and Romein, 2003). Likewise, Iran’s governments desire in transforming the Tehran Metropolitan Region (TMR) to a PUR. In order to evaluate the feasibility of this concept in Iranian context, it is necessary to first answer the following questions: “What is the definition of PUR based on the existing literature?”, “What are the advantages and disadvantages of the PUR?” and “What are the fundamental elements for measuring polycentrism in a region?”. This chapter of the reports presents various explanations of the PUR by reviewing prominent literature related to this subject. The main goal of this chapter is to extract some features of the polycentric urban region and exploit them as tool for examining degree of polycentricity of TMR.

Therefore this chapter of the report is organized as follows: In the second section the demise of the Monocentric model is discussed. The third section explains why there is no unified definition for polycentricity, afterward it continues with different explanations of PUR in subsection 3.1. The diverse modes that PURs can evolve will also be discussed in subsection 3.2. In the forth section the author tries to provide a tool for measuring the level of polycentricity of a region. In the next section author expresses the advantageous and disadvantages of a polycentric model. The sixth section illustrates several elements which are necessary to form a polycentric urban region. Finally based on the provided information and arguments the author will draw a conclusion in section seven.

2.2 The Demise of the Monocentric

Until the 1970s, the conceptualization and evaluation of the internal structure of cities were based on the monocentric city models, influenced by the ecological analysis of Ernest Burgess, published in 1925 in his essay on: ‘The Growth of City’ (Davoudi, 2003, p.980-981). The Burgess model (the concentric zone model), explained the distribution of the social group within the four concentric rings surrounded the central business district (CBD) (Diagram 2.1). In the monocentric model the average density of development declines systematically with increasing distance from the centre (Alonso, 1964, in: Davoudi, 2003).

In the face of rapid and complex urban changes, monocentric model became increasingly inadequate for describing the spatial structure of contemporary cities. The main evils arising from overgrown monocentric cities were seen as congested transport systems, particularly roads; rising land costs; longer travel-to-work times which quite apart from the time costs to individuals would result in productivity losses because of worker fatigue; decreased access to open space and the countryside; increased need for costly investments in new infrastructure; increasing pollution of air and water; worsening health problems; and even increasing moral degeneracy and crime (Andre’ Sorensen, 2001). However as Kloosterman and Musterd (2001, p.625) claims, the erosion of the monocentric model took place between 1925 and 1965, when the new transport technologies enabled a shift in economic relationships between and within firms. The shift in economic relationship consequently resulted to the distribution of employment and population and, hence, the pattern of spatial development (Scott, 1988; Porter, 1990; Krugman, 1991).

Diagram 2.1: The Burgess concentric zone model, (Source: http://www.studyblue.com)
Theoretical Framework

2.3 Towards Defining the Concept

The notion of polycentricity is not entirely new concept. What is new, however, is the growing popularity of the concept amongst urban planners and policy-makers (Davoudi, 2003, p.979). Despite the vast academic and policy literature has emerged focusing on the concepts of polycentrism (Burger and Meijers, 2011, p.1), nevertheless, the theoretical framework of this urban configuration is still not well founded and a clear typology or taxonomy is lacking (Kloosterman and Musterd, 2001, p.623). This section tried to illustrate the reasons of ambiguity for the concept.

Davoudi (2003, p.979) explained parts of this divergent interpretations among various authors by their different academic backgrounds and research focuses. For instance urban planners use the concept as a strategic spatial planning tool; economic and human geographers use it to explain the changing spatial structure of cities; the European Union (EU) Commissioners and their counter parts in member states often promote the concept as a socio-economic policy goal aimed at achieving a balanced regional development.

Furthermore, polycentricity would mean differently when applied to different spatial scales. Davoudi (2003, p.980-987) identified three distinct scales of polycentric configuration, ‘Intra-urban scale’, ‘Inter-urban scale’ and ‘Inter-regional scale’. According to her, with a few exceptions, the concept of polycentricity has traditionally been applied to the ‘meso’ level of urban agglomeration, focusing on intra-urban patterns of clustering of people and economic activity in places such as Los Angeles, Paris and London. More recently, the concept has also been used at the ‘macro’ level of inter-urban scale to denote the existence of multiple centres in one region. Examples from north-west of Europe, west coast of America and Kansai area in Japan are frequently mentioned as typical polycentric pattern of intraregional structures. A third, ‘mega’ level of polycentricity has been added to the debate by the European Commission, and promotes polycentricity as an alternative to the core-periphery conceptualization of the European territory, by “strengthening a polycentric and more balanced system of metropolitan regions, city clusters and city networks and promoting integrated spatial development strategies for city clusters” (European Council of EU Ministers responsible for Spatial Planning, 1999, p.21).

While the versatility of the concept may partly explain its persisting prominence, at the same time the Babel-like confusion surrounding the concept impedes academic progress (Burger and Meijers, 2011, p.1). Although there is no simple agreed definition, in order to answer the main research question of this project, it is necessary to create a framework for PUR.

Diagram 2.2: The spatial scale of the polycentricity, (Source: Drawn based on Davoudi, 2003, p. 980-987)
2.3.1 Polycentric Urban Region (PUR)

Since the interest of this research is polycentricity at regional scale or PUR, this section tries to find an explanation for PUR among the prominent publications concern this topic. Therefore, it is tried to understand when a region can be defined as a PUR or in the other words which criteria should be satisfied for a polycentric urban region.

Dieleman and Faludi (1998, p.366) explain PUR as a region where the once separate cities of relatively similar and modest size have now coalesced into one functional urban region. Davoudi (2005) has expressed a similar view and describes PUR as a region with three or more historically and politically distinct cities with no hierarchical ranking (although, inevitably, one of these cities has the largest number of inhabitants), in a reasonable proximity and with functional interconnection. But this definition of the PUR will bring up some ambiguity.

One uncertainty is belonging to the definition of the reasonable proximity. According to Geddes (1915) who tried to explain the PUR more quantitatively, the rule of thumb for convenient commuting distance in PUR is an hour, which is the most acceptable centre-to-centre distance for lots of commentators on PUR (Davoudi, 2003, p.936). Another challenge in defining a PUR concerns the degree of interaction and inter-dependence between the centres. Champion presents three category of the region concerned to the degree of interaction and inter-dependence (Diagram 2.3). At the lowest level, it is possible to conceive of a polycentric urban patterning without any relations between its centres, and urban population lives in several urban areas rather than being concentrated in a single one. The middle-range level is one in which there is some minimum degree of interaction between urban centres. Lastly, at the highest level, each centre specialises in providing a distinctive set of ‘city-level’ functions for the whole region.

Although some commentators of the PUR indicate that nodes without balanced relations would not form a polycentric system (ESPON 1.1.1, 2004), Green (2007, p.2082) contradicts with them and argues that, “any group of reasonably close settlements is polycentric to some extent and any formal definition of polycentricity should reflect that”. This means that an urban system should be assessed in terms of levels of polycentrism, and this is in support of the Champion’s observation about degree of interaction and inter-dependence between the centres (2001, p.666).

The aforementioned claims will develop the debate on the morphological and functional aspects of polycentricity which rests on the question of whether polycentricity refers just to morphological aspects of the urban system or whether it should also incorporate relational aspects between the centres making up the urban system in question (Green, 2007; Meijers, 2008b). Diagram 2.4 shows morphological and functional polycentricity.

Based on the different explanation of the PUR, it is possible to find some criteria for PUR that most commentators are agreed on them. The PUR can be defined as relatively close centres which have functional interaction. The level of interaction would vary from one region to another.

---

Diagram 2.3: The degree of interaction and interdependence of PUR, (Source: Parente, Looking for urban synergy, 2010)
Diagram 2.4: The left side schematic shows the importance of centers in the morphological polycentricity while in functional polycentricity (right side schematic) the relations between centers are more important. (Source: Redrawn after the example of Burger and Meijers, 2011, p.8).

2.3.2 Alternative Routs towards Polycentricity

In this section formation of the polycentric regions are discussed. According to Lambregts (2006, p.116), “all urban systems have come from a different starting points, followed their own, path-dependent development trajectories and, over time, have been shaped by their unique mix of broader structural forces and place-specific contingencies”, which to a large extent determine the nature of the predominant challenges a region faces in future. Hence, in order to ascertain the PUR’s difficulties, understanding historical evolution of the PUR seems to be necessary.

In 2001, Champion (2001, p.644) introduced a simple but clarifying framework for historical evolution of the PUR. In his framework, he identified three diverse modes that polycentric urban region can evolve: a centrifugal, an incorporation and a fusion mode (Diagram 2.5). In the words of Champion, the centrifugal mode is refers to evolution of a former monocentric city to a PUR, once the continuing growth of the city imposes such severe strains like escalating land rents in the CBD and growing problems of access to the central area from outer residential areas. In this condition the most affected production and service activities will be squeezed out to the alternative centres, which may come to rival the original centre in size. The incorporation mode nevertheless is the consequence of alterations of the former monocentric city to a PUR through the expansion of its urban field and incorporation of the surrounding small centres that had been largely self-sufficient previously. These other centres then may form a more powerful catalyst for attracting extra non-residential activities and perhaps providing an even stronger challenge to the main original centre. Finally, the fusion model is characterized by the combination of several previously independent centres of similar size, as a result of their own separate growth both in overall size and lateral extent and particularly because of the improvement of transport links between them (Champion, 2001, p.664-665).

Based on the Champion’s framework it can be concluded that pre-existing forms of settlement can influence subsequent patterns of development. That is the reason why Lambregts (2006) stated that, “in some regions the concept of polycentric spatial development is welcomed as a possible answer to such problems as urban congestion, regional imbalances and unbridled sprawl while in other regions polycentricity is rather seen as a barrier to interaction and (economic) efficiency”. Therefore, considering the variety of origins out of which PUR can evolve, could facilitate the identification of potentials and also, problems or challenges concerning to the polycentric development.
Diagram 2.5: Evolution of polycentric urban region, (Source: Redrawn after the example of Champion, 2001, p.665).
2.4 Measuring polycentricity

As mentioned before there are different levels of polycentricity. In order to measure the level of polycentricity and the potential for development of PUR three aspects of analysis are discussed in this section (Diagram 2.6). The first two aspects, morphology and functional relationship are known as essential element of PUR. However governance seem to be helpful for reaping the alleged benefits of polycentricity. These three aspects are mentioned by various authors as a means to evaluates the polycentricity such as Bailey and Turok (2001) and Dühr (2005). Differentiation of these aspects is more a mean to facilitate the polycentric analysis, since in reality those aspects are very complementary with each other (Parente, 2010, p.33). In the following the three aspects will be introduced shortly.

**Spatial Form**

The spatial form is related to the physical organisation of urban activities in a territory, which Burger and Meijers (2011) categorized it as a morphological dimension of the polycentricity. According to them, the morphological dimension basically addresses the size and territorial distribution of the urban centres across the territory and equates more balanced distributions with polycentricity (morphological polycentricity). Meijers et al. define a polycentric development policy as “a policy that addresses the distribution of economic and/or economically relevant functions over the [spatial] system in such a way that the urban hierarchy is flattened in a territorially balanced way” (Meijers et al., 2007, p.7).

Some proponent of polycentrism tried to define objective criteria for the spatial patterning of a polycentric development, such as the employment and services distribution across a number of centres. The decentralization of jobs directly impacts in spatial and temporal pattern of live-work commuting, and consequently on the spatial organisation (Cervero, 1998, p.1059). Giuliano and Small (1991), one of the pioneers in defining that sub-centres makes a polycentric urban system, says that the criteria to identify potential nucleus should have a minimum density of 5,000 jobs per square mile and a minimum total number of 10,000 jobs (Parente, 2010, p.33).

One of the important issues in measuring the spatial form of the urban region considering the differences between centralization-dispersion and monocentricity-polycentricity dimensions. The centralization-dispersion dimension refers to the extent to which population and employment is centralized in cities or dispersed over smaller nonurban places in a noncentralized pattern. The monocentricity-polycentricity dimension reflects the extent to which urban population and employment is concentrated in one city or spread over multiple cities in the wider metropolitan area. The following diagram explains the relation between centralization-dispersion and monocentricity-polycentricity dimensions (Diagram 2.7).
Towards Regional Synergy

Functional Relationships

Burgers and Meijers (2011, p.2) discourse that the relational dimension takes the functional connections between the settlements into account and considers a balanced, multidirectional set of relations to be more polycentric (functional polycentricity). They continue that, proponents of the functional polycentricity approach generally claim that nodes without balanced relations would not form a polycentric system (ESPON 1.1.1, 2004).

Dühr (2005) makes a distinction between two types of functional polycentricity or relations between urban areas as she named it; structural polycentricity and institutional polycentricity. According to her structural polycentricity refers to the synergies and flows of the spatial structure and institutional polycentricity concern the voluntary cooperation. Generally, the most commonly used criterion for measuring functional polycentricity is the labour market flows based on journey-to-work statistics. However, Davoudi (2003, p.994) suggest that to “move beyond the simple criteria of labour market flows and to incorporate other indicators of interconnection such as nonworker trip-generation activities or business links, flows of resources, goods and information”. In terms of the degree of functional polycentricity, Kloosterman and Musterd (2001) argue, the functional distribution may be weakened as the polycentric urban region becomes more of a homogeneous economic environment where people can move rather easily from one place to another creating one large pool of labour, or it may be strengthened as cities (or locations) can specialise in specific functions for the whole of the polycentric urban region.

Governance

The governance of polycentric structures is one of the most complex issues, since it deals with multi-level of actors in different levels and competences (Parente, 2010, p.34). One argument for planning at the scale of a PUR is that the governance arrangements provide the region with greater organisational capacity. PUR promotes co-operating of local authorities through voluntary arrangements. At least two types of benefit may arise from this kind of collaboration. First, there may be ‘resource synergies’ from combining expenditure or coordinating programs. This may enable partners to undertake new or larger projects by pooling their resources and avoiding duplication. Secondly, partnerships may generate ‘policy synergies’ as the processes of joint-working and knowledge-sharing lead partners to come up with a different understanding of problems and new solutions. Cross-fertilisation of ideas and expertise should lead to greater creativity and innovation (Baily and Turok, 2001, p.701).

2.5 Advantages and disadvantages of PUR

Adherents of the PUR believe that polycentricity is a tool to enhance economic competitiveness, promote balanced development and social cohesion by reducing regional disparities. However, it has been proved that every model has indeed advantages and disadvantages, which should be considered in order to gain from opportunities and be prepared for the inconveniences.

In relation to discussion about the advantages of the polycentricity, Bailey and Turok (2001, p.698) declare, “The PUR concept is alleged to promote regional economic competitiveness while safeguarding environmental objectives. It promotes the advantages of stronger interaction between neighboring cities to develop specialised and complementary assets, while avoiding large-scale urban sprawl and destructive territorial competition”. They also state that, PUR provides a means of gaining some of the economies of scale which world cities enjoy without experiencing the costs or agglomeration diseconomies which their monocentric form entails.

Integration of separate cities may provide greater agglomeration economies, by benefits of sharing an enlarged labour market, major facilities such as seaports or airports (Priemus, 1994), or specialised services such as higher education or research and development establishments (Lambooy, 1998). Economic innovation may also, be enhanced by closer co-operation between separate cities, as geographical proximity and interaction reduce transaction costs and foster the development of business networks, which promote inter firm trading linkages and facilitate the exchange of knowledge and expertise (Lambooy, 1998). Finally, integration allowed cities to develop synergies between different locations. By encouraging interaction between neighbouring cities, each will develop specialisations in areas in which it has a competitive advantage. Consequently, there will be some reorganisation of activity within the region which leaves individual firms and the region as a whole in a stronger competitive position (Bailey and Turok, 2001).

Champion (2001) also debated on the benefits of the PUR by arguing that the shift from a monocentric urban region to a polycentric one will be accompanied by changes in the geography of land prices and, thus, of residential areas. While the monocentric model was predicated on the basis of the need for access to the single centre, with a pronounced peaking of land values at this point, the PUR model, by contrast, will have less variation in land values,
Theoretical Framework

with less pressure on each separate centre. In the rest of this section some criticisms on the PUR will be considered.

One of the criticisms on the PUR concept is that it will raise the concern about the environmental costs, since it is promoting personal mobility and long-distance commuting. Hence the emphasis in the PUR literature on promoting integration and interaction, increasing car use which is against environmental sustainability. Another criticism is that there is insufficient distinction made between different kinds of relationship between cities and other centres. If complementarity is taken as evidence of interdependence, it must be between locations of broadly equal status, and not merely reflect unidirectional and hierarchical relationships, such as those that exist between national or regional capitals and other centres. In addition, the development of functional specialisations must involve mobile activities that have a choice where they go, not immobile ones that arise from basic physical advantages (for example, port functions or extractive industries).

Although the process of interaction between centres leading to the reallocation of activities between them as beneficial for the region, the outcome is likely to be uneven with winners and losers. In this situation opponents of the PURs argue that, some centres will lose particular types of employment and some may experience an overall decline in employment, with potentially severe impacts on particular social groups. Such impacts generate political tensions which undermine regional coherence and consensus. While stronger urban economic growth is clearly necessary, it is also important to consider the types of economic activity which core cities need to attract to meet the needs of the unemployed. PURs may be a means of addressing polarisation within a region at the same time as promoting competitiveness, which is not discussed within the literature.

2.6 Planning a PUR

As Davoudi (2003, p.991) debates there is an implicit assumption that the development of a PUR can diminish regional disparities. Although PUR provides smaller cities and towns with a better chance to compete more effectively in the world market, it is not possible to pick up any neighbouring cities and transform them into a PUR. *“It has already been established that physical proximity between cities does not necessarily lead to functional complementarity. Nor does the creation of a larger entity from a group of smaller cities leads to competitive advantage”*. Therefore, in the absence of internal economic dynamics and a high degree of functional complementarities between the centres, a PUR will be no more than a group of geographically proximate and physically linked cities. As Davoudi (2005) argues, forging functional synergies between neighbouring cities requires:

1. Hard infrastructure: efficient transport and telecommunication networks
2. Soft infrastructure: regional identity, effective institutions and governing capacity

2.7 Conclusions

The aim of this part of the report was to build a theoretical framework about polycentrism in order to found the research on. In this chapter by reviewing the various articles on the concept of polycentrism, the polycentric urban region defined as relatively close centres which have functional interconnection. Three diverse modes that polycentric urban region can evolve centrifugal, incorporation and fusion mode introduced. Moreover spatial form and functional relationship are introduced as key elements for developing PURs. The regional governance can affect the efficiency of a polycentric urban region. In the last section the economical advantageous of the polycentric model are discussed, also some disadvantageous of this model are pointed out.

Further in this research the three presented elements are going to be used in evaluating the extent that TMR can be defined as a PUR. This evaluation will be carried out both in normative dimension, through historic study of the region and the effect of the government plans on the region, and analytical dimension, by considering these three elements as a tool for measuring the polycentricity in current reality of TMR.
Chapter 3

Reviewing the Planning History of TMR
(Normative Dimension)

This part of the research dedicated to the normative dimension of the polycentricity, which according to Davoudi (2003), uses the polycentrism as a guiding principle to achieve a goal on the level of policy strategies. This chapter by analysing different urban planning and policies which affected the TMR, from the time Tehran was chosen as a capital till now, attempts to investigate how polycentrism is affecting the normative documents. In this chapter the history of Tehran is divided to three time periods. In the first period, before 1940 planning was based on infrastructure design and development. This era was witness of three major urban events in Tehran: walling the city, expanding the walled city and building a new urban infrastructure. In the Second period (1940-1980) planning was through Land-use regulation. This period includes Land reform regulation in Tehran, preparation of the first Master Plan and increase in migration to Tehran and birth of the metropolis. In the third period (1980- present), planning was through policy development. This period is related to after the revolution in Iran in which the first plan for the region is prepared.
Towards Regional Synergy

Chapter 1

1797
- Tehran is selected as Capital of Iran in by Qajars dynasty

1906
- Constitutional revolution, the first national parliament was established

1908
- Peace convention between Iran, Turkey and GB
  Construction of the North-South railway was started

1925
- Establishment of Pahlavi dynasty

1926
- Beginning of the modernization process or westernization of Persia

1930
- The country divided to territories under the control of Russia and Great Britain

1939
- Iran was occupied by the Allies during the war. Reza Shah’s son became the king

1941
- The Second World War was started

1951
- The Oil industry of Iran was nationalized
  Autonomy of economy from oil was declared

1971
- The Pahlavi dynasty was collapsed by the revolution

1988
- Iran officially became an Islamic Republic on April 1

1993
- Eight-year Iran-Iraq war started

2003
- Cultural revolution: all universities shut down for two years

2005
- Ahmadinejad became the president

2006
- US increased sanctions against Iran due to the new president’s nuclear ambitions

2009
- Mahmoud Ahmadinejad is declared to have won a resounding victory in presidential election

2011
- The rival candidates challenge the result and their supporters take to the streets

History Timeline
Reviewing the Planning History of TMR (Normative Dimension)

1908

Tehran is selected as Capital of Iran in by Qajars dynasty

Constitutional revolution, the first national parliament was established

The country divided to territories under the control of Russia and Great Britain

Establishment of Pahlavi dynasty

Peace convention between Iran, Turkey and GB

Construction of the North-South railway was started

Beginning of the modernization process or westernization of Persia

The Second World War was started

Iran was occupied by the Allies during the war. Reza Shah's son became the king

The Oil industry of Iran was nationalized

Autonomy of economy from oil’ was declared

The Shah announced the ‘White Revolution’
A six-point program calling for land reform.

The increase in oil prices caused the growth of Iran’s GDP

1980

The Pahlavi dynasty was collapsed by the revolution.

Iran officially became an Islamic Republic on April 1

End of war

beginning of construction era

Ahmadinejad became the president.

US increased sanctions against Iran due to the new president’s nuclear ambitions.

Mahmoud Ahmadinejad is declared to have won a resounding victory in presidential election.

The rival candidates challenge the result and their supporters take to the streets.

Preparation of the first Tehran metropolitan region plan

The second comprehensive master plan of Tehran.

Severe sanction on Iran
3.1 First Phase (before 1940): Planning through infrastructure design and development

The first phase of Tehran’s planning refers to the period before the Second World War, whereby at least three major efforts set the framework for the city’s growth and development: walling the city (1550s), expanding the walled city (1870s) and building a new urban infrastructure (1930s) (Madanipour, 2006).

3.1.1 1553-1797: Small village in the foot of Alborz Mountain

Tehran was a small village outside the ancient city of Ray, which lay at the foot of Mount Damavand, the highest peak in the country (Image 3.1). Ray had been inhabited for thousands of years and was the capital in the 11th century; however, it declined at the end of the medieval period, when Tehran started to grow (Lockhart, 1960, in: Madanipour, 2006). The first town planning exercise in Tehran was undertaken in 1553, with the construction of a bazaar and city walls, in accordance with the pattern of ancient Persian cities (Barthold, 1984, in: Madanipour, 2006). This set the framework for the other development of the city in future.

3.1.2 1797-1920: A twofold renaissance for Tehran

No one knows exactly why, at the end of the 18th century, Agha Mohammad Khan, the founder of the Qajar dynasty, named a backwater enclave of the Alborz Mountains as the capital of the Iran in 1785 (Bayat, 2010), and ignoring the previous imperial achievements. Nevertheless there are some assumptions which support this ambiguity. Although Tehran does have neither long imperial and colonial histories nor memorable architecture, it has a strategic location in the country. This strategic location is because of: First having equal distances from other major cities of the country and being far from the country borders which make it easy for the king to control affairs of the country. Second, setting at the intersection of east–west Silk Road along the southern edge of Alborz Mountain and the north–south route that connected the Caspian Sea to the Persian Gulf, which all the trades of the time was done from those merchant roads (Madanipour, 2006).

Tehran was restricted by walls encompassing an undeveloped, poor, and not very prosperous city with 15,000 populations. The structure of the city followed exactly the model of traditional Iranian settlements in which the bazaar and mosque were the main social elements of the city (Map 3.1).

The palace of the king also, located next to the bazaar as the most powerful socio-economic feature of the city, in order to control every single activity of that kind (Mashayekhi, 2009). The city’s traditional social fabric was defined by the mahalleh or quarter system, which organized urban space not along class lines, but according to ethno-religious divisions, clustering citizens of the same ethnic or religious affiliation, whether rich or poor, within particular quarters (Bayat, 2010). Gradually after becoming the capital, the city swelled by courtiers and soldiers,

Image 3.1: Tehran is located at the foot of Alborz range. In this drawing mount Damavand the highest pick in Iran is also shown (Source: Azadeh Mashayekhi, Behind the mutation, 2009).

Image 3.2: Outside the walls of Tehran in the first half of the 18th century (source: archive of Milad tower Tehran).

Image 3.3: Inside the walls of Tehran in the first half of the 18th century (source: archive of Milad tower Tehran).
Reviewing the Planning History of TMR (Normative Dimension)

who were followed by trades and services. From a population of 15,000 at the end of the 18th century, Tehran grew tenfold by the 1860s (Ettehadieh, 1983, in: Madanipour, 2006).

The traditional pattern of the city remained unchanged, and the city itself quite stagnant, until the second half of the 19th century (Bayat, 2010), when Naser eddin Shah, king of Qajar visited Europe and he fell in love with Paris. This moment was the beginning of the modernization process or westernization of Persia. The consequence of closer relationships with Europe was the introduction of technological innovations, new institutions and fashions which influenced traditional Persian society (Mashayekhi, 2009).

The second town planning exercise in Tehran, therefore, was conducted for accommodating growth and introducing modernization and reform. Starting in 1868 and lasting for 12 years, new city walls, in the form of a perfect octagon with 12 gates, were constructed which were more useful for growth management and tax collection than for their defensive value (Madanipour, 2006) (Map 3.2).
It is important to mention these transformations in the city were inspired by the vision of a ‘modern city’ derived from Baron Haussmann, whose ideas spread at this time from Paris to the Middle East (Bayat, 2010). The king of the Persia sought to elevate Tehran to the level of the European cities. The most evident consequence of the changes in this period is the development of the “European city” in the northern part of the traditional city. This city differed from the traditional one, not only on account of its morphological pattern, but also because new institutions and building types were introduced (Mashayekhi, 2009). The city continued to grow and pressure for modernization in

Map 3.2: This map shows Tehran in 1890 after Naser eddin Shah’s visit of Europe. The city expanded in all directions, especially from the North. The city had octagonal shape with 12 gates and new development differs from traditional city morphological pattern (Source: Azadeh Mashayekhi, behind the mutation, 2009).


Reviewing the Planning History of TMR (Normative Dimension)

Map 3.3: Tehran in 1890. On that time two small cities of Rey and Shemiran were completely separated from Tehran. However, the city was expanding in all directions. As it can be seen this map shows some small villages such as Vanak, Amir Abad, etc. that soon became part of Tehran. (Source: Azadeh Mashayekhi, behind the mutation, 2009)
Towards Regional Synergy

Chapter 1

Chapter 7

Chapter 6

Chapter 5

Chapter 4

Chapter 3

Chapter 2

Towards Regional Synergy

Chapter 1

Chapter 7

Chapter 6

Chapter 5

Chapter 4

Chapter 3

Chapter 2

Towards Regional Synergy

Chapter 1

Chapter 7

Chapter 6

Chapter 5

Chapter 4

Chapter 3

Chapter 2

Towards Regional Synergy

Chapter 1

Chapter 7

Chapter 6

Chapter 5

Chapter 4

Chapter 3

Chapter 2

tensified, which was manifested in the Constitutional Revolution of 1906. A modern municipality was established in 1910, transforming the old system of urban governance (Madanipour, 2006). During 130 years rule of Qajar kings in Iran, despite the importance of Tehran as Capital of Iran, the city was growing slowly, so that the population of Tehran in 1921 was about 200,000 people and the area of the city was limited to 24 square kilometers (Ghamami, 2004).

3.1.3 1920-1940: Birth of the metropolis

Iran’s post First World War period began with a triumvirate of Iranian political grandees, encouraged by the British government, attempting to shoehorn Iran into the British Empire. This was followed by a bizarre coup d’état, engineered by a British general, which brought to power the Reza Shah Pahlavi who ended 130 years of Qajar dynasty (Ghani, 2000, in: Salek, 2007).

Reza Shah rose to power in 1925 in conditions of remarkable political instability and social insecurity caused by years of civil war, foreign occupation and nomadic uprisings (Bayat, 2010). Reza Shah continued processes that had been started by Naser eddin Shah Qajar, but which had been halted because of difficulties presented to the country during the First World War. During Reza Shah’s 16 years of rule, major developments, such as follows carried out:

1- Large road construction projects, the Trans-Iranian Railway (Image 3.10) were built and the number of miles of highway increased from 2,000 to 14,000 consequently integration of regions into a national market (Abrahamian, 1982).

2- Modern education was introduced and the University of Tehran was established (Image 3.9). The government sponsored European educations for many Iranian students (Stanton, 2003).

3- The number of modern industrial plants increased 17-fold under Reza Shah (excluding oil installations) (Abrahamian, 1982).

4- The new regime’s emphasis was on secularism and nationalism, which were reflected in administrative centralization, modernization of the army, expansion of bureaucracy (Abrahamian, 1982, in: Madanipour, 2006).

5- One important area of modernization of the new regime was public health. Before that time death in early ages among children was an ordinary event which was one of the key factors in slow rate of population growth.

Besides the modernization process in the country the main objective of modernization in Tehran was transforming

Image 3.8: On February 21, 1921, Reza Khan staged a coup d’état, to get control over a country. This photo shows him in the next morning after the coup (Source: Institute for Iranian Contemporary Historical Studies).

Image 3.9: Reza Shah at the opening ceremony of the University of Tehran’s Faculty of Medicine (source: http://en.wikipedia.org/wiki/Reza Shah).


Map 3.4. Tehran in 1937. Still in this time Rey and Shemiran were completely separated from Tehran. As it can be seen the city expanded in all directions. Rey and Shemiran have also grew in size and population.

(Source: Azadeh Mashayekhi, behind the mutation, 2009.)
it from the traditional Iranian Islamic city to a modern metropolis. The urban grid, public spaces, state institutions, and housing typologies introduced during Reza Shah's reign permanently altered the character of Tehran (Salek, 2007). The 1930s witnessed widespread road-widening schemes that tore apart the historic urban fabric, making them accessible to motor vehicles (Madanipour, 2006).

Reza Shah constructed a national transportation network in order to promote the unity of the country's territory. The new street network was imposed on the winding streets of old neighborhoods, with the aims of unifying the space of the city, overcoming the traditional factional social structure, easing the movement of goods, services and military forces, strengthening the market economy and supporting the centralization of power. The development of communications, including a better road system and increased use of motor cars, was a factor in accelerating the extension and dispersal of the capital (Mashayekhi, 2009).

The existence of a modern transportation system by the 1930s encouraged industrial growth, which was further promoted by government financial incentives. Construction of modern manufacturing plants was a high priority, as was the development of whole industries rather than institutions and boulevards designed by European and European-trained architects, in the northern parts of the former wall (Bayat, 2010).

The traditional structure of the city, comprising the city gates, its wall and citadel, was certainly in conflict with the image Reza Shah had in mind and with the need to allow the city to expand beyond its limits. Thus, the city of Tehran went through its third town planning exercise. In addition to demographic pressure, the arrival of motor vehicles, the regime's desire to control urban populations and to modernize the urban infrastructure led to a substantial transformation of the capital. Hence the city walls were demolished once, and attempts were made in the following decade to end the mahalleh system, through the adoption of a zoning pattern based largely on class segregation. A new urban model took shape, with modern public spaces, state institutions, and housing typologies introduced during Reza Shah's reign permanently altered the character of Tehran (Salek, 2007). The 1930s witnessed widespread road-widening schemes that tore apart the historic urban fabric, making them accessible to motor vehicles (Madanipour, 2006).

Image: 3.12 This photo shows Tehran's streets in 1930s. In contrast to the old street pattern which was based on a pedestrian system and a hierarchical pattern of narrow streets, a modern transportation network was developed. This network changed the traffic pattern from pedestrian to vehicular and eased the flow of inhabitants and goods into and outside the urban spaces. The wide boulevards, squares, and public spaces were superimposed on the traditional city (Source: http://www.skyscrapercity.com).
small, individual factories. Financial incentives included government- sanctioned monopolies, low-interest loans to prospective factory owners, and financial backing for plants and equipment by the Ministry of Industry. The number of industrial plants (excluding those processing petroleum) increased 1,700 percent during Reza Shah’s reign.

Rapid industrial growth created a modern, urban working class that nonetheless coexisted with people who had more traditional occupations, values, and ways of life. This new industrial work force developed in the five major urban centers, where 75 percent of the modern factories were located: the towns of Tehran, Tabriz, and Isfahan, and the provinces of Gilan and Mazandaran. Tehran’s population alone increased from more than 196,000 in 1922 to about 700,000 by 1941. Modernization accelerated the pace of life through changes in culture, education, and traditional social norms, including those governing the role of women. Due to housing shortage in this era and rapid population growth there was a need for massive housing projects. The project of ‘Chaharsad Datstghah’ (400 housing unit) became one of the first projects of lower-income housing in new neighborhood of Tehran (Salek, 2007).

In general, the urban planning and development attempts of the first phase were all efforts at modernization, instigating and managing radical changes. The transformations of the capital in the second half of the 19th century opened up the city’s society and space to new economic and cultural patterns. Economically, the city started to be integrated into the world market as a peripheral node. Embracing the market economy divided the city along the lines of income and wealth, while new cultural fault lines emerged along lifestyle and attitude towards tradition and modernity. Rich and poor, who used to live side by side in the old city, were now separated from one another in a polarizing city. Ever since, these economic and cultural polarizations—and their associated tensions—have characterized Iran’s urban conditions (Madanipour, 2006).

Image 3.13: This photo shows Toopkhane square recently Imam Khomeyni square. The influence of Western architecture can be seen in the buildings of that time (Source: http://www.skyscrapercity.com).
Towards Regional Synergy

3.2 Second phase (1940 till 1980): Planning through land-use regulation

Before 1940s there was not much difference between Tehran province and other major provinces of the country, such as East Azerbaijan, Gilan, Mazandaran and Esfahan in terms of growth level and development. From the second half of 1940s as a result of government investment and subsequently private sectors in this region the growth and development of Tehran reached an unprecedented rate. In the short period Tehran overtook the other regions of the country and became the undisputed economy hub. Throughout the 15 years (1940-1955) Tehran’s population grew 3 times and reached to 1,500,000 people. Numerous problems and shortcomings of the rapid growth of the late 50s promoted the government to remedy (Zanjani, 2003). During the 1960s Tehran saw the preparation of plans to regulate and manage future changes. The city had grown in size and complexity to such an extent that its spatial management needed additional tools, which resulted in the preparation of a comprehensive plan for the city (Madanipour, 2006).

3.2.1 1940 - 1964: Expansion of the capital in course of industrialization

All changes to the city came to a halt at the beginning of Second World War (1939-1945) and the development process slowed down. In August 1941, the Allied powers Britain and Soviet Union invaded and occupied Iran, subsequently forcing Reza Shah to abdicate in favour of his son, Mohammad Reza Shah.

After the World War II and the nationalization of oil (1951), and the following industrialization, Iran’s economical role increased in the world. Revenues from the oil industry created surplus resources that needed to be circulated and absorbed in the economy (Madanipour, 2006). Therefore, the central government focused on the capital as the center of industry and trade, and fuelled the construction of manufacturing companies in Tehran. The city became a magnet for migrants from all parts of Iran and several World War II refugees fled to Tehran. In 1956, the population had increased to 1.5 million, of which 433,000 were migrants (Dashti, 2002, in: Schuppe, 2007).

Tehran experienced rapid expansion, and the hexagon-shaped city was transformed into a boundless young metropolis with the beautiful mountains to the north as its only limit. The vertical structure from the bazaar to the mountain became the backbone of the urban structure. Hence main development and expansion of the city was took place in the northern direction as a result of maximum quality of infrastructure and services along the main axis (Mashayekhi, 2009). With the advent of the car, the structural pattern of Tehran underwent a number of momentous transformations. In the regional level as it can be seen in the map, in 1956 there were four population
Map 3.6: This map shows the neighbourhoods constructed between 1940-1964. In this map, the areas are shown with red-yellow circles. This map can be seen that during this time, the city has grown towards east and north (source: by author).
centers in Tehran Metropolitan Region namely Tehran, Karaj, Varamin and Damavand (Map 3.5). According to the census of 1956 Tehran’s population was 1,512,082 and after that Karaj’s population was 14,526.

In 1963, the Ministry of Housing and Urban Development (MHUD) drafted a land reform and expanded the municipal area. In the west and north, the MHUD parceled land, and handed it over to Tehran Municipality in order to provide land for civil servants and workers to establish homes. The Kuy-e-Narmak, Naziabad, Tehran Pars, Kuy-e Kan, Lavisan, Abbas Abad and Farahabad are examples of the neighborhoods developed in this period (Salek, 2007) (Map 3.6). Since the majority of these worker lacked money to build houses, they had to sell the land, resulting in land speculations on the housing market. The land speculations led to increasing prices within Tehran in the following decades. In this situation, new agencies and building societies, public and housing cooperatives exploited the opportunities thus offered in the suburbs of Tehran to build up new neighborhoods around the city. Cheap rural immigrant laborers and cheap material reduced the building costs. The construction of residential neighborhoods took place all-around Tehran, while industries were on the plain barren lands in the south. The higher-income classes preferably lived to the northern and north-eastern region in vicinity of the mountains due to the better climatic and environmental conditions. Migrants and industrial workers moved near the industries that concentrated in the south. In 1966, the city had expanded as the villages of Ray (in South) and Shemiranat (in North) merged with Tehran and its population had increased to 3 million (Dashti, 2002, in: Schuppe, 2006).

Although the rapid growth of Tehran up to 1960s resulted to the expansion of city and appearance of settlements in metropolitan fringes but these all were limited to the area close to the city or areas which were connected to the old central parts of Tehran (Rey and Shemiranat), the city did not stretch out to the farther cities and villages. Beside Tehran, Karaj and Varamin were then two pleasant counties at the center of the agricultural activities which has the population of the more than 50,000 people. According to census 1966, the population of Karaj was 88,548 people, and Varamin had only 80,162 people (Zanjani, 2003).

Map 3.7: TMR population distribution in 1966. The roads are shown in this map are constructed before 1973. The Population growth rate between 1956 and 1966 was about 4,38 (Source: by author, data from Iran Sensus Center).
Reviewing the Planning History of TMR (Normative Dimension)

Map 3.8: Tehran in 1953. This map shows that the city has expanded toward north and east in this map still Rey and Shemiran are separated from Tehran (Khayyambeh behind the mutation, 2009).
3.2.2 1965-1979: Rapid Growth and the first Efforts to Control the Growth

“There are few examples of a mega-city being tamed by a single idealistic planning vision like Tehran; and there are few American cities where the planning ideas being developed in the universities and offices were carried out to such an extent as in Tehran” (Vanstiphout, 2006).

The explosion of Tehran in 1960s brought a massive fear about the future of the capital for the government. In early 60s, two major plans in separate levels (national and city) were adopted by government and carried out as follows: investment in potential districts, pursuing the decentralization policy, efforts to reduce attractiveness of Tehran and providing more balance in urban system at national level were started (national level). On the other hand and simultaneously, by providing and conducting comprehensive plan and establishment of city growth supervisory council, the necessary bases for control of city growth were provided (city level) (Ghamami, 2004).

At the national level by directing the investments to the other regions of the country and construction and development of the main industries in other cities such as: Esfahan, Tabriz, Arak, Ahvaz and on the other hand exerting limitation for establishment of the industries in 120 km radius of Tehran, efforts for decentralization was started. (Ghamami, 2004).

At the city level, the MHUD instructed a consortium of a local consulting engineer company and an urban planner from the U.S. (Victor Gruen) to prepare the first comprehensive master plan of Tehran, which was approved in 1968 (Schuppe, 2006) (Map 3.9).

One of the major steps in preparing plan was to formulate a new urban policy, and to define framework and land-use pattern for the development of Tehran. In his report to the Ministry of Housing, Gruen defined the main problems of the city: high density in the city center; expansion of the commercial activity along the main roads; air and water pollution; unemployment in the poorer areas and the migration of low-income groups and rural people to Tehran. “The proposals were, nevertheless, advocating

Map 3.9: The first Master Plan of Tehran in 1969. The major aspects of this plan were: the building of new apartment towns around the city, the development of new roads and highway networks, green zones and huge parks in the outskirts of the city and improvement in Tehran’s urban facilities. Tehran’s downtown should be surrounded by ten satellite towns each with about 500,000 inhabitants, separated from each other by green belts. Each of the satellite towns should consist of four zones around a local downtown or center with high-rise buildings. Each unit (zone or satellite town) would have five residential districts around their centers which should reduce the density and congestion of the historic core of Tehran. This resembled Ebenezer Howard’s “social cities”, in which a central city was surrounded by a cluster of garden cities (Source: Altas Tehran).
Reviewing the Planning History of TMR (Normative Dimension)

physical changes, attempting in a modernist spirit, to impose a new order onto this complex metropolis. The future of the city was envisaged to be growing east-westward in a linear polycentric form, reducing the density and congestion of the city centre” (Madanipour, 2006, P. 435).

Victor Gruen and his Iranian partner believed that ideal city is a city with a heart. Each urban unit should have a shopping and administration center, like the American modern towns and their suburbs. The most fascinating element of these urban units was to provide a kind of local democracy and independence from the greater cities (Vanstiphout, 2006).

Gruen’s ideas in his comprehensive plan for Tehran were largely influenced by the British New Towns, the fashionable planning ideas of the time. In his book, The Heart of Our Cities, Victor Gruen (1965) had envisaged the metropolis of tomorrow as a central city surrounded by 10 additional cities, each with its own centre. This resembled Ebenezer Howard’s (1960, p: 142) “social cities”, in which a central city was surrounded by a cluster of garden cities (Madanipour, 2006). Gruen in Tehran’s comprehensive-plan used a linear version of Howard’s concept. He envisioned a implemented his theory of the ideal Metropolis and city divided into ten large and fairly self-contained districts of 500,000 inhabitants, separated from each other by green belts and linked to one another through a network of freeways and a rapid transportation system. The commercial facilities would be concentrated around the public transportation nodes with high residential density. Beside British influences of the master plan it has borrowed some ideas from United states included a network of freeways to connect the disjointed parts of the sprawling metropolis; zoning as the basis for managing the social and physical character of different areas; and the introduction of “Floor Area Ratios” for controlling development densities, which were the only implemented parts of the plan (Madanipour, 2006).

The plan was laid out for a 25-year period and proposed a new 230-km² boundary to contain growth for the next five years with strong land regulations (service zone), and for future growth a 650-km² boundary (buffer zone). The High Council of Architecture and Urban Planning
(HCAUP) was assigned to regulate Tehran’s expansion between the 5-year and 25-year boundary and the implementation of the proposals was upon the Municipality, with the financial help of the MHUD (Zebardast, 2005). By limiting Tehran’s growth, this plan indicated a paradigm shift of urban planning, as the MHUD began to pursue the strategy of decentralization. With funds of the central government they intended to fuel the development of new townships around the city to absorb the excess population of the city (Thum, Shirazi, 2005, in: Schuppe, 2006). Around the city some new towns like Shahrrak Gharb (Image 3.14), Ekbatan (Image 3.15) and Kooey_e Nohome Aban were built close to Gruen’s ideas but most of the other major peripheral towns did not follow any of the concepts of his Ideal Metropolis. Kooy Nohom Aban began in 1965-1966 in south Tehran for sale to slum dwellers that would pay for their units at low monthly rates over 15 years. HCAUP to control the development around Tehran, they did not challenge the land deals. The “illegal” land deals led to conflicts between Tehran Municipality and the Interior Ministry, since the city government blamed the MHUD and HCAUP for the uncontrolled development of mainly townships with poor living conditions.

Since 1970 there were some companies and ministries who provided average homes for their workers (such as Peikan Shahr for the workers of “Iran National” (the name of a car factory in the west of the city), Shahrrake Naft for the personnel of the national oil company and Shahrrak e Rah Ahan, for the personnel of Iranian Railway) but these were exceptions rather than the rule.

In the mid-70s, Iran’s Plan and Budget Organization (PBO) hired Sectarian, a French planning consultancy, to prepare a spatial strategy plan for Tehran region. Sectarian introduced the New Town strategy with the intention of decentralizing Tehran’s population and economic activity away from the downtown to new settlements in the peripheries. The main concept of the strategy of building the new satellite towns around Tehran was to prevent further development of large informal residential subdivisions around Tehran. The government recommended the development of several new satellite towns around the city, but most of the Tehran’s satellite towns were founded without dependence on any kind of a preliminary rural nucleus. During the implementation phase, most of the peripheral farms, gardens and green spaces were lost, and converted into residential towns (Salek, 2007).

Image 3.15: The first Master Plan of Tehran in 1969. The major aspects of this plan were: the building of new apartment towns around the city, the development This is the photo of Ekbatan one of the mega-projects developed by Americans in Iran. Ekbatan is a modern district in the west side of the metropolis and close to the Mehrabad airport and Azadi tower. It is a huge complex of U-shape block apartments. Each U-shaped block has a 3-stepped appearance, with five floors, nine floors, then 12 floors. When the Gruzen Partnership won the Ekbatan project, they sought Gruen’s collaboration. The direct influence of Gruen’s ideas can be seen in all the parts of the project including residential, and recreation spaces, but the most remarkable influence of Gruen inside the Ekbatan project can be seen in its commercial areas and shopping centers. Gruen in the modern urban literature mostly is called the inventor of the modern shopping mall. Gruen envisioned the suburban mall as a new type of urban public space in the new dispersed residential fabric. (Source: http://www.shahrak-ekbatan.ir)
Reviewing the Planning History of TMR (Normative Dimension)

Map 3.10: Tehran in 1973. By the comparing this map with the one 1953, it can be seen that besides the concentration in north and east in this period, the city has also expanded toward the west which was also mentioned in the text. Ekbatan and Shahrake-e Ghavdeh were two districts in west which were built in this period. (Mashayekhi, behind the mutation, 2009).
One of the senior urban planners of the MHPD describes the phenomenon of informal settlements as: spontaneous and informal settlements include of those settlements that pose some or all of the following features:

1. Most of these settlements are formed by relying on the self-motivation of the residents.
2. They are formed in the lack of supervision, urban control and formal management of the government and public institutions.
3. These settlements have been established because of the lack of urban infrastructure and urban services.
4. In these settlements, the land ownership, land uses and land subdivision settlements are outside of the normal and common official and legal frameworks and do not have the formal licenses from the institutions and official systems.
5. Their formation and evaluation have not been based of any urban program (Saniee Nezhad, 2005 in Salek, 2007).

From 1976, the government also tried to establish some guidelines for lower income housing and engaging the private sector with building lower income suburban districts, since many workers of governmental companies which were in the inner-city could not afford the cost of travel from their work place to the center. In the case of middle-class suburbs, the most important factor in the rapid expansion of suburbs in 70s and 80s was the development in private transport especially private cars (Because of booming economy, Iranian’s average income increased rapidly) and also development in public transport. The inner-city was deteriorating socially and environmentally and this process enabled those who could afford it to move to cleaner, more pleasant surroundings and still within easy access to their place of employment (Salek, 2007).

Between 1965-75 with inauguration Tehran-Karaj high way in 1967 and establishment of factories and companies along Tehran-Karaj, khorasan and Qom roads ..., population of the cities and villages near Tehran grew. This also resulted to the appearance of new population centers. In this situation Tehran population was increased 1.7 times while population of Karaj became 4 times more and reached 180,000 people. Eslam Shahr village with 3,000 people in 1965, in south-east Tehran, was transformed to the city with 20,000 inhabitants. Varamin’s population became more than 26,000 people. Moreover population of the three cities of Nazar Abad, Shahriar and Pishva passed 10,000 people (Ghamami, 2004).
3.3 Third phase (After 1979): Planning through policy development


3.3.1 1979–1989: Revolution

In 1978-9 during the time of Islamic revolution, for the first time the hitherto unfriendly urban spaces of Tehran showed signs of an exceptional and dramatic harmony. In street demonstrations there was clear evidence of strangers of all kinds coming together by the single aim of being against the dictatorship and wishing to overthrow the monarchy (Mashayekhi, 2009). After two years of mass demonstrations in Tehran and other cities, the year 1979 was marked by the advent of a revolution that collapsed the monarchy in Iran. The causes of the revolution can be traced in the shortcomings of the Shah’s model of development, which led to clashes between modernization and traditions, between economic development and political underdevelopment, between global market forces and local bourgeoisie, between foreign influence and nationalism (Madanipour, 2009).

Immediately after the Islamic Republic came to power the main goal became to abolish every trace of modernity or westernized culture inherited from the Pahlavi régime. (Mashayekhi, 2006). Even though Tehran's pre-revolutionary structure and architecture remained the same, these were now to be overlaid with a revolutionary ideology and reshaped by the practices of a new regime.

For the first five years after the Islamic Revolution, no importance was given to follow the comprehensive plan of 1967. Because of its populist slogan, one of the first priorities of the revolutionary government in its early years was to solve the issue of housing for people with lower incomes. During this period, a huge allocation of land was made for people in the lower income class. A large number of lower incomes and so some middle class citizens seized the opportunity to occupy many vacant land plots in and around Tehran (Salek, 2007).

During the early years after the revolution, due to the lack of strong urban rules and regulations and some newly established rules, the city's expansion accelerated. However, after about five years, the Islamic government realized that they needed new strategies to combat migration and the massive flood of refugees. They tried to limit the...
new arrivals from settling into the twenty zones of Greater Tehran and encouraged them to move back to the rural areas and smaller towns.

The revolution was followed by a long war (1980–1988) with Iraq, which halted economic development and the investment in urban development dwindled. Moreover there was a rush of Iran-Iraq war refugees, and also Afghan refugees from Soviet Union’s invasion of their country, arriving in Tehran. In 1981 the housing situation in Tehran had become critical as the population limit of 5.5 million was passed (Bayat, 2006 in Schuppe, 2006). At that time, the MHUD finally gave permission to Tehran Municipality to enlarge the municipal limits to the 25-year boundary, which consolidated the informal settlements (Schuppe, 2006). The political instabilities continued during the war and the government made a little effort to prevent infringements of the construction regulations due to war priorities, revolutionary slogans and the availability of some expropriated lands. This situation permitted significant illegal and low quality construction activities which in fact resulted in the rapid expansion of the slum areas. Just outside the official boundaries of Tehran, ten new towns under the name of Taleghani, six under the name of Vali Asr, six under the name of Motahari and four under the name of Qods were established. During the war Islam Shahr increased by 700 percent, and Jannat Abad and the western district of Pounak by almost 900 percent (Salek, 2007). During these decades of uncontrolled development the city had become a herd of problems such as high air pollution, high built-up density, unemployment, traffic congestion, inefficient infrastructure, and the continuous migration of low income groups.

From the early eighties, due to the urban policy of the municipality of Tehran all the local municipalities had to raise their own funds and the only source of money for them was housing property taxes. For the richer suburbs it was an opportunity to increase their urban services and infrastructure, but for the poorer suburbs this modification caused a significantly low quality urban system and inadequate urban management which in fact resulted in the wide spread slum areas (Aladdiny, 2007).

Map 3.12: This map shows the population of TMR in 1986. In this map in addition to the growth and appearance of new cities, Eslamshahr has grown enormously. In 1963 after establishment the Land Reform law, uncontrolled rural migration to the urban areas, particularly Tehran began. Since Eslamshahr was in vicinity of Tehran and also because of cheap land price in this region, it attracted the immigrants’ attention. Therefore the population of this region increased gradually. In 1975 due to the increment of residential areas especially along with Tehran-Qom rail way and Tehran-Saveh road, by approval of responsible authorities Eslamshahr’s municipality established. Since that time some close rural areas have merged to the Eslamshahr and transformed it to the one of the populated areas in TMR in 1983 (Source: Map by author, data from Iran Sensus Center).
The years after 1983 became the booming period of the worker’s housing cooperatives. In this period, a considerable number of substantial houses were built in the higher-priced suburban areas such as Shahruk e Gharb, Shahruk e Omid, and Saadat Abad, but by far the greatest amount of suburban housings were built for the lower or middle-classes who worked largely for the expanding service industries or for governmental institutions. These new suburbia mostly were rapidly established along Tehran’s arterial roads. This was the period in which the scale of suburban living expanded significantly. The suburbs were built in homogeneous architecture of very predictable four story apartment blocks with flat roofs, and two or three bed rooms. Generally these types of flats where built without ornamentation or in any distinctive style. Their general impression was one of uniformity. The exterior and interior of these types of buildings were not remarkable from any architectural aspect (Salek, 2007).

The landscape of these suburban simply became described as asphalt streets with minimum green space, grey blocks of concrete and limited parks and sport spaces inside them. There are of course many suburbs which fitted this image. Structures were metal with cladding materials. In some cases the government wanted to build high level of constructions but the existing technical resources, labour and local technology allowed only simple constructions (Salek, 2007).

During 1976 to 1986 immigration to the TMR become more severe. However in this period part of government policy without any preplanned strategy in regard of providing people’s food automatically resulted to establishment of some new regulations. This new regulation which prevented the unconditional settlement of the immigrants in Tehran were such as: prohibition on buying and renting a house, Possession of Basij documents for enrolment in schools and receiving the essential services. Such actions resulted to the settlement of the immigrants in the surrounding areas of Tehran. Consequently the other residential areas near Tehran grew very fast in size and population. In this period at least 714,940 people entered to TMR and 265,944 people left it. The growth of the cities as result of the immigration resulted that 6 rural areas transformed to the city and 68 rural areas merged to the urban areas (Zanjani, 2003).
3.3.2 1989–1997: Reconstruction

After the revolution and war, a period of normalization and reconstruction started, which lasted for most of the 1990s. This period witnessed a number of efforts at urban planning in Tehran (Madanipour, 2006). The municipality of Tehran and the MHUD started to optimize resource exploitation and to complete many unfinished urban and sub-urban projects (Amirahmadi, 1996 in Salek, 2007). Once again, urban development had intensified without an effective framework to manage it (Madanipour, 2006). After changes of the national Constitution in 1989, Municipalities became economically self-supporting. The city officials started the practice of “selling zoning variance” as new means of financial resources. Whenever there was demand, city officials allowed builders an increase of the FAR to build in higher densities and alterations of land uses, stipulated in the 1968-master plan, in exchange for a fee (Zebardast, 2005). “In some years, the revenues earned from selling density comprised about 90% of the total municipal revenues” (Bertaud, 2003, p.19). This practice was continued throughout 1990s, resulting in several high-rise building constructions throughout the city. The allowance of variable densities caused the increase of built-up densities and infrastructure deficits in the declined regions. In inner-city and southern quarters many buildings with small dwelling units were constructed and the provision of infrastructure had become more difficult due to the increase of population (Zebardast, 2005). This development caused many protests among Tehran’s residents living in the high-dense city quarters. With the relaxation of zoning regulation, the developers and housing agencies were given the opportunity to buy most of the open areas which were defined as green zones in the Tehran’s Comprehensive plan of 1967, and built informal settlements on them. Most of these settlements became attached to the city later (Salek, 2007).

In 1991, the Mayor criticized the first master plan for being mainly a physical development plan, rooted in the political framework of the previous regime, and not paying enough attention to the problems of implementation (Dehaghani, 1995, in: Madanipour, 2006). In the beginning of the 1990s, it became evident to the government that the city had not developed according to the first master plan. Hence, the comprehensive plan’s 25-year lifespan came to an end in 1991. This time a firm of Iranian consultants (A-Tech) was commissioned to prepare a plan, which was approved by the HCAUP in

Reviewing the Planning History of TMR (Normative Dimension)

Map 3:14: Tehran in 1996. By comparing this map with the one 1973, it can be seen that during 1973 to 1996 the city has grown toward the west and north-west (Mashayekhi, behind the mutation, 2009).
Towards Regional Synergy

Chapter 1

Chapter 7

Chapter 6

Chapter 5

Chapter 4

Chapter 3

Chapter 2

1993. “This plan also focused on growth management and a linear spatial strategy, using the scales of urban region, sub region, district, area and neighborhood. It promoted conservation, decentralization, polycentric development, development of five satellite new towns, and increasing residential densities in the city. It proposed that the city be divided into 22 districts within five sub-regions, each with its own service centre” (Madanipour, 2006, p. 436).

The 1993 plan was not welcomed by the municipality, since they were not consulted during the plan-making process, and were disagreed with its assessments and priorities, finding it unrealistic, expensive, and impossible to implement. As a result, the municipality produced its own strategic plan for the period 1996–2001, known as Tehran Municipality’s First Plan, or Tehran 1380 (1380 = Persian year for period 2000–2001). Rather than introducing a land-use plan as its goal, this was the first plan for the city that emphasized a set of strategies and proposed policies to achieve them. It identified the city’s main problems as shortage of resources to deliver its services; the pace and pattern of urban growth; environmental pollution; the absence of effective public transport, and inefficient bureaucracy (Shahrdari-e Tehran, 1996, in: Madanipour, 2006). The municipality’s vision for the future of the city was then outlined to have six major characteristics: Clean City; Smoothly Moving City; Green City; A High Cultured City; Dynamic City; Modern-Traditional Texture (Dafateri-Moghaddam, 2001 in Schuppe, 2007). It also, included preparation of comprehensive and detailed plans for land use and conservation of the Tehran metropolis (Shahrdari-e Tehran, 1996 in Madanipour, 2006).

In course of drafting the Strategic Plan, the Municipality made some efforts to implement parts of the proposals, such as increasing the amount of green open spaces in the south from 2.5 m² to 10 m² per person, or constructing new parts of the motorway network, which was proposed by the 1968 plan; opening large parts of the city to new development, and easing movement across the city. In course of reducing disastrous situation of traffic and air pollution, 1,500 diesels and petrol engines of public busses and taxis were converted to run natural gas, “Pollution Indicator Boards” were installed to increase the people’s awareness about the hazards of pollution, (Madanipour, 2006). These led to the declaration of Tehran, as one of 25 “Best Practice-Cities” on the UN-Habitat conference in 1996 (Dafateri-Moghaddam, 2001, in: Schuppe, 2007). Furthermore, laws had been passed that adopted some of the proposals of the 1992-master plan such as the division of the city into 22 partly autonomous districts (Madanipour, 2006).

Map 3.15: This map shows the population of TMR in 1996. In the period between 1986 and 1996, Karaj, Eslamshar and Qods which was established during the war grew very fast. Qods is located close to the industrial areas beside Tehran-Karaj road. The growth rate of Tehran in compare to the other cities of the TMR was very low, such that the growth rate of population of Tehran became less than natural growth rate. This means that in this period migration balance in Tehran was negative. However the rate of migration to TMR still is high (Source: Map by author, data from Iran Sensus Center).
Reviewing the Planning History of TMR (Normative Dimension)

Image 3.17: These two photos show the same location in Iran. In the top photo, Esteghlal international hotel is stand alone and labors are planting the Valiasr Street’s trees in 1965. The bottom photo shows the same location after 45 years. The Esteghlal hotel is specify with a rectangular around it (Source: http://www.skyscrapercity.com.)
3.3.3 1997–2003: Reform

The controversial period of reconstruction was followed by a period of democratic reform, which re-launched an elected city council for the city. The council published its own vision of the city as Tehran Charter in 2001, which was the summary of the principles agreed between council members, non-governmental organizations, and urban experts at a congress about the subject. The Charter adopted sustainability and democracy as its key principles, which were used to develop strategies for natural and built environments, social, cultural, economic and transport issues, urban management, and the city's regional, national and international roles (Shahrdari-e Tehran, 2004 in Madanipour, 2006).

In 2001, the Strategic Plan was extended for a 25-year period. However, since the problems of the city such as air pollution, traffic congestion, and decline in certain city quarters, social conflicts, and insufficient infrastructure were still evident, the Municipality drafted a new master plan.

Their goals were the rehabilitation of blighted areas, reducing pollution, increasing the efficiency of transport, and developing cultural amenities worthy a regional capital (Thum, Shirazi, 2005 in Schuppe, 2007). In that period the gap between the Municipality of Tehran and the Interior Ministry regarding planning objectives has increased. Despite the problems in Tehran, the central government has not made any efforts to assist the Municipality with finance for infrastructure. Instead the MHUD has pursued the decentralization strategy by freezing the infrastructure capacity of Tehran while providing funds for infrastructure for the satellite towns of the TMR. In this context, the MHUD intends to enact a law that freezes the population limit of Tehran at 7.65 million.
Map 3.17: Tehran in 2006. Because of natural barrier of the mountain in the north, the city expansion toward the north is saturated. Development of the road toward the west provides the potential residential areas in west side of the city (Mashayekhi, behind the mutation, 2009).
3.3.4 From 2003 to present: Present Strategy of Decentralization

During 1976-2006 development of the service centers and road networks continued. Along the major roads (Damavand, Khorasan, Varamin, Qom, Shahriar, Saveh, Eshtehard, Karaj and Varamin) several residential and industrial complexes were constructed or planned. Construction of Imam Khomeini International Airport, other transportation terminals and service centers have also started. Population growth in Tehran was gradually decreased and from 4.15 percent in period of 1966-76, declined to 2.89 percent in period of 1976-86, 1.11 percent (less than natural population growth) in period of 1986-96 and 1.3 percent in period of 1996-2006. The growth rate also has slowed down in TMR. The spatial growth rate from 5.2 percent during 1965-75, declined to 4.2 percent during 1976-86 and 2.7 percent during 1986-96. Despite the reduction of population growth rate, the physical expansion rate of cities and villages in TMR remained constant in this era, which was because of leniency of the governments in the first years of revolution. Karaj’s population increased 5 times and became 1,377,450 people. Eslam Shahr’s population reached at 351,171 inhabitants. Eslam Shahr in 30 years transformed from a small village to the big city which is the third greatest city of the TMR after Tehran and Karaj. Three cities of Gharchak, Varamin, Qods, Paskdasht, Malard and shahrriar with population of 173, 208, 229, 126, 228 and 189 thousand people joined the cities with more than 100,000 populations (Ghamami, 2004).

Based on the idea of the limiting growth in Tehran, the MHUD and the HCAUP had approved the first Regional Development Plan in 2004, valid until 2020. It is the first time in the history of Tehran that a plan on regional scale has been passed.

The plan suggests solutions to absorb the surplus population of Tehran when the 7.65-million limits are passed. The plan envisages creating nine urban agglomerations by equipping some larger cities with (major) infrastructure funded by the central government to serve as regional centers, which will increasingly perform the functions of capital cities. The TMR for 2020 is planned to consist of high-density urban cores spread over a distance of 200 km, which are to be separated by “green zones” to preserve agriculture and the rural character of settlements. These unities are planned to be connected by a transportation network. The nine urban unities are either already existing towns or suburbs, or are going to be developed as new towns. Based on the regional plan Tehran municipality prepared the third Master Plan of Tehran in 2006. In this plan construction of the green belt for prevention of the city growth was emphasized.

The “New Town”-concept is based on the establishment of totally new autonomous towns in order to relieve development pressure of the major cities, in particular Tehran. Since 2003, there is collaboration between Iranian
and German partners to manage the development of the New Towns (Hiesecke, 2006 in Schuppe, 2006). In Iran, the national government has established the “Iran New Towns Development Organization” (INTDO). The INTDO works together with the “Building and Housing Center” (BHRC), which is a national agency that is in charge of implementing technical norms of the housing sector. The title of the research is: “New Towns as a Concept for the Sustainable Development of Mega-Urban Regions”. Their sample is New Town of Hashterd, located 65 km west of Tehran. This town is being developed to absorb the surplus population of Tehran and Karaj. The population is at present 60,000 (estimate in 2005). It is projected that the population is going to boost up to 0.5 million by 2015. This implies an accelerating population growth rate of 2083% (1990-2015) (Federal Ministry of Education and Research, 2005 in Schuppe, 2006).

Image 3.18: This image shows the new town of Parand in March 2008. The new town of Parand is situated 10 km west from Robat Karim (situated 35 km southwest from Tehran) on the way to Saveh and it has about 7000 students in Islamic Azad University. The town is intended to provide residence for the staffs of Imam Khomeini International Airport, create a balance in the settlement pattern of Tehran, establish an appropriate environment to draw in the extra population of Tehran and offer an alternative to unsystematic settlements. Parand is expected to accommodate 100,000 citizens across 1,467 hectares. It is divided into a number of areas namely an urban texture, greenery, town services, regional services and industrial district. These areas are planned to develop in 3 stages. Parand is a well-planned town which responds to the community’s needs. It aims to host low-income families (laborers’ and employees’ housing cooperatives) by providing low-priced residential units with bank loans there by attracting various classes of people. Parand is also an Iranian name. It means natural silk (Source: http://www.skyscrapercity.com).

Image 3.19: This image shows the new town of Hashterd. Hashterd is located 68 kilometers (42 mi) west of the city of Tehran. It is the capital of Savojbolagh County (Source: http://www.skyscrapercity.com).
Chapter 3

3.4 Conclusion

As it was mentioned in the beginning, this chapter aimed to investigate the urban planning and policies which influenced the development of the TMR during the history in order to examine how polycentrism is affecting the normative documents, and also, looking for the deficiency of those documents to promote the polycentric development. In the following a brief history of development in the TMR will be explained.

In the first stage of the developments, the attempts were done to modernized and westernized Tehran, transforming the enclosed traditional Islamic city to an ever growing metropolis with new economic and cultural pattern divided the city along the lines of income and wealth. Nationalization of the oil fuelled the construction of manufacturing in Tehran as an undisputed economy hub of Iran. The land reforms of the 1960s also, released large numbers of rural population from agriculture, which was not able to absorb the exponential demographic growth. These new labour forces were poured into Tehran. Before 1960s Tehran didn’t experienced a real planning. But after that, various urban planning and policies affected the urban development of the TMR, and resulted to what is now today. By looking at different plans and policies of government, it is not hard to see the influence of the polycentric development policy in them at different level. At the national level from early 60s, the government pursuing decentralization policy by directing the investments to the other regions of the country, attempt to reduce attractiveness of Tehran and providing more balance in urban system at national level. At the municipal level also, Tehran had three plans, referring to morphological aspect of polycentrism. The 1968 plan, for the first time introduced the idea of a polynucleated system rather than monocentric and envisaged the future of the Tehran growing east-westward in a linear polycentric form, reducing the density and congestion of the city centre by encouraging the development of new centralities, through commercial activities (Map 3.18). In the mid-70s, the New Town strategy introduced with the intention of decentralizing Tehran’s population and economic activity away from the downtown to new settlements in the peripheries. The 1993 plan, promotes decentralization, polycentric development in Tehran by dividing the city into five sub-region and development of five satellite new towns (Map 3.19). The 2006 plan also, promotes linear polycentric development within the Tehran, but this time north-southward (Map 3.20). In the regional level, the first regional plan of the TMR in 2003, promoted the deconcentration
and decentralization of the people and activities, through two proposals: incentives toward nine potential centres with high-density urban core, and connect them with transportation network (Map3.21). Although all these plans promote polycentric development in different levels, they mostly advocate physical changes. In the plans the most attention was given to the spatial form of the region and encouraged morphological polycentricity. Although the 2003 regional plan of the TMR pay some attention to the relational aspect of polycentricity by developing an integrated metropolitan area in order to consolidate its competitiveness. This plan also, proposed the decrease in number of commuter toward Tehran through the increment of jobs and income in other cities of the region. Altogether, it can be concluded that despite government’s plan for polycentric development, these plans do not considered the entire complexity of the issues and merely reflected the spatial dimension.

Besides the plans the consequences of the plans are also important to consider. Here in short it is tried to summarize the procedure which promoted the current regional structure. With arrival of economical activities and population settlement in each region the land price increases. Increment of land price will result to the marginalization of the low income people. This class of society who are not able to afford the life expanses within city will establish new settlements in fringes. With growth of population and activities in the fringe the land price in this area begins to grow. This procedure again will result to the marginalization of lower income people. Tehran metropolitan region is to some extent an example of such regional development. The first, second and to some extent third national development plans (1907-1925) propelled the economic activities in Tehran. This process resulted to the migration of huge number of people to this city. Gradually with the spatial saturation of the city the land price increased. Concurrent with these changes the policies imposed in Tehran’s first comprehensive plan has implicitly emphasized on the drift of the low income people from Tehran and locating them near the activity centers. However this process resulted to the settlement of low income people in the fringe (Eslamshar).

With increment of in population and activities in the fringe areas during the time, they gradually found the new identity. Therefore new urban plan for them were developed. By preparation of new plans the same process occurred for Eslamshar. As an instant, Akbarabad is one of the cities formed after preparation of Eslamshahr’s comprehensive plan in 1985. This process is depicted in the diagram 3.1. One should remember that in planning and establishing new regulations housing of low income population is an important issue. As it is explained in this paragraph new set of regulations resulted to the marginalization of lower income people. Therefore it is curtail to consider the housing problem of such class of society in final proposal.

Diagram 3.1: This diagram shows the elements which influenced the current structure of the TMR (Source: Diagram by author).
Chapter 4

Analysis the Urban Structure of TMR
(Analytical Dimension)

This part of the research is associated to the analytical dimension of polycentricity. According to the methodology of the research presented on Chapter 1, the analytical dimension uses the concept of polycentrism to explain or analyse an existing or emerging polycentric phenomenon. Therefore, this chapter of the report is related to investigation the current reality of the TMR and uses the findings of the theoretical framework to develop a broad analysis based on the morphological, relational and governance aspects of polycentrism. Exclusively, this part of the research evaluates the level of the polycentricity in the TMR based on the potential clusters of population and activities, relation between urban areas within the region and institutional capacity of the region. It is also important to take into account the limitation of the available data and the difficulties for measuring some urban facts made it impossible to provide reliable and concrete responses for some research questions. In order to deal with the aforementioned deficiency, this research tries to combine several indicators for a more reliable and consistent conclusions.
4.1 Introduction of location

4.1.1 Location

Covering an area of 730 km-sq, Tehran is situated in the north-central part of Iran, on the slope of the Alborz Mountain. As the national capital it is the most populated city in Iran and the centre of cultural, economical, political and social activities. Today Tehran is a big city with population of 9,110,347. One of the largest cities in Western Asia, and is the world’s 19th largest city (Municipality of Tehran, 2008) (Map 4.1).

With roughly 13.4 million people, TMR is Western Asia’s largest Metropolitan Region. The TMR is divided into 9 urban areas and 17 districts, encompassing Greater Tehran city and Karaj and their surrounding suburbs. Hosting one seventh of Iran’s population, the region extends over a surface of 1247 square kilo-meters (491.9 square miles) (Map 4.2).
4.1.2 Geography

Tehran’s urban area between the Alborz Mountains (Image 4.1) in the north and the desert, Dasht-e Kavir (Image 4.2), in the south is located on vast mountain slope with an altitude of 900-1700 m above sea level. In higher altitude there are some snowy slopes and semi-humid mountainous climate conditions, whereas it becomes hot and arid on lower altitude. Limited by the mountains the city of Tehran has expanded towards the south and west (Altas Tehran, 2006). As it can be seen nor can the city expand along the northern and eastern heights. So the city can only expand in the western direction due to its suitable geographical condition. The new residential states have mostly developed in this direction.

Image 4.1: Alborz Mountain in the North of Tehran (Source: Atlas Tehran).

Image 4.2: In this image the Alborz Mountain in the north and Dasht-e Kavir desert in the south can be recognized (Source: google map).

Image 4.3: The north-south section of the region. As it can be seen the TMR is expanded from 1000 m to 1800 over the sea level. This image emphasises on the special geographical position of the TMR (Source: Mashayekhi, behind the mutation, 2009).
4.1.3 Comparing the Scale

<table>
<thead>
<tr>
<th></th>
<th>Randstad</th>
<th>TMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>7.100.000</td>
<td>13.400.000</td>
</tr>
<tr>
<td>Area</td>
<td>8.200 Km²</td>
<td>18.800 Km²</td>
</tr>
</tbody>
</table>

Map 4.4: Comparing the scale of the TMR in Iran and Randstad in the Netherlands.

4.1.4 TMR in the Bigger Framework

Image 4.4: This image shows the connection of the TMR to the other cities out of its border (Source: google earth).
Analysis the Urban Structure of the TMR (Analytical Dimension)

- Analysis of the urban structure of the TMR (Analytical Dimension)
- Key elements:
  - Agricultural Land
  - Urban region
  - Built Up Area
  - Industrial units
  - Major Road
  - Freeway Network
  - Highway Network
- Urban regions highlighted:
  - Tehran
  - Karaj
  - Eslam Shahr
  - Pakdasht
  - Qarchak
  - Kahrizak
  - Pishva
  - Pardis
  - Hashtgerd
  - Shahriar
  - Imam Khomeini International Airport
  - Payam Airport
- Roads and highways:
  - Tehran-Qom Highway
  - Tehran - Saveh Highway
  - Roudehen
  - Khorasan Road
- Map 4.5: This map shows 8 urban regions and industrial units and road networks which connecting these regions together (Source: Map by author).
4.2 Spatial Form of the TMR (Morphological Aspect of Polycentricity)

Based on the literature of the polycentricity, nodality provides the basis for measuring morphological polycentricity. It can be argued that in a morphologically polycentric system there is no dominant centre or alternatively, that centres are relatively equal in terms of nodality or their absolute importance (Burgers and Meijers, 2011).

In order to measure the morphological aspect of polycentricity in the TMR it is necessary to build an understanding about spatial configuration of this region. Thus this part of the research intend to analyse the spatial form of the TMR in following themes: Concentration of the Population, Concentration of the Service Activities, Concentration of the Industrial Activities and Distribution of the Mobility Nodes. The aforementioned themes help to built a comprehensive understating of the spatial distribution of the various centralities within TMR. Furthermore, the research add another dimension to the spatial form analysis and look into the social profile of the inhabitant of the TMR. Despite the fact that the social theme being not so relevant for the polycentric analysis by most of studies, this research considers that the social distribution of the population within region influence on the distribution of the various types of economic activities.

4.2.1 Concentration of Population

The morphological configuration of polycentric urban region has relation with the distribution of economic clusters with metropolitan influence over the regional territory (Giuliano and Small, 1991, Kloosterman and Musterd, 2001). Therefore, one can argue that the concept of polycentrism mostly relates to the economic distribution rather than demographic distribution. However, as Champion (2001) states, it is possible to consider of a polycentric urban patterning that could only refer to the fact that the urban population of any region or country lives in several urban areas rather than being concentrated in a single one.

The spatial distribution of population influence on the economic activities and consequently on the polycentric configuration. Since the local inhabitants are the main user of the urban system, job will follow them gradually. Therefore, this section takes the distribution of the population into account.

Map 4.6: TMR’s population density in 1996 (Source: Map by author).
According to the Map 4.6 and 4.7, which illustrate the population density in different urban agglomerations of the TMR and the distribution of the population in different counties, Tehran metropolis has the highest density of the population. After that Karaj-Shahriar urban agglomeration and Varamin urban corridor have the most concentration of the urban population.

In the map 4.8 the growth of the population in the region during 1956 to 2006 are depicted. The map series illustrates the tremendous population growth in Tehran and western part of the Region. With regard to the map it can be said that the growth of population in West and South-West of the region were more than the East part of it.
4.2.2 Concentration of Service Activities

According to Hall and Pain (2006) polycentricity at regional level refers to outward diffusion from major cities to smaller cities, reconfiguring different levels of the urban hierarchy (Christaller, 1966 (1933)): lower-level service functions are dispersed out from higher-order central cities to lower order cities (Davies, 1996). These spatial processes are related to two basic and parallel shifts: the globalization of the world economy and what can be its ‘informationalization’, the shift in advanced economies away from manufacturing and goods-handling towards service production, particularly into advanced services that handle information (Hall and Pain, 2006).

The most significant expression of the shift to informational mode of development as Castells (1989) named it, is the emergence of the so-called advanced producer services (APS): “a cluster of activities that provide specialized services, embodying professional knowledge and processing specialized information, to other service sectors” (Hall and Pain, 2006, p.4). They offer expertise in a wide range of areas: management and administration, production, research, human resources, information and communication, and marketing (Wood, 2002). As Anas et al (1998, p. 1439) witness “One of the most interesting features of modern urban landscapes is the tendency of economic activity to cluster in several centres of activity”. Thus, there are contradictory trends here: as production disperses worldwide, services increasingly concentrate into a relatively few trading cities (Hall and Pain, 2006). As Kloosterman and Musterd (2001) argue these concentration of the economic activities in several centres, called polycentrism.

The aforementioned trends could happen anywhere in a modern society dealing with globalization and informationalization. Accordingly, in order to measure the morphological polycentricity in TMR, it is also, necessary to consider the concentration of the urban activities in morphological analysis. Since data related to the location of the urban activity centres in TMR is not available, inspired by the thesis of the Paula Pessoa in 2010, the Google map is used as a source of collecting data. In order to create a specific map for specific categories of the urban activities, some keywords were defined to extract the useful information from this data. It is important to note that these information are quantitative than qualitative, since each dot is a representative of one place in reality but it misses its size or importance.

In order to analyze the service activities, they divided to four key groups, based on the study of Llewely-Davies (1996, in: Hall and Pain, 2006), but with adjustment to fit to the context of the TMR. These four groups are as followings:

- **Finance and Business**: including banking and insurance, companies related to finance, law, accountancy, and services including consulting, architecture, civil engineering and industrial design.
- **Power and Influence**: institutional buildings related to the state and municipal government, such as ministries, municipalities and executive branches.
- **Research and Educational**: Related to the creativity and knowledge producing. Places such as research and knowledge institute, conference centres and universities.
- **Tourism and Leisure**: including both touristic businesses and destinations, such as hotels, historical places and museum, also Leisure destinations such as theater, cinema, cultural house, sport and swimming pools.

Analysing different groups of services separately, illustrates various distribution of activities in TMR. Some services tend to cluster in one or two major cores, while the others tend to have more dispersed manner. Analysing each group of services will be explained distinctly in the following.

**Finance and Business**: The first key group, finance and business, related to both public and private sector services (commonly, chief companies are under the ownership of the public sector). This group of services has the highest density of activity, since includes variety of advance services. Map 4.9 illustrates that these group of services strongly concentrate in the centre of Tehran and its historical extension towards the north. After advances in transport infrastructure and rising levels of car ownership, the process of decentralization of upper class people to the north (due to its better climate) led to the extension of the historical core of Tehran towards the north and merging with historical core of the Shemiranat city. After that most of the new businesses were formed around theconnection roads of two historical cores. There is also slight concentration of services in the east and south of Tehran which was formerly historical core of the Rey city and then merged to Tehran. Furthermore, there are some minor concentrations in the city of Karaj, second biggest city of the region in west of Tehran. The rest of the businesses are distributed scatteredly in the rest of region.
Analysis the Urban Structure of the TMR (Analytical Dimension)

Map 4.9: Cluster of service activities - Finance and Business (Source: Illustrated by author based on Google Maps | Key words: Business, Company, Bank, Insurance, Engineering, Consulting, Attorney).

Map 4.10: Cluster of service activities - Power and Influence (Source: Illustrated by author based on Google Maps | Key words: Ministry, Municipality and governmental organization).
Map 4.11: Cluster of Research and Educational centers (Source: Illustrated by author based on Google Maps | Key words: Research, Knowledge, University, Institute)

Map 4.12: Cluster of service activities - Tourism and leisure (Source: Illustrated by author based on Google Maps | Key words: Hotel, Museum, Historical Places, theatre, Cinema, Cultural House, Sport, Swimming pools).
Analysis the Urban Structure of the TMR (Analytical Dimension)

Map 4.13: Cluster of 4 group of service activities - Finance and Business, Power and Influence, Research and Educational centres and Tourism and leisure.

**Power and Influence:** The second key group, Power and Influence, related to the governmental services, have a much dispersed configuration. In the case of the institutional building related to the state, they are concentrated in the centre of Tehran and its historical extension towards the north. While, the institutional building related to the municipal governments were distributed in different municipalities of Tehran and also, concentrated in the city centre of the other cities (Map 4.10).

**Research and Educational:** The third key group, research and educational, represented by produce and exchange of knowledge and services related with higher education and research institute. This group of activity has a strong concentration in the center and medium concentration in the north of Tehran due to location of the most universities in that part. Nevertheless, concentration of the research and educational activity is not only in the Tehran, the map 4.11 illustrates some smaller centres in the Karaj, and also in the Qods, located in south-west of Tehran. The rest of the activities of this group slightly dispersed across the region.

**Tourism & Leisure:** The forth key group, related to the touristic businesses and Leisure. Not surprisingly tourist centres have strong concentration in the centre of Tehran as a most historical part of region. Since in this group hotels are considered as a one of the components of this service activity, there is a slight linear concentration in the northern part of the Tehran. Since this area due to its location on the foot of Alborz Mountain has a cleaner weather and better view, there are several luxuries hotels located there. Leisure means different in Iran due to its strong religious background and strict political context. Therefore, people instead of going to the bar or spend their time in clubs and concerts, spend their time by doing sport activities and going to cinemas or theatre as means of entertainments. Though, these elements were considered as key components of the leisure activities in TMR. Unexpectedly, in contrast with other service activity that has slight concentration outside the Tehran; all the services related to leisure are located in Tehran and Karaj. The rest of region is suffering from lack of leisure facilities (Map 4.12).
These four groups were combined on the Map 4.13, and represented the distribution of all service activities in the TMR. According to this map, there is a very strong concentration of the ‘advanced service activities’ in the centre of Tehran. Due to its long history and the location of bazar, Tehran’s centre placed most of the service activities (from the point of the quantity) in it. North, which is basically encompasses the extension of the historical core of Tehran, also demonstrates the concentration of the ‘advanced service activities’, due to placing of the upper class and high educated families. Thus, it is not surprising that most of the advance services located there. Gradually these activities dispersed along of the surrounding areas of Tehran, with a very slight concentration on some specific areas (especially in the historical centre of the south and in the east). Beyond the official borders of Tehran, the other cities concentrate these activities on their city centres, which is in a small portion in comparison with Tehran. Among these cities Karaj has the most concentration of the service activities. These services were concentrated slightly in various centres distributed in Karaj. After Karaj, Eslamshahr, Andisheh new town, Qods, Shahriar and also Varamin also show a better concentration of the services in their centres. Rest of the region is suffering from lack of the advanced services.

Although according to Hall and Pain (2006), the clusters of advanced service activities are the main indicator of polycentric configuration. It is important to consider other urban activities such as concentration of commercial clusters as well as the distribution of the urban facilities, to have wider view on the distribution of urban activity over the TMR territory. The commerce is more dispersed activity on the metropolitan territory, although it has stronger concentration on centre and north. The map also demonstrates slight concentration over Karaj, Shahriar, Eslamshahr and Varamin. The commercial activities consist of shopping centres have a strong influence in attracting metropolitan flows. There are many kind and size of shopping centres in TMR, Different of North American shopping centres, which are outside of the cities; those are located within the urban tissue, being a strong metropolitan attractor and a great generator of traffic and development on their surroundings (Map 4.14).

The urban facilities mainly related to schools and hospitals. Since this activity has more local influence, it is expected that the whole region benefits from them to some extent. According to the MAP 4.15, these facilities are distributed over the Tehran and Karaj in a respectable manner. In the case of the roads lead to the Firouzkooh, Semnan and Qom there are not sufficient facilities for the inhabitants who live along these roads.

Based on the distribution of the advanced service activities, one can perceive a very monocentric configuration for the TMR, which is not out of the question in this regard. But it is also, important to consider two important issues; First, the concentration of the service activities in Tehran, is more than a one historical centre. It also encompasses many centres with different urban age, various economic activity and social identity, which are stretched from historical centres of Tehran towards the north. Therefore, within the official limits, Tehran cannot be considered as a pure monocentric. Second, the history and population density of Tehran should be considered as important factors in analysing the concentration of the service activities. Other cities except Karaj and Varamin do not have long history and due to their minor population in comparison with Tehran, observation of the not mature centre in them is not surprising.
Introduction

Map 4.14: Cluster of Commerce Activities (Source: Illustrated by author based on Google Maps | Key words: Commerce, Shopping Centre, Market).

Map 4.15: Cluster of Urban Facilities (Source: Illustrated by author based on Google Maps | Key words: Hospital, High school)
Chapter 4

Agricultural Land
Built Up Area
Major Road
Freeway Network
Highway Network
Service Activity

Map 4.16: Cluster of service activities (Source: Illustrated by author based on Google Maps).
Introduction

4.2.3 Concentration of Industrial Activities

The industrial activities partly concentrated in the west of the Tehran and starched along the road connected Tehran to the Karaj (Maps 4.17). Although these industries are in the official limits of the Tehran, once they were in the periphery and far from the residential areas. The rest of the industrial activities go beyond the official borders of Tehran, reaching surrounding cities. These industries which have a concentrated decentralized configuration, are formed several industrial town such as Parand, Eshtehard, Nazar abad, Pishva and etc. The distribution of the industrial activities has relation with the policies of industrial development which stimulated the decentralization of these activities from the Tehran city from 1973. According to this policy, a number of major urban centres were identified as growth pole to concentrate major national investments. They planned to attract large-scale and private enterprises away from Tehran; to stimulate the mobilization of each particular region’s natural resources; to constitute a system of secondary cities; and to promote national spatial integration (Zebardast, 1990). But the problem is, under a market-oriented economic system, decision-making by private enterprise does not ensure that industrial activities will be located as expected in the decentralized growth poles. Also, government’s industrial decentralization policies had a minor affection the dispersal of industries way from the TMR and transfer them to the other regions of the countries. On the migration phenomenon, industrial decentralization was effective, and it resulted to the new migrants not only located in the Tehran’s city boundary.

Map 4.17: Location of the main industrial activities in the TMR is illustrated in dark gray colour in the map (Source: Illustrated by author).
Map 4.18: In this Map generic information about industrial towns are provided (Source: Illustrated by author based on the information from website of industrial towns company).
In the map 4.18 the main industrial towns with their functions are presented. The number of industrial units, number of labours and contracts are also depicted in this map.

By categorizing the function of each industrial unit, it can be concluded there are four main industrial cores in the region. The industrial units along Tehran-Karaj corridor are mostly active in field of food production, car manufacturing and chemical products. There are two industrial cores along with Tehran-Qom highway which are mostly active in metal and machinery. Along with Khorasan road several industrial units with focus on food and beverage production created an industrial core in this region. The map 4.19 illustrates location and field of activity of each industrial units.
4.2.4 Distribution of Mobility Nodes

Transportation nodes have a relevant urban dimension for a polycentric analysis, since they are the interconnection of the mobility flows (Bertolini and Dijst, 2003, in: Parente, 2010). Furthermore, in TMR context transportation system has highly influence on the urban expansion. Places with higher accessibility to different transport modes show a greater potential for urban expansion. Hence, considering the spatial distribution of these nodes over the TMR territory, will reveals the accessibility of different agglomeration to mobility networks, and finally can lead to the more accurate measuring of polycentricity over TMR territory.

According to the Map 4.20 TMR is served by two major and three specialized airports distributed over its territory. The first one is Imam Khomeini International Airport (IKIA), located 50 kilometers south-west of Tehran and handles all international flights of the country (Image 4.5). The second one is Mehrabad National Airport, the old airport located in the western part of the Tehran metropolis in the middle of the city urban tissue (Image 4.6). Mehrabad was the primary airport of Tehran in both international and domestic passenger traffic but has been replaced by IKIA in most of its international flights.

The three other airports are: Payam airport, which is an international cargo airport located in Karaj (40 Km from Tehran); Dushan tappeh Air Base, formerly flight training base for Islamic Republic of Iran Air Force, located in the eastern part of the Tehran metropolis; and Firuzabad Airport, a local airport with light traffic which serves private flight charter (located in south-east of Tehran).

Among all these airports, Imam Khomeini International Airport and Payam Airport express great potentials for future development. Imam Khomeini International Airport, the newly constructed airport, is the largest International Airport of the country which is located in the huge vacant land of the south-west of Tehran. As the Government planned, it will be an Airport City in the future. This opportunity can trigger the development in the south-west of the Tehran and turned it to a new centrality in the future. However, this airport is not well integrated with the public transportation neither buses nor train system (metro), which hold up the developments of this area. Furthermore, Payam Airport could be also, considered as a potential in the western part of the region since it is combined with Special Economic Zones (SEZ). Payam Special Economic Zone is the closest SEZ to the Tehran metropolis,
with 3600 hec area. It established in Karaj for development of air cargo and postal transportation, storage of goods, cold store, packing services, goods productivity, perishable and time sensitive goods export. Payam is the only SEZ in the region with the privilege of its own airport and airline. Adjacent to industrial, economical and agricultural centre of Tehran, with easy access to railroad, underground and other related highways and finally existence of the cheap labor in the area could provide great opportunity for this area to attract domestic and foreign investments. The capacities of the aforementioned airports should be considered in the future development proposals.

Beyond air transportation, there are also the train, bus and metro system serving the TMR. Tehran has a central train station in the southern part of the city with connecting services round the clock to various cities in the country. There also train station in the Karaj (west of Tehran), Eslamshahr (south-west of Tehran) and Varamin (southeast of Tehran) (Maps 4.20). The train line is managed by Railway Company of the Islamic Republic dependent on Transportation Ministry and linked different municipalities to Tehran. However, except Tehran Central Station, all these train stations do not have any relevance for the urban development of the region. Since these trains are not used at the regional level, therefore their usage are not frequently and it is only at inter regional level. The image 4.7 presents the most of the existing situation of the train in the country.
Since buses provide connections at low fares, accessibility to the bus system is an important issue in TMR. Especially this comes to a high sensitivity when we talk about low-income settlements. Inhabitants of these settlements do not have proper income to spend it on transportation, and in the current situation buses are the only public transportation modes that provide mobility at low price. Hence considering the access to the bus system has a relative significance in this analysis.

According to the map 4.21, most of the settlements have access to the bus system. However the map illustrates the tendency for concentration of these bus nodes within the western and south-western part of the region. This shows the higher integration of these cities with the system. The map also displays two different types of cities. Cities illustrated with red circle have a Bus Company for themselves, but cities illustrated with black circle do not have one. In TMR, Tehran, Karaj and Eslamshahr have Bus Company which is an independent organisation responsible for the supervision of bus system performance. In the rest of the regions municipalities and county authorities are the responsible for the supervision.

Map 4.21: Main bus stops in the TMR (Source: Illustrated by author).
Metro is the last transport mode that added to the region by Urban and Suburban Railway Company. Development of the Metro is not complete yet. In the first phase of the construction, 69 stations were built. According to the current situation metro station are covering two axe in Tehran; one from north to south (connect historical core of the Shemiranat to the historical core of the Rey) and the other from east to west, which continued towards Karaj. The rest of the region is excluded from using the metro. Comparing the location of the metro nodes with the distribution of the economic activities, we perceive a similarity of both configurations, which tend to concentrates on the central axis of Tehran from north to south.

In the second phase, 90 stations are under construction along the metro line, and government also plans to construct 52 more stations in the third phase. These metro stations mainly will take place Tehran and Karaj (Map 4.22). This newer and more efficient public transportation mode will induce many transformations along its area of influence, provoking some changes on configuration of concentration areas of TMR.
4.2.5 Social profile of the TMR

In this section those factors (despite the economical factors) which influence the behaviour of population reside as well as understanding the social groups and structures will be considered. In this study the TMR is divided to the 7 urban regions. In each urban region the social profile based on following categorization will take place.

Social categorization of society based on occupation provides an appropriate framework for investigation of impact of social factors on the community levels. This is because some of important socio-economical differentiations in the society, such as education, cultural aspects regarding to the job and benefits from the privilege of the job are almost in line with the occupation itself. Therefore categorizing the region based on their occupations helps us of better understanding of needs and social behaviour of people.

Map 4.23 shows the social combination of the TMR according to 4 social categories. These social categories are:

- **Administrative and Professionals**: Capital owners and high expertise (managers and professionals) (upper class).
- **Employees and Shop Keepers**: jobs related to the small investments, mostly service and trade and also jobs rely on low education and medium or low specialization such as Clerks and technicians (middle class).
- **Labours**: jobs related to physical works, professional and amateur (Lower class).
- **Farmers**.

People who poses administrative and professional job normally considered as high class people in Iran social context. The second category, employees and shop keepers usually form the middle class part of the society. Labors which are normally the lower income part of the society form the low class part of the society. Farms can be categorized in each class of society. Map 4.23 shows that more than half of the population in Tehran are engaged with first and second group of jobs, therefore this city includes high and middle class people. In Karaj more middle class people are reside. In the other part of the region we can see lower class people are resided.

Investigation of the population combination of these urban agglomerations shows that Tehran and Karaj-Shahriyar urban agglomerations have more diverse social structure. In contrary Eslamshar, Varamin, Pakdasht and Roudehen more than half of the families are categorized in labour group. Studies of ratio of the farmer families has shown that Tehran and Eslamshahr region have the lowest ratio of the farmer families in the whole region. Therefore these two regions are more than other regions exposed to the urban settlements.
Map 4.2: Areas with the greatest concentration of the low income people in the village around the city of Tehran (2006) (Source: Atlas Tehran).
A study of the urban areas of the low income population in the marginal areas of Tehran in recent decades shows that, unlike in industrial and developed countries, in Tehran it is the low income groups that have moved considerably. They have left the central areas due to the high costs of living and have migrated to the marginal areas where housing is cheap. They have settled in scattered villages and estates, where they are deprived of the minimum urban services and infrastructure. They have increased the costs of urban management for organizing these unofficial settlements and improving living and bioenvironmental conditions. Unofficial settlement in Tehran begun with the purchase and construction of land or letting of houses outside the official housing market and outside the legal city limits, with more and more people moving from houses in the margins of the city to these settlements. An examination of unofficial settlements developed from 1976 to 2006 shows that they expanded around Tehran during this period. These settlements were first developed in the southwest of Tehran, next to the industries established along Karaj road. In the decade that followed, as the number of settlers increased, unofficial purchases of land in the southwest boomed and the number of unofficial settlements (inside and outside the city limits) increased. At the same time, new settlements began to appear in the southeast. From 1986 to 2006, while the unofficial settlements were mainly concentrated in the southwest, they also began to appear in the east and along two main routes in the southeast (Khavaran and Ramin) and the west (along the margins of Karaj highway and between Karaj and Abik). Thus, settlements developed around Tehran first in the southwest, along Tehran-Karaj road (the present Islam Shahr had a population of 50,000 in 1976), and as the population increased and with it the land value, lower income groups were forced to settle in other unofficial settlements. Some of the settlements that have turned into cities in the last decades include: Akbarabad, Malard, Pakdasht, Hassanabad, Bagherabad, and Soltanabad. Map 4.24 depicts the location of the low income settlements in the TMR.

Diagram 4.1 shows the unemployment rate in TMR’s counties. Based on this Diagram Karaj and Marzan abad have the highest rate of unemployment in the region while Shemiranat, Damavand and Pakdasht have the lowest rate of unemployment. It can be interpreted that in the west because of concentration of huge population in this side of TMR there is not enough job opportunity for the people.
4.2.6 Conclusion

For measuring the morphological aspect of the polycentricity, this research built an understanding about spatial configuration of the TMR by analysing different layers of spatial form such as Concentration of the Population, Concentration of the Service Activities, Concentration of the Industrial Activities and Distribution of the Mobility Nodes. This part of the research intended to measure the spatial distribution of the various centralities within TMR. Moreover, it used the spatial form model (Diagram 4.6) as a tool to evaluate the spatial configuration of the TMR in terms of monocentricity/polycentricity and centralisation/dispersion (based on the Wei, 2012). The results will be present in the following:

- Regarding to the concentration of the population TMR tend to be more monocentric, with concentrating most of the population in Tehran. However cities located in the west and south-west of Tehran (Karaj, Shahriar and Eslamshahr) have higher growth rate in comparison with the other part of the region that shows their potential in attracting the population that could be considered for polycentric development. Furthermore, although the population are partly concentrated in some centralities, mostly dispersed outside the Tehran boundaries. Generally TMR is tending to be more dispersed monocentric according to concentration of the population.

- Most of the advanced services are concentrated in the centre of Tehran with extension towards north. Based on the distribution of the advanced service activities, one can perceive a monocentric configuration for the TMR. Although there are slight dispersion of the services in some part of the region but these services mostly concentrated in two main centralities (Tehran and Karaj). This shows the potential of the Karaj in comparison with the other cities of the region. Existing medium centrality in Karaj could be considered as an opportunity for the polycentric development. Generally TMR is tending to be more centralized monocentric according to concentration of the service activities.

- Industrial activities are distributed over the TMR territory in a more balanced way. They are mainly located in Tehran’s peripheries along the main highways. As a result TMR is more polycentric in terms of concentration of the industrial activities. Furthermore, these activities due to their nature and sharing common facilities are tending to be more clusters. Thus, TMR presenting more centralized polycentric feature according to concentration of the industrial activities. The main industrial cores are located in the Western part of the Tehran metropolis (Tehran-Karaj Corridor), along the Tehran-Qom and khorasan road.

![Diagram 4.2: Concentration of population in the TMR (Source: Diagram by author).](image)

![Diagram 4.3: Concentration of advanced service activities in the TMR (Source: Diagram by author).](image)
- The mobility nodes have a balanced distribution over the TMR territory. Nevertheless, only Tehran and Karaj are favoured by concentration of different mobility nodes and rest of the region mainly have access to the bus nodes only. Hence, TMR is tending to be more dispersed polycentric according to distribution of the mobility nodes. The two main potential mobility nodes for future developments are IKIA (located between Tehran-Saveh and Tehran-Qom Highways) and Payam International Air Cargo (located in the Karaj vicinity).
Tehran is more monocentric in term of distribution of the activities!

Diagram 4.7: Percentage of the industrial activities (black) and percentage of population (red) in the TMR (Source: Illustrated by author, data from Iran national census).
4.3 Functional Relationship between Urban Areas (Relational Aspect of Polycentricity)

As it was mentioned in chapter 2, the relational dimension of polycentricity, referred to as functional polycentricity, takes into account the functional connections between the settlements and considers a balanced, multidirectional set of relations to be more polycentric (ESPON 1.1.1, 2004; Green, 2007; de Goei et al., 2010). So it could be said, the existence of multi centralities in an urban structure is not enough for being a polycentric system, and the functional interaction between those urban centralities is also crucial for the system to be considered as a polycentric one.

The aforementioned functional interaction between urban centres could happen in both physical and virtual manner. Generally, the most commonly used criterion for measuring functional polycentricity is the labour market flows based on journey-to-work statistics. However, it is necessary to incorporate also other indicators of interconnection such as non-work trip-generation activities or business links, flows of resources, goods and information (Davoudi, 2003). This research due to the lack available information or even existence of them for TMR, only takes the flows of population into account for measuring the functional relationship between urban centres.

In a functional polycentric system, centres are relatively equal in terms of centrality or their relative importance. Thus, measuring centrality or relative importance of the centres, could be a way for measuring functional polycentricity within the region. Centrality refers to the surplus of importance of a centre based on incoming flows from other places (Burger and Meijers, 2011). Hence, this analysis will not take the internal flows of the cities into account and only consider external flows to measure functional polycentricity within the TMR.

The days when a person was born, lived, worked, married, played and died in the same community are past. Now one person may do each of these in a separate community, even moving back and forth across municipal and county boundaries several times a day (NYSARC, 2010). The people travel for many reasons (work, study, shopping, leisure and etc.) and these movements occur due to two facts. First, various centralities with different identities are distributed over the urban territory, which make it crucial for inhabitant to travel to acceptable distances for their daily activities. In addition, it is necessary that these centralities are linked together by a suitable mobility network to facilitate these movements. On the other hand, the movement is just the way or the mechanism to achieve a desired location (excluding for sightseeing tour), which will not happen in the absence of proper transportation infrastructure.

It is also necessary to mention that, the functional relationship analysis focuses on the structural analysis of polycentricity, related with the spatial structure, rather than to the institutional analysis, related with the voluntary cooperation (Dühr, 2005). The latter aspect will be developed on the following section of the report, the structure of the urban governance in TMR. This section of the report will focus on the flows of population in the both highway and public transportation systems. It measures the degree of trip generation and attraction for different counties. It measures the origin-destination of daily commuting for the each county and compares them together. Finally it draws conclusion based on the finding of the research.
4.3.1 Highway Networks:

Highway networks have a high density during the day in TMR. Due to deficiency of the sustainable rail transportation system, most of daily commuting will occur with private cars, public taxis, buses, mini-buses and motorcycles between different urban areas within the region. Because of the low quality of the public trans-portion system (overload, uncomfortable, and unsafe), there is a growing demand of car users. This situation creates lots of traffic congestion within the main intraregional roads.

The density of the road networks illustrates clearly the radial predominance between Tehran metropolis and surrounding cities (Map 4.25). However the map does not determine the direction of these flows, but taking into account the predominant location of the jobs and economic activities (central and northern part of Tehran) (Maps 4.24 to 4.16), and the identity of the surrounding informal settlements as a dormitory towns, one can easily realize the prevalence of the flows toward the Tehran.

The radial pattern of flows is not merely due to the concentration of the activities within the Tehran metropolis, the structure of the intraregional highway networks is also encourage such a movement among the inhabitants of the region. In the absence of the ring road that connects the peripheral settlements to each other, it is not surprising to observe the dominance of the radial flows towards Tehran. The aforementioned deficiency in the regional highway system is facilitates the consolidation of the Tehran metropolis as a main regional pole.

Map 4.25 also, displays different network densities among various cities of the region which is necessary to take into the consideration. The degree of network density reflects the extent to which centres in the region are functionally interdependent (Green, 2007). In this regards, Tehran-Karaj highway has the highest network density among the all regional highways (this road is also, the densest highway of the country). This huge number of movement is partly due to importance of the road in the national context (will be elaborate more in the next Chapter). Furthermore, this road provides connection between Tehran and Karaj which have a highly functional integration with each other. Karaj is a big city which is the centre of agriculture and livestock of the region. It contains numbers of important agricultural lands, built-up areas, and transportation networks.
research institutes of the country. Besides that, there are some industries located in the western periphery of Karaj. As a result Tehran and Karaj share a significant amount of workforce with each other and consequently a huge number of daily commuting will occur between these two cities.

After Tehran-Karaj highway, Tehran-Eslamshahr highway (south-west of Tehran) has the highest density of the road network. These strong flows of population could be explained by the fact that Eslamshahr is a city with more than 357,171 populations, who are mostly low income people (maps 4.23 and 4.24).

Also there is no strong centrality within the city of Eslamshahr, and there are only some industries scattered around the city (map 4.18). Hence many people have to commute to Tehran for their daily activities. The map also illustrates medium network density in Tehran-Qom highway (south of Tehran), Tehran-Varamin highway (south-east of Tehran) and Tehran-Pardis highway (east of Tehran). Based on the density of the highway network map, it could be concluded that Tehran has a stronger relationship with Karaj and Eslamshahr in terms of flows.
4.3.2 Bus Networks:

Bus and mini-bus as the only public transportation systems that serve the whole regional context play a crucial role in the population mobility. According to comprehensive studies of transport and traffic of TMR, among all the daily trips occur by public transport, 33.5% will happen by buses and mini-buses of the United Bus Company and 20.5% by other buses, and only 10% by public taxi.

The density of bus networks display the same trend as the movement pattern of population flows (Map 4.26). Again, the map illustrates the radial pattern of bus movement between Tehran and surrounding cities, except in the west and south-western part of the region that there are some concentrations of the bus networks. According to this map, three cities are the crossing place of the bus networks. These three cities are Tehran, Karaj and Shahriar shown by circle in the map (Map 4.26). This fact shows the accessibility of these places to the bus system and also illustrates importance of these places in terms of generating and attracting trip in regional context (otherwise the concentration of different bus networks does not make sense).

By looking at the density of the bus network, it can be observed that, Tehran-Karaj and Tehran-Eslamshahr bus network has the highest density. Furthermore, Tehran-Varamin and Tehran-Pardis highway has the medium density of the bus network. In line with the bus network density map, it can be concluded that west and south-west of the region display different trends in terms of concentration of the bus networks, which reveals the highest interaction between the cities located in these parts.

Map 4.26: Intensity of bus network in the TMR (Source: Illustrated by author).
4.3.3 Rail transportation Networks:

In TMR there are two types of rail transportation system: the train system and the Metro system. Train system or suburban railway network, as it was mentioned before, does not have any relevance for analysis of the regional context. This transportation system does not have any usage for daily commuting at regional level and it only used for interregional trips.

However, the metro system mobilizes 2.5 million people per day. The construction of the Metro network is by Tehran Urban and Suburban Railway Group, who are responsible for the construction of the metro in Tehran metropolis and the whole regional territory. Unfortunately in the current circumstances the metro system does not cover the whole regional territory. Currently, Tehran metropolis only has two metro lines (one from north to south and one form east to west) and there is also one metro line that connects Tehran to Karaj.

This analysis does not measure the flows of population with metro network, since there is no data available for the density of the Metro lines and the busy stops. However, the purpose of this analysis was to measure the capability of Metro as the only clean public transportation system within the TMR territory for mobilization of the region’s inhabitant.
100

Analysis the Urban Structure of the TMR (Analytical Dimension)

Image 4.11: BRT bus station in Tehran, Enghelab street.

Image 4.12: Tehran-Karaj on the ground metro.
4.3.4 Origin-Destiny

The origin-destiny analysis takes into account the journeys related to ‘work’ and ‘study’. Those are the two main reasons for daily commuting of the population in TMR: work (80%) and study (6%) (comprehensive studies of transport and traffic of TMR, 2002). First part of the origin-destiny analysis relates to the measurement of the trip generation and attraction tendency for each urban area.

In order to measure the generation or attraction of the trips for each area, this research used the data produced by Tehran Comprehensive Transportation and Traffic Studies Group in 1995. The aforementioned data was produced based on the trip generation and attraction model, which has the 99% accuracy. It takes both intermunicipal and intermunicipal trips into account and groups them by municipality. This research translates these data in maps for a better understanding and measurement of the trip generator and attraction poles.

Comparing trip generation map (4.28) and trip attraction map (4.29) reveals interesting facts:

1) Tehran metropolis has a significant share in generating and attracting the trips. This can be explained by the high concentration of the population and various activities in this metropolis. Tehran is the economic, political and cultural centre of the country and especially TMR. Furthermore, Tehran has far better supply of education facilities to attract people to study. Hence, High proportion of the generating and attracting trips has been expected in this metropolis. Even within the city of Tehran, central and southern part of the city have a higher portion in generating and attracting trips, which is in contrast with concentration of service activities in the northern part of Tehran (map 4.16). This is basically due to the fact that, this advanced services in the central-northern part of Tehran has mostly high educated employment, who are also lives in the northern part of the Tehran. The relatively low attraction of northern part of the Tehran as a destination for commuters from other parts of the region proves that most of the commuters from the surrounding settlements of the region are work at low-skilled jobs. On the other hand, central part of the Tehran due to the bazaar and

---

1. This data is based on the population who live outside the big cities (Tehran, Karaj). Since these settlements mostly lack urban facilities or strong economic basis, inhabitants of these settlements have to travel every day to big cities for their daily activities.
Analysis the Urban Structure of the TMR (Analytical Dimension)

southern part of the city due to small industries and low
skill services is a great destination for commuters from the
surrounding cities of Tehran.

2) Beside Tehran, Karaj has the high and Shahriar has the
medium share in generation of the trips. In terms of at-
tracting the trips Karaj and Shahriar has high and Eslam-
shahr has a medium share. In the case of surrounding
municipalities of Tehran, intermunicipal trip is more that
intermunicipal one. This explained why municipalities like
Karaj and Shahriar have a high portion in both generating
and attracting the trips. Having more intra-municipal trips
is reasonable, since these municipalities are huge and in
the absence of the comfortable and efficient public trans-
portation system, people prefer to commute to the close
distances from their place of live. This shows the impor-
tance of the distances in the choosing of the work loca-
tion.

3) Finally, other municipalities, especially the ones located
in the peripheral areas of the region, have the lowest share
in the generating and attracting trips. This is not surpris-
ing, since base on the concentration of the activities map
(4.16) these places do not have any fascination for the
people from other municipalities to travel there. In term
of generation, again due to the lack of efficient public
transport it hard for people to travel for longer distances.

To sum up, beside Tehran as the main population and
economic pole of the region, municipalities located in the
west and south-west of Tehran (Karaj, Shahriar and Eslam-
shahr) has a high importance in the generating and attract-
ing daily commuting. This could be explained due to two
facts. First, proximity to Tehran and better access to the
mobility network provide a suitable situation for travelling
to Tehran and within the municipal border for them. Sec-
ond, because of the existence of small centralities in these
settlements they have the potential to attract more trips
than the settlement located in the peripheral or eastern
part of the region.

The second part of the origin-destiny analysis relates to
the relation between different municipalities in terms of at-
tracting the trips by measuring the trip attraction of each
municipality separately in terms of being destination for
other municipalities. Again this analysis proven the previ-
ous claims and illustrates a greater share of the workforce
between Karaj, Shahriar and Eslamshar with Tehran.

2. The facts that, who are the commuters and belongs to which class of society needs to be considered in developing strategy for future.

Map 4.29: Trip attracting areas in the TMR (Source: Map by author; data from research centre of urban development and architecture).
Map 4.30: In this series of maps destination of the trips originated from other areas is shown in the white colour. In this map number of people travelling from each area to the specified destination (white colour) is categorized in different colours (Source: Map by author; data from research centre of urban development and architecture).
Map 4.31: In this series of maps destination of the trips originated from other areas is shown in the white colour. In this map percentage of the people travelling to the specified destination (white colour) with respect to the population of the origin is categorized in different colours (Source: Map by author; data from research centre of urban development and architecture).
4.3.5 Conclusion

In order to measure the level of the functional interaction and interdependency between various cities in TMR, this research analysed the region in different relational aspects. Measuring the density of the highway networks and the bus networks, and the extension of the metro lines over the TMR territory illustrated the travelling patterns between centralities. Furthermore it evaluated the origin-destination of daily commuting to discover the generation and attraction of the trip per municipality. Based on the finding of the research the following statements could be claimed for the functional integration between cities within the TMR (Map 4.32).

- The degree of the functional interaction differs in different parts of the region. Central cities have more integration than peripheral ones. This is due to the fact that the latter group of cities are not located in the daily commuting distances and daily interaction with central cities could not happen easily for them, especially in the absence of the rapid, cheap and fast regional public transport system.

- Even within the central part of the region not all the cities have the same degree of interactions. Tehran has more functional interaction with the cities located in its western (Karaj) and south-western (Esalamshahr and Shahriar). This is because of the greater population density these cities have and the better infrastructural connections between Tehran and aforementioned cities.

- The current mobility infrastructure encourages the radial movement towards Tehran. The radial predominance between Tehran metropolis and surrounding cities is due to the absence of the regional ring road that connects the peripheral settlements to each other.

Finally it could be concluded that although the relations between cities in TMR is more unidirectional form other cities towards Tehran (due to the concentration of the jobs in Tehran); the interaction is stronger between Tehran and Karaj and also Tehran and cities located in the Tehran-IKIA corridor.
Analysis the Urban Structure of the TMR (Analytical Dimension)
4.4 The Structure of the Urban Governance in TMR

This section of the report embarks on careful identification and analysis of the urban governance in TMR. The analysis of the urban governance aims to understand and to assess the polycentric aspects of governance in TMR. In order to control the urban growth and provide a good condition for living in the region, government need to manage the development with long or medium-term objectives and strategies and also, coordinate sectoral policies such as transport, agriculture and environment. According to Unece - United Nation Economic Commission for Europe (2008, p.6), “Spatial planning can help deliver economic, social as well as environmental benefits... It can provide a way of managing and steering development, thereby creating a more stable climate for development and investment.” Spatial planning aims to promote democratic governance that responds to the needs of local communities; improves urban environmental performance and social cohesion; improves real estate markets and secures private rights.

The following parts of this section will continue by a brief introduction on the importance of the globalization and its significance in changing the regional structure. This section will be followed by identification of the existing urban governance of the TMR, which will be analysed in three sub-section: territorial studies, institutional and functional studies, and study of tools and supportive sources. After that the current planning system in Iran will be discussed and the author will evaluate the current planning system based on the principles of spatial planning by Unece (2008). Moreover the author introduce the management system of TMR, and evaluate its existing tools.

4.4.1 Globalization and Regional Restructuring

Urban and regional analysis was profoundly influenced by the dominant discourse of globalization in the 1990s. Two strong lines of influence were those which link a globalised economy to regional economies, and those which link the goal of economic competitiveness to necessary reforms of city and regional governance (Herschel and Newman, 2002). Since the mid-1970s, territorial competition has increased in size, strength and diversity and has been scaled down from the nation-state to the city and the region as principal geographical platforms (Meijers et al, 2003). National government still has a strong stake in metropolitan development, but the policy arena has turned into a multi-actor and multi-level game, which makes the challenge for metropolitan governance and spatial policy coordination increasingly complicated (Salet et al, 2003).

Inspired by the globalization process, many governments around the world have embarked on restructuring efforts, or are undergoing transition to new structures. These adjustments and transformations in their structure take form in different ways such as decentralisation, devolution of responsibilities to appropriate levels, privatisation, creating a special regional governance level, and creating strong coordination, cooperation, collaboration and participation mechanisms among different governmental, public, private and non-governmental sectors throughout the region (Ahmad Akhoundi et al., 2006). In the following the current structure of urban governance in TMR will be discussed, and it will be evaluated how many of aforementioned adjustment and transformation have been realized in its structure.

4.4.2 Identification of the Existing Urban Governance in TMR

Tehran Metropolitan Region does not constitute an official entity. It is neither national nor provincial nor local level. The governance of this entity thus is a more complex issue, since more actors are involved on its management. The TMR is compounded by two provinces (Tehran and Alborz) and 17 counties (Tehran, Karaj, Hashtgerd, Eshtehard, Shahriar, Eslamshahr, Shahr Rey, Varamin, Pakdasht, Damavand, Lavasanat, Shahrestanak, Taleghan, Akhtar Abad, Hasan Abad, Javad Abad, and Firooz Kooh). These districts covers 50 municipalities (urban areas) and 1500 villages (rural areas) (Map 4.2).

In order to understand the urban governance of this complex entity, the hierarchy of influence, and also operation of different institutions it is necessary to study the Tehran Metropolitan region’s administration system. To do so, this research uses the model produced by Ahmad Akhoundi et al. in 2006. This model analysis the administration system of the TMR in three parts:
1) Territorial studies
2) Institutional and functional studies
3) Study of tools and supportive sources
Political Territories and Local Management Zones in Tehran Metropolitan Region

Main units of State Division in Iran are: Parish, District, County and Province. From the administrative perspective, Parish works under District, which itself is subordinated to county. Each county is administratively subordinated to a province which itself works under supervision of central government. Iran’s government system is based on State Division law. Thus, the government system in Iran has a hierarchical order. The Parish and the Central Government in Tehran stand at the lowest and highest levels of this hierarchy respectively (Diagram 4.8).

In each level of State Division hierarchy, there is a government representative who is responsible for the implementation of government policies at that level. Nevertheless, each ministry and state organisation has its own representatives at province, county and district levels, which follow the policies, set out by the central ministry. This dual political management (State divisions authorities via ministers and heads of central organisations) sometimes creates problems in local decision taking processes.

The urban and rural development management system comprises an expanse of geographical space which requires an integrated attitude towards all factors involved in urban and rural growth, expansion and development. The structure of the urban management system in TMR will be discussed later. The table (4.1) display various involved organisation of planning and management in Iran and their functions in the different national, regional and local levels.

<table>
<thead>
<tr>
<th>Level</th>
<th>Organisation name</th>
<th>Type of functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>National</td>
<td>Islamic Assembly&lt;br&gt;The Cabinet&lt;br&gt;High Council of Urban planning and Architecture&lt;br&gt;Management and Planning Organisation&lt;br&gt;Ministry of Housing and Urban Development</td>
<td>• City and Village Islamic Councils&lt;br&gt;Municipalities&lt;br&gt;Policy-making and legislation&lt;br&gt;Policy-making and coordination&lt;br&gt;Policy-making and spatial planning&lt;br&gt;Policy-making, economic coordination and budgeting&lt;br&gt;Policy-making and spatial-physical coordination&lt;br&gt;Policy-making, coordination and spatial control</td>
</tr>
<tr>
<td>Regional (Province and County)</td>
<td>Governor General Office&lt;br&gt;Provincial Planning &amp; Development Council&lt;br&gt;Provincial Planning &amp; Management Organisation&lt;br&gt;Housing &amp; Urban Development Organisation&lt;br&gt;Agricultural Jihad Organisation&lt;br&gt;Governors Offices&lt;br&gt;County Islamic Council</td>
<td>• Policy-making, coordination, supervision, and spatial management&lt;br&gt;Policy-making, spatial-economic planning, budget allocation&lt;br&gt;Policy-making, economic planning and budgeting&lt;br&gt;Physical -spatial planning&lt;br&gt;Spatial planning and management&lt;br&gt;Spatial Policy-making, coordination, supervision and management</td>
</tr>
<tr>
<td>Local level</td>
<td>City and Village Islamic Councils&lt;br&gt;Municipalities&lt;br&gt;Governor General Office&lt;br&gt;Provincial Planning &amp; Development Council&lt;br&gt;Provincial Planning &amp; Management Organisation&lt;br&gt;Housing &amp; Urban Development Organisation&lt;br&gt;Agricultural Jihad Organisation&lt;br&gt;Governors Offices&lt;br&gt;County Islamic Council</td>
<td>• Spatial Policy-making, coordination, supervision and management&lt;br&gt;Spatial, physical, and executive management</td>
</tr>
</tbody>
</table>

Diagram 4.8: Political division units in Iran (Source: Diagram by author).

Table 4.1: Main organisation of governmental and public institutions and their functions in different national, regional and local levels (Source: Table by author based on “Governance of Tehran City” by Ahmad Akhoundi et al.).
Influential Institutions and Actors in Tehran Metropolitan Region Governance

The institutions and actors in Tehran Metropolitan region can be divided into the following five categories regarding their scope of responsibilities and their goals and nature:

*Governmental-State institutions* are those institutions which are responsible for the execution of government policy throughout different parts of the state in three fields of policy-making, planning, and execution.

*The Governmental-Public institutions* are those institutions whose scope of authority is limited to a definite territory of the country. Municipalities can be cited as an example of such institutes in Iran.

*Non-governmental institutions* consist of organisations which follow some public goals such as public welfare, influencing policy-making or supplying not for profit services without the intervention of governmental actors.

*Private sector institutions* are organisations which are formed on the basis of rules and regulations. The main goal of these institutions is the acquisition of profit. These institutions are divided into two main categories of Production and Service institutions.

*International institutions* are organisations which operate in the lands of a country in accordance with the mutual agreements between a country and the government or governments of other countries or international organisations such as “the United Nations Organisation”.

Although Tehran Metropolitan Region is territorially coherent, it lacks institutional management arrangements which are suitable for this region. Table (4.2) illustrates different political and managerial division units and their institutional type. Unfortunately in current circumstance, Tehran Metropolitan Region governance has been scattered between two systems of National and local governance (governmental-state and governmental-public institutions). The other institutions do not have a significant influence in this regard. Even the local managers as the only elected elements of government at the state decision making levels, do not have enough independence and authority for integrated governance of their territory. Even in municipalities, the governmental-state elements exert a significant influence. Overall, the existing institutional management arrangements do not let other institutions take part in decision making process and resulted to a centralized governance system which will be discussed in the following parts comprehensively.

---

<table>
<thead>
<tr>
<th>Territories</th>
<th>Division Units</th>
<th>Governing Authority</th>
<th>Appointing Authority</th>
<th>Type of Institution (Governmental/public)</th>
<th>Type of Relations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Political Divisions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Province</td>
<td>Governor General</td>
<td>The Cabinet</td>
<td>Governmental</td>
<td></td>
<td></td>
</tr>
<tr>
<td>County</td>
<td>Governor</td>
<td>Interior Minister</td>
<td>Governmental</td>
<td></td>
<td></td>
</tr>
<tr>
<td>District</td>
<td>District Governor</td>
<td>Governor General</td>
<td>Governmental</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parish</td>
<td>Reeve</td>
<td>Governor</td>
<td>Governmental</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Managerial Divisions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City</td>
<td>Mayor</td>
<td>City Council</td>
<td>Public</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Village</td>
<td>Reeve (head of rural district)</td>
<td>Village Council</td>
<td>Public</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.2: General Characteristics of Political Territories and local management (Source: Table by author based on “Governance of Tehran City” by Ahmad Akhoundi et al.).
Supportive Tools and Resources for TMR Governance

Development Plans & Programs
Considering 15 existing development programs and plans at urban, regional and national levels, indicates that most of these programs have not paid attention to the existence or formation of TMR. The reviews illustrate that the most important existing planning and policy making document of the country that has paid maximum attention to a reality called TMR and its issues, is “the Plan for Tehran Metropolitan Region and its Surrounding Cities” approved by the Cabinet in 2003. This plan has pointed to ‘the establishment of a management institution for TMR ‘ as one of the preconditions for its realisation.

Financial and Credit Resources
Identification and Assessment of Economic Capacity of Tehran Metropolitan Region:
The economic capacity of Tehran Metropolitan Region is a potential capacity that can be harnessed for management goals of this region through necessary measures. Holding around 17.7% of the total population and 1% of the total area of the country, Tehran Metropolitan Region had 24.9% of Gross Domestic Products in 2004. The proportion of economic value added of this region to the total value added of the country has increased from 24.14% of Domestic Gross Product in 2000 to 24.9 % in 2004. Continuation of this trend will undoubtedly help Tehran Metropolitan Region remain the most attractive location for absorbing and settling the population, which is against the decentralisation policy in Iran.

In Tehran Metropolitan Region, the greatest portion of economic value added belongs to service sector. This sector owns over 70% of the region’s domestic product, has the greatest share among all economic sectors, and plays the most significant role in the region’s economy.

Identification and Assessment of Financial and Credit Capacity of Public Sector (Municipalities and Rural Districts):
In 2002, 40 municipalities provided services and managed urban settlements of TMR. From the total revenues of all municipalities located in TMR, a significant portion belongs to the metropolis of the region (Tehran) and after that two large cities of Karaj and Eslamshahr. In 2002, the remaining 36 cities of the region have owned merely 4.75% of the revenues (Diagram 4.10 and 4.11). This only due to the fact that, from all the revenues collected in TMR, the biggest share belongs to the taxes and duties (Diagram 4.9). In this situation municipalities with poorer citizens cannot collect enough taxes to increase their revenues. This way of allocating financial credits to different municipalities of the region not only increase the gap between city of Tehran and other cities of the region, but also do not encourage the regional unity in TMR. The previous information in this section of the report was extract from the paper of the Governance of Tehran City - Region: Challenges and Trends, which was the only digital data available regarding to the urban governance of TMR. The next part of this section will discuss and evaluate the planning system of Iran.

Diagram 4.10: The share of municipalities located in Tehran metropolitan region from the total collected revenues in 2002, data from “Governance of Tehran City ” by Ahmad Akhoundi et a.

Diagram 4.11: percentage of the population and collected revenues of each municipalities within Tehran metropolitan region based on International coding system of municipalities financial sources (GFS)-2002. data from “Governance of Tehran City ” by Ahmad Akhoundi et a.

Diagram 4.9: The ratio for collected revenues of municipalities within Tehran metropolitan region based on International coding system of municipalities financial sources (GFS)-2002, data from “Governance of Tehran City ” by Ahmad Akhoundi et a.
4.4.3 Evaluation of the Existing Planning System in Iran

Regardless of the strong national planning system since 1948, regional planning is not very well developed in Iran. Although some specific regional projects had been undertaken sporadically since 1953, they did not follow a coherent and consistent regional policy. Instead, the individual ministries pursued policies without giving sufficient consideration to the regional dimension and also, without coordinating their spatial strategies with each other. Before 1965, the national planning authority, Plan Organization, was only responsible for preparing, coordinating and supervising the national plans and policies. Subsequently in 1965, the responsibility for preparing the annual government budget was also transferred to this body. Giving too much responsibility to Plan Organization, division of functions between planning and implementation was becoming blurred with the result that projects were frequently not realized properly. Hence, in 1973, the title of the planning authority altered to Plan and Budget Organization (PBO) and its head elevated to be a minister of state with seats in the Council of Ministers and on the Economic Council. At the same time, however, the law initiated a process of decentralizing decisions in two directions: on one hand, to ministries and other executive agencies that have the responsibility for implementing projects and on the other hand, to the provinces. The logic of these changes was to make clear that PBO was a planning authority rather than executive and implementation one (Richardson, 2006).

During the preparation of the fifth national plan (1973-78), the planning authority was thinking in terms of regional disaggregation of the national plan and using public investment decisions to introduce interregional planning. However, with the passage of the National Plan and Budget Law and the debate that preceded it, this approach was dropped in favour of building up planning from existing administrative and political structures, the provincial level. After that, most of the attention of the regionalization division of PBO was given to the problems of how to make the problematic task of decentralization effective, and the need to develop full-scale, comprehensive, and integrated planning was lost its importance. As a result, the distinction between regional planning and decentralization became blurred. In order to promote provincial planning, a share in the national development budget is separately identified for special regional projects (SRPs), and responsibility for deciding upon the location of these projects and implementing them is given to each provinces. Moreover, to prepare these special regional projects and to integrate them into provincial budgets, provincial planning bureau (PPBs) has been established in each province which works with the existing provincial staff of each ministry (the division between planning and implementation is being replicated at the provincial level). The governor-general also, has been given more power and he became in charge of the PPBs. The PPBs proposal primarily is discussed by the governor-general chairs, the Provincial Development Committee, before the final approval of the elected Provincial Council. However, in practice, the provincial budget is made up of sectoral allocations already decided in Tehran, so that provincial control exists only in regard to choosing the location for a project. The sectoral allocation of the budget by national government, generate some deficiency in the management of the provinces, since the national government are not aware of the amount of the expenditure need for each sector in each provinces. Also, allocating small share of the overall development budget to SRPs, the scope of these projects is limited in terms of scale (Richardson, 2006). Therefore, in the current circumstances, the provincial authorities does not play any significant role in developing comprehensive plans at regional level, which enhance the living conditions for the citizens.

However, in order to have a more realistic view on the plans prepared by the government and evaluate their efficiency, this research used a framework to measure their competency as guiding plans for spatial developments (the criteria are used in this research are not the only criteria for measuring the planning systems, the author used them as framework example to evaluate the current planning system of the country). Unece (2008) identifies six key principles to underpin the detailed framework of the law and policy of spatial planning: democratic, subsidiarity, participation, integration, proportionality and precautionary principles. Here the author will use four of these principles which are relevance for this research to evaluate the current planning system of Iran.

1. Subsidiarity Principle: The subsidiarity principle argues that is “necessary for the decision to be made at higher levels because the scale of the issue or objective being pursued cannot properly be addressed at the local level...Many planning issues “spill over” from one locality to another, across municipalities, regions and even countries. In these cases, there is an argument for ceding some parts of decision-making to a higher level covering the larger area to avoid incoherent spatial development strategies” (Unece, 2008, p.11). The aforementioned statement claims that some decisions are necessary to be made at the national or regional level; otherwise the local
authorities should make decision for the concerned issues. This is not the case in Iran, since the planning system in Iran is highly centralized. In fact, all the plans and policies are made by the higher level of authorities. Even though the municipal authorities gain more autonomy in the past decades, the development regulation, including the draft of laws, plans and the decisions about infrastructure investments were exclusively upon the agencies of Interior Ministry.

This way of top-down decision making will generate difficulty in managing the local territory. A centralized planning system by the national government in the situation that there is no proper access to the local information can lead to the developments of the plans and policies that do not address appropriately the most significant needs of the local levels. Furthermore, it also discourage the local authority to cooperate. This can lead to a refusal of implementing any of the proposed regulations by the superior authorities.

Development of regulation cannot be done efficiently, while the national government are assigned to coordinate the development of several regions. Since the territorial jurisdiction is too wide, they are likely to be overcharged and it is not possible to maintain a view for the details. This way of management can rather damage the development of a city than help to improve it. Therefore, one can argue that, since all the important decisions are made by the higher level of authority, then planning system of Iran follows the subsidiarity principle. But it is also important to keep in mind that subsidiarity principle only refers to some major decisions that needs to be made at higher level of authority due to the scale of the issues or their objectives, otherwise it is necessary other decisions relate to local level to be made at that level. Although in the current discussions, there is a debate to give the local municipality the authority to develop their own plans, but this is still on paper, and did not realize in reality yet.

2. Participation Principle: The participation principle argues that "effective procedures for community involvement will enhance the legitimacy of policy and decision-making by creating a sense of local ownership and ensuring consideration of citizens’ and property owners’ rights. The decision-making process should be transparent so that all citizens are made aware of the reasoning behind decisions...Citizens should be able to comment on proposals and if necessary make formal objections on draft plans and appeals against planning decisions" (Unice, 2008, p.11).

Planning in Iran fails in regards to participation principle, since all the plans and regulation will be drafted by superior authorities, without cooperating with the local authorities, public and private institutions. This way of planning leads to a deficient outcome and causing to dissatisfaction from the government. Although, making decisions involves a degree of consultation with elected councils, public participation is interpreted as being synonymous with referral of projects for approval to local political representatives. There has been little practical response to involve all the people directly in the making decisions that affect them and to encourage them to participate in implementing projects.

Furthermore, a centralized way of policy-making without any participations, creating a high dependence on the decisions of a superior agency as all measures are designed to correspond to the opinion of the central authority. But by participations it is possible to have a broader view on problems and the possible options for solving them. Although, in the recent years the citizen are more informed about the decision had been made by the responsible authorities and the plans and official documents of the governments are available on the internet, still it is not possible for citizens to express their ideas about the decision made by administrative authorities or there is nowhere to make a formal objection against the government plans and proposals. Therefore, the planning system of Iran does not follow the participation principle.

3. Integration Principle: The integration principle consider the integration between levels of government (jurisdictions), which helps to create complementary and mutually reinforcing policies and actions; across policy sectors, which mutually reinforce positive benefits; and across administrative boundaries, which creates policy coherence and reduces damaging competition across larger territories (Stead et al, 2004).

In governance system of the Iran, although the integration occurs between levels government (vertically), it does not take place across the administrative boundaries and across policy sectors (horizontally) properly. The vertical integration works because the competence defined by law decreasing some conflicts of power. But the horizontal integration needs more effective policies to promote the cooperation. It is important the policy sectors coordinate their spatial strategies with each other to consider the effects of their decisions on regional dimension. It is also necessary that the different municipal boundaries integrate more instead of destructive competition with each other and cooperate for a more coherence regional territory.
4. Proportionality Principle: The proportionality principle argues around the maintaining an appropriate balance between commitment and flexibility in policies. On one hand, commitment can contribute to creating certainty and reducing risk. On the other hand, spatial planning policy must also be flexible enough to adapt to economic, social and technological trends as well as to stimulate innovation. The proportionality principle helps facilitate judgments about where prescription should stop and more discretion should be given to citizens, developers and local decision makers (Unece, 2008).

Concerned with the proportionality principle, planning system in Iran needs to be more flexible. This flexibility is especially necessary in regards to the unsustainable political, socio-economic situation of the country. In the current situation due to the inflexible decision making, when something unexpected happens the plans will fail. Which is happens lots of the time in the country, especially in economic crises, many projects cannot be realized, since there is no alternative solution for them. Beside evaluating the planning system, it is also important to look at the management system of the region, to have more accurate judgment about the urban governance of TMR.

4.4.4 Evaluation of the Existing Management System in TMR

In the current management system of the TMR, municipalities are known as the urban managerial authorities in the region, and integration of these managerial territories forms urban managerial territories of the whole region. It is important to clarify that in Iran the criteria of having a municipality is having more than 10,000 populations, (urban settlements without municipalities does not considered as a city). In this situation many of urban settlements with population of less than 10,000 lack the municipal authority to manage their territories. Therefore, it is important to identify how much of the region is under the coverage of these urban managerial territories.

Looking at the location and population map of the cities and villages in the region (map 4.33), it can be seen that the majority of the urban settlements with more than 5,000 population (potential candidates of being city) and villages with more than 2,000 population are located in the Fertile plains in the South and South-West of Tehran and South and West of Karaj. The main reasons of the concentration of the cities and villages in the aforementioned plains are: Low slop land, high quality soil, easy access to the water resources and main road networks. In addition to the cities and villages these plains are also the main location for the industrial activities. The obvious point is that the mentioned plains will be also the suitable location for establishment of new industries in future. This is because, that the mountains in the North provide a barrier for the growth toward the North; also the desert in South and South-West of the region is not able to compete with the mentioned plains in terms of population attraction. Now on, the author will use the term of “urban and active zone of the region” for these plains.

In the map 4.34, the managerial territories of the cities (cities buffer zone) in the region are reflected. In this map the main part of the “urban and active zone of the region” (approximately 50 percent of its area with including new-cities limit) are covered by a continuous urban management. Almost 1/3 of the total 46 urban settlements with more than 5,000 populations in the region are located in the protected buffer zone of Tehran. The others are located in the protected buffer zone of the other cities of the region or approximately connected to the mention cities buffer areas. In order to realize a continuous coverage urban management in the whole urban and active zone of the Tehran Metropolitan Region, one solution is to expand the buffer zone of the existing cities. However this solution is facing with two major problems: First, the limited technical and administrative capacity of small municipalities is not proportional with the much increment of the area of the cities buffer zone. Second, transformation of the whole urban and active zone to the cities buffer zone creates many legal restrictions for the executive units. These executive units play different roles in development, protection or supplement of the crucial needs of the region. Therefore as explained above, the extension of the cities buffer zones is not a solution for the irregularities in the settlements of the region. In fact this irregularity is due to other elements which will be discussed in following.

From urban management point of view the irregularity regarding to land use and settlement of population and activities, more than anything is due to the lack of comprehensive vision and coordinate management in the region. Tehran Metropolitan Region is an integrated region. There are interconnections between its components and the fate of one element is not separated from the others.
Map 4.33: Location of the cities and villages of the TMR (Source: Illustrated by author).
Transformation of Karaj from 40,000 population city to the more than one million populations, and transformation of the Eslamshahr village to a city with more than 256,000 populations can only be as a result of growth and development of Tehran. Therefore understanding and recognition of the internal problems of the cities without consideration of their relation with the surrounding cities is impossible.

In the current circumstances, there are 50 municipalities and 17 district authorities and several executive sectors responsible for the regional affairs. Unfortunately there is no organized coordination among these organizations. Moreover there is no general strategy according to the whole regional problems and interests. The ministries (national level) focus on general issues (national) and do not pay attention to the minor issues (local), they look at the region based on their shares in national and provincial level. The function of such organizations is more related with their internal requirements and strategies which are time variable. On the other hand local administrations (Municipalities and district authorities), in the management of their territories, focus on local issues and do not pay attention to the national issues. These local organizations function based on local needs. Consequently, such incoherent and uncoordinated management system in the region, consist of district authorities, municipalities and ministries is not able to provide and execute holistic view on the region. The explanations for this fragmented management system can be categorized in four major aspects:

1. Failure in the Administrative Division of TMR

In current situation, urban management is based on the division of the whole geographical region to the “city limit”, “city buffer zone” and “outside of city buffer zone”. Municipalities are in charge of the “city limit” and “city buffer zone”. Master plan, Comprehensive plan (for urban areas) and guiding plans (for rural areas) are used as a basis and tools for management of the aforementioned areas. In the “outside of the city buffer zone” provincial authorities and its subsidiary units (district and parish authorities) and commission consist of representative of each unit are in charge for the management. The “Regulation of construction outside the city buffer zone” and other Regulations and instructions provide managerial tools for the management of these areas.

Although, in the current management system of the TMR, whole geographical spaces of the region are covered regarding to the land use management and there is responsible authorities with predicted management tools for each division units, it does not answer to the regional problems. In the above framework since “city” and “city buffer zone” are separate from “outside of the city buffer zone”, their management units function independently. This situation may not cause serious problem in the region with small cities which are far from each other, but in Tehran Metropolitan Region not only the “city buffer zone” but also the “outside of the city buffer zone” are extremely under the influence of growth and development of the cities. In the other words the land use regulation in the “outside of city buffer zone” is extremely influenced by the cities and vice versa. In this definition the “outside of city buffer zone” is not any more independent from city but also it is considered as a degree of the city spaces. Hence the management, plans, strategies and regulations should be all coordinated.

2. Unequal Distribution of Power

Unequal distribution of power between different administrative divisions is also the reason of generating imbalance in the regional territory. This is mainly caused by the questionable definition of city and village. As it was mentioned before, settlements with less than 10,000 populations keep the status of a village. This creates “border effects” between cities and villages. The centralized system of organizing the local authorities, in which rural authorities of villages are financially and legally depended on superior authorities, whereas municipal authorities are autonomous and have more competence (i.e. legislation for regulation of land use or taxing; allotment of infrastructure finance) causes imbalance between the management units. One consequence is that the land within the jurisdiction of the weaker rural authorities is more likely to lack proper land use or tax regulations as well as infrastructure. This is reinforced, when the superior agencies that should be responsible to control the overall-development of a region, also focuses on cities more than rural areas in view of regulation control and infrastructure finance. This has been the case in the TMR as the national agencies have put priority on Tehran’s development for a long time while neglecting other towns or villages. This is a very risky planning approach, especially when the “weaker” rural authorities of villages do not have the competence to control development themselves. Since the territory in jurisdiction of a village is less restricted by law, profiteers are likely to be attracted. They seize the chance to turn this land into development zones without facing costly regulatory constraints within the territorial jurisdiction of Municipalities (Schuppe, 2006).
Analysis the Urban Structure of the TMR

Map 4.4: The integrated managerial zone of the cities in the TMR (Source: Illustrated by author).

- Municipalities
- Masterplan and Detailed plan for Cities
- Regulation for Protected Buffer Zone
- Construction regulation for outside protected buffer zone
- Rules, guidelines and other regulations
- Governor, Commission composed of representatives of the sectors
This has major disadvantages for the regional development. From an ecology point of view, the quick urbanization of land causes the vanishing of rural areas that are important to ensure preservation of environment. Furthermore this development has negative effects on the inhabitants of the newly emerged suburbs. They have to bear the poor living conditions due to the lack of technical infrastructure, public and private services, and low quality buildings structures. Overall, the unequal distribution of competence in the regional administration structure can create spatial distortion. Unbalanced distribution of the administrative authority will resulted to the fragmented management system.

3. Inconsistency in Regional Management
In current situation, managerial elements of the TMR-cities’ municipality, district authorities and executive units are functioning without adequate communication and coordination with each other. In the following the functioning of these responsible authorities are explained:

- Tehran municipally is functioning almost independently. Complexity and multiplicity of the problems that municipality is facing with them, having the financial, technical and administrative capability, failure and weakness in the municipal laws and also tolerance in their implementation resulted that the decisions of High Council of Urban Planning and Architecture and role of Ministry of Housing and Urban Development do not have that much influence in Tehran management. In this situation the Tehran’s Comprehensive plan also, does not develop properly.

- The other cities of TMR are functioning under Interior Ministry supervision. These municipalities are not subject to coordinated policies and programs and their tools for urban management are independent plans. These plants are provided by Ministry of Housing and Urban Development (for big cities) and Interior Ministry (for small cities).

- Outside of the cities buffer zone, “Regulation of construction for outside the city buffer zone” is the base for development. Due to the lack of policies and programs and regional plans, and also variety of authorities and decision making units, its functionality in guidance and control and coordination in development of the region is facing with serious failure.

- The executive units which are responsible for development or protection of natural resources are functioning independently, according to their policies and goals.

4. Lack of Tendency for Cooperation among the Responsible Authority
The failure in cooperation between the administrative authorities of the region is not only due to the current policy that not encouraging the cooperation among them, but also about the lack of tendency between managerial authorities to cooperate! This is nothing to do with the rules and regulation for collaboration, but this lack of tendency can be the results of the several possible reasons:

First, decision-making is more complex while several administration boundaries are cooperating together. In this situation there are more issues needs to be considered during the decision-making and coming up with a solution that satisfies different parties, is not easy. It may also generate conflict among them. Second, it is also, possible that they do not feel responsible enough for cooperating with each other. When there is no rules and regulation to force them for cooperation, richer municipalities do not feel to cooperate with poorer ones and try to solve the problems of the weaker urban settlements together. Finally, it might be the possibility that administrative authorities do not know the benefits of cooperating with each other. Hence they do not feel the urgency of it. Although cooperating will produce some conflict among the responsible authorities and will generate a more complex decision-making process, at the end, it will help to diminish the regional problems, and develop coherence and consistency within the regional territory.

4.4.5 Conclusion:
In the last decades, it became clear that the removal of many major regional problems, such as traffic, air pollution, environmental deterioration, and open space system of the region, and also enhancing the economic and political position of the TMR in global economy, requires a new approach to the region’s governance and management system. In the present condition, TMR is not recognised by law as an official entity, and its existence is rooted on the natural process of urban development. Thus, many governmental institutions had their influences on the governance of the TMR; one national government, two provinces, 50 municipalities and several ministries. In this situation, there is no regional administrative authority to manage the metropolitan development, realized the proposed regional plans as well as coordinate it with the other level of governance. Although in 2003 High Council of Architecture and Urban Planning approved a regional plan for the TMR, it misses regional management institution to integrate different part of the region to a unify entity and realize the plan.
The current management system of the region is organized in a rigid structure, considering the official borders rather than the regional phenomenon, which is not necessarily coincided with the fluid zones of urban labour and commodity market or infrastructural formation. In this case, local jurisdiction frequently divides rather than unify the urban region. The nonconformity of governmental territories with functional territory of city-regions is one of the main challenges in the management and governance of TMR. The current rules and regulations also, do not encourage the cooperation among the different responsible planning and management organisation. Consequently, in the absence of integrated regional perspective and cooperation among different administrative authorities, many issues and problems will simply circulate in different locations within the same region instead of being solved.

Under present circumstances, the fragmentation of governmental and managerial territories from one side, and centralised system of planning and its dominant sectorlism from the other side (political and functional fragmentation) have created a formidable challenge for integrated policy-making in Tehran Metropolitan Region. Forming an integrated policy-making in a situation where state organizations do not cooperate and pay attention to local organizations, there is no clear policies for TMR management, and the key actors are not committed to implementing such policies seems to be a vain effort. This fragmentation in integrated policy-making for Tehran Metropolitan Region, has contributed to the problems and challenges for realization of coordination.

Due to the special status of Tehran Metropolitan Region, re-consideration in its governance structure seems to be very necessary. Increasing political fragmentation due to increasing number of political and managerial territories, increasing complexity and diversity of decision-making patterns which stems from the lack of a uniform regional perspective and approach in its governance and management, and processes such as globalization and transition from governing to governance highlight the necessity of this re-structuring. The most important factor for the realization of this goal is creating a common perspective and its acceptance by all influential elements in the region’s governance and management. This is the only way for unifying and directing diverse and fragmented forces of the region for the realisation of a single, common perspective.
Chapter 5

Research Conclusion, Planning & Spatial Strategy

This part of the report is dedicated to the conclusion of the research and proposing a planning guideline to direct the future development of the TMR based on its contemporary needs. At the end of this chapter the author will propose a vision for the TMR 2050 that will be discussed explicitly further in the design chapter.

The premier part of this chapter aims to answer the following sub research questions: Are the trends in the TMR in the same direction with the vision of the Government (polycentric development)? In order to answer this question, first it assesses different dimensions to provide an overview of the research findings. After that, based on the conclusion, it evaluates the viability of the government proposal and offers recommendations to improve their proposal in the next part. The second part of this chapter aims to answer: What are the urban planning recommendations to enhance the quality of life in the TMR? These recommendations are provided to deal with trends of urban areas towards deconcentration of activities and increasing mobility, and intended to provide conditions that TMR could develop by enhancing its social cohesion, economic competitiveness and environmental sustainability. Finally, it proposes a vision based on the existing potentials that will provide a suitable scenario for future development.
5.1 Research Conclusion

In order to evaluate the possibility of the polycentric development in the TMR (based on the government proposal), this thesis developed a multi-dimensional research and analysed the TMR structure in both normative and analytical dimensions. The analytical and normative dimensions bring different perspective of the urban system together. The normative dimension tries to provide an overview of urban planning and policies that affected the urban development of the TMR. On the other hand, the analytical dimension of this research presents a comprehensive analysis of the current urban situation of the TMR in three morphological and relational and governance aspects.

In order to come up with a wiser solution to solve the urban problems of the TMR and direct its future development in a desired track it is necessary to consider those two frameworks together, since both of these dimensions have their influence on each other. By studying the normative documents, the proposed plan and policies and their consequences will be reviewed. Since the current urban conditions of the TMR are the result of these past decisions, it is important to learn from these past planning experiences and try to do not repeat the wrong actions. Analysing the current condition of the TMR makes it possible to propose new plans that consider the real needs of the society. The unsuccessful plans are the result of both not considering the current conditions and dynamism of the urban areas and not bringing in mind the past planning experiences. That is why this research insists on considering both dimensions to provide a plan that answers the needs of the society (Diagram 5.1).

Hence, the Table 5.1 provides an overview of both dimensions in order to develop an integrated understanding of TMR. This will brings outcome to develop a detailed and concrete conclusions to evaluate the government proposal. The result of this section will pave the way for proposing a guideline for the future development of the TMR.

Based on the summary of the research findings it can be concluded that the government plan for developing nine poles in the region is too ambitious and far from reality. Although the proposed plan seems to be a good solution for the TMR’s problems, it does not consider the facts and region’s potentials. Here is the research conclusions:

1- One of the major issues that promoted the current situation in the TMR is neglecting the low-income people housing. Throughout the TMR’s history government has been always neglected housing of the low-income people as one of the major issues in its plan. Without any specified plan for this issue, any effort to improve the current situation in the region is doomed to failure. Although recently we can hear from the news that there are some efforts to built some social housings in the Tehran’s peripheries but it still not responding to the low-income housing problems issue.

2- In the government plan it is not clear that according to which regional potential 9 poles are introduced. Since for introducing a new pole in the region, it is crucial to consider the potential and capability of the specified location. This is the missing part in the government’s plan.

Diagram 5.1: This diagram shows the relationship between normative documents and analyses of urban reality.
NORMATIVE

- Administrative centralization in 1930’s, turned Tehran to the unique Political pole of the country.
- Massive road construction in 1930’s, resulted to connection between Tehran to the other important cities of the country (enhancing Tehran position) and the gradual emergence of new settlements along these roads.
- During the 1940’s, Tehran became an unprecedented economic pole of the country due to the investments of the governments and private sectors.
- Land reform of the 1960’s, released large numbers of rural population from agriculture and pour them into Tehran.
- Pursuing decentralization policy from early 60’s, by exerting the restrictions on construction of the industries in 120 km radius of Tehran, attempting to reduce attractiveness of Tehran and directing the investments to the other regions of the country (providing more balance in urban system at national level).
- Introducing the idea of a polynucleated system rather than monocentric one. Reducing the density and congestion of the Tehran’s city centre by encouraging the development of new linear centralities east-westward (The 1968 Master Plan).
- Introducing New Town strategy in mid-70s, with the intention of decentralizing Tehran’s population and economic activity to new settlements in the peripheries.
- Proposing polycentric development in Tehran by dividing the city into five sub-regions and development of independent centrality for each of them (The 1993 Master Plan).
- Promoting the deconcentration and decentralization of the population and activities in nine potential urban agglomeration with high-density urban core (The First Regional Plan in 2003).
- Proposing the decrease in number of commuter toward Tehran through the increment of jobs and income in other urban core of the region (The First Regional Plan in 2003).
- Promoting linear polycentric development within the Tehran in north-south historical corridor of the metropolis (The 2006 Master Plan).
- Only promotion of the morphological polycentric development through physical changes, and did not consider other aspects in planning.

ANALYTICAL

- Spatial Form
  - The population is concentrated mainly in Tehran metropolis, and also in cities located in the west and south-west of Tehran such as Karaj, Eslamshahr and Shahriar.
  - The service activities are mainly grouped on the central part of Tehran (historic centre), expand towards the north. After Tehran, Karaj also has a medium concentration of the service activities.
  - Industrial core are distributed over the TMR territory equally. The Main Industrial cores are located in the Western part of the Tehran metropolis (Tehran-Karaj Corridor), Karaj periphery and along the Tehran-Saveh, Tehran-Qom and Varamin Highways.
  - The mobility nodes have a balanced distribution over TMR territory. The two main potential mobility nodes for developments are IKIA (located between Tehran-Saveh and Tehran-Qom Highways) and Payam International Cargo (located in the Karaj vicinity).

Table 5.1: Summary of research findings.
### Functional Relationship

- The highway system, the main mobility path, is radial toward the Tehran central area.
- There are no ring roads in the regional infrastructure system that connect peripheral settlements together.
- Buses and mini-buses are the only public transportation systems that serve the whole regional context.
- The Bus routes are predominantly along radial roads toward the Tehran central area. However, there are medium concentration of the Bus routes in the Karaj and Shahriar.
- Tehran-Karaj and Tehran-Eslamshahr has the highest density of the highway network and the bus network (the highest functional relationship at regional level is between Tehran and Karaj, after that Tehran and Eslamshar).
- There is no rail transit system (a sustainable public transport system) that cover the daily commuting at regional level.
- The main daily flows within TMR comes from the surrounding municipalities toward Tehran.

### Governance

- The current governance system is organized based on the political borders and does not consider the functional relationship.
- Although Tehran Metropolitan Region is territorially coherent, it lacks institutional management arrangements. The existing institutional management arrangements do not let other institutions take part in decision making process and resulted to a centralized governance system.
- The way of allocating financial credits to different municipalities of the region do not encourage the regional unity in TMR and only increase the social gap between city of Tehran and other cities of the region.
- The planning system in Iran is highly centralized. The development regulations were exclusively upon the agencies of Interior Ministry and the local authority are mainly responsible for the implementation and supervision of the development plans.
- Planning in Iran fails in regards to participation principle, since all the plans and regulation will be drafted by superior authorities, without cooperating with the local authorities, private sector and civil society participations.
- In governance system of the Iran, although the integration occurs between levels government (vertically), it does not take place across the administrative boundaries and across policy sectors (horizontally) properly.
- There is no appropriate balance between commitment and flexibility in plans and policies. Plan and policies in Iran are not flexible enough to adapt themselves to the economic, social and technological changes.
- There is no authority at regional level who is responsible for developing plans and policy and supervision of the local authority for conformity to these plans and policies.
- Unequal distribution of the power between cities and rural areas, in which rural authorities of villages are financially and legally depended on superior authorities, whereas municipal authorities are autonomous and have more competence.
- Management system of the TMR is suffer from failure in the administrative division. Since the city and its protected buffer zone are under the supervision of the municipality, but beyond the protected buffer zone Governor general is the responsible authority. There is no cooperation between these two responsible authority in providing rule and regulation for development.
- In current situation, managerial elements of the TMR are functioning without adequate communication and coordination with each other.

Table 5.1: Summary of research findings.
3- According to the morphological analysis the only city in the region after Tehran which has potential in terms of concentration of the service activities to become another regional pole is Karaj. Karaj based on its long history and identity as well as transportation, agricultural and scientific position in the country is able to play the role of the second pole in the region. According to the analytical dimension of the research excluding Tehran and Karaj the other cities in the region have no social and economical bases for being a regional pole.

4- According to the functional relationship analysis, daily commuting patterns and population flows, Tehran-Karaj corridor and Tehran-Eslamshahr corridor have shown highest potential for transit oriented development. These two corridors are two lines with potential for development in the region which are somehow neglected in the governments plan or have been considered as the same degree of importance in comparison to the other corridors of the region.

5- Without having regional authority, it is impossible to expect that local authorities collaborate together for solving the regional issues. Such a regional authority coordinates the local authorities to provide more balance and pave the way for implementation of regional plan.

Based on this research and analysis on TMR, it is believed that, although the government plan with some modification can be a good plan on paper, it is far from the existing realities in the region and its potentials.
Although in previous section it is stated that the government’s plan is not realistic, in the generic point of view the polycentric model of the TMR with some modification and alternation still can play the major role in future development of the region. Therefore in the following paragraphs the author will discuss about the strength and weakness of both polycentric and monocentric model in the TMR context and based upon that a conclusion will be drawn for suitable model for the region. The current monocentric model of the TMR, which is consist of the high density urban core (Tehran) and dispersed periphery and polycentric model in general view are analysed by SWOT system in the following table.

<table>
<thead>
<tr>
<th>Strength</th>
<th>Weakness</th>
<th>Opportunity</th>
<th>Threat</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tehran</strong></td>
<td>• Economic prosperity&lt;br&gt;• Provision of suitable infrastructure and services</td>
<td>• Congested transport system&lt;br&gt;• Over densification&lt;br&gt;• Air pollution&lt;br&gt;• High land price&lt;br&gt;• Longer commuting time&lt;br&gt;• Shortage of open space near residential area</td>
<td>• Enhancing the role of Tehran in global economy&lt;br&gt;• Opportunity of living in the Metropolis&lt;br&gt;• Good access to job&lt;br&gt;• Provision of adequate public transport</td>
</tr>
<tr>
<td><strong>Periphery</strong></td>
<td>• Quick access to open space&lt;br&gt;• More space per housing units&lt;br&gt;• Clean air&lt;br&gt;• Cheap land price</td>
<td>• High land use consumption&lt;br&gt;• Reduced accessibility to facilities and services&lt;br&gt;• Car dependency increases oil consumption&lt;br&gt;• Not enough population for provision of the adequate infrastructure and public transport&lt;br&gt;• Uneven development&lt;br&gt;• Marginalization of low income people</td>
<td></td>
</tr>
<tr>
<td><strong>Polycentric Model</strong></td>
<td>• Prevent urban sprawl&lt;br&gt;• Promote balanced development&lt;br&gt;• Reduced social polarization&lt;br&gt;• Avoiding problem of large dense metropolis and dispersed suburbs&lt;br&gt;• Less variation in land price</td>
<td>• Encourage intercity commuting&lt;br&gt;• Medium scale urban facility</td>
<td>• Develop specialisation by enhancing their potentials&lt;br&gt;• Pooling resources (Resource synergy)&lt;br&gt;• Policy synergy&lt;br&gt;• Opportunity of living in medium size city with social welfare&lt;br&gt;• Provision of adequate regional public transport</td>
</tr>
</tbody>
</table>

Table 5.2: SWOT analysis of the monocentric and polycentric development (illustrated by author).
Based on the SWOT diagram, Tehran as a unique economic pole of the country provides the possibility of developing suitable infrastructure and urban services in Tehran, offering the chance of experiencing a life in a big metropolis with access to the best cultural, educational, and leisure facilities. Furthermore, concentration of the most professions in Tehran resulted in a high employment rate and good accessibility to the job in Tehran. However, this massive and fast urban development of the Tehran was not all about strengths and opportunities. Compact development of Tehran although reduces the land consumption, it is also resulted to the over densification of the neighbourhoods and shortage of the open space in residential areas (especially in the central parts of Tehran). In the absence of efficient public transport system in huge metropolis like Tehran, the city main roads experience high traffic congestion associated with high CO2 emission that place Tehran in the one of the most polluted cities of the world. Focusing too much attention to Tehran's development left the rest of the territory unattended and resulted to the high socio-spatial polarization within the regional territory. Beside dense urban core, monocentric model in TMR is accompanied by huge urban sprawl. Although the dispersed developments of the Tehran’s periphery provide quick access to open space, more space per housing units and clean air for their inhabitants, they imply larger quantity of urban land, which inevitably leads to more transport needs and higher energy consumption. Disparity of population in the peripheries with low population concentration does not encourage the government to provide an efficient public transport for peripheries. High car-dependent and long journeys result to pollution, noise and fatal accidents.

On the other hand, the polycentric model reduces the socio-spatial polarization by promoting more balance development at regional level and provides the opportunity of the growth for the other urban cores. This will result less variation in the land price and give a broader chance for the people to live in the centre. Compact developments in some specific locations prevent urban sprawl. Moreover it provides the opportunity for provision of the public transport. Polycentric model is also creates opportunity of living in a medium size city that is favoured with social welfare. However, this model also has its own deficiency, it encourages intercity commuting. The medium size cities have medium size urban facilities; therefore people have access to lower urban facilities in comparison to mega cities. In polycentric development institutional cooperation is one of the major controversial issues which is an important element in providing successful polycentric urban region.

In order to achieve the most suitable spatial strategy that solve the regional problems it is important to pick the advantages of each concept and put aside its deficiencies. The author will take this strategy into account and by considering the region potentials; a suitable spatial development will be proposed for the region in the lasts sections of this chapter. In the following section, the report presents set of planning recommendations that improve the quality of life in the TMR.
Chapter 5

5.2 Regional Planning Guideline for the Tehran Metropolitan Region

As presented in previous parts of the research the monocentric configuration of the TMR is not compatible with its twenty first century’s requirements. The current spatial structure of the region did not updated itself with the trends of the society towards the social and economic transformations resulted from the process of globalization, dispersion of the functions and activities and increased of the mobility system. While we observe a massive trends of the population decentralization, the functions and activities are still located in Tehran, resulted the social and economic disparity in the TMR. Furthermore, in the absence of proper public transport system the region faced with many environmental problems. The main causes for aforementioned regional deficiency articulated as the lack of efficient planning system and long-term visioning for the future urban development (especially at the regional scale), which was worsened by rapid urban growth of the region in the last few decades. The lack of attention from responsible authority to the regional territory and its role in increasing economic performance not only set back the TMR from taking advantage of its potentials, but also produced many social, economic and environmental problems for the inhabitants of the region.

As it was mentioned before, the goal of this research is to have an intensive review on the metropolitan dynamism to contribute in a comprehensive understanding of the urban condition of the TMR, in order to provide possible scenarios for future development based on the existing potentials of the region. Furthermore, it aims to search for appropriate and innovative planning strategies in order to enhance the social cohesion, economic competitiveness, environmental sustainability at the regional level.

Image 5.1: Watching the whole metropolis from the Tehran's roof! Sometimes it is also, necessary that the responsible authority looking at the bigger context to understand the complexity of issues and relation between different elements. Looking at smaller scale is not always enough for decision-making. Looking at the regional scale along with local scale, let the decision-makers to come up with a wiser decision. (Source: Mohammadali F. "Love on Tehran’s roof." Online image. Flicker.com. 02 Dec 2007. Web. 09 May 2012. <http://www.flickr.com/photos/mfakheri/1396343056/> )
Based on reviewed literatures related to the regional planning, studying regional planning documents of the western countries as samples (like Third regional plan for the New York Metropolitan area, UNECE, Barcelona Metropolitan Plan) and also considering conditions of the TMR according to the findings of analytical dimension of the research, the author proposed a planning guideline for Tehran Metropolitan Region. The planning guideline consists a set of strategic actions in order to guide the future development. The proposed planning guideline do not intend to make the TMR more polycentric. However it aims to boost regional performance, facilitate more balance in distribution of services and opportunities, and enhance the economic competitiveness of the region, while safeguarding the environmental sustainability. It is necessary to highlight that, these planning actions are not a fixed policy. They are basically, planning goals that recommended by author to reflect the requirement of TMR in the 21 Century.

For better understanding and according to the context of TMR, the planning action of the guideline is categorized in five themes as following: Centrality, Mobility, Low-income Settlements, Landscape and Governance. These themes are covered all the important issues related to future development of the TMR.

**Planning Guideline for the Tehran Metropolitan Region**

**Proposed Planning Recommendation Concerned to Different Themes**

<table>
<thead>
<tr>
<th>A. Centrality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Reinforce existing potentials of other municipalities to provide more balance in regional territory and reduce the pressure from Tehran Metropolis;</td>
</tr>
<tr>
<td>2. Assign tax incentives to support new institutions and urban services in newly proposed regional centality;</td>
</tr>
<tr>
<td>3. Encourage the special and distinctive character and identity for each centralities to enhance the synergy between centralities;</td>
</tr>
<tr>
<td>4. Strengthen the main industrial core as the regional centres of production;</td>
</tr>
<tr>
<td>5. Create regional development corridor by maximizing development around public transport nodes.</td>
</tr>
<tr>
<td>6. Promote the cluster-based strategy to create a unique and powerful synergy for different economic sectors (services and industries) by attracting and retaining groups of complementary and interdependent organizations that do business with each other and/or have common needs for talent, technology and infrastructure;</td>
</tr>
<tr>
<td>7. Encourage compact growth around public transport nodes, to promote more sustainable growth;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. Mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Strengthen the main region’s centralities and prominent industrial cores by linking them to the public transport system (Rail transport system);</td>
</tr>
<tr>
<td>2. Finish the missing link in the regional highway networks that support the existing centres or reinforce the isolated one;</td>
</tr>
<tr>
<td>3. Provide suitable mobility system with the scale and functions of the location (in the case of the Service and Industrial centres it is important to provide accessibility with different choice of mobility such as car, train, bus and etc);</td>
</tr>
<tr>
<td>4. Set regulation for preventing from further urban sprawl and encourage compact growth in order to facilitate the possibility of developing public transport;</td>
</tr>
<tr>
<td>5. Encourage public transportation usage for daily commuting by lowering the travelling cost for low-income employers and students;</td>
</tr>
<tr>
<td>6. Enhance environmental health and the population’s safety by developing well-planned transportation corridors;</td>
</tr>
</tbody>
</table>
1. Connect low-income settlements to the existing and proposed job centres by public transport (Rail transport system, Bus);

2. Restrict single functioning settlements by support mixed-use development (coexistence of activity and housing);

3. Provide more employment opportunities in low-income settlements;

4. Providing basic facilities in low-income settlements (especially education, health care and cultural services);

5. Sharing resources and services among smaller municipalities to facilitates higher quality services for these urban areas;

6. Meeting the housing demands of low-income inhabitants by providing social housing construction to prevent inflation or land speculations;

7. Extra effort for improving education in low-income settlements (by dedicating tax incentive for continuing education and providing adequate education facilities), in order prevent further poverty by training educated inhabitants in long term;

1. Robust land use regulation for protecting agricultural lands and national protected areas;

2. Use landscape as a tool to provide boundary for urban settlements and prevent further urban sprawl (example green belt);

3. Upgrade the landscape quality in order to increase the spatial value and social cohesion in the urban areas;

1. Regulate a zoning plan for TMR in order to guide the development at regional level (Already the zoning plan is only exist at the municipal level. In order the reduce the conflict and produce a guidance for the local authority it is necessary to provide a zoning plan at regional level);

2. Create responsible authority at regional level that coordinates the regional development by drafting the regulations and monitoring them (example Regional Planning Council);

3. Narrowing the spatial gap between Tehran and other peripheral cities by dedicating more funds to the weaker municipalities (Current revenue system is based on the collecting taxes, and poorer cities can not collect enough tax to provide the infrastructure and facilities for their inhabitants);

4. Drafting the development plans and policies at the local level has to be done by the local authorities (Governments should apply the principle of subsidiarity in the allocation of competence and make efforts to build the capacity of lower levels to take on spatial planning tasks (Unece, 2008);

5. Integrating local and national stakeholders on the regional level (involve stakeholders in process of the decision making);

6. Increase the cooperation between different administrative boundaries, especially between two cities with high spatial and functional integration like Tehran and Karaj (There should be a balance between cooperation and competition among different cities within regional territory);

Table 5.3: Planning Guideline for the Tehran Metropolitan Region  (Source: Illustrated by author).
5.3 Towards an Alternative Spatial Strategy

As it was mentioned, the government’s plan for developing nine urban centralities in the region is too ambitious and far from reality, since all urban cores proposed by the government do not have the same potentials and some of them are far from being an urban centrality. Furthermore, the proposed plan of the government is based on the urban conditions of the TMR in 1996. Hence the spatial strategy considers the dynamics and trends of the region on that moment. Now, there is necessity to update this proposal with the current dynamics of the region.

The intention of this graduation project was to find the existing potentials of the TMR in morphological and relational terms to build upon that. Starting from nothing is not a wise decision. Beside being costly in terms of finance and human resources, there is no guarantee that new centrality will not fail for being accepted by population and activities. Therefore in order to propose a feasible spatial strategy, it is necessary to consider the current or possible future potentials of the urban areas of the TMR.

The Normative and Analytical dimensions of the research provide this understanding and make clear about the opportunities in the TMR, that needs to be considered while proposing a new spatial strategy. In the following the proposed spatial strategy for the TMR 2050 will be explain step by step.

The below map (Map 5.2) illustrates the current concentrations of the service activities in the TMR that extensively discussed in chapter 4. This map shows the strong concentration of these activities within the historical centre of Tehran and its extension towards north. Historical centre contains traditional bazaar and considered as the commercial heart of the region, and the north centre of the Tehran which a relatively modern centrality with diversity of the economic activities ranging from innovative activities to media and art. As it was mentioned in the section 5.1 both monocentric and polycentric configuration have their own cons and pros. The smart way of visioning the future, is selecting the advantages of each concept and
put aside its deficiencies. Tehran as a huge metropolis enjoys the agglomeration economies of such an extensive critical mass. This provide the extreme economic investments in Tehran and possibility of developing suitable infrastructure and urban services for the inhabitants of this metropolis. The aforementioned two centralities of Tehran are old and strong and represent the capital of Iran as the main economic pole of the country and furthermore are the current potential of Tehran to become as a global city. Therefore, the proposed spatial strategy for TMR 2050, emphasis on the reinforcing the Tehran centralities as the main regional centralities. All the functions related to Tehran’s status as a capital of the Iran and its global position will remain in Tehran. But regional functions will be distributed in the other future centralities of the TMR.

As illustrated in the map 5.3, beside Tehran, Karaj is the only city that with a medium centrality in the regional territory. In addition to the concentration of the services activities, Karaj is the second populated city in the TMR and based on the relational analysis, it represents the highest functional integration within Tehran.

Furthermore, as it was discussed in the morphological analysis, Payam international air cargo, located in the Karaj vicinity, could be also considered as a potential. This air Cargo is combined with Special Economic Zones (SEZ) that could provide great opportunity for this area to attract domestic and foreign investments. The aforementioned claims show the higher chance of the karaj for being a new regional centrality which is considerable for this research.

Planning Actions:
A1: Reinforce existing potentials of other municipalities to provide more balance in regional territory and reduce the pressure from Tehran Metropolis;
A2: Assign tax incentives to support new institutions and urban services in newly proposed regional centrality;
C4: Provide more employment opportunities in low-income settlements;

Map 5.3 Karaj and Payam cargo airport as a new potential for the region (Source: Illustrated by author).
Furthermore, considering the government new proposed developments, is an important factor in the future visioning. Currently government are investing in two major projects. One is located in Tehran-Karaj corridor, and planned to be the biggest touristic and recreational centre of the region. The investment in Tehran-Karaj corridor trigger the developments towards karaj which is an affirmation for development of Karaj. Furthermore, developing Tehran-Karaj corridor consolidates the relations between Tehran and Karaj and transform this corridor to one of the major destination for population.

Imam Khomeini International Airport, the newly constructed airport, is the largest International Airport of the country which is located in the huge vacant land of the south-west of Tehran. As the Government planned, it will be an Airport City in the future. This opportunity can trigger the development in the south-west of the Tehran and turned it to a new centrality in the future.

IKIA has the potential of being an strong regional centrality, since it is the gate of the region towards global world. This provide the opportunity of introducing an international business district in the airport vicinity. Furthermore, the Tehran-IKIA corridor is the most populated corridor in the region (the third populated agglomeration after Tehran and karaj). Everyday, this corridor experiencing a tremendous commuting flows from the low-income population settled along the corridor towards Tehran. Building new centrality in the south-west of the region, will direct part of this flows to opposite direction and reduce the pressure from Tehran.

**Planning Actions:**
- A1: Reinforce existing potentials of other municipalities to provide more balance in regional territory and reduce the pressure from Tehran Metropolis;
- A2: Assign tax incentives to support new institutions and urban services in newly proposed regional centrality;
- C4: Provide more employment opportunities in low-income settlements;

Map 5.4 Imam Khomeini International airport as third potential node of TMR triangle (Source: Illustrated by author).
Due to the role of the industrial activities in the region economies, this research identifies the main industrial poles in the morphological analysis. Since these industrial core are free from contaminant factories, they could be combined with innovative companies that work with industries and form an innovative centres of productions that serves the population with their productions as well as providing jobs for different class of the region.

Combining these industrial poles with two aforementioned service centralities, we will form two stronger regional centralities that could assist Tehran centralities. This developments promote more balanced distribution of the urban activities within the regional territory that beneficial both for the Tehran and Karaj city-region and the settlements along the Tehran-IKIA corridor.

Regarding to Tehran this will bring the opportunity of removing unnecessary functions that will reduce the daily commuting towards Tehran and will provide room for adding new functions related to the role of Tehran as the capital of the country. Furthermore, it helps Tehran focus more in the functions that enhance its relation in the global market. On the other hand, for the centralities outside Tehran it will provide the chance to attract new activities and population for further growth.

**Planning Actions:**
A4: Strengthen the main industrial cores as the regional centres of production;

Map 5.5: Location of industrial nodes in TMR (Source: Illustrated by author).

---

Towards Regional Synergy
In order to activate these newly proposed centralities and exploit their maximum potentials, it is necessary to provide a good accessibility to them. As it was clarified in the relational analysis the current highway networks structure, encourage a radial flows towards Tehran.

In order to overcome this deficiency, this thesis proposed the construction of the second and third regional ring road. That connect workforce to these new centralities and spread the commuting flows over the regional territory. This will reduce the traffic congested within the main highways towards Tehran in the rush hours.

Since intersection of two highways (radial highways and ring roads) are strategic locations due to their maximum accessibility by car, they should be place in the strategic locations as well. These locations has high potential for urban development and population preferred to live along highways to have the highest accessibly by car (The primary mode of transport in TMR).

Planning Actions:
B2: Finish the missing link in the regional highway networks that support the existing centres or reinforce the isolated one;
Since most of the urban areas in the peripheries of the regional centralities are low-income settlements, it is necessary to connect these people to the job centres by public transport network. Commuting by car is not economically and environmentally sustainable. Many of these population can not afford a car, and the oil price are increasing everyday. Moreover, this way of commuting will increase the CO2 emission of the region.

Efficient public transport network will provide the means for a fast, frequent, cheap inter municipal commuting which increase the interaction between cities. In designing the Regional Rail Transit lines the fact of accessibility to the job for low-income inhabitants was in the highest priority. In order to create balance between the increasing mobility of people and the environmental requirement of reducing the need to travel it is necessary to integrate spatial development with public transport at regional level. the settlements along the Tehran-IKIA corridor.

**Planning Actions:**

- **B1:** Strengthen the main region’s centralities and prominent industrial core by linking them to the public transport system (Rail transport system);
- **B5:** Enhance environmental health and the population’s safety by developing well-planned transportation corridors;
- **C1:** Connect low-income settlements to the existing and proposed job centres by public transport (Rail transport system, Bus);
- **A7:** Encourage compact growth around public transport nodes, to promote more sustainable growth;

---

Map 5.7: This map presents the existing, planned and proposed train and metro lines for the TMR (Source: Illustrated by author).
Combined Strategy for TMR 2050

The proposed spatial strategy for TMR 2050 is represented in the map below. TMR Triangle is consist of three main centralities which are linked by public transport corridors. In order to avoid destructive competition between these centralities and also encourage cooperation among them, it is necessary to create a functional synergy between them. Creating functional synergy in TMR Triangle is only possible through developing:

- An efficient transport network
- An effective governing capacity
Chapter 6

Regional Design & Institutional Recommendation

This chapter of the report is associated with the proposed strategy and design for the TMR 2050 to illustrate the triangle vision in a more concrete manner. The aim is to be more specific on the proposals and avoid generic assumptions. This part will provide a suitable scenario for the upcoming urban development of the TMR in a way that it meets the major goals of the research, economic competitiveness, social cohesion and environmental sustainability. The purposed spatial strategies for the regional configuration of the TMR are according to the larger planning framework developed in the previous chapter. More in-depth analysis displayed in the beginning of this chapter will help to come up with a more understanding of the intervention areas in order to propose a suitable regional design and planning the right program for the areas. Since the intention of this research is not to provide a concrete answer and it is more about raising the attention towards the necessity of the regional planning and design and also providing a framework for a way of looking at the regional issues, it tries to develop a flexible regional strategy and design that could be adapted with the economic, social and technological trends in the future.

Furthermore the author combines the spatial strategy and design with an institutional design to provide a framework for realization of the aforementioned interventions. To sum up, this chapter aims to answer the last sub research question: What are the spatial strategy and design proposals to promote a synergy in the TMR?
6.1 The Concept the TMR Triangle

In the previous chapter an alternative spatial strategy for Tehran Metropolitan Region 2050 based on the existing potentials and the future needs of the region was proposed. This strategy is focusing on the TMR triangle which is shown in the diagram 6.1. The corners of this triangle are three major high potential nodes (Tehran, Karaj, IKIA) of the region. Corridors which connect these nodes are considered as high potential area for future development through Transit Oriented Development (TOD).

Diagram 6.1: The concept of the TMR Triangle (Source: Illustrated by author).
6.2 Identifying the components of Triangle Strategy

Since one of the major objectives of polycentric development is to develop specialisation by enhancing the potentials, in this section each element of the TMR triangle will be analysed in more detail. This will help to have better understanding of their identities for future development.

As Tehran has been considered in previous chapters, the focus will be more on Karaj and Payam aircargo, IKIA and airport city, Tehran-Karaj and Tehran-IKIA corridors.

Diagram 6.2: Elements of the TMR Triangle (Source: Illustrated by author).
6.2.1 Karaj

Location
Karaj is one of the biggest and populated cities in Iran. According to the census of 2006 the population of this city was 1,377,450 people. Karaj is the 5th most populated city in Iran and the second biggest city in the Tehran Metropolis Region.

Karaj is located in the 35 kilometres West of Tehran and southern slope of Alborz Mutation. From the south and West this city is limited to Shahriar and Ghazvin respectively. Karaj is also located in the way of the vehicles carrying imported goods from Azerbaijan and Turkey border to the destination of Tehran and vice versa. Karaj is also located in the way of one the most important roads which connect South of Iran to its North (Chaloos road). Tehran-Karaj Free way 46 years ago for enhancement of decentralization from Tehran and easy connection between Tehran and its west surrounding settlements was inaugurated. Today Karaj is connected by Highways and railway to Tehran 40 km east and Qazvin 100 kms northwest, and by commuter rail to Tehran subway system (Metro). The highway system includes three highways: Tehran-Karaj Freeway, Karaj special road (highway), Karaj old road (Fat’h highway). Tehran-Karaj Freeway (also known as the Autobahn) is the most high traffic highway in Iran (Karaj municipality).

The economical base for Karaj is its proximity to Tehran, where transportation of products between the capital and the Caspian Sea is central. Chemicals, fertilizers and processed agricultural goods are also produced here.
History

The history of Karaj dates back many centuries. The stone built Zoroastrian fire temple of Takht-e-Rostam from the Parthian era is a testament to this. Before Mongol invasion caravans traveling the way through Sagzabad and Shahriar to Rey (At that time Rey was one the most important city in Iran). From this period onwards the Qazvin - Karaj road is preferable to the previous path.

The Soleimanieh palace (currently housing a college of Agriculture), the mausoleum of Shahzadeh Soleiman, Imamzadeh Rahman and Zeid Palang Abad-e-Eshtehard are other historical relics of the Karaj area. During the Pahlavi dynasty era, the Morvarid Palace was constructed in nearby Mehrshahr district, designed by the Frank Lloyd Wright Foundation.

Image 6.2: Shah Abbasi Caravanserai was a roadside inn where travellers could rest and recover from the day’s journey. Caravanserais supported the flow of commerce, information, and people across the network of trade routes (Source: Photo by Babak Gholizadeh, 2004).

Image 6.3: Soleimanieh Palace was constructed by order of Fath Ali Shah Qajar (early of 19th century). The edifice was designed and built in one of the Shah’s residential places between Tehran and Soltanieh in Zanjan, near the river of Karaj in a big Persian garden/ Architect Mohammad Hussein Khan Nezamol Dawleh Esfahani The construction in its early structure included such buildings as Golshan edifice, Dar Ghermez (Red Door) edifice, garden of Farsh Abad, The first and second garden, the Pavilion and a ruined five-story tower just remained. Wall paintings, frescoes, plaster molding, tile working ...are from the attractive points in the palace (Source: photo by bijan).
In past Karaj was a small village near Tehran. Because of its pleasant weather it was full of gardens and farms. The rapid growth of Tehran as capital of Qajar and Pahlavi dynasty resulted that Karaj as one the most potential city of the region did not exempt from this rapid growth. Growth and development of Karaj began with establishment of some new factories such as: steel factory, sugar factory, Agriculture University and Institute of husbandry during the Pahlavi (1931). In the late 60’s with growth of land price in Tehran, land allocation and new small town construction for middle class people began in Karaj. Town construction law was passed in 1970 and till 1977 for almost 80 towns in the region (mostly in Karaj) land separation plan was prepared. Among these towns 10 of them were located within Tehran protected zone and 32 of them were located within Karaj protected buffer zone. Among 6 old cities of the region in 1965 only Karaj had the capability of attracting middle class people. Although the process of new town construction as result of the revolution and war was interrupted, marginalization and migration of middle class people to the old cities of region (especially Karaj) continued. Karaj in the course of 1975‐85 (years of revolution and war) absorbed 10 percent of surplus population of the region.


Image 6.5: View of Karaj (Source: http://mohammaddarvish.com).
Functions
In this section the location and distribution of the 5 functions of the Karaj are illustrated. These 5 functions are: Higher education, administrative, service, trade and trans city centres (research institutes). The trans city activities are those kind of activities which have not only local impact but also its activities can also influence the whole region. In these maps the major roads and location of Payam airport as a potential economic hub in the karaj region are shown. In the next part more information about Payam airport and Payam special economic zone will be provided.

Map 6.2: Location and distribution of Higher education (Source: Map by author, data from website of Karaj’s municipality).

Map 6.3: Location and distribution of administrative sectors (Source: Map by author, data from website of Karaj’s municipality).

Map 6.4: Location and distribution of service sectors (Source: Map by author, data from website of Karaj’s municipality).

Map 6.5: Location and distribution of trade centres (Source: Map by author, data from website of Karaj’s municipality).

Map 6.6: Location and distribution of trans city sectors (Source: Map by author, data from website of Karaj’s municipality).
Unlike Tehran in which most of the activities have been concentrated in specific locations in the city, in Karaj activities are scattered, and there is no particular concentrated centre. Educational and research institutes which are shown with yellow and violet colours are mainly active in field of biology, agriculture and animal husbandry. Karaj city is well known because of its prominent activities in these fields.
Payam International Cargo

Payam Special Economic Zone (PSEZ) is to become the economic hub of the newly-established close to Karaj. The purpose of establishing this special economic zone is transportation of mail, goods, warehousing, mortuary services, packaging and export industries. Given the permit issued by Universal Postal Union, the zone will handle all postal affairs of Middle East in near future, he pointed out. As per regulations, close to 10 countries will become member states of the regional postal group.

In order to attract Foreign direct investment (FDI) Payam has created equal opportunity and possibility of investment for Iranian and foreign subjects on every scale of partnership, in addition guarantee foreign investment according to attraction and protection law of foreign investments and freedom of invest transfer and obtained income of it, with no administrative encumbrance laws. Furthermore, there is free entrance, without customs duties for goods, machinery and row material until it has been stationed in the zone, with possibility to export goods from zone without customs formalities (http://en.wikipedia.org/wiki/Special_Economic_Zone).

Border Oil Exploration in 2 Months

Iran announced that it plans to boost exploration activities in the country’s western and northern border regions. News media agency quoted the National Iranian Oil Company’s (NIOC) director for exploration, Mohammad Mohammadi, as saying that exploration activities will be accelerated for setting up new oil-drilling rigs near the borders of Turkmenistan and Iran within two months. The regions of Kazerun, Bushire, Bojnord and Kerman will be among the areas of oil exploration activities," Mohammadi stated. The announcement was in line with the country’s efforts of discovering new oil gas fields. In fact, in a recent Iranian oil official said that the country has a comprehensive plan to accelerate implementation of oil and gas reserve in shared borders and offshore fields.

EGFI Record Performance Confirmed

Export Guarantee Fund of Iran’s General Assembly has announce confirmed EGFI's financial accounts and launched its upgraded performance.

Commerce Minister Mohsen Mehrajaddini, as the head of the assembly, pointed the company’s performance in the fiscal year 2009-10, Mohde News Agency reported. EGFI as Iran’s official Export Credit Agency, supports domestic export activities by providing foreign currency financing, which in turn helps manufacturers to export their goods and gain access to international market, as well as it assists in earning foreign exchange.

This amount of earned business covers about 17 percent of the country’s total exports which is among the highest credit ratings among the world’s export credit agencies. This upswing in EGFI’s activities is due to improvements in its policies and successful plans for boosting credit and creating confidence in clients and foreign governments.

The executive secretary of the conference, said representatives of government, non-government as well as MPs and university professors have been allocated to Shahid Beheshti Medical special economic zone, he said, adding Japanese investors have produced 52-inch LCD TVs last year. This year, they will produce 100,000 cars annually in a joint meeting.

"Centauro (Samand) production. Venirauto plant to increase Samand production," Soleimani said. He elaborated that all hardware and software facilities will be launched in Payam Airport with cooperation of Post Office within six months. Norouzi added that the 20-year-old airport romantic over an area of 18,000 hectares and has the largest runway and airport facility ever for cargo planes.

农产品加工

Steel Company Launches Mideast’s 1st Milling Machine

For the first time in the Middle East, a steel rolling machine was designed, manufactured and launched in Iran’s Ahvaz Steel Company. Managing Director of the company, Mehdi Faghih Khosravi, said the company by designing and manufacturing machines like the rolling, has broken the barriers of foreign sanctions by designing and manufacturing machines like the rolling, IRIB reported.

The high-end machine has been manufactured by the latest technology which is used in producing parts of machines like the milling, has broken the barriers of foreign sanctions by designing and manufacturing machines like the rolling, IRIB reported.

"We have maintained an increase of 20 percent in the country’s western and northern border regions. News media agency quoted the National Iranian Oil Company’s (NIOC) director for exploration, Mohammad Mohammadi, as saying that exploration activities will be accelerated for setting up new oil-drilling rigs near the borders of Turkmenistan and Iran within two months. The regions of Kazerun, Bushire, Bojnord and Kerman will be among the areas of oil exploration activities," Mohammadi stated. The announcement was in line with the country’s efforts of discovering new oil gas fields. In fact, in a recent Iranian oil official said that the country has a comprehensive plan to accelerate implementation of oil and gas reserve in shared borders and offshore fields.

Payam Airport

Payam Special Economic Zone (PSEZ) is to become the economic hub of the newly-established close to Karaj. The purpose of establishing this special economic zone is transportation of mail, goods, warehousing, mortuary services, packaging and export industries. Given the permit issued by Universal Postal Union, the zone will handle all postal affairs of Middle East in near future, he pointed out. As per regulations, close to 10 countries will become member states of the regional postal group. Also Mehrabad Airport (in Tehran) is to shift all of its cargo affairs to Payam Airport (Iran daily, sep 15, 2010).

In order to attract Foreign direct investment (FDI) Payam has created equal opportunity and possibility of investment for Iranian and foreign subjects on every scale of partnership, in addition guarantee foreign investment according to attraction and protection law of foreign investments and freedom of invest transfer and obtained income of it, with no administrative encumbrance laws. Furthermore, there is free entrance, without customs duties for goods, machinery and row material until it has been stationed in the zone, with possibility to export goods from zone without customs formalities (http://en.wikipedia.org/wiki/Special_Economic_Zone).
6.2.2 Imam Khomeini International Airport (IKIA)

Being the primary international airport of the country, Imam Khomeini International Airport (IKIA) expresses a great potential for future development and turns into a new international business centre of the Iran. IKIA is located 30 kilo meters southwest of Tehran metropolis, and is accessible only by car, taxi and bus via the Tehran-Saveh Freeway (Freeway 5) and Tehran-Qom Freeway (Freeway 7).

The construction of the airport was begun before the Iranian Revolution of 1979. The original design was based on Dallas Airport by TAMS, a consortium of US designers. After the Iranian Revolution, the project was abandoned until the government of Iran decided to design and build the airport using local expertise. On 26 October 2007, it was announced that all international flights except domestic flights and flights to Saudi Arabia were transferred to the IKIA, and it became Tehran’s primary international airport. Twenty-three air carriers provide service to over 6.5 million passengers each year with destinations throughout Europe and Asia. In order to increase the capacity of the airport, the government planned to add two terminals in the second phase of the airport construction. One Haj terminal for the religious flights to Saudi Arabia with the area of the 47 ha, and the capacity of 1.6 million passengers annually, the other one is the second international flight terminal with the area of the 500,000 m² and the capacity of the 20 million passengers annually (IKIA website).

The French firm ADPI, subsidiary of the Aéroports de Paris Group has been commissioned for providing a master plan development study, with a second phase of development offering a 26.5 Million Annual Passengers throughput capacity. Based on this master plan a small town is going to build close to airport to benefit from this transportation node and provide service for commercial activities. This small city as it is shown in the map is consisting of several centres such as:

Map 6.8: Proposed plan by Government for the investment opportunity of the private sector in Imam Khomeini Airport City (Source: IKIA website).
**IKIA Centre:** As the primary Square of the airport and proximity to the terminals, this place could be one of the best International commercial centre in the TMR for locating the central office of international companies, commercial centres, hotels, conference halls, offices and shops.

**Commercial Avenue:** Commercial centres consist of retail and whole sale, boutique and service offices. This section is also the location of the administrative offices of the airport city. It is also host of Temporary and permanent Exhibition.

**Business City:** This centre will be the location of financial companies, banks and office of foreign investors.

**Conference City:** This centre provides enough facilities for organizing national, regional and international conferences, annual meetings of companies and commercial exhibitions. It also includes restaurants and 4 and 5 star hotels.

**Media City:** The city with focus on media innovation which includes: Office of national and international news agencies, International centre of printing and publishing, Offices of media marketing, International centre of Music, film and cultural affairs, Photography studio equipped with edge technologies.

**Knowledge City:** The knowledge city with the aim of research, education and training will be developed. The knowledge city is an educational campus consist of high quality universities and educational centres in medical and non-medical fields combined with the facilities for the students.

**Sustainable Energy Resources:** Sustainable energy resources include electrical power produce from wind and solar energy. These resources are going to be used as sustainable energy resources in the IKIA. Of course there are some limitations regarding to the height of this complex, that they should be considered.
**Eco-Industrial Park:** In these complex industrial units are mutually connected to create potential economic, environmental and social benefits with following features: Aggregation of single companies which exploit the green manufacturing technologies.

**Sport city:** This sport city includes: roofed and non-roofed stadium, Sport academies, Sport shopping centre, Parks, hotels, restaurants and coffee shops, Residential areas and schools. Health and emergency centres.

**Eco-tourist Park:** Resorts and recreational centres, Ponds and artificial lake, Zoo, Global village with theme hotels and studios and cinema, Iran tourism trade centre, Traditional restaurants.

**Centre of Islamic culture and Art:** This Complex creates an opportunity to display Islamic art and culture in different dimensions. This can be located close to Haj terminal in order to complete the chain of economic, cultural and training activities related to the Haj, Exhibitions and museum, related training centres, Mosque and library, Administrative buildings, Sport facilities, Temporary residential accommodation, Commercial and service buildings,

**Internet City:** This complex can be a strategic base for countries with emerging markets. Construction and development of such city is very important in Middle East. Categorized opportunities for this complex can be: International software developer companies, Commercial services, Consultancy services, Marketing services, IT development centre in Middle East.

---

**Image 6.7: Major part of airport city of the IKIA (Source: diagram by author).**
6.2.3: Tehran - Karaj Corridor

Tehran-Karaj corridor refers to the places located along with Tehran-Karaj highway and between city of Tehran and Karaj. In the map 6.9 it can be seen that Tehran-Karaj corridor connects Tehran to the other cities in the west part of country. More than 60 percent of this corridor is located in 21st and 22nd districts of Tehran (Map 6.10). The rest parts of this corridor consists of disperse residential and industrial areas. Map 6.11 shows the buit-up area in this area. As you can see there are lot of open spaces in 22nd district of Tehran. These open spaces provide more freedom for urban planners to allocate necessary functions. These function are based on the needs and requirements of the region.
Map 6.10: Municipal districts of Tehran-Karaj corridor (Source: Map illustrated by author).

Map 6.11: Built-up area of Tehran-Karaj corridor (Source: Map illustrated by author).
Existing Functions in Tehran - Karaj Corridor

By looking at the map 6.12 it can be easily understood that the 22nd district of Tehran is almost vacant of industrial related activities. The 22nd district is the last hope of Teheranis to create a suitable and optimal urban life. According to the Tehran’s comprehensive plan this district is a part of continuous spatial development of Tehran city. Currently unless some scattered housing units, Azadi Sport complex and Chitgar Park is devoid of urban construction.

The 21st district of Tehran in the past few decades, more than anything was considered as location for industries, Workshops, Transportations and Warehousing. Two big Iranian automotive industries and some Health care and pharmaceutical industries are located in this district. Development of residential areas in this region has been always considered as a side issue (Map 6.12).

Proposed Functions in Tehran - Karaj Corridor

According to the government’s plan the 22nd district will be transformed to the biggest touristic and recreational centre in Tehran Metropolis. Execution of large and unique civil, recreational and touristic projects such as: Construction of an artificial lake, an artificial waterfall and gondola lift, park and dozens of other large and small projects succeeded the region to receive the Letter of Appreciation from the World Health Organization and joining to the international community of safety.

In the years after the revolution the tendency for constructing military bases and housing for the population in 21st district has emerged. In general this district is combination of small residential and industrial areas. The government plan for this region is to keep the population in this district constant and make balance between industries and residential areas.
Towards Regional Synergy

Map 6.16: Visualizing the Tehran-Karaj corridor (Source: Map illustrated by author).
6.2.4 Tehran - IKIA Corridor

Tehran – IKIA corridor consist of three counties (Eslamshahr, Baharestan and Pakdasht) and two major cities, Eslamshahr and Robatkarim (Map 6.16). This corridor has the highest concentration of population in the region. After Tehran and Karaj, Eslamshahr is the third populated city in the region. In the late four decades because being in vicinity of Tehran, concentration of the major industrial areas in the region and low land price have attracted low skill labours and low income people.

During forty years this corridor has experienced high growth of population. Because of the IKIA and Parand new town and other urban projects it is estimated that this region will expect more population in future at the regional level.

Map 6.16: Municipal districts of Tehran-IKIA corridor (Source: Map illustrated by author).

Diagram 6.7: Tehran-IKIA corridor in the TMR Triangle (Source: Illustrated by author).
Looking at the built-up area map (Map 6.17) shows scattered structure of built-up areas in this corridor. This disperse structure of built-up area has also find its way in the agricultural lands. This situation would be resulted to the destruction of the agricultural lands. The map 6.18 shows that these built-up areas have low concentration. Since the lands in this corridor are important for agricultural uses, in future development of the region this trend should be considered as a serious issue and bases for prevention of future destruction of these lands should be provided.
Map 6.19: Visualizing the Tehran-IKIA corridor (Source: Map illustrated by author).
Accessibility in Tehran - IKIA Corridor

This region is located between Tehran-Saveh Freeway and Tehran-Qom Freeway. Eslamshar is also connected to Tehran by a direct highway (Map 6.20). The main public transport system in this corridor is bus network connection. Each city in this corridor has a central Bus station for intercity transportation (Map 6.21).

Disperse distribution of the population and low density of residential areas cause realization of any simple and effective public transport system for this region unfeasible.

Map 6.20: Existing highway system in Tehran-IKIA corridor (Source: Map illustrated by author).

Existing Functions in Tehran - IKIA Corridor

Several big and small industrial units are located in this corridor. Three main industrial towns in the region which are also introduced in chapter 4 are located in these corridors. That two of them create industrial cores active in field on metal and machinery.

6.3 Proposed Identity for the Elements of the Triangle Spatial Strategy

One of the objectives of polycentric development is to develop specialization to encourage interaction between centralities. In this regard, Tehran will remain the main economic centre of the region and it also, identify as the political, cultural and recreation centre of the TMR Triangle. Karaj will identify as the agricultural, educational and research centre of the Region and the centrality for International air cargo and its related companies. Lastly the IKIA as the international airport will be the gate of the region to the global world and the location for the international companies and offices. The identity of these three nodes not only concerns with their role in the TMR but also, international characteristic of each node make a new international identity for this region. This international identity follows from the fact that Tehran as capital of Iran has its global image. Furthermore, IKIA because of international airport and Payam air cargo due to air transport hub gain their international identities.

Map 6.23: Proposed Identity for the Elements of the Triangle Spatial Strategy (Source: Map illustrated by author).
6.4 Regional Design

This part of the report dedicates to the regional design proposal for the TMR Triangle 2050. The elaboration of the regional design contains two layers of interventions: The Rail Transit System and The Spatial Development of Transit Nodes. Thus, the rest of chapter is as followings: first, the proposed Railway Networks will be explained, and by considering the demands for accessibly to this network the transit nodes will be adjusted. After that base on the earlier analysis in this chapter and the significance of each transit nodes, various types of spatial developments will be recommended. Finally, the implementation of the two layers of intervention will be explained.

6.4.1 Regional Rail Transit Proposal

Transportation as one of the major issues in large cities has been always emerged as an inevitable problem. Lack of integrated vision and adequate attention to transportation and traffic issues, have been resulted to many costs and social, economic and environmental damages. Tehran as the political capital as well as the economic, social and cultural capital of the country suffers from traffic conflict and its consequences like high fuel consumption, air and noise pollution, loss of time in traffic and car accidents (TUSRC, 2007).

Today, rail transit system is recognize as one of the transportation modes which upgrade quality of life by providing safe, fast, cheap and environmental friendly choice of mobility.

The need for efficient public transport is not limited to present. The demand for transportation is increasing in future. With increasing the amount of inhabitants and workers in the region, the daily movements of people in the TMR will also keep on growing. With the introduction of an attractive public transit modality, people are tempted to use public transit instead of individual (car) transport. Introduction of the Regional Rail Transit System combined with a Park & Ride system can reduce the congestion on the road network, especially within the big cities of the region like Tehran and Karaj. This will lead to an improvement of the air- and sound quality in Tehran. The poor air quality of Tehran is a major issue due to the load of car and bus traffic in the region. The introduction of a Rail Transport System will reduce emissions in the TMR. Using Rail Transport System will bring range of qualitative and quantitative benefits to the TMR inhabitants. This benefits are summarized here:

- Provide Faster Travelling Option within the Region
- Provide Safe Commuting
- Reduce Car Accidents
- Create Calm and Comfortable Social Atmosphere
- Reduce Energy Consumption
- Improve Environmental Quality by Reducing Contaminant Transport Network

Rail Transport System Proposal by Government

Discussing about Rail Transit Transport System for Tehran is not a new subject, it traced back to the first master plan in 1958. Study of urban transport of the Tehran was done by SYSTRA (former SOFRETU) in the form of comprehensive report named Tehran Traffic and Transportation Plan in 1974. By establishment of the urban and suburban railway group of companies in 1975, the responsibility for the railway construction was upon this organization. However till 2007 only 3 of the proposed rail transport systems were completed (TUSRC, 2007). With the high appreciation of the society from the existing three lines and their undeniable effects on people’s life, there is no doubt for completing the rail transport system. However, the government’s proposal for the future rail transit system within the TMR basically focuses on Tehran and at the second priority Karaj’s Metros. This decision is in contrary with the proposed TMR Triangle strategy. Although there is a suburban railways that connects Tehran to the Airport, it neglects the low-income settlements. As a result, the low-income population who have the less opportunity to buy a car cannot use the public transport for their daily commuting. Hence it is necessary to design a regional rail transit system in a way that it attains the goals of TMR Triangle Strategy.
Image 6.11: introducing new public transport (Source: Image illustrated by Randy Lyhus).
Proposed new Railway lines:

Introduction of the new public transit network will provide the possibility of the compact development in the TMR. As it was already displayed, during the last decades, Tehran was experienced a rapid urban growth that was extended way beyond the traditional city boundaries in scattered manners. This way of development destroys the agriculture lands and damages the environments. As a result in the present situation, it becomes more and more clear that the challenge for the future is to develop within the existing urban boundaries of TMR.

By encouraging compact development around the public transport nodes, not only the accessibility to the employment centres will increase, but also the agricultural lands will be preserved. Furthermore, compact development will provide critical mass for providing different services for the area. This is especially important for the low-income settlements along the Tehran-IKIA corridor that suffering from the lack of urban facilities.

Map 6.25: Proposed new rail transport system for the region (Source: Map illustrated by author).
Intercity or Stop train?

Introducing new rail transit system in the existing urban areas will attract the population around transit nodes and provide situation for the urban areas to grow. This case makes the transit nodes as an opportunity to direct the future urban expansion in desired locations. As result of this, availability of space around transit nodes for further urban expansion plays an important role in decision making for placing the transit nodes.

All the transit nodes do not have the same characteristics. Some of them count as major destinations and greater amount of people travel to them in daily commuting, while others are only destinations for limited amount of people. Being a destination is affected by the functions around and in a proximity of transit node. In order to have a more effective rail transit system it is necessary to consider the need for access to different nodes while planning for public transport.

One layer of public transport provides higher frequencies, higher speed and longer stop distances (Intercity). However the other layers are characterized by lower frequencies, lower speed, and shorter stop distances (Stop train).

Map 6.26: detail of the train stops (Source: Map illustrated by author).
6.4.2 Spatial Development of Transit Nodes

The introduction of new transit network will provide spatial development opportunities for its area of influence. New type of public transport combined with urban renewal, can contribute to the vitality and economic activity of the TMR Triangle’s urban corridors. The retail functions and office space will be increase in the vicinity of the transit nodes. In practice, the introduction of a new public transport modality can increase the turnover of retail or commercial activities close to a transit node. Furthermore, this will result in an increase of land value and next to this, the property taxes for the municipalities. In that way these new developments are creating support for the public transport system and can cover part of the developing public transit costs. Thus, new investments in the public transport system should be a part of a more integral investment policy for the TMR Triangle. High costs and poor results can be avoided when these two quantities are not developed separately, but in an integrated way (Priemus et al., 1999). Consequently, the central goal of these spatial developments is to provide a good alternative for the individual (car) transportation, as well as initiating the economic development in the less developed areas of the region’s periphery. For proposing the spatial development around the transit nodes this research used two kind of principles: Transit Oriented Development (TOD) and Node-Place model of Bertolini. These principles will be explain in the next part.

Image 6.12: This image illustrates economic and social importance of transit hubs in all scales. (Source: http://www.gehlarchitects.com).
Regional Design & Institutional Recommendation

**Principle 1: Using TOD Principles for New Development**

Transit-oriented development (TOD) is universally defined as compact, mixed-use and walkable districts connected to regional destinations by high quality transportation networks. TOD is a form of development that recognizes and facilitates the important relationship between land use and transportation planning. Frequently this kind of development takes place within walking distance (800 meter) of transit nodes. TOD provides a range of benefits including:

- Increased transit ridership
- Reduced traffic congestion, car collisions and driving
- Reduced air pollution and energy use
- Improved environmental quality and health
- Increased mobility options
- Reduced personal transportation cost
- Increased economic activity
- Increased property values, and therefore, increased public revenues to support additional community investments

Creating walkable areas with better access to transit encourages development that enhances the liveability and quality of life. Thus, the appeal and liveability of an area can be improved with convenient access to transit which is achieved in part by concentrating development around transit stations and stops.

Diagram 6.10: Advantageous of TOD (Source: TRANSIT ORIENTED DEVELOPMENT POLICY GUIDELINES, December 2004, Calgary land use planning and policy).
Like other planning and design concepts, TOD is not free from critiques. One of the major critiques to the promotion of TOD is that it will result in the gentrification of low-income settlements. Construction of new developments will boost the economic performance of the area and provide urban services and facilitate better life quality which resulted in the increasing of living demand in the aforementioned area. This will raise the housing cost that will push the low income households farther away from the jobs and transit nodes. This subject has a priority in the case of the TMR since Tehran-IKIA corridor is located in low-income settlements.

In order to mitigate negative effects of TOD in housing market, it is necessary that in planning for TOD consider the low-income households by providing affordable housing for different income groups.

Neighbourhoods with a mix of both affordable and market-rate housing can also provide many benefits, such as reducing income segregation and providing lower-income residents with opportunities to enhance their social and occupational situations.

As it was mentioned previously, many lower-income households prefer lower housing prices and higher commute costs by choosing to live in Tehran peripheral settlements. Providing low-cost housing (social housing) near transit can significantly lower the combined housing and transportation problem.

Low-income populations are more transit-dependent and less likely to own a car than other demographic groups. Mixed-income transit-oriented development helps to ensure that transit’s highest percentage riders have access to transit, helping to stabilize or increase transit ridership.

Housing opportunities near transit nodes for low-income populations can improve access to work, education, and services, without the high transportation costs associated with driving.

Principle 2: The Node-Place Model of Bertolini

The second principle used in this design proposal is the node-place model of Bertolini (1999) which used as the basis for the analysis and research of the potentials of new stations in the TMR. According to Bertolini (1999), the goal of every public transport node is making interactions possible. The degree of possible interactions is determined by two components: the node value and the place value (Bertolini, 1999). Therefore, the station area has an ambivalent character. On the one hand it functions as a node in the (regional) public transport system. On the other hand the station area is an important place in the (local) city or urbanized area (Bertolini, 1999 in: van Dijk and Stinissen, 2009).

The node value of a station represents its accessibility (Bertolini, 1999). If the station is very well accessible, this will result in a high node value. The place value represents the diversity and intensity of activities that can be performed near the (public transport) node (Bertolini, 1999). The graph of this node-place model of Bertolini is shown in Diagram 6.11. According to this diagram it is possible that the node and place values are not equal. It is possible to have a high node value or supply of public transport, while the urban activities around the node are low and not (yet) developed. On the other hand, it is also possible the urban activities are quite intense and diverse; however, the node value or supply of transportation is relatively low. In the case equal node and place value

First, stations with a very high node- and place value are (public transit) nodes which are under stress (Bertolini, 1999). The intensity and diversity of the transportation flows is maximal, these nodes have a very high node value. Furthermore, the intensity and diversity of activities surrounding the node is also high, resulting in a high place value. The situation is called ‘under stress’ because all these different and intense activities and flows result in a great chance of conflicts (Bertolini, 1999). There is a limited amount of space and there are multiple extensive claims on this space. The opposite of this stressed situation is the situation of dependency. When there are very few transportation services and the node value of this station is very low. Furthermore, the amount of urban activities around the station is resulting in a low place value. Another situation is the accessible or balanced situation. Hereby the place and node value are equal. The existing potentials of the station area are in balanced with the actual present urban activities.

The goal is to search for a balance between nodes and place value. In that way the potentials of a station area are used optimally. There is a mechanism behind this thought. Improving the provision of public transport of e.g. a station will lead to the creation of favourable conditions for intensification and diversification of the land use around this station (Bruinsma et al., 2008). The space value of this station area can be improved by adding urban activities. This process of intensification and diversification will lead to the growth in demand for connections. Hence, creation of new conditions for development of new infrastructure at this node is possible. This cyclic process is shown in Figure 6.12.
General Rules For Transit Node Developments

**Catchment Area**
TOD locations within comfortable walking distance of transit nodes.

**Compact Development**
Medium to high-density housing and employment.

**Muli-Modal Transit Nodes**
Accessibility to various modes of transport in the transit nodes.

**Mix of Uses**
Diverse and complementary high-activity uses, such as retail, professional services, housing and employment,

**Pedestrian Oriented**
Attractive pedestrian environment, with street-facing buildings that connects the transit stop to the commercial, civic and residential areas.

Typology for Development of the Transit Nodes:

Transit nodes display different characteristics. Some of these nodes are located in bustling downtowns at the heart of the regional economy, while others are located in residential neighbourhoods where transit provides a convenient means for commuters to travel to and from work, and get to and from leisure activities. Some nodes are located in areas that are experiencing rapid pressures to grown and change, while others are more established where change will be more incremental (Centre for transit-oriented development, 2007). Beside these differences, various transit nodes also share specific similarities and common features. In the following each transit nodes type will be introduced and prepare the ground for the second design intervention of this graduation project.

**Airport Node**

Airport node is positioned in the first place in the transit nodes development hierarchy. This node is the gate toward the global world. Therefore both, node and place value are high in this node. In terms of node value, this node has high accessibility by different modes of transport such as train, Express bus, and Automobile. In terms of the place value this transit node is served by a high density development with the focus on international business market. In the TMR, Imam khomeini international Airport and Payam International Air Cargo are example of such transit node development.

Main land uses in the Airport Node are:

- Primary international companies and banks, commercial centres
- Major Centre for organizing national, regional and international conferences, annual meetings of companies and commercial exhibitions.
- 4 or 5 star hotels for foreign visitors.
- Retail shops and services to meet the needs of local workforce and traveller.
- Promotion of a vertical mix of uses to ensure that ground-floor street frontages are active.

**Regional Centre**

Regional Centre is positioned in the second place in the transit nodes development hierarchy. This node is the regional downtown, with a dense mix of employment, housing, retail and entertainment that caters to regional markets. Both, node and place value are high in this centrality and it is the primary centres of economic and cultural activity for the region.

The housing typology is mostly High-rise and mid-rise apartments. This node is served by a rich mix of transit modes such as metro, train, BRT, local buses and public taxis. In the TMR, Tehran north centre and the Karaj centre are example of such transit node development.

Main land uses in the regional centre are:

- Offices and other high-intensity employment destinations.
- Major commerce and other high-intensity visitor destinations.
- Major cultural and entertainment destinations.
- High-density residential to provide a local community, after-hours activity, safety and custodianship of public spaces.
- Local retail shops and services to meet the needs of local residents, workforce and visitors.
- Promotion of a vertical mix of uses to ensure that ground-floor street frontages are active.
**Town Centre**

Town Centres are positioned in the third place in the transit nodes development hierarchy. Town Centres contain a mix of residential, employment, and retail, usually at slightly lower intensities than Regional Centres. These places are magnets for surrounding areas, while also serving as commuter hubs to the larger region.

The housing typology is Mide-rise and low-rise buildings and few single family housing. A variety of transit options serve Town Centres, with a mix of origin and destination trips, focusing primarily on commuter service to jobs in the greater region. In TMR, Eslamshahr Central Station, Parand Central Station, Pakdasht Station are examples of such transit node development.

Main land uses in the Town Centre are:
- A substantial residential community involving medium and low-rise residential and mixed-use developments.
- Intense commuter destinations such as commercial and employment opportunity that will benefit from the excellent transit connections.
- A good range of community services and facilities serving local inhabitants and surrounding municipalities.
- Local retails and services to meet the needs of local residents, workforce and visitors.
- Promotion of a vertical mix of uses to ensure that ground-floor street frontages are active.

**Neighbourhood Centre**

Neighbourhood Centres are primarily residential areas that are well-connected to Regional or Town Centres. They have moderate to high densities, and usually feature local-serving retail mixed in with housing. Commercial and other employment is often limited to small businesses.

The transit nodes are in or near existing neighbourhoods. In some of these centres only limited amounts of land for development or re-development are available, while in others there are mostly undeveloped areas with large parcels of vacant land.

Main land uses in the Neighbourhood Centre are:
- Predominantly residential; medium and low-rise apartments or single family housing.
- Neighbourhood employment - professional offices and services close to the transit node.
- Neighbourhood-serving retail shops and services.
- No major attractor destinations.

**Semi-Industrial Centre**

Semi-Industrial Centres are adjacent to both residential and industrial areas, with the two area separated by a major barrier (major road/highway; rail line). They are the secondary centres of production within the region.

The housing typology is mostly mide-rise and low-rise buildings and single family housing. Only node value is high in Semi-Industrial Centres. They have a good accessibility by highway. These nodes are served by a rich mix of transit modes such as automobile, train, local bus and express bus. In the TMR Triangle, Chahardangeh Station is an example of such transit node development.

Main land uses in the Semi-Industrial Centre will be:
- Clusters of complementary land interdependent industrial activities.
- Few innovative companies related to industries.
- Local retails and services to meet the needs of local residents, workforce.
- A substantial residential community involving medium and low-rise residential and single family housing.

**Industrial Centre**

Industrial Centres are the primary centres of production within the region. They are adjacent or within industrial areas or other large employment centres.

Only node value is high in Industrial Centres. They have a good accessibility by highway. These nodes are served by a rich mix of transit modes such as automobile, train, local bus and express bus. In TMR Triangle, Shamsabad Station is an example of such transit node development.

Main land uses in the Industrial Centre will be:
- A dominant Industrial land use.
- Clusters of complementary land interdependent industrial activities.
- Few innovative companies related to industries.
Design Guidelines Matrix for Transit Nodes Development in TMR

Design Guidelines Matrix are being developed to provide general parameters and strategies for local governments to promote and implement development that is supportive of transit investment. The guidelines support various transit nodes development ranging from regional to local.

The intention is not to provide a blueprint for development of station area, but a general guidelines that support both regional goals and the local needs at the same time. The guidelines provide the following variables that should be considered when planning for and implementing development around transit station areas. These variables are developed considering both regional goals and local necessities. Since each of these nodes has their own specifics potentials and necessity for development which needs in-depth local analysis, designing each of these station areas will be upon the local jurisdiction with the participation of the local inhabitants. In this way not only the transit nodes development will satisfies the regional goals in terms of providing adequate spatial development in regional strategic locations, but also it is flexible enough to give the local jurisdiction enough authority to make the final decisions with negotiation with other stakeholders. This way provides support from local authority to realize regional goals.

<table>
<thead>
<tr>
<th>Transit Node Type</th>
<th>Airport Node</th>
<th>Regional Centre</th>
<th>Town Centre</th>
<th>Neighbourhood Centre</th>
<th>Semi-Industrial Centre</th>
<th>Industrial Centre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Within Airports.</td>
<td>Within the centre of the large cities.</td>
<td>Within the centre of the municipals or future medium cities.</td>
<td>Adjacent or utilises residential areas.</td>
<td>Adjacent to both residential and industrial areas, with the two areas separated by mostly non-urban (green space/highway, rail lines).</td>
<td>Adjacent or utilises industrial areas or other large employment centres.</td>
</tr>
<tr>
<td>Land Use</td>
<td>Development (Airport Agency, International Company, Government Agency, Supporting both Retail &amp; Services); Mixed Use: Cultural and Entertainment Centres; Mixed Use: Residential; Mixed Use: Business &amp; Service; Restriction of all forms of industries and auto-related uses.</td>
<td>Development (Commercial, Office, Institutional); Mixed Use: Commercial and Retail; Mixed Use: Residential; Restriction of all forms of industries and auto-related uses;</td>
<td>Development (Industrial, Office, Institutional); Mixed Use: Commercial and Retail; Restriction of all forms of industries and auto-related uses;</td>
<td>Development (Industrial, Office, Institutional); Mixed Use: Commercial and Retail; Restriction of all forms of industries and auto-related uses;</td>
<td>Development (Industrial, Office, Institutional); Mixed Use: Commercial and Retail; Restriction of all forms of industries and auto-related uses;</td>
<td>Development (Industrial, Office, Institutional); Mixed Use: Commercial and Retail; Restriction of all forms of industries and auto-related uses;</td>
</tr>
<tr>
<td>Land Use Ratio</td>
<td>100% Non-Residential</td>
<td>50% Residential &amp; 50% Non-Residential</td>
<td>50% Residential &amp; 50% Non-Residential</td>
<td>50% Residential &amp; 50% Non-Residential</td>
<td>50% Residential &amp; 50% Non-Residential</td>
<td>More than 95% Non-Residential</td>
</tr>
<tr>
<td>Density</td>
<td>High-density commercial, employment; Moderate to high-density mix of residential, commercial, employment, and industrial uses;</td>
<td>Moderate to high-density mix of residential, commercial, employment, and industrial uses;</td>
<td>Moderate to high-density mix of residential, commercial, employment, and industrial uses;</td>
<td>Moderate to high-density mix of residential, commercial, employment, and industrial uses;</td>
<td>Moderate to high-density mix of residential, commercial, employment, and industrial uses;</td>
<td>Moderate to high-density mix of residential, commercial, employment, and industrial uses;</td>
</tr>
<tr>
<td>Height of Building</td>
<td>High-rise and mid-rise buildings; Moderate to low-rise buildings and single family housing;</td>
<td>High-rise and mid-rise buildings; Moderate to low-rise buildings and single family housing;</td>
<td>Moderate to low-rise buildings and single family housing;</td>
<td>Moderate to low-rise buildings and single family housing;</td>
<td>Moderate to low-rise buildings and single family housing;</td>
<td>Moderate to low-rise buildings and single family housing;</td>
</tr>
<tr>
<td>Section</td>
<td>Metro (Rail Transport System); Local Bus; Express Bus</td>
<td>Metro (Rail Transport System); Local Bus; Express Bus</td>
<td>Metro (Rail Transport System); Local Bus; Express Bus</td>
<td>Metro (Rail Transport System); Local Bus; Express Bus</td>
<td>Metro (Rail Transport System); Local Bus; Express Bus</td>
<td>Metro (Rail Transport System); Local Bus; Express Bus</td>
</tr>
<tr>
<td>Transit Modes</td>
<td>Automated Rail Transport System; Express Bus</td>
<td>Automated Rail Transport System; Express Bus</td>
<td>Automated Rail Transport System; Local Bus; Express Bus</td>
<td>Automated Rail Transport System; Local Bus; Express Bus</td>
<td>Automated Rail Transport System; Local Bus; Express Bus</td>
<td>Automated Rail Transport System; Local Bus; Express Bus</td>
</tr>
<tr>
<td>Mobility Facility</td>
<td>Park &amp; Ride; Bicycle Facility</td>
<td>Park &amp; Ride; Bicycle Facility</td>
<td>Park &amp; Ride; Bicycle Facility</td>
<td>Park &amp; Ride; Bicycle Facility</td>
<td>Park &amp; Ride; Bicycle Facility</td>
<td>Park &amp; Ride; Bicycle Facility</td>
</tr>
<tr>
<td>Average Job / Housing Ratio</td>
<td>No Residential: 5 Jobs: 1 Dwelling;</td>
<td>5 Jobs: 1 Dwelling;</td>
<td>5 Jobs: 1 Dwelling;</td>
<td>5 Jobs: 1 Dwelling;</td>
<td>5 Jobs: 1 Dwelling;</td>
<td>5 Jobs: 1 Dwelling;</td>
</tr>
<tr>
<td>Total Job Target</td>
<td>Less than 50,000</td>
<td>50,000 - 100,000</td>
<td>100,000 - 150,000</td>
<td>Less than 50,000</td>
<td>50,000 - 100,000</td>
<td>More than 100,000</td>
</tr>
<tr>
<td>Example</td>
<td>Tehran Swimming Club, Paradise International Shopping Centre</td>
<td>Eslamshahr Central Station; Eslamshahr Central Station; Eslamshahr Central Station</td>
<td>Eslamshahr North Station; Eslamshahr North Station; Eslamshahr North Station</td>
<td>Eslamshahr North Station; Eslamshahr North Station; Eslamshahr North Station</td>
<td>Eslamshahr North Station; Eslamshahr North Station; Eslamshahr North Station</td>
<td>Eslamshahr North Station; Eslamshahr North Station; Eslamshahr North Station</td>
</tr>
</tbody>
</table>

Table 6.1: Design guideline metrix for transit node development in the TMR (Source: Table by author).
### Design Guidelines Matrix for Transit Nodes Development in TMR

<table>
<thead>
<tr>
<th>Transit Node Type</th>
<th>Airport Node</th>
<th>Regional Centre</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Commercial or Mixed Use</strong></td>
<td>Employment (Airport Agency, International Company, Commercial Activity); Supporting Retail &amp; Services;</td>
<td>Employment (Commercial Activity, Office, Institution); Mixed Use; Cultural and Entertainment Destination; Residential; Major Retail &amp; Services; Restriction of all forms of industries and auto related uses;</td>
</tr>
<tr>
<td><strong>Residential</strong></td>
<td>Supporting Retail &amp; Services;</td>
<td>Residential; Supporting Retail &amp; Services; Restriction of all forms of industries;</td>
</tr>
<tr>
<td><strong>Industrial</strong></td>
<td></td>
<td>Residential; Supporting Retail &amp; Services;</td>
</tr>
</tbody>
</table>

- **Location**: Within Airports. Within the downtown of the large cities.

- **Land Use**: Employment (Airport Agency, International Company, Commercial Activity); Supporting Retail & Services;

- **Land Use Ratio**: 100% Non-Residential, 20% Residential & 80% Non-Residential

- **Density**: High-density commercial, employment; High-density mix of residential, commercial, employment, and civic/cultural uses;

- **Height of Building**: High-rise and mid-rise buildings

Table 6.1: Design guideline matrix for transit node development in the TMR (Source: Table by author).
### Regional Design & Institutional Recommendation

#### Design Guidelines Matrix for Transit Nodes Development in TMR

<table>
<thead>
<tr>
<th>Town Centre</th>
<th>Neighbourhood Centre</th>
<th>Semi-Industrial Centre</th>
<th>Industrial Centre</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Town Centre Icon" /></td>
<td><img src="image2.png" alt="Neighbourhood Centre Icon" /></td>
<td><img src="image3.png" alt="Semi-Industrial Centre Icon" /></td>
<td><img src="image4.png" alt="Industrial Centre Icon" /></td>
</tr>
</tbody>
</table>

- **Within the centre of the medium or future medium size cities.**
- **Adjacent or within residential areas.**
- **Adjacent to both residential and industrial areas, with the two area separated by major barrier (major road/highway; rail line).**
- **Adjacent or within industrial areas or other large employment centres.**

#### Land Use Ratios & Location

<table>
<thead>
<tr>
<th>Location</th>
<th>Airport Node</th>
<th>Regional Centre</th>
<th>Town Centre</th>
<th>Neighbourhood Centre</th>
<th>Semi-Industrial Centre</th>
<th>Industrial Centre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employment (Commercial, Office); Mixed Use; Residential; Supporting Retail &amp; Services; Restriction of all forms of industries and auto related uses;</td>
<td>50% Residential &amp; 50% Non-Residential</td>
<td>80% Residential &amp; 20% Non-Residential</td>
<td>35% Residential &amp; 65% Non-Residential</td>
<td>more than 95% Non-Residential</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate to high-density mix of residential, commercial, employment, and civic/cultural uses;</td>
<td>Moderate to high-density, predominantly residential uses with supporting retail and employment uses;</td>
<td>Moderate density, predominantly industrial units with supporting residential areas;</td>
<td>Varies;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mide-rise and low-rise buildings and few single family housing</td>
<td>Mide-rise and low-rise buildings and single family housing</td>
<td>Mide-rise and low-rise buildings and single family housing</td>
<td>Varies</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Design Guidelines Matrix

<table>
<thead>
<tr>
<th>Transit Node Type</th>
<th>Airport Node</th>
<th>Regional Centre</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Transit Modes</strong></td>
<td>Automobile</td>
<td>Metro</td>
</tr>
<tr>
<td></td>
<td>Rail Transport System</td>
<td>Rail Transport System</td>
</tr>
<tr>
<td></td>
<td>Express Bus</td>
<td>BRT</td>
</tr>
<tr>
<td><strong>Mobility Facility</strong></td>
<td>Park &amp; Ride</td>
<td>Bicycle Facility</td>
</tr>
<tr>
<td><strong>Average Job / Housing Ratio</strong></td>
<td>No Residential</td>
<td>10 Jobs: 1 Dwelling</td>
</tr>
<tr>
<td><strong>Total Job Target</strong></td>
<td>More than 50,000</td>
<td>20,000 - 50,000</td>
</tr>
<tr>
<td><strong>Example</strong></td>
<td>Imam Khomeini International Airport</td>
<td>Karaj City Centre</td>
</tr>
<tr>
<td></td>
<td>Payam International Cargo</td>
<td></td>
</tr>
</tbody>
</table>

Table 6.1: Design guideline matrix for transit node development in the TMR (Source: Table by author).
## Design Guidelines Matrix for Transit Nodes Development in TMR

<table>
<thead>
<tr>
<th>Town Centre</th>
<th>Neighbourhood Centre</th>
<th>Semi-Industrial Centre</th>
<th>Industrial Centre</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Diagram" /></td>
<td><img src="image" alt="Diagram" /></td>
<td><img src="image" alt="Diagram" /></td>
<td><img src="image" alt="Diagram" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mode</th>
<th>Town Centre</th>
<th>Neighbourhood Centre</th>
<th>Semi-Industrial Centre</th>
<th>Industrial Centre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automobile</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rail Transport System</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local Bus</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Express Bus</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Park &amp; Ride</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bicycle Facility</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 Jobs: 1 Dwelling</td>
<td>1 Jobs: 3 Dwelling</td>
<td>7 Jobs: 1 Dwelling</td>
<td>Varies</td>
</tr>
<tr>
<td></td>
<td>5,000 - 15,000</td>
<td>limited</td>
<td>5,000 - 15,000</td>
<td>More than 30,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eslamshahr Central Station</td>
<td></td>
<td>Eslamshahr North Station</td>
<td>Chahardangeh Station</td>
<td>Shamsabad Station</td>
</tr>
<tr>
<td>Parand Central Station</td>
<td></td>
<td>Parand Stations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pakdasht Station</td>
<td></td>
<td>Soltanabad Station</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Spatial Development Proposal

In order to categorize the spatial developments around the transit nodes the potentials of each node are considered. As it was already discussed based on the node-place model of the Bertolini, whenever the node values are higher, it will lead to the greater intensification and diversification of the land use around this transit node. In this way the station area could be more in balance and its potentials can be utilized. In identifying which transit node in TMR Triangle should have what kind of transit node type, the author considers this mechanism.

In this regards the two anchor points of the TMR Triangle, Karaj and IKIA, and also Payam Cargo due to the high accessibility by different modes of transport, present a high node value in the context of TMR 2050. As a results they will be supported by highest level of spatial development that is in the same line with the goals of TMR 2050. After that three nodes in the Tehran-IKIA corridor has the good node value, due to access by both highway and railway. Therefore they will have the higher spatial development in comparison with the nodes located in this corridor.

Map 6.27: Typology of spatial development proposal (Source: Map illustrated by author).
### 6.4.3 Implementation of the Regional Design Proposal

After preparing the regional design proposal, it is necessary to move to the next step and think about the implementation of this proposal. Huge project like developing the TMR Triangle is too complex to realized without any planning for its implementation. Due variety of involved discipline (infrastructure and spatial development) and the scale of the proposal, many stakeholders are involved in this project. Furthermore, all the interventions could not be realized together, and there should be a time planning based on the priority of the actions. Therefore, this section of the report will discuss about involved stakeholder and proposed a phasing schemes for the regional design implementation.

**Stakeholders Identification**

For developing smart and successful regional spatial strategy, identifying and engaging the whole range of stakeholders is fundamental. Engaging stakeholders in the process of policy making provides a way of exchanging knowledge and information to improve the spatial planning process. It can also help create consensus between stakeholders and enhancing building support and ownership for spatial strategies and plans.

<table>
<thead>
<tr>
<th>Public Sectors</th>
<th>Planning and Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Transportation and Housing</td>
<td></td>
</tr>
<tr>
<td>National Management and Planning Organization</td>
<td></td>
</tr>
<tr>
<td>Interior Ministry</td>
<td></td>
</tr>
<tr>
<td>Ministry of Economic Affairs and Finance</td>
<td></td>
</tr>
<tr>
<td>Municipalities</td>
<td></td>
</tr>
<tr>
<td>High Council of Road</td>
<td></td>
</tr>
<tr>
<td>Department of Coordination of Provinces affairs</td>
<td></td>
</tr>
<tr>
<td>Management and Planning Organization of Tehran Province</td>
<td></td>
</tr>
<tr>
<td>General Governors and District Governors</td>
<td></td>
</tr>
<tr>
<td>Tehran Urban and Suburban Railway Groupe of Companies</td>
<td></td>
</tr>
<tr>
<td>Karaj Urban and Suburban Railway Groupe of Companies</td>
<td></td>
</tr>
<tr>
<td>New Towns Development Corporation</td>
<td></td>
</tr>
<tr>
<td>Housing Foundation of Islamic Revolution in Iran</td>
<td></td>
</tr>
<tr>
<td>Airport Companies</td>
<td></td>
</tr>
<tr>
<td>Local Banks</td>
<td></td>
</tr>
<tr>
<td>Development Department of Municipalities</td>
<td></td>
</tr>
<tr>
<td>Construction Department of Road and Transportation Ministry</td>
<td></td>
</tr>
<tr>
<td>Department of Highways</td>
<td></td>
</tr>
<tr>
<td>Department of Road and Transportation of Tehran Province</td>
<td></td>
</tr>
<tr>
<td>Department of Road and Transportation of Alborz Province</td>
<td></td>
</tr>
<tr>
<td>Tehran Urban and Suburban Railway Groupe of Companies</td>
<td></td>
</tr>
<tr>
<td>Karaj Urban and Suburban Railway Groupe of Companies</td>
<td></td>
</tr>
<tr>
<td>Department of Construction and Development of Railways</td>
<td></td>
</tr>
<tr>
<td>Airport Development Companies</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Private Sectors</th>
<th>Planning and Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Banks and Finance Companies</td>
<td></td>
</tr>
<tr>
<td>Road Investors</td>
<td></td>
</tr>
<tr>
<td>Railway Investor</td>
<td></td>
</tr>
<tr>
<td>Real Estate Developers</td>
<td></td>
</tr>
<tr>
<td>Local Developers</td>
<td></td>
</tr>
<tr>
<td>Transportation Companies</td>
<td></td>
</tr>
<tr>
<td>Airlines</td>
<td></td>
</tr>
<tr>
<td>International Investors</td>
<td></td>
</tr>
<tr>
<td>Real Estate Developers</td>
<td></td>
</tr>
<tr>
<td>Local Developer</td>
<td></td>
</tr>
<tr>
<td>Private Road Development Companies</td>
<td></td>
</tr>
<tr>
<td>Private Railway Development Companies</td>
<td></td>
</tr>
<tr>
<td>Airlines</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Civil Society</th>
<th>Planning and Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Owners</td>
<td></td>
</tr>
<tr>
<td>Local Residents</td>
<td></td>
</tr>
</tbody>
</table>

Table 6.2: Involved stakeholders in the TMR triangle development (Source: Table by author, data from Tehran Municipality).
Engaging the stakeholders could provide opportunities for participation (where the decision-making authority is open about the way forward and may wish to collect views on options), consultation (where the decision-making body has a preferred option or even draft proposals which it can present to others for review and refinement), representation (where those affected by proposals are permitted to make a formal objection to the authority) and appeal (where those in opposition to the decision have the ability to appeal to a higher administrative authority and/or the courts on specific grounds). Early participation will help to generate more creative solutions that are likely to meet a wider range of objectives (Unece, 2006).

In a huge project like developing TMR Triangle, variety of stakeholders are involved, who are responsible for different stages of the process: Planning and Budget, Implementation and Maintenance and Utilization. Each step will involve specific actors that are separated in three different groups: Public Sector, Private Sector and Civil Society.

Here is the example of involved stakeholders in the development of the proposed spatial strategy and the regional design for TMR 2050.
Phasing Scheme for Proposed Regional Design Implementation

As it was mentioned, in a huge project like TMR Triangle 2050, all the interventions could not be realized together, there are some actions needs to be done first, to provide the background for the others. Additionally some interventions have the priority in terms of the importance for the realization, since in the long time frame of the project noting could be predicted in terms of financial capability or the change of decision-making or executive power. Hence, there should a time planning based on the priority of the actions needed to initiate the redevelopment process. The phasing scheme shows this priorities and illustrates the times needs for each actions to be completed.

As displayed in the schemes, different interventions have overlap with each other. Therefore in the specific periods of time several interventions will be completed. These interventions are grouped in a general terms, such as Tehran-IKIA corridor development which is dedicated to the several transit nodes spatial development along this corridor. Hence, for a better transparency of the process, this graduation project identifies the actions need to be completed in a specific time frame of 2020, 2030, 2040 and 2050. The following maps illustrate the progress of the process and the image of the region in each 10 years clearly.

Diagram 6.14: The phasing scheme development (Source: Diagram by author).
Regional Design & Institutional Recommendation

Phase 0: Existing Situation

Map 6.28: Visualization of phase 0 of developments (Source: Map illustrated by author).
Phase 1: 2012-2020

**Actions:**

- **Second and Third Regional Ring Road:** To reduce the radial movement towards Tehran, and connect peripheral settlements to each other.

- **Railway from Tehran to Imam Khomeini Airport (Part 1):** Connect the capital to the international Airport, and provide the choice of commuting with public transport for the low-income settlements located in that corridor.

**Actions:**

- **Imam Khomeini Airport Development (Part 1):** Using the potential of the international airport for the construction of the new business district and provide new job opportunity for the people living in southwestern part of the region.

- **Developing Karaj City Centre (Part 1):** Initiated the development in karaj as new regional centrality.

Map 6.29: Visualization of phase 1 of developments (Source: Map illustrated by author).
Phase 2: 2020-2030

**Actions:**

- **Railway from Tehran to Imam Khomeini Airport (Part 2):** Finishing the railway connection from Tehran to airport.

- **Imam Khomeini Airport Development (Part 2):** Connecting Tehran with Airport by rail transit network can accelerate the process of the Airport development, since at this time people have an easy access to airport.

- **Developing Karaj City Centre (Part 2):** Finishing the Karaj city centre development provide job opportunity for the Karaj and its suburban areas population. This will reduce the need for commuting to Tehran.

**Actions:**

- **Payam International Cargo Development (Part 1):** As a strong opportunity for economic development of the Karaj.

- **Station Development in Eslamshahr, Robatkarim and Parand:** These stations will act as a sub centres for more daily basis and primary jobs in the Tehran-IKIA corridor.

- **Station Development in Tehran-Karaj Corridor**

Map 6.30: Visualization of phase 2 of developments (Source: Map illustrated by author).
Phase 3: 2030-2040

Actions:

- **Imam Khomeini Airport Development (Part 3)**
- **Station development in Karaj Central Axis**
- **Payam International Cargo Development (Part 2)**
- **Station Development in Tehran-IKIA Corridor**: These stations are mainly residential units with TOD principles. That encourage more sustainable environment in Tehran-IKIA corridor.
- **Station Development in Tehran-Karaj Corridor**

Map 6.31: Visualization of phase 3 of developments (Source: Map illustrated by author).
Phase 4: 2040-2050

Actions:

- **Imam Khomeini Airport Development (Part 4)**
- **Station Development in Tehran-IKIA Corridor**
- **Station Development in Tehran-Karaj Corridor**
- **Railway from Karaj to Imam Khomeini Airport**: This railway encourages the functional synergy between two new introduced regional centralities.
- **Railway from Eslamshar to Behesht Zahra**: Connect Eslamshar to the huge industrial centre near Behesht Zahra with railway transit network.

Map 6.32: Visualization of phase 4 of developments (Source: Map illustrated by author).
6.5 From Building Regional Governance to Regional Development

Past experiences in Iran proved that in the absence of the appropriate responsible authority, plans will only remain on paper and never realize in reality. The case of the TMR is also demonstrated this fact. After passing 9 years from the approval of the TMR regional plan, no action took place in line with the realization of the plans objectives. Hence updating regional vision based on the current trends of society seems ineffectual in the absence of the regional authority that manages the metropolitan development, realizes the proposed regional plans. Therefore, establishing a regional authority is the first step for solving regional deficiencies. This section of the report aims to propose an institutional recommendation in order to realize this goal. Before explaining the new governance system at regional level, it is important to explain the necessity of the regional planning.

6.5.1 The Necessity of the Regional Planning

As the resolution of urban problems is scaled up to the regional level, the urgency of regional planning is becoming increasingly important. In the absence of integrated regional perspective and spatial plan that guide the future development, many issues and problems will simply circulate in different locations within the same region instead of being solved. Therefore, it is necessary that policy maker keep the entire region in a holistic view while drafting the development plans. This does not stand for the downgrading the local planning, but also emphasis on the necessity of the planning in all scales.

By concept of regional planning national economy will broken down into a manageable set of interdependent regions (Richardson, 2006). In the current circumstances provincial planning is considered as a regional planning, which is still does not assigned for preparation of the common spatial plan for the whole provincial territory. Nevertheless it is still necessary to have planning at metropolitan regional territory. The necessity of the regional planning could be explained by two facts. First the gap in scale between national plans and provincial plans is too large for effective coordination (national territory is divided to 31 provinces) unless a link is made via development of a national-regional-provincial system. Second, the provincial planning is based on the political jurisdiction which is not coinciding with functional urban territory. As it can be seen in the case of the Tehran Metropolitan Region, Karaj which has the most functional integration with Tehran is located in another province.

All together, regions should have two criteria: regions should be coinciding with the boundaries of the provinces aggregated together (administrative coherence), and they should be based in the functional linkage rather than homogeneity consideration (Richardson, 2006). In the case of the Tehran Metropolitan Region, region is consisting of two provinces (Tehran and Alborz). The following section will discuss the necessity of the building regional governance in order to develop and realize the regional plans.

6.5.2 Building Regional Governance

Analysis of the urban governance in TMR highlighted the importance of the regional governance in solving the regional problems and leading the future urban developments in TMR. Furthermore, in order to increase the regional cohesion and competitiveness, it is necessary to enhance the regional capacity (Lambregts et al., 2008).

Regional governance is principally about a vertical relationship between national government and its constituent local governments; and a set of horizontal relationships between local governments, with their respective civic sectors and with their regional institutions (Miller and Lee, 2011). The proposed new regional governance structure does not call for a separate political and administrative structure. Adding a new layer to the political and administrative structure of the government lead to lots of changes in the government system and produced plenty of difficulties in introducing new system. Hence, the author suggests for an independent regional authority like Regional Planning Council (RPC) that is accepted by all influential elements in the regional governance and management system.

The Regional Planning Council (RPC) should prepare long-term plans and policies to guide the growth and development of Tehran Metropolitan Region. RPC also should provides leadership on national infrastructure, sustainability, and competitiveness concerns.
The main tasks at the regional level are to interpret and adapt national policies and priorities to regional conditions, to provide a strategic plan which addresses the functional planning relationships and overall development patterns, and to provide guidance and assistance to local authorities in the creation of local planning instruments (Unece, 2008).

The board membership typically consists of locally elected public officials, representative from different ministries, along with representatives from the business, education and the community service sectors. However, in order to make balance between regionalism and localism and both regional and local interests, the PRC should be a combination of the locally elected public officials (who produce more locally-focused policy) and non-elected public managers (who produce more regionally-oriented policy) (Gerber and Gibson, 2009). It is also suggested that in order to have more democracy in the planning, the non-elected official, be more responsible for the preparing informations and developing vision and spatial development plans rather than decision making. The decision making will be approved based on the votes of the locally-elected officials.

Through information exchange and collaborative planning, the Regional Council could provide a comprehensive and integrated regional spatial strategy. This regional spatial strategy have to address transportation, economic development and small business promotion, housing, land use, land protection, sustainable development, low-income settlements reinforcement. Collaboration is the Key concept in the regional governance. By working together municipalities can accomplish more than the sum of their parts. They can use the resources more efficiently and enjoy the economy of scale, so they can provide better services, create job and develop infrastructure.

It is necessary to keep in mind that, do not confuse the lack of the separate political and administrative structure at the regional level with the concept of volunteer cooperation. As it was mentioned it the governance analysis section, if the cooperation become volunteer there might be a danger of not having cooperation at all (See chapter 4, section 3.4) . In order to reduce this risk, it is crucial that higher level of the authority set policies to obligate cooperation for the local authorities.

### The Roles of Regional Planning Council (RPC)

- Supervising local spatial planning to ensure conformity with national and regional strategies;
- Encourage local authorities to collaborate with each other in preparing local spatial strategy (especially bordering local authorities);
- Facilitate dialogue between provincial and national governments and individual municipalities;
- Arrange annual regional conference for exchanging information
- Training expert planner for local authorities across the region and updating their knowledge and skills by arranging regular workshops;
- Work with local leaders to identify opportunities for shared services to eliminate duplication and reduce the costs of government services.
- Extensive regional analysis of the regional development trends, identify new opportunities and potential areas for national and local government.
- Comprehensive report on evaluation of the previous plan and their impacts on local and regional territory
- Develop comprehensive regional development strategies to describe economic trends, strategies and opportunities.
- Develop a comprehensive land use regulation plan at regional level and supervise obeying the regulation in order to preserve the land and prevent from further urban sprawl;
- Provide a platform for negotiation of different stakeholders;

Table 6.3: Role of regional planning council (Source: Table by author.).
The council could mainly acts as a project facilitator that provides a platform for the negotiation of the different stakeholders. It should coordinates roundtable discussion to enable reaching to an agreement on spatial developments strategies (Unec, 2008). Cooperation between different players of the region will allow a more efficient use of local talents and human resources. In the following the possible roles of the RPC based on the needs of the TMR is proposed.

For developing smart and successful regional spatial strategy, identifying and engaging the whole range of stakeholders is fundamental. Engaging stakeholders in the process of policy making provides a way of exchanging knowledge and information to improve the spatial planning process. It can also help create consensus between stakeholders and enhancing building support and ownership for spatial strategies and plans. Engaging the stakeholders could provide opportunities for participation (where the decision-making authority is open about the way forward and may wish to collect views on options), consultation (where the decision-making body has a preferred option or even draft proposals which it can present to others for review and refinement), representation (where those affected by proposals are permitted to make a formal objection to the authority) and appeal (where those in opposition to the decision have the ability to appeal to a higher administrative authority and/or the courts on specific grounds). Early participation will help to generate more creative solutions that are likely to meet a wider range of objectives (Unec, 2006).

The proposed spatial plan and regional policies should promote the social participation and induce the private sector involvement as a partner for urban development. The proposals should have two criteria:

1) Proposed regional plans should be more specific and less abstract than the current one, in order to avoid different interpretations of plans and facilitate their coherent implementations.

2) Proposed regional plans should be more flexible, in order to be adaptable to the upcoming economic, social and political changes.

These spatial planning and regional policies proposed by the RPC, after acceptance by the National government have to be followed by the local authorities. The PRC should have an special team to supervise the adherence of plans and policies by local authorities and in the case of any violation from later groups they should report it to the responsible authority.

It is crucial to note that, building regional capacity is not simple. There are many challenges for building regional capacity such as horizontal interregional authority competition (Lambregts et al., 2008), and also, various interests in visioning the future development between different local authorities (horizontal) or between (sub) national and local authorizes. For developing effective governance it is necessary to diminish these obstacles and searching for innovative ways of enhancing the regional capacity in more effective ways. Therefore, it is also important to learn lessons from other countries. This could be an excellent issue for further research in TMR.
Chapter 7

Conclusion

The final chapter of the report is dedicated to the conclusion. The conclusion of this master thesis consists of three parts; synthesis and evaluation. In the synthesis, all sub-research questions asked in the beginning of the research will be answered. This will provide a brief review of the whole research. In the second section the proposed spatial strategy for the TMR will be evaluated in two aspects; First the influences of the proposal on the problems will be evaluated. Next to this, the proposal will be compared with the current government’s proposal. The third section includes the final conclusion of the thesis.
7.1 Synthesis

In order to answer the main research question of the thesis, the author develop 11 sub-research questions (SRQ) and answered them through a multi-dimensional research. Although this thesis answered to all of these questions within different chapters of the report comprehensively, for a more convenient access to the answers of this questions, the author answered them continuously in this section. Since the sub-research questions will cover the whole graduation process, answering to them will develop a synthesis of the whole graduation project.

SRQ 1: What is the definition of the PUR based on the existing literature?

Although the concept of polycentricity is becoming increasingly popular in spatial planning, it is still not supported by a clear dentition (Davoudi, 2003) and there are several characterizations amongst different authors for an urban system to be considered as a polycentric one. Meijers et al. (2007, p.7) define a polycentric development as “a policy that addresses the distribution of economic and/or economically relevant functions over the [spatial] system in such a way that the urban hierarchy is flattened in a territorially balanced way”. Dieleman and Faludi (1998, p.366) explain PUR as a region where the once separate cities of relatively similar and modest size have now coalesced into one functional urban region. Davoudi (2005) has expressed a similar view and describes PUR as a region with three or more historically and politically distinct cities with no hierarchical ranking, in a reasonable proximity and with functional interconnection.

While there is a consensus between various authors regarding to existence of multiple centralities in an urban system, there are still different opinions in terms of necessity for functional interactions between these centralities. Some commentators of the PUR indicate that nodes without balanced relations would not form a polycentric system (ESPON 1.1.1, 2004). However some authors like Champion (2001) supports different levels for PUR in terms of degree of interaction and inter-dependence between the centralities. Based on the different explanations in the existing literature, this research defines the PUR as a concept that denote the existence of multiple relatively close centres in one region with a functional interaction. The level of interaction would vary from one region to another.

SRQ 2: What are the advantages and disadvantages of developing PUR?

PUR is not an impeccable model. It has its own advantages and disadvantages like other spatial planning models, which should be considered in order to gain from opportunities and be prepared for the inconveniences. PUR helps to diminish regional disparity and social segregation by encouraging more balanced development within the regional territory. Unlike the core-periphery conceptualization of monocentric model that all the opportunities are concentrated in one urban centre, PUR promotes the distribution of economic activities over the spatial territory with less pressure on each centrality. Furthermore, PUR promotes the advantages of stronger interaction between neighbouring cities to develop specialised and complementary assets, while avoiding large-scale urban sprawl and destructive territorial competition. Cooperation of neighbouring cities may provide greater agglomeration economies for smaller cities by facilitating resource and policy synergy to compete more effectively in the world market.

On the other hand, PUR will raise the concern about the environmental costs, since it is promoting personal mobility and long-distance commuting. Moreover, process of interaction between centres leading to the reallocation of activities between them as beneficial for the region is followed by creation of the winners and losers at local level.

SRQ 3: What are the fundamental elements for measuring polycentrism in a region?

Since not all clusters of cities that are located in a close proximity form a PUR, it is necessary to define crucial elements that provide the possibility of measuring the polycentricity in any urban systems which represents a polycentric phenomenon. Based on the existing literatures, this research extracts three aspects for measuring polycentricity in an urban region. These aspects are: Spatial Form, Functional Relationship and Governance. The first two aspects, morphology and functional relationship are known as essential elements for developing a PUR. However governance seems to be helpful for reaping the alleged benefits of polycentricity. In the following these three aspects are explained briefly.

Spatial Form: The spatial form basically addresses the size and territorial distribution of the urban centres across the territory and equates more balanced distributions with polycentricity (morphological polycentricity) (Burger and Meijers, 2011).
**Functional Relationships:** Functional relationship takes the functional connections between the urban settlements into account and considers a balanced, multidirectional set of relations to be more polycentric (functional polycentricity) (Burger and Meijers, 2011).

**Governance:** The governance aspect of polycentric development addresses the necessity of building regional governing capacity and promotes cooperation of local authorities through voluntary arrangements in order to develop integration between different centralities.

**SRQ 4: How does the government encouraged or discouraged the polycentrism in the TMR, through urban plan and policies?**

In order to investigate how the polycentric model was encouraged or discouraged by the government, this research made a review of different urban planning and policies affected the urban development of the TMR. Here an abstract review of these policies is presented.

Before the 1960’s most of the efforts were done to create a strong centrality within the country. In 1930’s, as a result of administrative centralization Tehran became the unique Political pole of the country. Massive construction of the road in that period connected the capital to the important economic destination of the country and paved the way for excessive investment in the TMR. Finally during the 1940’s this dream came to reality and Tehran became the unprecedented economic centre of the country. The monocentric development of Iran turned out to be not a wise policy and resulted to many problems for the capital of the country due to its tremendous growth rate. As a consequence after the 1960’s the government changed their policy directions and encouraged decentralization from Tehran. Looking at different plans and policies of government illustrates the influence of the polycentric development policy at different level of policy-making.

At the national level from early 60s, the government pursuing decentralization policy by directing the investments to the other regions of the country, attempt to reduce attractiveness of Tehran and providing more balance in urban system at national level. At the municipal level Tehran experienced three master plans (1968, 1993 and 2006). Each of these plans encouraged polycentric development within Tehran. At regional level government proposed a polycentric development within Tehran metropolitan region. This plan envisages creating nine urban agglomerations by equipping some larger cities with infrastructure and urban services funded by the central government to serve as regional centralities.

**SRQ 5: How the population and activities distributed over the TMR territory?**

For measuring the morphological aspect of the polycentricity, this research built an understanding about spatial configuration of the TMR by analysing different layers of spatial form. The results will be present in the following:

- Regarding to the concentration of the population TMR tend to be more dispersed monocentric, with concentrating most of the population in Tehran. However Karaj, Shahriar and Eslamshahr have higher growth rate in comparison with the other part of the region.
- Most of the advanced services are concentrated in the centre of Tehran with extension towards north. Although there is medium centrality in Karaj, TMR is tending to be more centralized monocentric according to concentration of the service activities.
- Industrial activities are distributed over the TMR territory in a more balanced way. They are mainly located along the Tehran’s main highways. TMR is tending to be more centralized polycentric according to concentration of the industrial activities.
- TMR is tending to be more dispersed polycentric according to distribution of the mobility nodes. Since only Tehran and Karaj are favoured by concentration of different mobility nodes and rest of the region mainly have only access to the bus nodes only. The two main potential mobility nodes are IKIA and Payam International Air Cargo.

Putting all layer of spatial form analysis together it could be concluded that, since there is minor tendency in spatial configuration of the TMR of being polycentric, it is more dispersed monocentric. Furthermore the research illustrated that the TMR is more polycentric in terms of distribution of the population and distribution of low-skilled jobs not the high-skilled one.

![Diagram 7.1: The overlap of different morphological aspects on polycentricity analysis (Source: Diagram by author).](image-url)
SRQ 6: What is the level of functional interaction and interdependence between various centres in the TMR?

In order to measure the functional interaction and interdependence between various cities in TMR, this research analysed the region in different relational aspects. Based on the finding of the research the following statements could be claimed for the functional integration between cities within the TMR.

- The degree of the functional interaction differs in different parts of the region. Central cities have more integration than peripheral ones.
- Even within the central part of the region not all the cities have the same degree of interactions. Tehran has more functional interaction with the cities located in its western (Karaj) and south-western (Eslamshahr and Shahriar).
- The current mobility infrastructure encourages the radial movement towards Tehran. The radial predominance between Tehran metropolis and surrounding cities is due to the absence of the regional ring road that connects the peripheral settlements to each other.

Finally it could be concluded that although the relations between cities in the TMR is more unidirectional form other cities towards Tehran (due to the concentration of the jobs in Tehran); the interaction is stronger between Tehran and Karaj and also Tehran and cities located in the Tehran-IKIA corridor.

SRQ 7: How can the existing governance of the TMR promote the PUR?

The governance structure plays an important role in reaping the alleged benefits of polycentricity. Hence, in order to evaluate the possibility of the polycentric development in the TMR, it is necessary to look at its urban governance structure and measure its potentials for developing such a planning model.

In the present condition, TMR is not recognised by law as an official entity; hence many governmental institutions had their influences on the governance of the TMR. Moreover, the current planning and management system is organized in a rigid structure, considering the administrative and political borders rather than the regional phenomenon. The nonconformity of governmental territories with functional territory of city-regions resulted many problems are being neglected in decision making.

In the current situation, there is no general strategy according to the whole regional problems and interests. Moreover, there is no regional administrative authority to propose and realize the regional development as well as coordinate it with the other level of governance. The ministries (national level) merely focus on the national issues and do not pay attention to the local issues. On the other hand local administrations (Municipalities and district authorities) focus on local issues and do not pay attention to the national issues. This creates incoherency and gap for the governance of the regional level. Furthermore, there is no integration across the administrative boundaries and across policy sectors. Unfortunately managerial elements of the TMR- cities’ municipality, district authorities and executive units- are functioning without adequate communication and cooperation with each other. This will result many issues and problems will simply circulate in different locations within the same region instead of being solved.

Consequently, forming a PUR, in a situation where local organizations do not cooperate with each other, there is no clear policies for TMR development and also the key actors are not committed to implementing such policies seem to be a vain effort. The only way for unifying and directing diverse and fragmented forces of the region is creating a common perspective and its acceptance by all influential elements in the region’s governance and management.
SRQ 8: Are the trends in TMR in the same direction with the vision of the government (Polycentric development)?

In order to answer to this question, it is crucial to review the development trends of the TMR during its growth.

From the second half of 1940s as a result of government investment and subsequently private sectors in Tehran, growth and development of this city reached an unprecedented rate. In the short period Tehran overtook the other regions of the country and became the undisputed economic hub. Development in this period was towards the north of the city. By displacement of the high class people towards the north, advance services have also moved with them. Numerous problems and shortcomings of the rapid growth of the late 50s promoted the government to remedy. In early 60s, government pursued decentralization policy by exerting the restrictions on construction within Tehran boundary and construction of new industries along the main corridors towards Tehran. By exerting restriction on construction in Tehran, the middle income people moved toward West and settled in Karaj and low income people mostly pushed toward south and southwest and creates new settlements near Tehran. Pushing low-income population towards the south was associated with creating informal settlements in the TMR periphery. This is due to neglection of the enough low-income housing in the government policy. This process will occur several times. Whenever the land become expensive, the poor population will be pushed to the further periphery.

In the forty years of decentralization policy the process of movement towards west and south-west continued. This trend is not consistent with the government’s plan, since in government polycentric vision the whole region is considered in the equal level. The main challenge for the TMR is now only population moved to the peripheries and the jobs are stay in Tehran. This incomplete de-concentration from Tehran is the source of many problems that region dealing with nowadays.

Diagram 7.2: Evolution of the TMR (Source: Diagram by author).

Diagram 7.3: The process of marginalisation of low income people to the periphery (Source: Diagram by author).
SRQ 9: What are the urban planning recommendations to enhance the quality of life in the TMR?

To improve the life quality in TMR, it is necessary to provide a general planning framework that promotes the future developments. Upcoming spatial strategies and regional design proposals for the TMR should follow the recommendations of the planning guideline for changing the regional condition to a desirable one. Based on the findings of the research most of the problems that the region dealing with is due to the uneven development within the regional territory, environmental unsustainability, neglecting low-income population, urban sprawl and institutional fragmentation. The planning guideline creates a framework in five themes that overcome each of the aforementioned problems. These themes are: Centrality, Mobility, Low-income Settlements, Landscape and Governance. The proposed planning recommendations are highlighted in chapter 5.

SRQ 10: What could be an alternative spatial strategy for the TMR based on the existing potentials in the region?

The research findings illustrate that, the government’s plan for developing nine urban centralities in the region is too ambitious and far from reality, since all urban cores proposed by the government do not have the same potentials and some of them are far from being an urban centrality. In the analytical part of this research, the morphological and relational analysis of the TMR exposed the potentials of the TMR Triangle as a new concept for the regional spatial structure. The TMR Triangle consists of three main anchor points as Regional Centrality; Tehran, Karaj and Imam Khomeini International Airport (IKIA). The research proven that except Tehran, only the two latter nodes have the highest potentials of being regional centrality. All of these centralities are formed from combination of the service cluster and Industrial pole that serve their surrounding settlements as the main centre for daily activities. This not only reduce the pressure form Tehran (traffic congestion and air pollution), but also reduce the daily commuting time for the population who lives outside the Tehran boundaries and saving their money and times for other activities. Furthermore, these regional centralities can support each other and enhance the position of the TMR as a stronger region. The former statement could only happen, when the aforementioned centrality starts to develop a functional synergy with each other. Therefore, the research proposed three elements to create functional synergy in the TMR Triangle; first, building rail transit corridors that provide physical connection between centralities as well as promoting new spatial development along these corridors to upgrade the socio-economic conditions in the settlements along these corridors. Second, build regional governing capacity to facilitate cooperation between aforementioned regional centralities. Finally, develop specialization to encourage interaction between centralities. In this regard, Tehran will remain the main economic centre of the TMR and it will identify as the political, cultural and recreation centre of the TMR Triangle. Karaj will identify as the educational and research centre of the Region and the centrality for International air cargo and its related companies. Lastly the IKIA as the international airport will be the gate of the region to the global world and the location for the international companies and offices.
SRQ 11: What are the design proposals and institutional recommendations to promote synergy in the TMR?

As stated in the proposed spatial strategy in order to create functional synergy in the TMR Triangle it is necessary to connect the major regional centralities with an efficient public transport and also build a regional governing capacity.

The design proposals in this graduation project are basically designing a new Regional Rail Transit System and Spatial Development along its transit nodes. Efficient public transport network will provide the means for a fast, frequent, cheap inter municipal commuting which increases the interaction between cities. In designing the Regional Rail Transit lines the fact of accessibility to the job for low-income inhabitants was in the highest priority. In order to create balance between the increasing mobility of people and the environmental requirement of reducing the need to travel it is necessary to integrate spatial development with public transport at regional level. In this way the seeming disadvantages of a polycentric structure (its propensity to generate inter municipal commuting), will be compensated. To direct the spatial development in a way that at same time it satisfies both regional goals and upgrade living quality at local level, this thesis designed a guideline to provide general parameters for local governments to promote and implement development that is supportive of transit investment.

Furthermore, in order to enhance the cooperation between crucial actors in regional developments it recommended for developing regional governance that is a mediator between national government and its constituent local governments; and local governments, with their respective civic sectors and with their regional institutions. Regional governance will encourage cooperation through providing a platform for negotiation of different stakeholders. This organization is responsible for developing regional development plan and supervising its realization.

7.2 Evaluation

7.2.1 Evaluating the Influences of the Proposed Spatial Strategy in Solving the Regional Problems

This graduation research proposed a solution for the TMR that will diminish the regional problems. These regional problems previously were addressed in the problem statement (first chapter) of the thesis. Therefore, it is necessary to evaluate that how the proposed plan will solve the regional problems and what are the probable problems emerging from this plan and how to prevent them.

In the left side of the diagram #.#, the current problems in the region are shown in the dark gray boxes. The red boxes illustrate the proposed plan to overcome these problems. The light gray boxes show the expected result from proposed plan. The dark gray blocks in the middle and right side contain the probable issues emerging from proposed plans. These issues have also been taken into account in this thesis and proposed solutions are added in the diagram. Following paragraphs explain the elements of the diagram.

High environmental problem of Tehran together with the traffic congestion within the city and its entrance axis during the rush hours (problems) will be reduced greatly by the provision of fast, frequent, cheap and accessible public transport (plan). Moreover a significant increase of costs associated to car use can also diminish the car travel (plan). Developing the high quality public transport with the increasing the car price will encourage the use of public transport among the inhabitants of the TMR (expected result). Integration of the public transport with land use development by promotion of high density mixed use around public transit nodes (plan) will prevent from further urban sprawl within the region and more encourage for the use of public transport (expected result). Using public transport will accompanied by the less personal transportation cost and less traffic congestion within the region which saves time formerly spends in the long traffic line and decrease the fatigue associated with it (expected results). However, these benefits may lead to an increase in the distance people travel and resulted to further urban sprawl within the region (Probable issue). This problem also could be solving by restricting of the construction within the suburb and promoting the policy of the concentrated decentralization within specific (Karaj city, IKIA and Tehran-IKIA corridor) urban cores.
Concentrated deconcentration will promote more balanced distribution of the urban activities within the regional territory. This form of the development does not the problems of Tehran such as overcrowded urban areas resulting to decreasing access to the open spaces and high land price in cities (problems). Moreover, it avoids from the problems those peripheral areas of the Tehran dealing with such as urban sprawl and uneven development and dependency (problems). Concentrated deconcentration developments introduce new centralities outside Tehran (expected result) and will eventually bring two types of benefits for the region. Regarding to Tehran this will bring the opportunity of removing unnecessary functions that will reduce the daily commuting towards Tehran and will provide room for adding new functions related to the role of Tehran as the capital of the country. Furthermore, it helps Tehran focus more in the functions that enhance its relation in the global market (expected result). On the other hand, for the centralities outside Tehran it will provide the chance to attract new activities and population for further growth (expected result).

However strengthen of these new centralities will increase the demand for living in these areas and raise the land price in them (expected result). In the lack of enough policy for the low-income settlements, they will be pushed to the further periphery (probable issue) as the experience of the TMR showed in the last decades, especially in the case of the Tehran-IKIA corridor that mostly occupied by low-income settlements. This problem also, could be solved by construction of the social housing or giving the housing loans to the low-income inhabitants of these areas (plan). In this way adding new economic activities to this area will gradually attracts middle-income population and construction of the social housing will guarantee the stay of the low-income population which results to the creation of the mixed-income neighbourhood.

On the other hand introducing new centralities within the region may also leads to destructive competition between Tehran and new centralities (probable issue), in order to avoid such a problem, creation of functional synergy by building network of urban centralities are proposed (plan). This functional synergy can be achieved by Institutional cooperation and regional identity as well as efficient transport network. Institutional cooperation and regional identity can be enhanced by introducing a regional council to ensure cooperation and harmonizes different centralities in a common action or effort.

Diagram 7.4: Evaluation of proposed strategy (Source: Diagram by author).
7.2.2 Evaluating the Superiority of the Proposed Spatial Strategy to the Government proposal

As it was stated in the Research Conclusion in chapter 5 the government’s plan for developing nine urban poles in the region is too ambitious and far from reality. Although the proposed plan seems to be a good solution for the TMR’s problems, it does not consider the facts and region’s potentials. According to morphological and relational analysis of the region, except from Karaj and IKIA there are no other potentials for planning new centralities. Moreover the current managerial and administrative structure of the TMR not only is not able to promote polycentric structure but also itself is a barrier for conducting such a strategy. After analysing the region in both Analytical and Normative dimensions, potentials for the future development in the region are recognized. The TMR Triangle strategy consists of spatial and institutional strategies for support the potential areas to grow and become other centralities cooperating with Tehran. The key goal in this research is by making optimal alterations in the government’s plan and considering the real situation of the region provide a plan which feasible.

It is also necessary to clarify that which part of the new proposed strategy is in the same line with the government proposal and in which part it suggests some changes. As it was discussed in the first chapter the government proposal emphasises on three aspects: Creating nine urban agglomerations with high density urban core. Separate these agglomerations by “green zones”. Connecting these regional centralities by a transportation networks. The TMR Triangle like the government proposal, promote a more balance distribution of the opportunities within the regional territory by encouraging the polycentric configuration for the TMR but in a more realistic way. However, this new strategy considers both morphological and relational aspects of the urban centralities in TMR, unless the government plan that only considers the morphological aspect. The TMR Triangle supports the government proposal for restricting the development within the existing urban boundaries and protecting them by introducing green belt (like Tehran). Moreover, the government proposal emphasises on the importance of public transport for the daily commuting, but it considers Bus as alternative for the intercity commuting. However, TMR Triangle takes rail transit system as a mean for this purpose.

Furthermore, the government proposal also addresses creating a form of regional management system for the TMR that controls the regional developments. The TMR Triangle strongly supports this idea, but it also emphasises in the necessity of cooperation for creating a vision, not only supervising the developments. This research put one step further and explains what this regional management system means and what it responsibility is.

---
7.3 Final Conclusion

This thesis aimed to understand the complexity and dynamism of the TMR, using polycentricity as an instrument to extract the potentials of this region in order to picture a better future. However during the process of research, the concept of polycentricity went beyond being an instrument and provided a model for future development of the TMR. The concept of the TMR Triangle addresses a more balance distribution of opportunities within the regional territories. Furthermore it opens up opportunities for debates, investigations and cooperations. However, it is important to emphasis that, this model do not follow are the charactristics that we observe in other PURs within Europe.

Based on the explanation of the PUR we expect a network of cities with no hierarchical ranking. However in the context of the TMR, Tehran expresses a different position in terms of locating different economic functions and urban services in itself. In the TMR, development of the PUR may diminish the hierarchical characteristic of centralities, but it will not remove it totally. This is partly due to the special status of Tehran metropolis in comparison with the other cities in the TMR. Tehran as the capital of the country, illustrates different role within the global and national context. It is important to keep in mind that the entire concept of polycentricity is highly scale-dependent: polycentricity at one scale may be monocentric at another (Nadin and Duhr, 2005, p82). The case of TMR is not exceptional in this regard. That is why the role of Tehran is not the same within the region. Here this issue will be discussed in different scales briefly.

GLOBAL SCALE: At the global scale, Tehran as the political and economic centre of country is the only city within the TMR Triangle (or even within the country) that is connected to the world. Although in the current circumstances due to the economic sanctions by the western countries, Iran’s relationship with the world is almost disconnected. Even in its most glorious era, Tehran was the only city within the Iran with the potentials of being global and it will have the highest potential if things will change in the future (map 7.1).

NATIONAL SCALE: At the national scale, Tehran as the capital of the country placed in itself most of the functions related to this status, therefore in morphological terms it has more nodality rather than the other centralities of the region (country). In relational terms also, it demonstrates stronger interaction with other cities within the country. Currently, Iran is tending to be more monocentric at national scale. However there are four other cities (Mashhad, Esfahan, Shiraz and Tabriz) which can be considered as strong cultural and industrial centralities, which could be considered as a possible potential for more balanced development at national level (map 7.2).

REGIONAL SCALE: At the regional scale, although the proposed configuration is polycentric, Tehran will express more importance according to its role in the global and national context. However in triangular strategy it is tried to enhance the introduced centralities by connecting to Tehran and benefitting from its national and international role (map 7.3).
CITY-REGIONAL SCALE: At city-regional scale, Tehran is the main centre for its surrounding settlements that provides their daily needs. This is the case also for the Karaj and IKIA city-regions. Therefore, at the city-regional scale the aforementioned urban areas express a monocentric configuration. As a strong centrality for their surrounding settlements, the need for daily travelling will be decreased to some extent (map 7.4).

CITY SCALE: Finally at the city scale the centrality could emerge as monocentric form or as a polycentric one. Within the TMR, city of Tehran is the only city that displays a polycentric structure by a linear centrality north-southward. Karaj also has the potential of being polycentric at the city scale. The other important cities of the region such as Eslamshahr, Robatkarim, Parand, Shahriar and Varamin due to their small scales will be monocentric at city scale (map 7.5).

Based on the statements argued in the previous paragraphs, polycentricity expresses a different configuration in the TMR, and it is not the same as we observe in the European context. This is initiated from the specific context of the TMR which is rooted in its urban development during the history. As Champion (2001) stated, the pre-existing forms of the urban settlements can influence the subsequent patterns of the urban development (chapter 2). Hence, although the TMR Triangle, encourages polycentric development at regional level and borrows the beneficial aspects of polycentric development from the European PURs, it translates it to the Iranian metropolitan context as well. As it was discussed in the research conclusion (chapter 5), the monocentric concept is not all about disadvantages. A wise strategy is to keep the good quality of existing structure and combine it with facilitator solutions of the polycentric concept. Tehran as the capital of the country grew bigger and stronger during the history and presents greater concentration of the activities in itself. Moreover, as a possible future global city (as a result of more integration with the global networks) it is necessary to enjoy its extensive critical mass and concentrates more global related functions. Hence, it could be concluded that the meaning of polycentricity in the TMR, is related to its regional scale and addressed the distribution of the regional functions in a more balanced way.
As final words it could be said that, although polycentric model sounds very rational and beneficial on paper and does not have the costs that monocentric model entails, it is wise to keep in mind that realizing this model in reality is not simple. As it was already discussed the concept of the TMR Triangle will solve many regional problems and help the TMR to upgrades its economic position with developing network of centralities. However making the concept realized needs lot of efforts and patients, especially in the case of the TMR with the long history of being monocentric region.

With a balance distribution of the economic functions over the TMR territory it is possible to diminish regional disparity. However, as it was already discussed in order to exploit the maximum potentials of the polycentric development it is necessary to create a functional synergy between the elements of the TMR Triangle through hard and soft infrastructure. Developing hard infrastructure will be realized by developing a regional rail transit system that connects the TMR Triangle components together. Although the past experiences proved than even physical development will take so long to be realized, this could be diminish through the on time negotiation with involved stakeholders and creating consensus between them.

However, the difficult part will be developing soft infrastructure. Soft infrastructure dedicated to the developing regional identity and building regional governing capacity. Here, the regional identity is concerned with the feeling of belonging together that helps in perceiving the polycentric urban region as an entity. The existence of such a regional identity in the polycentric urban region helps to generate social support that facilitates developing a common perspective and accelerates its realization. In the case of the TMR the huge social segregation between Tehran and other cities (especially cities located in the south) may hamper developing this regional identity. Tehran will not be satisfied being identified as a single entity with areas with social and economic problems. Although eventually by improving the conditions in surrounding cities, Tehran could receive benefits from them, it will be encounter with the Tehran’s reluctance in the beginning.

Developing polycentric urban regions also requires cooperation across administrative tiers and sectors and between public, private and other interest groups. Even when there is common agreement in building regional governing capacity, putting such multi-level governance in to practice is complicated. Especially in the TMR that horizontal collaboration between different local authorities is not routine. Furthermore, with the long history of being monocentric region, Tehran was always a priority in development of infrastructure and urban facilities. It might be associated with reluctance of Tehran to share these opportunities with the other. However considering the whole region, major part of the problems that Tehran encounters with them is associated to the regional deficiency. In general statement TMR is an integrated region. There are interconnections between its components and the fate of one element is not separated from the others. Therefore it is essential for Tehran to take a huge step toward regional cooperation by considering that solving any regional issue will lessen the burden from Tehranis shoulders. The conditions facilitate the cooperation between multiple regional actors and encourage them for participation could be considered as subject for further research in future.

The other issue that should be considered is the importance of regional planning. There is no doubt that in order to control the further urban growth and create a more competitive and attractive region, it is essential to manage its development with long term objectives and spatial strategies. Although it is not possible to predict the future, especially in the shadow of political and economic unsustainability of Iran, this does not in conflict with having overview on deficiencies and tracing the desirable future. In the first regional plan of the government, though it is too ambitious and too general, it was for the first time that regional planning was exercised in Iran. For the first time the problems were being looked from a larger framework that a city boundaries. Unfortunately due to the complexity of the realizing the proposed regional vision in the context of current institutional framework of the region, plans and policies remained only on paper and like before, regional planning became the forgotten layer of the planning in Iran.
No one denies the difficulty of providing a common vision in the situation that different public and private actors follow different interests. Nevertheless, in the last decades it has been proven that problems are not limited to the city boundaries and ask for coherent regional planning. Although Iran experiencing an acceptable national and city planning, it misses regional planning. The main goal of this graduation project was to highlight the importance of regional planning and illustrates that how thinking at regional level and proposing spatial strategy at this scale will help to solve many of the problems that close cities dealing with. Hence no matter how regional planning is complex or the TMR Triangle is difficult to achieve. We have to start off from somewhere and aim high in picturing the future. As Daniel Burnham stated: “Make no little plans; they have no magic to stir men’s blood and will not be realized. Make big plans; aim high in hope and work, remembering that a noble, logical diagram once recorded will never die.”
Bibliography


ZEBARDAST, E. Do Plans Matter? Managing a Metropolis with Two Directives for more than a Decade; The Case of Tehran City. Paper presented at the International Conference for Integrating Urban Knowledge & Practice, Gothenburg, Sweden, May 29 - June 3, 2005
