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EFFECTS OF RAPID URBANIZATION ON LIVABILITY IN TURKISH CITIES:
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ABSTRACT

Urban areas experienced rapid changes in during the last century. With swiftly growing urban populations, the growth of urban areas has accelerated in the last couple of decades. Dealing with “rapid” urbanization is an important concern in urban and spatial studies. The literature shows a wide variety of studies on the economic, social and cultural aspects of urban growth. Most recently, the concept of livability - quality of life - has been debated. This study attempts to measure of livability that is appropriate to the neighborhood scale. In this study, livability is measured with defined indicators: accessibility of public places (schools, health care centers, parks and gardens), availability of open spaces (green areas) and environmental quality (cleanliness of the city, rainwater management and safety). Old and new neighborhoods of Denizli-Turkey were selected as the study site. The research explores differences between old and new neighborhoods in developing cities, in case of livability based on selected indicators. 1029 surveys were conducted with residents of the study areas. People were asked about current conditions of their city and neighborhood, availability and quality of the public services and environmental quality related to study indicators. All results from the surveys were descriptively analyzed and spatially represented. Based on the results, there is no concentration neither in new or old neighborhood in terms of accessibility. New neighborhoods on the city edge have advantage of availability of green spaces and higher values of environmental quality.

1. INTRODUCTION

Today, the term “urban planet” is one of the best ways to describe the world. As stated many times in the literature, world population is growing rapidly in urban areas and has increased dramatically since the 1950s (Auch *et al*, 2004; Beall, 2010; Jacquemin, 1999). According to predictions, two-thirds of the world’s population will be living in urban areas in 2025. That figure was only 37 percent in 1970 (Evans, 2002). There are reasons for this increase, such as changes in economic sectors from agriculture dominance to industry first, then manufacturing and service sector comprising more of the economy. This has provided better job opportunities, increased availability of public services (e.g. more schools, more health care centers), and a more modern social environment. Nowadays, people move to new locations not just for jobs but also aspects of a high quality of life. These can include features such as parks, walking and biking trails, public squares and gardens, sidewalks, water features, sport facilities, among others (Schmitz *et al.*, 2003). Basically, people look for higher living standards and nicer living environments in urban areas so they move from rural to urban sites. This movement has contributed to the increase in urban population. It is obvious that there is more need for housing, infrastructure and services for the area with larger population. There were many challenges to cities during last for decades because of rapid expansion.

Industrial cities in developed countries experienced rapid urbanization immediately after the industrial revolution. However, in developing countries, this is a current issue, since most of those cities are behind in levels of industrialization and

urban development progress when compared to cities in developed countries[1]. 85 percent of the world's population lives in developing countries and the urban population growth rate is higher in the countries of this part of the world. The majority of this population is concentrated in the hinterland of the metropolitan areas (Evans, 2002). City planning and management is even harder in metropolitan areas where millions of people live.

The built environment of most cities is very complex (Pacione, 1983). No matter where urbanization occurs, there are commonalities during urbanization processes both in terms of reasons and results. While there are positive results, such as accessibility of worldwide goods, modern communication between communities and institutions, the existence of better public services; there are also some negative impacts such as housing problem, environmental pollution, higher crime rates, and traffic congestion. For instance, housing is one of the biggest problems during urbanization periods in the cities, since residential buildings occupy a major part of any urban area (Pacione, 1983). The population increase requires more settlement area and more residential units in the city. Since both are often lacking, there is an increase in illegal housing until the local government provides public housing for the number of people without legal settlement.

Besides housing, another important element of an urban area is the transportation system. Transport is the life blood of the cities (Pacione, 1983). Transit oriented development and pedestrian-friendly design are two ways to expand transportation options (Schmitz *et al.*, 2003). The purpose of transportation is to move

[1] Developed countries generally refer the countries of North America and West Europe (Australia, Israel, Japan, South Africa and recently Turkey are also in this classification). Their most common features can be listed as: highly industrialized, capitalist economy, high level of economic diversification, higher GDP, higher income, strong human resources, better opportunities of education and health (UNESCO, The World Bank, UNCTAD, WTO, World Factbook)

the population and goods in a narrative of modes, such as freeways, highways, parks ways, connectors, by passes, bike roads, green belts and sidewalks. Efficient public transportation is a necessity in urban areas as it provides easy access from one place to another. Provision of an efficient transportation network, connecting residential areas with other city functions, especially working and recreational areas, make people happy to live in that place. The quality of accessibility of public services—education and healthcare services—is highly correlated with how efficient the transportation system is. The way that the system is designed, how well it is managed and sustained are important in measuring the quality of accessibility in public transportation.

There are also social problems that arise in urban areas, such as the need to provide space for cultural, entertainment and recreational facilities. Rapidly urbanizing areas are more likely to have less open space due to rapid urban growth resulting from a lack of strategic urban planning. A city's image is important when measuring its environmental quality. Places where elements of nature exist in open space are always more attractive to the human eye. When a city has been covered with concrete and asphalt it becomes a less pleasant environment to live in.

Cleanliness and safety are also major elements of inner city environments. They impact the livability conditions for both residents and visitors. Clean areas not only create a better appearance but also aids in preventing the spread of diseases within the community. One of the major problems of developing countries is disease because of open sewers, non-potable water sources and a lack of sanitation in public places. Safety is also crucial for social and daily life on various scales and different groups of society, such as children, the elderly and the handicapped. Comfortable use of public facilities,

especially of parks and sport fields, mark the level of safety in a city. Pedestrian friendly streets and urban environments, environmental quality in terms of absence of air, water and noise pollution, public security, availability of open and green spaces are all basic features that make a city beautiful. If each of these patterns is set up in the right way in a city, people are more likely to enjoy the area.

The term “spatial organization” refers to the arrangement of physical and human objects on the Earth's surface. This also signifies the optimization of urban patterns and population, specifically in terms of distance from homes to places of work, shops, public services, recreation facilities and entertainment centers (Bertaud, 2001 and 2004). Residential urban patterns will be an object in looking at the spatial organization in an entire city in this study. Urban patterns are affected by development and changes in both technology and the economy. The development of transportation systems has a very important role in these changes.

Livability means the well-being of a community. This has many characteristics that make a place where people want to live now and in the future (VCEC, 2008, XXI). “The achievement of livability requires some conditions which enhance social, environmental, economic, cultural and governance goals and outcomes” (Sue and Cait, 2009). According to Evans (2002) livelihood and ecological sustainability are two important sides of livability. He explains livelihoods, as “jobs close enough to decent housing with wages commensurate with rents and access to the services that make for a healthful habitat”. He also states that there should be a balance between the urban area and its surrounding ecological environment to sustain livable environment of a city.

According to his approach, an ecological degradation would also cause loss of livelihood of such area.

There is also a side of livability issues which are government priorities more, such as economic displays, availability of resources, electoral distribution and concentration; and other side is that which people care more about, which mostly related to everyday life and what residents are directly affected by, such as accessibility of public services and availability of green spaces. In other words, government cares about sustainability of economy and ecology, people care more about quality and quantity of city functions and facilities. For example, all economic investments stimulate the local economy and indirectly make the government happy. Public investments, converting spaces into places[2], provide more public services and these kinds of efforts increase the quality of life of the residents in an area.

Scale is always very important for socio-spatial studies. Different research on various city functions requires different scales of analysis. While some issues concern the surrounding region of the city and require smaller scale (covers larger area with less details of spatial objects), such as some environmental threats, there are other issues that should be analyzed at a larger scale (covers smaller area with more details of spatial objects), such as distribution and availability of playgrounds. Different land use types can be used as an analysis scale for a city, such as industrial and residential sites. Neighborhoods, as they are the smallest part of general official administrative divisions, can easily be considered as a scale of spatial analysis.

[2] This is the process of creating useful and meaningful public places out of vacant and unuseful open spaces in urban area.

The neighborhood scale is crucial as the unit of analysis to frame this work, as other research demonstrates this is a scale people relate to, based on an individual's conceptions and livability expectations. A study of United States National Research Council, called Community and Quality of Life (2002), shows that some people pay more attention to their own neighborhood rather than other parts of their city. There are others however, who are not concerned with the features of their neighborhoods except for its security and cleanliness. For instance, in some cases, some residents may not know what school district that they live in.

How does a community shape a neighborhood's urban environment? As mentioned above, neighborhoods are the smallest unit of Turkish administration, but it holds a deeper meaning for the people who may spend their entire lives in one neighborhood. A neighborhood is where people feel safer than anywhere else in the world, where they have strongest sense of place, and perhaps witnessed all kinds of spatial changes over time but still call it their neighborhood. In some cases, a neighborhood is the place where we may want to live forever, even if it has been destroyed by a flood, hurricane, or an earthquake. Even though cities are increasingly globalizing every day, most places in all cities, including New York and London, remain local not global (Castell, 2004). Therefore, the economic, social, cultural and historical qualities of the communities play an important role on shape of their environment.

What do people want in their neighborhoods? Schmitz , *et al.* (2003) shows that: expansive parklands, ball fields, bigger and better recreation centers; suites (office space) for business purposes, lap pools and indoor game centers are some desired

features in neighborhoods in North America. However, there are communities in developing countries which only desire to have potable water sources and sanitation in their neighborhoods. These forms of extreme contrasts are evidence that there is no "one size fits all" formula in the case of creating a livable environment.

1.1. Objective and Scope:

The objective of this study is to understand how rapid urbanization has shaped urban forms and urban livability in Denizli, Turkey. I will explore the differences between the city's old and new neighborhoods in terms of quality of life, at one time and one space as a result of rapid urbanization and spatial changes during last thirty year time span. I am curious about whether rapid urbanization processes makes some parts of the city more livable than others.

There are two main research questions:

- What is the influence of **rapid urbanization** on the **spatial organization of residential urban patterns**' changes in Turkish cities between 1980 and 2010?
- **How livable** are the newer neighborhoods compared to the older ones as a result of rapid urbanization, **based on selected indicators** used in the literature?

This study is based on an investigation of the livability of Denizli, as a developing city, by examining a number of defined indicators as contributing to overall livability. These indicators are broadly categorized into accessibility of public spaces (schools, healthcare centers, recreational places and shopping centers), availability of open and green spaces (playgrounds, trail paths, sport fields and family tea/coffee gardens) and environmental quality (cleanliness, flooding and safety). The details of

how to find appropriate indicators for livability measurement and how these indicators fit into the study area will be addressed in chapter 2 and 3. A livability measurement considers objective and subjective elements of the sample population's expectations within a specific geographic location. There have been a number of quality of life and livability studies conducted at a national and international level. This study has been designed to provide a more detailed current livability analysis of the selected study area by the indicators above.

The central hypothesis of the study is to prove with empirical data that the existence of accessible public services and city functions, availability of open and green spaces, and good environmental quality make a neighborhood and a city more livable.

Study results include information about how residential urban patterns have changed between 1980 and 2011; how they have been influenced by rapid urbanization and how livable neighborhoods are now. A survey was conducted with local people -residents- of the study area. The purpose of the survey was gathering public opinions about the livability conditions in their neighborhoods and the conditions in their city, based on study indicators. At the end of the study, there is a comparison between the (public opinions) and spatio-temporal analysis of the residential urban patterns. Based on the indicators, we can observe whether current planning applications and urban development are helpful in making neighborhoods more livable in the views of the citizens or not.

This study is intended to be repeated at intervals in the future to measure progress. This will contribute to the discipline, a first livability research in the area with defined indicators and included spatial analysis results, for future studies and

investigations. Residential urban patterns changes are discussed in the study. Decision makers will have the opportunity to use the results of this research to prepare a strategic city plan for future years. One of the other benefits of the study is measuring the sufficiency of public facilities in study area, such as distributions of schools, hospitals, and recreational places. The other purpose of the study is providing a base livability index and groups of indicators which can be apply to future livability research for other developing cities, not only in the country but in an entire surrounded region.

The study will be formed around three analytical chapters, in addition to discussions of literature review and methods:

Characteristic Forms of Urban Patterns in Turkish Cities: The goal of this chapter is to show the larger urban trends on a country level to provide better understanding of Turkish urbanization processes and urban pattern analysis in city scale.

In this chapter, general information about urban patterns of Turkish cities is provided. This chapter includes locations, history, impacts of natural barriers (topography, rivers, mountain ranges, etc), administrative characteristics, the role of city squares, main street formation, intercity highway formation, distributions of public services and general problems as a result of urbanization.

Spatial Organization of Residential Urban Pattern in Denizli - Detailed View of Neighborhoods: The goal of this chapter is to investigate the general residential urban pattern changes throughout time and to be able to provide a better understanding of how it is has been affected by rapid urbanization. In this chapter, spatio-temporal analysis was applied to be able to see how residential urban patterns

have been formed in and around the city in the study's time frame. Only residential areas will be included by their locational and structural changes.

Livability Analysis of Neighborhoods: The goal of this chapter is to provide comparative information about livability in old and new neighborhoods based on selected indicators. In this chapter, livability measurements were taken through a survey and through spatial analysis of neighborhoods. This is a "one time at one space" analysis, thus there is not a longitudinal component. Large samples have been taken for the survey in neighborhoods. These neighborhoods are represented by both charts and maps.

2. LITERATURE REVIEW AND BACKGROUND

2.1. What Constitutes Urban Geography?

Urban Geography is one of the important branches of the discipline, rising in stature, especially after World War II, when cities, such as Berlin, Koln, Pisa, Rouen and Ancona in Europe were destroyed (Taylor, 1998). Some social and spatial aspects emerged during the reconstruction of these cities, such as housing and transportation. These two topics have always been substantial in urban geography because they are regarded as the backbone of cities.

After 1950, developing countries and other major cities around the world faced the issue of rapid population increase caused by social, economic, and environmental problems. The world's urban population has increased, partially due to longer life expectancies and decreasing death rates, and a natural cumulative population increase and migration from rural to urban areas. The rapid increase in the world's population, especially in urban areas, has further increased the speed of consumption of natural resources. Lack of control and planning is another growing issue of urban areas. Rapid urban growth also disturbs natural environment and increases resource consumption as well. For example, in Istanbul, urban areas have grown 87.9% in twenty years (1987-2007), and 5.4% of forest have destroyed during this time (Karaburun *et al*. 2009).

These issues facilitated the emergence of concepts such as sustainability and sustainable development. The most popular description for sustainable development is "'development which meets the needs of the present without compromising the ability of future generations to meet their own needs (World Commission on Environment and Development's, 1987)". There are many perspectives and approaches for sustainable

development studies. Most deal with the sustainability of the physical environment and natural resources. As mentioned in the quotation above, there is an issue about the needs of future generations, such as water and green places.

In addition to the physical environment and natural resources, city cores (mostly covered by older buildings), vacant buildings, and brown fields need to be a part of sustainable development. For instance, instead of opening up a forested area or filling up a seacoast or river bed for a new entertainment center; a vacant building or warehouse could be used instead. Wind energy, hybrid (electric) automobiles, new isolation techniques for building to keep the hot or cold air inside, use of solar power panels, automated irrigation techniques and recycling are some sample results of sustainable development attempts.

The list of issues can be longer. What we see here is that all these issues have relation with some socio-spatial elements. No matter how cities are formed, their spatial pattern undoubtedly affects physical, ecological and socioeconomic processes within their boundaries and beyond (Lack and Wu, 2002). Urban geography always investigates relations and interactions, similarities and differences, impacts and influences between socio-spatial phenomenons.

2.2 Urban Geography

"Geography deals with distribution patterns of phenomena and factors that influence the ever-changing nature of those patterns. Urban geography is particularly concerned with an understanding of the distribution patterns of places, the distinctive nature of these places as well as the regularities that exist among them, in terms of spatial relationship between people and their environment (Amoah, 2006)."

All the approaches in urban geography deal with three major issues (Hall, 2001): how people make their choices about a variety of things in an urban area? Whether there is an impact on urbanization because of these choices or does urbanization effect human choices? What are the outcomes of this relationship and what are the variables?

General concepts of urban geography theories are social, cultural, economic, and political aspects of contemporary life (Taylor *et al*, 2007), in case of space and power (Michel Foucault, 1984 and 1986), place (Tim Cresswell, 2004), time, scale (Peter Taylor, 1984; Neil Smith), landscape (Carl Sauer, 1963), gender (Monk and Hanson, 1982), behavior, everyday life and related social aspects of urban life and structures. French philosopher and historian Michel Foucault, who is known for his interest in the built environment, has contributed to spatial sciences with his "power of place" and "space of domination" definitions. Henri Lefebvre, is a Marxist influenced scholar, engaged the processes of space. His major contribution is about the "production of space (1991)" which deals with space and people interactions, built environment with all its social aspects. Physical space (representational space), abstract space (representations of space) and social space (spatial practices) are three main pillars of his thought. Physical space represents the space of everyday life; abstract space uses for constructed space by professionals and social space is the product of spatial practices of the society (Lefebvre, 1991; Mugavin, 1999; Merrifield, 1993). Today, physical space is fulfilled by spatial pattern components of abstract and social spaces (Edmonds, 2003). So, modern urban places form by relations of these spaces (Gotham e*t al.*, 2001). These relations directly affect the livability conditions of urban areas. If this study was framed by Lefebvrian triad space, there would be a connection between with each of those three

spaces and study indicators. In other words, livability indicators of the study are strongly related to these spaces.

Quantitative, behavioral, structuralist and post-modernist (post-structuralist) approaches are major approaches in human geography and they also have strong impacts on creating knowledge about urban geography (Knox and Pinch, 2010; Hall, 2006). Positivist approaches (ecological and neo-classical approaches related to human behaviors) is another philosophy dating back to 1820 which had strong impacts on urban geography thought starting during the 1950s (Hall, 2006). The behavioral approach is also derived from positivist philosophy. This tries to explain human behavior based on their values, goals and motivations, and also includes the effects of people's subjective environmental knowledge. Another approach is called humanistic which has limited impacts on urban geography but can be seen in the contribution of Edward Relph's (1976) "Place and Placelessness" study (Relph, 1976; Seamon and Sowers, 2008). Saskia Sassen is a proponent of behavioral and humanistic approaches from a liberal perspective. The structuralist approach is mainly derived from Karl Marx's thought about affects of political economy (capitalism, feudalism, or socialism) and constructed role of people and their behavior in an economic structure (Castell, 1977; Hubbard, 2006). David Harvey is one of the biggest supporters of this approach as structuralist and neo-Marxist scholar. Harvey interprets cities as places where people accumulated to be able to consume capitalist goods and productions (Harvey, 1989). Neo-Marxist approaches are another theoretical base which derived from Karl Marx's thought and emerged against the urban social problems during 1960s, such as poverty, social and racial inequality (Short, 1984; Hall, 2006). Post-structural authors focus their

criticism on urban designs and architectures. Harvey defines post-structural thought as reconstructing of places for capitalist global economy (Harvey, 1989). This approach is originally the production of Los Angeles School of Urbanism which has not been able to be influential as strong as Chicago School in the discipline. Studies by Allen Scott[3] and Edward Soja[4] represent majority of the work of the Los Angeles School about post-structuralist approach. Post-structuralism also applies to the rejection of grand theories of explanation. Post-structuralist theoretical attention to the social and political institutions determined by economic but often emphasized by its libidinal and liminal formations (Peters, 2003).

In addition to all these, feminist theory and feminist urban researches have contributed to the area by investigate urban areas, according to inefficiency and impacts of urban spatial organization for women's lives (Fincher, 1990; Hanson, 2005). Basically, inequality between genders and male-oriented spatial organizations are the main concerns in this approach. Use of public space, journey to work, public safety, and housing choices are some of the larger concerns of feminist geographers (Gilbert, 1997; Kwan, 1999; Hutchison, 2010).

Urban geography can be easily distinguished from the other sub-disciplines in geography, since it is directly dealing with the identifications and explanations of towns and cities, their interaction in space and time, social preferences and behaviors in these places, flows of goods and people, location decisions, socio-spatial similarities and

[3] Metropolis: from the Division of Labor to Urban Form, 1988
Global City-Regions: Trends, Theory, Policy, 2001

[4] Postmodern Geographies: he Reassertion of Space in Critical Social Theory, 1989.
Thirdspace: Journeys to Los Angeles and Other Real and Imagined Places, 1996.
The City: Los Angeles and Urban Theory at the End of the Twentieth Century

differences between places, characteristics of different land use and so on (Herbert and Thomas, 1982; Hall, 2001; Pacione, 1983; Aguilar, 2002). However, there are also other social sciences focusing on similar social phenomenon, such as regional and city planning, sociology and economics. The differences between urban geography and other social sciences is the scholarly approach used to answer questions about urban issues. For instance, housing and neighborhood preferences could be answered as "balance of supply and demand" by an economist, while "social exclusion or segregation" could be the approach of a sociologist. When a geographer deals with these issues however, both physical conditions and social environments are important to study (Wyly, 2011). That does not necessarily mean that all these socio-spatial sciences are completely separated from each other. On the contrary, they are all supporting and contributing to each other with their own indicators and results. Geography further incorporates social and spatial outcomes into its decisions, while acknowledging social groups, human needs and environmental requirements as well. In this sense, regional and city planning is not the only discipline with connections to geography, but it is the closest discipline that urban geography is related to. Simply put, urban geography is a socio-spatial science that deals with improving the built, economic and social environment to provide more benefits for communities.

> "The geographer's contribution to urban studies will continue to be distinguished by the attention which it focuses on spatial dimension –on place, space, person and environment interaction- but as most geographers would admit that spatial processes per se are rarely explanatory processes, the need to probe deeply in to social, political, and economic forces at a variety of levels of analysis will increasingly be recognized (Herbert and Thomson, 1982)."

Almost everyone may have some level of knowledge and something to say about urban development and urban problems, in general. It is understandable, since people have urban experiences each and every day, they face problems and issues with the urban functions, they struggle to sustain their life between home and work, some have a hard time to reach places for their leisure time and some have even harder conditions, such as lack of efficient sewer system and drinkable water (Jacquemin, 1999). These are the primary issues addressing in urban geography. Even though people may have some interpretations about urban problems, definition of reasons and solutions of those issues are as complicated as an advance mathematical formula. As an analogy, urban geographer should put groups of people (children, elderly, handicapped, workers, poor, rich, etc), places (residential, industrial, recreational, education, healthcare, governmental, cultural, historical, etc), and other variables, such as economic status, education, location, culture, history, etc., in an order, as if a mathematical formula and equation, to be able to provide appropriate knowledge about urban phenomenon.

Until the industrial age, cities were planned in similar ways by similar reasons, such as defensive constructions and access to water sources. During the industrial age, this has been changed by the establishment of factories and warehouses in the inner-city. This new spatial agglomeration not only attracted people from rural areas to the cities but it also changed the urban form of those cities. This is another example of how social and spatial issues are related.

Immediately after the industrial revolution, environmental pollution, housing problems, urban inequality, urban poverty, transportation, rapid urban growth,

migration and population management emerged as urban problems. This period is considered the beginning of contemporary urban planning because all of these issues could only be solved through urban management and planning, as well as dealing with social issues. In this period, some of the basic models and theories are studied and applied, especially in US and in several European countries (Taylor, 1998). The garden city movement in the UK, the city beautiful movement in Chicago and zoning in New York are three important examples for practical applications. The contributions of Chicago School's scholars (Park, Burgess, Reckless, Shaw, MacKay) are considered as one of the pioneering attempts to produce academic knowledge about urban environment from urban sociology perspectives (Hubbard, 2006). They have been mostly influenced by sociologist Max Weber's thinking. Ethnicity (ethnic minorities), social classes, housing classes, distribution of labor are some of the preliminary issues that the Chicago School's scholars dealt with (Hall, 2006). The book written by Park and Burgess (1925), called *The City: Suggestions for Investigation of Human Behavior in the Urban Environment*, includes information about early urban growth, urban zones, human and nature relationships, spatial changes in central city, and investigation all these urban issues with socio-spatial view. When urban geography was acknowledged as a sub discipline of geography in 1950s, it was already an interdisciplinary science, because of the contributions of scholars from many other sciences, such as sociology, philosophy, history, and environmental sciences.

From the classification of Amoah (2006), there are three topical areas that geographical city studies follow:

- Evolution, organization, and dynamics of cities. (physical environment, economic, sociological, political and historical factors on growth)
- Internal structure of cities and understanding of urban form with respect to space and time. (spatial structure, social structure, urban land market, housing, neighborhoods, transportation and mobility, economic activities)
- Planning and managing change in the city, addressing the problems that arise from growth, decline, and stagnation of cities. (housing, employment, transportation, neighborhood and downtown revitalization, growth management, local economic development and globalization)

2.2.1 Urbanization

There are many uncertainties about the exact time of the beginning of urbanization due to disagreements about what the exact indicators for urbanization are or what its exact definition should be. There are many factors in the subject of urbanization, such as land size, population and types of economic activities, therefore chronological ambiguities are normal (Bairoch, 1988).

The term “urbanization” represents increasing concentration of the population in cities and a transformation of land uses mostly from farmland and forestry to a human made environment. In the literature there are many definitions of urban areas and urbanization as processes, such as the condition of being urbanized, physical growth of urban areas as a result of global change or a process in which an increasing proportion of an entire population lives in cities or suburbs. The last century has been the most rapid period of urbanization in history according to urban population statistics. High

population, population density, and heterogeneity are the three important characteristics of urbanization (Nevarez and Moser, 2009). According to UN reports, the urban population increased from 220 million in 1900 to 732 million in 1950 (29% of the world's population). By 2007 50% of the world population was living in cities (UN Population Division, 2008). The basic economic change from agricultural to industrial had a strong impact on populated urban area, especially during late 1800s and early 1900s (Hall, 2001). After that, technological improvements in communication, transportation, medicine and science allowed for higher densities in urban areas (FIG report, 2010).

> "Even though they are not absolute and sufficient, following can be consider as basic reasons of early urbanization: the existence of fulltime craftsman, furnishing evidence of a division of labor; the existence of a fortifications or walled enclosures, thus distinguishing the city or town from the village, which remains open; a population of sufficient size and above all, density; a specifically urban habitat, houses built of durable materials, habitations arranged so as to form streets, and so forth; permanent settlements, as opposed to transient encampments (Bairoch, 1988)."

When a given area faces these urbanization processes in a short period of time, it is considered "rapid urbanization." Statistical data about demographic change, economic development, and surface area of the city help researchers understand the speed of growth in a certain area. Besides this, the average urbanization progress of an area can be compared to other cities within the same country as the area being studied. These comparisons allow researchers to see how fast an area is urbanizing. This comparison should be in country level because every country has different level of development, in terms of technology and economy. The progression of urbanization is

different as well (Hall, 2001; Bosselman, 2008). For instance, compare an American city to a city in a developing country. Obviously one would not obtain the same results.

A contemporary definition of an urban place is a "center of government economic activities and business decision making as well as primary markets of culture and intellectual accomplishment (Greene and Pick, 2006)". In a general context, the major relationship between growth and urbanization is the influence of policy makers and the regulation of city growth through globalization and economic geography (Spence and Buckley, 2009). Hartstone identifies the city as a place where people concentrate, due to the employment opportunities and life styles. It is also mentioned that a city is a very complicated mechanism with intensive land use, various socio-economic and political institutions and various urban functions and resources (Sinan, 2006; Aydemir *et al*, 2004). Sezal identifies the city as a transition of the community from the life in narrow space to wider space (Sinan, 2006; Bal, 2002).

Tim Hall (2001) stated that "urban geography is nothing, if not dynamic" and "cities are always changing." This dynamic form, or in other words ongoing spatial changes in cities, is much more observable since roughly the 1950s. He also mentioned that understanding the changing process of an urban area is one of the important problems for geographers and others studying the city (Hall, 2001). Bosselman (2008) mentioned "cities are dynamic spatial networks with interrelated geometries, some messy and unresolved, others clear and intractable." Cities are dynamic in terms of development and changes. Global changes and rapid urbanizations accelerate this dynamism and directly affect the form of urban patterns (Bosselman, 2008; Freestone, 2000). Since globalization is ongoing phenomenon, its influence on the built

environment continues as well. The globalization of the world has led to social and economic changes in countries; and, as a result of these changes, rapid urbanization has caused many environmental, economic and social problems in both developed and developing countries.

There are basic differences between industrial cities (as early urbanized areas) and today's metropolitan areas (as the symbol of global and urban world today) in terms of reasons and results of socio-spatial changes. In general, industrial cities have one dominant product in the area, such as steel or coal, and almost every resident of that city is dependent on that sector. Once this major economic sector declines the city withers because it loses its population and human power quickly. However, there is more economic diversity in metropolitan cities today. Besides the specific (primary) sector of the area, there are always multiple economic powers in these metropolitan cities. The service, education and health sectors are often present. Therefore, even though one of those sectors may decline, the others would be able to sustain local economy.

Jacquemin (1999) has another approach which is focusing on demographic transition to explain the important differences between developed and developing world cities during the industrialization and urbanization period. In western cities, there was a large migration from rural areas to urban areas and the rural population decreased much faster than in developing countries. At the same time, population growth is slowed down overall, due to changes of livelihood and the economic logic of having children. In developing countries, however, urban areas naturally grow by population increasing, foreign investment, immigration and emigration (Jacquemin, 1999).

"Everything in a city is connected to everything else (Cities Alliance, 2007)." This is another challenge in urban and spatial studies efforts to manage urbanization processes. While preparing a strategic urban plan, every single service and land use parameter needs to be accounted for. Otherwise, while trying to create a better service or place in a certain part of the city, another part can be negatively impacted. For instance, planning a shopping center in an area, makes surrounded environment attractive for people and business but consequently this may cause the decline of old and traditional shopping places in the area. So, the balance is such a crucial term while working on urban development and renewals.

> "No single recipe for managing change can be applied to all cities. Cities are affected by their location, their climate and natural features. Cities and urban settlements don't operate in isolation— they are part of a national structure, subject to central government, strengthened or limited by regional and national infrastructure, budgetary policies, development priorities, decentralization policies. To meet the urban challenges of today, and the challenges to come, appropriate management frameworks must be available, through which cities can apply innovative approaches suitable for their local circumstances (Cities Alliance, 2007)."

In this age, we have to pay closer attention to urban places because of two main reasons: Interconnectedness and complexity of economic and social elements (Levy, 2009). Urban population is continuously rising and technologies are more developed than ever. These make things hard to organize, especially in urban areas where thousands and in some places, millions of people live together, forming a complex dance of interactions producing highly varied urban spaces. As an example, different types of housing development (apartments, single family houses, gated communities, etc.) generate different types of traffic in an area, if you build a neighborhood market or

shopping center in the same place, this causes another set of traffic generation consequences that need addressing.

Centralization and decentralization of urban patterns and functions (eg: locational change of commercial, residential and industrial places) are issues under this interconnectedness (Morgan, 1989; Timar, 1992; Esbah *et al*, 2005). For example, international and domestic migrants cause rapid urban growth and population increase, causing some problems in most of the big cities. Industrial decentralization, residential deconcentration and the emergence of satellite towns occur as a precaution in most of those areas (Jacquemin, 1999).

As a short summary, urbanization is the phenomenon which occurs by population increasing in urban areas because of economic, technological and social developments, and resulted as larger built environment where people produce and consume more.

2.2.2 Where Urbanization and Globalization Meet?

With the world's population at its largest size in the second half of the 20th century, employment and housing are becoming more of an issue in big cities. The growing capitalist economy in urban areas has attracted more people to the cities, increased the labor force, encouraged consumption, facilitated the expansion of infrastructure, and caused more investments in public and private institutions. Though this is happening in developed countries, it is being kept relatively under control, but in the developing world this is happening very rapidly and the governments of these countries are challenged to provide services that will benefit both the population and the

economy. Therefore, environmental and social problems in developing cities are common during globalization and urbanization processes (Herbert and Thomson, 1982).

Three basic dynamics of urbanization (urban growth) are: economy, demography and social characteristics (Greene and Pick, 2006). These all are directly affected by globalization as well. Simply, global economy accelerates investments through cities. New opportunities attract more people to the area. More people and more economic activities require more social and public services. Therefore, larger society and interactions of people resulted as dramatic social changes in urban areas.

According to Richardson, the basic spatial impacts of globalization are: industrial activities, population increase, distribution and density, housing, transportation, natural resources, public facilities and pattern of clustering (Richardson, 2005). Managing all of these is hard for the developed world; in the developing world a lack of resources, political will (policies) and in some places the lack of technology and skilled employees makes matters worse.

After WW II and deindustrialization of cities in developed countries during 1950s, it was the opportunity for planners to shape contemporary cities by using experience from past and the advantages of technology. Things rapidly changed after this period however, through technological innovation and communication. These accelerated the establishment of global networks between different communities, in terms of social relations and economic exchanges. In a short period of time, global financial systems have emerged from the availability of the internet and 24-hour connection with the global market. Foreign investments and multinational companies followed the process, and aggregations of mass of office spaces, headquarters of big

companies, plants and braches of global producers and service sectors for all these were created global cities.

> "There are three basic changes and developments in the city forms all around the world over the last 20 years: the territorial dispersal of economic activities, of which globalization is one form, contributes to the growth of centralized functions and operations; centralized control and management over a geographically dispersed array of economic operations does not come about inevitably as part of a world system; economic globalization has contributed to a new geography of centrality and marginality." (LeGates and Stout, 2000)

The industrial revolution is the most important theme in understanding the modern world and its tremendous economic system (Beall, 2010). It has also resulted in historical economic, social, and political development processes. Modernization, construction of contemporary cities, complicated social and economic relations between nations and the creation of the world system are results of a long history of the human beings progress in civilization.

Besides those impacts mentioned above, globalization is not only about the exchange of goods and services or factors of production, but globalization embraces many other phenomena including ideas and modes of governance (Richardson and Bae, 2005). Economic activities have always played pivotal role in urbanization. As Harvey discusses in his "Neoliberalism and the City" speech, transformation of urban life is predicated on absorbing capital surplus (Harvey, 2006). The answer to the question of "what is role of the city in this capitalist world?" is the giant system for solving capitalist surplus consumption problem. He mentions city highways, suburbs and reconstruction of the rest of the urban system organization depends on this contemporary economic system and reflection of preliminary results of capitalism on

cities.

However, during globalization progress, urban areas are not the only thing that has been changed. Societies of city inhabitants, their perceptions and their sense of place have also been changed. Therefore, each and every urban function needs to be organized and designed based on the perceptions of urban community (Kaypak, 2009). "There are non-economic aspects of globalization, such as political and cultural globalization, which affect the lives of many people in a far reaching way (Richardson and Bae, 2005)". The impacts of cultural globalization are more visible in the developing countries than in developed world, since globalization and popular culture originated in this part of the world. The urban environment strongly affected by globalization in terms of architecture, retail characteristics, agglomerated commercial and financial areas as well as individuals who follow Western fashion, music and life style in general. On the other hand the effects of globalization on urban structure of developed countries cannot be ignored. Today, we witness Asian districts in many North American cities with their own shopping markets, retail streets and houses; the same thing has happened in parts of Europe where a dominantly Muslim population resides.

Jacobs (1996) stated that "globalization does not signal the erasure of differences but a reconstitution and revalidation of places, localities, differences." Indeed, societies in different parts of the world have a chance to engage and get familiar with other cultures and different ways of life. This engagement is more visible in developing countries in the case of social and urban environment (Jones and Visaria, 1997).

Castell's (2004) take on globalization support Jacobs' idea above. He says "in a sense, most places in all cities, including New York and London, are local not global" (Castell, 2004). Basically, when we think about global cities and places, what we have in mind is that a few images, landmarks, landscapes, representation of places or some indicators of the cultures belongs to those places. For example in New York City, I would say Times Square is the point that makes this city global for tourists, Wall Street is the one for economist, or Hollywood is the global point of Los Angeles, California. The rest of these places, residential areas, neighborhoods, parks, and country sides are for more local use. This is one of the big impacts of information technology and the global communication network on urban and social structure. Those places are made global because we can reach them through technology, we don't have to physically be there to know about them. Another approach to this situation is described as "marketing or selling of city images". Harvey describes a picture from New York by using John Kifner's report and mentions all sorts of people who share the same urban space, such as punk rockers, women with children, businessmen, etc (Harvey, 1992). These are all outputs or results of postmodernism that signify cinema, television, video, (it is now social networking and internet), fashion and youth styles, present images and diverse histories and so on. They are all mixed daily and form the contemporary city today and as result urban structure and urban society change accordingly.

Even though globalization, urban and economic developments go hand in hand in most cases, this is not always true for every place, especially in developing countries, such as Mexico city, Bogota, Johannesburg, Seoul, Rio de Janeiro and Shangai (Richardson, 2005). Castells' research, which is a comparative study between Latin

America and Asian cities slums, shows that "local communities continue to be a source of identity but not a source of economic or political power. For example, in Mexico City, squatter settlements account for about two-thirds of the megapolitan population without playing any distinctive role in the functioning of Mexico City as an international business center (Castells, 1997)." So, when we look at these places from an urban development perspective, impacts of globalization is only appear on economic and politic centers of these cities.

Another impact of globalization (capitalist economy) on urban areas is emergence of socio-economic classifications. Harvey (1992) and Jacobs (1961) are simply denied the idea and form of bourgeois taste and social classification in public with a socialist approaches to the city form. However, social and spatial segregations are one of the most important significant features of the capitalist societies. The neighborhoods of low, middle and high income are strictly separated from each other. This is not usually the case for socialist societies (Sinan, 2006; Keles, 1978). However, according to another argument by Karakurt (2007), regionalization in an urban area due to economic and social classes is not a new structure. On the contrary, there were extremely strict separations between different social classes and their residential locations even in the pre-industrial cities.

As already discussed, globalization and urbanization are related to each other in many ways and get along with each other many parameters. Development and improvement of one of these can immediately affect the other. In other words, highly urbanized cities could not be as functional today, if global opportunities did not exist in

the way they do now. Conversely, global economic systems would not work appropriately without advanced urbanized areas.

2.2.3 Social Aspects of Urbanization

Besides globalization, urbanization is often associated with growing social and ethnic diversity and increased social stratification in a place. Social stratification is a global problem. Almost every country has some form of social class system based on ethnicity, religion or economic condition. Social stratification theory as addressed by Marx (Marx and Engels, 1848) and Weber (Gerth and Wright, 1948) to explain the differences leading to differentiation. Marx stated that the differences between incomes create social stratifications and that those who have wealth and power take advantage of those who do not. Marx classified groups of people in a society as either capitalist or workers. Weber's classification however, is more related to occupational skills, status and organizational power, and his level of classification are generally from high to low (Kerbo, 2006; Bian, 2002; Sinan, 2006).

During deindustrialization and the urbanization process, the social characteristics of cities change as well as the physical appearance. Economic sectors shifted from manufacturing to service. That means more education and skills are needed for better income. Not everybody has the opportunity to get a decent education or acquire the skills needed to earn a decent income. Often those who are in the working class may lose all that they own because they cannot compete in the economic world. Those who have been educated or who have been able to sustain and develop their business became wealthier in a short amount of time. During this period the middle class has become smaller, gap between high and low income got bigger and these create

some sort of social and economic problems for the countries.

While income and economic conditions change, preferences for living area and life style is also change. As a result, some neighborhoods emerge where we can easily distinguish the classes. For instance, the upper class prefer to live in highly prestigious neighborhoods where they can be separated from other groups, protected by guards and doormen; the lower class usually resides in neighborhoods where the environment seems to be in steady decline; there are social and environmental problems along with poor housing conditions. Gated communities, gated luxury housing and luxury residence apartments are just some of the concrete samples of urban social stratification (Yildiz and Inalhan, 2007).

Suburbs (sprawl) and residential concentration on city edges impact stratification because these attract investment and cause a decline of the central city. Basically, these processes cause concentrations of poverty in the inner-city and wealth in the city edge. Thus, there are many social and environmental problems associated with suburbs, such as air and water pollution, higher crime rates in central city and social stratification.

2.2.4 Urban Patterns

The patterns of cities represent how different functions and elements are spatially distributed and mixed together (Lynch, 1981). There are three classic theories of urban morphology: 1) the concentric zone theory is the pattern that has concentric rings of different land use types with a central business district in the middle (Burgess, 1925). Concentric zone occurs by pull factor of the CBD, lack of mobility has an important role that is why everything is located around the CBD. 2) The sector theory is

a modified concentric zone by developing of transportation networks (Hoyt, 1939). Once the mobility of society is increased, by the help of highways, people start to live away from the CBD and suburbs emerge. 3) The multiple nuclei theory (Harris and Ullman, 1945) is patchy urban pattern formed by multiple centers of specialized land use activities (Luck and Wu, 2002). The multiple nuclei theory basically represents agglomerations and metropolitan urban areas. These theories were developed from the experience of North American cities and belong to the industrial / post-industrial development period. Therefore, these are not really appropriate models for other countries and cities. However, basic spatial organizations and ideas can be modified and developed into another model to apply to other places. In other words push and pull factors (concentration on CBD, availability of transportation to city edge, economic agglomerations, etc.) can result in similar urban patterns. It is possible to create a modified model by finding out how each study area has been growing, how the transition zones occur in sample cities and how these are affecting general urban growth processes.

Residential urban patterns are one of the most important components of the urban area, and this is occupying a major part of every city (Pacione, 1983). Housing preferences and housing patterns are changing by effects of urbanization (Yildiz, 2004). Therefore, there are considerable structural and spatial differences in residential urban patterns in the present time compared to the past, as well as spatial organization of those and their relation with other urban patterns.

Herbert and Thomson (1982) categorized urban development studies in three pillars: pattern, process and response. Patterns represent a continuation and

development of a traditional concern in urban geography and these are the product of ongoing processes of urbanization today. Response studies are basically responding to the questions and issues which may rise out of development of patterns. (Herbert and Thomson, 1982)

They also classified urban patterns according to their predominant functions, as clustered, linear and regular patterns. A clustered pattern represents location based on specialization of a place, such as mining and recreation. Linear patterns occur at both the point of where transportation systems meet and along the route of that system. A regular pattern generally represents city centers where retail and administrative services are available (Herbert and Thomson, 1982).

Gaffuri and Travisan (2004) have used other details to analyze urban pattern of an area. Their classification includes town, urban district, urban block, empty space in block, building groups in block and building alignments. They focus more on location and distribution of buildings, as well as their number, density, types of construction, types of function, and areas. While looking at urban patterns through buildings, location and distribution of public buildings should be accounted for as well. All the public building and facilities, such as hospitals, schools, and libraries have to be fit into overall model of the development (Hall, 2001).

The transportation network is the most important key for the relationship between different urban patterns. The transportation network is supposed to be sustainable despite changes in urban areas. For example, CBDs change over time, by the effects of demographic, economic, cultural and global factors (Herbert and

Thomson, 1982) and the transportation network should be able to adopt all those changes for the benefit of both producers and consumers.

There are three basic approaches of urban geography that can be used for urban pattern analysis: Descriptive, explanatory and interpretative. The descriptive approach is more likely to show a macro picture of urban forms and processes in country with general concepts, such as housing, economy, socio-cultural and physical geography features. Explanatory approaches deal with more detailed analysis of urban patterns, including spatio-temporal changes and relations. This shows basic spatial and functional changes on same place in different time. Interpretative approaches are the final work after the analyses are done. Including thoughts, evaluations, statistics and critiques about the results.

In Bourne's (1982) reading there are three internal structure approaches for urban areas: urban form (spatial patterns of features in city; descriptive), urban interaction (linkages and flows that integrate the various features; explanatory), urban spatial structure (highest level of analysis, represent organizational linkages that connect urban interaction and urban form to a cohesive system, interpretative) (Greene and Pick, 2006). These also complement previous three approaches, in terms of urban pattern analysis.

There is another study mentioned on three levels of urban pattern analysis for a certain urban area and this supports the idea of individual modeling for different cities. First, defining location and topography of the entire city; second, identifying the main streets, squares, canals and building blocks; and third analyzing plots and plot patterns (Koster, 1998). This method would also be helpful to see details in a city because those

are important indicators to understand the big picture, in terms of relations and interactions of spatial patterns. Even the locations of a city's symbols or land marks are relevant to represent an urban area, design and coordination of the surrounded places (Koster, 1998; Jerke, 2008).

2.2.5 Urban Growth and Urban Development: What is Good and Bad Growth?

There are various definitions of urban areas. Population concentration of a country is one way to define it. For example, while one country's urban definition is 100.000 people, some other may only be a minimum of 2000. Industrial activities, the level of economic activities, the physical size of the cities are a few of the other parameters for defining urban areas.

Urban development and urban growth are sometimes considered synonymous but they are not. Urban development is defined in several ways, such as demographic, economic and social explanations. All of these definitions most likely use comparison between urban and rural areas to highlight relative measures of differences. However, urban growth is the absolute increase in the physical size and total population of urban areas. In short, urban growth basically represents physical growing, while urban development requires improvements in urban functions.

Good and bad urban growth should be discussed in several different scales, in terms of time and place. During the emergence of early industrial cities, a good location for a city was by the sea shore or along a river because waterways provided ready and cheap transportation opportunities and waste disposal. Development along this type of location was considered good for cities. After a short time however, it caused many environmental and social problems due to the absence of regulations and appropriate

plans for the distribution of residential, industrial and other city functions. In this example, development of industrial cities with masses of factories in the middle of the city, surrounded by affordable and low income houses is not good urban development, if we judge this by today's standards of conditions and perceptions. At that time however, this ineffective urban development matched the residents' desires. Being close to work from home and compact distribution of everything they needed was the nicest way to live because of the advantage of accessibility and lack of mobility of people.

There are four criteria that summarize the elements of good growth: The presence of rich variety of consumer goods and services; aesthetics and physical setting; good public services; and good transportation infrastructure (Greene and Pick, 2006).

Today's cities have two important development issues: Sustainable development and protection of natural environmental. Since 1950, rapid urbanization has been the cause a lot of social, environmental and economic problems all over the world. Decision makers, planners, scientist and politicians are more aware of these issues, especially during the last ten-fifteen years. The world's urban population is rapidly increasing and will likely continue to grow. At the same time, natural resources are becoming scarce especially for metropolitan areas where the population is in the millions, commercial and residential buildings number in the thousands. The balance between supply and demand may be broken, in any case such as housing, employment, retails, if this continues. Conclusively, sustainable development is a must for good urban development. For example, work or study from home to reduce traffic and natural resource consumption, conversion of brown fields and vacant buildings to a usable format, encouragement to use wind and solar energy and recycling are some examples

of changes that contribute to successful sustainable development and good urban growth.

Housing and urban infrastructure are two main problems of cities during last two decades. Location decision and establishment of industrial campuses is another important issue. International and national migrants and firms caused rapid urban growth and messy problems in urban areas. The emergence of rural development, industrial decentralization, subcentralization and satellite towns were some of the major results of this growth (Jacquemin, 1999). In the context of good and bad urban growth, we should look at the interaction of these new development patterns with the entire city, in case of transportation network, spatial distribution and social interaction. At the same time, environmental quality and open/green spaces always need to be checked to able to see how good or bad that growth is.

The late 19th and early 20th centuries were the starting point of the progressive era in terms of planning of American cities. Since the absence of open spaces was an issue, people resolved to solve it. Central Park in New York City was one of the first effort and perhaps the best project; in terms of providing a recreational area in an urban place. Tenement housing reform is another example of an attempt to provide better conditions for city residents. The "City Beautiful" reform movement was started. These were some basic parts of Chicago's plan and literally starting point of urban planning as a discipline. For example, use of statues, artificial lakes, ornamental pools, gardens in city design come from these movements. A step further, we see zoning acts. New York City zoning was the first application, and then it was applied to many other cities in a short period of time (Levy, 2000; Levy, 2009). All of these are considered attempts and

examples for good urban growth.

In contemporary cities, there are several common issues to deal with, such as the lack of open space, transportation, protection of natural environmental and sustainable development. One of the best solutions proposed for these problems so far, is called "smart growth". This requires transit based and pedestrian friendly growth. There should be town, city and county level boundaries to control growth. Also, some legislation proposed for commercial area, such as limited base area for shopping malls (big box) and also limited parking lots to encourage public transportation. One of the biggest issues of smart growth is considering green areas and open spaces between each urban pattern. Portland, Oregon, has the best example for this sort of development. Even though Portland's population is increasing incredibly fast, only two percent more land has been used for new settlement areas since 2000 (Macionis and Parrillo, 2003). Plus, the urban environment is pleasant with greenbelts and pedestrian friendly streets. One major idea from smart growth thinking is the renewal of existing urban areas, instead of constructing new residential neighborhoods.

The priorities of urban planning provide needs of people and support outstanding economy in an area. One of the other crucial parts of good urban growth is to pay attention to cause and effect relationships between new developments and current patterns. For example, environmental issues might emerge while attempt to improve industrial development, or a security problem might emerge while creating green spaces without considering surveillance. In short, the good and bad urban growth is directly related to the availability of open/green space, levels of dependency of automobile, social and spatial equality, accessibility of public services, less pressure on natural

environment and economically durable urban growth is good; oppositions are naturally bad.

2.3 Urban Livability and Indicators

2.3.1 What is Urban Livability?

"Today, research on quality of life encompasses many concerns, including sociology, psychology, geography, economics, history, medicine, pharmaceutics, education, criminology, architecture, transport, arts, income, employment, community, environmental issues, and marketing. Despite all this activity, there is no consensus on what livability is (Bowling and Brazier, 1995)." Livability is a very important concept for urban societies, even though it cannot be defined precisely or measured quantitatively (Woolcock, 2010) because it encompasses variety of elements and indicators, such as "elements of home, neighborhood and metropolitan area that contribute to safety, economic opportunities and welfare, health, convenience, mobility and recreation" (Vuchic, 1999; Woolcock, 2010). In other words, concepts of livability differ from an area to other and depend on types of perspectives and indicators.

Urban livability is an issue when spatial researchers are dealing with the growth of cities and rapid urbanization. There are several literal definitions of livability. One defines livability as available livable property and another definition accentuates the means necessary to live in a place (National Research Council, 2002; Cities Alliance, 2007). Livability is a concept also used in a wide range of contexts, such as transportation, healthcare, politics and building architectures. In the context of spatial sciences, such as geography and planning, it basically represents existence of functions, facilities and structures which make city livable. Another definition is "livability is the

sum of the factors that add up to a community's quality of life—including the built and natural environments, economic prosperity, social stability and equity, educational opportunity, and cultural, entertainment and recreation possibilities (Partners for Livable Communities, 2011)." Evans (2002) argues that economic and environmental concerns are important as "to be livable, a city must put both sides of the coin together, providing livelihoods for its citizens, ordinary as well as affluent, in ways that preserve the quality of the environment."

Every change in an urban area has an impact in terms of livability. The question of "what makes a city livable?" clearly has as many answers as the number of people that have been asked this question. There is no exact definition of livability and no single theory can be applied everywhere. Every place has its own cultural, social and economic dynamics and features, thus, livability standards vary from place to another. However, there are general issues and indicators, such as education and health, may be included in any case. On the other hand, applicability of an index to multiple places depends on indicators and study scale.

As a spreading phenomenon, the outcomes of urbanization vary according to the geographical and geopolitical position of a region (Esbah *et al*, 2005). For example, today in developing countries, the growth rate of urban settlement is five times faster than that of developed countries (Lopez and Bocco, 2001). Regarding this rapid urbanization, people struggle for shelter, infrastructure and services in some overcrowded cities, instead of having concern of open spaces or recreational facilities. These different outcomes directly influence people's expectations and understanding of the quality of life, affecting planning and urban growth policies in that place.

Sometimes, livability and life satisfaction studies are considered to be studying the same phenomenon. Life satisfaction studies different from livability research however.

> "Livability and life satisfaction measures provide some overlapping information, as both measures apply a triple bottom line approach including economic, social and environmental concepts. However, there is an important difference between them. While life satisfaction measures ultimately focus on the characteristics and wellbeing of people living in a given geographic area, livability measures tend to focus on characteristics of the area and the services the place can offer to residents. Therefore, life satisfaction measures are more likely to be impacted by subjective characteristics of the population which may be beyond the control of policy makers, while livability measures are more likely to include factors which policy makers are able to influence. In general, livability measures appear to be more practical from a public policy perspective (Measures of Livability and Sustainability)."

Life satisfaction works mostly deal with the economic and political conditions of large scale areas, such as countries, livability studies are more focused on spatial and functional issues and can be applied to small scale areas, such as neighborhoods or even a main street. Large scale studies are more interesting for decision makers and politicians to be able to set their future policies and watch where they are standing as an administrative institution, while small scale research provides more benefits to residents of places, since the qualitative results of these types of researches are concrete and applicable in their physical environment for their use.

2.3.2 What are Urban Livability Indicators?

> "Indicators are tools for measuring progress toward agreed goals. Indicator programs may have a suite of indicators or a single index. Each indicator may be informed by more than one measure, and may represent subjective and/or objective

> data. The unit of analysis may be a population group or a geographic area (Sue and Cait, 2009; Balsas, 2004)."

"Livability measurement is clearly a challenging task (Sue and Cait, 2009)." Indeed, livability is a difficult subject to study, since there are a myriad number of indicators. Plus, every demographic, social and economic group has different perceptions, understandings, and expectations about urban livability. The diversity of potential measures within livability studies makes it even harder to research.

Each discipline and study that deals with livability requires indicators to measure or interpret the livability of places. These indicators should be designed based on the interest of the study and fit into research approaches of the discipline. While such indexes have been created by using these indicators, there is no "one fits all" approach in terms of livability measurements. As an example of indexes, Happy Planet Index uses ecological footprints and the Human Development Index uses general demographic and economic features as indicators.

Anholt City Brand index (2006) includes the indicators: presence (a city's international status and standing), place (beauty, climate and other physical attributes), potential (economic and educational opportunities), pulse (urban appeal and lifestyle), people (friendliness, openness, cultural diversification and safety), and prerequisites (basic facilities: hotels, schools, public transport and sports).

The EIU (Economist Intelligence Units) livability rating consists of five weighted categories: Stability (mostly related to security of individuals and nation), healthcare (availability and quality), culture and environment (climate, recreation, goods and services), education (availability and quality), infrastructure (transportation, housing, water, sewer, and other utilities).

The Victorian Competition and Efficiency Commission has conducted an annual study on the quality of living in 380 cities. Their 10 key categories are: political and social environment (political stability and crime), economic environment (banking services), socio-cultural environment, health and sanitation, schools and education, public services and transportation, recreation, consumer goods, housing, natural environment.

The International Living magazine is one of the other institutions which surveys annually, measuring the quality of life index since 1984. They have done this at a country level and their indicators include: cost of living (US dollars), culture and leisure, economy, environment, freedom, health, infrastructure, safety and risk, climate.

United Nation Human Development Index is another example index that measures international and country level livability. They use three dimensions: health, education and living standards. They also include data on four main indicators: life-expectancy at birth, mean years of schooling, expected years of schooling and gross national income per capita in US dollars.

An example of an academic approach to improve the quality of life in an area suggested the following criteria (Levy, 2009): unity and coherence; minimum conflict between pedestrians and vehicles; protection from rain, noise, wind; easy orientation for users; compatibility of land uses; availability of places to rest, observe and meet; creation of a sense of security and pleasantness.

According to another academic livability research, results show that one-third of those surveyed mentioned that availability of public transportation, sense of community,

sense of connection, diversity, pedestrian access and open spaces as an amenity would have serious impacts on their quality of life (Schmitz, 2003).

Table 1: Sample livability (quality of life) indices

Anholt City Brand Index (2006)	Economist Intelligence Units	Victorian Competition and Efficiency Commission	International Living Magazine	United Nation Human Development Index
Presence (a city's international status and standing)	**Stability** (mostly related to security of individuals and nation)	**Political and Social Environment** (Political Stability And Crime)	**Cost of Living** (US Dollars)	**Health**
Place (beauty, climate and other physical attributes)	**Healthcare** (availability and quality)	**Economic Environment** (Banking Services)	**Culture and Leisure**	**Education**
Potential (economic and educational opportunities)	**Culture and Environment** (climate, recreation, goods and services)	**Socio-Cultural Environment**	**Economy**	**Living Standards**
Pulse (urban appeal and lifestyle)	**Education** (availability and quality),	**Health and Sanitation**	**Environment**	**Life expectancy at Birth**
People (friendliness, openness, cultural diversification and safety	**Infrastructure** (transportation, housing, water, sewer, and other utilities).	**Schools and Education**	**Freedom**	**Mean Years of Schooling,**
Prerequisites (basic facilities: hotels, schools, public transport and sports).		**Public Services and Transportation**	**Health**	**Expected Years of Schooling**
		Recreation	**Infrastructure**	**Gross National Income per Capita in US Dollars**
		Consumer and Goods	**Safety and Risk**	
		Housing	**Climate**	
		Natural Env.		

Reducing longer trips and traffic congestion, less dependency on automobiles, establishing customer-friendly, community-oriented and efficiently designed public transportation can be also listed as indicators which enhance the livability of an area (Livable Communities Initiative, 2011). They also provide general characteristics of a livable community as follows: Full community participation in decision making process; well-planned neighborhoods where houses, schools and parks are within easy walking distance; transit, bike and pedestrian access, to reduce dependence on the automobile; mixed used neighborhood, with residential, commercial, recreational, educational and health care; safety, security and accessibility of public transit systems; environmental practices, such as careful parking and traffic management systems.

The livability index of Happiness in Nation (Table 2) includes three different indexes with many indicators as follows: Education, health care, women's right, economic welfare, population stability, geographic situation, political stability, political participation, cultural homogeneity (Estes, 1984); brotherhood, progress, peace, order, variety (Narrol, 1983) and for large cities public safety, food cost, living space, housing standard, communication, education, quiet, traffic flow (PCC, 1990).

Table 2: Indicators of the livability index of Happiness in Nation

The Livability Index of Happiness In Nation		
Narrol – 1983	Estes - 1984	PCC – 1990 (for large cities)
Brotherhood	Education	Public safety
Progress	Health care	Food cost
Peace	Women's right	Living space
Order	Economic welfare	Housing standard
Variety	Population Stability	Communication
	Geographic situation	Education
	Political stability	Quite
	Political participation	Traffic flow
	Cultural homogeneity	

It is evident from the approaches described above, that there are many different conceptualizations as to what livability is comprised of. Even though there are some general concepts, such as education and health, the ways in which institutions and researchers view livability vary. Different parameters can be used for livability measurements but remain the under same or similar indicators. This can be arguing whether this type of use of parameters makes things easier or not. On the one hand, it looks more complicated. On the other hand all those societies around the world have different social, cultural and economic backgrounds. Therefore, use of different parameters would be a must to be able to conduct a livability measurement everywhere.

Accessibility of public places, availability of green spaces and environmental quality were used as indicators of this study (Appendix 8).

2.3.2.1 Accessibility

Although there are several definitions of accessibility, the basic definition is how easy it is to get from one destination to another. Accessibility also can be defined as a measure of which activities may be reached from a given location using a particular transport system (Al-Sahili and Aboul-Ella, 1992). Accessibility is one of the important factors affecting the values of urban properties, along with quality and locality (Sue and Cait, 2009). An individual's accessibility to opportunities, resources, goods, services and activities are central components of livability (National Research Council, 2002; Litman, 2008). This is also an important indicator to examine social and spatial equality. Accessibility is a complex indicator because it includes factors like distance, time, and ease of mobility.

> "Accessibility is a multifaceted concept involving some challenging measurement issues, for example, space-time

> accessibility measures. These measures derive from the time geographic perspective and capture the effects of individual activity schedules on accessibility. Since daily and weekly activity schedules vary widely by socioeconomic variables such as class, life cycle, culture, and gender roles, space-time accessibility measures are sensitive to individual differences in accessibility. Space-time accessibility measures can support livability measures that take into account the varying access to resources and opportunities between social and demographic groups in a community. (National Research Council, 2002)."

The accessibility of public services is highly correlated with both the quality of the transportation network and distribution of goods and services in a city. In the case of transportation, the construction of larger roads and boulevards to supply better opportunities for transportation demands does not necessarily improve the accessibility in the area (Keceli, 2008). This is because one of the most important rules of transportation management is "every road can be filled up by traffic" (Kaplan, 1989).

The concept of accessibility varies between demographic groups and depends on the location of the city, where the residents want to travel, what kind of transportation they prefer to use, their age, gender, preferred travel time, desired travel distance, travel cost, comfort of travel, the condition of the route that they will travel, among other issues.

The mode of transportation is important to consider. Walking is an often ignored form of transport. According to a survey, 80% of people can walk up to 400 meters in 6–10 minutes which is considered a comfortable walking distance in a mixed used urban area (Ewing, 2000). Dittmar (2004) mentioned that "optimal walking distance between a transit station or stop and a place of employment (or residence) is 500 – 1000 feet (150 to 300 meter)". The Regional Planning Association defines transit –friendly communities as intensively developed areas within ¼ - ½ mile (400 to 800 meter) of rail

stations (or around any public transportation network route). They also mentioned that the general features of these areas are mixed used, pedestrian based and incorporating traffic calming design. All of these encourage people to walk, as it is generally five to ten minutes to reach any station or stop on foot (Regional Plan Association, 1997).

The scale of study area is main element for determining the types of measurement. For instance, Istanbul is a large city with approximately 12.5 million inhabitants. It is almost impossible to establish all sorts of facilities each neighborhood or every single residential environment all over the metropolitan area. So, driving distance or availability, frequency and travel time of public transportation maybe use to measure accessibility of city functions and public services in this city, if the study deals with a metropolitan area.

The neighborhood scale is different, especially in smaller and developing cities, neighborhoods are more compact and people are less dependent on automobile and public transportation, compared to metropolitan areas. This makes walking more reliable in neighborhoods. So, walking distance is the most practical measurement for accessibility studies, on the neighborhood scale.

In this study, walking distance was used to indicate the quality of accessibility to schools and parks/recreation areas, while driving distance is used for healthcare and shopping centers. Also, accessibility of public transportation routes is analyzed by walking distance.

2.3.2.2 Availability of Green Spaces

Green spaces are one of the most important amenities of an urban area. These are places for leisure activities, family gatherings, sports and joy for urban communities

who struggle between home and work. Recreation means groups of physical, emotional, social, sophisticated and cognitive activities which people participate in during their free time (Broadhurst, 2001).

Green spaces are not just for recreational purposes as they can also be a good part of transportation network, especially for pedestrians by creating paths, trails, and roads within a good strategic plan (Sue and Cait, 2009).

Accessibility to green spaces is related to two indicators of this study, as to the availability of this type of area and how accessible they are. This is supposed to be a major component of spatial organization in the city while working on a strategic urban plan and design. It was suggested and done in Melbourne, creating better accessibility helps to sustain and protect public open spaces, such as regional parks, creeks, connecting corridor and coastal sites (Sue and Cait, 2009; Parks Victoria, 2002).

Today, urban areas are not formed by only residential and commercial areas. Recreational areas make cities more livable and attractive (Kara *et al.*, 2008). At the same time, the availability of green spaces in a city enhances public health, avoids some level of social problems, improves social relations and self-improvement, contributes to tourism and the economy, and also contributes to environmental protection and sustainability (Toronto SCORP, 2006; Torkildsen, 1999; Broadhurst, 2001).

In this dissertation, playgrounds, trail paths, family tea/coffee gardens and sport fields were accounted for as green spaces. Their availability, cleanliness, security, ease and comfort of usage, social and environmental qualities have been investigated.

2.3.2.3 Environmental Quality

The literature about environmental quality reveals a variety of variables that have been used. They are a mix of both physical and social environment elements (Owens, 2009; Quality of Life Index, 2005). In some research, the environment is divided into two realms; natural and built (social) environments (Stiftel, 2009). Some of these natural environmental elements are pollution (water, air, soil, noise), climate change, biodiversity, habitat preservation, cleanliness and aesthetics; while some of built environment (social environment) elements listed are security, comfort, diversity, culture, unemployment, education and health (Amati, 2008; Lawson, J., 1992; Lawrence and Low, 1990).

People may have concerns about both physical and social environmental problems in their area. Therefore local governments and municipalities must pay close attention to both (Boer, 2008). During strategic urban planning processes, the possible impacts of physical and human environment on each other should be considered.

Since human activities are directly related to opportunities in the area, and positives and negatives in their physical and social environment, environmental quality is an important indicator for livability studies (Bigio and Dahiya, 2004). It is hard to cover all environmental elements in a single study though, as seen in the sample indices discussed earlier.

In this study, cleanliness and security of public places were used as environmental quality indicators. Additionally, flooding frequencies were also investigated, as one of the major natural hazards in the study area, after earthquakes.

2.3.3 Livability as an Urban Problem during Globalization

As mentioned above, livability related to urban facilities and functions affect how individuals feel about living there. There is strong agreement in the literature about the need to pay attention to urban livability not just for economic benefits or for life satisfaction but also as an important driver of faster, sustainable regional growth (Gilbert, 2004; REDC, 2009).

As Sassen (2000), Harvey (2006) and many of other scholars discuss, there is an imbalance, social and spatial inequality in both the developed and developing part of the world. While Sassen discusses this topic in terms of the concentration and decentralization of economic activities in some certain cities of the countries, Harvey's approach is more social (obtained from Marx's ideologies) and focuses on reconfiguration and restoration of class power. Harvey also puts emphasis on the wage gap between the lower and upper classes and takes it as a source of crucial upcoming social problems. Sassen said "global cities are machines for producing wealth but they also produce and expand inequalities" (Sassen, 2007). Indeed, the globalized and capitalist economy is the system of power. According to Harvey, in the capitalist system, individuals and institutions have to extend their businesses to be able to survive, if they do not invest more somebody else will. The question is where to extend and when? Sassen also asks the question of "whose city is it?" in the transnational politics and business discussion in globalization and its discontent (Sassen, 1998). Obviously, the global economy and capitalist investments have strong impacts on physical and social changes in urban areas. These changes directly affect livability conditions of cities and most likely cause inequality in terms of the livability condition of places.

The effects of markets on urban form and livability are an important step when looking at the quality of life in an urban area. Doubtless, technology accelerates the opening and spread of global markets. Basically, the market area, commercial and financial agglomerations in a city are playing a pivotal role on urban form. Distribution of retail and manufacturing places, locations of target population and needs of accessibility influence the shape of the city. This global market requires huge industrial activities that most likely cause environmental issues, especially for places where heavy industry, exist. Local political strategies should be support these economic changes but at the same time they need to sustain flavors of the places, in terms of culture, origin and local the economy. Otherwise, while a place economically develops, there would be degradation in terms of quality of life, as seen in Bangkok (Evans, 2002). It was also a problem for the major cities of United States, such as Chicago and New York. However, preliminary planning studies, protection policies and several movements/acts for urban development prevented these places from deteriorating completely. Evans also mentioned that "increasing productivity (economically) is an essential element in improving livelihoods; it also creates resources that can be used to provide the infrastructure and services essential to a livable urban environment. Nevertheless, for most developing cities the problem is connecting growth to livability" (Evans, 2002)

> "Half a billion people in developing countries live in arid regions with no access to irrigation systems. Another 400 million are on land with soils unsuitable for agriculture, 200 million in slope-dominated regions, and more than 130 million in fragile forest ecosystems. These areas, covering an estimated 73 percent of the Earth's land surface, face significant problems for agriculture investment and have limited ability to sustain growing populations. Sensitive to land use patterns, they are particularly vulnerable to degradation, erosion, floods, and landslides (World Development Report, 2003)."

There are three major results of post colonial development in developing cities: in economic terms it has created a widespread unemployment and underemployment, and mass poverty has become one of the main characteristics of city life; in social terms almost all cities are having massive problems of providing sufficient infrastructure, housing and services to their citizens, who are also physically and mentally suffering from environmental degradation and lack of open spaces; at the political level local government and administration are too often characterized by widespread inefficiency and loss of real power, and are under constant pressure from all levels of urban society (Jacquemin, 1999). Therefore, concepts of livability in these countries are very different than developed countries.

> "The large cities of the Third World are becoming "world cities," increasingly important nodes in the financial and productive networks of the global economy, but they are not providing livelihoods and healthy habitats for ordinary people (Evans, 2002)."

Every city has a specific feature that makes it different from the others, such as science, art, religion, nature, history, culture and so on (Kaypak, 2009). These features can help improve livability of the area and make it more attractive with good urban plans, policies and managements. However, these attractions bring some other urban problems to deal with, such as traffic, pollution and crime. That is why it is necessary to have a good plan that will incorporate unique features, such as livability elements and make the place attractive. For instance, industrial cities in China have strong economic power and high opportunity of work, however I would ask, does it really make those cities livable itself? In Paris, do residents of neighborhoods around Eifel Tower really feel that they have livable environment, or they already frustrated because of crowd of tourist and traffic? Why don't New Yorkers look happy while they are walking on

Times Square, when it is a place that millions of people around the world really want to be at?

Livability is a difficult issue to deal with for decision makers and administrators. Making everyone happy at the same time is almost impossible. Therefore, there is always something more to improve quality of life in urban areas.

3. METHODOLOGY

3.1 General Information

The methodology of this study was formed by using interdisciplinary techniques and approaches involving geography –specifically urban geography- and regional and city planning. GIS was used as a tool for spatial analysis and representation. Some theoretical backgrounds of social geography and sociology were used as well, since the study is integrated with urban livability.

A geographical view posits that people are directly affected by functions and facilities in their surrounded environment. Geography also influences people's everyday lives. Planning is another discipline that greatly influences the daily life in a community. This is because people organize and schedule their activities based on the function of the facilities in their environment. Using digital mapping, or GIS technologies, as a tool for spatial studies and analysis is now an inseparable part of spatial sciences. Livability is a topic of many different sciences by its different features. Sociology, in general, focuses on social segregation, economic inequalities, and lack of equal opportunity for different groups of people based on age, gender, status and so on.

Livability measurements and spatio-temporal changes (spatial organization) of urban patterns are the two main topics of this study. Effects of rapid urbanization were used as main determinant factor of these concepts. The residential urban pattern has higher priority in the study because the majority of the urban area is occupied by houses in my case study, as it is the case for every urban place. The livability measurement requires a relationship between residential areas and any other urban functions. This

study was applied to a developing city in Turkey, Denizli, which is a medium size city in Turkey and has almost 650,000 people in the urban area.

The determination of livability indicators in certain areas is a challenge because there are many possible variables, but there is no single combination to apply everywhere. According to an argument in the report of National Research Council (2002), every single indicator should be well defined in the way that it is used in a study. This helps an audience to better understand the data that is collected in the research. Indicators in this study were defined with consideration of the basic daily needs of residents of the city. Those indicators are for everybody in city without any differentiation of their economic or social status, such as availability of schools in walking distance, or cleanliness of neighborhoods.

Livability indicators of this study are the accessibility of public services and the availability of open and green spaces and environmental quality of neighborhoods, as those described in chapter 2.

The livability analysis of this study is on a "one time, one space" basis. Since spatial patterns, community features, economic, social and technological conditions are rapidly changing in time, a temporal analysis of livability would not provide appropriate results. In other words, even if we agree on how to measure livability for people who lived in a sample area in past, for example 15 years ago, and then for people who live there in present, the collection of people, urban patterns and functions are different between the two time periods, and the changes that are described would not necessarily be relevant for every person in both the past and the present. The interpretation of such is even more complicated if we rely on statistical averages to measure livability, as it

has been done frequently in practice. However, comparisons between livability studies which have been done in same area, in different times and same or similar indicators would provide appropriate academic knowledge.

Neighborhoods were used as the study scale of this research. A smaller area, like the neighborhood, provides more appropriate results in terms of livability. Because, this avoids social, spatial and economic differences between the sample populations. Even though there may be some outliers in any place, majority of population have similar social and economic status in the neighborhoods. Moreover, the differences are not as apparent when the study is conducted on a larger area. This is actually the case for most international livability indexes when they are applied at the country level for large areas and when there is a small sample size for each variable. Appendix 7 shows the summary of analyses and data of the study.

3.2 Survey

A survey questionnaire was prepared based on certain selected livability indicators (Table 3). The aim of the survey was to gather public opinions about urban livability of the city and neighborhoods. The survey was done in three modes: online, telephone and street surveys. 329 online, 500 phone and 200 street surveys were completed by the residents of Denizli. A few of those responses were eliminated before the analysis because of a lack of information of the neighborhood, insufficient responses and large number of blank variables. In the index, neighborhoods with fewer than six responses were excluded.

The only required question on the survey pertained to the neighborhood where the respondents lived. This is the key factor, as it is the scale of spatial analysis in the

study. This format was absolutely necessary, to be able to properly use the survey results in a GIS environment.

The survey was built on 4 main parts:

i. General information

ii. Accessibility of public places

iii. Availability of open and green spaces

iv. Environmental quality and overall evaluation

Table 3: Survey questions

General Information	Accessibility of Public Places	Availability of Open and Green Spaces	Environmental Quality and Overall Evaluation
Gender	Is there any available public transportation service in your neighborhood?	Is there a playground in your neighborhood?	How would you rate the (i) street cleanliness of your neighborhood and (ii) frequency of garbage collecting?
Age Group	How far is your home from the closest bus/minibus stop BY FOOT?	IF YES, how would you rate it in terms of (i) safety and (ii) cleanliness?	How would you rate the recycling system and service in your neighborhood in terms of (i) distributions of containers, (ii) frequency of collection and (iii) classification of containers?
Household Income	How would you rate the overall traffic condition in the city, in terms of (i) road quality, (ii) traffic congestion, (iii) traffic management (wait time on traffic lights, directions, one way roads etc)?	Is there a trail path in your neighborhood?	Do you have flooding when there is a heavy rainfall in the city?
Highest Level of Education	What part of the city did you face traffic congestion; please refer to 2 street names?	IF YES, how would you rate it in terms of (i) safety and (ii) comfort (usableness, amenity, social environment?	How would you rate rain water management and sewer system in your neighborhood?
Marital Status	Do you have parking problems in the city?	Is there family tea garden or café with outdoor space in your neighborhood where you can hang out with your family?	How would you rate overall public safety in your neighborhood?
How many vehicles do you have in your household?	IF YES, please refer to 2 locations that you have difficulties for parking?	IF YES, how would you rate it in terms of (i) quality of social environment, (ii)	Which one would you refer as most frequent crime type that happens in your neighborhood (You may choose more than one

		environmental quality and (iii) cleanliness?	options). Traffic Accident, Robbery (House), Robbery (Vehicle), Fight, Armed Assault, Kidnapping, Sexual Harassment, Extortion, Other
Is your residential unit a rental or your own?	Do you have parking problem in your neighborhood?	Is there a public field for sportive activities (soccer, basketball, tennis, etc) in your neighborhood?	How would you rate overall livability of DENIZLI, in terms of (i) accessibility of public places and services, (ii) park and recreation facilities, (iii) environmental quality and security?
Type of your residential building	How far is your home from the closest school BY FOOT?	IF YES, how would you rate it in terms of (i) quality of facilities, (ii) security and (iii) ease of usage?	How would you rate overall livability of your NEIGHBORHOOD, in terms of (i) accessibility of public places and services, (ii) park and recreation facilities, (iii) environmental quality and security?
Neighborhood of residence.	How far is your home from the closest park/recreation area BY FOOT?		How would you rate the investments and services of current municipal administration?
Street of residence	How far is your home from the closest health care center BY VEHICLE?		Please write below, if you think there is a necessary investment or insufficient public service in DENIZLI, to provide you better life and environmental quality.
	How far is your home from the closest shopping center BY VEHICLE?		Please write below, if you think there is an necessary investment or insufficient public service in your NEIGHBORHOOD, to provide you better life and environmental quality.

The general information section included personal data about respondents, such as age, gender, income, education, marital status, house ownership, car ownership, types and age of their resident building, neighborhood and street of residence.

In the accessibility questions, information about public transportation, general traffic conditions, parking, and closest distance of school, healthcare, recreation and shopping facilities were gathered.

In the part about availability of open and green spaces, playgrounds, trail paths, family tea/coffee gardens and sport fields were included as facilities and functions. Their safety, cleanliness, use of easiness and comfort, quality of facilities, quality of social and physical environment were investigated.

In environmental quality, cleanliness, flooding and public security were used as study indicators. Questions about street cleanliness, frequency of garbage collecting, general recycling system providing by city, frequency of flooding, rainwater and sewer system management and most common criminal incidents of the area were asked.

3.3 Mapping, Data and Sources

As mentioned above, GIS technology was used as a tool for spatial analysis and representation in the study. Maps provide a better view and understanding of the overall condition of a city and neighborhoods in detail, complementing statistical outputs of the survey, charts and graphics. Therefore, all survey responses were converted into GIS environment and mapped in polygon features.

ArcGIS 10 software was used for the mapping work. However, a majority of these base maps used were in different formats than ArcGIS, such as ncz and tab. Therefore, they needed transformation into an ArcGIS environment.

Basic statistical information was gathered from state and municipal departments, such as population, demographic features and details, housing, economy, transportation and communication. The institutions that were visited are listed in appendix 9.

Table 4 shows the list of provided documents, maps and other information by public and private institutions. General Command of Mapping is the only institution

which has aerial photos of the study area for past years. Only monoscopic (panchromatic) orthophotos are provided for governmental institutions and academic researchers when requested. All these photos were produced by using Vexcel Imaging software and given in TIFF format. All photos, images and vector features were geographically coordinated by using Transverse Mercator with D European 1950 datum. There are multiple photos and images to cover entire study area and they were all spatially adjusted. Basarsoft is one of the best GIS companies in Turkey and distributor of MapINFO in Turkey and Middle East. Cities Bank is a governmental institution which helps municipalities in case of urban growth and development by financial supports, cadastral operations and technical assitance. Since building and road data were not provided by Department of GIS/UIS of Denizli Municipality, Basarsoft and Cities Bank data were used in the study. Most of the municipal departments, as well as Cities Bank, dominantly use the national GIS software, called Netcad. When a Netcad project files (.ncz) converted in to ArcGIS shapefile, users have at least three different files, as point, polygon and line. There would be additional file, as text, symbol and notes, if .ncz file has them. Each file need to be geocoded before it use in ArcGIS environment.

Table 4: List of data and sources

Data	Source	Quality and Feature
Aerial photos of the study area for: 1971 (two photos) – 1/40000 1986 (12 photos) – 1/10000 1992 (two photos) – 1/40000	General Command of Mapping	Orthophotos 1971 cell size (x, y) - 0.89, 0.92 1986 cell size (x, y) - 0.29, 0.28 1992 cell size (x, y) - 0.91, 0.98
Satellite images of the study area for: 2008 (one image) – 3 bands 2009 (11 images) – 3 bands	2009 - General Command of Mapping 2008 – Denizli Municipality, Directorate of Information Technology (Department of GIS/UIS)	IKONOS 2008 cell size (x, y) - 0.47, 0.47 2009 cell size (x, y) - 0.51, 0.52
Digital map of neighborhood borders (before and after transition)	Denizli Municipality, Directorate of Information Technology (Department of GIS/UIS)	Vector (geometry) and database (name, area) in .shp format
Digital map of buildings	BASARSOFT CITIES BANK	Both are only vector (geometry) in .tab and .ncz formats
Digital map of roads (transportation networks)	BASARSOFT Denizli Municipality, Directorate of Transportation	Vector (geometry) and database (name, length) in .tab and .ncz formats
Digital map of land marks (including public buildings)	BASARSOFT	Vector (geometry) and database (name) in .tab format
Digital map of parcels	CITIES BANK	Only vector (geometry) in ncz formats
Digital map of parks and gardens	Denizli Municipality, Directorate of Parks and Gardens	Only vector (geometry) in ncz formats
Digital map of public transportation networks (buses and minibuses)	Denizli Municipality, Directorate of Transportation	Only vector (geometry)in ncz formats
List of recreational places with inventory	Denizli Municipality, Directorate of Parks and Gardens	Updated by summer 2011 in .xls format
List of schools (including location, date of established, capacity)	Denizli, Provincial Directorate of National Education	Updated by summer 2011 in .xls format
List of health care centers (including location, date of established, capacity)	Denizli, Provincial Directorate of Health	Updated by summer 2011 in .xls format
Statistics (population, economy, environment, trade, employment, tourism, traffic accidents, cultural, productivity, transportation, building, etc)	Statistical Institute of Turkey (TUIK)	-
Municipal journals and press	Denizli Municipality, Directorate of Press	Hard copies and .pdf format (for the available ones)
Other official documents	Denizli Municipality, Directorate of Zoning and Urban Development Denizli Municipality, Directorate of Premises and Confiscation Public Library	-

3.4 Conceptual Framework

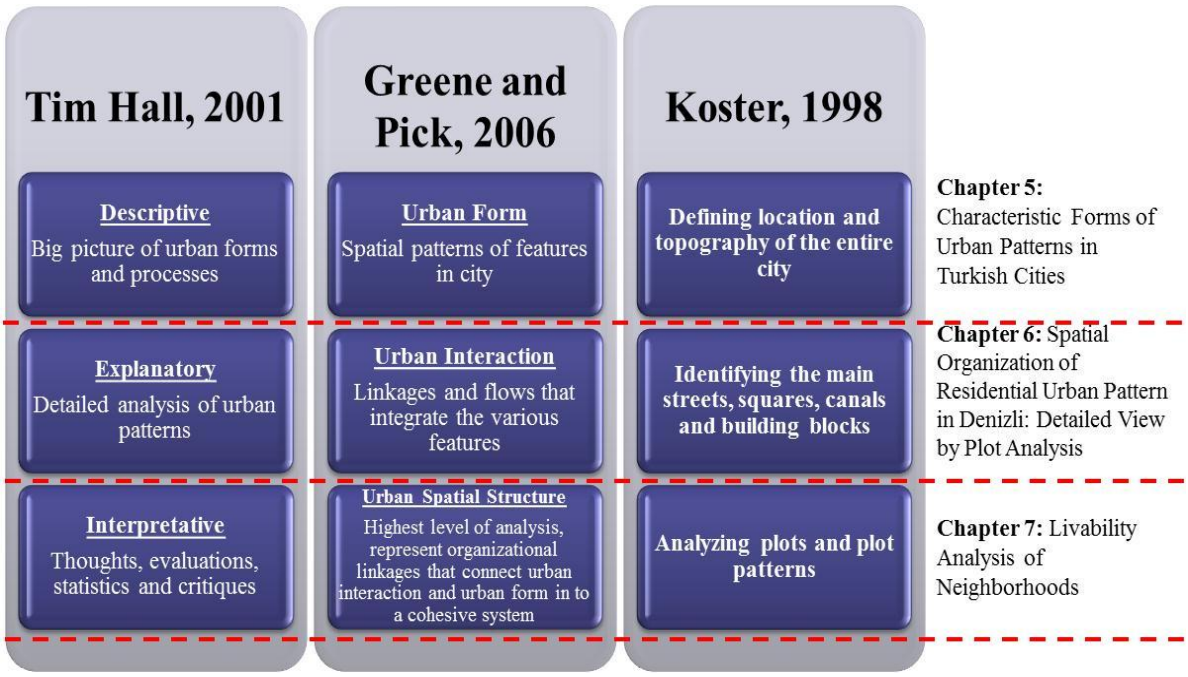
The combination of approaches in Hall (2001), Greene and Pick (2006) and Koster (2998), was used to set up analytical chapters of this study (Figure 1).

There are three basic approaches of urban geography that can be used for urban pattern analysis: Descriptive, explanatory and interpretative (Hall, 2001). A descriptive approach mostly shows a big picture view of urban forms and processes at a country scale, with general concepts, such as housing, economy, socio-cultural and physical geography features. The explanatory approach deals with a more detailed analysis of urban patterns, including spatio-temporal changes and relations. It shows basic spatial and functional changes in one place over a period of time. The interpretative approach is the final procedure to interpret the analyses, including thoughts, evaluations, statistics and critiques about whether current urban forms make cities livable or not, by the help of comparisons with reference area.

There are three internal structure approaches for urban areas: urban form (spatial patterns of features in city; descriptive); urban interaction (linkages and flows that integrate the various features; explanatory); urban spatial structure (highest level of analysis, represent organizational linkages that connect urban interaction and urban form in to a cohesive system, interpretative) (Greene and Pick, 2006).

Finally, there are three levels of urban pattern analysis for a certain urban area and these are likely to support an idea of individual modeling for different cities. Those are: Defining location and topography of the entire city; identifying the main streets, squares, canals and building blocks; analyzing plots and plot patterns (Koster, 1998).

Figure 1: Study Approaches

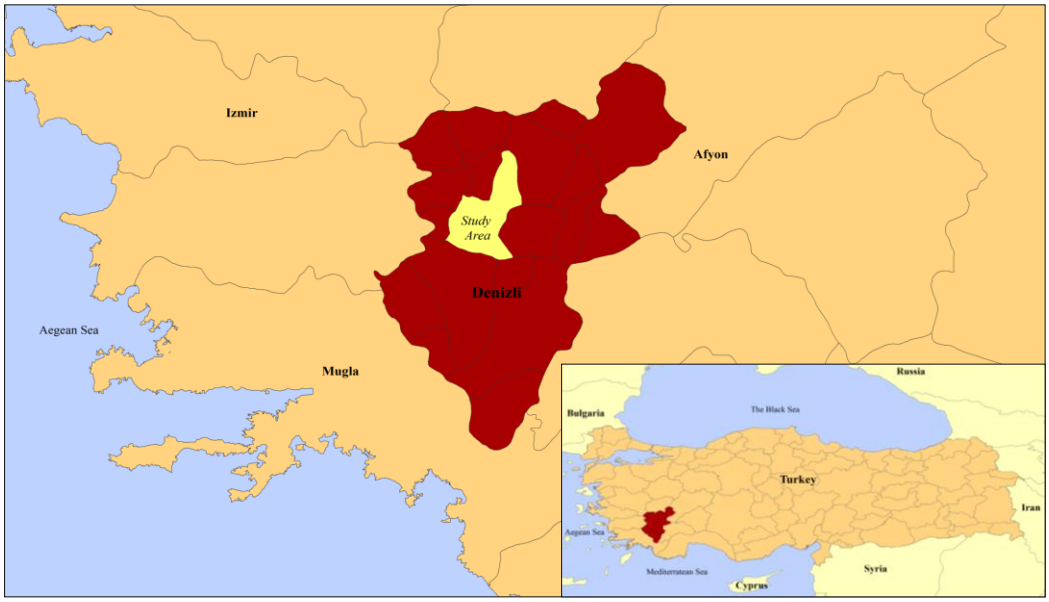


4. STUDY AREA

4.1. General Displays

Denizli is the second biggest city of the Aegean Region (west part) of Turkey, in terms of population of city center and economy (Map 1). The city spans a total of 11,868 km^2, the total population is 942,278, including towns and villages, and there are almost 655,322 people living in the central city. The city's center is approximately 140 km^2. The region that the city is located in has been occupied as a settlement area for thousands of years, since the ancient Greeks and Byzantium. The current location was established as a town during Seljuk period.

Map 1: Location of Denizli, Turkey

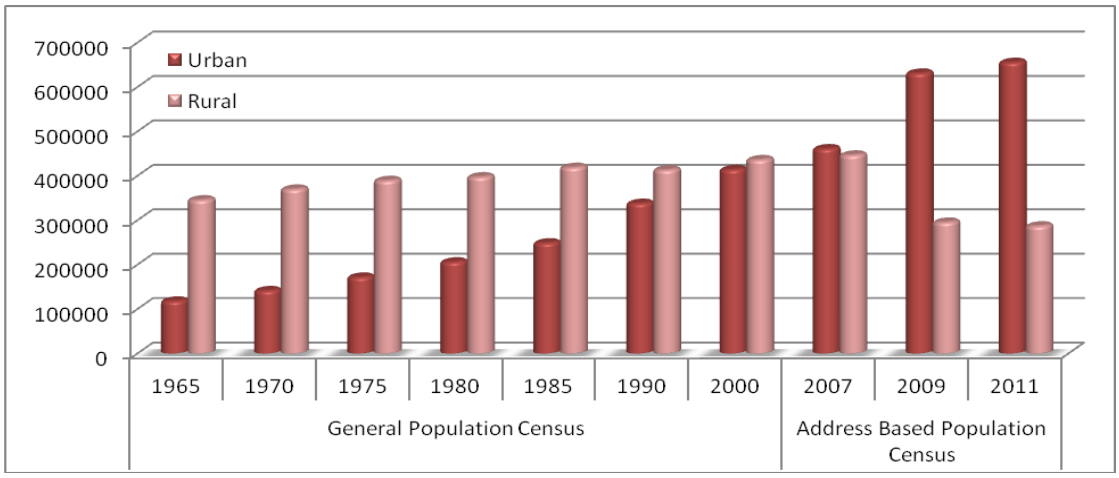


The city's population was 655,322 according to the 2011 census (Table 5, Graph 1; December, 2011). While there are 338,940 more people counted in Denizli since 1980, the country's urban population increase median is 121,903 people. Even including metropolitan municipalities (large number of population, attracts more

people, creates a high fertility rate), the population increase of Denizli is above the state average which is 404.589 people. When we ranked all cities based on urban population increase since 1980, Denizli is 17th and it takes 3rd place when we take metropolitan municipalities out of the list (TurkStat, 2010).

Table 5 and Graph 1: Urban and rural population of Denizli[5]

	General Population Census						Address Based Pop. Census	
	1970	**1975**	**1980**	**1985**	**1990**	**2000**	**2007**	**2011**
Urban	141309	171586	205938	248673	337793	413914	460747	655322
Rural	369851	389330	397400	418805	413089	436115	446578	286956
Total	511160	560916	603338	667478	750882	850029	907325	942278



Altitude of central city is 354 meter from sea level as an average and it decreases from west to the east and south to north. It causes flooding and air pollution in the neighborhoods which are located in lower part of the city. 47% of total territory of the city covers by mountains. There are two mountain ranges by the central city and they block the urban growth on west and south part of the central city.

[5] General population census used to manage by face to face interviews by the residents of settlements in their residential units. Address based population census started at 2007 which is automated system according to the residential unit and inhabitants records of mukhtars.

As a general description, Denizli is a touristic, industrial, and educational city. Pamukkale[6], including the ancient cities of Hieropolis and Laodikia, is one of the most famous tourist places in the country and it is unique in the world. The industrial complex of city is third largest of the country with more than 2.5 billion dollars in export volume per year. There is a large university called Pamukkale University, founded in 1985, with more than 30,000 students.

These features make Denizli a candidate for "Metropolitan Municipality" status. This is an important step for urban structure because in the Turkish administrative system, municipalities have a regular budget from the state government and this depends on its status. Naturally, metropolitan municipalities have a larger budget and additional support for transportation and infrastructure of the city (Official Journal, 1994). This directly affects the urban patterns of the area. Metropolitan municipalities have larger responsibility area, more authority and initiative, more human power and budget. They are responsible all strategic, development and land use plans, except plans by 1:1000 or smaller scale cadastral projects. Planning interactions and preparing SWOT analysis for entire area is more efficient with all these authority and power. For example, establishment of a rail system, building connection points with other transportation systems, organizing other urban functions along this line with a strategic urban plan, such as a shopping center, new settlement and recreational places, requires the authority and power of a metropolitan municipality. Simply, regular municipalities' responsibility areas are not large enough to plan and organize all urban patterns and

[6] Pamukkale is one of the famous natural sites both in Denizli and Turkey. There is a hot spring and travertines which form by carbonate minerals left by flowing water. It is recognized in World Heritage list of UNESCO.

functions of surrounding areas along the central city. Metropolitan municipalities have a larger responsibility area, as well as a larger budget.

4.2. Local Administration and Neighborhood

Neighborhoods are the smallest administrative divisions of municipal governments in Turkey[7] (Kocberber, 2005). The head of the neighborhoods is called a Mukhtar. The Mukhtar is elected by residents and serves for four years in office. Their basic responsibilities are record the residents of the neighborhood, provide official domicile approval when needed before any other municipal or state department, record births and deaths in the neighborhood and report them to the Census Bureau, record and report locational changes of residence, track the residents for military duty and provide approval for some local social and commercial activities.

During the last decade, there have been several changes on the central municipal border and neighborhood areas in Denizli. In January 2004, 22 municipalities and 25 villages which were located around Denizli's central city area were included into the Denizli Municipality administrative area by the decision of the Grand National Assembly of Turkey. There were 55 neighborhoods in Denizli until March 2008. Some of those neighborhoods merged with others and as a result, the number of neighborhoods was reduced to 31 by the change of municipal regulation. Some of neighborhood's names were also changed at the same time (12th March, 2008, haberler.com). A year later, the city council decided to include some of the surrounding villages and towns into the municipal border as neighborhood and made another

[7] According to a cabinet decision on 4th April 1945, decision no. 3/2412, and the legislation number 4541 on 10th April 1944 and also municipal legislation number 5393.

regulation changes in April 2009 (2nd April, 2009, Haber24.com). Now, there are 79 official neighborhoods belonging to the central municipality. Table 7 shows these changes by time and name of the neighborhoods, in chapter 6.

4.3. Why Study Denizli?

There are several reasons why Denizli is an appropriate case study area for this research. Denizli is one of the best developing cities in the country, based on population increase economic power and urban growth.

Based on reports of the Chamber of Industry and Chamber of Commerce of Turkey, Denizli is one of the five outstanding and successful cities based on economic activities. These cities are referred to as the Anatolian Tigers. The city has a large industrial campus with 184 institutions (January, 2009). Textiles is the dominant sector, and there are also factories for the chemical, marble, mechanics, agricultural machinery, plastic industry, steel and iron, food, glass and metal industries. The diversity of economic sectors is one of the reasons the city attracts population from other parts of the country.

Denizli is located on an important transportation network linking capital cities to the seashore, agricultural lands and touristic areas. Also, the city has specific natural, historical and recreational attraction places, especially for touristic activities, such as Hierapolis-Pamukkale, Karahayit-Hot Spring, Honaz Natural State Park and one of the largest recreational city parks of Aegean Region.

Suburban developments have been observed in Denizli, as well as luxury apartment complexes and single family houses on the city's edges. It is easy to observe the distinctions between the older settlement areas and new ones. All of these play a

crucial role in the urban development and urban livability of a city. Therefore, the analysis and method for this city would be proper and applicable for other developing cities as well.

4.4. Brief History of Denizli

Laodikia was the closest settlement area to where Denizli is located today. This city was destroyed by an earthquake in 1174, then some of the residents who left the town, settled in today's Denizli. This place was conquered by Gyaseddin Keyhusrev during 13th century. Denizli joined Ilhanli seigniory in 1291 as a city. Beginning in the14th Century, it served as the capital of Inancogullari which was one of the Anatolian seigniories at the time. After that, for a short period of time, it was under the control of Timur Khan who won the Ankara War and conquered all of Anatolia. In 1428, the Ottoman Empire took control of the area and Denizli officially became a part of the Ottoman Empire. It was a sub-district of Izmir until 1883. Several other villages were added into the border of city in 883 and 1888 (Sarakoy, Buldan, Tavas, Acipayam), then it became a sanjak (a type of county) dependent on Aydin. It has been a city, since the establishment of Republic of Turkey in 1923. According to records on Cities Bank, the first municipality of Denizli was established in 1876 (Ataman, 2004).

4.5. Urban Development of Denizli

Denizli is located on a plain and surrounded by a mountain range on the west, south and southwest. There is the Denizli Plain on the North and Northeast of the city center. A man-made lake, agricultural fields and highland area on east and southeast. Therefore, the only direction for urban growth is towards the west and northwest up to the mountainous area, southeast until the highlands and along the intercity highways.

The city used to grow toward the southeast direction but because of the topography, growth has stopped for the most part. However, there is still construction occurring in residential areas, on open fields in neighborhoods and on the side of the mountains. The open spaces on this part of the area are in use for agriculture. Lately, the northwestern part of the city is attracting population and construction companies. Therefore, there is a fast growing population in this area, especially during last 10 years (Map 2).

Ataman (2004) mentioned that Denizli is one of the best examples to observe urbanization of Turkish cities. During the second half of 19th century, the population increase and urban growth were very remarkable in Turkey and in Denizli as well.

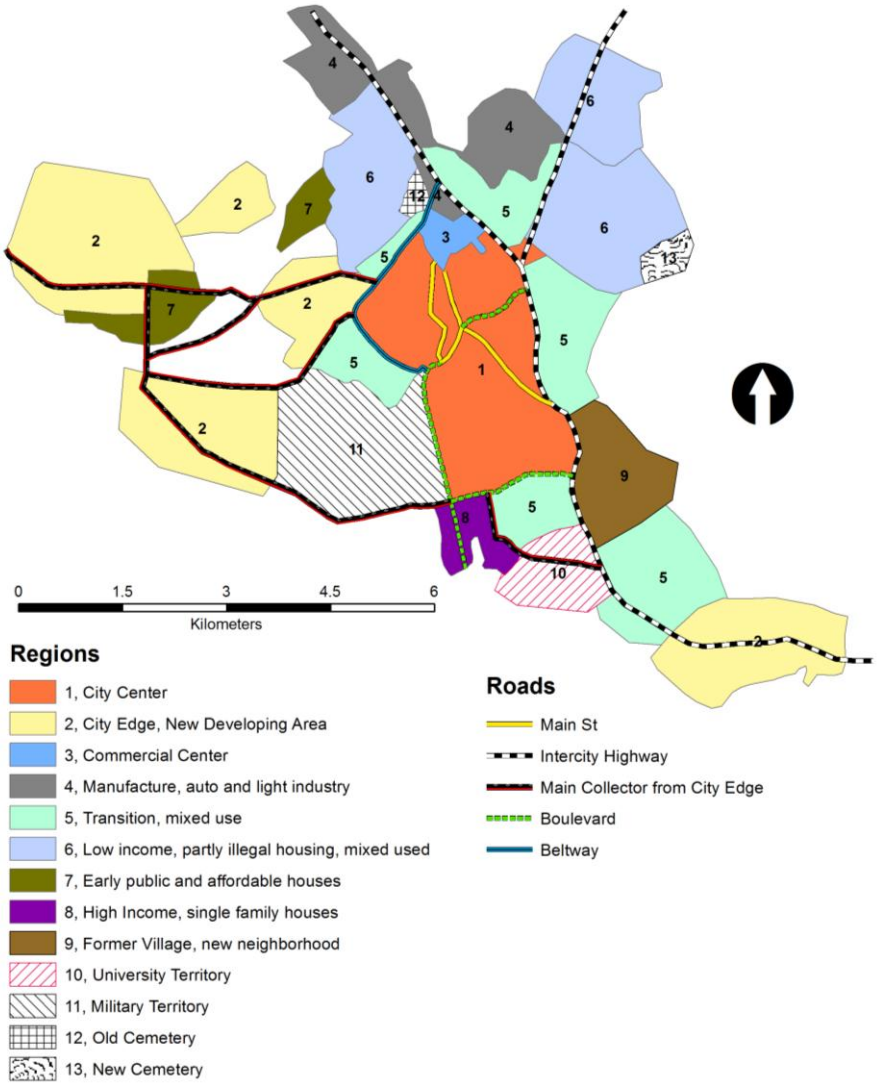
This was especially true after 1970, when there was migration from rural areas (towns and villages), surrounding sub-districts and also from eastern and southeastern cities. Some new settlement areas emerged with the arrival of new residents of the city. Naturally, people who are originally from the same place often settle down in the same neighborhoods in Denizli. For example, neighborhoods, called Dokuzkavaklar, Anafartalar, Sumer and Sevindik, are generally occupied by people who came from Cal, Baklan, Civril and Afyon; while most of those people who came from eastern and southeastern Turkey are located in Karsiyaka and Esentepe (Ataman, 2004).

Economic opportunities in the city attracted a lot of people to the area in a short period of time, especially after 1980. Therefore, there were certain places where illegal housing (squatter area) occurred. In addition, growth without a city plan caused difficulties for the municipality to provide services, such as infrastructure, schools, healthcare centers, and also caused some environmental problems, such as water and air pollution in the city for a long period of time. Problems with transportation networks

(condition of roads and management) and lack of open spaces (absence of green spaces and playgrounds) are other important problems resulting from rapid urbanization of the city.

There have been many improvements and public investments in Denizli since the early 2000s. Changes of governmental and municipal policies on urban growth and development are the main reasons for these positive changes. They will be discussed in following chapters.

Map 2: General urban patterns in Denizli



5. CHARACTERISTIC FORMS OF URBAN PATTERNS IN TURKISH CITIES

The goal of this chapter is to show the big picture at the country level to provide better understanding of the urbanization processes and urban pattern analysis on a city scale.

In this chapter, general information about urban patterns of Turkish cities is provided. This chapter includes a glance through the recent past, the urbanization period and the urban transition of locational and physical characteristics, and administrative issues; in addition, the role of city squares, main street formations, intercity highway formations and general problems will be discussed as a result of urbanization.

5.1. Introduction

In general, the major factors behind urban growth are population growth, industrial revolution, economic change (from cottage industry to factory productions) and the development of transportation, such as railroad and steam boat (Levy, 2009). Even though these main factors are similar for almost every city in the world, there are slight differences in terms of time of urban growth and types of factors. For instance, the city beautiful movement in Chicago can be regarded as a turning point or the beginning of urban planning in the US, during the late 18th century, and of course provides a good paradigm for other metropolitan cities in the world. Immediately after the industrial revolution there were many problems in industrial cities, including housing and disease problems. These challenges encouraged decision makers and scholars to work toward improving all the city functions and facilities. Early industrialization calls for a quick step toward early urban growth and development.

This post-industrialization and early urbanization occurred in America and West European countries, when it was a time of war or colonialism in many developing countries, including Turkey, roughly between 1850 and 1950. At this time in Turkey, the economy was down, people were suffering in many ways, and the administrative structure of the country was on the verge of switching from a monarchial government to establishing democracy. There were almost no public services available, no government investments existed, and the decision makers of the time could not even think about urban structures or plans. It took almost two thirds of a century to recover everything and deal with urban problems.

Turkey is established on a territory which has served many civilizations since before Christ. There are still many ruins and remnants from these early civilizations and their cities in different parts of the country. Seljuk, Byzantium and Ottoman, as three of the greatest empires in history, were located in Anatolia and they all left considerable amount of constructions behind. There were many castle cities from the feudal era, since the area was located in between many traditionally and culturally different civilizations, which means there were many threats. Traditional, cultural, natural, and geopolitical condition of this territory, such as access to Mediterranean Sea, direct contact with Central Asia and boundary with Middle East (place of natural resources and holy lands) attracted civilizations to the area throughout history. The Republic of Turkey was established in 1923 after a long period of war and political conflicts.

After the declaration of the republic, there was a great need to address economic and social development. The last 100 years of Ottoman Empire and early time of Turkish Republic with wars and political struggles (from early 1800s to 1923), resulted

in a lack of work force (since most of the population were women, children and elderly after years of wars –Kastan, 2006-), absence of public investment, loss of scholars, weak economy and poor cities. Early administrations had worked on economic investments as well as establishing new state institutions, such as national education, national history and literature, institutions of Turkish language, etc. There were a few attempts to establish private institutions in case of economic development, such as carpet factory in Bursa and sugar factory in Usak. Most of the economic power and work force was used to establish governmental institutions (Kastan, 2006; Karaman, 2003).

Therefore, the early discussions and studies about urban geography and urban studies in Turkey roughly started from late 1960s. This is actually the general case for most developing countries. They could not address any urban development issue earlier than this time because of different reasons, such as independence movement, period of decolonization and World Wars (Jacquemin, 1999). When we look at the industrialization periods of the countries, as a big factor of urbanization, most developing countries reached this point during the mid 1900s rather than late 1800s as developed countries did.

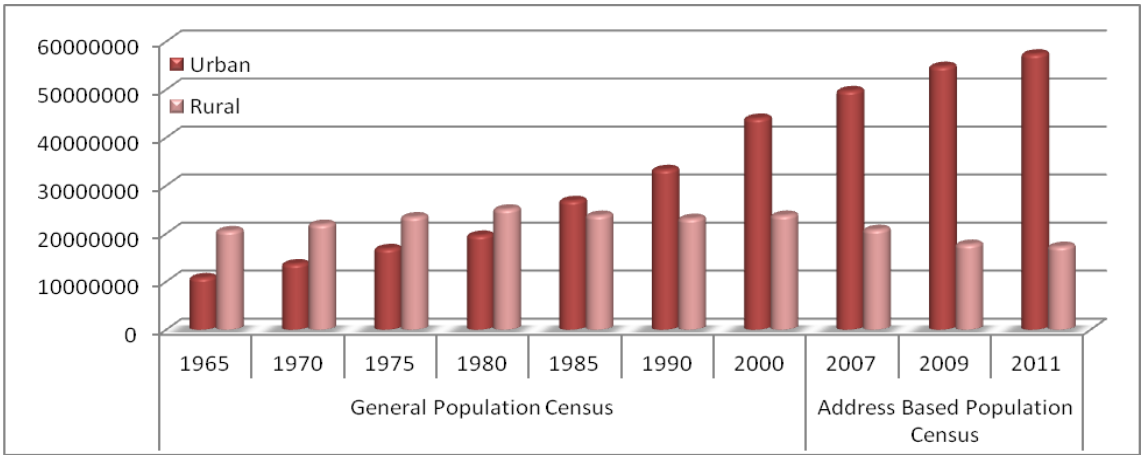
From 1960 to 1980 the central and local governments in Turkey, especially in the western part of the country and metropolitan municipalities, faced serious problems regarding rapid population growth. Illegal housing and a lack of infrastructure emerged as major issues (Keceli *et al*, 2008; Meshur *et al*, 2008). Rapid population growth continued until the late 1990s, then smoothly slowed down after the year 2000 (Table 6, Graph 2) but still continues. While only 34.4% of the total population was located in

urban areas in 1965, this increased to 43.91% in 1980 and 59.01% in 1990. Presently, the urban population of the country is almost 57.5 million which comprises 76.7% of total population.

The transformation of Turkey has been advancing since the 1980s, based on the regional and global economies, political structure, sociological and demographic changes (Karakuyu, 2008). For instance, while service sector employment was 23.4% (4.335.230 people) in 1980, it rose to 33.5% (8.719.693 people) in 2000. Remarkable changes in foreign trade are another indicator. While the total export value of Turkish products was $31.334.216 in 2001, it was $102.135.006 in 2009. Likewise, in 2001 the import value of foreign products was $41.399.083 while in 2009 the value was $140.919.431 (TurkStat, 2010).

Table 6 and Graph 2: Urban and Rural Population of Turkey

	General Population Census						Address Based Pop. Census	
	1970	**1975**	**1980**	**1985**	**1990**	**2000**	**2007**	**2011**
Urban	13691101	16869068	19645007	26865757	33326351	44006184	49747859	57385706
Rural	21914075	23478651	25091950	23798701	23146684	23797743	20838397	17338563
Total	35605176	40347719	44736957	50664458	56473035	67803927	70586256	74724269



5.2. Urbanization Period and Transition

Starting from the 1950s and increasing in pace during 1960s, larger cities in Turkey have faced immigration from rural areas and smaller cities. This caused a rapid urban population increase in many cities. Since official settlement zones were not managed properly by the local administrations, shanty areas emerged and grew rapidly. First administrators attempted to establish modern cities by modeling developed countries. However, a lack of protection of historic heritages and loss of flavor of the old civilizations were experienced in Turkish cities, as it is one of the common issues of cities, which have existed and built on such an area for centuries (Elsheshtawy, 2004). Simply, traditional identities and urban patterns of the cities have been destroyed during urbanization or the so-called modernization period. This process not only disturbed the historical legacy of cities but placed additional pressure on the natural environment and resources.

Three main impacts of urbanization and transition period can be listed: First, many historical places were destroyed instead of restored during early attempts for urban renewals, and multi-story apartment buildings have been built in these historical areas. Second, an increase in urban population brought other problems as well, such as pollution (water, air, soil), crime, social and spatial inequality. Third, new residents of the cities, which mostly belonged to lower socio-economic groups, created their own neighborhoods by illegal houses in and around agricultural and forestry areas that were not official residential zones.

Today, city centers are mostly covered by multi-story mass apartment blocks, office spaces, retails and public buildings. Green spaces were not even considered

seriously as a part of cities during strategic urban planning and zoning, until the last ten-twelve years. Even urban furniture (such as, bus stops and park benches) and landscapes did not represent any local features but followed the fashion of the time. This caused an ugly standardization of city centers, squares and parks in different places. As a result, there were many similar urban places with similar physical appearance, instead of places with unique or traditional local design that would represent its history and identity.

Since the early 2000s, this condition has been changing. New approaches of the current government on urban growth, city planning and municipal management help to avoid the negative results of irregular urban growth of Turkish cities. Lately, there is more evidence of growth with good plans and improvements of the physical environment of cities. Green spaces are taken care of and there are more investments in infrastructure renewals and transportation systems. A public housing act is led and managed by the Housing Development Administration of Turkey (HDAT) which is directly affiliated with the Office of Prime Minister. This institution provides affordable houses to help local government to manage urban renewals. They also build public buildings, such as schools, and luxury housing depending on the needs of places.

The muslim world is not able to manage adaptation to modernization and technological improvement, especially since early 1800s. Colonialism is a big factor on this issue, especially for North African countries. They could never develop, grow and contribute the architecture/urban design (Elsheshtawy, 2004). Turkey was never colonized by another power; however it has always been in the middle of international and regional conflicts. Therefore, those problems consumed all of the time, budget and

any efforts made by the Turkish governments for a long period of time, precluding investment in public goods and services. This is another indirect effect on long and slow process of urban development in the country.

5.3. What is there in Turkish Urban Studies?

As this is the case for almost every developing country, urbanization is in front of industrialization in Turkey, by the effects of rapid population increase (Kocak and Tolonlar, 2008). It has been the result of the first movement of immigration from small cities to larger cities, mainly to the Istanbul, even though it was already overcrowded by the 1950s. The first recorded squatter area in Turkish urban geography studies is Zeytinburnu, Istanbul (Karakuyu, 2006). This area was occupied as a place for illegal housing in the late 1940s and it has continued to grow as a squatting area until a new regulation was passed in 1986. During late 1970s and early 1980s, Izmir and Ankara, and also some other secondary cities, such as Bursa, Kocaeli, Eskisehir and Antalya struggled with squatter settlements (Yucesahin *et al*, 2004; Cakir, 2011). In general, 1986 regulation defines the areas of settlements, status of buildings, regulates whether existing building will remain and legalize, need improvements and legalize, or remove.

As the impacts of squatter areas, inefficient infrastructure, lack of public services and environmental issues emerged as urban problems as the result of rapid urbanization (Tuncdilek and Tumertekin, 1959; Tumertekin, 1973). Especially in larger cities, mainly Istanbul, Ankara and Izmir, there were issues of water and air pollution, for a couple of decades. Even in 1980's Turkish movies, Istanbul was shown as covered by a gray sky; street views were always disturbed by piles of waste; the "golden horn" which was one of the beautiful natural bays in the world was polluted by urban

discharge and so on. As it was the case in other big cities, urban researchers of pre-90s dealt with environmental problems based on rapid urbanization and rapidly increasing population (Keles, 1984; Avci, 1993).

At the same time crime rates increased in growing cities because of socio-spatial inequality and segregation. People who moved to bigger cities from rural parts of the country engaged with illegal works to be able to reach a higher quality of life they hoped to find. The weakness of the local government and security departments allowed the spread of these sorts of illegal groups and networks. This caused issues of security in metropolitan areas and there were little but theoretical studies on the topic until the late 1990s (Dursun, 1997; Donmezer, 1994). Establishment of digital mapping systems, spatial crime analysis techniques and city surveillance networks reduced these crime trends.

Urban geography and urban planning perspectives were incorporated by governmental and municipal departments during the second half of the 1990s, with consideration and appreciation of the importance of urban issues for proper growth and development. The main reasons behind this immediate change of political view were the unpleasant environment in a large number of cities and public unhappiness about the situation. Regulation changes about squatter areas in 1984 and 1986 and the spatial rehabilitation attempts of the local governments resulted in a renewal act, more commonly known as urban transformation projects (Sisman and Kibaroglu, 2009), such as Dikmen Valley urban transformation project, as one of the pioneer sample. New regulations about urban transformation during 2004, 2005 and 2006 aim to transform shanty areas into modern and healthy urban places, old industrial sites into more

efficient and useful urban functions, protect historical sites and buildings by restoration and modern usage, or transform them as an attraction place for the area, and finally rebuild the places which were destroyed by natural hazards (Kocak and Tolonlar, 2008; Aydin, H. A., 2008).

The years between 1999 to mid-2000s were one of the most important times for urban renewal in urban geography researches in Turkey. Devastating earthquakes in Kocaeli and Duzce attracted attention to this topic. According to official numbers, almost 17,480 people died, 48,901 were injured, more than 150,00 people lost their homes, 96,796 buildings were completely destroyed and more than 225,000 building damaged according to report of Crisis Management Center of Prime Minister (Report, 2000). Therefore, decision makers, planners, geographers and others who deal with urban, social and spatial sciences agreed on the weaknesses in urban construction regulations, spatial organizations and building qualities. After this event, urban renewal, reconstruction, renovation and building regulations were mentioned in literature for a long time (Iskenderoglu *et al*, 2003; DPT, 2001).

After this period, infrastructure and superstructure renewals, providing more public services and green areas, accessible city projects, improving transportation system are some of the main issues of 2000s. The policy, called “a university for each city”, turned into huge renovations in Turkish cities in terms of economic and social life. Cities located in the east, southeast and northeast parts of Turkey have received many benefits from this policy. New universities attract many people to the area as local consumers, such as faculty members and students. In addition, these institutions of learning attracted and retained younger people, balanced with the ones who moved out

of those cities because of a lack of job opportunities, lower quality of life and public safety.

At the same time, the "city beautiful movement" of Turkey has been happening since 2002. The administrative approach of the current ruling party (Justice and Development Party, AKP) accelerates the public investment in cities. It includes creating green and open spaces in cities, providing recreational areas, protection of historical and natural sites and also providing public services in the same area to contribute to cultural heritage, infrastructure renewals (transferring electric line to underground, providing natural gas system, etc), improving transportation systems (highways, bridges, tunnels, public transportation), new regulations and enforcement for residential and commercial buildings in both visual and construction basis, online municipal services, sport fields, conversion of brown fields and vacant buildings in city centers, accessible city projects, city squares renewals and so on. Each of these issues has been in the literature as varied case studies, as research projects, master thesis and PhD dissertations (Aydin, 2008; Genc, 2008; Kocak and Tolonlar, 2008).

Also since the early 2000s, sustainable development has been an important topic in the literature all around the world. It is an interdisciplinary topic, where geographers, planners, sociologists, can be involved in the same studies with geologists, climatologists or environmental engineers. Since most Turkish cities are surrounded by agricultural lands, it is one of the biggest issues of sustainable growth in Turkey, to be able to find methodologies and create strategic plans for growth without disturbing agricultural areas. It is the same for the development of cities which are located near forestry areas and water resources. As mentioned earlier, the renovation of brown fields

and vacant buildings are a part of sustainable growth attempts.

Housing and urban infrastructure have always been two main problems in cities. When decision makers realized that international and national migrants cause rapid urban growth, rural development, industrial decentralization and lack of concentration, the creation of satellite towns emerged as a precaution before worse condition could happen in the cities (Beall *et al*, 2010). During the second half of the last decade, urban social problems arose again, specifically social exclusion, social segregation, gated communities and social inequality, from the effects of the global economy on the country. Economic integration into the global economy has caused rapid growth in the Turkish economy, but at the same time it caused the emergence of social classes, especially from the effect of differences in wages. The topic of social exclusion has been mentioned in the literature in different ways, such as physical, economic, social and spatial exclusion (Church *et al.*, 2000; Duffy, 1995). Social inequality is directly related to the economic condition of different communities all around the country. Gated communities have been studied as a result of this sort of social classification and spatial segregation between demographic, economic and social groups of the community.

The production of urbanization in Turkey has been affected by four main changes since the early 1980s. These are: changes in the structure of investment in the built environment, the organization of industrial development, the practice of architecture and the technologies employed in building provision. Together, these changes have accounted for a number of emergent forms in the landscape of cities

(Hall, 2001). Turkey has at least a decade delay in these processes in terms of national literature and empirical investigations.

5.4. What is Common in Urban Patterns of Turkish Cities?

One of the common jokes in Turkey, is when people introduce where they are originally from, his/her company which has never been in that place, can easily talk and pretend as if he/she has been there by using basic city square definitions, common statues, the municipal building's location and common shops. This is actually proof of how Turkish cities are similar in physical appearance, in terms of spatial organization of urban patterns.

In this section, some of those common features are discussed. The purpose of this discussion is to give some sense of these places, background on the way they develop and roughly current condition, before we examine the details in the case of Denizli and the livability analysis.

General locations, basic evidences of locational transition of settlement areas, city squares, main street formations, intercity highway formations, and characteristics of new and old settlements are the issues that are included in this section. Sample scenes were provided from different cities which are located in different regions of the country.

5.4.1. Castles and City Walls as City Landmark

Castles and city walls are one of the important landmarks of Turkish cities. Security was the first requirement for the settlements and cities throughout history, next to water and food supplies. Since Anatolia has been occupied by many civilizations and tribes for centuries, there are now thousands of castles all around the country (NTV, 100

Kale; Sevgen, 1959). Figure 2a and 2b show some examples of those castles and how they stay in the middle of today's cities.

Generally, castles were built on top of a hill, for defensive advantages (Figure 2a). There are also other types of castles which were built on flat plains (Figure 2b). These types of castles usually have higher and stronger walls. Instead of explaining general features and purpose of the castles at the time they were built, their condition and impacts on current urban patterns in cities will be discussed here.

Today, most of these castles serve as a tourist attraction for both national and international travelers. All of these are managed by different departments of Ministry of Culture and Tourism. Not all of them are prepared for regular visiting. There are some which are mostly destroyed and some have been closed, either because of the risk of damaging the structure or continuous archeological digs. Generally, they have no facilities inside except for the remaining parts of the old city, like jails, bastions, towers and other rooms. With the permission of local governments, some of the castles have developed some recreational services inside, such as restaurants, tea gardens and playgrounds. In this case, these places are one of the elements of recreational opportunities in the areas.

The closest available spaces around the castles that are built on top of the hills have been used for both agriculture and residential purposes. Therefore, these areas are generally the oldest neighborhoods in the cities. They always have tiny streets, old buildings and irregular spatial organization; as you can see in Figure 2a. There is always a contradiction in the urban development of these areas because while local administrators try to improve environmental quality, they also have to protect historical

identity. Private restorations also cause some destruction of these areas. On the other hand, for infrastructure and easy access, there have to be some changes.

The castles, which were built on plains, already had residential areas inside the walls at the time. Today, most of those places are occupied by retail centers and bazaars. Some places are dramatically occupied by illegal houses these places. As you can see on Figure 2b the area is covered by a mass of buildings. Some of those city walls are protected very well (eg. in Diyarbakir), while some were partly destroyed (eg. in Kayseri) and some were totally lost (eg. in Denizli).

Figure 2a: Castle and neighborhoods in Afyon

Figure 2b: Castle and neighborhoods in Diyarbakir

5.4.2. Historic Centers

Historical centers are other landmarks of development in Turkish cities. Even though some of these centers have been destroyed, there are still a remarkable number of historical, religious, educational and commercial buildings in existence and in use. Naturally, early settlement areas were built around these places and cities started to grow from these neighborhoods. As it is in the early neighborhoods by the castles, these neighborhoods have irregular spatial organization as well (Figure 3a and 3b). It is so hard to deal with urban development and renovation of these areas. There is much loss in terms of historical flavor and identity in these areas, especially in the case of physical appearances and structural changes of the residential units.

The protection of large historical landmarks is easier than protection of smaller buildings and facilities (e.g. fountains), since they are continuously being used. The problem is to adapt them to the surrounding built environment and at the same time leave their original features. Main buildings in those complexes, such as huge mosques and bazaars with many shops in it, are well protected. However, small pieces of those complexes, which contribute to a sense of those places, could be lost in time.

Green areas around these historic centers serve as public places for people to hang out, get together or just spend some leisure time in a pleasant place (Figure 3a and 3b). Not everyone has that opportunity, however. For example, in figure 3a, the traditional campus around Ulu Cami (mosque, bazaar, madrasa) is under pressure from streets, residential and commercial buildings. Therefore there is limited space for green areas; however, there are still some public places between buildings.

Figure 3a: Historical centers with religious, educational and commercial buildings: Bursa, Ulu Mosque

Figure 3b: Historical centers with religious, educational and commercial buildings: Edirne, Selimiye Mosque

5.4.3. City Squares and Main Streets

Another common feature in Turkish cities is the formation of city squares. These places are usually located where administrative buildings (municipality, governor), retail shops, public spaces and public transportation networks meet. There is always a mosque, a big or small square with a statue of Ataturk and a kind of representation of city symbol/s which is usually the most famous product or folkloric feature of that city or region. City squares are most likely formed in the same place of historical center. Also, they may be established in a different central point of the city.

The public space may be an open area by the main intersection, as it is shown on figure 4a, or a parcel between the roads, as it is shown on figure 4b. These public spaces serve as a place of enjoyment for the elderly, as a place for a short break for the people, as a venue for national celebrations, public concerts, political parties' meetings and so on. Basically, this is a place that serves the common good of a city's residents.

Figure 4a: City squares, Gaziantep

Figure 4b: City squares, Trabzon

The availability of public transportation from any other part of the city through its center makes it accessible. The proximity of administrative buildings, retails, banks and other services is an opportunity for people to attempt many tasks in a small area and in a short amount of time.

The concept of having a main street in Turkey is a necessity. Every single city has at least one main street and there is always mixed land use for residential, commercial, financial, administrative and recreational purposes. These streets start at the city square and continue to another minor square or commercial center of the city. This is a place that is open as a social and economic corridor in the core of the city where people can shop, walk, hang out, handle their official works, take their children to playground or enjoy a cup of tea.

5.4.4. Topography

Topography plays important role in spatial organization of urban patterns not just for Turkish cities but for all cities around the world. However, this is more important in places where topography is rough with many highlands and mountains.

Figure 5: Impacts of topography on urban growth, Tokat

Samples on figure 5 show a city that is established on flat areas close to the mountains, and urban growth naturally follows the path of valley. In some cases, this development encroaches upon the natural environment. Generally, these urban expansions disturb forestry areas, cause deforestation and erosion.

Many cities in Turkey have a mountain or mountain range on at least one of their sides. Therefore, urban growth in the direction of the mountain range is impossible. If there is another building or natural obstacle on the other side of the city, -

such as dam, agricultural fields, the historical protection areas or a military base - city growth is compulsorily forced through only available directions.

5.4.5. Intercity Highways and Surrounded Areas

Intercity highways are also an important component of urban growth in Turkey. Because of the fact that these places attract both business and residential for different reasons, such as lower land prices during the early time of development, cheaper residential opportunities for workers, and easy access to work from home. Therefore, there are supposed to be public investment in these areas. However, as these locations used to be occupied by shanties in earlier times, there is a lack of infrastructure and services. Thus, these are places where socio-spatial segregations and inequalities are mostly felt by the residents.

Figure 6 shows several examples of this pattern. In images, brighter and bigger sized buildings are industrial and manufacturing buildings, while darker, smaller and red roofed buildings are residential. Notice the open fields by the industrial sites in picture one, three and four. Obviously, they used to stand alone and were separated from the residential areas. However, they were not far enough from urban centers. Now, they are located adjacent the residential area. In picture two, the industrial sites are completely surrounded by residential; you can notice the residential even in the same parcel of industrial site.

Most of those industrial and manufacturing centers have been designed in areas by the highways and most likely on the other side of the highway rather than where the city center is located. However, these zones are always too close to city center and apparently those urban plans have no long term consideration at the time they were

made. Therefore, those industrial sites are now located in between residential areas. This condition has caused some environmental problems, such as air pollution in neighborhoods, as well as social problems, such as security.

Figure 6: Industrial and residential sites by intercity highways
1) Gaziantep, 2) Afyon, 3) Kayseri, 4) Van

In some cities, such as Istanbul, firms have moved to another area due to some regulation changes. It is a solution for the small or medium size business in these areas, such as auto-repair complexes, however moving big factories is more difficult.

There are also larger industrial complexes, called Organized Industrial Zones. They are located away from the cities, since there are bigger factories and heavy industries (Figure 7). They are always located by the intercity highways. These factories also caused some residential and retail development on the corridor along the highways between the city center and these sites. There are more people who work in these areas

who commute from the city centers rather than live in rural areas and villages around these sites.

Figure 7: Organized Industrial Zones
1) Gaziantep, 2) Denizli

5.4.6. New Settlements and Forms of City Growth

There are structural and physical changes of urban patterns occurring during the urbanization process. Since cities are mostly covered by residential areas, these changes are more apparent in this type of urban pattern. In general, there are nicer buildings and well-designed environment in new neighborhoods. Therefore, it is easy to distinguish these places from the older parts of the cities. This distinction is actually causing a level of socio-spatial separation and inequality. This is actually one of the common features of capitalist countries and cities.

Figure 8 shows some samples of these new settlement areas. In general, the location of new settlements areas depends on current zoning areas which are defined by municipal regulations. These are most likely located on land that is available for city growth. Urban renewal areas are also considered as new settlement areas, especially illegal housing places. In some cases, private construction companies invest in inner city areas for new residential buildings, even though it costs more to build there than on

the city's edge. However, their concepts, market and customer features are more specific. The government also involves this new settlement establishment by the Housing Development Administration of Turkey (HDAT). Simply, the government provides lands for housing, then the HDAT deals with private companies and uses its own resources to build residential sites in cities. They provide affordable houses, single family houses and upper level residences.

New residential areas are formed in different characteristics and on a different spatial relationship with other parts of cities. Figure 8 picture 1 and 2 shows single stand new residential buildings and sites. These are generally private investment and they are built as special sites. In most of the cases, they have a school, a mosque, sport fields, playgrounds and green spaces as public area for the residents of the site. Some of these sites are gated communities.

Figure 8 picture 3 and 4 shows other common types of new settlements area. They are designed more efficiently than older places in the city. They have almost all city functions and services in the area. Their building quality is better and the physical appearance is nicer. They are a mix of multiple floor apartments and single family houses. These areas are generally formed by a combination of constructions of different private companies and governmental investments. Since they are already an attraction area for people and businesses, they are also the best location for new big shopping malls. Two negatives about these places are residents' longer commutes to the city center and the lack of sense of community, compared to old neighborhoods.

Figure 8 picture 5 and 6 shows two sample sites from the same city. Picture 5 shows the building sites which have been built by the HDAT and picture 6 shows

combinations of two privately owned luxury building sites. These two sample sites are located just by the older neighborhoods where houses are smaller and economically lower. Even though these types of luxury residences are evidences of economic and social development, their location is important to avoid any segregation or social classification problems.

Figure 8: New settlements and forms of city growth
1) Kayseri, 2) Sanliurfa, 3) Kastamonu, 4) Isparta, 5-6) Bursa

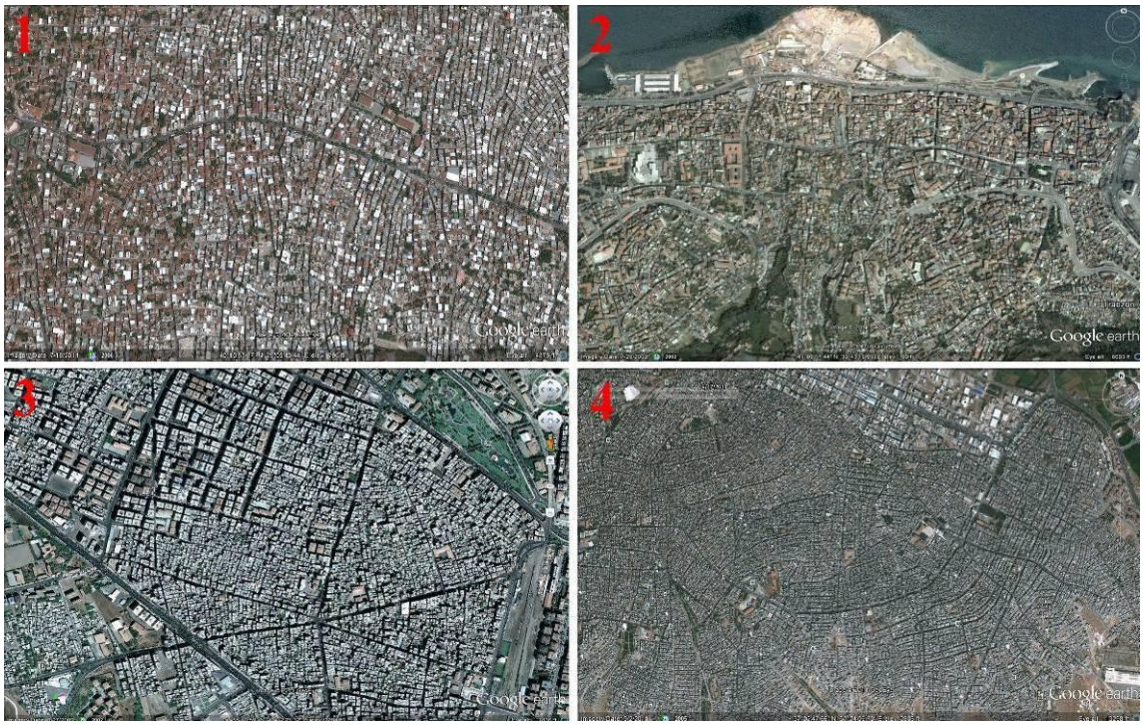
5.4.7. Concept of Green Space

Having green space in an urban area is an environmental phenomenon in Turkey. Even though most of the cities were originally pretty green with a lot of trees and open spaces, a lack of planning and control messes this feature up. Especially after the 1950s, larger cities had to deal with immigration, and administrators, private constructors and companies paid little attention to keeping green spaces in neighborhoods, or at least keeping some trees and open spaces available.

Figure 9 shows some sample scenes from different cities. Even though the pictures cover more than one neighborhood, you can barely see green areas and open spaces. It is a pretty dramatic occurrence and it is disconcerting to include picture 1 and 2 from the cities which are famous for their green environment. That is actually one of the worst misconceptions about green environment. Forestry areas around the city are beneficial for recreational activities but the scale of using these places are weekly or monthly, instead of daily. However, green spaces are one of the most important needs of every demographic group in an urban area and on a daily basis.

In picture 3, a green space appears on the northeastern corner. This is a sample of green spaces as public places. This space here is a parcel between two streets, with approximately 500 meters length and 125 meters width. It has a running trail, artificial rivers, ornamental lakes, playgrounds, picnic tables and other basic facilities. It is a nice example to show the creation of green spaces in an urban area. However, notice the size of it compared to buildings' area. You can also barely recognize some green spots in picture 4 and also notice how inefficient it is for the size of buildings' area.

Figure 9: Sample cities with lack of green spaces
1) Bursa, 2) Trabzon, 3) Diyarbakir, 4) Gaziantep



5.5. Summary of Current Urban Problems in Turkish Cities

One of the common issues in Turkish cities is the protection and preservation of historical places (Meshur *et al*, 2008). We are not talking about single stand ruins or just city walls here, but castles and surrounding residential areas, religious and educational buildings as a big complex in the middle of the cities, commercial centers (bazaars) and old road houses. The existence of these features is beneficial for cities for a variety of reasons, such as tourism, the local economy, a sense of place and historical identity. However, it is hard to manage these areas and their integration with surrounding neighborhoods.

Based on the old national arts, pictures and miniature paintings, it is easy to recognize narrow streets with fancy wooden buildings of Turkish cities were the origin of this city (Kaplan, 1989). The historical identity, local flavor and original patterns of

these places have been demolished because of restorations and rebuilding residential areas. On the other hand, most of these old places need renovation in terms of providing better infrastructure and transportation systems to be able to adapt to today's economic and social conditions. There are some protected areas, such as Safranbolu, which is still standing in its original form, but it is almost impossible to accomplish this in every city.

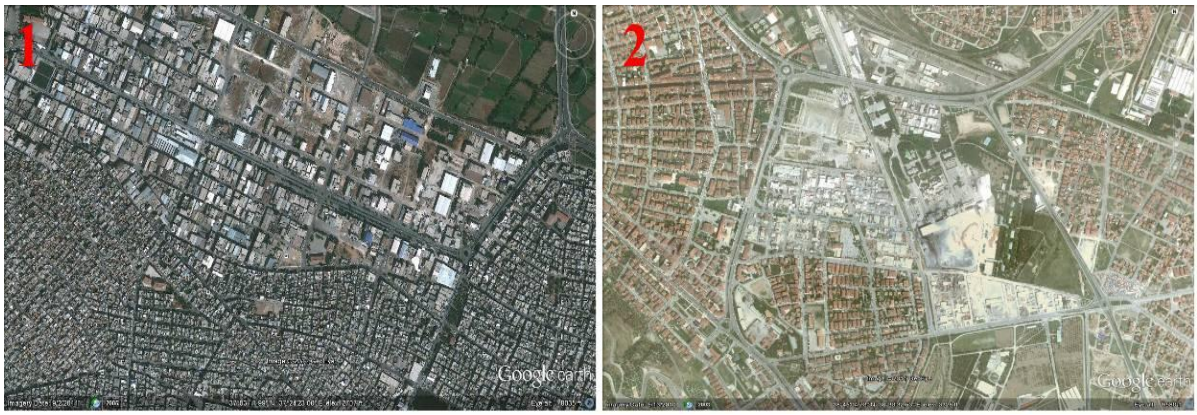
Urban renewals simply mean the reconstructed buildings that are old, have lost their functions (such as an old building of a flour factory), do not attract people and business any more, due to today's social, economic and physical conditions (Ozden 2000, Yigitcanlar, 2001). According to Genc (2008) illegal housing, natural hazard risk and construction of shopping malls are some of the important reasons for needs of urban renewals projects in Turkey.

Another issue is about new settlement areas and the way they developed. Yildiz and Inalhan (2007) define four main new settlement types, such as garden cities (suburbs), gated-luxury housing, multi-storey residences and mixed inner city housing. These types of residential developments have radically transformed the urban environment with their different characteristics in which social segregation has become more prominent than in the past, not just in Turkey but all around the world (Baycan, 2007). Characteristics of these settlement types differ from country to country, with respect to their characteristics and in particular with respect to different reasons of development, security, ethnicity and prestige (Gulumser, 2005). Although their negatives are known, they are a part of the trend of suburbanization that is based on the creation of self-contained and separate communities with carefully constructed identities (Webster *et al*., 2002).

More and more cities are growing in this way and social problems are emerging while spatial contradictions are starting to appear. Today, there are many places in Turkey where we can see residential sites located by the industrial zones. These two patterns are not supposed to share a space because of environmental quality and security concerns. In Figure 10, you can differentiate industrial sites from the residential areas only by the size of the building and the color of the roofs, not by any spatial pattern.

Absence or inefficient green space is a very obvious condition in almost every urban area of the country. However, current municipal governments are working to improve the amount and quality of green spaces in the cities. For example in Denizli, there used to be 1450000 square meters of green spaces available in 2004, now it is more than 5000000 square meters (WEB 1).

Figure 10: Mixed land use of industrial and residential sites
1) Gaziantep, 2) Afyon



5.6. Conclusion

This chapter is review of the general features and conditions of Turkish cities. As it is mentioned in the chapter 3, this chapter expresses the bigger picture of urban forms and processes, plus spatial patterns of features in the city with definitions of their locations and topography. It gives the reader a sense of cities in this country, and also

provides some basic information to help to better understand the following chapters that focus on detailed urban pattern analysis and livability analysis in the case of Denizli.

6. SPATIAL ORGANIZATION OF RESIDENTIAL URBAN PATTERNS IN DENIZLI: DETAILED VIEW OF NEIGHBORHOODS

The goal of this chapter is to investigate general residential urban pattern changes throughout time and to be able to provide a better understanding of how it has been affected by rapid urbanization.

In this chapter, spatio-temporal analyses were applied to be able to see how residential urban patterns have been formed in and around Denizli, as a sample study area, between 1971 and 2010. Their locational and structural changes in time and space were included, as well as their spatial interactions with other urban patterns, such as commercial, recreational, education and healthcare centers.

6.1. Introduction

Cities are dynamic and continuously changing. Economic, social and technological developments have strong impacts on these changes. In addition, the effects of local and global investments are also considered to be drivers of urban pattern changes. Obviously, there are many spatial and structural differences between old and new parts of cities; especially in residential areas. There are significant differences between old and new commercial and recreational places as well, in terms of their locations and functions.

These dynamic processes and changes resulted in various types of differences even between the same urban patterns. For example, the city core which is the possible closest location to the main street, used to be one of the most popular locations for residential units (based on price per unit); today, the city edge and new developing areas

are preferable for residential units. The way that these new settlement areas are growing will be discussed later in this study.

There are also differences between functions of urban patterns, as well as their location. For instance, old shopping centers and bazaars traditionally do not include any other services in the same area but shops. However, shopping malls are designed to be used as a leisure time activity spaces and attract more people, compared to the old bazaar. There are negatives and positives of both of these and they were included in this research.

During the continuation of the urbanization processes in an area, the lack of open and green spaces emerged as an urban problem, as mentioned earlier. The speed of growth and the lack of monitoring and control caused an unpleasant city center with mass building and the formation of gray landscapes. Creating green spaces and providing recreational services are important issues that local municipalities deal with today.

Another issue is the difficulty in handling both urban development and growth at the same time. As a reminder, while growth refers to physical enlargement of places, development refers to improvements of socio-economic conditions and its footprints on urban landscape. Equal public investment is a must to manage urban development successfully. Otherwise, there will always be weak and unpleasant places in the area with unhappy and complaining residents. Good and bad examples of about these issues will be discussed.

The direction/s of growth is another issue that needs to be monitored. Topography is the main element to define growth directions. Forest and water resources

are the places that you want to keep residential and industrial sites away from. Mountains and highlands are natural barriers that cannot be ignored. Agricultural areas and other natural resources are also considered as barriers for urban growth, and so, municipal and governmental regulations are prepared according to these elements. When directions of growth are naturally defined due to these factors, there may be differences in terms of characteristics of urban patterns in different directions. For example, while a part of the city is occupied by luxury residencies and gated communities, one of the other parts of the city may struggle because of illegal houses.

Spatial organization of public services is also crucial during urban growth, especially education, healthcare and transportation. These all require a large budget and plenty of time to be developed.

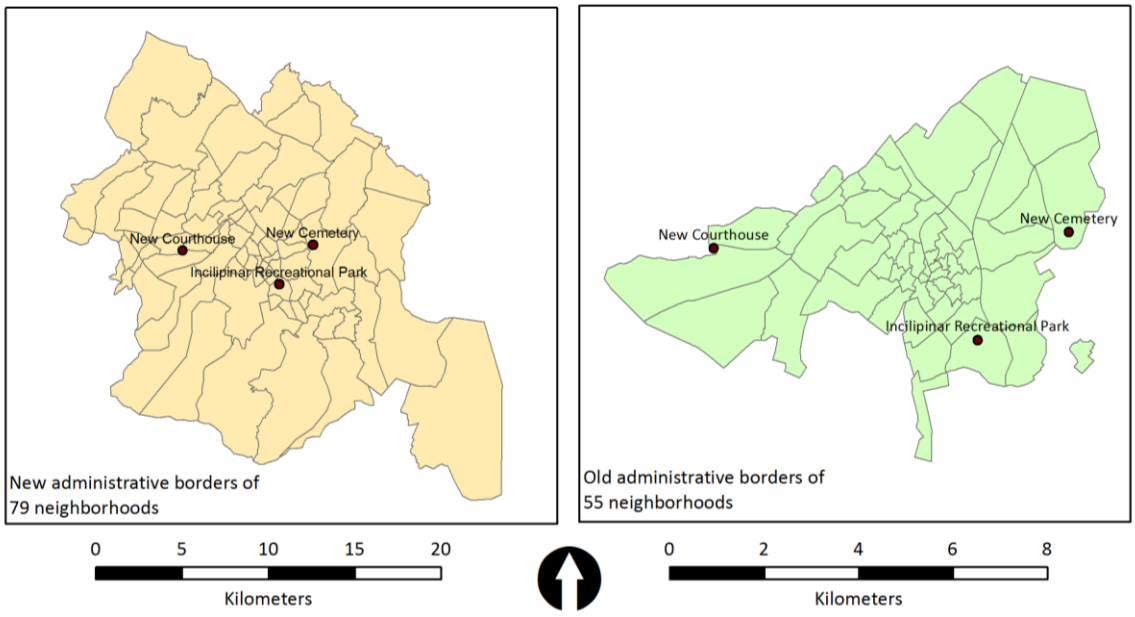
None of these issues mentioned above exist separately. They are interrelated in terms of their development and function. In other words, they should be considered as complementary factors for each other. Their proper order and distribution in urban areas contributes to the improvement of creating a livable environment for residents.

Neighborhoods were taken as the scale of analysis for the study, since the study focuses on comparisons between old and new neighborhoods. Basically the reasons that neighborhoods were selected as analysis scale are: a) neighborhoods show us the difference between the area that is highly invested or needs more care; b) neighborhood analyses give us an opportunity to see which neighborhood needs what; c) neighborhoods help us to see differences between old and new places.

6.2. General Displays of Neighborhoods

As mentioned in the chapter 4, there have been several changes in the central municipal border and neighborhood areas in Denizli. There were 55 neighborhoods in Denizli until March 2008. Some of those neighborhoods were merged with others and as a result, the number of neighborhoods was reduced to 31 by the change of municipal regulation at that time. Some of neighborhoods' names were also changed. After another regulation change in 2009, there are now 79 official neighborhoods which are the smallest administrative divisions and are led by Mukhtars. Table 7 shows these changes throughout time and the name of the neighborhoods and Map 3 shows the old and new borders of neighborhoods.

Map 3: Administrative borders of neighborhoods of Denizli



There are several reasons behind these changes, such as urban growth through different directions around the city center, attempts to create more efficient administrative borders and trying to achieve requirements for being a metropolitan

municipality by size of population and area. Even though these changes have caused temporary confusion for both the citizenry and administrators, there was a need for improving municipal management and to control city growth.

Table 7: Neighborhoods of Denizli

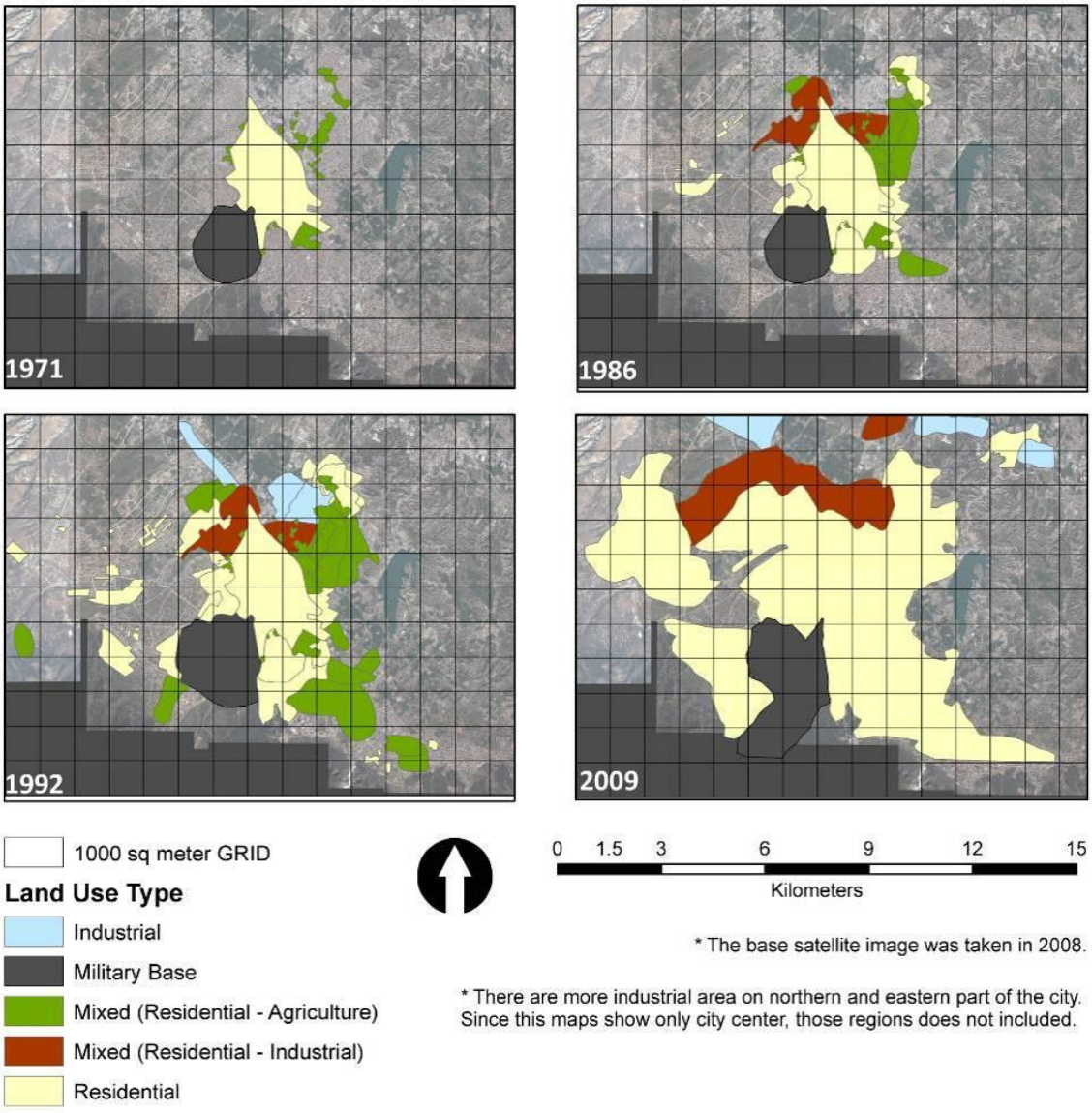
Neighborhoods of Denizli until March 2008				Added Neighborhoods on April 2009				Added Towns and Villages on April 2009	
1	Akkonak	32	Atakent	1	1200 Evler	25	Hisar	1	Akkale
2	Aktepe	33	Bakırlı	2	Adalet	26	Hürriyet	2	Bağbaşı
3	Altıntop	34	Barbaros	3	Akçeşme	27	Kadılar	3	Bereketli
4	Anafartalar	35	Çamlık	4	Akhan	28	Kale	4	Bozburun
5	Atalar	36	Çaybaşı	5	Alpaslan	29	Karahasanlı	5	Cankurtaran
6	Bahçelievler	37	Delikliçınar	6	Asmalıevler	30	Karakova	6	Eskihisar
7	Cumhuriyet	38	Dükkanönü	7	Bağbaşı	31	Karakurt	7	Gökpınar
8	Değirmenönü	39	Esentepe	8	Barbaros	32	Kayalar	8	Goncalı
9	Deliktaş	40	Eskimüftü	9	Barutçular	33	Kayhan	9	Göveçlik
10	Dokuzkavaklar	41	Günbattı	10	Bereketler	34	Kervansaray	10	Gümüşler
11	Fatih	42	Gündoğdu	11	Bozburun	35	Korucuk	11	Güzelköy
12	Fesleğen	43	Gürcan	12	Çakmak	36	Saruhan	12	Hallaçlar
13	Hacıkaplanlar	44	Gürpınar	13	Çamlaraltı	37	Servergazi	13	Hisarköy
14	İlbade	45	Hatipoğlu	14	Cankurtaran	38	Şemikler	14	Kadılar
15	İncilipınar	46	Kayalık	15	Cumhuriyet	39	Şirinköy	15	Karakova
16	İstiklal	47	Kiremitçi	16	Eskihisar	40	Siteler	16	Karakurt
17	Karaman	48	Kirişhane	17	Fatih	41	Tekke	17	Kayhan
18	Karşıyaka	49	Kuyupınar	18	Gökpınar	42	Yenimahalle	18	Kınıklı
19	Kuşpınar	50	Meska	19	Goncalı	43	Yenişafak	19	Korucuk
20	Mehmetakif	51	Musa	20	Gültepe	44	Yeşilköy	20	Saruhan
21	Mehmetçik	52	Saltak	21	Gümüşçay	45	Yunusemre	21	Servergazi
22	Merkezefendi	53	Uçancıbaşı	22	Güzelköy	46	Zafer	22	Şirinköy
23	Muratdede	54	Üçler	23	Hacıeyüplü	47	Zeytinköy		
24	Pelitlibağ	55	Yeşilyurt	24	Hallaclar	48	Zümrüt		
25	Saraylar								
26	Sevindik								
27	Sırakapılar								
28	Sümer								
29	Topraklık								
30	Yenişehir								
31	15 Mayıs								

* In first column, highlighted neighborhoods are merged with other neighborhoods.

* Notice that added towns and villages seen as neighborhood in middle column.

These recent changes create some difficulties for analysis. However, the definition of old and new settlement areas has been managed by using aerial photos and satellite images of the area. Map 4 shows the general land use changes in the city between 1971 and 2009 by approximate spatial representation. This map was manually created by using aerial photos of past years and satellite image of 2009. Residential, agricultural, industrial, mixed and military bases were used as defined urban patterns in this map. Also, 1000 sq meter grids were used to provide better view of growth and its directions in time and space. There are some single stands or group houses – as 3-4 houses located together- in the surrounding area of the city center, especially in 1971 and 1986. Those were not included in the map. Also, the area of military base has been shown roughly, since exact borders were not clear on aerial photos of 1971, 1986 and 1992.

Map 4: General land use change of Denizli[8]



6.2.1. General Land Use Change

According to numbers derived from the Denizli Municipality' digital maps of neighborhoods (Map 3), the total area was 37 sq km when there was 55 neighborhoods, after regulation changes the total area increased to 381 sq km with 79 neighborhoods. Table 8 shows general land use change of the Denizli city center between 1971 and

[8] Map created manually based on years and by using aerial photos and a satellite image. This is only provides approximate areas of patterns.

2009 by approximate areas of urban patterns. When we look at the general land use change map, growth of the residential area is immediately apparent. While the residential area was 16.75 sq km in 1992, it increased to 50.37, which is a 200.72% increase in growth area. Also, industrial areas in the area of city center increased from 2.57 sq km to 11.25 sq km, which means a 337.74% rise between 1992 and 2009. This number does not include other industrial sites and the Organized Industrial Zone which are located out of the central municipality border. Mixed (residential-industrial) land use also increased by 206.79% from 1992 to 2009, since people who desire to live as close as possible to the location of their job, settled down in places near these sites. The borders of the military base are not completely appearing and existing parts do not really clear on aerial photos of past years. Thus, the enlargement in size of military base does not necessarily mean it is spatially growing but there is more area shown on 1992 aerial photo and 2009 image.

Table 8: General land use change (sq km) of Denizli city center between 1971 and 2009[9]

	Residential	Industrial	Mixed (res-agr)	Mixed (res-ind)	Military Base
1971	6.07	0	1.56	0	3.38
1986	10.7	0	4.25	2.65	3.38
1992	16.75	2.57	11.41	2.65	5.25
2009	50.37	11.25	0	8.13	7.09

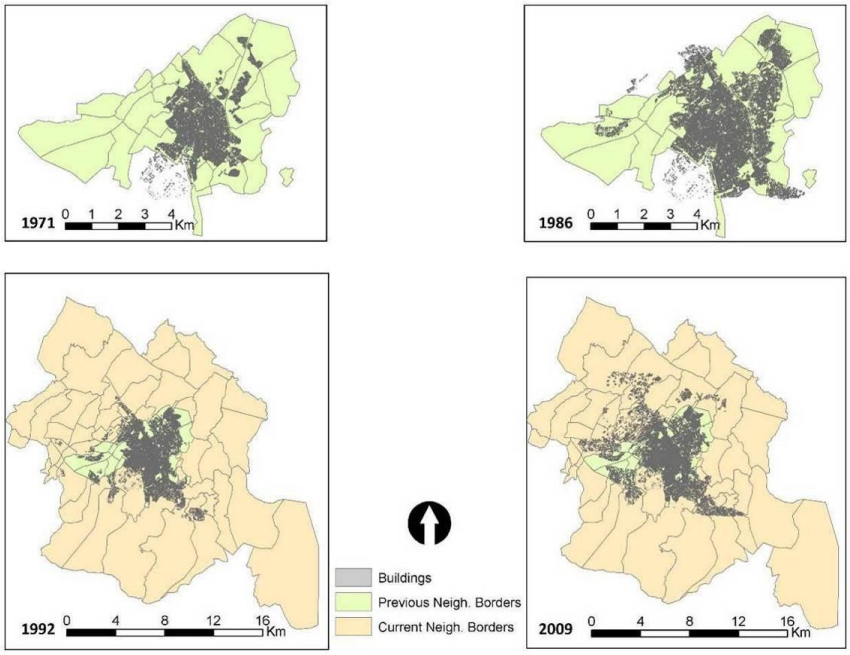
6.2.2. Growth of Built Environment

The built environment growth is shown on map 5. Buildings on the maps include not only residential but also industrial, commercial and public buildings. Since the building's map was not provided by municipality, it has been derived from City

[9] Areas values derived from Map 4

Bank and Basarsoft data. These are only geometry without any database. The numbers of buildings are 19299 in 1971, 41680 in 1986, 54748 in 1992 and 65840 in 2009. Only the buildings in the city center are included. Notice the difference of scale between 1971-1986 and 1992-2009. While the built area was only occupied by the city core in the previous neighborhood borders in 1971 (55 neighborhoods), it exceeded this area through the surrounded space, as it is shown in 2009 (79 neighborhoods). Obvious growth is shown toward the west until the mountainous area, south and southeast along the intercity highway between agricultural land and forestry area, and north along the intercity highway.

Map 5: Growth of built environment in Denizli



The open fields around neighborhoods (outer ring), are not available for growth because of some barriers, such as a mountain range on the west, the southwest and the south sides, agricultural fields on the northeast, a lake on the east and rough topography on the southeast. Also, a military base covers a huge area in the southern area but

recently a regulation change proposal has been presented to the parliament about using military territories for urban development, if it is needed. If it gets accepted, then this would be very helpful for urban renewal and the development of city centers in most of Turkish cities.

6.2.3. Defining of Old and New Neighborhoods and Specific Features

There may be a need of clarification about the terms of old and new neighborhoods in this study. The separation of old and new neighborhoods does not necessarily mean that we are talking about their old and new administrative borders, as it shows on map 3. Old neighborhoods are the places which have been there long before new developments and have been serving as living environments for at least 30 years. Therefore, one of the important points of this study is to investigate the location and structural differences of urban patterns in between old and new neighborhoods, and their effects on livability.

Evliya Celebi, who is one of the most famous travelers of the world, mentioned in his journal -Seyahatname-, that there were 26 neighborhoods and 3600 number of residential units in Denizli when he visited the city in 1671-1672. In the Municipal Annual (1973), there were 36 official neighborhoods in the city center. Then more were added and 55 neighborhoods remained until 2008 regulation changes. Map 6 shows, there are 46 neighborhoods in 1971 (different from the official numbers because there were no Mukhtar assigned to ten of those neighborhood at the time but there were buildings), in 52 neighborhoods in 1986 and in 55 neighborhoods in 1992. And again currently, there are 79 neighborhoods (Map 6).

Map 6: Neighborhoods' growth in time[10]

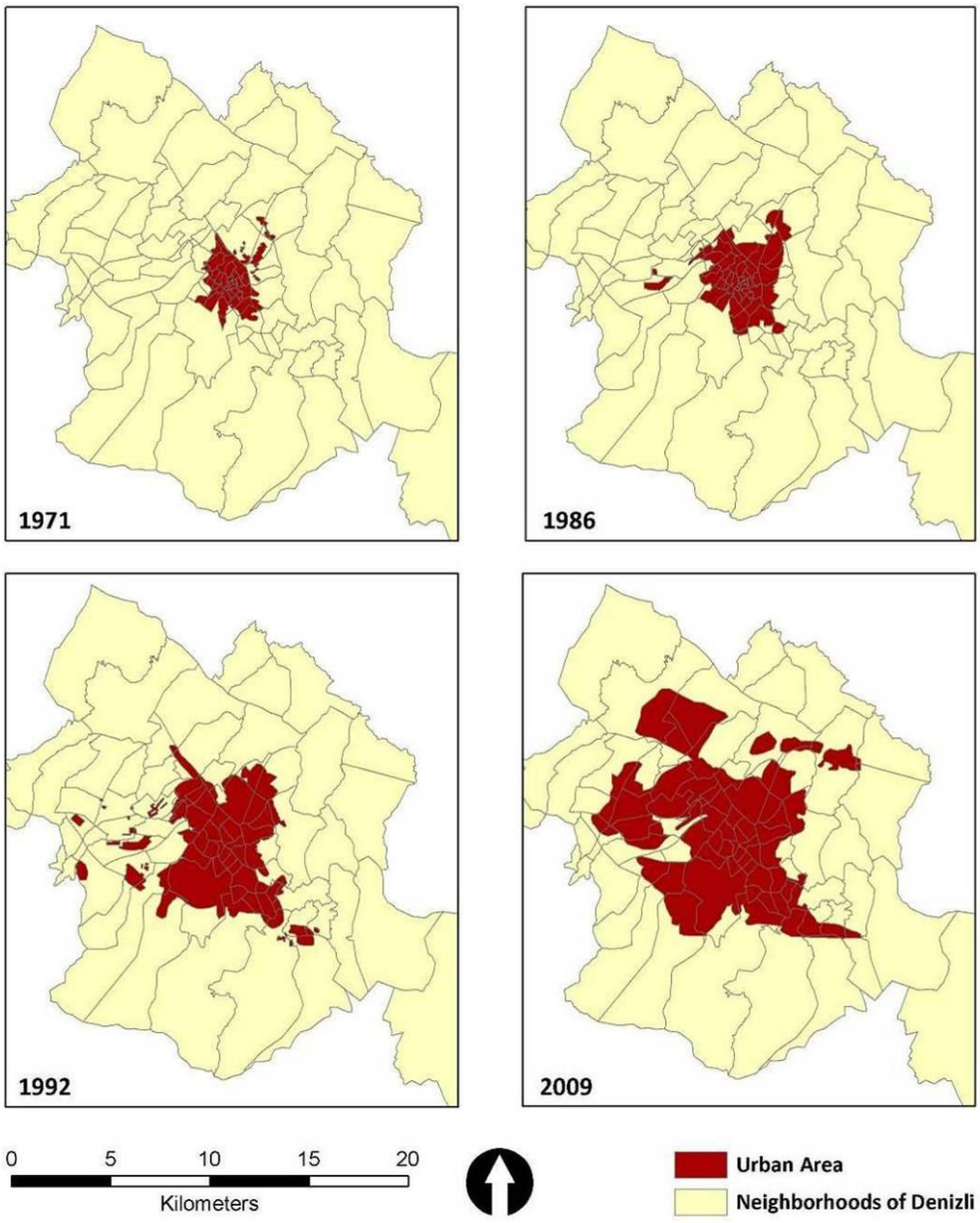


Table 9 shows 46 neighborhoods that were recorded in 1971. These are considered pre-1980s and old neighborhoods in the city. While most of those are in a compact area and pretty much show similar spatial characteristics, some of them used to

[10] Area of neighborhoods created by using building map

be on the city edge and the way they were established and developed are different than others (Ataman, 2004). For example, while the Saraylar neighborhood is one of the first neighborhoods where multiple floor apartments were built (1974, Ogretmenler Sitesi), Karsiyaka and Dokuzkavaklar were used as illegal housing sites until the mid 1980s. Most of early neighborhoods cover smaller area compared to newer neighborhoods (Map 6); to be able to have a more organized administrative system in the city (Ataman, 2004). Some of these old neighborhoods officially merged with others, such as Musa, Kayalik and Gurcan (Table 7).

Table 9: Neighborhoods of Denizli in 1971[11]

Akkonak	**Deliktas**	**Hacikaplanlar**	**Kuspinar**	**Sirakapilar**
Altintop	**Dokuzkavaklar**	**Hatipoglu**	**Kuyupinar**	**Sumer**
Anafartalar	**Dukkanonu**	**Ilbade**	Mehmetcik	**Topraklik**
Atalar	**Eskimuftu**	**Incilipinar**	Merkez Efendi	**Ucancibasi**
Bakirli	Fatih	**Istiklal**	**Muratdede**	Yesilyurt
Camlik	**Feslikan**	**Karaman**	**Musa**	**Yucebag**
Caybasi	**Gunbatti**	Karsiyaka	**Pelitlibag**	
Cumhuriyet	**Gundogdu**	**Kayalik**	**Saltak**	
Degirmenonu	**Gurcan**	**Kiremitci**	**Saraylar**	
Deliklicinar	Gurpinar	**Kirishane**	**Sevindik**	

Narrow streets and traditional houses were common landscapes in most of these neighborhoods until the early 90s. Land prices grew significantly higher during these times because of the need to balance supply and demand, and due to the value of being close to the city core. Therefore, many landlords of traditional houses either sold them to builders or destroyed the houses themselves and built larger buildings to reap more income. These approaches caused great loss in terms of historical background and traditional flavor of the city.

[11] Bold neighborhoods are official (Municipal Annual 1973), rest derived from the map 6.

Rapid urbanization negatively affected old neighborhoods. Besides the destruction of historical footprints, newer buildings interfere with the green environment of the city with masses of apartment blocks, lacking any open space, not even gardens. Today, retail and commercial space covers a remarkable amount of area in these old neighborhoods. None of these areas are completely zoned as industrial or commercial; however, since all the commercial activities have been in this small area for a long time, surrounding neighborhoods are now totally mixed with many kind of land uses.

6.3. General Characteristics and Spatial Organization of Urban Patterns in Denizli

6.3.1. Growth of Residential Urban Pattern

There are significant differences between old and new residential areas, in terms of density, physical condition, having open spaces and architecture. Neighborhoods were investigated starting from the city center to the city edge through the general growth paths, as west, north, and southeast.

Map 7 shows the density of the urban area at the time[12]. First of all, notice the differences of scales between 1971-1986 and 1992-2009. That is aiming to provide better view for each. Since the total area is smaller in 1971 and 1986, a small scale is used to be able to see details. When we look at the details, the city is more compact without any remarkable city edge in 1971 and 1986, while more sub centers appear

[12] Density maps were created with the ArcGIS, point density tool of spatial analyst toolbox, with 100 radius circle neighborhood and 20 output cell sizes. A population field was not available to be included, so they were not weighted by that. Point features were created by polygon features of buildings. Simply, building polygons were converted into point features by features to point tool. This calculates central point of each polygon and sets all the outcomes as a single point feature. In output map, values 0-100 are excluded to be able to avoid an unnecessary crowd in the view which occurs because of single standing houses or small building groups.

during 1992, continue to do so today. There used to be a small number of houses around the city in 1971 and 1986, however, since their density value is lower than 100, the map does not show them. Also, there are many more low density areas in 1992 and 2009. This actually gives us a clue about how important it was to be close to the city center until late 80s but then moving out of the city core emerged as a trend. There may be several reasons, such as an increased ability to commute on a daily basis, availability of public transportation, lack of space in the city center, public and private investments on the city edge, lower land prices and a nicer living environment.

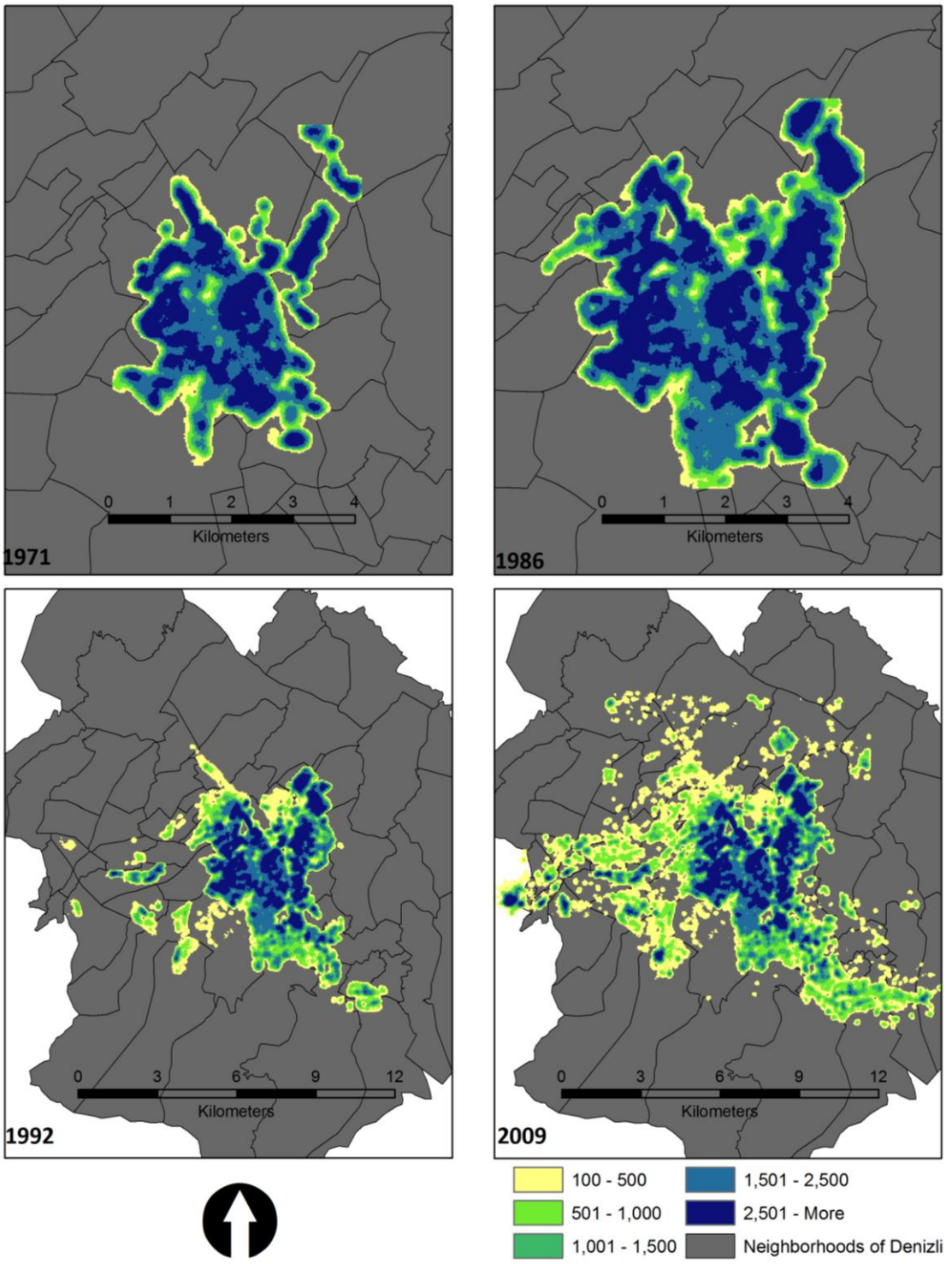
Tracking the growth by neighborhood borders may help to realize growth directions and density differences in Map 7. For example, there are salient parts through north, south and northeast in 1971, and surrounded areas of those salient parts are occupied in 1986. Also, while four new settlement areas appear as sub-center in 1992 (3 groups on the west and 1 group on the southeast), there are more sub-centers and currently developing areas seen on 2009.

The densest area remains in the city core. Fewer changes have occurred in this area; however, those have no strong impact on density analysis. Since the central city has almost no more space for construction, except rebuilt units, investment and construction have moved to the city edges in certain directions.

As mentioned above, structural changes of the residential patterns changed over time and space, as well as other urban patterns, such as commercial and recreational patterns. This condition was investigated here by several samples based on research interest. Education and healthcare centers, shopping places and transportation systems are included as indicators for spatio-temporal observation over the area. These

observations are aiming to provide information about detailed spatial order of urban patterns and its effects on livability, before the final chapter.

Map 7: Density map of built environment Denizli



6.3.2. Locational and Structural Changes

The dynamic form of cities is more observable since early 1980s in Turkey. Indeed, the location of urban patterns has been changing through time from city center to city edge with different directions and relations. Every spatial change has regional, economic, social and environmental reasons, and those reasons help researchers to identify characteristics of locational and structural changes.

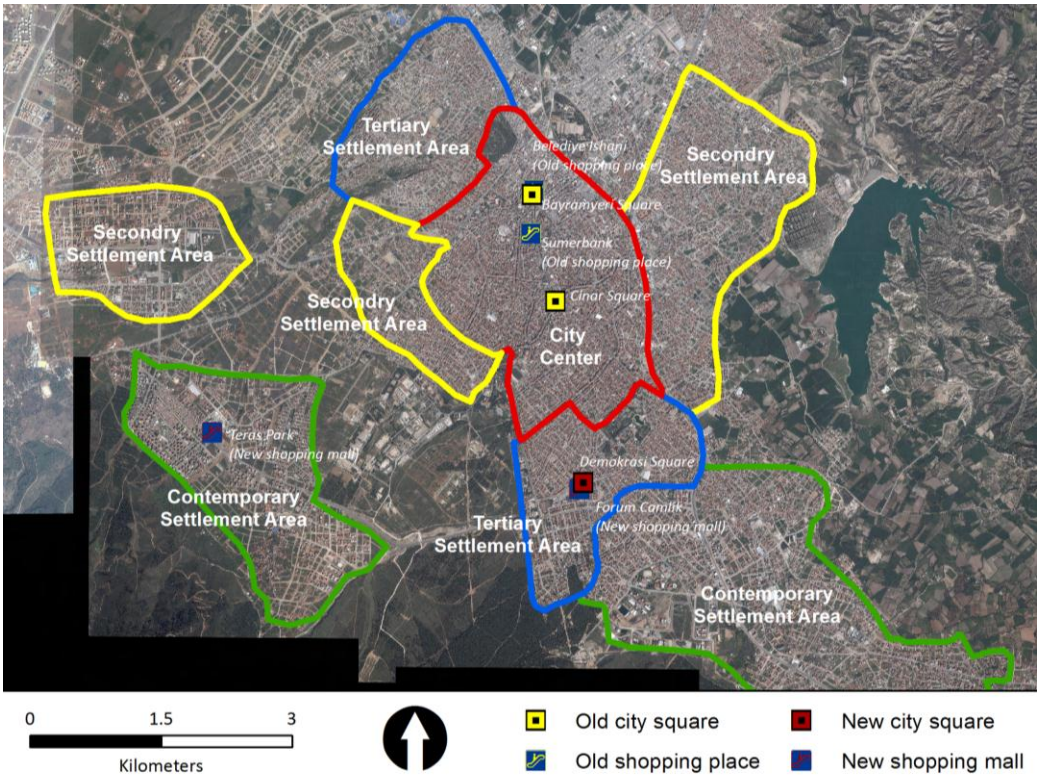
Figure 11 shows sample snapshots from Denizli. It includes locational changes of residential areas, sample points of city squares and shopping centers (malls). The expression of old and new represents the time that they have been in service in their location. The borders of the settlement areas were created roughly by using density maps. The historical center and surrounding area is in the middle with a red border. Until 1980s, there were a few settlements outside of this region. The zones with yellow borders are defined as secondary settlement areas (second wave of expansion). The one on the east side used to be a shanty area until the late 1980s, and then the area was fixed by regulated renewals. In 1971 aerial photos, there were already some small neighborhoods in this area. First settlement area in the yellow zone in the west was built by the government in 1977 after a big earthquake occurred in 1976. Those are basically public houses and provided accommodation to those whose houses were destroyed by the earthquake. Also, there are a few other building groups in the same area which were also built by the government through a part of the projects, called “protection from shanty area development” starting in 1975-1976. Those early settlements are still standing today, however in the north, northeast and northwest sides of this area there are lot of new residential buildings and public facilities, including schools, parks, healthcare

centers and administrative buildings. This place has been one of the most attractive regions of the city, in the last decade. The zones with blue borders show the area which developed starting in the early 1980s and were worked on until the end of that decade. The one on the north has an industrial zone which is by the residential areas. There used to be illegal houses in the region but most of those have been either improved and legalized, or removed by municipality. The blue zone in the south used to be on the city edge and was one of the famous recreational areas for the city during pre-1980s. Today, this is a part of the city core, with growth nonexistent due to lack of space but the area continues to develop by improving existing facilities and adding new ones. Old recreational areas in this place are still serving the same purpose but in a different structure. That will be discussed later in this chapter. City growth was started in the green zones during early 1990s and it is still continuing. Smoothly designed residential zones, nicer environment, more open space and available public facilities are common features of these regions. There are residential blocks as groups and single stand or groups of single family houses. These areas attract businesses, as well as people, so that there are many retail shops. Also, shopping malls prefer to be in and around these regions.

The locations of urban functions and facilities have changed in time as well. In Figure 11, notice the yellow squares which represent the city squares. The one in the north is the old town, where the city castle used to be located. The one in the middle is still serving as a main city square since the late 1960s. The red zone in the south was created in 1992-1993, as another public square of the city. It has never been as popular as previous ones in terms of its attraction for people and business. However, a new

shopping mall built in the same square in 2007-2008 has improved functionality of this public space. As you may realize, old shopping centers in the city center and their location are highly correlated with old city squares, while the new ones have been moved out of the city core and are located either in new settlement area (the one on west side) or out of city which does not show on this figure.

Figure 11: General locational changes of urban patterns

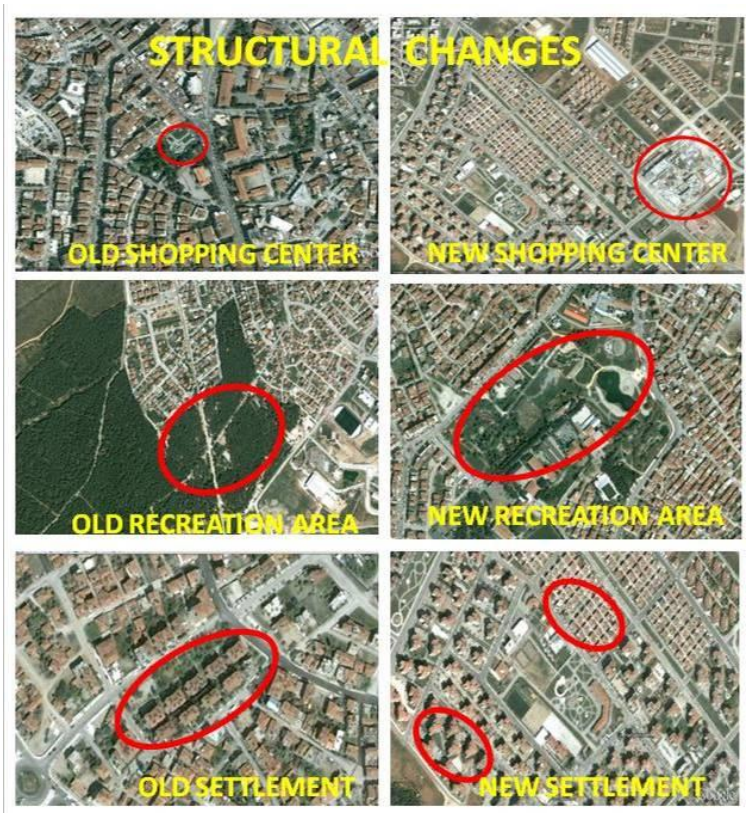


Obviously, urban growth and development bring many economic, social and spatial changes to cities. The way people live in a city and their daily practices are also changing as people adapt to their renewed urban environment. Therefore, their perception and consideration about the places where they go and do shopping, enjoy leisure time or choose a neighborhood to live in, are very distinctive compared to the past. This may not be a feature of only developing cities in Turkey but also in cities all

over the world. However, it is more observable in rapidly developing cities, since everything has been happening in a short period of time and in a smaller area compared to metropolitan cities.

Figure 12 shows samples for structural change based on time and space. Commercial areas, mostly shopping centers, used to be more related to city core and easy to access from any other part of the city. New shopping centers are most likely located either in and around new settlement areas or out of the city center, since they need larger space for all the facilities that they offer. Basic differences between old and new recreational areas are facilities and the landscape that they have. Ornamental pools, gym sets, trail paths, buffet markets, tea gardens, safe and clean environment are basics of today's recreational areas. In residential areas, we notice a lot more regular patterns in built areas, instead of compact and irregular distribution, as it is in old neighborhood. There are always green spaces and playgrounds in new sites. They also have taller buildings compared to old neighborhoods which mean more people but less sense of community.

Figure 12: Sample structural changes of commercial, recreational and residential patterns



6.3.3. General Distribution of Public Services: Schools, Healthcare Centers, Green Spaces and Transportation

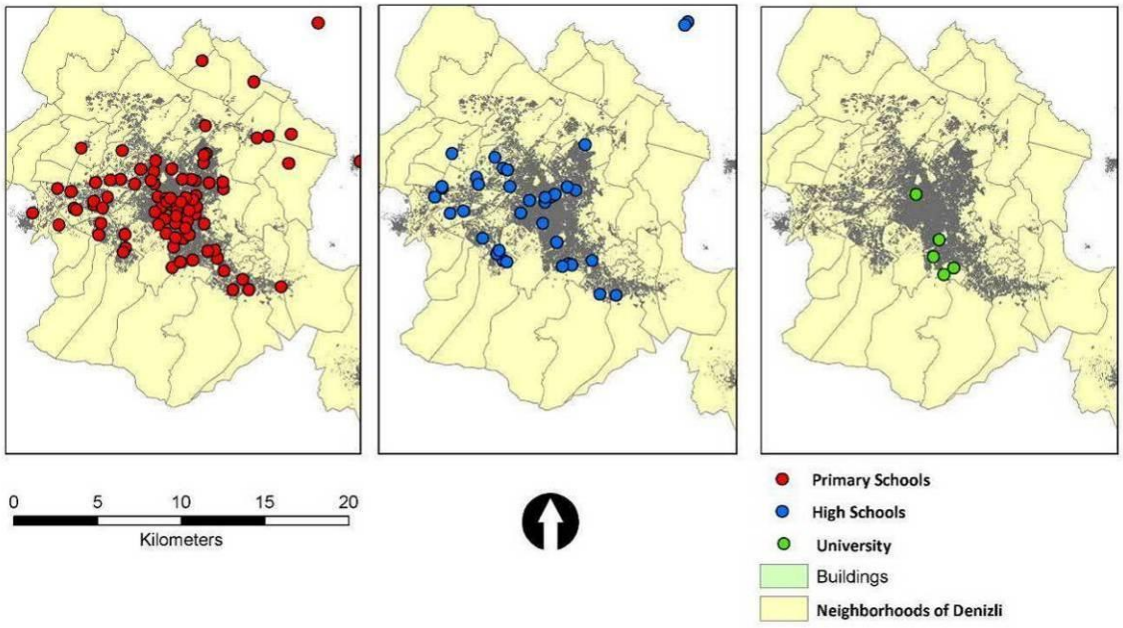
Public investment is one of the most difficult works for local governments during rapid urbanization period. Road networks, infrastructure, schools, health care centers and more other services should be provided simultaneously which always takes a long time. Spatial inequality occurs during this period. In addition, lack of control and monitoring may cause false location decisions for new investments.

When we look at municipality annual journals and work reports from 1971 to present, there is always some work and improvements made in transportation, the sewage system, energy infrastructure, urban renewal, new regulations, open spaces,

health, education, sport, culture and public participation. However, available resources (budget and human power), technical/technological capabilities, political approaches and perspectives play an important role in determining the success of these improvements.

Map 8 shows general spatial distribution of primary schools, high schools and university buildings from 2010 data. These include both private and public schools. There are 91 primary schools and 37 high schools recorded.

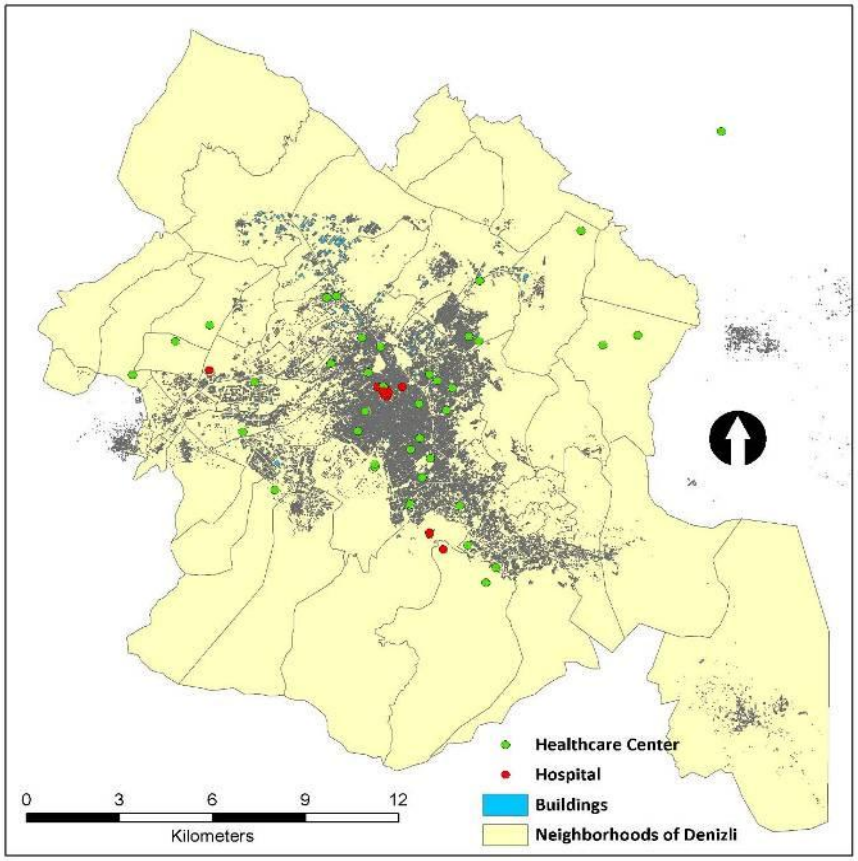
Map 8: Distribution of schools



Map 9 shows the distribution of healthcare centers in Denizli. Red spots in the map represent public and private hospitals which have emergency rooms and any other health care services. Green spots represent family doctors' clinics, dispensaries and medical laboratories. There are 11 hospitals and 45 health care centers. The establishment dates for clinics and dispensaries are not available. Even though we have

the establishment dates for hospitals, it does not provide much information, in terms of spatial analysis because almost all of them are located in the same place in the city.

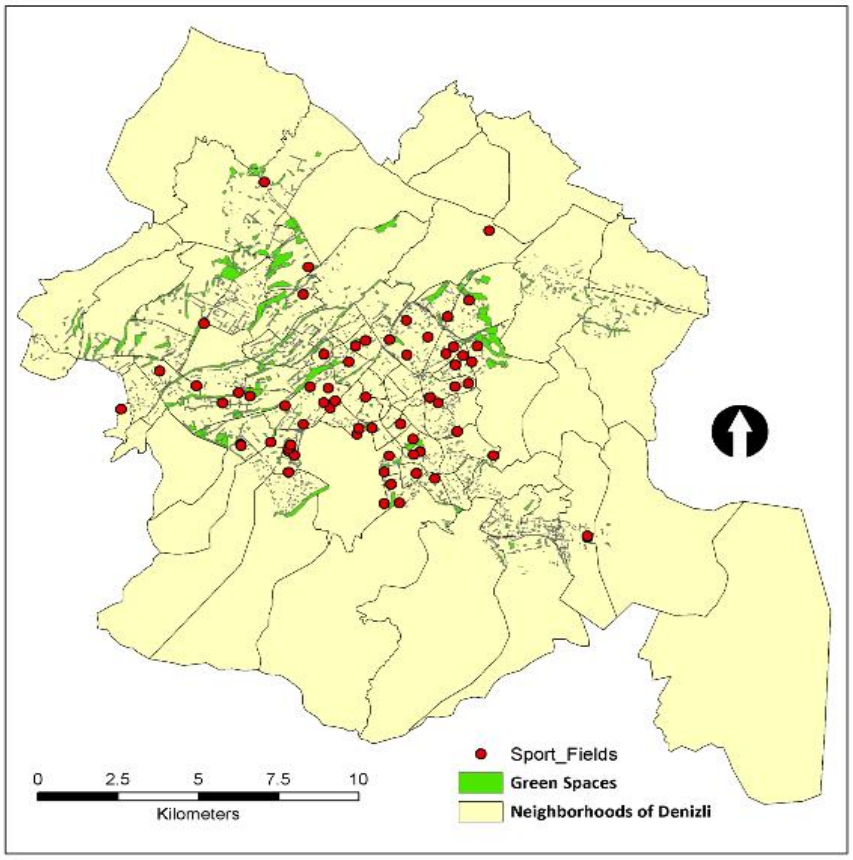
Map 9: Distribution of health care centers



Map 10 shows green spaces and sport fields based on 2010 data. Sport fields have been derived from Basarsoft data and green spaces have been derived from the data of Denizli Municipality, Department of Parks and Gardens. Even though it looks like a great deal of green spaces, not every one of them is used for recreational purposes. They indicate every green space in their maps, including little tiny blocks between two streets and parcels between streets and residential blocks. Therefore there are 4969 different polygons recorded in the map, however, there are 366 playgrounds, 176 gym set areas, 443 grass areas and 293 tree areas indicated in the summer 2011

official records of Department of Parks and Gardens. Obviously, even though each green space helps the city to look more appealing, not every one of them provides recreational opportunities. There are 73 sports fields recorded which are shown as red dots in the map. There are soccer fields, basketball fields, tennis courts and swimming pools in the data. Some are single stand facilities, while some of the others are in special sport complexes.

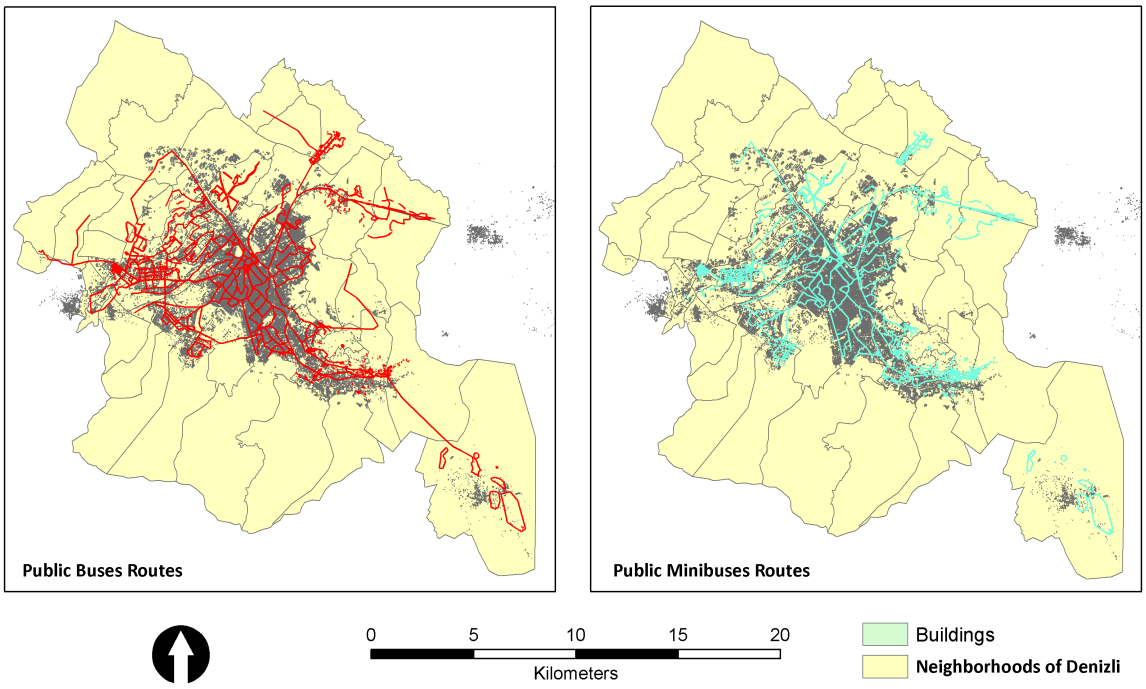
Map 10: Distribution of green spaces and sport fields



Public transportation is one of those elements that make public services accessible for every demographic group, in terms of age, gender, economic status and health condition. Vehicle and gas prices are quite high in Turkey. Thus, it is not that easy to have a vehicle and afford it. This underscores the importance of public

transportation. Map 11 shows public transportation network in Denizli. There are basically two different services, buses and minibuses. There is no subway or train service. Most of the routes of buses and minibuses are the same, especially in the city core. Almost everywhere in the city, there is an available public transportation system.

Map 11: Public transportation routes



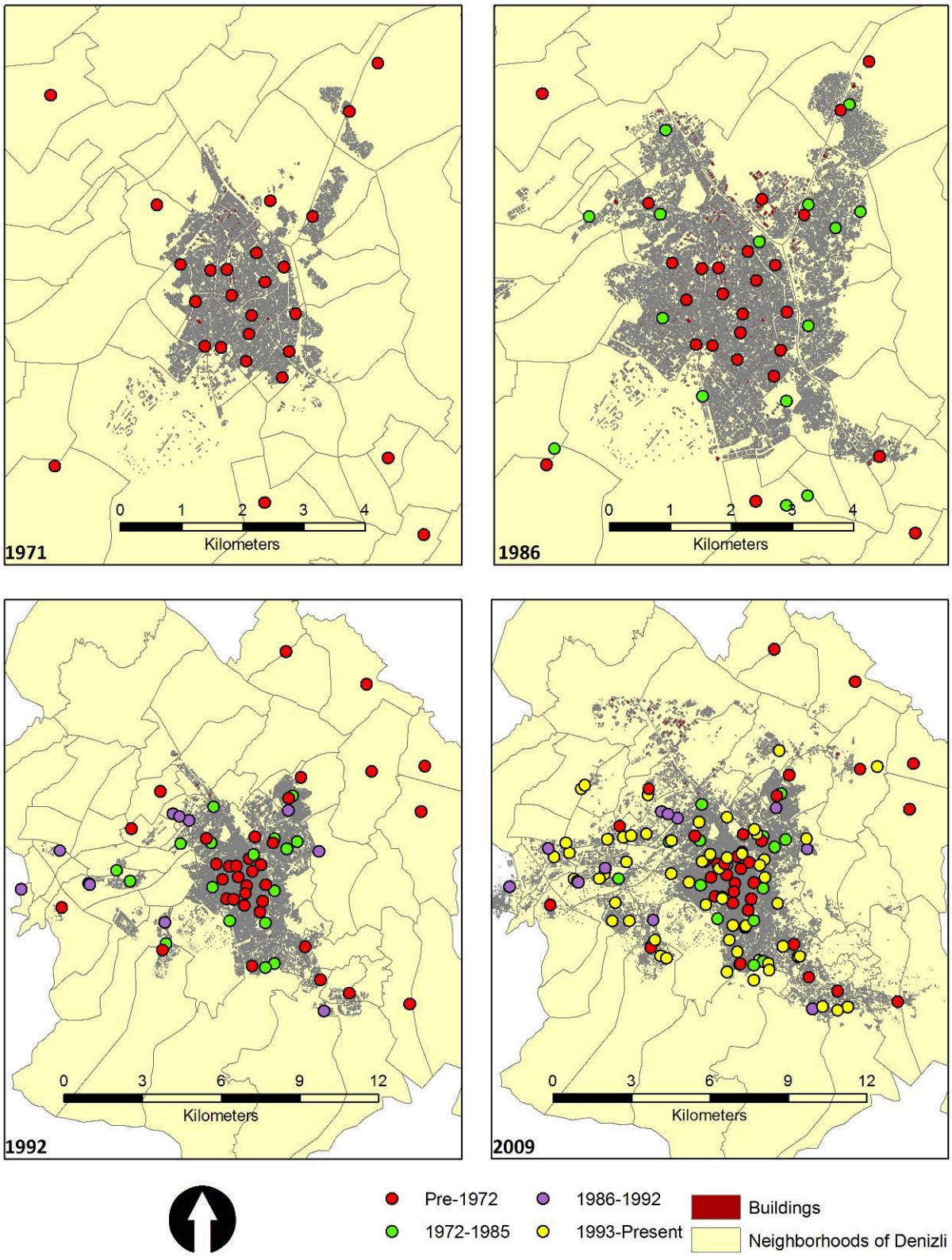
6.3.4. Spatio-Temporal Distribution of Public Services: Schools, Healthcare Centers, Green Spaces and Transportation

Temporal distribution of public services should be taken into account as well. That provides information about urbanization and spatial equality between old and new neighborhoods. Also, that helps to investigate how public investments have been done during last 30 years. In addition, we are able to see spatial relations between residential development and public services. However, there is a lack of information about establishment dates of roads and recreational areas. Municipality annual journals, aerial photos and other published books are used to figure out how those two patterns have

been developed over time. Spatio-temporal distribution maps of schools and hospitals were created by using records of official documents which were provided by Directory of National Education and Directory of Healthcare Services of Denizli.

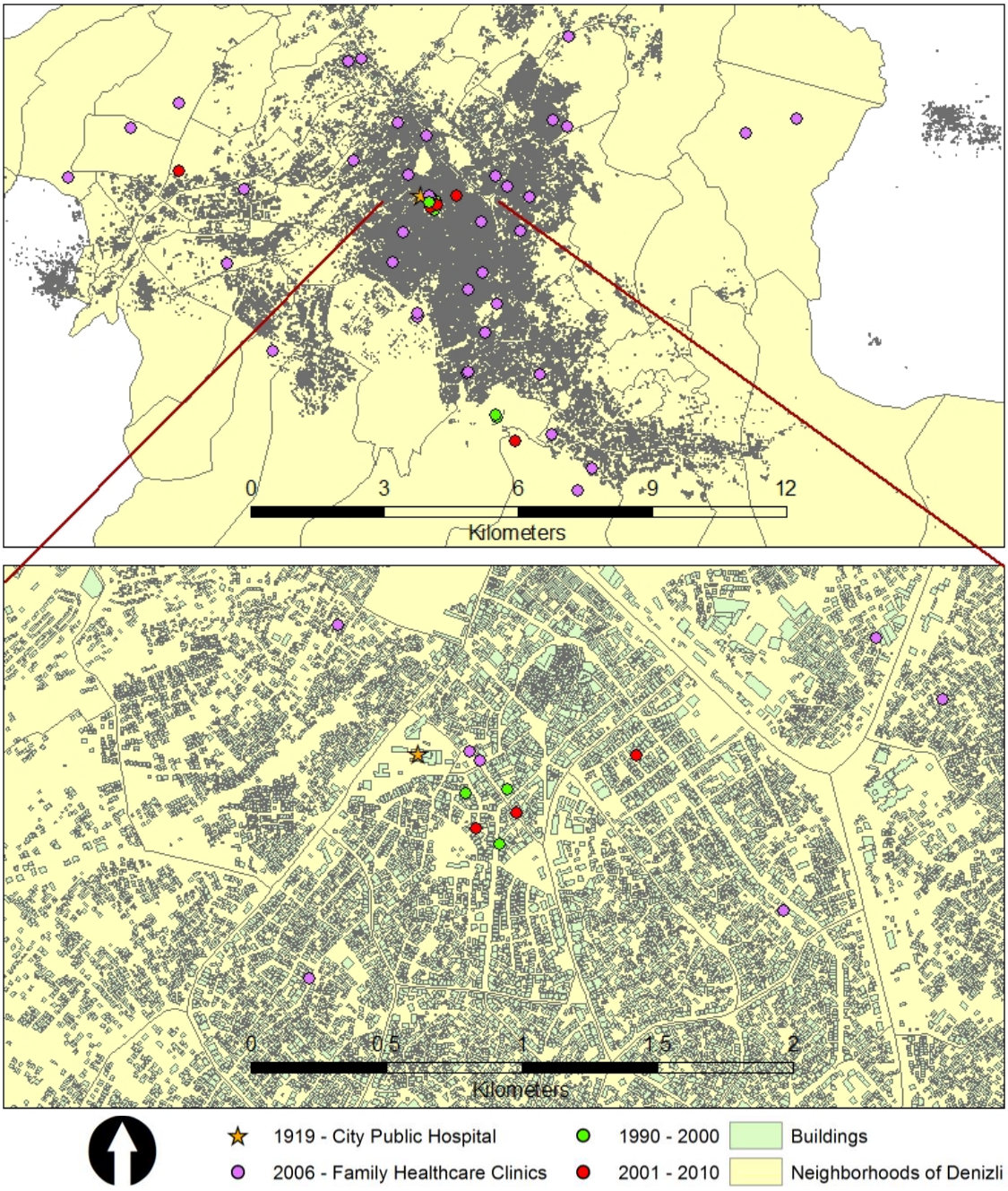
When we look at the spatio-temporal distribution of schools (Map 12), it is easy to realize that there is a high correlation between education building and residential areas. There are 41 schools in pre 1972, 17 in between 1972-1986, 13 in between 1987-1992 and 65 from 1987 to present. There is more investment in education after the mid-1980s, due to urban and population growth. Red dots, which appear on the outside of the built area, are located in small towns and villages. Until the term between 1993 and present, locations of new schools pretty much follow the path of urban growth. Then, as you may see on the 2009 map, there are even more investments all over the city both in the city core and edge.

Map 12: Spatio-temporal distribution of schools



Map 13 shows healthcare centers in time and space. However, we are lacking information about family healthcare clinics, since there was a regulation change in 2006 and all neighborhood healthcare centers have been replaced with family healthcare clinics. Basically, their locations have changed and even healthcare department offices have no clue about previous places. According to the records of Directory of Healthcare Services, there are only 31 neighborhoods that have family healthcare centers in their administrative borders. However, we have establishment dates for the hospitals. There are 11 hospitals and 7 of those – plus, a public dispensary and a family healthcare center - are located in the same part of the city (see zoomed area in Map 13). This is one of the densest parts of the city, in terms of residential, business and obviously traffic. Almost every public transportation route passes through here. However, it is difficult to access this area by driving because of traffic congestion and a lack of parking lots. Since the biggest public hospital has been located in this area since 1919, it has attracted all kind of medical business through here. The availability of all these medical firms services have attracted new hospitals which were established after 1990. This aggregation does not seem proper in the concept of equal opportunity of accessibility. In addition, it also disturbs residential units in the area because of traffic attraction and continued crowding. Also, they could have spread out of the city by the advice of municipal plans which may have helped to avoid possible concerns about spatial inequality.

Map 13: Spatio-temporal distribution of health care centers



There is no temporal information about the establishment of green areas, playgrounds and general recreational spaces, since most of those were randomly built and destroyed to build other urban facilities, such as residential, roads or public buildings. However, when you look at Map 10 above, you can easily realize the lack of

green space in city core. Again, not all of those green polygons represent recreational spaces. Until the early 2000s, there were only two designated recreational places in the city, called Camlik and Incilipinar. These are two of the oldest green spaces; however, they were not well designed and had almost no facilities except for tea gardens and basic playgrounds. The development and management policies of the current municipal government have facilitated expansion of green spaces; redesign of these two and creation of six other recreational places in different parts of the city. Since recreational places require a lot of open space, almost every one of them is located on city edges.

Public transportation systems are run by both the municipality and private companies. The routes of buses and minibuses have been continuously changing due to urban growth and places where they have to provide services. These frequent changes of routes and operators cause a lack of temporal information about routes of buses and minibuses. Additionally, establishment dates of the road systems are not even available in any municipal department, according to municipal administrators. There are remarkable investments in intercity highways since the mid-2000s, such as underpasses and pedestrian bridges but they do not have direct impacts on the big picture, except for a few neighborhoods. In addition, there have been several important bypasses and connectors built in the last 8-10 years. Their impacts will be also discussed in accessibility part of chapter 7.

6.4. How Does Rapid Urbanization Affect the Urban Patterns?

In the study, residential urban pattern is considered as the main element, and public services are taken into account with their spatial relations. As the descriptive analysis shows, there have been obvious changes in every urban pattern during last 30

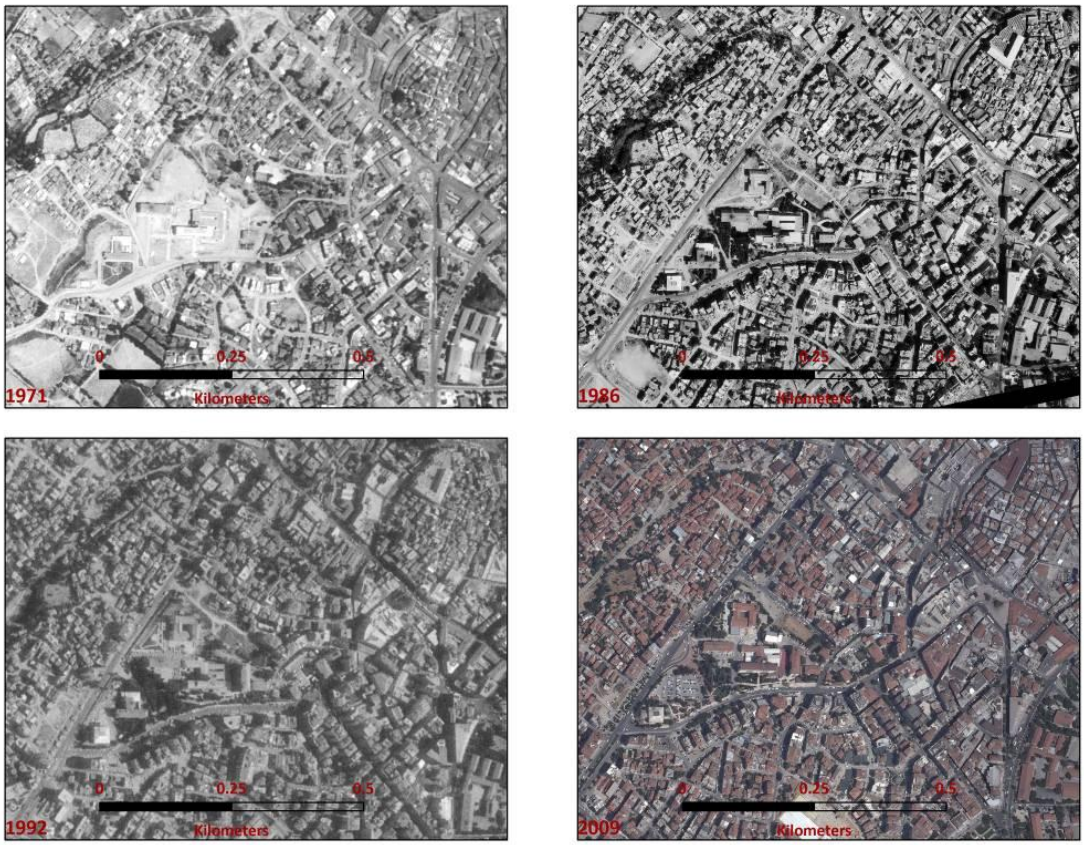
year, due to rapid urbanization. Economic and social changes play important roles. Changes in municipal and governmental approaches make the biggest difference in terms of urban development, while growth is rapidly continuing.

In this section, selected residential areas are investigated from old neighborhoods to newer neighborhoods. Sample snapshots are taken from surrounding places of certain landmarks, such as the city square, intercity highways and recreational places, to be able to provide a better understanding of development and changes of the areas. These images provide a closer look at each urban pattern in a discrete time period. These introductory comparisons help to better understand livability conditions of neighborhoods which will be discussed in the next chapter.

Figure 13 shows temporal snapshots from the Saraylar and Sirakapilar neighborhoods which are two of the oldest neighborhoods in the city core. The old bazaar, which used to be the first settlement of the city in a castle, is located on the northeast corner. The large complex is the oldest public hospital in the city, in the mid-west and in between two boulevards. The oldest city square is also located just by the old bazaar, called Bayramyeri square. In 1971, the area was already occupied by mixed land use of commercial, residential, medical service and businesses. General irregular spatial organization of patterns, as one of the common features of old settlements, is shown here very clearly. Even today, narrow streets between building blocks are remaining. Although all this area is mixed in use, the northwest and the south sides are mostly residential, while the north and the northeast sides are mainly commercial. This area is also where all public transportation meets in the city. The existence of the old bazaar and old city square are the main reasons to collect all buses and minibuses here

from any other part of the city. In addition, this place has been formed as healthcare zone in the city. Since the oldest and biggest public hospital is located in the area, almost all medical services locate there and the area continues to attract new healthcare investments in the area. However, as it was mentioned before, traffic, parking and crowding have emerged as main concerns of the area during the last decade. The southeast part of this area, hosts four other hospitals, one public dispensary and a family healthcare center. None of these has a parking lot.

Figure 13: City core: old bazaar (Kaleici) area and oldest public hospital of the city

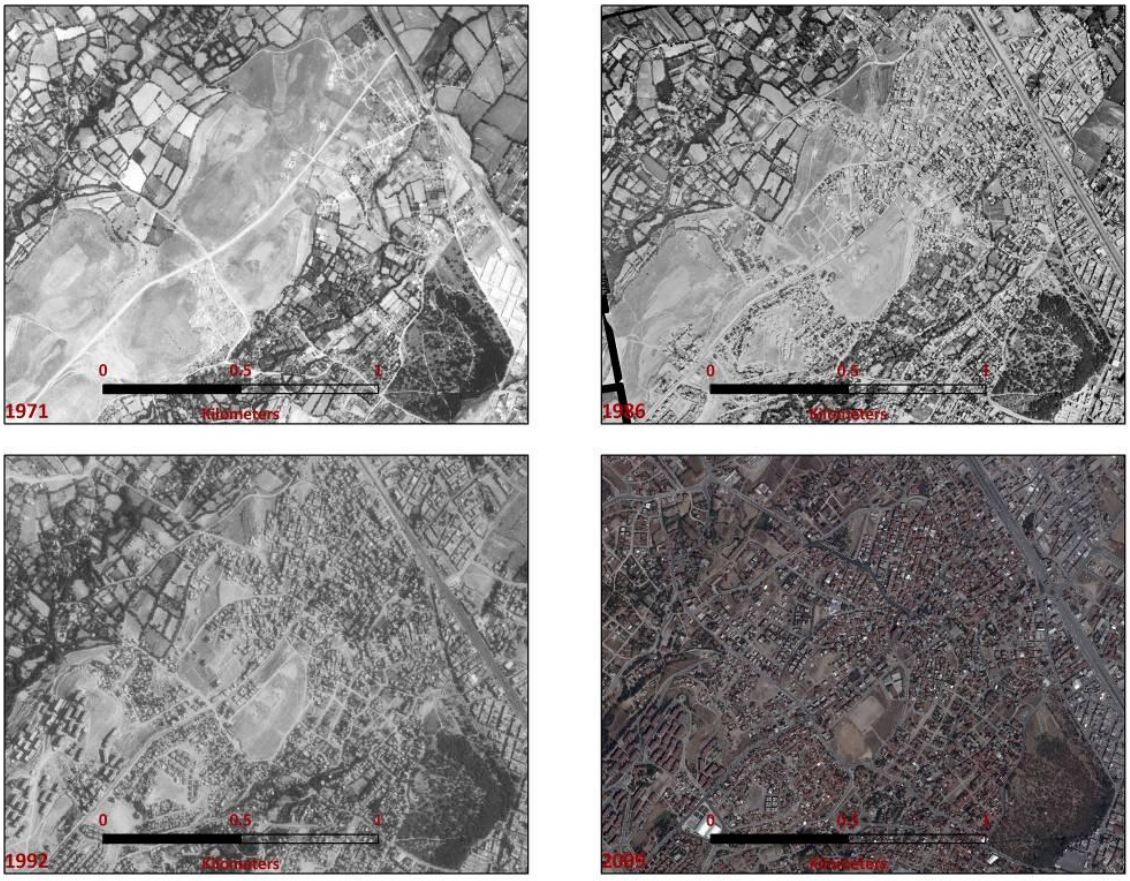


In Figure 14, there is an old city cemetery located in the southeast corner. This is only 400 meters northwest from the old bazaar area. This area covers the neighborhoods including Ilbade (old Bakirli), Yenimahalle and Alpaslan (parts of old Gumusler), and parts of Mehmet Akif Ersoy (Meska area) and part of Muratdede (old Esentepe). The

surrounding area of the cemetery has been occupied mostly by automotive and repair shops. There is an Izmir-Denizli intercity highway shown on the northeast part. Starting from late 1970s, industrial investment and housing (partly illegal) have been located in this area. In the 1990s, growth continued through this area, and eventually, the mid-south area was occupied by illegal houses. Then, the Meska social houses were built between 1985 and 1995 by the Denizli municipality. This was one of the preliminary attempts of preventing illegal housing. The Meska apartment blocks are shown in the southwest corner of the images. Obviously this growth disturbed agricultural activities on the northwest side. As you can see in 2009 image, all those agricultural fields are occupied by industry and residential buildings.

Another old part of the city is the Incilipinar neighborhood which is named after one of the oldest recreational places in the city (Figure 15). This neighborhood started to develop as a residential area during the late 1970s, after the closest neighborhoods, Istiklal, Feslikan (old Feslegen) and Pelitlibag, maximized their growth due to lack of space. One of the oldest recreational areas is shown in the middle of the images as the darkest area with trees. Until the early 1980s, there was not much built environment around this site; it served as a pleasant recreational area for a long time. The Department of Agriculture of Denizli built a chicken farm near this area during the early

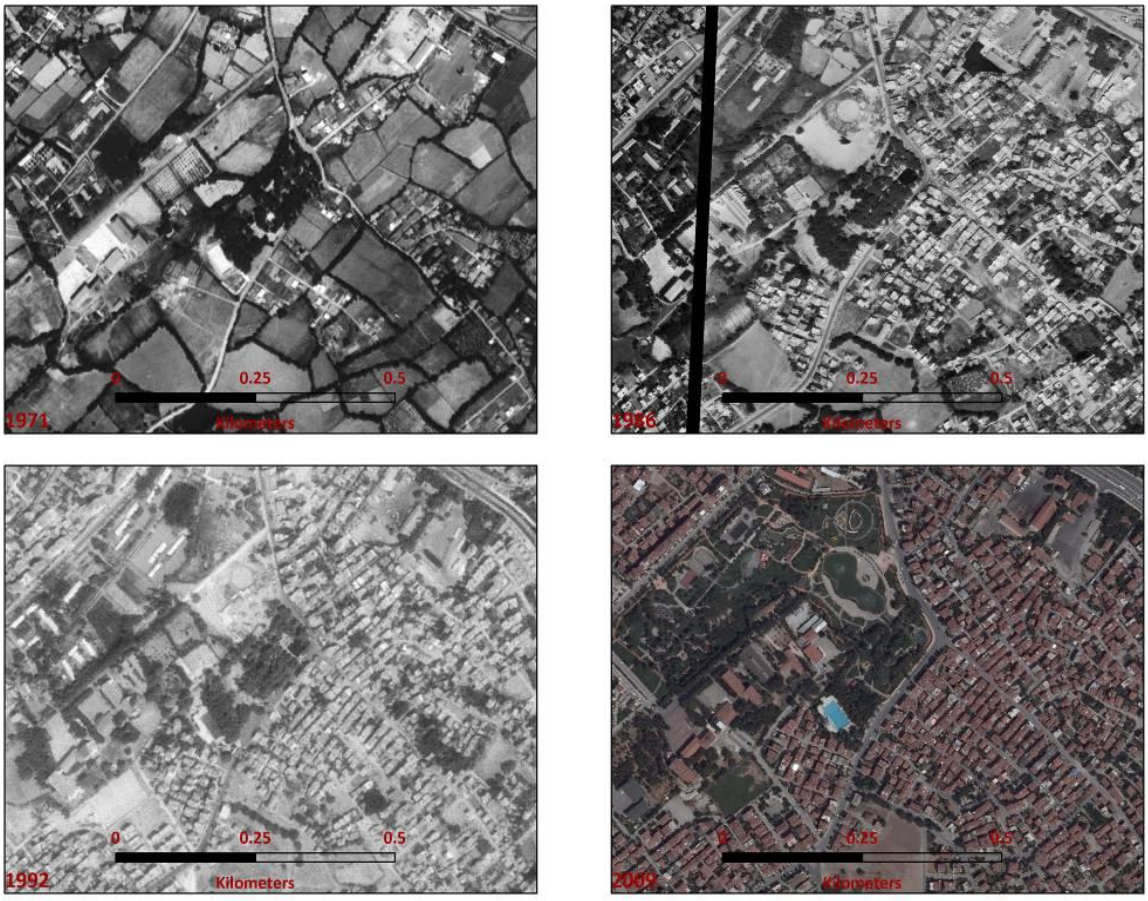
Figure 14: Old cemetery area and Izmir-Denizli intercity highway



1980s or late 1970s (date unknown, because of lack of information), which is located on the northwest side of 1986 and 1992 images. At the time, the area was also under pressure of urban development from all other directions. There was another open space parcel between the chicken farm and the Incilipinar Park where the first campus area of Pamukkale University Education College is located. Also, there was a field which was used for a seasonal amusement park of the city. In the early 1990s, construction started for a cultural center in the field of the seasonal amusement park but it could not be finished. In the late 1990s, the amusement park moved to another part of the city. Incilipinar Park declined pretty badly because of negative development in its surrounded area and poor management. The incomplete construction area started to be

used by homeless people and criminals. Recreation areas declined because of unsuitable social conditions, especially for kids and women. At the time, this neighborhood had one of the highest crime rates in comparison to others. All of these caused a dramatic decline of the entire area. House prices declined, retailers avoided the area and people barely visited the recreational area. The area was renewed in 2004 - 2005. The chicken farm was uninstalled, the incomplete construction area was destroyed, and the Education College moved to another place. All these open and brown fields added on park area. Then, old recreation areas were renewed with a detailed landscape plan and perfect design with all kinds of recreational facilities.

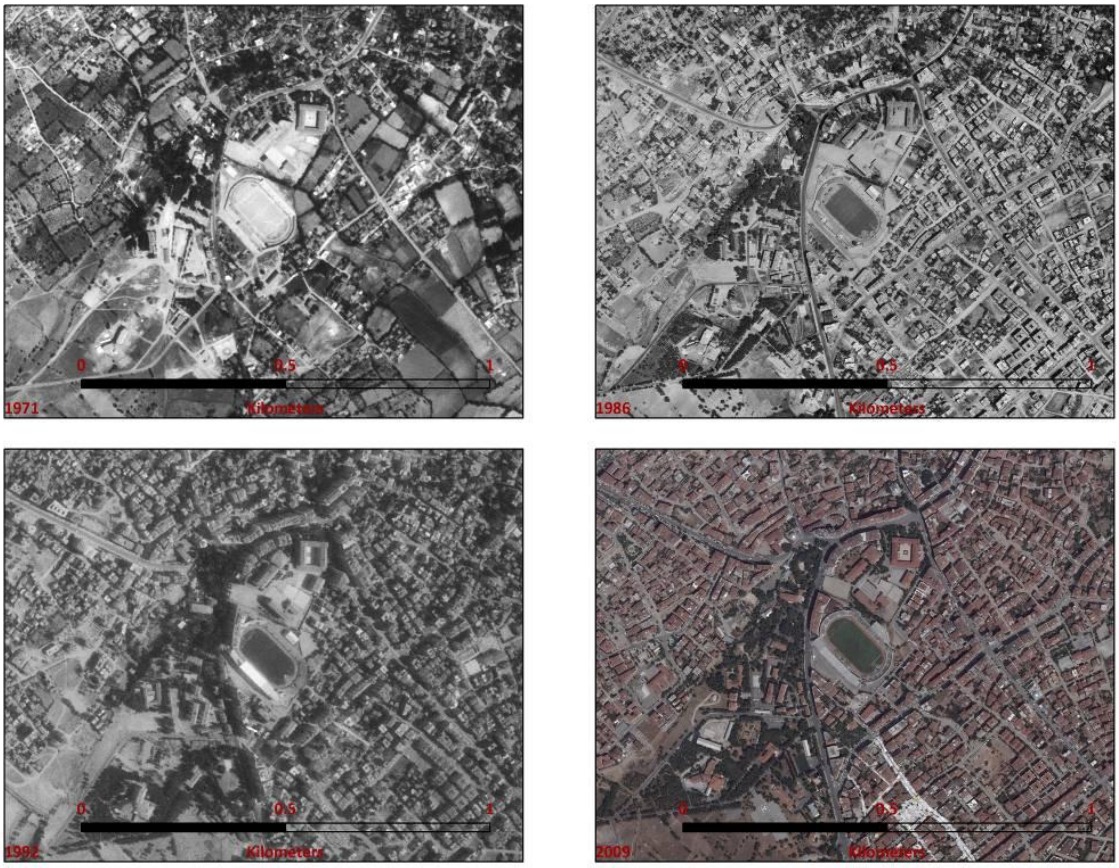
Figure 15: Incilipinar recreational park



Inner city military bases are one of the main drivers of urban growth directions of Turkish cities. Figure16 shows temporal snapshots around Denizli Ataturk Stadium and a part of huge military base in Denizli. This is also one of the oldest parts in the city core which is in the administrative borders of Kuspinar, Mehmetcik and Karaman (old Kiremitci) neighborhoods. There were pre 1970s built environments in the area, such as Denizli High school (est. 1932, square building on the north of the soccer field), the city soccer field (est. 1950) and residential areas, especially in the north part, which is where the current main street and city square are located. The area was already fulfilled with residential areas before the mid-1990s. When you look at the 2009 image, the only open and green space belongs to the military and that is a forbidden area for the public. Today, this area is in the middle of Denizli, and lying towards the forestry and mountainous area through the southwest. It almost covers 1/5 of total area of city center. This space could have been used for better urban growth and development. The Ministry of Environment and Urban Development has proposed a draft law about military areas in the parliament (March, 2012). It basically requires opening up parts of these areas for public housing and using other urban facilities in case urban renewal purposes are needed.

In these four examples from the different parts of city center, we see how rapid urbanization has been occurring in the area and how it has been affecting urban pattern changes, in terms of irregular spatial organization, lack of open spaces, distortion of agricultural area and mixing of industry and residential. There are also remarkable samples from the city edge.

Figure 16: The area of Denizli Ataturk Stadium and part of military base

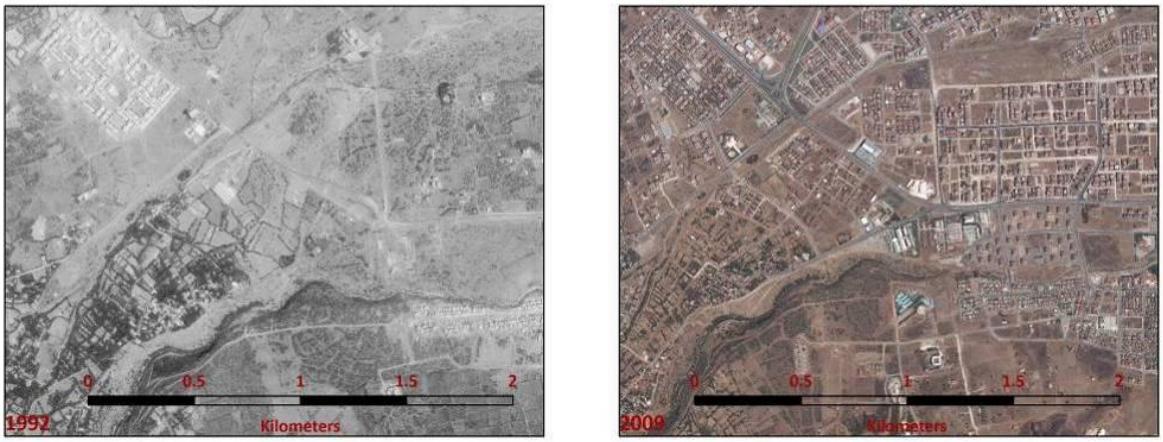


When we are looking at new settlement areas on city edge, the speed of urbanization is more visible, as well as its impacts on environment. Again, the urban growth directions of Denizli are west, south, southeast and north due to topology, zoning and general trends. In these regions, we see more regular spatial order compared to the city core; however, it still does not look perfect at all. There are some parts where its growth is completed because of lack of space, while in some other places it is still rapidly continuing.

Figure 17 shows the area on the western part of the city which is on 1200 Evler, Adalet, Bereketler and Bahcelievler neighborhoods. As mentioned before, Bahcelievler is the public housing neighborhood which was established after a major earthquake in

1976. Bereketler used to be a rural town and recently joined the central municipality area as a neighborhood. Adalet is one of the new neighborhoods attracting many people, business and public services during last decade. 1200 Evler neighborhood was named after the first housing estate in the area which has 1205 residential units (the building blocks on northwest corner of the images). They were built during the early 1990s. By the time they built, there was no urban development from Bahcelievler neighborhood, which is located on the southeast part of the images, to 1200 Evler housing estate site. When looking at the 2009 image (figure 17), one should notice how much growth has occurred in less than two decades. In detail, besides residential building, a hospital, a new court house and one of the biggest recreational parks have been built in the area. Plus, there are many new schools, mosques, playgrounds and other public services that have been provided. And also, many public transportation services have been added to the area throughout different parts of the city.

Figure 17: Urban growth on city edge, 1200 Evler



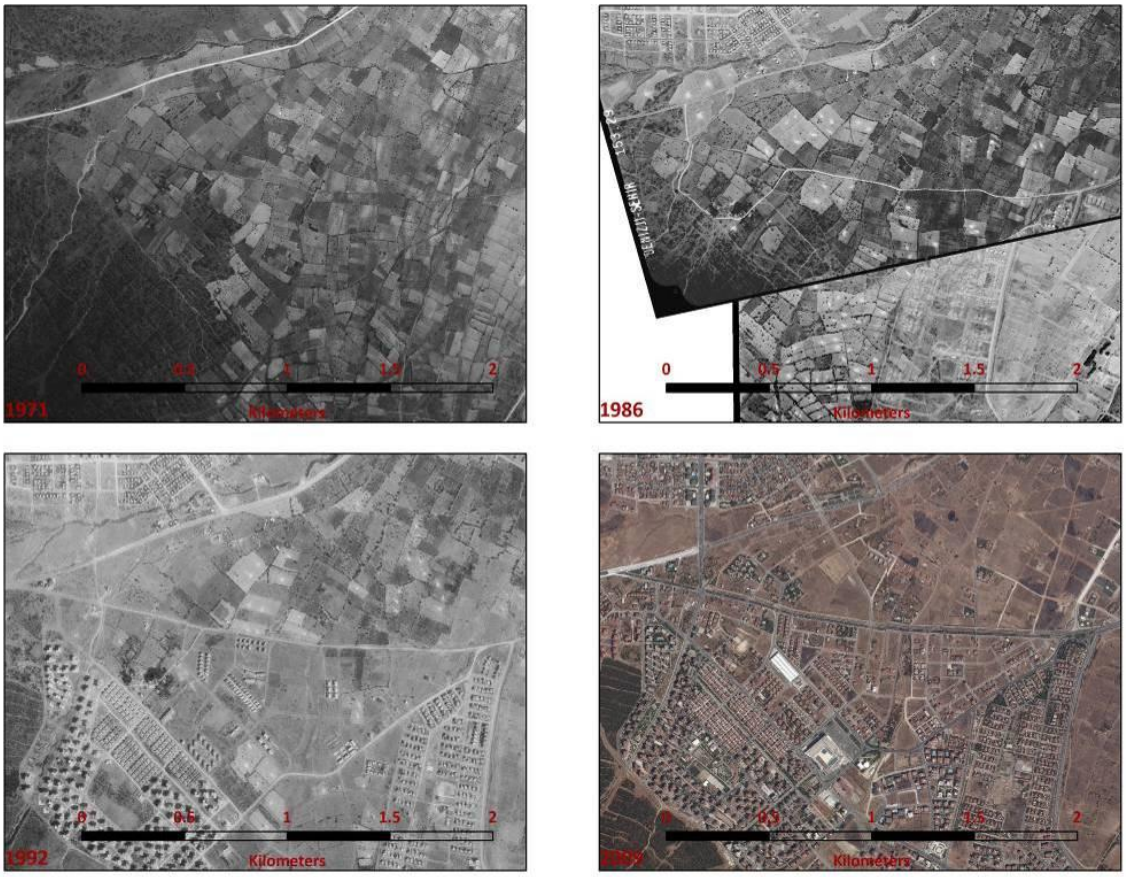
As a reminder, growth is a physical enlargement of urban area, while development is about improvement of quality of environment and services. Figure 18 shows one of the best examples about an urban development (improvement), which is

Adalet Park. This park is located on the eastern part of the area that was described in the last passage. A closer look provides more understanding to the growth in the area. Simply, while there was nothing in 1971, the Bahcelievler and Imar Iskan public housing area is shown in 1986 (notice the road in the middle and the creek on northeast side). There is not much growth from 1986 to 1992. Then, there was a construction boom in the area starting from late 1990s. The parcel in the middle remained a useless open space for more than 20 years. There was nothing but a soccer field. The creek has a valley in middle of this space and there used to be some criminal incidents during the 1980s, so it was an unsafe place. Finally, in 2010, this area was converted into a park with recreational facilities and beautiful landscapes. Further discussion about this renewal and this specific place will be included in chapter 7.

Yenisehir and Servergazi (former towns, new neighborhoods) are other neighborhoods where the city grows towards their location. These are located in the west part of the city. Yenisehir is only 1.3 kilometers away from Adalet Park. Figure 19 shows the area on a smaller scale to be able to see the entire region. The area started to develop during the early 1990s with the building of several housing estates. This area has typical contemporary urban growth characteristics, with gated places, campuses of single family houses, housing estate sites, larger buildings, more open spaces and a shopping mall. This area grows between the border of the military base and a national forestry area. Since there is no more space through these borders, there is an expected growth in the northern part of the area.

Figure 18: Creating recreational place, Adalet Park

Figure 19: Urban growth on city edge, Yenisehir



The final sample about city edge development is from the southern and southeastern part of the city. Early aerial photos are not available for the area. This place was formed with the combination of several former towns and villages into new neighborhoods (Figure 20). These neighborhoods are Zeytinkoy, Bagbasi, Zumrut, Kervansaray and Gokpinar. There are also housing estate sites and gated places but since there were already some settlements, the spatial organizations of urban patterns are different when compared to Yenisehir. This area still has some more space to grow. However, it lies between agricultural fields and a national forestry area. Therefore, there is an expected space issue here in this region in near future. There is already much pressure on forestry area by buildings.

Figure 20: Urban growth on city edge, Bagbasi

6.5. Conclusion

This chapter provides information about neighborhoods in Denizli, how they have changed and how urban patterns have been formed in and around the city in a given time frame. Distribution and density of urban patterns have been discussed. Spatio-temporal views are presented and interpreted in the concepts of urban growth and development. As it is the second step of our methodology to successfully achieve proper analyses of urban growth and development of the area; detailed analyses of urban patterns, linkages and flows that integrate the various features, identifying the main streets, squares and building blocks have been included in this chapter. It aims to provide more information about the study area, to help better understand the following chapter, which will focus on livability analysis in the case of Denizli.

7. LIVABILITY ANALYSIS OF NEIGHBORHOODS

The goal of this chapter is to provide comparative information about livability in old and new neighborhoods based on defined indicators. In the final chapter of the study, livability conditions are investigated through survey results. These were also applied to spatial analysis based on neighborhoods. This is a "one time one space" analysis, thus there is no longitudinal component. Large samples have been taken for the survey in neighborhoods. The results are represented by both charts and maps.

7.1 Introduction

Urban places are becoming larger in space, as well as in population size. At the same time, the world is becoming more integrated through technology. Facilitating the continuing debate about globalization and the localization of places and communities. Because of attendant changes, the expectations and perceptions of communities, whether or not they meet high or low standards of living, are changing very fast. With these changes, there is a large number of people who are experiencing everyday struggles in urban life. Basically, better job opportunities and higher standards of livelihood have been enough to attract thousands of people from rural areas to urban areas; today people are looking for more amenities and functions in their environment to improve their quality of life.

James Donald's analogy, called "city as a text", recognizes each of these elements, features and the physical environment in cities as "representations" and "imagined environments" of that place (Elsheshtawy, 2004). However, these representations may differ from one person to another. In other words, the

interpretations of quality of spatial objects and benefits vary depending on point of views of observers. In the context of livability, "subjective" is one of the most frequently used words because there is no singular livability index, neither on the international nor the national level, that can incorporate the myriad views.

The needs of the majority of the population on a daily basis are important for urban studies and actions of decision makers. There are always outliers in negative or positive directions, when we are dealing with urban planning. For instance, while the majority of the population desires to have a school in walking distance or at least wants to have easy access to public transportation on a location in central city, wealthy families might want to enjoy the environmental quality on the edge of the city, not hesitating to make that daily commute. Service and facility improvements in urban areas need to have close attention to its possible strengths, weakness, opportunities and threats (SWOT) by the relations of surrounding urban facilities and functions

Evans (2002) stated that urban livability is all about sustainability and the social justice of streets, factories and sewer systems in a built environment, instead of fields and forests. Even though the sustainability of ecological footprints in the surrounding environment of a city is very important, providing good quality services and infrastructures are even more crucial for the quality of urban life. The surrounding environment has direct and indirect effects on quality of urban life, such as air quality or pollution and providing better opportunities for recreational activities. Cities are judged by surrounding areas as well as inner city space. However, the amount of time that people utilize these areas is different from inner city functions, resulting in a much different analysis.

There are two main types of data to consider when analyzing livability (Cities Alliance, 2007), qualitative and quantitative. Researchers usually collect qualitative data when they use subjective indicators and quantitative data when they are researching objective indicators. However, this is another debate. For example one of the main questions asked is, what classifies data as subjective or objective in the case of measuring livability?

Conducting surveys to random groups are the best way to measure livability, instead of focusing on a specific group of people (Ferries, 2010). Random selection of respondents provide more objective results without consider needs and perceptions of any specific group of people. However, a focus group is a form of qualitative research in which a group of people are asked about certain conditions and their experience with those conditions (Focus Group, 2006). So, the approach for gathering information about livability should be designed and defined around the study purpose. For instance, if there is a specific problem to solve, such as the security of the elderly and children, then a focus group would be needed to be able to reach a conclusion with appropriate data results.

The National Research Council (2002) proposes dealing with a single place at one point in time, as this study is formed. Because of the fact that the livability of multiple places over different scales and time, requires having different parameters. In other words, a researcher is supposed to deal with different groups of people with different life styles and daily habits, even if the study is concentrated in one place. This directly impacts people's conceptions about livability.

7.2 Defining Indicators and Survey Design

7.2.1 How to define livability measurement indicators?

First of all, the most important issue about livability measurement indicators are that there is no index or group of indicators that can be applied everywhere. Therefore, the study area needs to be examined before the livability measurement processes start. Conditions and features of that area should be determined based on the purpose of the study. For example, while a study about the quality of life for elderly people in an urban area may need a list of indicators, these would not be appropriate for a study about the quality of life for a teenage group in the same area.

A livability indicator is "a measurement that reflects the status of some social, economic, or environmental system over time. Generally, an indicator focuses on a small, manageable, tangible, and telling piece of a system to give people a sense of the bigger picture' (Redefining Progress, 2004)." As it has been mentioned in the chapter 2, there are many international livability and quality of life indexes dealing with countries and World capitals. Most of these use indicators related to the general economic conditions and some other descriptive values, such as the number of tourists per year or a season. So, there are differences between indicators that would work for government and decision makers and indicators for the benefits of regular people.

In the report of the Westminster livability index, livability measurements are defined as "measurement is to communicate data in such a way that it encourages the government to implement appropriate legislation." While that is true, the results of livability measurement should be used further than legislations. That is why there is supposed to be a separation between the general indicators on the international and

national level. National level indicators, which are for cities or even smaller areas, can be applied to other cities in different countries, if those places have enough similarities.

In summary, in order to define livability measurement indicators, the following needs to be done: define the purpose of livability measurement for the study area, examine and understand the features of the area related to purpose, find out the strengths and weaknesses of the objects, create indicators and define techniques to gather data about those indicators, define an appropriate way to present and interpret results. Also suggestions and advice from local administrators are helpful, even though it is not necessarily that easy to contact them in every case. Since they are the ones who are responsible for service and facility improvements of the area and already have experiences from the public feedbacks and complains, they may have remarkable ideas to use for defining livability indicators.

7.2.2 Survey Design for the Study

Regarding all these basics about livability measurement indicators, a survey was designed and conducted to local people in the study area. As discussed, there is no temporal analysis in this part. Therefore, the latest form of the city (with every existing building) is included for spatial analysis. Neighborhoods are used as the study scale. The accessibility of public services, the availability of green spaces and environmental qualities are the general titles of the indicators of the study. Comparisons between old and new neighborhoods are studied by using spatial representations of the survey results.

There are 4 sections in the survey, titled by general information, spatial organization of public services and accessibility, open/green spaces and recreation

services and environmental quality and general comments. There are 10 demographic questions in the first section. In other sections, there are 49 questions, including sub questions. The last section has six additional questions about the overall evaluation of the neighborhoods and the city in general. Finally, there is a question about the performance of the municipality for the last seven years, in regard to environmental quality issues.

The survey was conducted in three different modes, including online, a random telephone call and street survey. Survey Monkey was used to collect online responses. Random calls to residential phones were made from a private call center by using neighborhood codes of the households. The information about survey and its purpose was given to respondents. A street survey was completed by the researcher and a contracted group of people. At the end, 329 online, 500 phone and 200 street surveys were responded to. 15 responses were removed because of the lack of required information or inappropriate responses. 1014 responses were used for statistical and spatial analysis. There are responses from 59 different neighborhoods (Table 10). There are 10 or more responses from 37 neighborhoods and less than 10 from 22 neighborhoods. Based on the study's purpose, only central neighborhoods are taken into account, so, no survey was conducted with 20 neighborhoods. These are former towns or villages located on the surrounded area of the city.

The following part of the chapter includes statistical outputs of the survey per section. Spatial distributions of all survey results will be shown in the section 7.4. Then, the comparisons between perceptions of people and real distributions of services will be discussed, in the case of the livability concept.

Table 10: Number of survey per neighborhood

Neighborhood	# of Survey	Neighborhood	# of Survey	Neighborhood	# of Survey	Neighborhood	# of Survey
1200 Evler	**7**	Camlaralti	**27**	Ilbade	**9**	Selcukbey	**2**
15 Mayis	**10**	Cumhuriyet	**23**	Incilipinar	**65**	Semikler	**2**
Adalet	**7**	Degirmenonu	**36**	Istiklal	**52**	Servergazi	**14**
Akhan	**3**	Deliktas	**12**	Karahasanli	**2**	Sevindik	**15**
Akkonak	**26**	Dokuzkavaklar	**14**	Karaman	**34**	Sirakapilar	**50**
Aktepe	**25**	Fatih	**23**	Karsiyaka	**27**	Siteler	**13**
Altintop	**11**	Feslegen	**26**	Kayihan	**2**	Sumer	**8**
Anafartalar	**12**	Gerzele	**6**	Kervansaray	**12**	Tekke	**1**
Asmalievler	**4**	Gokpinar	**2**	Kuspinar	**46**	Topraklik	**28**
Atalar	**30**	Goveclik	**2**	M. A. Ersoy	**30**	Yenimahalle	**14**
Bagbasi	**12**	Gultepe	**6**	Mehmetcik	**75**	Yenisehir	**40**
Bahcelievler	**20**	Gumuscay	**9**	Merkezefendi	**16**	Yunusemre	**17**
Barbaros	**1**	Hacikaplanlar	**16**	Muratdede	**12**	Zeytinkoy	**10**
Bereketler	**2**	Hallaclar	**4**	Pelitlibag	**22**	Zumrut	**7**
Cakmak	**1**	Hurriyet	**2**	Saraylar	**10**		

7.3 Survey Results

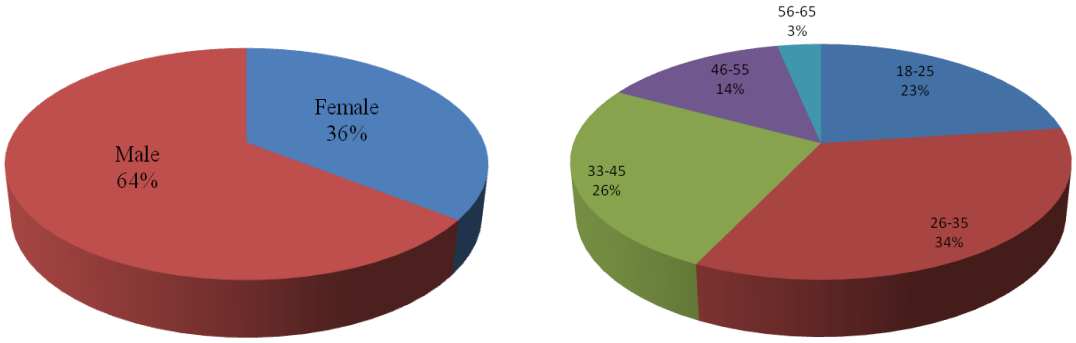
7.3.1 General Information

In the first part of the survey, descriptive information was gathered from the following questions: gender, age, household income, highest level of education, marital status, vehicle ownership, house ownership, type and building date of residential unit, neighborhood and streets of residence. None of these questions were required except for the neighborhood of residence. The responses without neighborhood entry were canceled and not included into the analyses.

50.2 percent of total population of Denizli is female. Latest census shows the distributions of age groups as 12% for 18-24, 20% for 25-34, 17% for 35-44 and 13% for 45-54. 67 percent of total population has degree from primary and high schools, while only 10 percent of city population has college degree.

35.5% of the respondents were female. There were 6 different age groups starting from 18 to 65. 22.7% of respondents are in 18-25 age groups, 34.0% are in 26-35, 25.6% are in 33-45, 13.7% are 46-55, and 4.0% are 56 years old and older. The survey was not given to people who are older than 65, due to IRB procedure (Graph 3).

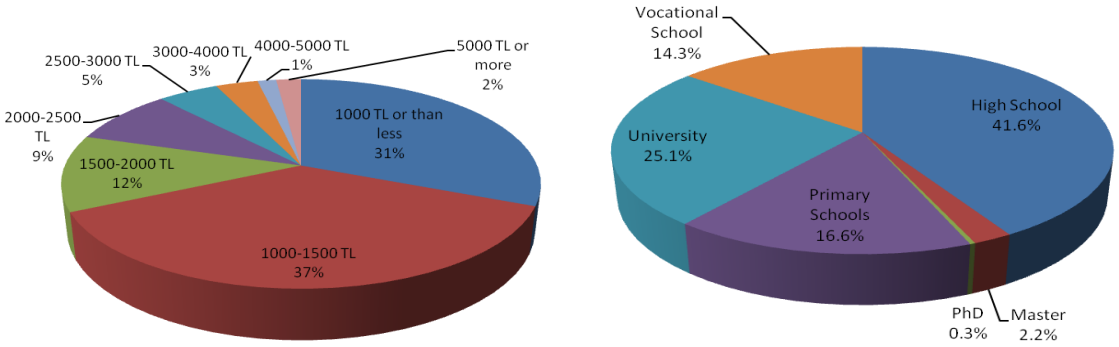
Graph 3: Percentages of gender and age group of survey respondents



There are 8 groups of social economic status: 1000 TL (Turkish Lira) or less, 1000-1500 TL, 1500-2000 TL, 2000 – 2500 TL, 2500-3000 TL, 3000-4000 TL, 4000-5000 TL and 5000 TL or more. TL represents the currency in Turkey, Turkish Lira. According to the results, 36.9% or respondents have 1000-1500 TL income per month and 31.1% of those have 1000 TL or less. Regarding percentages of age groups, the majority of respondents is either students or recently graduated and just has started to work. The minimum monthly wage of 2011 was only 658 TL. That means, if a couple is working together, earning minimum monthly wage, they can only make 1316 TL per month, which is another reason that both of these income groups have higher percentages than others. In contrast to household incomes, automobile and home ownership rates show relatively high values. 50.5% of respondents have a car and 16.7% of respondents have 2 cars per household. 30.3% of respondents have no cars. In

terms of home ownership 58.9% of respondents have their own house, 38.9% of them are tenants (Graph 4).

Graph 4: Percentages of household income and education level of survey respondents

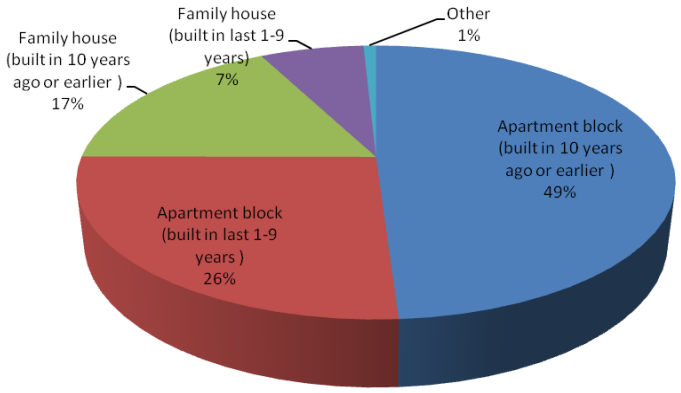


In the survey, the following education levels were listed: primary school, high school, vocational school, university/college, master and doctoral degrees. The required primary school education used to be 5 years long until 1997; now Turkish law requires 8 years of primary school education and dismisses the separation between primary schools and intermediate schools. Since there is no separation in the survey between primary and intermediate schools, probably some of the online and phone survey respondents were confused about the highest level of education in question. When we look at the education results, they do not really match the general demographic features of the country. For example, the percentage of people who have a high school diploma is much higher than expected. The results of the 2010 census (TUIK, 2010) show that only 19.3 percent of people have a high school diploma, while there are 41.6 percent in the survey results. However, while the total number of primary, intermediate and high school degreed people in the census data is 66.3 percent, the same value shows 58.2 in the survey result. The total percentage of people who have a master's or doctoral degree is 2.5. The percentage of those who have received degrees from a vocational school is

14.3. In addition, 25.1 percent of respondents are university students or graduates of a four-year university degree program (Graph 4).

When we look at the results of type and building dates of residential units, 49 percent of those are multiple floor apartment blocks and were built ten years ago or earlier. 26.1 percent of respondents live in 9-year-old or younger apartment buildings. Moreover, 17.4 percent are single-family houses, which were built 10 years ago or earlier, while 6.7 percent of the houses are 9-year-old buildings, or younger (Graph 5). The spatial distribution of these buildings will be shown later in this chapter.

Graph 5: Percentages of building types and construction date



7.3.2 Accessibility of Public Services

This part of the survey includes questions related to transportation and accessibility of public spaces and services. The purpose of the questions is to gather information about the perceptions and opinions of respondents about the general transportation system, availability and rationality of distance between their residential area and public services. Schools, health care centers, shopping centers and park/recreation areas were taken as public spaces and services, as all these are big parts of urban daily life. The availability of public transportation, walking distance to the

nearest stops or stations, general traffic and parking conditions were also the issues touched on.

According to the research, 97.5 percent of respondents agree that they have public transportation route/s in their neighborhoods. As mentioned previous, there are buses and minibuses in service. Moreover, 91.1 percent of respondents mention that there are both services available in their area. Furthermore, 5.3 percent of respondents say that they have only minibuses and 3.6 percent have only buses. Also, the distribution of stops and stations seems reasonable based on people's responses, with 65.9 percent of respondents mention that they have either a stop or a station within a 5 minute walking distance and 26.3 percent of them have one in a 5-10 minute walking distance.

There was infrastructure and superstructure construction in the study area when the survey was conducted. Hence, many streets were closed to thru traffic and many of those open streets were in bad condition. However, there were also some streets that were completed in perfect condition, in terms of pavement and physical appearance. Therefore, the responses about overall traffic and road conditions should be interpreted in the context of ongoing progress at that time. Despite the negativity about the road work, the responses to the survey showed that people held an optimistic view on road quality. Although there were many of closed and bad roads, only 10.2 percent of respondents rated it as "very bad" and 16.5 percent of them said "bad." On the other hand, road conditions have been rated by 40.5 percent of people as "good," 25.8 percent as "moderate" and 7.0 percent as "very good".

Traffic conditions were worse than ever by the time the survey was in process in the area, because of the closed roads and detours in the neighborhoods and narrow streets. Traffic congestion was rated as “very bad” by 10.5% and as “bad” by 3.8%. There are still 38.2 percent of those who answered “moderate,” 24.7 percent of respondents rated it as “good” and 2.9 percent gave “very good” rates. People were also asked about general traffic management in terms of waiting time on traffic lights, directions, signs and one way roads. It has been rated as 10.6% “very bad” and 20.9% “bad.” Moreover, 34.8 percent of respondents think that it is “moderate,” 29.8 percent of them say “good” and 4.0 percent responded “very good.”

Municipal management is part of a highly political process, so, there are always supporters and critics. While the process of infrastructure and superstructure construction is ongoing, there are a lot of complaints, mostly made by the opposition, and it caused serious debate between political parties. Because of this situation, some of these traffic condition answers might be biased, like the questions related to municipal works. For instance, questions about road conditions were rated by 67 respondents as “very good.” When we look at how these individuals rated municipal works since 2005, there are 49 responses “very good”, 7 “good” , 4 “moderate”, only 1 “bad” and 6 of these are blank.

As the urban population is getting larger and car ownership is getting higher, parking problems are emerging in urban areas, especially in the city core. Thus, 79.6 percent of respondents think that there is a parking problem in the city. Only 26.9 percent of people have a parking problem in their neighborhoods. The most frequent regions where people have parking problems in the city are Bayramyeri (old bazaar

area) by 246, Cinar (main street) by 238, Doktorlar avenue (where the largest hospital is located) by 33, Lise avenue (one of the largest connector roads to the main street) by 32, Saltak avenue (one of the largest connector roads to the old bazaar area) by 26, and other ungrouped places by 66 responses. These are the results from the first options of this question. The most frequent (top 10) neighborhoods, where people say that they have parking problems, are Istiklal, Kuspinar, Mehmetcik, Degirmenonu, Sirakapilar, Incilipinar, Atalar, Topraklik, Pelitlibag and M. Akif Ersoy. These are all located in the city core, old neighborhoods, close to the main street and commercial centers.

The accessibility of the closest school and park/recreation areas is measured by walking distance, while health care and shopping centers is measured by driving distance. The reason is that hospitals and shopping malls are expensive and require massive investment, so that there are no expectations of having one in each neighborhood. However, schools and parks are places that people use on a daily basis. So, that is nice to have them within walking distance from home.

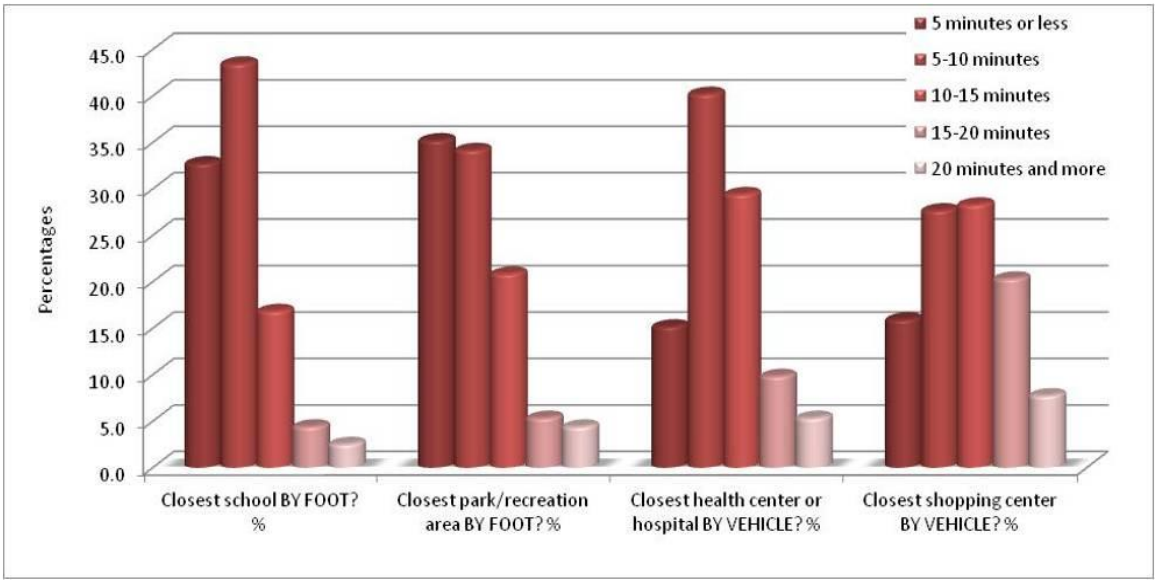
There are 5 given time scales for the accessibility of public services, these are: 5 minutes or less, 5-10 minutes, 10-15 minutes, 15-20 minutes and 20 minutes or more. The percentage of responses for the distance of schools is 32.7% for 5 minutes or less, 43.5% for 5-10 minutes, 16.8% for 10-15 minutes, 4.4% for 15-20 minutes and 2.5% for 20 minutes or more. The majority of responses (76.2%) show that they have school within a 10 minute or less walking distance, which is a very reasonable distribution. Also, 35.2 percent of respondents have a park/recreation area within a 5 minute or less walking distance, while 34.2 percent have one in 5-10 minutes, 20.9 percent have one in

10-15 minutes and 9.7 percent have one of these facilities in 15 minutes or farther (Graph 6).

It is shown that 5-10 and 10-15 minute driving distances are the most frequent answers for health care and shopping centers. While 40.2 percent of people can reach the closest health care center in a 5-10 minute drive, 29.4 percent should drive 10-15 minutes. Besides, 15.2 percent of residences have an ability to reach a health care center in less than a 5 minute drive, 15.1 percent of them should drive at least 15 minutes. An uneven distribution of health care centers has already been mentioned in the previous chapter; obviously that distribution has an impact on these results.

Shopping centers are the last pattern that is included in the accessibility part of the survey. So, 56 percent of people have access to a shopping center within a 5-15 minute drive distance; 15.9 percent are able to find one in 5 minutes or shorter time; 28.1 percent of those should drive at least 15 minutes to reach a shopping center.

Graph 6: Percentages of responses for accessibility of public services



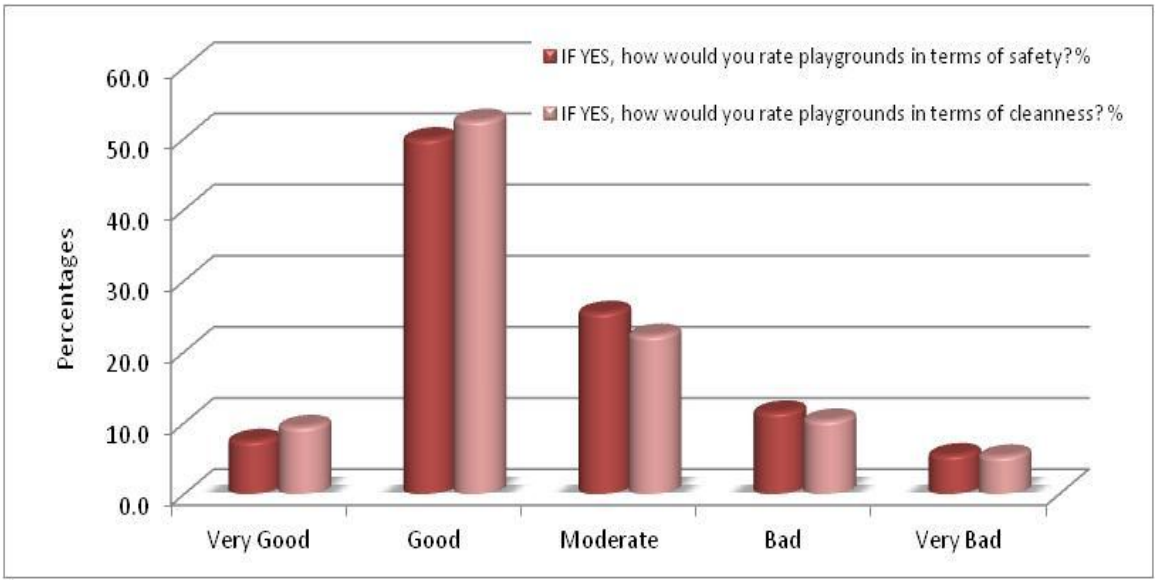
7.3.3 Open/Green Spaces and Recreation Services

This part of the survey includes questions about the availability of open/ green spaces and recreation services based on neighborhoods. The purpose of the questions is to gather information about the perceptions and opinions of respondents about safety, comfort, cleanliness, quality of facilities, quality of the social environment and environmental quality of the available recreational places. Playgrounds, trail paths, family tea gardens/cafés and sports fields were taken as recreational service areas. People were asked whether or not they have any of these services in their neighborhood. If their answer was "yes", their responses for follow up questions were considered.

In the overall evaluation, the safety and cleanliness of the playgrounds is favorable (Graph 7). Playgrounds safety is rated at 49.9% and their cleanliness is rated at 52.5%, as "good". The second highest rates for both playground features are on the "moderate" scale. Safety has 25.5 percent and cleanliness has 22.3 percent of "moderate" rates. The neighborhoods that have the highest "bad" rates for playground safety are: Aktepe, Anafartalar, Dokuzkavaklar, 15 Mayis, M. Akif Ersoy, Feslegen, Kuspinar, Topraklik, Deliktas and Yenimahalle. The first 3 neighborhoods, which have more than 20 percent "bad" rates, are former shanty areas and are located on city edges. Also, these areas have always been occupied by low income groups. We have a total of 51 respondents from these 3 neighborhoods and 48 of them earn at most 1500 TL or less monthly income. The other 7 neighborhoods have less than 20 percent of "bad" rates. The neighborhoods M. Akif Ersoy, Deliktas and Yenimahalle have similar characteristics with the first 3 neighborhoods. Kuspinar, Feslegen, Topraklik and 15 Mayis are generally safe places and they are all old neighborhoods; the reasons for their

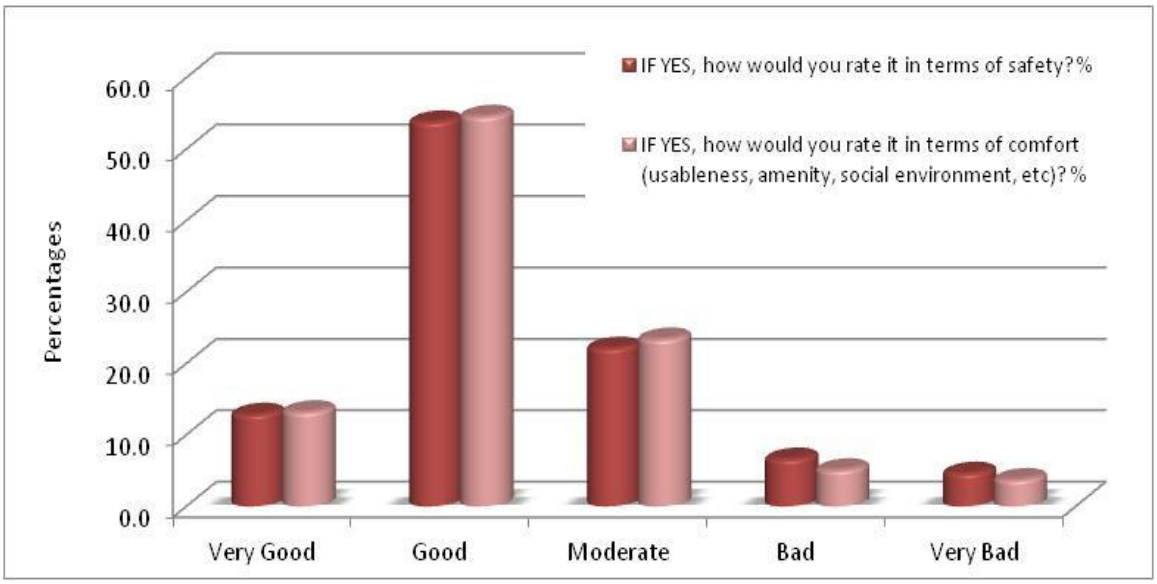
'bad' ratings need to be specifically investigated. The neighborhoods Sevindik and Muratdede have the highest "very bad" safety ratings for playgrounds. These two neighborhoods also have the highest "very bad" conditions in terms of cleanliness.

Graph 7: Percentages of responses for safety and cleanliness of playgrounds



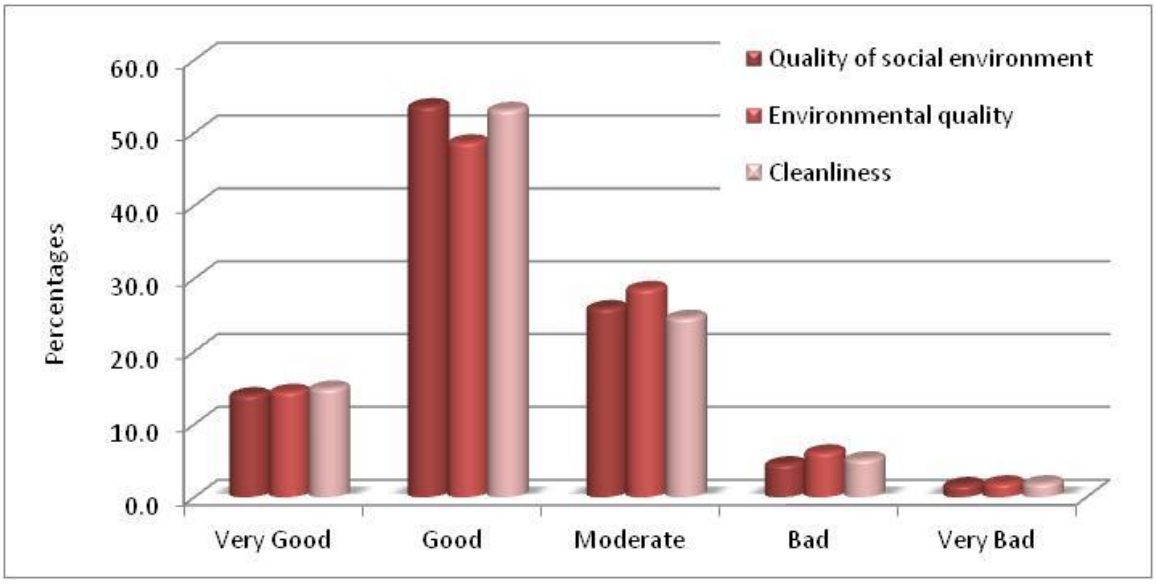
Trail paths are relatively new amenity in urban areas and recreational places in Turkey. Ten years ago, you could barely find a designated trail path with special pavements and basic facilities but now trails are developing all over the Turkish cities quite rapidly. This is related to the changes in social structure as well, and it will be discussed in the results. 39.8 percent of respondents confirmed that they have trail paths in their neighborhoods. They are generally built in large recreational parks, instead of single (stand-alone) trails. The safety of these areas is rated as "good" by 53.8% and comfort (usableness, amenity, social environment) is rated as "good" by 54.6% (Graph 8). "Moderate" rates take the second place, i.e. 22.1% for safety and 23.4% for comfort.

Graph 8: Percentages of responses for safety and comfort of trail paths



Another question in this section of the survey was about the availability of family tea gardens and cafes in neighborhoods. These places are the most common outdoor and social places where people spend their leisure time with their family and friends. The concepts and physical appearances of these places have been changing throughout time, as well as the features of their social environments. 54 percent of respondents say that they have these kinds of places to go in their neighborhoods. Almost half of the respondents answered “good” for all follow up questions (Graph 9). “Moderate” rates are about 20% for both questions. We have higher values for “very good” rates in this question, as 14% responded for quality of the social environment, and 14.5% for environmental quality and 15% for cleanliness.

Graph 9: Percentages of responses for quality of social environment, environmental quality and cleanliness of family tea gardens and cafes

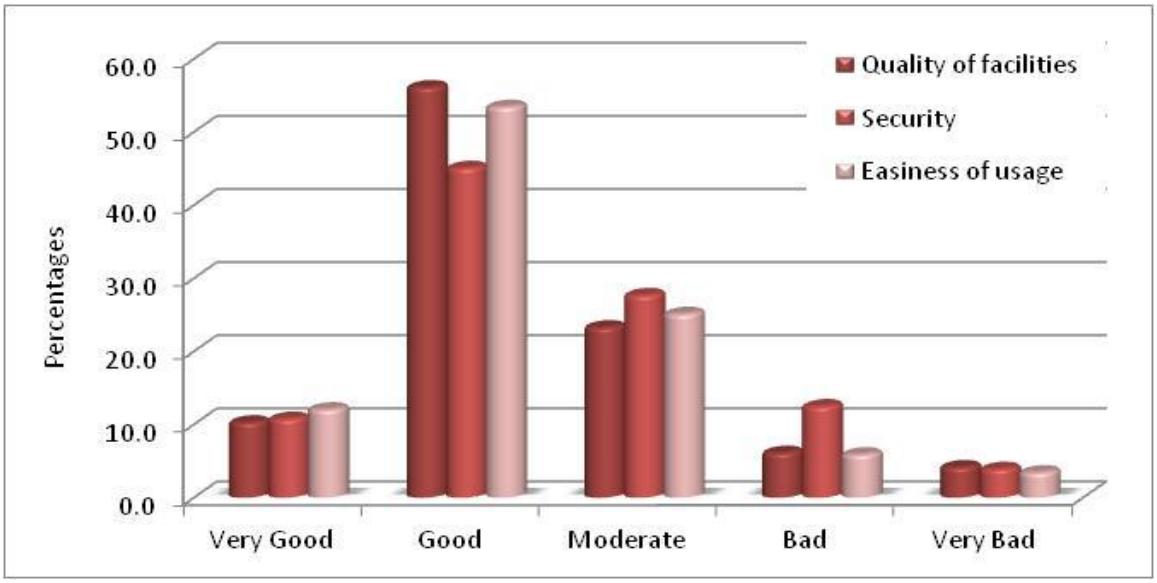


Designated public sports fields are also becoming more common next to other recreational facilities and trail paths. These areas are free and open public fields with appropriate design and facilities. Generally, their locations are associated with recreational parks and public schools, but there are also some individual ones. When the survey was conducted, 43 percent of people had at least one of these fields in their neighborhoods. They were asked to rate the quality of these facilities, the security and easiness of usage of these places. The qualities of the facilities were rated as "good" by 56.1% and as "moderate" by 23.3%. For security, 45.1% of answers were "good," and 27.7% of respondents rated it as "moderate." Also, 53.8% of answers were "good" and 25.1% of them were "moderate" in terms of the easiness of usage (Graph 10).

In general, responses about open/green space and recreational facilities show the level of happiness in people with the dominant rate of these facilities as "good." However, it also communicates that facilities and services in this area still need to be improved to be able to be rated as "very good." In the next part of this chapter, spatial

details of these facilities will be discussed and correlations between survey responses and spatial distribution will be investigated.

Graph 10: Percentages of responses for quality of facilities, safety and easiness of usage of sport fields



7.3.4 Environmental Quality

This part of the survey is devoted to the conditions of neighborhoods in terms of cleanliness and related services; security is also included as an indicator of environmental quality. Flooding and earthquakes are two of the most frequent natural problems in Denizli. Flooding, rain water and sewer system management were included in the survey as well. The purpose of the questions is to gather information about how people feel about these conditions and what the differences between old and new neighborhoods are based on study indicators. People were asked about street cleanliness, frequency of garbage and recycle collections, distributions and classifications of recycle containers. They were also asked if they have frequent flooding in their neighborhood and how they would rate the rain water management and

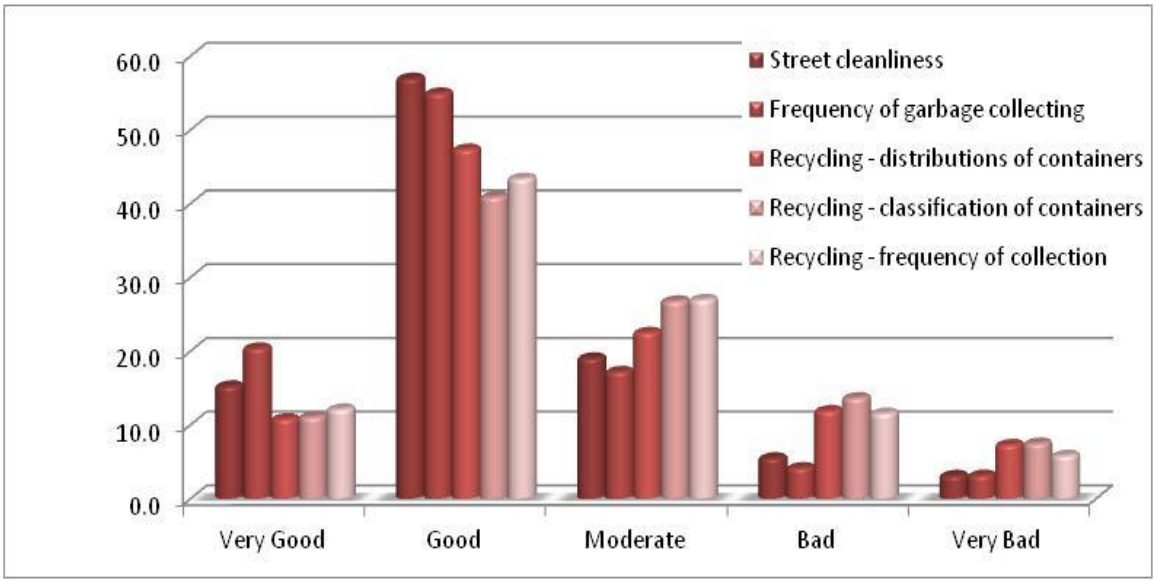
sewer systems. In the security part, they were asked to determine the general rate of overall public safety in their neighborhoods and their choice in the most frequent criminal incidents, which happen in their neighborhoods. Traffic accidents, house and car robbery, sexual harassment, extortion, kidnapping, armed assault and fight are listed as options of this question.

Denizli has been awarded the "Most Environmentalist City" by the Ministry of Environment and Forestry in June 2009 and the "Most Healthy City" out of 2947 municipalities. The indicators used as the basis for the environment award are package waste collection and decomposition facilities, solid waste treatment facilities, existence of a designated regular waste storage area, drain water treatment, parks and general cleanliness of the city (Hayat Dergisi, 2009). Survey results support this success. It is estimated that 91.4 percent of total responses are mixed responses of "very good," "good" and "moderate" rates. Also, people are happy about the frequency of garbage collection in their neighborhood, with a 92.6 percent positive rating, 20.4% for "very good," 55% for "good" and 17.2% for "moderate." From the official record of municipality it is evident that garbage is collected every day in 28 neighborhoods, three days a week in 47 neighborhoods and two days a week in four neighborhoods. Garbage collection is organized by municipality and operates through private companies.

Even though, the survey results show a successful recycling management system and service, official documents and municipal representatives do not support it. According to June 2011 municipal records, there are 34 locations that collect glass for recycling purposes. So, nine of them are health care centers (one of the hospitals has three large and nine small glass recycling containers), four of them are restaurants and

other institutions, and 21 of them are neighborhood containers. In the report, three of those containers were removed. Neighborhoods, where glass recycling containers are available, are Istiklal, Kuspinar, Mehmetcik, Camlaralti, Yenisehir and Servergazi. There are only 16 locations stated where they have paper recycling containers: two of those are private institutions and 14 of those are container locations. Neighborhoods where available paper recycling containers are located are Kuspinar, Camlaralti, Mehmetcik, Gumuscay, Servergazi, Yunusemre and Incilipinar. Although official numbers show a weak recycling system in the city, 47.4% of respondents rated the distribution of recycling containers as "good," 40.9% of them rated the classification of containers (such as, paper, plastic, glass, etc.) as "good," and 43.4% of respondents rated the frequency of collection as "good" (Graph 11).

Graph 11: Percentages of responses for cleanliness and related services



Responses for flooding in neighborhoods show positive results and outcomes of the recent infrastructure projects of current municipality. So, 75.7 percent of respondents mention that they have no flooding in their neighborhood and 54 percent of

respondents rated rain water management and sewer systems as “good.” If the survey had an option as “not any more” for this question, responses to this question would probably be different. Most of those neighborhoods used to experience flooding problems in the past. Altintop (around the city square), Anafartalar, M. Akif Ersoy, Dokuzkavaklar and Cumhuriyet are the top 5 neighborhoods where there are still flooding problems after heavy rainfall. When the survey was conducted, the infrastructure construction had not yet been started in the Altintop neighborhood, which is in the middle of the city. The other 4 neighborhoods are generally old shanty areas; therefore there are problems with infrastructure. Also, Anafartalar, Dokuzkavaklar and Cumhuriyet neighborhoods are located in the lowest part of the city. Therefore, these places need immediate protection projects to avoid flooding.

Safety is another indicator that is included in the environmental quality part of the survey, since it is a very important element of social life in urban areas. Even though Denizli Directorate General of Security (Police Departments) has been visited and the Ministry of Internal Affairs has been contacted many times, data about criminal incidents were not provided. The local newspaper’s offices were visited to be able to get access through their archives to gather information about criminal incidents at least for a one-year period from the local news. However, it was not successful. Therefore, survey results are the only source that we can use to interpret crime rates and their distribution in this research.

The neighborhoods that have higher than a 20 percent “bad” rate are Anafartalar, Aktepe, Altintop, Dokuzkavaklar, Deliktas, Karsiyaka and Fatih. All these neighborhoods are former shanty areas; they are located at the city edges and occupied

by the low-income population in general, except Altintop neighborhood. The neighborhoods that have 10 to 20 percent of "very bad" rates are Sevindik, Mehmet Akif Ersoy and Muratdede. These three have the same features as the previous ones.

Graph 12 shows the total number of responses per given crime types. House robbery and fights have the highest rates; traffic accidents and car theft are in the second place. Traffic accidents are not a crime; however, it is considered a phenomenon because of its high frequency of occurrence all over the country. Therefore, it was included in the survey. Even though other criminal incidents have fewer responses, their locations still need to be specifically investigated. Response percentage of the following rare incidents are: less than 20% for sexual harassment, less than 16% for armed assault, less than 14% for extortion and less than 13% for kidnapping.

Graph 12: Total number of responses per crime types

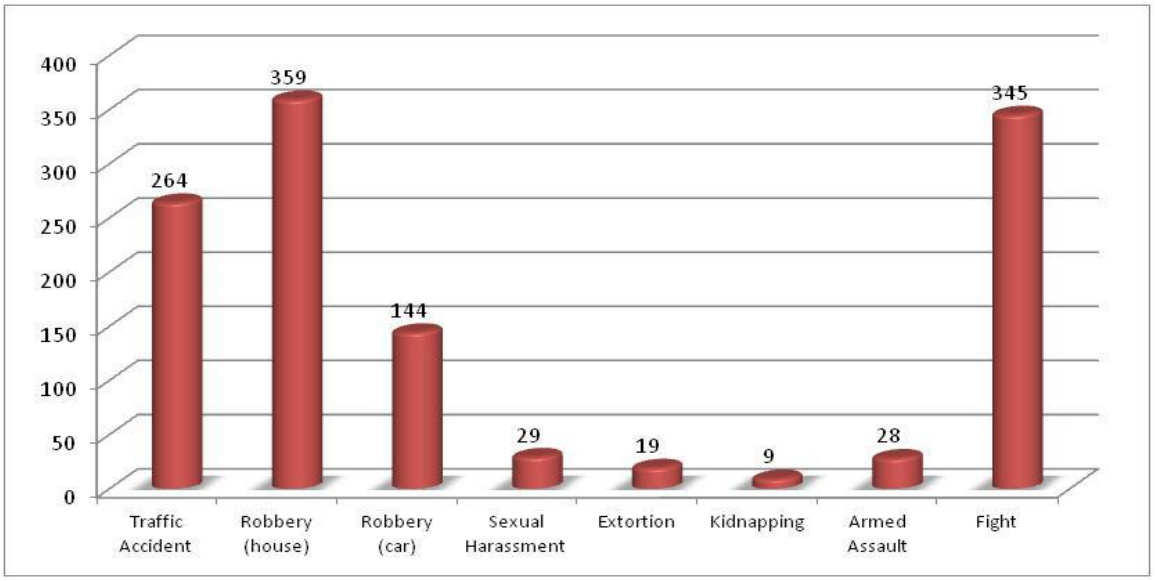


Table 11 shows the top 10 neighborhoods per crime and Table 12 shows the frequency of each neighborhood in this list. There are only 26 neighborhoods mentioned. So, 9 of them are listed only in one type of crime, 4 of them are listed in 2

types of crimes and 3 of them are listed in 3 types of crimes. Fatih, Anafartalar, Topraklik, Aktepe, Dokuzkavaklar, Sevindik, Altintop, Karsiyaka, M. Akif Ersoy and Zeytinkoy are the neighborhoods listed in 4 or more types of crimes.

The highest rate per incident and their neighborhood were found as follows: traffic accidents in Saraylar and Topraklik – 50%, house robberies in Aktepe – 68%, car robberies in Aktepe – 68%, fights in Aktepe – 74%, instances of sexual harassment in 15 Mayis – 19%, instances of armed assault in Anafartalar – 16%, instances of extortion in Dokuzkavaklar – 14%, and instances of kidnapping in Sevindik – 13%.

Table 11: Top ten neighborhoods for each crime types based on survey results

	Traffic Accident	Housse Robbery	Car Robbery	Fight	Sexual Harressment	Extortion	Kidnapping	Armed Assault
1	Saraylar	Aktepe	Aktepe	Aktepe	15 Mayis	Dokuzkavaklar	Sevindik	Anafartalar
2	Topraklik	Anafartalar	Anafartalar	Anafartalar	Sevindik	15 Mayis	Zeytinkoy	Sevindik
3	Kuspinar	Fatih	M. Akif Ersoy	Karsiyaka	Anafartalar	Altintop	Altintop	Zeytinkoy
4	Pelitlibag	Karsiyaka	Zeytinkoy	Sevindik	Fatih	Topraklik	Topraklik	Saraylar
5	15 Mayis	Merkezefendi	Deliktas	Fatih	M. Akif Ersoy	Sevindik	Fatih	Altintop
6	Bahcelievler	Topraklik	Atalar	Dokuzkavaklar	Saraylar	Incilipinar	Akkonak	Fatih
7	Hacikaplanlar	M. Akif Ersoy	Istiklal	Topraklik	Altintop	Pelitlibag	-	Muratdede
8	Servergazi	Dokuzkavaklar	Karsiyaka	Kuspinar	Aktepe	Fatih	-	Karsiyaka
9	Karaman	Zeytinkoy	Fatih	M. Akif Ersoy	Dokuzkavaklar	Cumhuriyet	-	Dokuzkavaklar
10	Anafartalar	Atalar	Topraklik	Atalar	Incilipinar	Aktepe	-	Hacikaplanlar

Table 12: Neighborhoods based on frequencies in top-ten lists of criminal incidents

Neighborhood	Frequency in survey responses	Neighborhood	Frequency in survey responses
Fatih	**7**	Hacikaplanlar	**2**
Anafartalar	**6**	Incilipinar	**2**
Topraklik	**6**	Kuspinar	**2**
Aktepe	**5**	Pelitlibag	**2**
Dokuzkavaklar	**5**	Bahcelievler	**1**
Sevindik	**5**	Deliktas	**1**
Altintop	**4**	Istiklal	**1**
Karsiyaka	**4**	Karaman	**1**
M. Akif Ersoy	**4**	Merkezefendi	**1**
Zeytinkoy	**4**	Servergazi	**1**
15 Mayis	**3**	Cumhuriyet	**1**
Atalar	**3**	Akkonak	**1**
Saraylar	**3**	Muratdede	**1**

7.3.5 Overall Evaluation

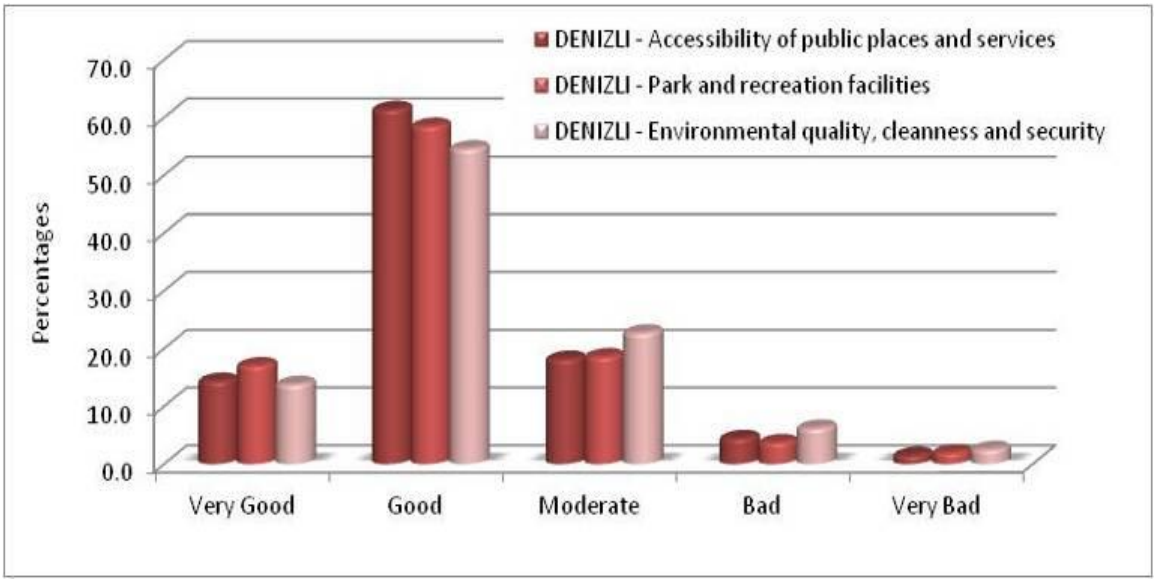
This part of the survey includes questions about the overall evaluation of the accessibility of public services, the availability of open/green places and environmental quality at both the city and neighborhood levels. The purpose of the questions is to gather public opinions about study indicators. Plus, the evaluation of municipal works since 2005 has been asked as well. These questions aim to elicit what people's perceptions of the municipality are. In addition, responses to these questions were used to determine the objectivity of certain responses. They were also asked the following open ended question: Do you have suggestions to improve livability or desire to have any facilities that you do not have yet? The answers to these open ended questions will be included in chapter 7.

Based on three basic indicators in this study, the accessibility of public services are rated as "good" by 61.4% of respondents, park and recreation facilities are rated as "good" by 58.5% of respondents, and environmental quality, cleanliness and security in Denizli are rated as "good" by 54.6% of respondents. "Moderate" values are 18.2%, 18.6% and 22.7% for the same order of indicators. The highest "very good" rate belongs to park and recreation facilities by 17.1%. Total "bad" and "very bad" rates are 6%, 5.8% and 8.8% (Graph 13).

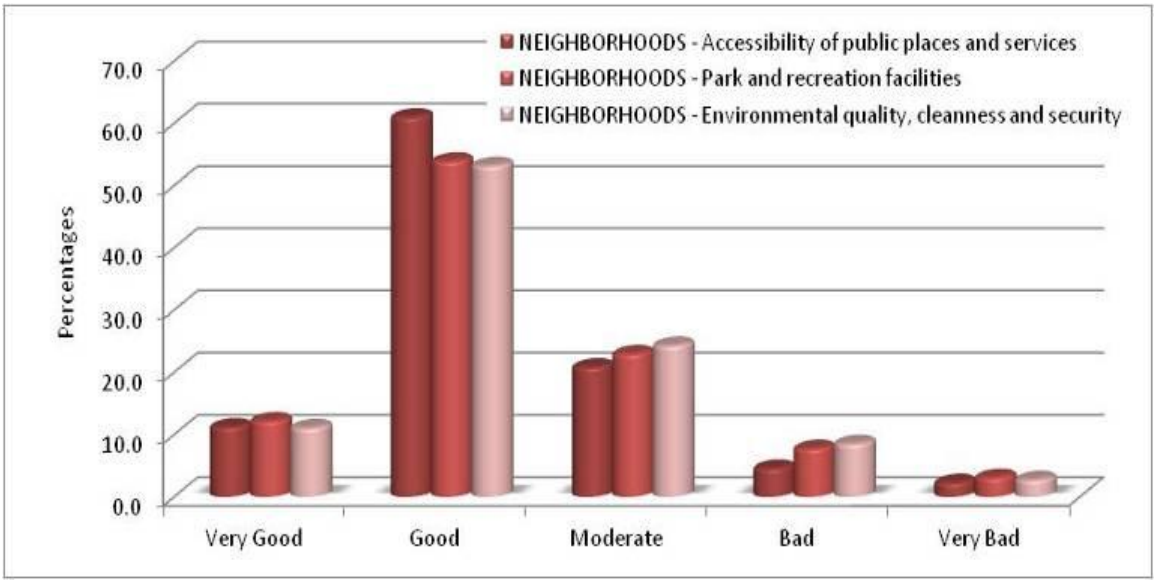
At the neighborhood level, again the highest rated scale is "good" for each indicator, at 61% for accessibility, 53.9% for parks and recreations and 53.2% for environmental quality. The highest rate for the "moderate" scale is recorded at 24.3 percent for environmental quality and the highest "very good" value appears at 12.2

percent for park and recreation facilities. Again, the total "bad" and "very bad" rates are 6.9%, 10.9% and 11.4% in order (Graph 14).

Graph 13: General thoughts about livability of Denizli, based on study indicators



Graph 14: General thoughts about livability of neighborhoods, based on study indicators



The level of information about general livability conditions of old and new neighborhoods were gathered from the survey results. In the next section, these results are spatially represented.

7.4 Spatial Representations of Survey Results

7.4.1 General Information

In this part of the chapter, spatial distributions and representations of survey responses are included. Also, there are comparisons between different variables and their spatial correlations that were investigated. This part aims to show significant differences between old and new neighborhoods through survey responses in the context of livability as a result of rapid urbanization. Even though survey results are analyzed in the previous section of the study and are mentioned in terms of specific neighborhoods, it is important to show their location and their spatial features to be able to provide appropriate interpretations about livability conditions and comparisons. In Map 14, colors show population ranges and numbers represent the number of completed surveys by residents of that neighborhood. The survey was conducted with the residents of the central neighborhood, instead of the recently added ones. The neighborhoods with yellow color that are located in the surrounding area of the central city are former towns and villages and thus were excluded. For the rest of the area, a minimum of 10 surveys were intended to be collected. As mentioned earlier, there are 10 or more responses from 37 neighborhoods and less than 10 from 22 neighborhoods.

The populations of the neighborhoods are decrease slightly from the city center to the city edges. That is another clue to how dense the central neighborhoods are. It also supports the growth directions that have been mentioned before. Unfortunately,

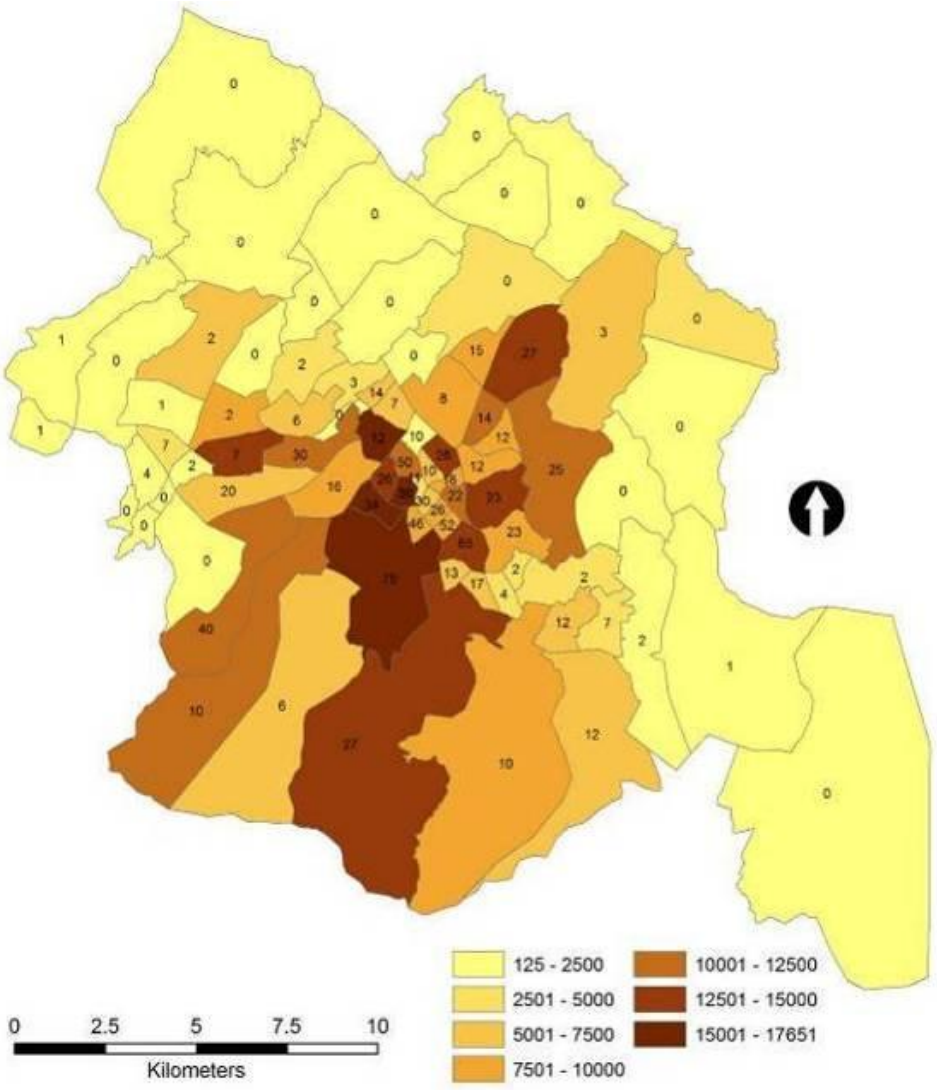
there is a lack of information about the neighborhoods' population from the past. Because of this, we are unable to create a map to show temporal population growth for neighborhoods.

Map 15 shows building types and building dates according to responses. The question has 4 options: an apartment block (built in 10 or more years ago), apartment block (built over the last 1-9 years), family house (built 10 or more years ago) and family house (built over the last 1-9 years). While 10 plus year old apartment blocks are concentrated close to the city center, the newer ones are generally located in new neighborhoods in the west and south. There are a few neighborhoods that have 26-50 percent newer apartment blocks in the city center. Those are actually some of the oldest neighborhoods; however, people destroy old buildings and construct new ones for more benefits.

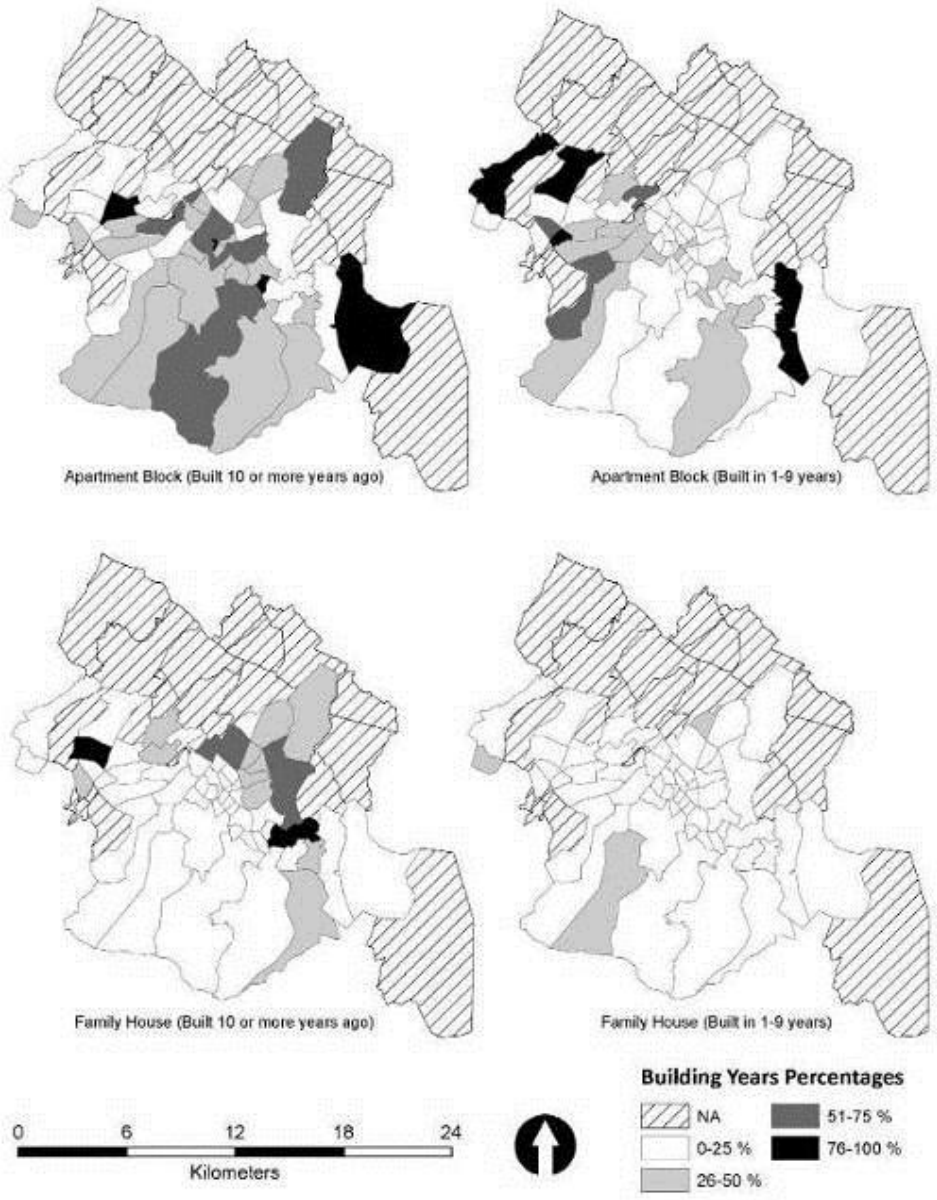
The concept of family houses is complex in Turkey. Until the mid 1970s, almost all residential units were family houses in the country, as well as in Denizli. Then, apartment blocks started to be built because of the changes of policies, profitability and space issues. During the last decade, people who can afford it have started to build single houses on the city edge to be able to stay away from the dense built environment in the city core. Also, some construction companies started to offer single/family houses and gated communities, which are a luxury. Economic development and the increasing purchasing power of people are two of the important reasons for this change. So, when we look at family houses now, we see that some buildings are in bad structural conditions, while other homes are in perfect condition; these homes are called luxury homes. Family houses, which were built 10 or more years ago, are concentrated

northeast and south of the city center. The neighborhoods on the northeast are generally old shanty and low income areas, while the ones in the south are former towns and new neighborhoods. There is no exact neighborhood that we can define as a family house neighborhood. However, some parts of Yenisehir, Servergazi and Gerzele are becoming highly occupied by these types of houses and sites in the last decade. There are some more single/family houses in different parts of the city but they are separated, so there is no spatial concentration (Map 15).

Map 14: 2010 population and number of survey per neighborhood



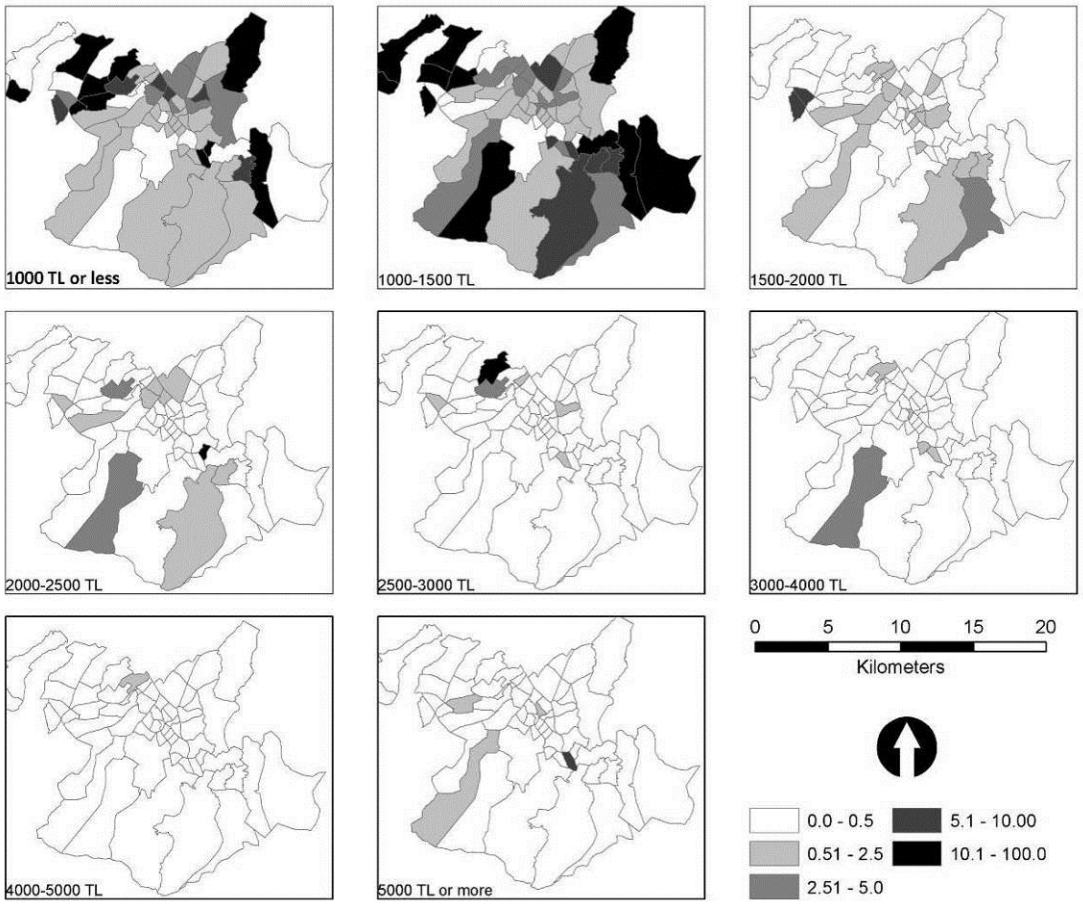
Map 15: Distribution of buildings by types and built dates



Map 16 shows the household income distribution per neighborhoods. Unfortunately, there are not many responses from the higher income group, so spatial comparisons are not as appropriate as they were supposed to be. Since the survey was conducted via random selection, the researcher has no control on the number of respondents based on their income. It is also surprising that the dominant number is low income, because Denizli is considered one of the wealthiest cities in the country. As

mentioned in the last section, a higher number of responses from young people and the amount of the minimum monthly wage may also be another reason for these results. Besides, there may be confusion between the terms of household and personal income for online and phone respondents.

Map 16: Distribution of respondents based on income (%)

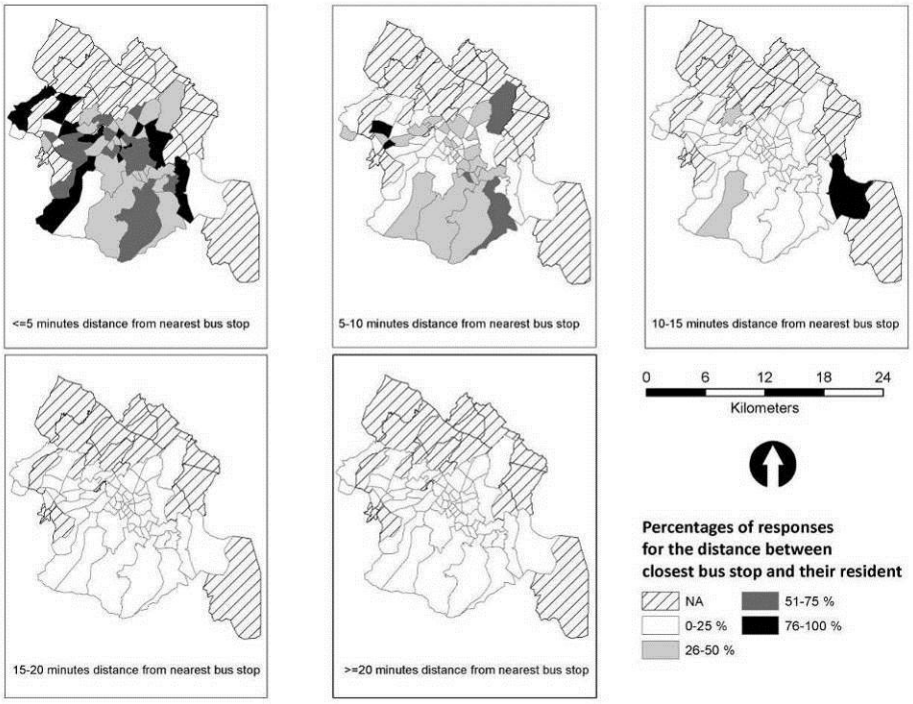


However, there are still some clues about where the low income group is concentrated and we can easily see how these concentrations are associated with old and new neighborhoods, as well as old and new building types. There was an expectation to see more concentration in the west and southwest on high income maps. Those regions are actually where expensive residential areas are located and where you can see gated communities.

7.4.2 Accessibility of Public Services

There is a large distribution in terms of the public transportation system in the city (Map 11). As it was mentioned, 97.5 percent of survey results show there are bus and minibus routes in their neighborhood. When we look at the distances between the closest bus stop and residential area, we see a high concentration of responses for the 5-minute or less option (Map 17).

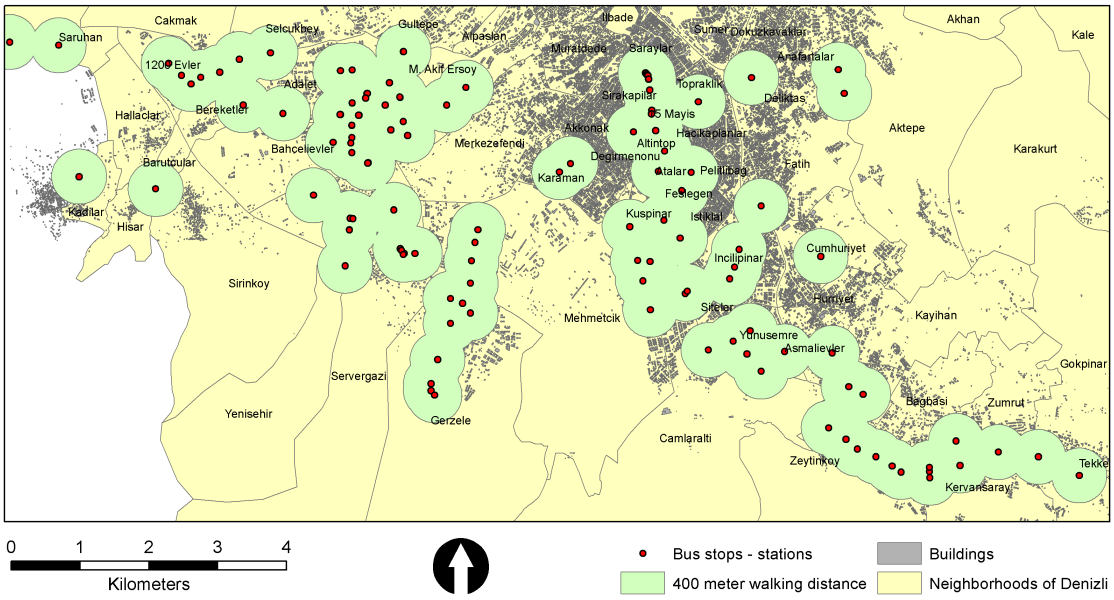
Map 17: Percentages of responses for the distance between closest bus stop/station and their resident



The transportation department of Denizli Municipality was not able to provide data for bus stops and stations. Thus, Cities Bank data was used to create a sample bus stop map. Unfortunately, this dataset as limited and many points were missing. However, available parts of the data were used to see how much area is covered in walking distance. Walking distance from home to stops/stations is defined as 400 meters based on the studies of Ewing (2000) and Dittmar (2004). So, 400 meter buffers

were created from bus stops' point features. The total building numbers were found by using the geometrical selection tool, and then the numbers of buildings in 400 meter areas were found by locational selection. As a result, 58963 buildings were counted in the general area, and 27909 of them were located in walking distance (10 minutes or less) to the nearest bus stops. Basically, the buffer area covers 47.33 percent of the defined sample part of the city, even though there are many missing points, especially in the city core (Map 18).

Map 18: Map of sample bus stops and 400 meter buffer zones as walking distance



After the availability of public transportation and general rating questions of traffic conditions, people were asked to write 2 streets, avenues or regions where they frequently faced traffic congestion. Map 19 shows the location of the neighborhoods based on the responses to this question. Neighborhoods are defined from places that are mentioned in answers. According to the answers, Cinar, Bayramyeri, Lise, Doktorlar, Saltak, Istiklal, Camlik, Halk and Ucgen are the most problematic regions in terms of

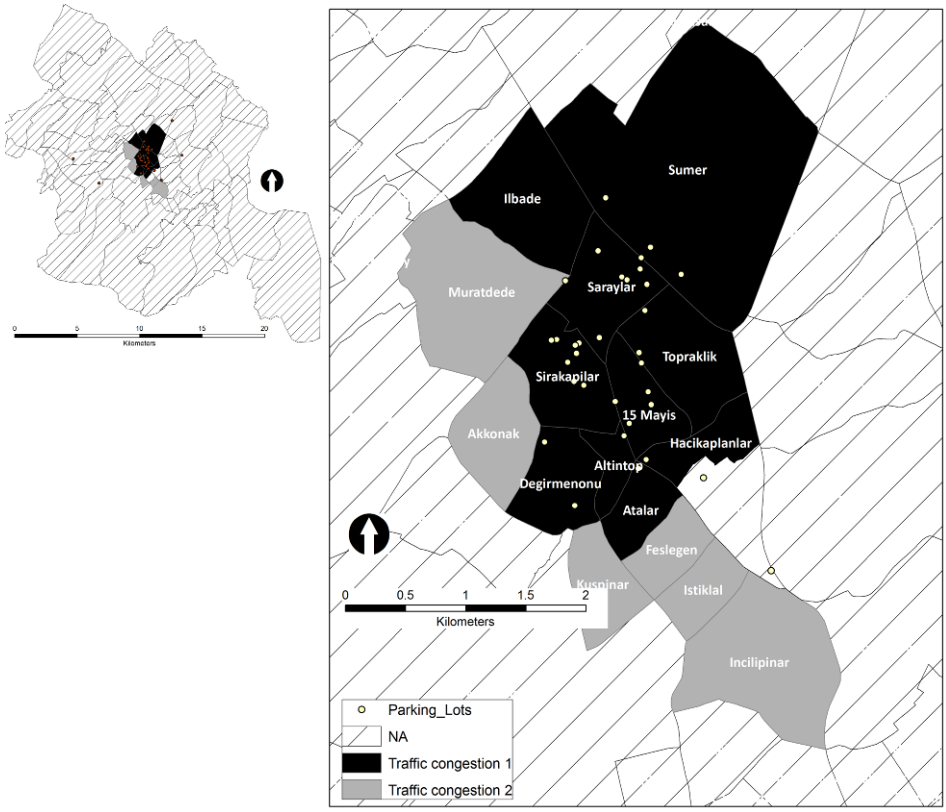
traffic congestion (Table 13). These places are located in Saraylar, Sirakapilar, Topraklik, 15 Mayis, Hacikaplanlar, Altintop, Degirmenonu and Atalar as the first group of neighborhoods and Muratdede, Akkonak, Kuspinar, Feslegen, Istiklal and Incilipinar as the second group of neighborhoods.

Table 13: Most frequent responses for traffic congestion and parking problem in the city

	Traffic Congestion 1		Traffic Congestion 2		Parking Problem 1		Parking Problem 2	
1	Cinar	214	Bayramyeri	173	Bayramyeri	246	Bayramyeri	217
2	Bayramyeri	140	Cinar	129	Cinar	238	Cinar	162
3	Lise	93	Lise	70	Doktorlar	33	Lise	36
4	Doktorlar	33	Saltak	56	Lise	32	Doktorlar	28
5	Saltak	49	Doktorlar	52	Saltak	26	Saltak	34
6	Istiklal	30	Istiklal	26	Others	66	Others	44
7	Camlik	22	Ucgen	22				
8	Halk	13	Others	69				
9	Ucgen	12						
10	Others	61						

As you may realize from the scale map of Map 19, these neighborhoods are located in the city core and all of them are considered as old neighborhoods. The majority of business and commercial places are located in this area. The old bazaar and other retail locations in the surrounded area attract a lot of people on a daily basis. The main street is also there; people call it Cinar. Plus, as mentioned in chapter 6, there are seven hospitals, including the biggest and oldest one, a public dispensary and a family health care center in the same region (Map 13).

Map 19: Map of neighborhoods where people frequently faced traffic congestion



Also, this area is where all public transportation meets as well. Besides all these traffic attraction factors, it is unsurprising that there is traffic congestion in the area given there has been an increase in car ownership rates but the same narrow streets have remained at least since the 1980s with only a few changes.

Responses to the parking problem in the city also point out the same places. Bayramyeri, Cinar, Doktorlar ave., Lise ave., and Saltak ave. are the top 5 regions where people have parking problems in the city (Table 13). Even though people were asked to mention two different streets or regions, the same places were mentioned in two options. There are 32 public parking lots in the region. Unfortunately, the capacity of these places are unavailable but the sizes vary, from 250-300 sq meter outdoor lots to

15000-16000 sq meter multiple floor parking places. However, that still does not supply enough service for that high demand.

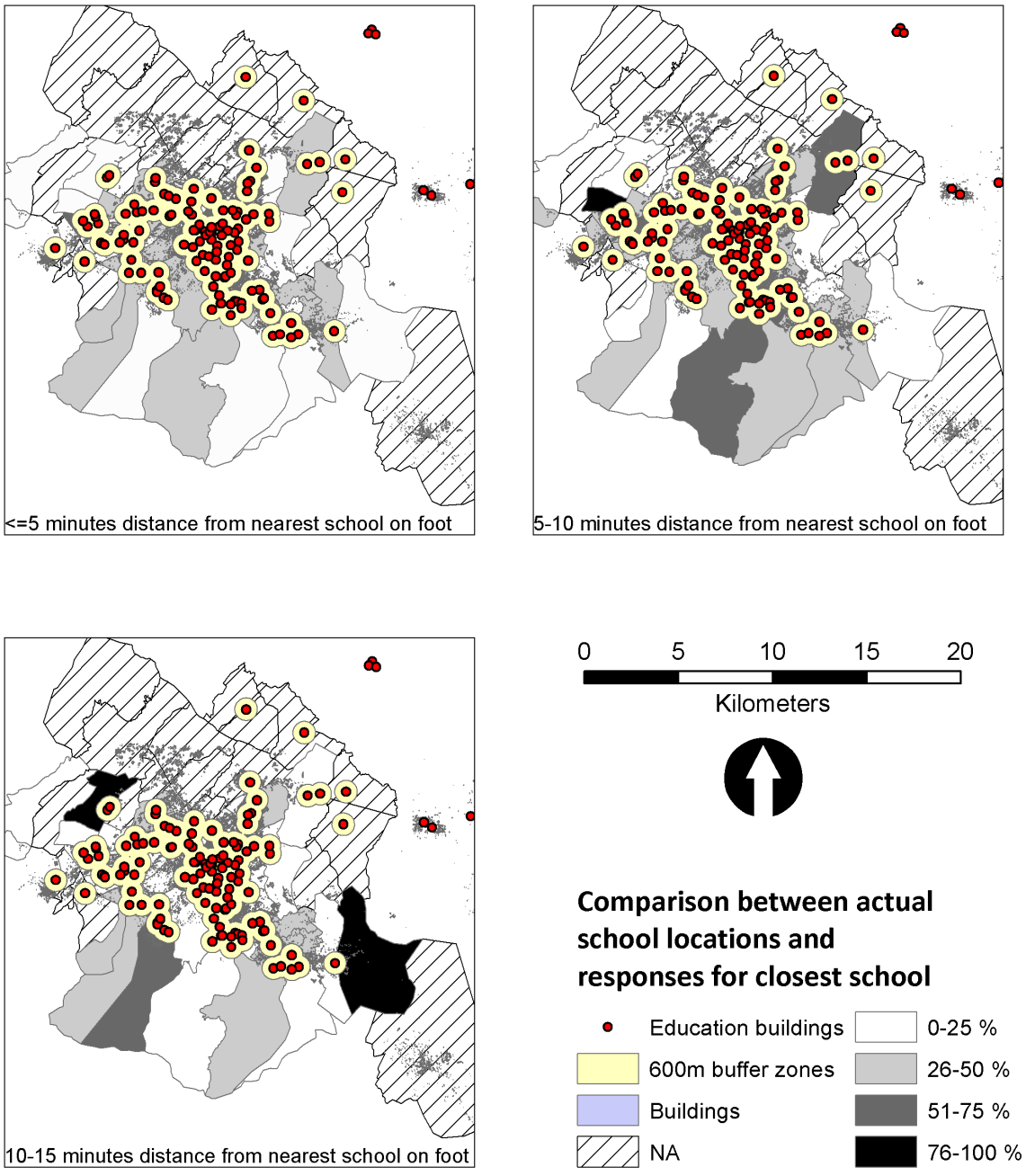
According to the Regional Planning Association report (1997), a 400-800 meter parking area, which generally takes a 5-10 minute walk, is reasonable in intensively developed, mixed used and pedestrian based areas. So, a 600-meter buffer was applied to the accessibility of the public service map in this study, as a medium of the defined walking distance.

As a reminder, the majority of responses about the distance between their houses to the closest school are 32.7% for 5 minutes or less, 43.5% for 5-10 minutes. In addition, 16.8 percent of respondents are living within a 10-15 minute walking distance away from the closest school. Map 20 shows the area that is covered by 600 meter walking distances from each school. There are 72564 buildings in the area as a result of geometric selection and 61289 of them are located within the 600 meter distance from the closest school, which is 84.46 percent. This percentage fits into the analyses through the survey results, since it means 84.46 percent of the area is within a 10 minute or closer distance, while roughly 16 percent of it is out of this range. The survey results show that 16.8 percent of total responses include a 10-15 minute distance.

According to the official records of Directory of National Education of Denizli, there are only five schools that are at their planned capacity. There are seven schools that have 11-150 more students, 40 schools have 1-10 more students, while 12 schools can hold 11-150 more students and 55 schools have 1-10 student less than their capacity. There is no size and capacity information for 17 schools. There is no significant spatial concentration of any schools based on their capacity and the number

of current students, except several highly populated neighborhoods in the city core (Map 21). There are 11 schools in these neighborhoods.

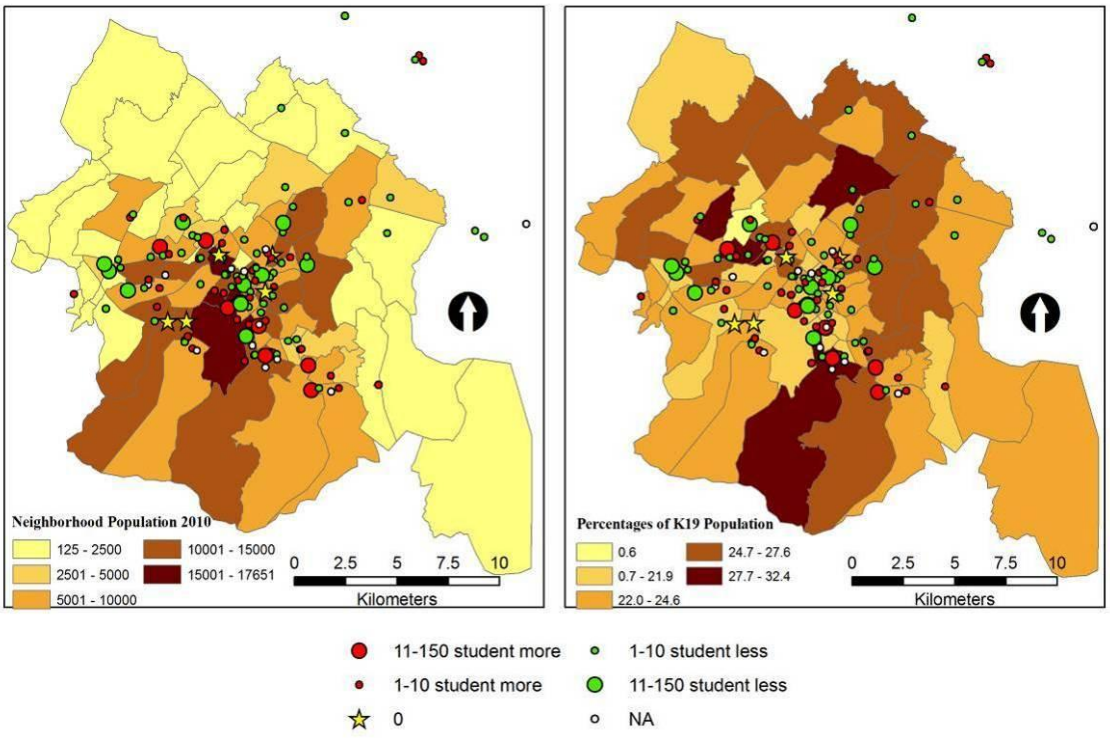
Map 20: Comparisons between actual school locations and responses for closest school



Seven of those are over populated, three of them are less populated and one school has an even number of students and capacity. Besides these, Map 21 shows the

comparison between the total population of neighborhoods and the population of K19 per neighborhoods. This map shows that the concentration of schools' locations does not match with the highly 5-19 year old populated neighborhood, especially the new ones and the ones in the surrounding area.

Map 21: Comparisons between total neighborhood populations and percentages of 5-19 year old populations per neighborhoods



However, when we look at the distribution in old and new neighborhoods, there are some remarkable results to point out. For instance, eight NEW neighborhoods are mentioned on both the over and less populated schools' neighborhood lists (Adalet, Akhan, Gerzele, Gultepe, Karahasanli, Kervansaray, Semikler, and Yenisehir). Also, there are 11 OLD neighborhoods are in both of those school population lists (Akkonak, Anafartalar, Bahcelievler, Degirmenonu, Deliktas, Incilipinar, M. Akif Ersoy,

Mehmetcik, Sirakapilar, Sumer, Topraklik) (Table 14). This condition will be discussed in the result chapter.

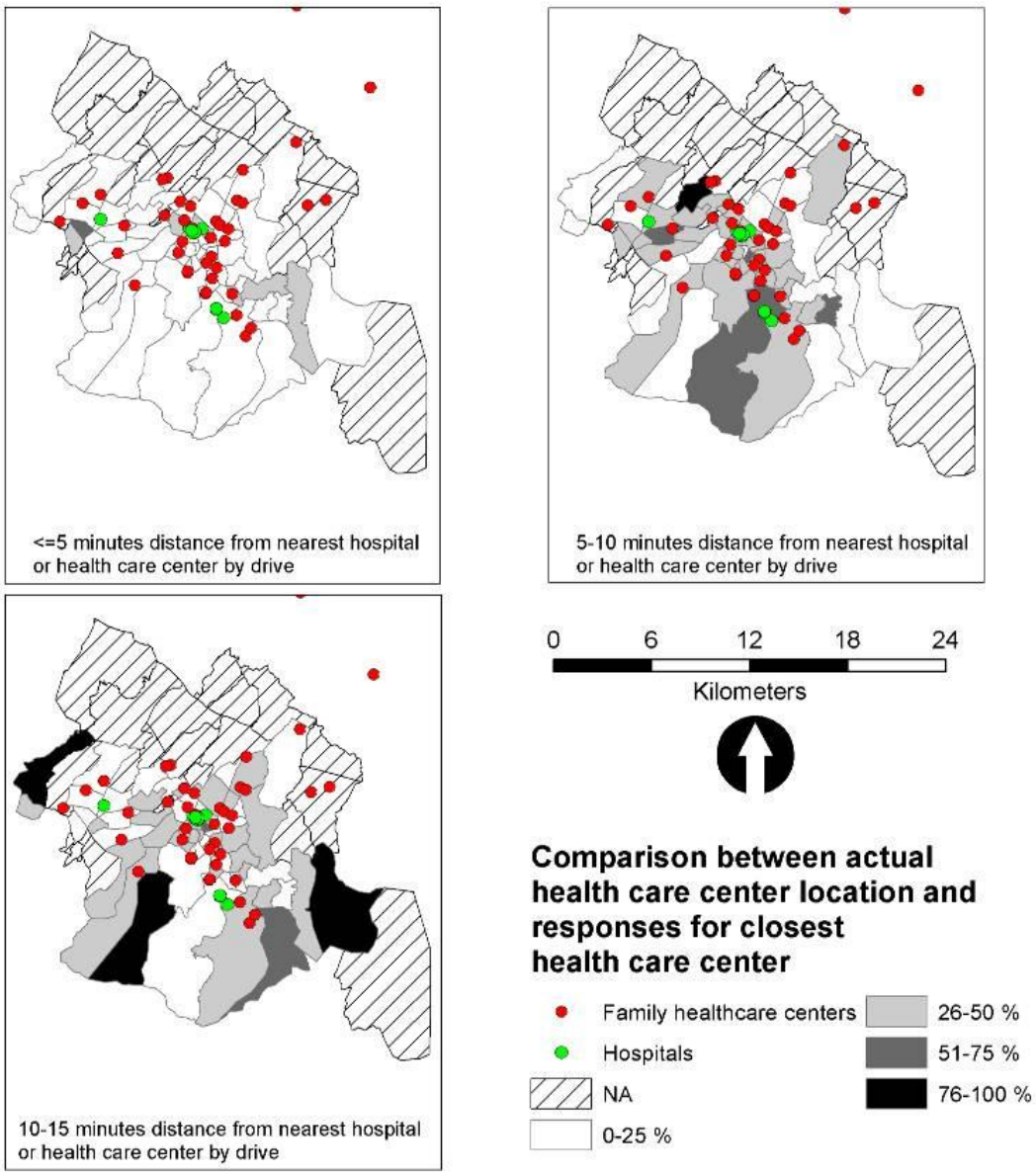
Table 14: Over and less populated schools

	Over Populated Schools in NEW Neighborhoods	Over Populated Schools in OLD Neighborhoods	Less Populated Schools in NEW Neighborhoods	Less Populated Schools in OLD Neighborhoods
1	Adalet	Akkonak	1200 Evler	Akkonak
2	Akhan	Anafartalar	Adalet	Anafartalar
3	Gerzele	Atalar	Akhan	Bahcelievler
4	Gultepe	Bahcelievler	Aktepe	Degirmenonu
5	Gumuscay	Camlaralti	Asmalievler	Deliktas
6	Karahasanli	Degirmenonu	Camlaralti	Fatih
7	Kervansaray	Deliktas	Eskihisar	Feslegen
8	Semikler	Dokuzkavaklar	Gerzele	Hacikaplanlar
9	Servergazi	Ilbade	Gultepe	Incilipinar
10	Tekke	Incilipinar	Guzelkoy	Istiklal
11	Yenimahalle	Karaman	Hurriyet	Karsiyaka
12	Yenisehir	Kayihan	Kale	Kuspinar
13	Zeytinkoy	M.A. Ersoy	Karahasanli	M.A. Ersoy
14	Zumrut	Mehmetcik	Karakova	Mehmetcik
15	-	Sirakapilar	Kervansaray	Merkezefendi
16	-	Sumer	Korucuk	Muratdede
17	-	Topraklik	Selcukbey	Pelitlibag
18	-	-	Semikler	Sirakapilar
19	-	-	Sirinkoy	Sumer
20	-	-	Yenisehir	Topraklik
21	-	-	Yunusemre	-

Responses for the nearest health care centers are concentrated on 5-10 minute and 10-15 minute driving distances in survey results. As a reminder, while 40.2 percent of people can reach a health care center within a 5-10 minute drive, 29.4 percent should drive for 10-15 minutes. Also, 15.2 percent of residents are able to reach a health care center within less than a 5 minute driving distance. Driving distance and travel time to a health care center are fuzzy concepts because of the impact of many variables, such as the condition of roads, urban structure of the study area, types of transportation network, time of the travel and so on (Schuurman et al., 2006; Nallamothu et all, 2006). So, in the literature, service areas for hospitals are generally defined by population size, social and economic conditions of the residents (Dartmouth Atlas of Health Care, 1996;

Wielki, 2009). Therefore, creating buffer zones from health care centers' points and analyzing the coverage of building numbers would not give appropriate results. Instead, the survey results and locations of health care centers are investigated by their neighborhoods for the purpose of the study (Map 22).

Map 22: Comparisons between actual health care centers locations and responses for closest health care centers



There are 12 hospitals and 45 family health care centers in the city. Family health care centers were established to serve the community in 2006 and were replaced with neighborhoods health care centers. Each of them has a certain number of full doctors (1 to 8, which depends on the neighborhood), several nurses and assistants. They have no emergency rooms, or offer any level of surgery. The majority of those hospitals have full health care services, except a few of them, which have specialized in certain medical fields, such as dentistry. Survey results seem to be acceptable for 5-10 and 10-15 minute driving distance responses regarding traffic conditions in the city, parking problems in a certain area and low speed. However, there was a strong expectation to see a concentration of responses for a 5 minute or less driving distance in the city core where the majority of hospitals are located, but the survey results did not report that. Again, heavy traffic and parking problems may be the reasons for this result.

There are only 31 neighborhoods recorded, which have at least one health care center (Table 15). That means 48 neighborhoods do not even have a family health care center based on the official records of Directory of Healthcare Services of Denizli. In terms of spatial distribution, 12 of those centers are located in new neighborhoods and 19 of them are in old neighborhoods. As it has already been mentioned before, 8 of the hospitals are located in the city core.

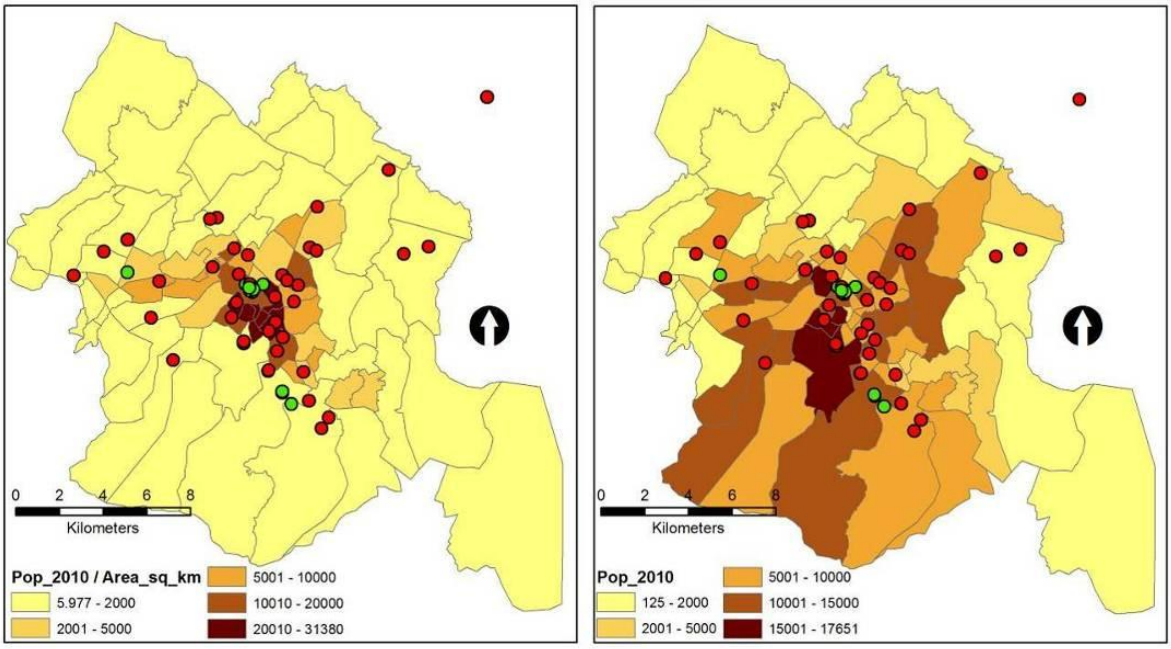
Map 23 shows a good distribution of health care centers in highly populated neighborhoods. When we look at the map of the general population (map on the right), it seems like there is an unequal spatial order of these services. However, the map on the left hand side shows highly populated parts of the city, as created by using the total population of the area and the area of neighborhoods. There are still some

neighborhoods, however, which have medium population density but have no health care facility in their administrative borders.

Table 15: Neighborhoods which have healthcare center in administrative borders

NEW Neighborhoods with a healthcare center		OLD Neighborhoods with a healthcare center	
Adalet	Karahasanli	Akkonak	Karaman
Akcesme	Saruhan	Anafartalar	Karsiyaka
Akhan	Selcukbey	Bahcelievler	M.A. Ersoy
Asmalievler	Servergazi	Camlaralti	Mehmetcik
Cakmak	Yenimahalle	Deliktas	Muratdede
Kale	Zeytinkoy	Dokuzkavaklar	Pelitlibag
		Ilbade	Saraylar
		Incilipinar	Sirakapilar
		Istiklal	Sumer
			Topraklik

Map 23: Health care centers' locations and population density of neighborhoods

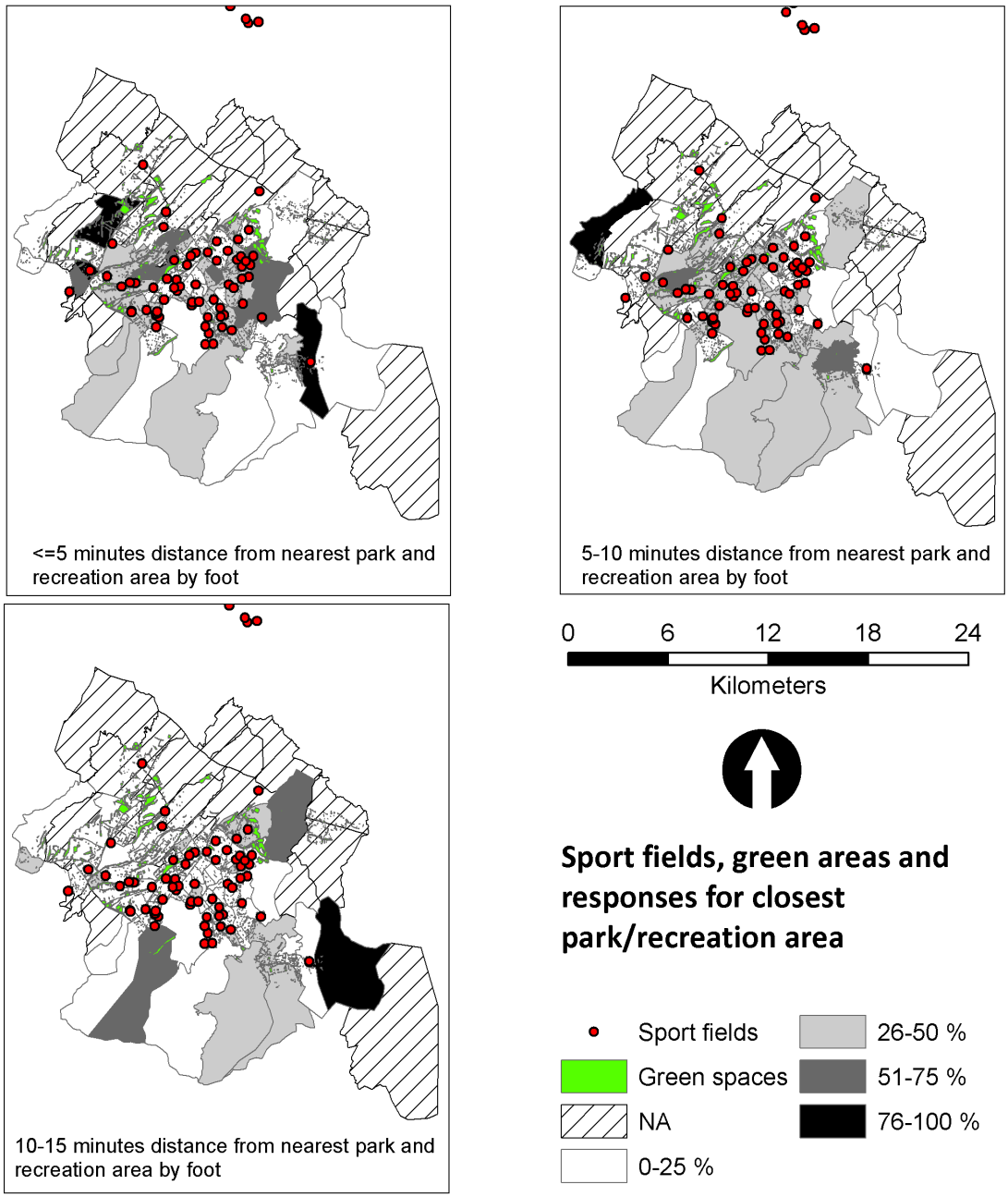


According to the survey results, the majority of people stated that they have access to a park or recreational area within less than a 10 minute walking distance.

Also, the majority of responses per neighborhood turned out to be in the range of 26-50%, except the ones that have the largest recreational park in the area, such as Adalet neighborhood, which has 51-75%. It is surprising that there are only 26-50% of responses in Incilipinar neighborhood, even though the second largest recreational park is in the area. Responses from this area are probably divided in two between 5 minute or less and 5-10 minute distances, because 26-50% responses were collected for both options. As a reminder for the general survey results for the closest park and recreational places, 35.2 percent of respondents have a park/recreation area within a 5 minute or less walking distance, while 34.2 percent have one in a 5-10 minute walk, 20.9 percent have one in a 10-15 minute walk and 9.7 percent have one of these facilities in a 15 minute walk or further.

Map 24 shows the distribution of sports fields and green spaces. As it has already been mentioned before, the map of green spaces was created based on the data of Denizli Municipality Directory of Parks and Gardens. However, it includes every single green space, without any consideration of possible recreational service in that area, such as blocks between streets or a brush area by the roads. It is almost impossible to create a map of small parks and playgrounds based on the existing data. Therefore, sports fields and large recreational parks are used for spatial comparisons and survey results are considered for other interpretations.

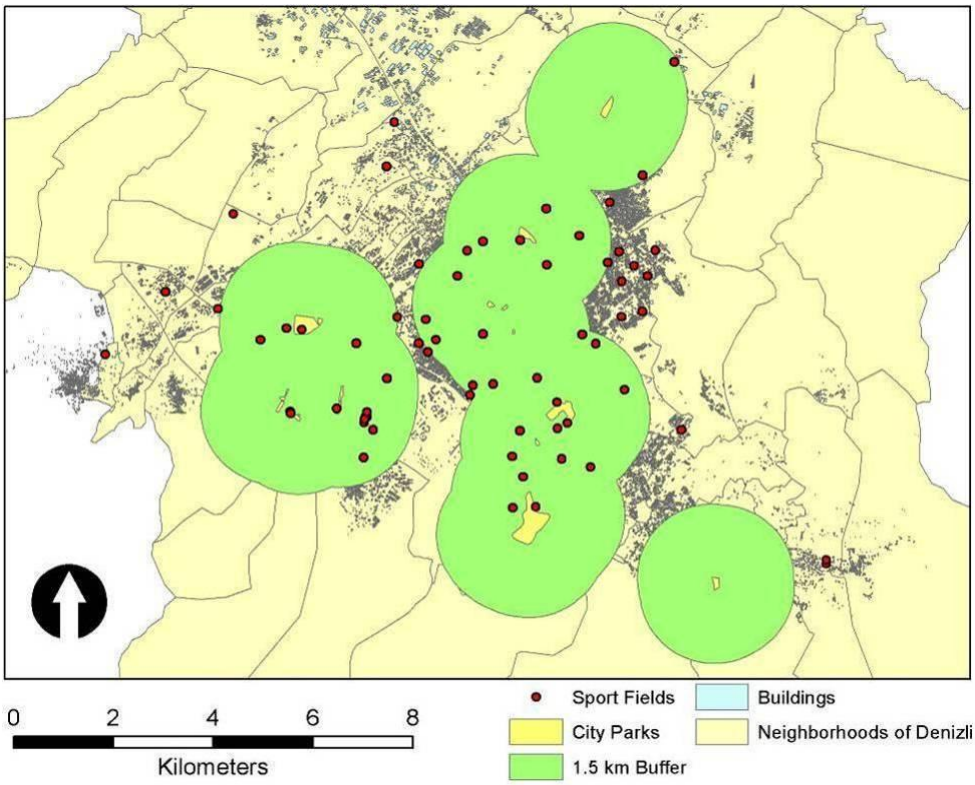
Map 24: Sport fields, green spaces and responses for closest park/recreation area



According to Indiana SCORP (2006) report, the service area of regional (county) parks is 1.5 kilometers and it is 500 meters for neighborhood parks (site parks, playgrounds) on a daily basis (Kara, 2008). Based on this definition, 1.5 kilometer buffer zones were created from the largest recreational parks of Denizli (Map 25). There

are 73996 buildings counted in the central municipal border. So, 52634 buildings are covered in service areas of the city parks, which are 71.1% of the total area. However, there are significant differences between the new and old recreational parks in terms of sizes and facilities. It is important to notice the sizes of three parks in the city core (in the middle of the buffer zone) and compare them with the ones on the city's edges. New recreational parks are relatively larger in size, have more facilities and better landscape designs as compared to the old ones.

Map 25: City parks and service areas



There are 34 neighborhoods recorded, which have at least one sports field in their administrative borders (Table 16). There may be new ones but no data are available about them, since the sports fields' point feature was created by using 2010 municipal database and the latest satellite image from 2009. In terms of spatial

distribution, 16 of those fields are located in new neighborhoods and 18 of them are in old ones.

Table 16: Neighborhoods which have sport field/s in administrative borders

NEW neighborhoods with sport field		**OLD neighborhoods with sport field**	
1200 Evler	M.A. Ersoy	Anafartalar	Ilbade
Adalet	Selcukbey	Bahcelievler	Incilipinar
Akcesme	Semikler	Camlaralti	Istiklal
Aktepe	Servergazi	Cumhuriyet	Karaman
Eskihisar	Siteler	Degirmenonu	Karsiyaka
Gokpinar	Sumer	Deliktas	Kuspinar
Hacieyuplu	Yenisehir	Dokuzkavaklar	Mehmetcik
Kadilar	Yunusemre	Fatih	Merkezefendi
		Feslegen	Muratdede

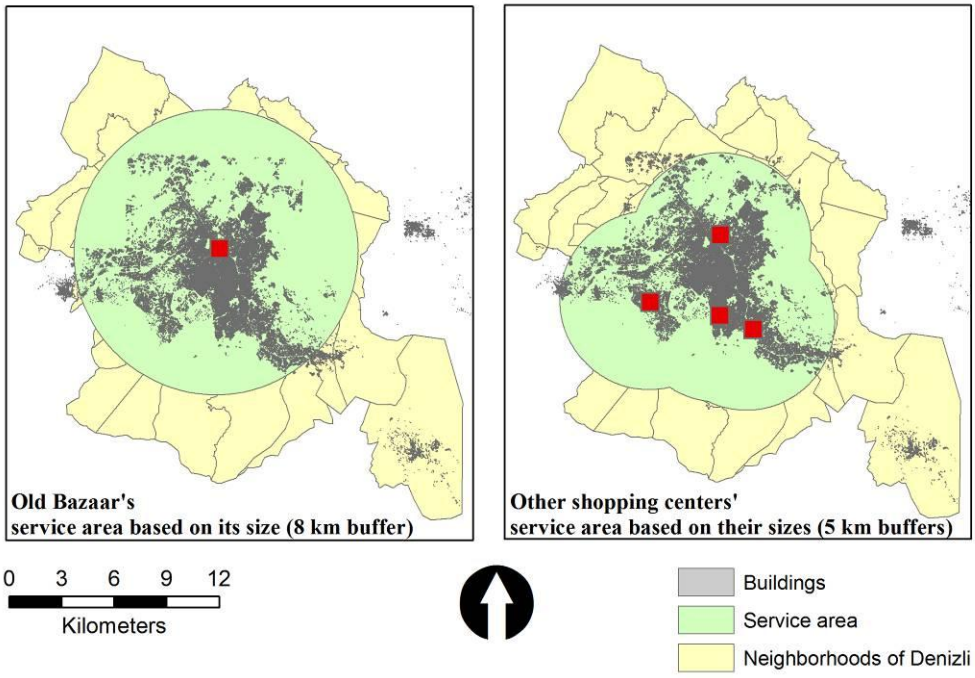
There are four shopping malls (Sumer Park, Teras Park, Forum Camlik and Pekdemir) and an old bazaar that are considered shopping centers in the study area. Old bazaar and Sumer Park are located in the city core, Forum Camlik is in the area between the city core and the new settlement region, and the other two are located on city edges. The approximate service area for a shopping center is formulated based on its size. According to the International Council of Shopping Centers' (ICSC) definitions, there are 8 different types of shopping centers, from the smallest to largest: neighborhood center, community center, regional center, superregional center, fashion/specialty center, power center, theme/festival center and outlet center. Each of these has different concepts, size, type and service areas. So, the shopping center types and service areas in Denizli were classified accordingly (Table 17). The areas of the shopping centers do not include parking area, only the building size. Considering the size of Denizli and regarding only developing cities in the study, the minimum service area distance is used for creating buffer zones from shopping centers.

Table 17: Shopping centers classifications and service areas

No	Name	Area (sq feet)	Area (sq meter)	Type (ICSC)	Defined Area Range (ICSC)	Service Area (ICSC)
1	Kaleici (Old Bazaar)	492169	45724	Regional Center	400000 - 800000 sq ft 34161 - 74322 sq m	5 - 15 miles 8 -24 km
2	Sumer Park	293929	27307	Community Center	100000 - 350000 sq ft 9290 - 32516 sq m	3 - 6 miles 5 - 10 km
3	Forum Camlik	214255	19905	Community Center	100000 - 350000 sq ft 9290 - 32516 sq m	3 - 6 miles 5 - 10 km
4	Teras Park	211092	19611	Community Center	100000 - 350000 sq ft 9290 - 32516 sq m	3 - 6 miles 5 - 10 km
5	Pekdemir	29372	2729	Neighborhood Center	30000-150000 sq ft 2787 - 13935 sq m	3 miles 5 km

Map 26 shows service areas of shopping centers and the old bazaar. Due to its size, the old bazaar is considered the regional center and minimum service area in an 8 km radius. In addition, 3 of the others are classified as community centers and Pekdemir is in the neighborhood center class. The minimum service area for these, except for the neighborhood center, is 5 km radius. The defined service area for neighborhood centers is 5 km max. All these shopping centers were established between 2008 and 2010. Before that, there used to be several other shopping centers that opened and closed in the surrounding area of the city. Somehow, they could not last too long in terms of sustaining themselves and remaining as an attraction area. The current shopping centers are in much better condition in terms of business. Their location may be a strong reason for this condition because previous ones were located outside of city centers where there is a 15-20 minute driving distance and public transportation service is weak. However, the current ones are located in settlement areas and public transportation is available to and from almost every part of the city. There are also a remarkable number of people within walking distance.

Map 26: Shopping centers and service areas

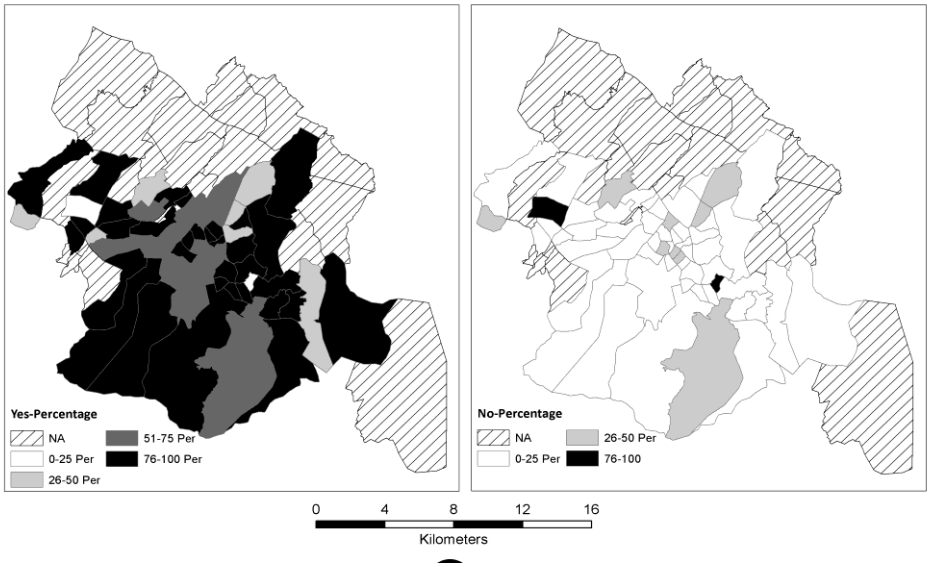


The service area of the old bazaar pretty much covers the entire city area. However, there are significant differences between the old bazaar and the new shopping centers and these differences affect the attraction of these places. As mentioned before, the old bazaar is not a "big box," although all types of foods and goods are sold in that area. The major problems in this place include parking, extremely hot or cold weather, which depends on seasons, and the absence of entertainment centers. On the other hand, as you may see on Map 26, shopping centers' service areas almost cover the old bazaar's service area. People who drive and desire to spend more time with more attraction while shopping are most likely to prefer going to shopping centers instead of the old bazaar. Another reason lies in the products and brands that shops carry in both the shopping centers and old bazaar. You can find well-known brands in shopping malls, and they have more quality products with various types and prices, and also with more payment options as compared to the smaller shops in the old bazaar.

7.4.3 Open/Green Spaces and Recreational Services

Playgrounds, trail paths, family tea gardens/cafés and sports fields were recorded as open/green spaces and recreational service areas in this part of the area. As a reminder, people were asked whether they have any of these services in their neighborhood, as well as safety, comfort, cleanliness, quality of facilities, social and environmental quality of those available places and services. So, 84.3 percent of responses show available playgrounds, 30.8 percent for available trail paths, 54 percent for available family tea gardens/café and 43 percent for available public sports fields.

Map 27a: Availability of playgrounds per neighborhoods based on survey results



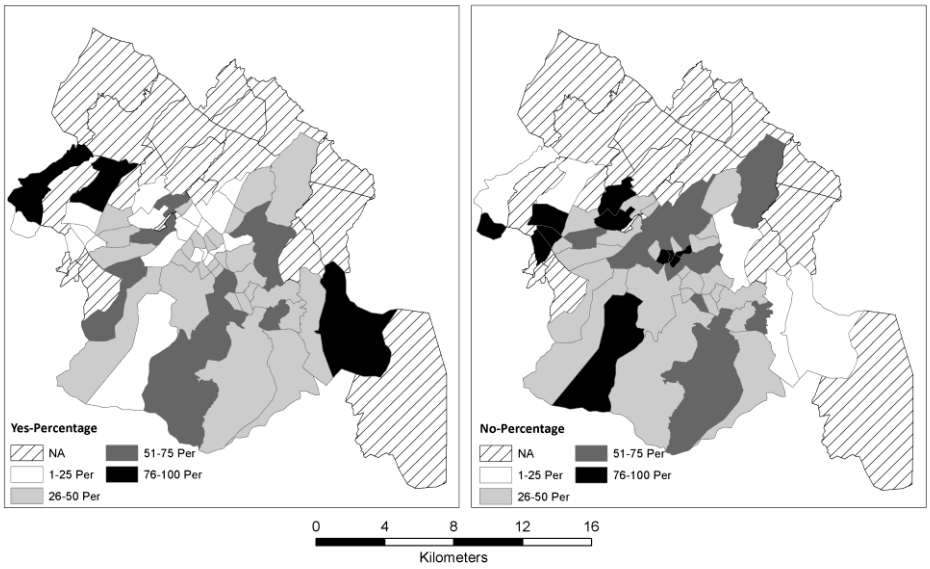
A lower percentage of availability of playgrounds in central neighborhoods is remarkable (Map 27a). Since there is no available spatial data for playgrounds, we are unable to gather substantial survey results for these particular neighborhoods. On the one hand, there have been a lot of improvements in terms of playgrounds over the last four-five years based on municipal publishing. The municipality has invested in every available area in neighborhoods to create playgrounds, such as vacant fields, school

gardens and mosques' yards. Atalar, Cakmak, Degirmenonu, Dokuzkavaklar, Feslegen, Goveclik, Hurriyet, Karsiyaka, Saraylar, Semikler and Zeytinkoy are the neighborhoods where there are many "no" responses given for available playgrounds. However, the number of positive answers is higher than that of negative ones for the majority of these neighborhoods, except three of them, Cakmak, Hurriyet and Karsiyaka. There was only one respondent from Cakmak and two from Hurriyet neighborhoods.

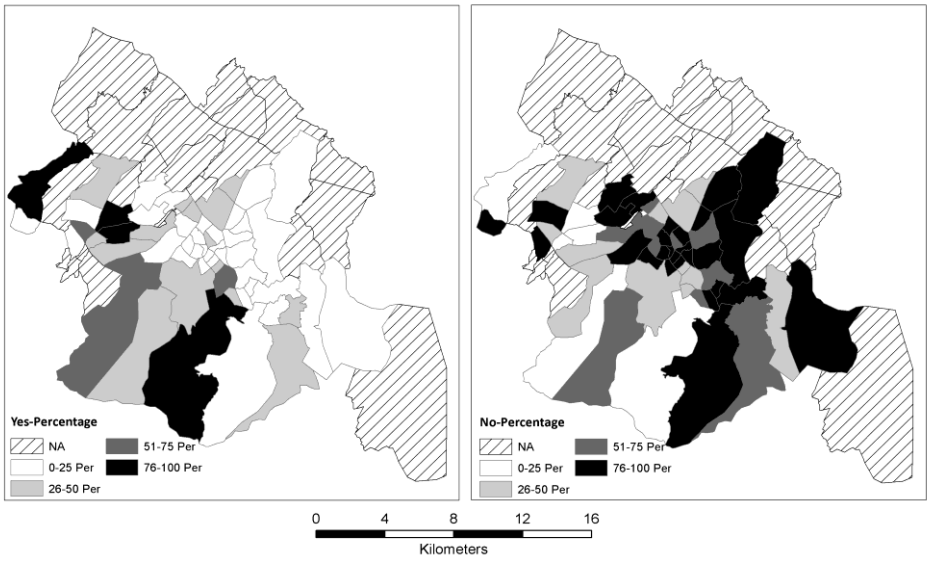
As highlighted, there are sports fields in 34 neighborhoods. Even though there are more respondents who stated that there are no sports fields in their neighborhoods (Map 27b) and they are concentrated in the central neighborhoods, there are actually many sports fields recorded in the area (Map 24). The perceptions of recreation and people's interests in leisure time may cause this result. In other words, if they do not use an available facility in the area, they may not be aware of its existence. The neighborhoods where there is no sports field are: Altintop, Asmalievler, Atalar, Cakmak, Gerzele, Goveclik, Gultepe, Hacikaplanlar, Hallaclar, Hurriyet, Pelitlibag, Saraylar, Sirakapilar and Topraklik (Map 10 and 24).

Trail paths are contemporary elements in Turkish recreational parks. These are increasingly common not only in Denizli but in almost all other cities in Turkey, especially in metropolitan areas. In study areas, the distribution of trail paths is most likely to be associated with the distribution of city recreational parks, since they are actually built in the park area. There are only a few places where single stand designated trail paths are available. The distribution of 30.8 percent of positive responses for available trail paths is shown in map 27c. It is obvious how they are separated from the city core, or from old neighborhoods.

Map 27b: Availability of sport fields per neighborhoods based on survey results



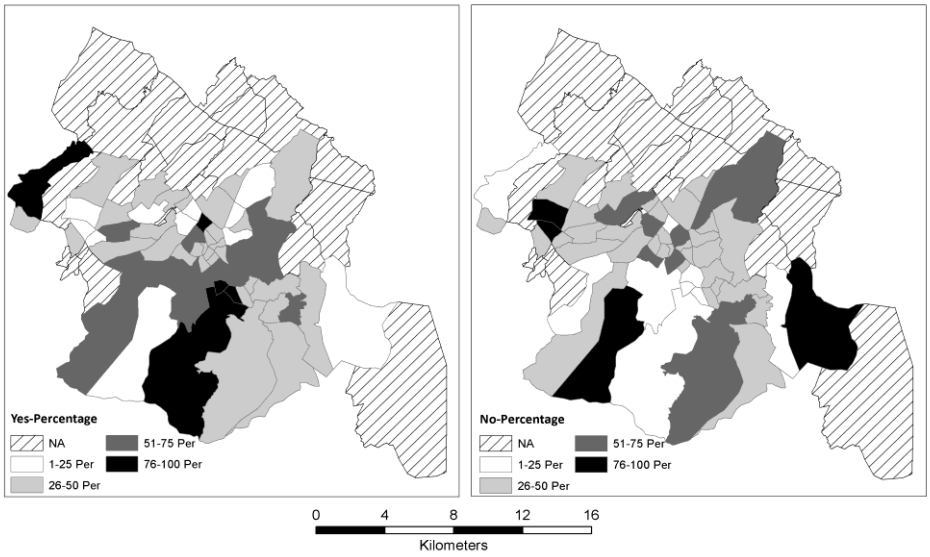
Map 27c: Availability of trail paths per neighborhoods based on survey results



Available family tea gardens and cafés are another subjective question and may be answered depending on the perceptions and interests of individuals. However, the distribution of "yes" responses shows a good match with the most popular area of the city, in terms of social gathering and spending leisure time in these types of places (Map 27d). In "yes" responses, black and dark gray neighborhoods are where university

campuses and dorms are located. Besides, the largest high schools, three of the shopping centers, two largest recreational parks and many small parks are located in these parts of the city. At the same time, these are also where new settlement areas are located and transition zones have developed. In contrast, the distribution of "no" responses is concentrated in the city core, old neighborhood, industrial and commercial areas. The highly mixed use of these places and the lack of space may be the main reasons for this distribution. The social environment and structures of these neighborhoods may be considered as another reason.

Map 27d: Availability of tea/café gardens per neighborhoods based on survey results

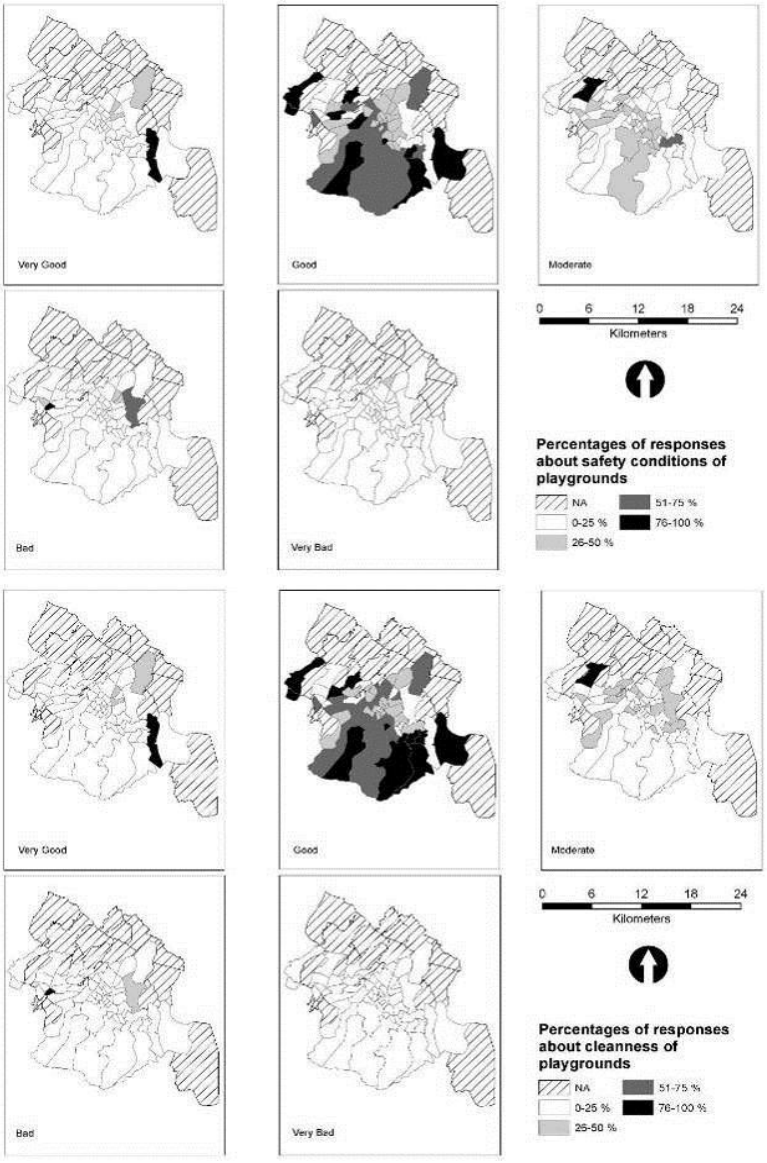


Each availability question has several follow up questions. Those are the cleanliness and safety of playgrounds; comfort and safety for trail paths; the easiness of usage, quality of facilities and safety for sports fields; the cleanliness, environmental quality and quality of the social environment of the family tea gardens and café. All of those responses are mapped to be able to see the differences between old and new neighborhoods based on their parameters.

The responses to the survey show 52.5% “good” for cleanliness and 49.9% “good” for safety. In cleanliness results, even though there is remarkable concentration on the map of “good” responses (Map 28), there are different levels of satisfaction between the residents of the old and new neighborhoods. As more than 50 percent of responses show new neighborhoods, 26-50 percent ranges more frequently in the city core and old neighborhoods. Also, there are more “moderate” responses in old neighborhoods.

Safety is especially crucial in places where visited by many women and children, such as playgrounds. Again, in general, people do not show much concern for the safety of playgrounds, except several neighborhoods, which are shown on “bad” responses distribution, like Aktepe, Deliktas, Anafartalar, Bereketler and 1200 Evler. It is important to notice that these areas are located in the same region of the city as two different groups (Map 28). Some common features of the group in the east are old shanty areas, low income groups, partly an urban renewal region. The one on the west side are new neighborhoods, former villages and partly low income areas. However, both places are away from the city center and have a lot of open spaces, forestry and brushy areas, which are generally considered as unsafe places. These neighborhoods need closer attention and higher safety priorities on the part of responsible administrative departments.

Map 28: Safety and cleanliness of playgrounds based on survey results



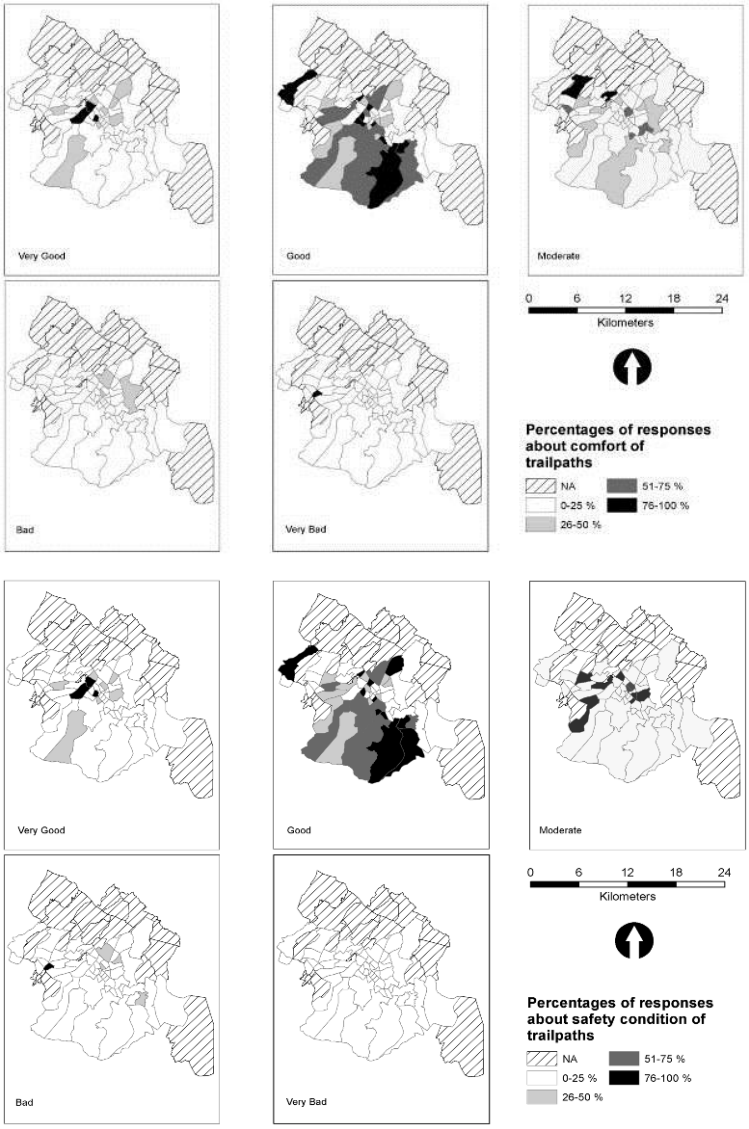
According to responses to follow up questions for available trail paths in neighborhoods, these facilities are in good condition in terms of comfort and safety. The purpose of the comfort question was aimed to get actual feedback from people whether they feel safe using this area for sportive walks, run or workout on outdoor gym sets, which are generally located at the end of trail paths. In fact, these facilities are some of the living proofs of social changes in the country. People from all age groups and

different socio-economic classes use these places very frequently, even housewives and elderly women. There may be a discussion with a sociological perspective about whether social changes make local governments invest in these sorts of facilities, or if the availability of these facilities are causing social changes.

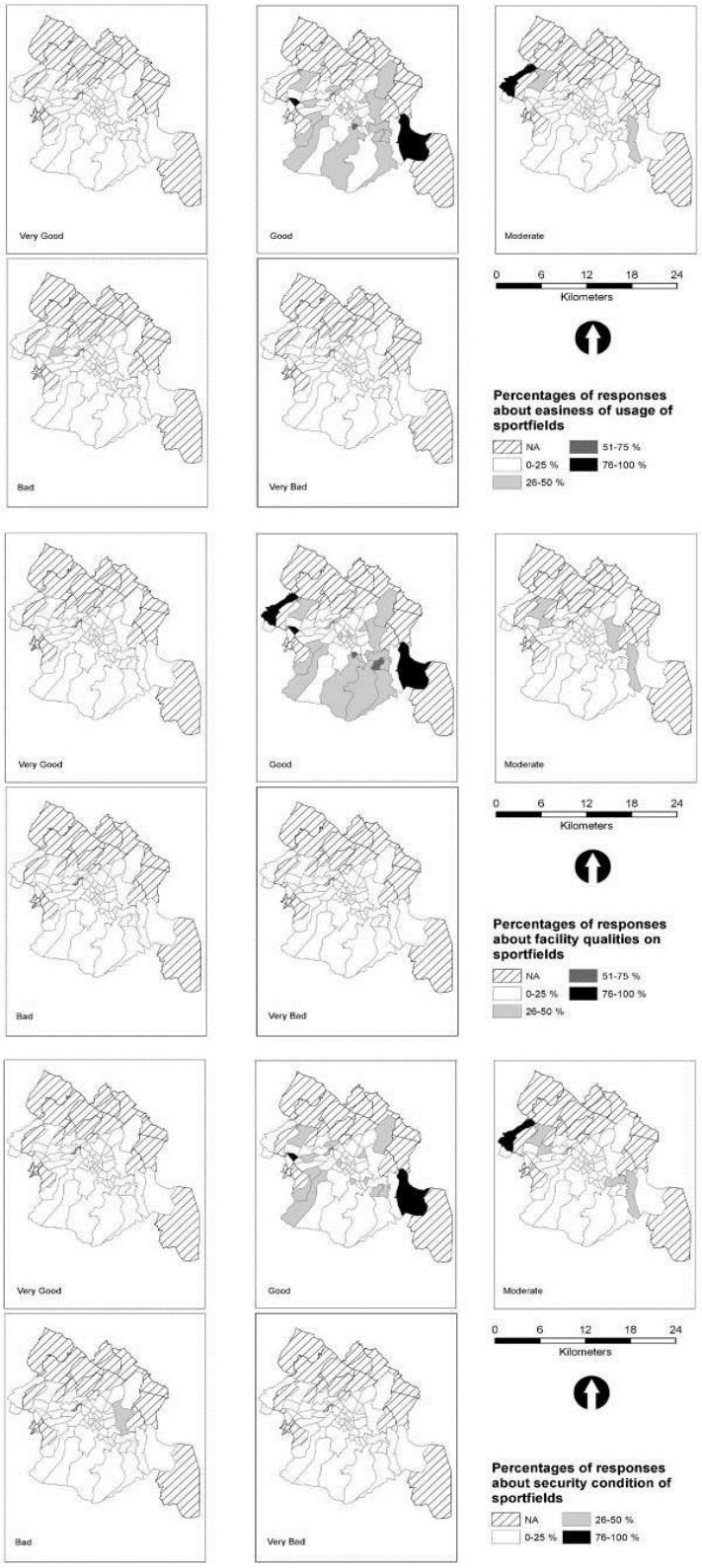
There is a high concentration of "good" rates of general safety results as well. Dark neighborhoods show "very good" rates, and the map shows the area around the latest and largest recreational park of the city called Adalet Park (Map 29). Also, on the "good" rate map, the darkest neighborhoods highly correlate with Sumer, Incilipinar and Camlik recreational places. Surveillance systems and security personnel in the area seem to be working very well in terms of avoiding criminal incidents in these areas.

Also, 43 percent of respondents confirmed that they have sports fields in their neighborhoods. It has already been mentioned that there are 34 neighborhoods, which include at least one sports field in the study area (Table 16). This question has a relatively small number of "yes" answers (388 responses), the maps show almost no concentration on any options except the "good" one (Map 30). The quality of facilities and the ease of usage of these places have been rated as "good" and these responses are concentrated on almost the same neighborhoods in the south. This area is where the university campuses and dorms are located. In the same area, we have lower rates for safety and it is also low as compared to the safety of playgrounds and trail paths, even though they are spatially associated with each other.

Map 29: Comfort and safety of trail paths based on survey results



Map 30: Ease of usage, facility qualities and safety of sport fields based on survey results



There are family tea gardens and cafés available in the neighborhoods of 54 percent of the respondents. The majority of the follow up questions were rated as "good" again. Questions about the quality of the social environment (personal relationships between people and behaviors) aim to find out how comfortable people feel when going to these places in their neighborhood and reveal the differences between the neighborhoods, if there are any. Questions about environmental quality were focused on landscaping, planting and noise; and these details were explained to respondents while asking.

Map 31 shows the spatial distribution of responses to follow up questions about available tea gardens and cafes. "Good" rating for the quality of the social environment is more than 50% in most of the neighborhoods. High "moderate" responses are remarkable in northwestern neighborhoods. This is a new developing area and has received a lot of public investments, including hospital, schools, parks, and some other governmental service buildings, as well as attracting a lot people as new residents. That may be a reason for this result.

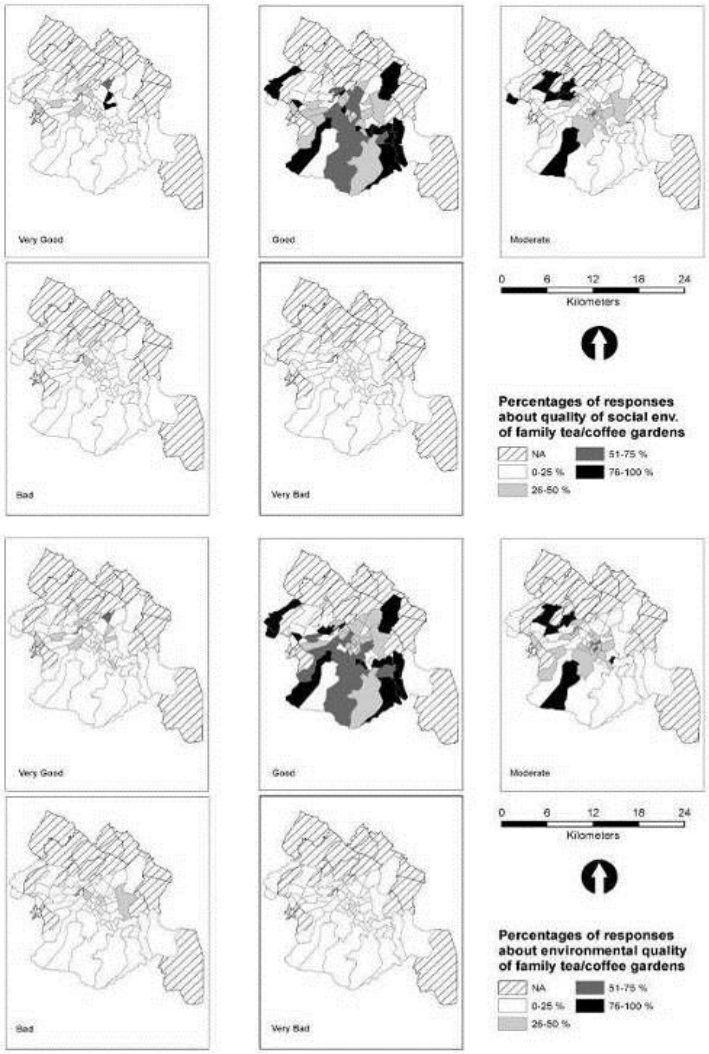
Another interesting result is "very good" rates for the quality of the social environment. The darkest neighborhoods are Sevindik, Dokuzkavaklar and Deliktas where there are old shanty areas and mostly low income groups. These neighborhoods are barely visited by other residents of the city who live in another part. So, the results show that the residents of the neighborhoods are happy with their own social environment as long as it remains local.

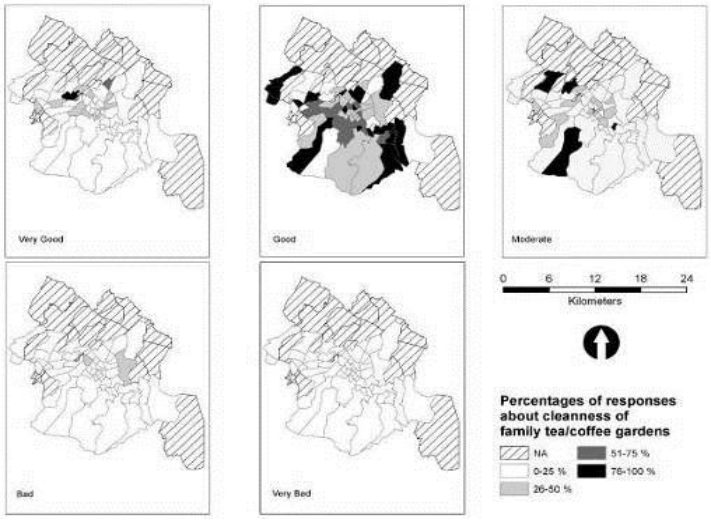
When we look at environmental quality, there are almost similar distribution patterns as shown on map 31. However, the respondents who live in the city core have

rated environmental quality lower than the quality of the social environment. Regarding more traffic, less plantation and poor landscaping in the central city, this result is not surprising.

Cleanliness is a very subjective concept but this question still tries to gather some public opinion about how clean those tea gardens and cafes are. Results show that people agree on the general cleanliness of the city. There are almost no "bad" and "very bad" rates of places.

Map 31: Quality of social environment, environmental quality and cleanliness of family tea gardens and cafes based on survey results





7.4.4 Environmental Quality

Public opinion was investigated by using indicators about the cleanliness of neighborhoods, frequency of garbage collection, recycling systems and services, flooding, rain water management and sewer systems, general safety and the most frequent incidents per neighborhoods.

As the "most environmentalist municipality," cleaning and garbage collection services are very good in the city. The current municipality removed open trash containers from the neighborhoods during 2007 and 2008. Instead, they increased the number of vehicles for garbage collecting and redesigned the frequency of collection based on the density of neighborhoods. Residents were informed about the collection days and time and asked to place their trash in the designated areas in their neighborhood. This practice helped to avoid a nasty scene around old trash containers and bad smells. Thus, the survey results concerning the cleanliness of neighborhoods

and frequency of garbage collection turned out to be "good" from the majority of respondents (Appendix 2)[13].

As mentioned in part 7.3.4, responses concerning recycling systems and services do not really correspond to the number of available recycling services. Only nine neighborhoods have recycling containers, namely Kuspinar, Camlaralti, Mehmetcik, Gumuscay, Servergazi, Yunusemre, Yenisehir, Istiklal and Incilipinar. The frequency of collecting recycled materials varies. Also, the classification of recycling containers is weak, since there are no plastic recycling containers defined; glass containers are mostly located in different institutions; paper recycling containers are located in only a few neighborhoods. Even though municipal records show this information, the majority of responses concerning recycling are rated as "good" in more than 40 neighborhoods (Appendix 3).

Flooding is the second most frequent natural hazard in Denizli, after earthquakes and has caused more financial damage since the 1976 earthquake. Flat topography, a location by a mountain range and having many creeks and rivers are major reasons for flooding in the area. Besides these, inefficient rain water management infrastructure also causes rapid flooding during heavy rainfall. There have been intensive infrastructure renewals in the city since roughly 2005 to improve the quality of drinking water and provide a better drainage system for the city. As survey results show (Appendix 4) that "no" responses for flooding are more than 50% in 50 neighborhoods. In 13 neighborhoods, there are 25-50 percent of respondents that state that flooding occurs in their area. Their experience of flooding may be different than that of other

[13] After survey conducted in summer 2011, municipality changes the regulation again and now each residential have a plastic container in front of the building.

residents of the same neighborhood depending on their actual location. However, when we look at the map (Appendix 4), those neighborhoods are either by the mountainous area, major creeks or on lower altitude as compared to the rest of the city. In addition, the majority of responses from these neighborhoods were “moderate” in terms of rain water management and sewer systems.

Public safety is another variable in environmental quality indicators. Responses for public safety are “good” in general but this requires a closer look at some certain neighborhoods. Aktepe, Altintop, Dokuzkavaklar and Ilbade are the only neighborhoods that have 26-50 percent of “bad responses” for public safety (Map 32). Anafartalar has the highest bad rate for public safety with 50-75%. All these neighborhoods are old shanty areas, except Altintop. Also, four of those are located in the part of the city that is separated from the city core by some industrial complexes and commercial areas (Map 32). They are also located on intercity highways. The majority of the low income population may be taken into account as common features of these four neighborhoods. Altintop is actually in the middle of the city where part of the main street and the city square are located. According to the survey, there have been 3 traffic accidents, 3 house robberies and 3 fights recorded. However, the official crime data is needed for an appropriate interpretation for this particular neighborhood.

Table 18 shows old and new neighborhoods where survey responses include 26-50 percent rated as “good” for public safety. However, this result may also reveal that at least half of the respondents do not think that public safety is “good” in their area. So, basically, these neighborhoods might need closer attention by using detailed data to improve public safety conditions.

Map 32: Public safety based on survey results

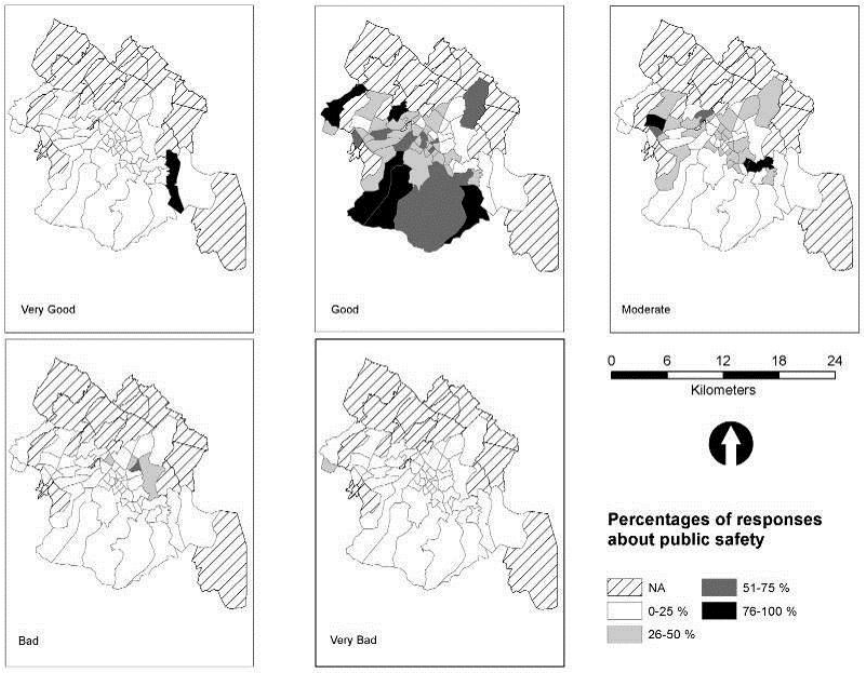


Table 18: Old and new neighborhoods which need improvements on public safety

NEW Neighborhoods which need improvements on public safety		OLD Neighborhoods which need improvements on public safety	
1200 Evler	Gumuscay	Akkonak	Karaman
15 Mayis	Karahasanli	Altintop	Kuspinar
Asmalievler	M.A. Ersoy	Atalar	Mehmetcik
Bereketler	Selcukbey	Bahcelievler	Muratdede
Goveclik	Yenimahalle	Cumhuriyet	Pelitlibag
Gultepe	Yenisehir	Incilipinar	Saraylar
	Zumrut	Istiklal	Sevindik
			Sumer

The most frequent criminal incidents are house robbery (359), fights (345), traffic accidents (264) and car robbery (144) according to survey results (Map 33). The neighborhoods with more than 50 percent responses for both house robberies and fighting are identical; these are Aktepe, Anafartalar, Fatih, Ilbade, Karsiyaka, Sevindik and Tekke. Additional neighborhoods on the house robbery map, which have more than

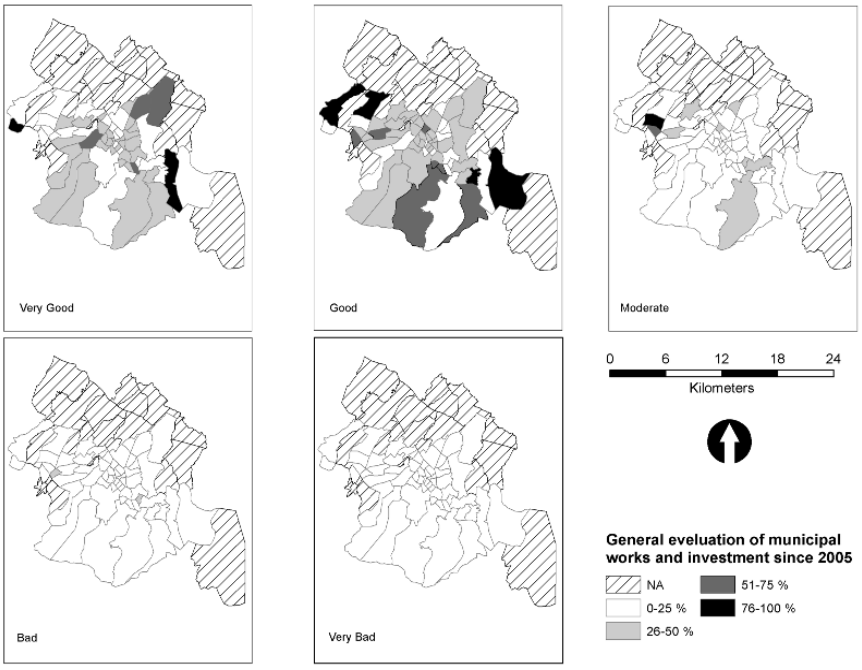
50 percent responses, are M. Akif Ersoy, Merkezefendi, Sumer and Topraklik. Several of those neighborhoods are also marked on the map of distribution for other criminal incidents (Appendix 5).

Map 33: Most frequent criminal incidents based on survey results

7.4.5 Overall Evaluation

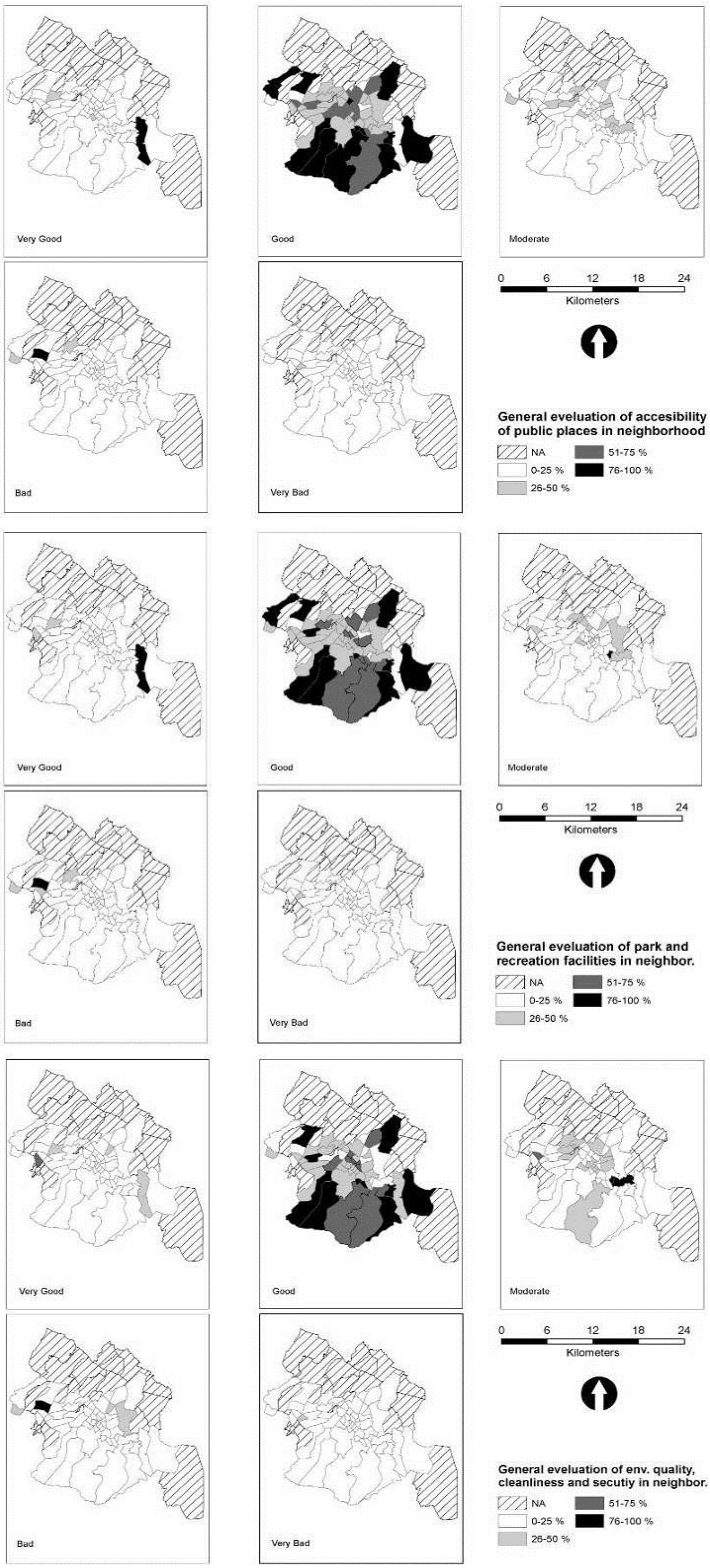
In last part of the survey, people were asked their opinions about the overall conditions of both the city and their neighborhoods based on study indicators. Additionally, they were asked to evaluate municipal works since 2005 (Map 34). As a reminder, graph 10 and 11 show the total rates of each indicator for overall evaluation.

Map 34: Percentages of responses for evaluation of municipal works since 2005 based on neighborhoods



Map 35 shows the distribution of general thoughts for neighborhoods based on study indicators. All indicators were rated as "good" by the majority of respondents. In other words, the residents of the city are satisfied with the provided services and overall conditions. Neighborhoods in northwest, south, southwest and northeast have the highest rates for each indicator. However, there are remarkable numbers of neighborhoods which have 26-50 percent of "good" rates on each map. The majority of satisfied neighborhoods are new, while the lower rated neighborhoods vary in age. Also, neighborhoods with "moderate" rates must be specifically investigated in order to find out reasons for inefficient services and needs for improvements. For instance, what is wrong with environmental quality and cleanliness of Kayihan? Why do people think

Map 35: Distribution of general thoughts about neighborhoods based on survey results



that accessibility is not that good in Hurriyet, Cumhuriyet, Hacikaplanlar and Deliktas? What can be done for Aktepe and Anafartalar to improve park and recreation services? The overall condition of the city is “good” as well (Appendix 6). There is no specific neighborhood with higher “bad” or “very bad” rates. The neighborhoods with lower values are needed to be specifically investigated for improvements.

The last rating question of the survey was about municipal works and investments since 2005. Survey results show that municipal services and investments were rated as “very good” by 34.6% of respondents and as “good” by 39% of respondents. There are 17.5 percent for “moderate,” 4.8 percent for “bad” and 4.1 for “very bad”.

8. RESULTS

As a quick summary of the analytical chapters of the study: The urban growth and development of Turkish cities were investigated in chapter 5. The country's close history, general social and economic conditions during the last century, their impacts on the urbanization period and the transition processes were explained. The latest issues in Turkish urban geography studies and common features of urban patterns were discussed. Common problems were shown through discussion of different cities of Turkey. Chapter 6 focused on the spatial organization of residential urban patterns in the study area. Factors that have impacts on urbanization and growth directions were discussed and neighborhoods of the study area were introduced. General land use change was shown, as well as the growth of the built environment in the city. As the purpose of the study is to investigate differences between old and new neighborhoods, they were defined by their specific features. The growth of the residential area was discussed in the context of its speed, location and direction. The spatio-temporal distribution of public services and recreational places was introduced. Also, effects of rapid urbanization on urban patterns were discussed by using temporal views of different parts of the study area. In the last chapter, survey results and their spatial representations were included. The concept and importance of livability as a research topic were shortly discussed. Study indicators for livability measurement were defined and introduced. Information about basic survey design and process was given. Each section of the survey was discussed separately in two different parts of this chapter in the form of analyses of survey results and their spatial representations. In the last

section of the final chapter, survey results were comparatively discussed by using spatial distributions of services based on old and new neighborhoods.

Common features of Turkish urban areas were reviewed, like city castles and surrounding neighborhoods, historical centers and landmarks in urban areas, urban growth pressure on these historical places, forms of city squares and the main streets, effects of topography, forms of intercity highways and surrounding areas, problems of mixed land use areas, new settlements areas and spatial concepts and creating green space in urban areas. Some of these issues were included to introduce general characteristics, such as topography and forms of the main street; while some of the others were included and mentioned individually in order to attract more attention of decision makers and governmental departments, such as growth management around historical centers, mixed land use of the industry and residential, new settlement sites and lack of green spaces. As mentioned in literature (Meshur, et al., Genc, 2008; 2008, Ozden 2000; Yigitcanlar, 2001), current urban problems of Turkish cities include: loss of historical places, as well as traditional and cultural flavor of cities; a lack of green spaces and an unpleasant built environment with a lot of buildings with gray landscape; economic, social and spatial inequality and segregation because of the distinctions between the new and old settlement areas.

Locational and structural changes of residential areas are other common features of developing cities in the country. Topography is one of the main drivers of urban growth. Besides this, land cost, municipal policies and new job opportunities (new commercial and industrial zones) also attract people and construction companies to build new settlements on the city edge. In general, new areas are less dense than city

cores. Larger buildings occupy most of the area compared to the central city, except single family house sites. Residential buildings are distributed irregularly in the city core, while there is more regular design in new places; however, even in new areas, the design and distribution of new residential areas are not satisfactory. This may be one of the results of rapid urbanization. The distribution of schools, as a public service, looks even and equal based on time and place. Health care centers are concentrated in a particular part of the city, as it is in Denizli and Kayseri. New areas have more open and green spaces and nicer landscapes but less sense of community and place.

This study does not focus on how things change in urban areas; it is concentrated on how those changes affect livability conditions of the entire area. In other words, all those urban features, their locational and structural changes are impacting the livability of those urban areas. After two informative and review chapters, results of rapid urbanization were investigated in the livability concept based on defined indicators.

According to survey results and analyses of their spatial distribution based on neighborhoods, people overall rated the livability of their city and neighborhoods as "good" based on accessibility, open/green spaces and environmental quality. However, results also show that some neighborhoods need to have more attention directed at some certain topics, such as the frequency of specific criminal incidents, lack of health care centers and lack of recreational parks. So, the study helps to provide spatial information and public opinion to use for future investment and future allocation of resources. Each survey response was analyzed descriptively as well as represented spatially. This provides an opportunity to see residents' perceptions of actual locations of services, as

well as satisfaction regarding the facilities. In other words, comparisons between public opinion and spatial distribution of public services show the efficiency level of the services provided to residents.

Study indicators were defined by daily activities of the residents and generalized with three topics, i.e. accessibility, green spaces and environmental quality. A combination of those basic elements and their specific features help to see the big picture of the city by correlating the results and their spatial distribution. According to the results of this study, there is the possibility for further research for each indicator in more detail.

Some of the findings and interpretations from the surveys are as follows:

The public transportation routes provided look perfect based on routes. If there was an available service schedule of operations on a daily basis, it could give better information and include the livability analysis part per neighborhood. Traffic congestion and parking problems are most likely to occur in the city core. So, that means that old neighborhoods are affected by these condition more than new ones.

Some neighborhoods are segregated from the others by building types. Plus, available facilities and other indicators also show social and spatial inequalities between these areas. This also may be a possible further study by using details of particular neighborhoods.

People, who live in new neighborhoods on city edges walk longer distances to schools (Map 20). Since most of hospitals are concentrated in the city center, people who live in new neighborhoods on city edges have longer driving distances to health

care centers (Map 22). The distribution of recreational services is good and only a few of the new neighborhood's residents travel a longer walking distance than others on average (Map 24). Residents of old neighborhoods, which are located in the central city, drive longer distances to city parks and shopping malls (not to the old bazaar), since all of them are established in neighborhoods on city edges.

In Sevindik, Aktepe, Anafartalar, Dokuzkavaklar and 1200 Evler neighborhoods, the safety of playgrounds needs to be improved. In Sumer and Zumrut (Bagbasi) neighborhoods, the safety of trail paths needs improvement. The use of trail paths is becoming more common. Survey results show that people, including housewives and the elderly, feel comfortable when using these facilities. This is a part of social trend reflecting a movement to provide and use trails. Then, this is another possible future study to investigate whether social changes accelerate spatial changes, or vice versa, in the study area.

The environmental quality of family tea gardens and cafes in new neighborhoods are better than the ones in old neighborhoods (Map 31). That may be a result of more people (crowd), traffic and a lack of green areas in the city center. The quality of the social environment of family tea gardens and cafes is generally good. There are some "moderate" rates when it comes to some new neighborhoods in the northwest corner and some old neighborhoods in the city center (Map 31). If there is a specific need to improve the quality of the social environment of these places, those are the target neighborhoods. There is obvious satisfaction with the cleanliness of neighborhoods. There are some moderate and bad rated neighborhoods. In the

neighborhoods where there is only 2-3-day garbage collecting (according to municipal reports), the municipality apparently needs to increase the frequency of collecting.

Apparently, recent infrastructure renewals help the city to avoid flooding. Only a few neighborhoods still have this problem because of their location, such as Anafartalar, Dokuzkavaklar and Cumhuriyet, which are located in lowest part of the city, Yenisehir and Servergazi situated by the mountain range. Therefore, these places need immediate protection projects to avoid flooding.

The distribution of crimes based on types and neighborhoods is concentrated on: Traffic accidents in Topraklik and Saraylar; fights, house and car robberies in Aktepe and Anafartalar. Some other neighborhoods, where the most frequent criminal incidents happen, are 15 Mayis, Sevindik, Dokuzkavaklar (Table 11 and 12). Commercial centers are located in Topraklik and Saraylar and day traffic is heavy in these areas. Thus, it is no surprise that there is the biggest number of traffic accidents in these neighborhoods. For the other types of crime, Aktepe and Anafartalar need more attention. Unfortunately, the social development and integration of old shanty areas into other parts of the city are slow processes. So, some of the negative elements still remain in these places.

Renewal areas still seem like shanty areas in terms of the social environment. The difference lies in the existence of more floor apartments instead of single family houses (mostly illegal). Physical changes of a place do not really help to improve the quality of the social environment all the time. People, who live in the Aktepe social housing area, still live in their neighborhood where they were born and grew up. They still have their daily life style, the same type of the use of space and regular habits. The

only difference is that they have adapted all those features to new multiple floor apartment sites. For instance, women still use the space in front of the main gate of the apartment for hanging out, kids still play on the roads instead of playgrounds, they plant flowers on the fire exit stairway, dry their clothes by hanging them out of their balconies, and even if they live on the third or fourth floor, they feel like they have to install window rails. All these show that social changes are more difficult than physical changes. Although the investments are made and services provided, encouraging people to use them appropriately usually takes more time than expected.

8.1 Livability Index Results

In this study, a neighborhood livability index was created by using all the variables of study indicators, spatial analysis results and survey responses. Each of those has defined weight values to contribute to the total livability condition. In fact, this provides a combination of both people's perceptions of functions and facilities and the location of facilities in the real area. At the same time, this combination helps to provide more accurate results, since people's perceptions are influenced by some other minor impacts that were not included in the study as indicators.

In the index, the existence of functions and facilities in the real area are presented by "1," if not by "0." For the functions that there was no data available, either assumptions were used (e.g. I assume that each neighborhood has at least one playground, so use "1" for this) or simply "0" entered due to the lack of data. Rating questions are represented by "1" for 76-100%, "0.75" for 51-75%, "0.50" for 26-50% and "0.25" for 1-25% based on the given answers. Mapping to standardize the data of responses for negative conditions, such as flooding, represented by the same scale but

with "-" negative value. The coverage of service areas of public services was also included based on the distances defined in the study. In the part devoted to the frequency of garbage collecting, a weekly schedule of collecting per neighborhood was included, besides survey results. So, "1" was used for the neighborhoods that have every day garbage collecting, "0.75" for 3 days a week, "0.50" for 2 days a week and "0.25" for once a week. Responses regarding recycling systems were not included in the index, since those were not match with the real spatial data. Only survey results were included for safety, because of the lack of data about criminal incidents.

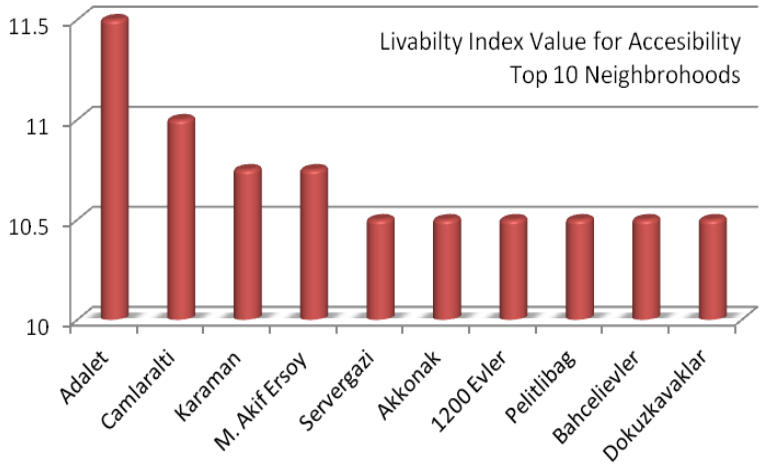
According to these definitions, livability index measurement was applied to every neighborhood by using each variable. There are two major steps to complete this. First, responses for all indicators and their variables are summed up per neighborhood. Then, the percentage of all variables is calculated by using the survey in that neighborhood. After that, another spread sheet is created and each variable's percentage values, availability information and rates are added to this new spreadsheet. Spatial analysis data are also included and rated. After all, the sum of the rated values per neighborhood is the livability index value for that area (Table 19).

Table 19: Measures of Livability Index Value (LIV)

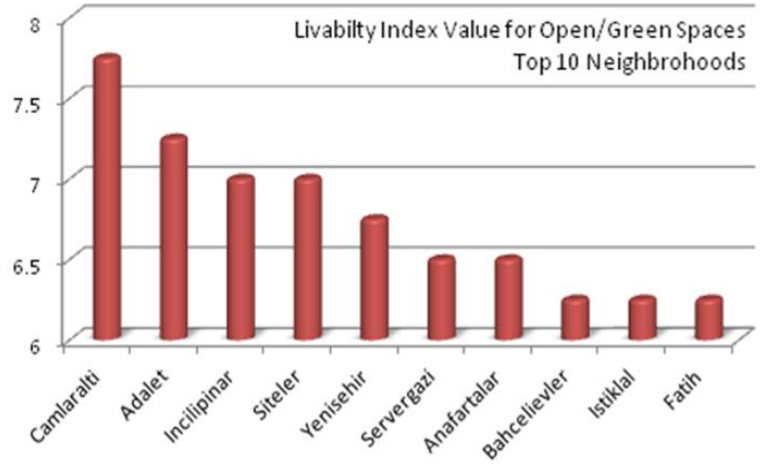
Neighborhoods	IndX - VarX Survey - %	IndX-VarX Rated	VarX-Availability (Spatial)	General Evaluation for Indicator X Survey - %	General Evaluation for Indicator X Rated	Livability Index Value (LIV)
List of Neighborhoods	76-100%	1.00	1 for available 0 for not available service and functions	76-100%	1.00	NxLIV = (IndX-VarX Rated) + (Availability value) + (General Evaluation for Indicator X Rated)
	51-75%	0.75		51-75%	0.75	
	26-50%	0.50		26-50%	0.50	
	1-25%	0.25		1-25%	0.25	
	0	0.00		0	0.00	

Graph 15, 16 and 17 show top-ten list of neighborhoods based on the livability index values for each indicator. Table 20 shows all neighborhoods and their livability index values per indicators. Map 36 shows distributions of neighborhoods based on LIV for accessibility. We do see any concentration neither in old nor in new neighborhoods. In map 37, it is clearly appear that central neighborhoods have lower values about availability of green spaces. Map 38 shows LIV for environmental quality; new neighborhoods on the city edge have more concentration. Even though there are several central neighborhoods shows good standing in terms of environmental quality, majority of those have lower index values.

Graph 15: Livability Index Value for accessibility, list of top-ten neighborhoods



Graph 16: Livability Index Value for open/green spaces, list of top-ten neighborhoods



Graph 17: Livability Index Value for environmental quality, list of top-ten neighborhoods

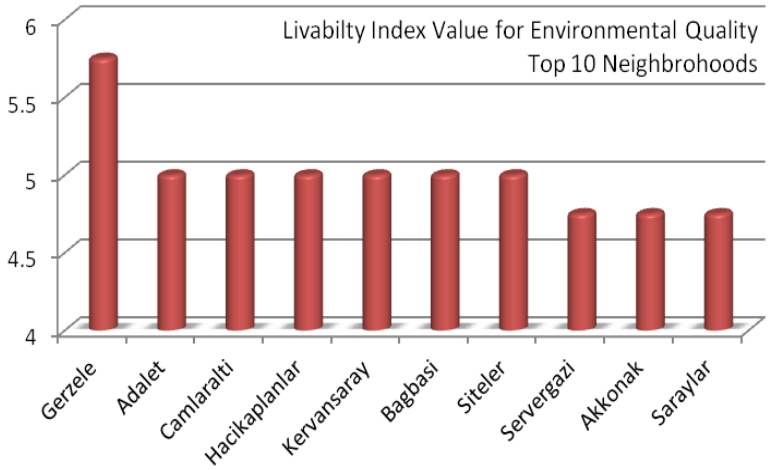
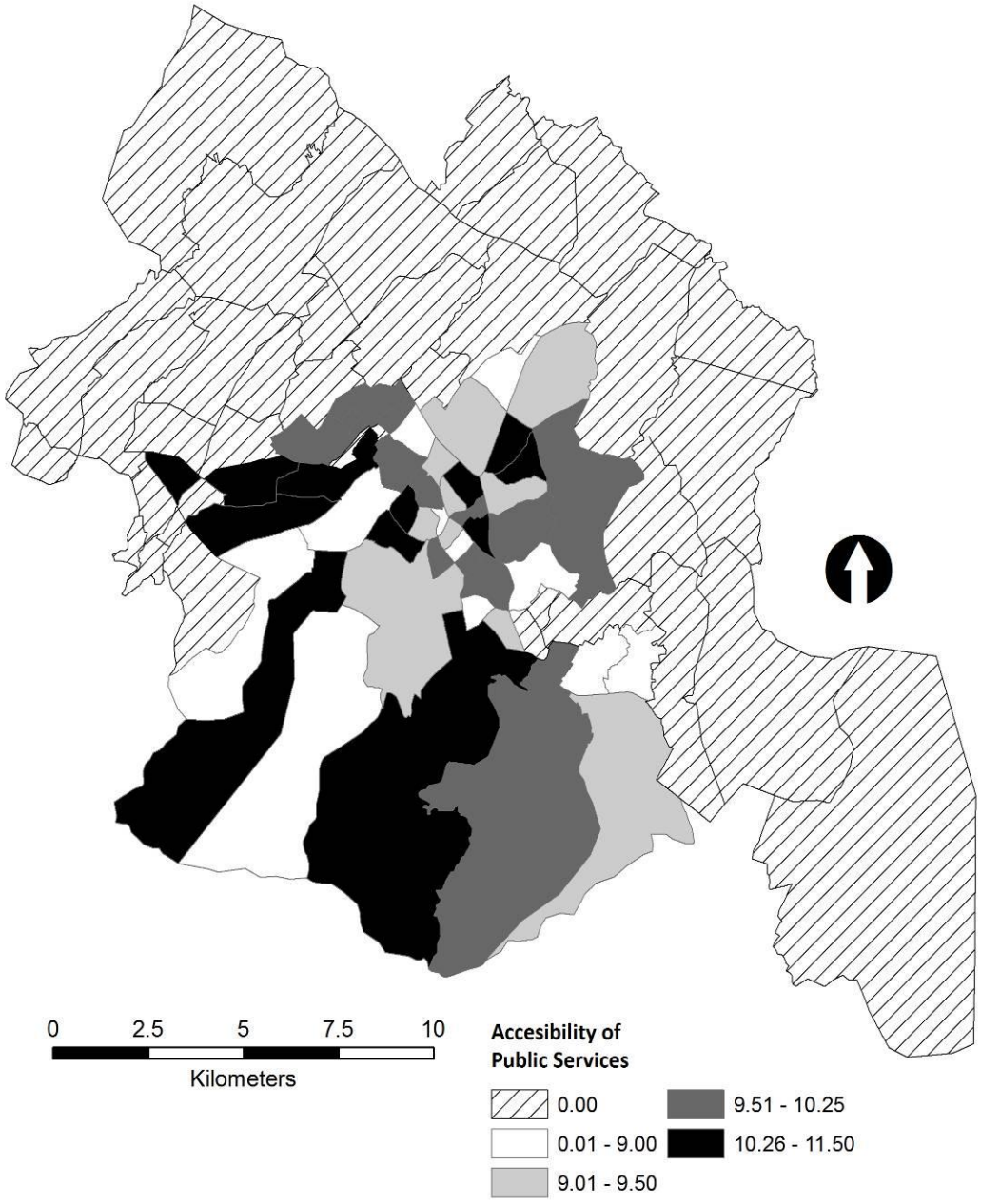


Table 20: Livability Index Values of Neighborhoods[14]

Neighborhood	Number of Survey	Normalized Values for Accessibility	Normalized Values for Green Spaces	Normalized Values for Environmental Quality	Mean of All Indicators
1200 Evler	7	9.1	6.8	7.4	7.8
15 Mayis	10	8.3	7.1	7.8	7.7
Adalet	7	10.0	9.4	8.7	9.4
Akkonak	26	9.1	7.1	8.3	8.2
Aktepe	25	8.5	7.4	6.5	7.5
Altintop	11	6.1	5.8	5.7	5.8
Anafartalar	12	9.1	8.4	5.7	7.7
Atalar	30	8.0	5.8	7.4	7.1
Bagbasi	12	7.4	7.1	8.7	7.7
Bahcelievler	20	9.1	8.1	7.0	8.1
Camlaralti	27	9.6	10.0	8.7	9.4
Cumhuriyet	23	7.2	8.1	6.5	7.3
Degirmenonu	36	8.3	7.1	7.8	7.7
Deliktas	12	8.0	6.1	5.2	6.5
Dokuzkavaklar	14	9.1	6.8	6.5	7.5
Fatih	23	8.5	8.1	5.7	7.4
Feslegen	26	7.8	7.4	7.8	7.7
Gerzele	6	7.4	5.8	10.0	7.7
Gultepe	6	8.5	4.8	7.0	6.8
Gumuscay	9	8.5	6.8	7.4	7.5
Hacikaplanlar	16	8.9	5.8	8.7	7.8
Ilbade	9	7.8	7.1	5.7	6.9
Incilipinar	65	8.9	9.0	6.1	8.0
Istiklal	52	8.7	8.1	6.5	7.8
Karaman	34	9.3	7.7	6.5	7.9
Karsiyaka	27	8.0	6.8	7.4	7.4
Kervansaray	12	8.0	6.5	8.7	7.7
Kuspinar	46	8.7	7.1	6.5	7.4
M. Akif Ersoy	30	9.3	6.8	5.2	7.1
Mehmetcik	75	8.3	7.7	5.7	7.2
Merkezefendi	16	7.2	6.8	7.0	7.0
Muratdede	12	8.5	6.5	5.7	6.9
Pelitlibag	22	9.1	5.8	7.4	7.4
Saraylar	10	8.3	6.1	8.3	7.6
Servergazi	14	9.1	8.4	8.3	8.6
Sevindik	15	6.5	5.8	3.9	5.4
Sirakapilar	50	8.9	6.5	6.5	7.3
Siteler	13	7.2	9.0	8.7	8.3
Sumer	8	8.3	7.1	6.1	7.1
Topraklik	28	9.1	6.1	5.2	6.8
Yeni mahalle	14	8.7	6.5	6.1	7.1
Yenisehir	40	7.8	8.7	5.2	7.3
Yunusemre	17	8.0	8.1	7.4	7.8
Zeytinkoy	10	8.5	5.2	6.1	6.6
Zumrut	7	7.8	6.1	7.0	7.0

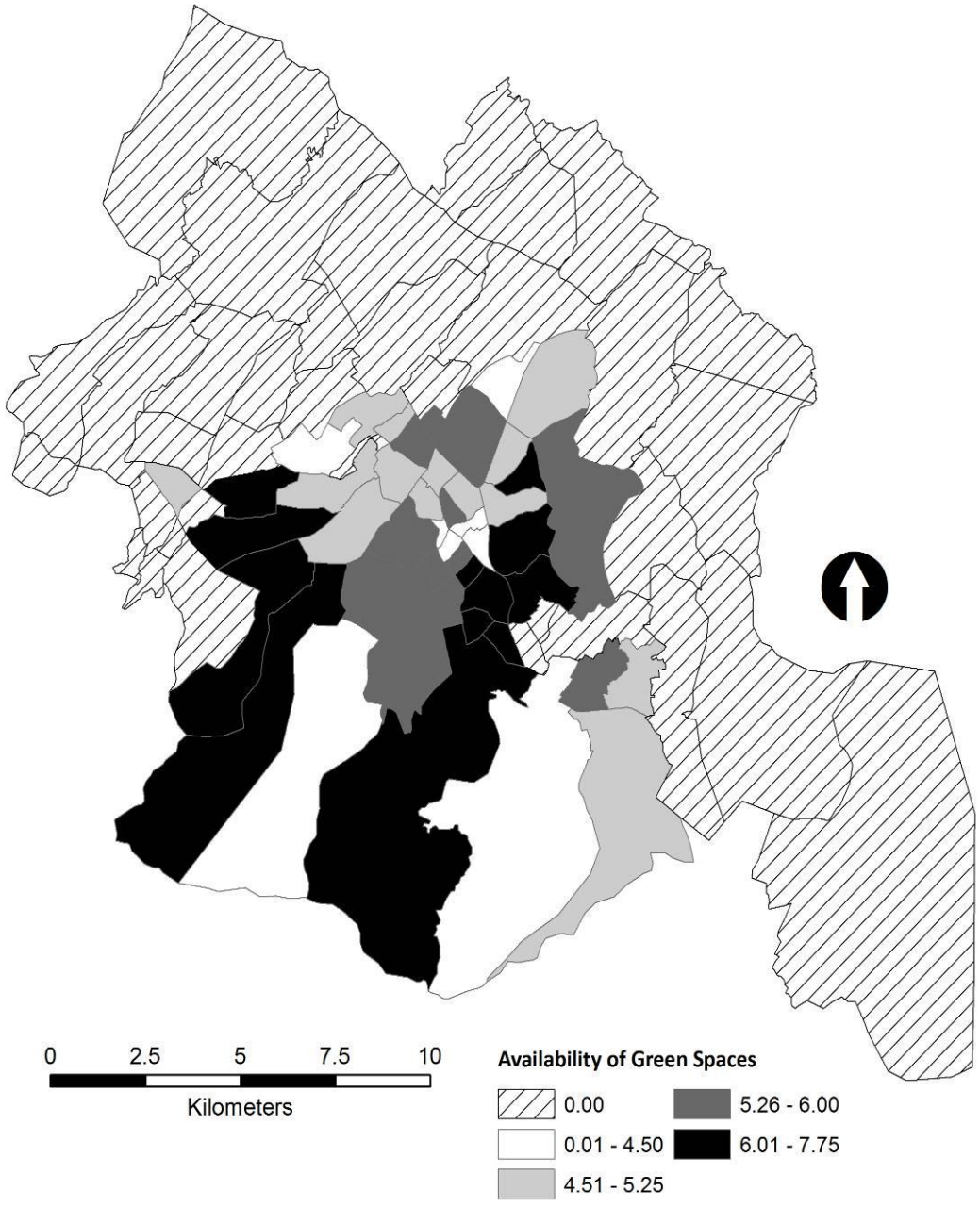
[14] Number of surveys are compatible with 2010 populations of neighborhoods, except Adalet (Map 14). Maximum value for each indicator is 10 and mean of indicators provides overall livability conditions of neighborhoods.

Map 36: Accessibility of public services based on livability index value[15]



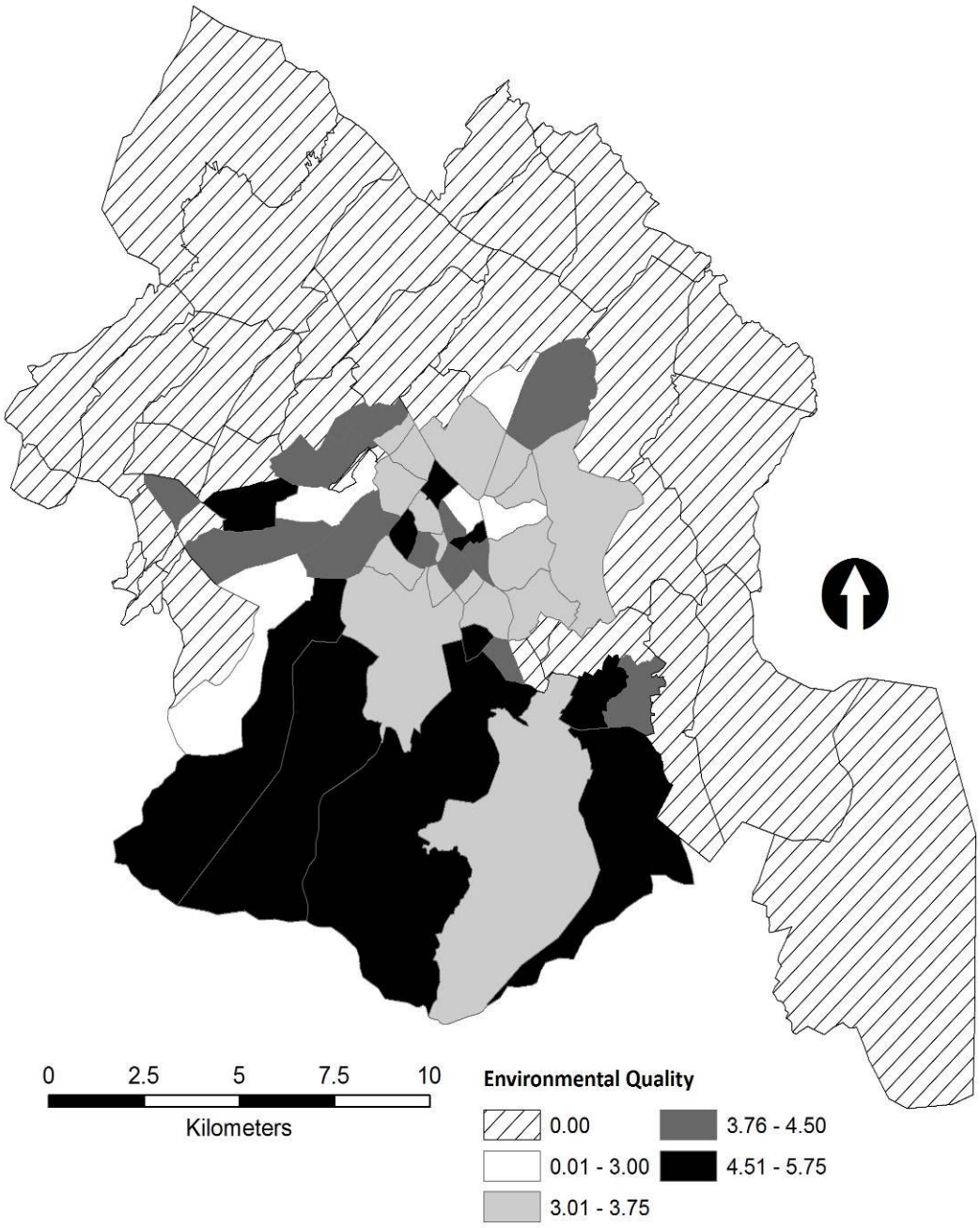
[15] The neighborhoods with dash represent the ones with either no responses or 5 and less responses.

Map 37: Availability of green spaces based on livability index value[16]



[16] The neighborhoods with dash represent the ones with either no responses or 5 and less responses.

Map 38: Environmental quality based on livability index value[17]



[17] The neighborhoods with dash represent the ones with either no responses or 5 and less responses.

9. CONCLUSION

This research has been done as an attempt to compare old and new neighborhoods' livability conditions in a sample study area by using specific indicators. Livability measurements and results are subjective and contextual, based on selected indicators, target groups, and special features of study areas. The study results could have been different if some other indicators were applied, such as the distribution of retail locations, health effects of air quality on the elderly or residents' perceptions of the sense of place in their neighborhoods. Therefore, there is no absolute result for the livability of such an urban place. It changes according to indicators and the purpose of livability research.

The livability index results of this study provide an opportunity to investigate differences between old and new neighborhoods based on the accessibility of public services, availability of open and green spaces and environmental quality. Services and urban functions related to daily activities of city residents were used to define appropriate indicators. Thus, the index values show the livability conditions of each neighborhood and provide a general idea about accessibility, the availability of basic services and their spatial distribution and people's perceptions.

The impacts of rapid urbanization were included as a fundamental reason for spatial changes. In other words, all spatial changes were considered the results of rapid urbanization. Therefore, general features of the transition period, municipal and governmental acts during this time and balance of supply and demand in terms of public services and facilities were important to mention. This information provides a better understanding of places.

There are several weaknesses of the study. The effect of private sector developers and their relationships with the municipality in addressing livability is not explored here. Governments work to provide the conditions for development and yet work to rein in the negative consequences that reduce livability. Investigations of practices of these regulations per neighborhood would provide another indicator for the index. I didn't explore the political or regulatory impacts on livability at this time, though. Future work must of course incorporate possible political changes, along with variations in how parties and voters see government roles

Use of "network analysis" would improve the quality of outputs for accessibility indicators. For example, measuring distance between each building to the closest public services based on some certain conditions and assumptions, such as average traffic condition or physical barriers if any, would help to avoid some issues that use of buffer may cause.

Another issue to confront was the lack of data in newer neighborhoods with so few respondents. It is clear that different survey methods will be necessary to ensure representative sample of the population. This is vital in order to address policy issue. Additionally, different methods, such as focus groups or even participant observation of neighborhoods and their perceptions of livability would address the politics of livability.

Perceptions and evaluations of facilities and services by different gender, age and economic groups could be investigated as influential statistical results by using basic statistical test, such as chi square and T-test. To do this, different theoretical approaches could use as conceptual framework, such as behavioral or feminist approaches.

Other physical features of the study area may be included in the index, such as topographical conditions of the neighborhoods, air quality, wind directions, closeness to a river or a mountain, etc. Effects of these sorts of elements may also have impacts on livability conditions. Therefore, these would be additional indicators for a future index.

In conclusion, the study tries to attract more attention to providing equal opportunities to the neighborhoods of a city based on accessibility, recreational opportunities and environmental quality.

9.1 Future Studies

A combination of three different approaches of urban geography will be improved for future studies (Figure 1).

Livability conditions of the city were investigated through survey and spatial evidence in this study. Another possible future study can be a visual analysis of livability perceptions of city residence investigated by videos and images on social media.

There is another possible comparative study about urbanization processes and livability conditions between American and Turkish cities.

The livability of urban renewal sites needs to be investigated. Besides this, effects of public housing sites (by the government) on specific parts of the cities in terms of livability may become another future research topic.

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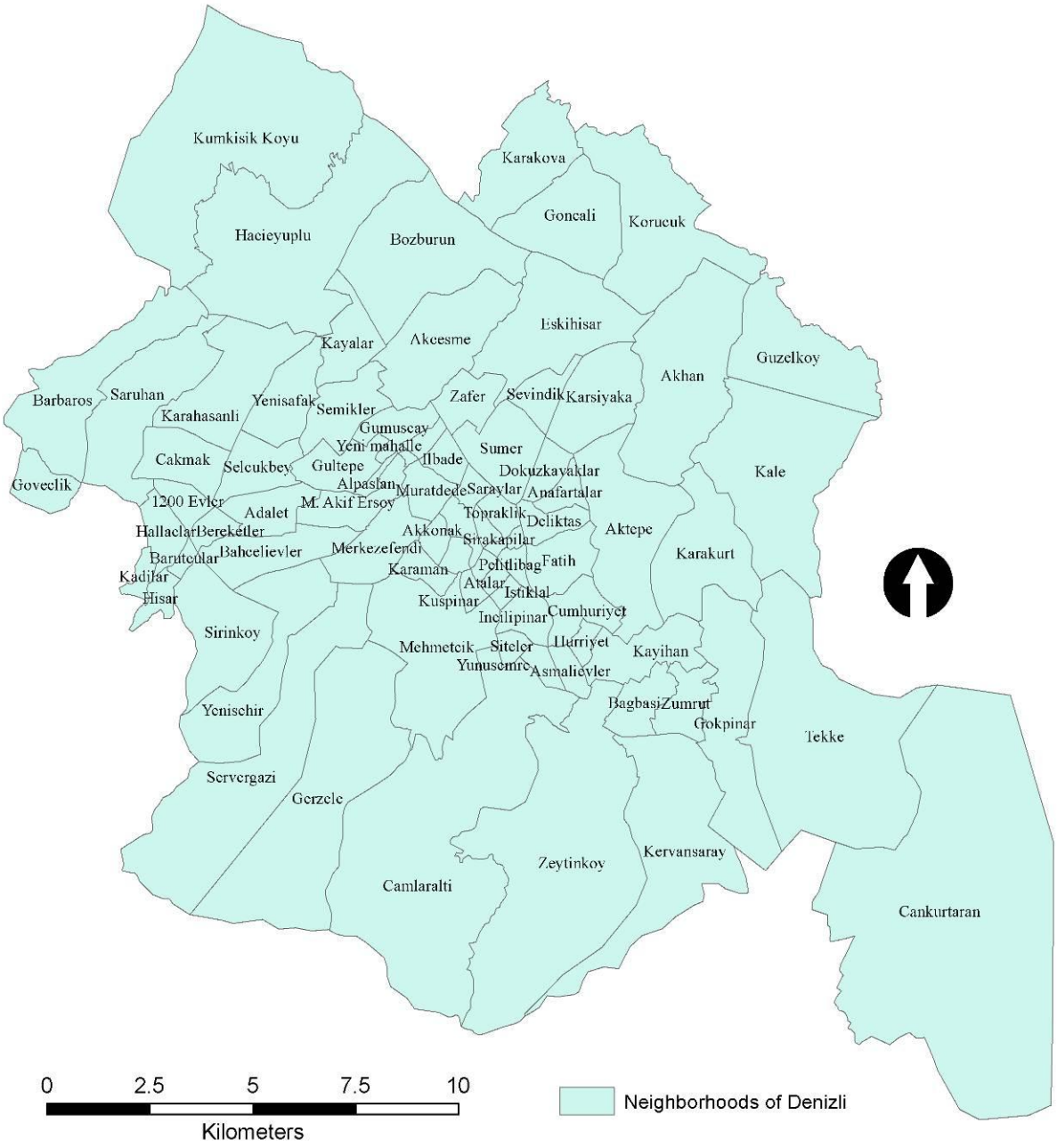
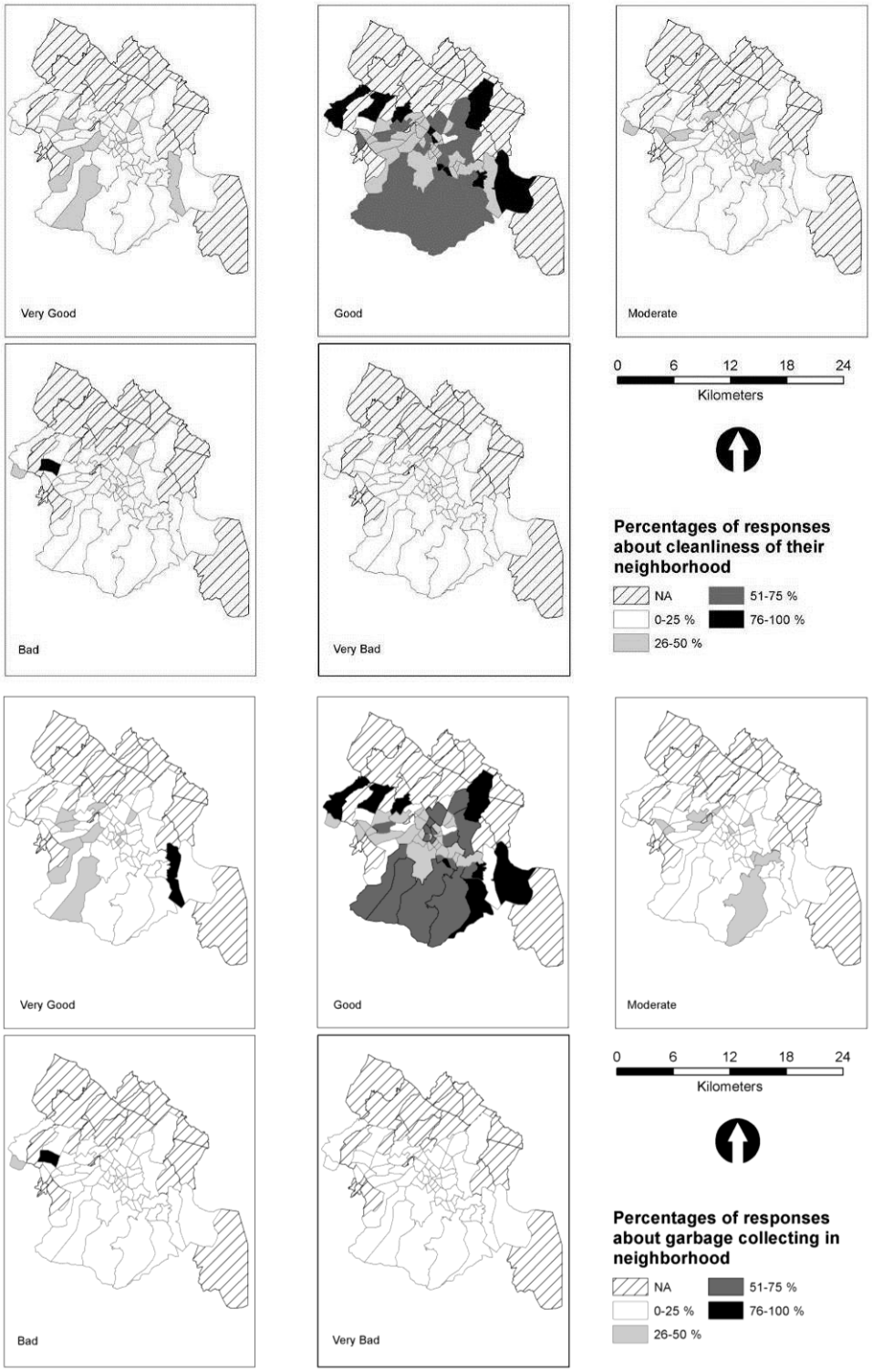
WEB 1, http://www.denizli.bel.tr/Default.aspx?k=haber-detay&id=12139

11. APPENDIXIES

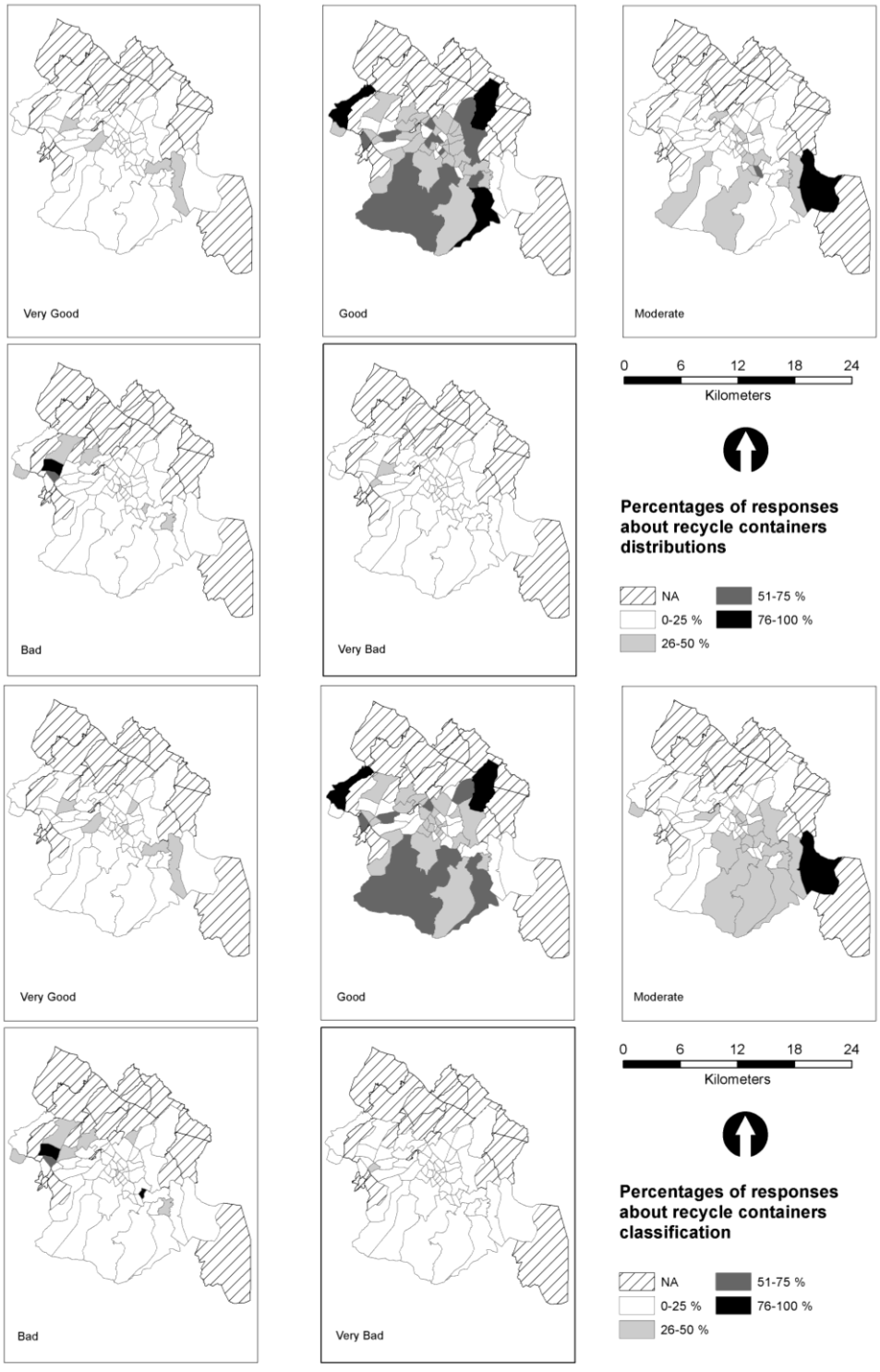
Appendix 1: Neighborhoods of Denizli

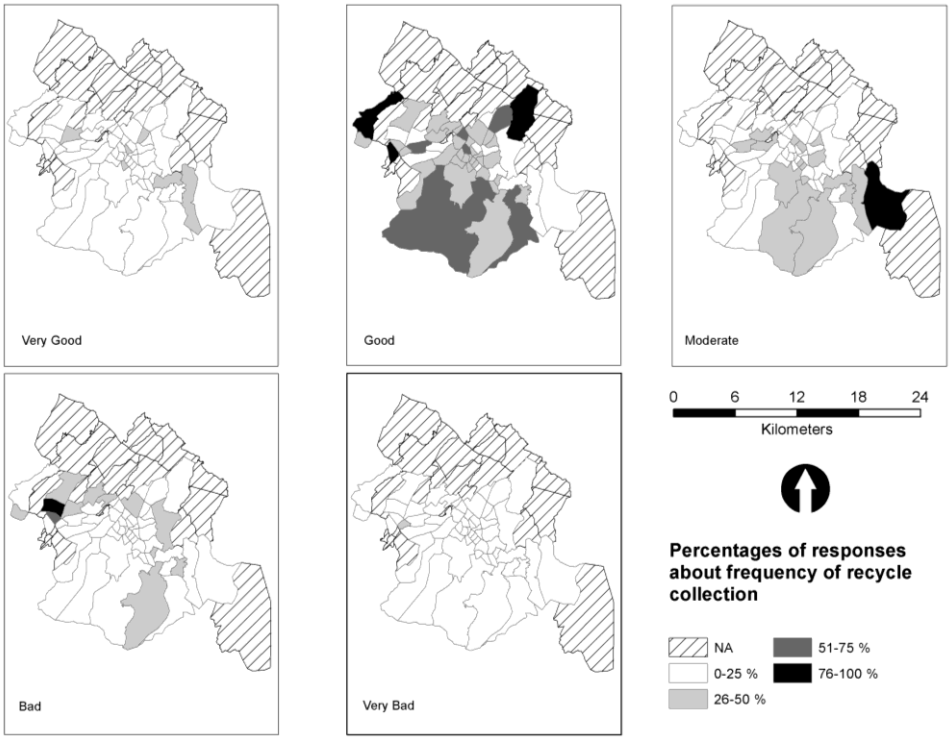


Appendix 2: Cleanliness of Neighborhoods based on survey results

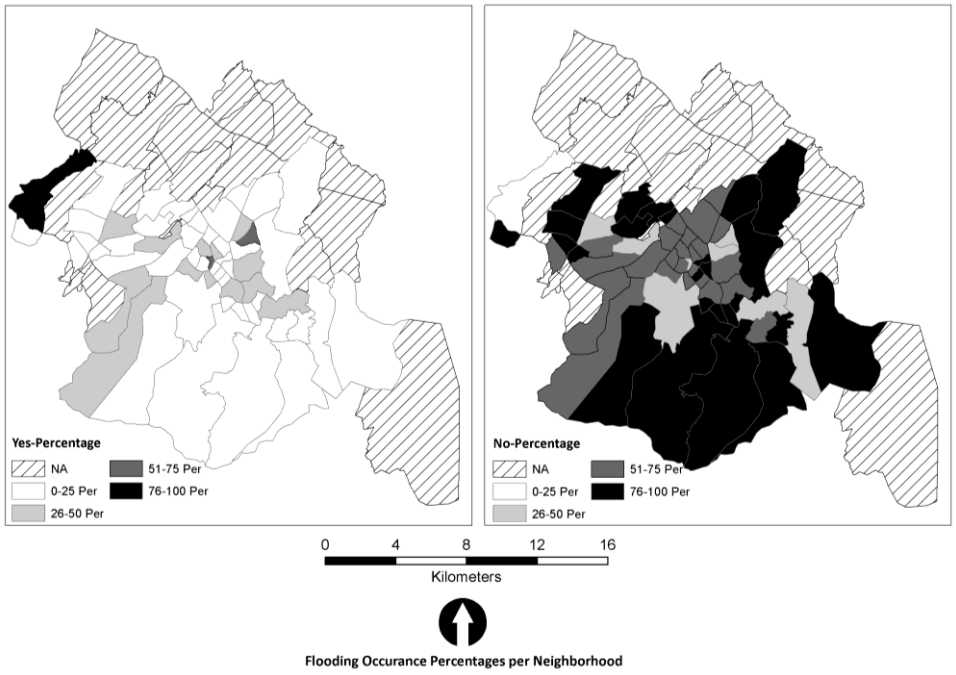


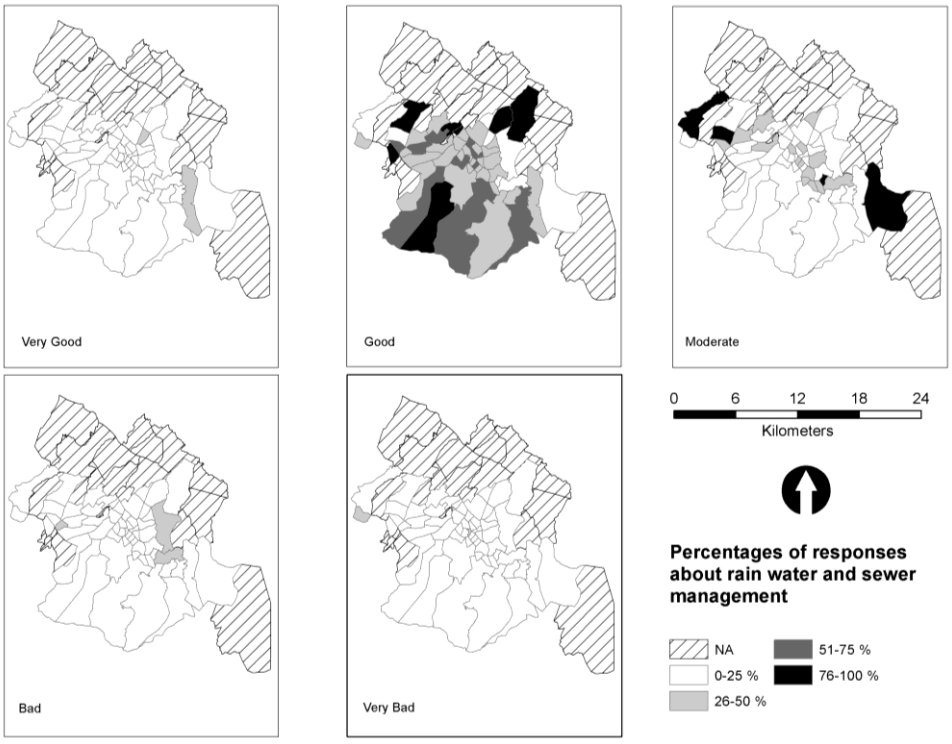
Appendix 3: Recycle systems and services based on survey results




Very Good
Good
Moderate
Bad
Very Bad
0 6 12 18 24
Kilometers
Percentages of responses about frequency of recycle collection
NA
0-25 %
26-50 %
51-75 %
76-100 %

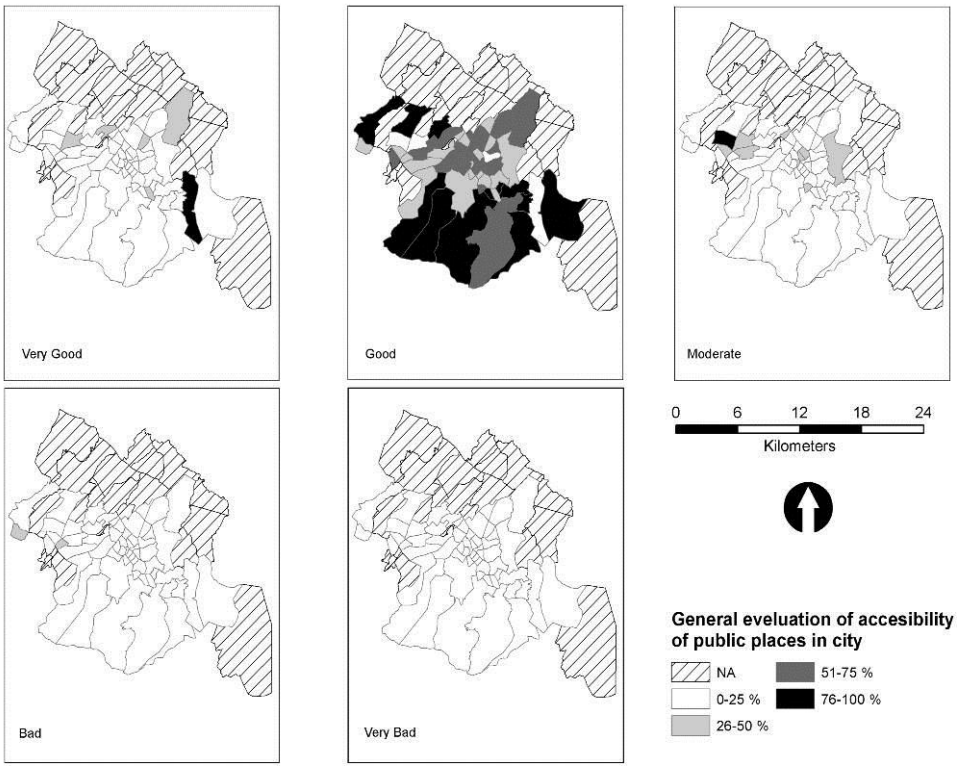
Appendix 4: Flooding, rain water management and sewer system in neighborhoods based on survey results

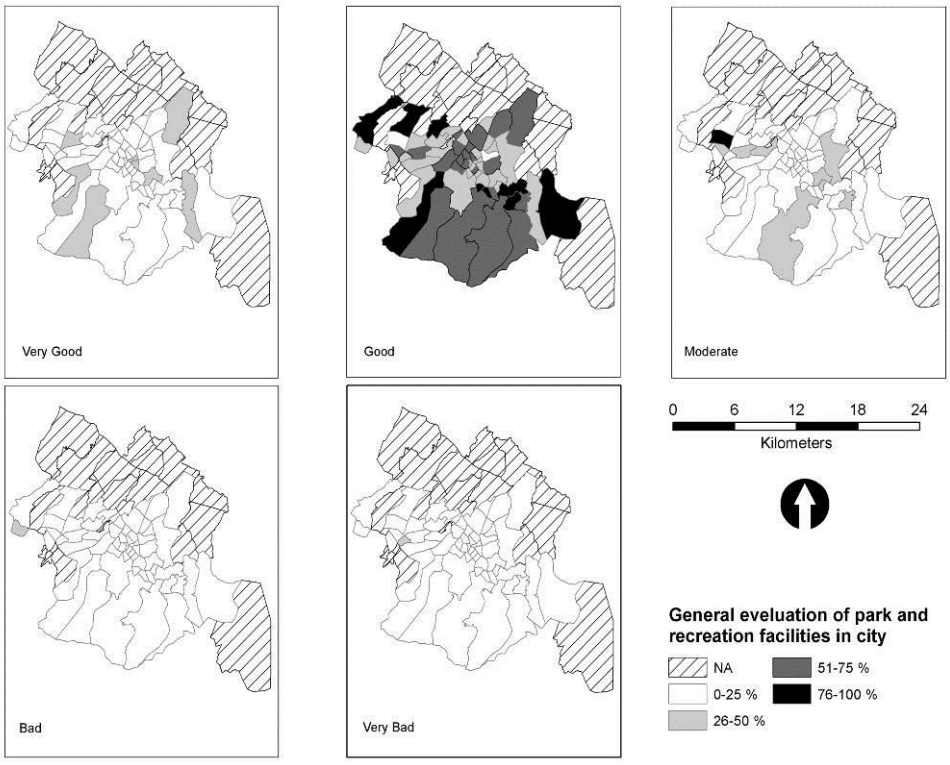


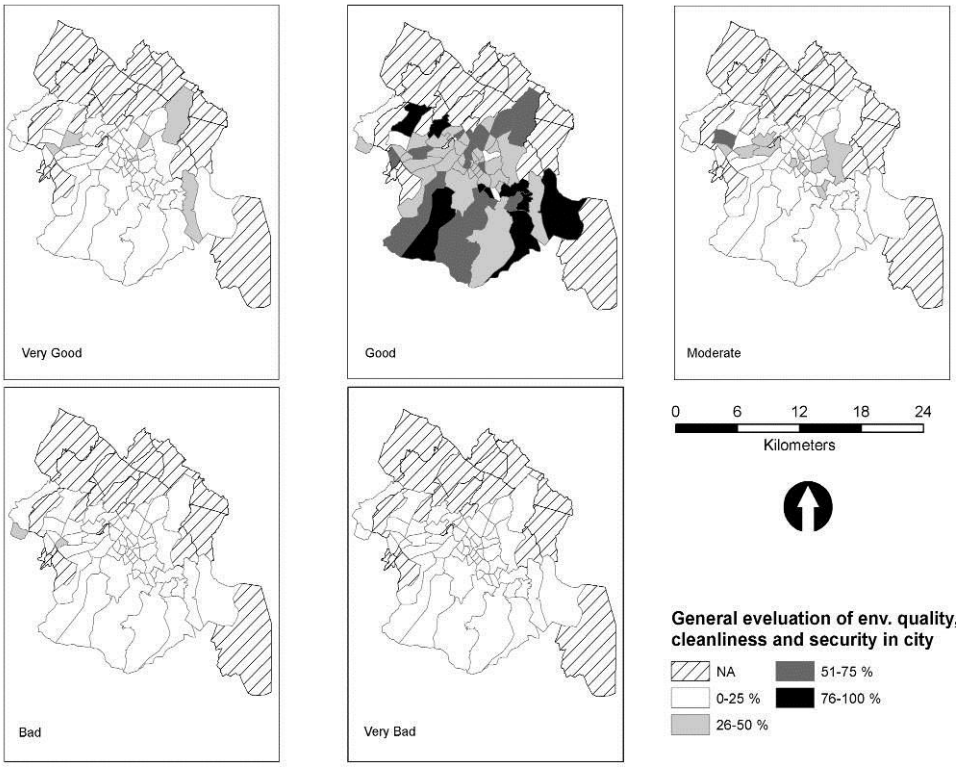


Appendix 5: Distribution of other criminal incidents based on survey results

Appendix 6: Distribution of general thoughts about Denizli, based on study indicators based on survey results



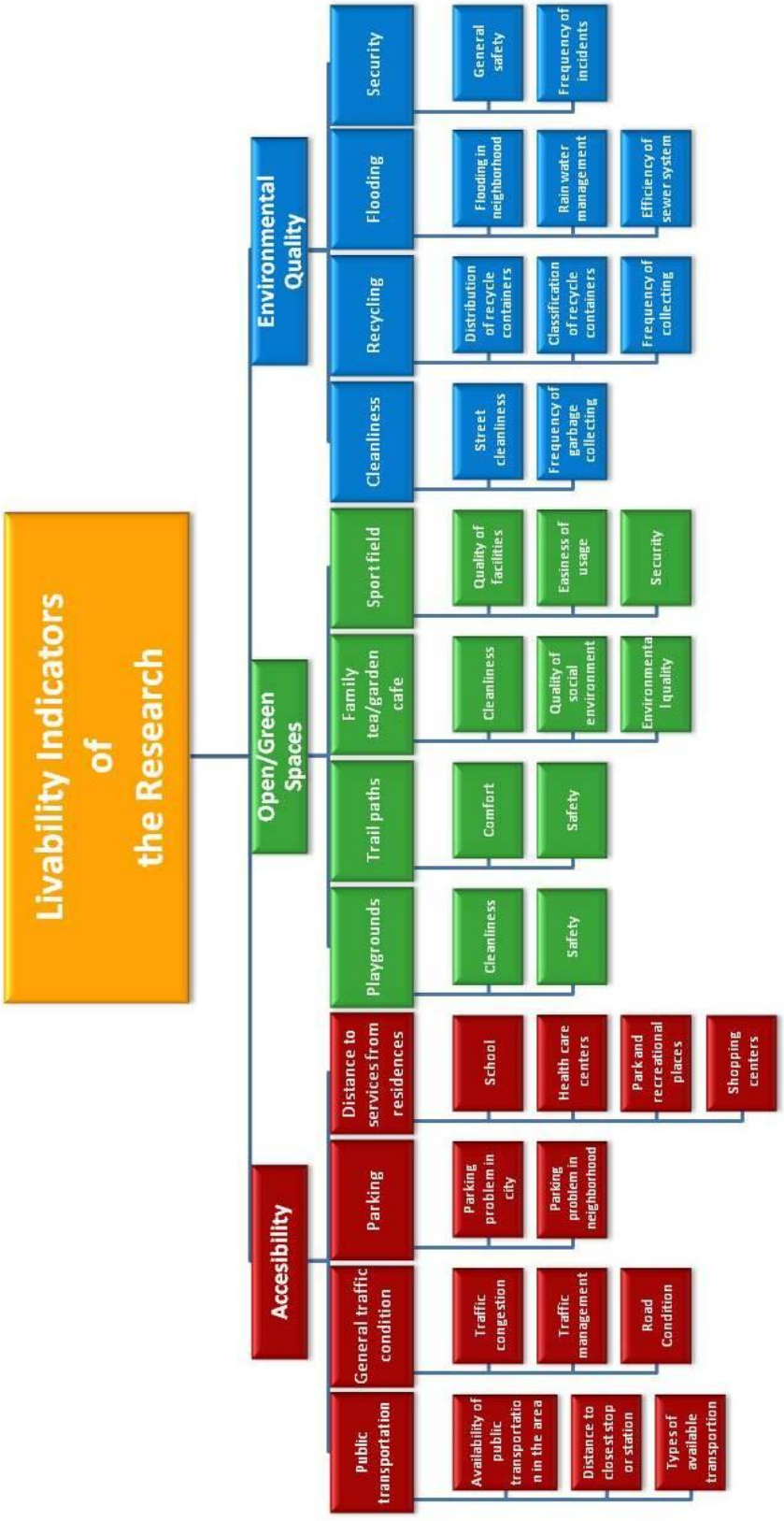



Very Good
Good
Moderate
Bad
Very Bad
0 6 12 18 24
Kilometers
General eveluation of env. quality, cleanliness and security in city
NA
0-25 %
26-50 %
51-75 %
76-100 %

Appendix 7: List of analysis and used data

Maps and Spatial Analysis	Survey	Statistical Data
Spatio-temporal distribution of built environments (urban patterns) and density map	Type of residential building: Apartment block or single family house Built within 1-9 years or 10 or more years ago	Numbers of buildings that created by using aerial photos and satellite images. No official numbers were provided for buildings
Spatio-temporal distribution of schools	Walking distance from home to closest school: 5 minutes or less 5 - 10 minutes 10 - 15 minutes 15 - 20 minutes 20 minutes or more	Number of Schools, years of establishment, number of classes, total capacity, number of current students
Spatio-temporal distribution of health centers	Driving distance from home to closest health care center: 5 minutes or less 5 - 10 minutes 10 - 15 minutes 15 - 20 minutes 20 minutes or more	Number of Schools, years of establishment, total capacity,
Spatial distribution of parks and recreational facilities	Walking distance from home to closest parks or recreational place: 5 minutes or less 5 - 10 minutes 10 - 15 minutes 15 - 20 minutes 20 minutes or more	Inventory of city parks and recreation facilities including, numbers and details of facilities
Spatial distribution of shopping centers	Driving distance from home to closest shopping center: 5 minutes or less 5 - 10 minutes 10 - 15 minutes 15 - 20 minutes 20 minutes or more	Service areas for each shopping center according to their size
Temporal land use map created by using aerial photos and satellite image	-	Residential, agriculture, industry, military and mixed use
Spatial distribution of the most frequent criminal incidents according to survey results	General thought about public safety Most frequent criminal incidents in neighborhood: Traffic accidents, house and car robbery, fight, sexual harassment, extortion, armed assault and kidnapping	No official data was provided
Transportation network, neighborhoods with traffic congestion and parking problems	Traffic congestion, road condition, traffic management, parking problem in city and neighborhood	No official data was provided, except public transportation routes without database

Appendix 8: Livability Indicators of the Research



Appendix 9: List of institutions

i. Denizli Municipality – Mayor
ii. Denizli Municipality – Vice Mayor
iii. Denizli Municipality – Directorate of Information Technology (Department of GIS/UIS)
iv. Denizli Municipality – Directorate of Premises and Confiscation
v. Denizli Municipality – Directorate of Zoning and Urban Development
vi. Denizli Municipality – Directorate of Transportation
vii. Denizli Municipality – Directorate of Environmental Protection
viii. Denizli Municipality – Directorate of Parks and Gardens
ix. Denizli Municipality – Directorate of Water and Sewer System
x. Denizli Municipality – Directorate of Press
xi. Denizli Municipality – Directorate of Cultural and Social Works
xii. Cities Bank – Department of Urban Development
xiii. General Command of Mapping
xiv. BASARSOFT – Turkey and Middle East Distributor of MapINFO
xv. Statistical Institute of Turkey
xvi. Denizli – Provincial Directorate of Health
xvii. Denizli – Provincial Directorate of National Education
xviii. Denizli – Pamukkale University (Multiple Departments)
xix. Denizli – Directorate General of Security (Police Departments)
xx. Local TV Channel - DEHA