INCREASING WALKABILITY CAPACITY OF HISTORIC CITY CENTERS: THE CASE OF MERSİN

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Approval of the thesis

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ABSTRACT

INCREASING WALKABILITY CAPACITY OF HISTORIC CITY CENTERS: THE CASE OF MERSİN

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Sustainability, livability and quality of life have become widely and in-depth discussed issues in the literature of urban planning and design. This study primarily aims to investigate the concept of walkability as a part of the literature on livability. To draw a wider theoretical framework for this study, it first seeks to answer the questions of what the terms of 'livability' and 'quality of life' mean, and what components they constitute. Then, it focuses on the concept of 'walkability' as one of the major components of these terms and as a measurable notion in urban design. Thus, this research seeks to define the notion of 'walkability' and to identify a set of measures of walkability in public spaces to be used for the assessment of the 'walkability capacity' of urban space. It should be noted that this research particularly tries to use the indicators of walkability which can directly impact on the design quality of urban space. Third, this research focuses on Mersin historic city center which has been in the process of deterioration for a while due to various current urban policies and strategies. As the case studies, it examines Uray and Atatürk Streets which constitute the major thoroughfares of the historic city center by using the set of walkability measures. It investigates the

walkability quality of four different character zones of Uray and Atatürk Streets, and identifies their walkability capacities, problems and potentials. Finally, it suggests the policy and practical solutions on the design of these public spaces that will not only improve the walkability capacity of these streets, but also be helpful for the revitalization of the historic city center.

Key Words: Quality of life, livability, walkability, walkability measures/indicators, public space, Mersin historic city center, Uray Street, Atatürk Street

ÖZ

TARİHİ KENT MERKEZLERİNİN YÜRÜNEBİLİRLİK KAPASİTESİNİN ARTTIRILMASI: MERSİN ÖRNEĞİ

BELGE, Züleyha Sara
Yüksek Lisans, Kentsel Tasarım, Şehir ve Bölge Planlama Bölümü
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Sürdürülebilirlik, yaşanabilirlik ve yaşam kalitesi, kent planlama ve kentsel tasarım yazınında genişçe ve derinlemesine tartışılan konulardır. Bu araştırma, öncelikli olarak, yaşanabilirlik yazınının bir parçası olarak yürünebilirlik kavramını incelemektedir. İlk olarak, daha geniş bir kuramsal çerçeveden, 'yaşanabilirlik' ve 'yaşam kalitesi' kavramlarının ne anlama geldiğini ve ne tür bileşenlerden oluştuğu sorularına cevap vermeye çalışmaktadır. İkinci olarak, bu terimlerin en önemli bileşenlerinden biri olan, kamusal mekanda 'yürünebilirlik' kavramına odaklanmaktadır. Bir kentsel mekanın 'yürünebilirlik kapasitesi'nin değerlendirilebilmesi için kullanılabilecek ölçütlerini tanımlamaktadır. Bu tezde, yürünebilirlik ölçütleri belirlenirken, özellikle kentsel mekanın tasarım kalitesine doğrudan etki eden yürünebilirlik ölçütlerine öncelik verilmiştir. Bu araştırma, üçüncü olarak, kentin son dönemdeki politika ve stratejileri sonucu bir süredir bozulma ve yıpranma sürecine giren Mersin'in tarihi kent merkezine odaklanmaktadır. Örnek alan araştırması olarak, Mersin'in tarihi kent merkezinin omurgasını oluşturan Uray ve Atatürk Caddeleri'ni, belirlenen yürünebilirlik ölçütleri doğrultusunda, incelemektedir. Bu araştırma, Uray ve Atatürk Caddeleri'nin dört farklı

özellikteki bölgesinin yürüme kalitesini incelemektedir ve bu bölgelerin yürünebilirlik kapasitelerini, problemlerini ve potansitellerini belirlemektedir. Son olarak, bu tez, hem Uray ve Atatürk Caddeleri'nin yürünebilirlik kapasitesinin artırılmasını sağlayacak, hem de tarihi kent merkezinin canlandırılmasına yardımcı olacak, söz konusu kamusal mekanların tasarımlarına yönelik politika ve pratik mekansal düzenlemeler düzeyinde öneriler sunmaktadır.

Anahtar Kelimeler: Yaşam kalitesi, yaşanabilirlik, yürünebilirlik, yürünebilirlik ölçütleri, kamusal mekan, Mersin Tarihi Kent Merkezi, Uray Caddesi, Atatürk Caddesi.

…to Hüseyin ÖZERDEM

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CHAPTER 1

INTRODUCTION

1.1. The Problem Definition and Case Study Area

A walkable environment is a safe, secure and convenient place to travel on foot. Walkability is regarded as the quality of pedestrian facilities, street patterns, sidewalks, roadway condition, built environment, and especially urban design qualities. Thus, walkability is directly related with the spatial quality of life, which is defined as a part of 'livability' means, experiences and daily life practices by the community within a space.

One of the main themes of the second United Nations Conference on Human Settlements (Habitat II), which was organized in 1996 in Turkey, was the sustainable human settlement. Although this concept is directly related with the livability, there are serious problems in the implementation of the principles of livability in Turkey. One of them is the travelling on foot, especially in city centers, which is the main problem of this thesis. In other words, livability is related to human basic needs.

Walkability is a prominent problem in Turkish cities. One of the major reasons behind this problem stands out the lack of concerns of local authorities towards increasing walkability of public spaces in cities. The problem has been exacerbated by both the changing transportation policies and walking habits of local community. However, one of the crucial variables to improve the urban design quality of cities, and especially city centers is to enhance their walkability.

Within the context of livability and walkability, Uray and Atatürk Streets in the historic city center of Mersin present illustrative examples in terms of showing the significance of the walkability, and therefore, livability of city centers. Both streets which constitute the main commercial spines, and were known as "port streets" until the beginning of the 20th century, have been playing crucial roles for Mersin as a part of the Mediterranean culture. Besides, Uray and Atatürk Streets have cosmopolitan character in commercial, cultural and historical terms. Also, including significant landmarks, such as Latin Catholic Church, Sursok Khan, Taş Khan, Arab Orthodox Church, Ulu Cami and Bazaar, Atatürk House and Mersin Culture Center (*Old Public House*), they have been the most used meeting places in the historic city center of Mersin.

Despite these characteristics of Uray and Atatürk Streets, there is an increasing deterioration process in historic city center, accompanied by the loss of its historic and cultural identity, values and prestige. With the rapid urban development, the city has grown in a linear form; new sub-commercial centers have emerged and middle- and high middle-income groups have tended to settle down and live in these newly developed sub-centers. As a result, the historic city has started to decline. This decline has been accecerbated by the development of Forum – a shopping mall. The loss of commercial and business activities has exacerbated the decline of the historic center, as a significant number of the users of the historic center have chosen alternative commercial centers because of climatic features of Mersin and socio-economic dynamics. Especially the recently-built shopping mall has attracted a significant number of visitors, as it provides a comfortable, clean, safe and sanitized environment for not only shopping, but also entertainment, recreation and socialization. Thus, many old users of the city center have opted to go to this shopping mall, rather than come to the historic center.

Besides, the historic city center of Mersin could not keep and sustain its characteristics as a Mediterranean port city. Although there is a high potential to set up strong spatial relations between the historic city center, the sea, the port and other historic artifacts along the coast, a strategy towards improving the public space network of the historic

city center is essential to improve the quality of public spaces and to revitalize this part of the city. Yet, it has not been provided so far.

Likewise, the decline and deterioration of Mersin historic city center has been also affected by inadequate walkable environment primarily caused by pedestrian and vehicular traffic conflicts, and the lack of concern on the urban design strategies that would prioritize the policy of increasing walkability capacity and quality of the historic city center. Therefore, improving the public spaces in Mersin historic center and their walkability quality and capacity is another very crucial issue for the revitalization of this historic area.

Successful regeneration schemes focusing on historic quarters do not only aim to revitalize these sites in economic, social and environmental terms, but also physical (or, spatial) terms. Improving the quality, vitality and viability of public spaces is one such spatial policy integrated with economic, social and environmental outcomes of these projects. Therefore, improving walkability quality of public spaces is widely seen not only as a spatial strategy to improve the quality, vitality and viability of public spaces, but also a regeneration strategy for the historic quarters of cities, and for conserving and sustaining their significant characters and authenticity.

As far as the contribution of Uray and Atatürk Streets to the identity of the city is concerned, it is crucial to maintain the positive urban design characteristics of these streets, and to conserve the historic and cultural heritage they contain. Walkability is one such strategy. As mentioned above, in many regeneration and conservation projects of historic city centers, increasing walkability is one of the major strategies to revitalize urban environments and to increase the attractiveness of the places for daily users, tourists and visitors, as well as investors. Even in some projects, increasing the walkability of the historic centers has been seen as a part of city-branding and marketing strategies. Assessing the walkability of these public spaces and their surroundings, thus the livability of the historic city center, will therefore provide rich empirical outcomes to be used for the enhancement of the urban design quality of these streets and the historic quarter of Mersin.

1.2. Scope, Aims and Objectives of the Study

In developing and evolving cities, the terms of sustainability and livability have become popular in the discourse of urban planning and design. This study primarily aims to investigate the concept of walkability as a part of the literature on livability. To draw a wider theoretical framework for this study, this research first seeks to answer the questions of what the terms of 'livability' and 'quality of life' means, and what components they constitute. Then, it focuses on the concept of 'walkability' as one of the major components of these terms and as a measurable notion in urban design. Thus, this research seeks to define the notion of 'walkability' and to identify a set of measures of walkability in public spaces to be used for the assessment of the walkability capacity of urban space. It should be noted that this research particularly tries to use the criteria of walkability which can directly impact on the design quality of urban space. Examining Uray and Atatürk Streets in Mersin by using this set of measures, and identifying problems and potentials to revitalize them, it seeks to suggest the policy and practical solutions on the design of these public spaces and the historic city center.

The main hypothesis of the thesis is that some urban design attributes (*attractiveness-convenience, connection to open space, safety, street patterns, quality of path, linkage with other transportation modes, connectivity of path network and accessibility*) directly improve the walkability of a public space, and also trigger a revitalization process. Some of these attributes are quantitative, while others are qualitative. The main research questions of the thesis therefore are two-fold:

1) What are the urban design qualities that influence and improve the walkability of public spaces in historic city centers?

2) How the urban design qualities influence and enhance the walkability in historic city centers?

1.3. Research Method

This thesis aims to draw a theoretical framework on the issue of walkability of public spaces to achieve livable environment in historic city centers. The notion of walkability is discussed in relation to livability, and a set of criteria to measure the walkability capacity of urban public space is identified. This research uses a case study approach, and examines Uray and Atatürk Streets in the historic city center of Mersin. Both streets are the important public spaces and the main thoroughfares of the city with social, cultural and economic functions, and cultural and historic heritage values. The walkability problem of these streets, which is widely affecting the daily public life, the economic, social and cultural life of the city, as well as the city's identity, is worth investigating to provide policy and practical solutions on the design of these public spaces and increasing quality of urban life and livability in the historic city center. It should be also noted that both streets have not been subject to any research from this perspective. The examples are investigated through the set of criteria on the walkability quality. The method of the study comprises following three stages:

- A literature review to examine the notions of quality of life/livability and walkability and to determine the indicators of walkability.
- An investigation on Mersin Historic City Center:
    - to evaluate socio-spatial development of Mersin as a Mediterranean Port City
    - to analyze urban design qualities and to define character zones
    - to determine the landmarks, nodes, boundaries and spatial relations
- An in-depth analysis on Uray and Atatürk Streets to assess their walkability capacity. The assessment of walkability capacity is made by means of questionnaires, extensive surveys, desk-based assessments and direct observations.

The details regarding the research method is provided in Chapter 3.

1.4. The Content of the Study

This study is composed of six main chapters, including introduction. ***Chapter 2*** provides a literature review to examine the three major concepts - livability, quality of life, and walkability- to draw a theoretical framework for the thesis, and to identify the set of measures for the walkability assessment.

Chapter 3 explains the research method of the study, including data collection tools and method of walkability analysis. In the first section, it explains literature review, desk-based assessment, extensive survey, direct observations and questionnaires as the research tools. In the second section, it explains how each walkability indicator - *attractiveness and convenience, connection to open space, safety, street patterns, quality of path, linkage with other transportation modes, connectivity of path network and accessibility*- are used to assess the walkability capacity of the case study area. It also explains how the questionnaire questions are related to the walkability indicators and they are used for the analysis of Atatürk and Uray Streets.

In ***Chapter 4***, the historical and morphological development of Mersin and its historic city center are investigated within four sections to put the case study areas in a wider context, and to describe the problems and dynamics of Uray and Atatürk Streets within the larger city scale. The first section explains the historical development of Mersin as a Mediterranean Port City. This section is followed by the morphological development of the historic city center to explain its crucial place, importance and position in Mersin. The third section examines the historical development of Uray and Atatürk Streets, regarding significant structures and networks to understand different dimensions. The last section investigates the essential characteristics of the case study area and its environs, and it explains the reasons of choosing Uray and Atatürk Streets as the case study area of this research.

Chapter 5 provides in-depth walkability analysis of Uray and Atatürk Streets, and discusses different walkability capacity of these streets, underlining their positive and negative aspects, strengths and weaknesses.

Chapter 6 summarizes the research findings, discusses the pros and cons of the investigated sites within the context of the city and the city center, and provides specific urban design policy recommendations for Atatürk and Uray Streets' character zones regarding the walkability indicators.

CHAPTER 2

LIVABILITY, QUALITY OF LIFE AND WALKABILITY

In the HABITAT II Turkish National Report and Action Plan (1996), sustainability, livability and justice were selected as the basic principles for human habitats, while civic engagement, enablement and governance were selected as the instrumental principles. In the report, sustainability is defined as a condition that should be performed. Livable habitation, at the same time, should be sustainable, fair and equitable. In the report, livability is defined as a term which is related to not only individual and social well-being, happiness, but also spatial characteristics and qualities of human settlements that directly contribute to the satisfaction of people living in a settlement. All these terms are closely related to human rights. Especially livability is the spatial dimension of human rights.

In the HABITAT Agenda, the concept of livability is used to refer to the quality of life (QoL) which is related to the spatial and physical features of our living environment, as well as social and economic factors. This term directly affects the organization of land-use pattern, building and population densities in urban space, architectural style, the accessibility of public spaces. This chapter aims to explore the notions of 'quality of life' and 'livability' as the key components of sustainable urban development. After setting up a relationship between walkability and these terms, it will explain the concept of walkability and a set of criteria to measure the walkability capacity of urban environment in detail.

2.1. The Concepts of 'Quality of Life' and 'Livability'

Improving the QoL in a particular place or for a particular person or group has become the particular concern of urban planners in recent times. The word 'quality' within the context of urban environments has been prominently used in the planning professions (Chapman and Larkham, 1999:211). The studies on the notion of QoL, however, started in the late-1960s as "an extension of the set of measuring instruments to gauge the impact of development policies and efforts" (Beukes and Colff, 1997:229).

Although QoL has been the focus of numerous studies, a universally acceptable definition has not been arrived yet (Das, 2008: 297). 'Quality' refers to "the degree of excellence of a characteristic", but the notion of the QoL "may mean different things to different people" (Das, 2008: 297). "To some, it may mean how happy they are and to others, it may mean the level of economic status, education, health or security" (Das 2008:297). Likewise, the term of QoL is used to refer to 'well-being', 'level of living', 'way of life', 'life satisfaction', 'happiness' and 'morale' (Dissart and Deller, 2000:136). Many studies, planning statements and projects refer to the term QoL as either the 'outcome' of economic, environmental, social, aesthetic, civic conditions, or the 'cause' of impressions about QoL, and these impressions can influence the perceived or actual prosperity or attractiveness of a place" (Massam, 2002:143).

As for livability, as a term, it is often viewed as enhancing the economic, social, cultural and environmental well-being of current and future residents. According to Lynch (1974, cited in Banerjee and Southworth, 1995: 761), a livable environment is "an environment in which one can act with competence, free from such dangers and discomforts as noise, pollution, accident, heat, clear and fatigue". Lambert (2005: 5) indicates the uniqueness of the notion of livability depending on each country's social, political and environmental determinants. Similar to the notions mentioned above, the term of livability is often used interchangeably with QoL on global scale.

QoL, as a concept, includes a variety of variables, ranging from social, economic, environmental terms to spatial ones. First of all, QoL is related to basic human needs. It is of a great importance to perceive the urban identity and sense of place. The spatial

quality of life is important in terms of generating identity of space and sustaining memory of the place.

Parfect and Power (1997:135) note the difficulty of measuring quality, stating that "The essential element of quality in urban environments is not something that can be easily measured, or even identified as it may well spring from a combination of factors relating to "sense of place", such as legibility, collective memory and issues of historical continuum". Massam (2002:142) also claims that all our families, community and even our place of birth influence our vision about QoL. He (2002:142) also notes that our individual and collective memories and histories determine our opinions about the quality of our lives.

Despite its difficulties, several researches in planning literature classify and determine indicators of QoL. Two distinctive types of urban QoL indicators are widely recognized. The first includes **objective indicators** which measure concrete aspects of the built environment, the natural environment, economy and social domain, while the second includes **subjective indicators** that are connected to the individual's evaluation of objective conditions of life (Das, 2007:298, Rossi and Gilmartin, 1980 cited in Massam, 2002:173,). Das (2007: 298) defines objective indicators as tangible conditions, and subjective indicators as perceptions of well-being, livability, health. For example, "a measure of people's attitudes toward crime in the neighborhood is a subjective indicator, while the number of burglaries or assaults that have occurred in the same neighborhood represents an objective indicator" (Rossi and Gilmartin, 1980 cited in Massam, 2002:173). Human actions, being contemporary view of QoL in planning, can modify spatial QoL. Therefore, the spatial QoL can be controlled, adjusted and enhanced by individuals through the use and management of these objective and subjective indicators.

Massam (2002) compares these indicators, underlines the differences and similarities. He (2002) concludes that the QoL's indicators show differences in terms of time, place and scales. He complements this idea with a three dimensional figure (Figure 2-1). The indicators in the QoL studies present three major dimensions (Massam, 2002: 157). The

first includes both “private/individual” and “public/collective”; the second comprises “means/input/causes” and “ends/output/effects”; while the last dimension focuses on “place” and “person”.

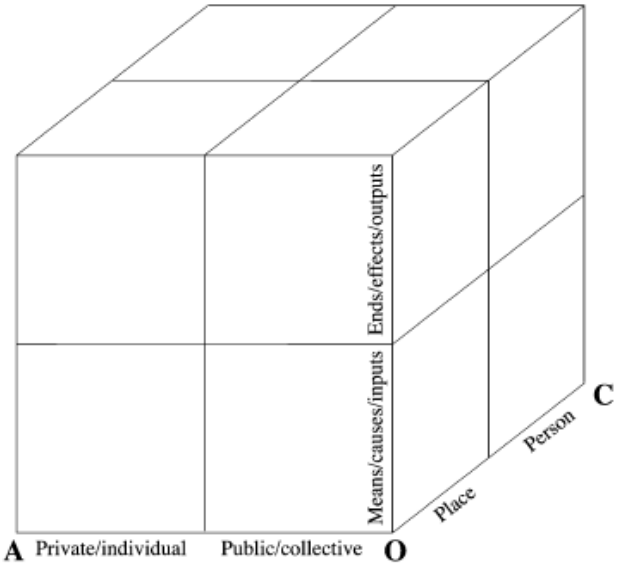


Figure 2-1: A typology of approaches to the study of quality of life (Massam, 2002:157)

Hancock et al. (1999:23) who developed tools to measure progress in QoL among Canadians and communities in Canada, indicate five measures of QoL that are: community, environment, economy, education and governance (Figure 2-2). Livability is placed at the intersection of ‘community’ and ‘environment’, while sustainability is indicated at the intersection of ‘environment’ and ‘economy’, and equity is placed at the intersection of economy and community. All these three concepts are placed within the circulation of education and governance.

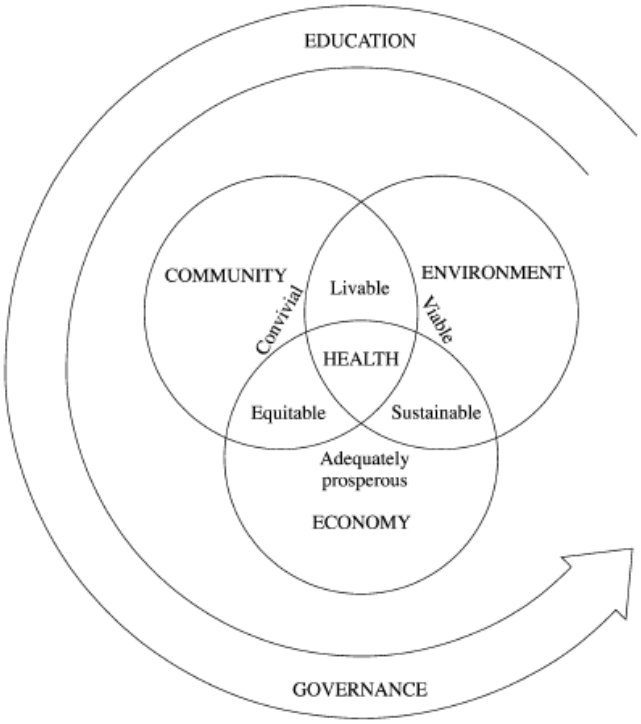


Figure 2-2: Basic framework for indicators (Hancock et al., 1999 cited in Massam, 2002:176,)

In another study, Hancock et al. (1999) identify the determinants of QoL as sustainability, viability, **livability**, conviviality, equity, and prosperity. In the same study, walkability is shown as one of the components of livability (table 2-1). , QoL is classified under the category of 'health status' and it comprises three major measures: well-being, life satisfaction and happiness.

The main focus of this study is spatial, for this reason if will focus on the notion of walkability; as one of the components of livability, and it will examine this notion from the urban design perspective.

Table 2-1: Indicator categories (Hancock et al., 1999:24)

A: DETERMINANTS	Conviviality	Governance
Sustainability	Family safety and security	Voluntarism/associational life
Energy use	Sense of neighborhood	Citizen action
Water consumption	Social support networks	Human and civil rights
Renewable resource cons.	Charitable donations	Voter turnout
Waste pro and reduction	Public services	Perc. of govern. leaders / services
Local production	Demographics	Healthy public policy
Land use	**Equity**	**C: HEALTH STATUS**
Ecosystem health	Economic disparity	**Quality of Life**
Viability	Housing affordability	Well-being
Air quality	Discrimination and exclusion	Life satisfaction
Water quality	Access to power	Happiness
Toxics production and use	**Prosperity**	**Master/Self-esteem/Coherence**
Soil contamination	A diverse economy	**Health-promoting Behaviors**
Livability	Local control	**Disability/Morbidity**
Housing	Employment/Unemployment	Stress/anxiety
Density	Quality of employment	Morbidity/disability measures
Community safety	Traditional economic indicators	Health utility index
Transportation	**B: PROCESSES**	Mortality
Walkability	**Education**	Overall mortality rate
Green/open space	Early childhood development	Infant mortality rate
Smoke-free space	Education/school quality	Suicide rate
Noise pollution	Adult literacy	
	Lifelong learning	

2.2. Walkability

QoL is general concept that defines not only spatial aspects, but also socio-economic terms, like equity and viability. Livability constitutes the spatial side of QoL. it is a broad term covering various topics from housing to green/open space, safety of community to smoke-free space or transportation to walkability. Walkability is perceived as a physical aspect or the spatial quality of 'livability'. It has recently become one of the main concerns of urban planners, architects, and landscape architects. This is because of the changes in urban planning and design approaches and transportation policies. For

example, Southworth (2005:246) notes that walking and bicycling are now seen as an integral part of transportation, as also underlined below for American cities:

> Over the past decade the quality of the walking environment has become a significant factor in transportation planning and design for American cities. Previously, movement by foot and bicycle was viewed as recreational, rather than legitimate transport to be seriously considered. (Southworth, 2005:246; Wigan 1994)

Walkable environment is a place where is a safe, secure and convenient to travel by foot (Krambeck and Shah, 2006). Walkability is regarded as the quality of pedestrian facilities, street patterns, sidewalks, roadway condition, built environment and especially urban design characters. Hutabarat (2009:145) claims that the definition of pedestrian and the development of pedestrian space have big importance to understand the walkability discourse.

The Oxford Dictionary (http://oxforddictionaries.com/definition/pedestrian) defines pedestrian as "a person walking rather than travelling in a vehicle". Therefore, the walking activity is regarded as a mode of transport.

Likewise, walking is an activity which keeps public spaces alive, dynamic and colorful. Forsyth and Southworth (2008) indicate crucial role of pedestrian experience in street as *"…In ignoring the pedestrian experience, the street lost its intimate scale and transparency, and became a mere service road, devoid of public life."* They (2008:1) also point out the relation between walkability and sustainability, stating that:

> Walkability is the foundation for the sustainable city. Like bicycling, walking is a 'green' mode of transport that not only reduces congestion, but also has low environmental impact, conserving energy without air and noise pollution. It can be more than a purely utilitarian mode of travel for trips to work, school or shopping, and can have both social and recreational value. It is also a socially equitable mode of transport that is available to a majority of the population, across classes, including children and seniors. (Forsyth and Southworth, 2008: 1)

A walkable environment must acquire certain qualities. It should offer pedestrian comfort, safety and visual interest, as claimed below:

> Walkability is the extent to which the built environment supports and encourages walking by providing for pedestrian comfort and safety connecting people with varied destinations within a reasonable amount of time and effort, and offering visual interest in journeys throughout the network. (Southworth, 2005: 248)

Likewise, a walkable environment should be close, barrier-free, safe, full of pedestrian infrastructure and destinations, upscale, cosmopolitan, as well as encouraging physical activity (Forsyth and Southworth, 2008:2). More specifically, a walkable environment:

- is formed with closer distance in cases where the vehicle cannot enter,
- is planned and designed for people with disabilities, so all kinds of people can walk equitably,
- makes people feel safe,
- is well-equipped for pedestrian in terms of infrastructure such as sidewalks, pedestrian crossings, separated trails, street furniture and street trees.
- should appeal to all kind of people with cafes, shops, a mix of housing types, open spaces, street furniture, and street pattern.

Walkability quality of urban environment can be measurable. There might be a number of qualitative and quantitative measures to assess walkability capacity. Safety, orientation, comfort, diversity, attractiveness, destinations and street pattern are some of these qualities which will be explained in detail in the following section of this chapter, and used as a set of measures for the walkability assessment of the case study.

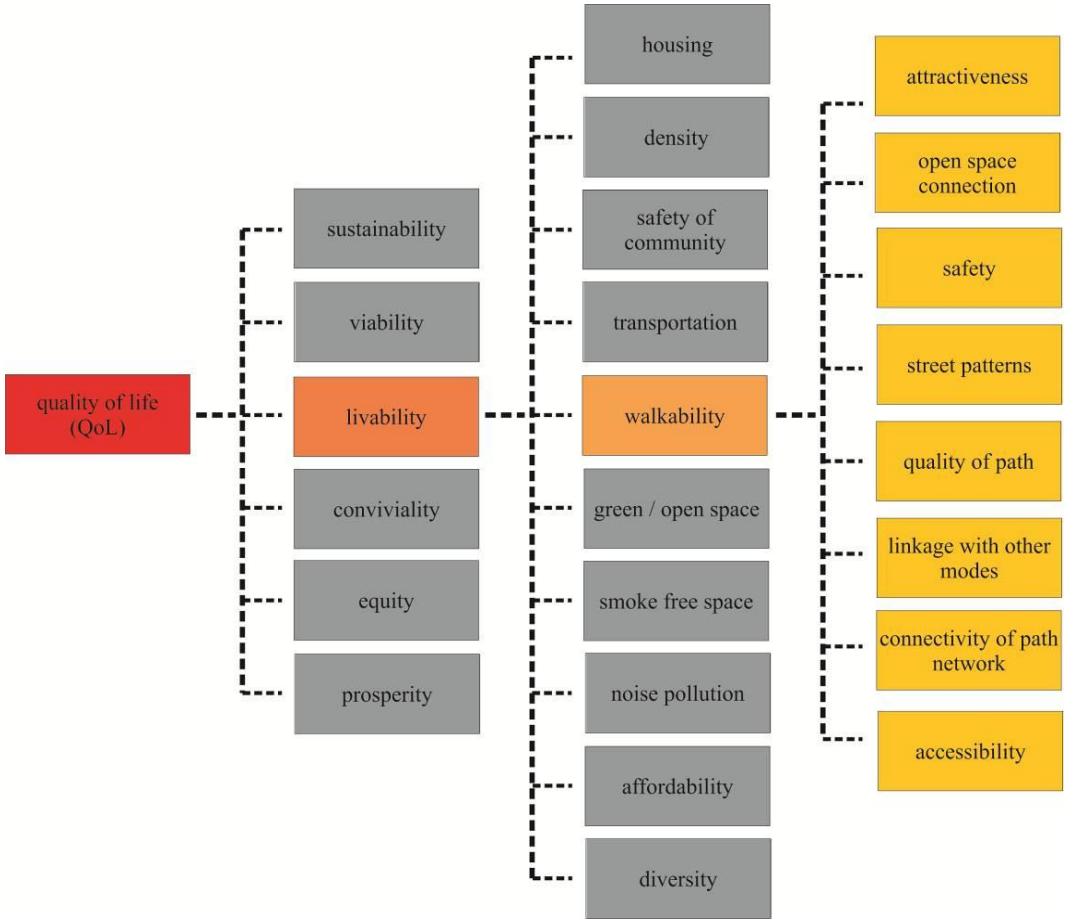


Figure 2-3: The evaluation of Quality of Life in terms of Walkability (Adapted from, Hancock, T., et.al. 1999, Hutabarat L.R., 2009, Lambert K, 2005 and Southworth, M., 2005 by Z.S. Belge)

2.3. Indicators of Walkability

Streets are defined in two ways: vertically, which has to do with height of buildings or walls or trees along a street; and horizontally, which has most to do with the length of and spacing between whatever is doing the defining (Jacobs, 1995:277).

2.3.1. Attractiveness and Convenience

One of the main indicators of the Global Walkability Index (Krambeck and Shah, 2006) is the "attractiveness and convenience" of the pedestrian network. More specifically the components and variables of "attractiveness and convenience" of the pedestrian network are:

- maintenance and cleanliness of walking paths,
- existence and quality of facilities for blind and disabled people,
- pedestrian amenities (coverage, benches, public toilets),
- permanent and temporary obstacles on walking paths
- availability of crossings along major roads (Krambeck and Shah, 2006).

The quality of street network and the presence of public amenities and facilities should be particularly designed with a particular attention to vulnerable groups, such as people with disabilities, elderly people, parents with babies and young children.

As mentioned at Global Walkability Index, Appleyard (1981:284) also underlines the importance of maintenance and planting to increase attractiveness of streets by stating that:

> The distribution of street trees, planting strips, and other public landscaping as well as private front yards would reveal the areas of deprivation. The presence of newly painted houses, cared for gardens, and new resident-constructed structures would be indicators of resident pride in the street, a characteristic worth preserving. Other qualities which give street uniqueness could also bring attention to streets that lack such a sense of place. (Appleyard, 1981: 270,271)

According to Montgomery (1998: 96) urban design transforms a place into a specific place with “activities and events”. Physical space, the sense of experience and the activities make “successful urban place” possible. Likewise, “the activities” that bring people together at street level lead to “vitality and diversity” in urban space (Jacobs, 1995: 8-9, Montgomery, 1998: 97). Moughtin and Mertens (2003:132) support this view by stating that:

> … most street activity occurs when it is convenient for large number of pedestrians to use the street in a variety of ways, also activity in streets increases when densities are high enough to inhibit the use of the motorcar and

> to support a range of facilities such as shops and schools which are within walking distance from a sustainable catchment area.

Activity produces “vitality and diversity” in urban space. Both concepts are used as separate and related notions. Montgomery (1998: 100) defines vitality as “pedestrian flows at different times of the day and night” in terms of their own pulse or rhythm:

> Vitality; The market square, the street vendor, the shop frontage and the sidewalk cafe are all important activities of promenading and people watching, which provide the dynamic quality of successful urban place appeared to have their own pulse or rhythm. (Montgomery, 1998: 100)

Moreover, historic areas -historic buildings and streets- particularly make places attractive and distinctive where people prefer to live and work. The attractiveness of the old streets is possible with the attractive street signs, so that these street signs can provide historical continuity and community stability (English Heritage, 2000: VII).

> The aim of thriving and attractive public spaces of a beautiful and aesthetically pleasing city is to enable its inhabitants to identify, enjoy and interact with that city as they feel it to be their personal place. Lighting can be seen as a vital ingredient in personalizing and humanizing the city and thus improving the quality of urban life.” (English Heritage, 2000: 51)

At that point, Jacobs (1995: 9) maintains that the best streets leave behind “strong, long continuing and positive impressions” so the best streets can be remembered. According to him (1995: 11), the great attractive streets should be entertaining, permitting anonymity at the same time as individual recognition, symbols of a community and of its history, representing a public memory, places for escape and for romance and places to act and to dream.

The other viewpoint of the attractiveness of the street is the diversity of the usage of the buildings. “Different uses and destinations” of the buildings like “movies, different-sized stores, libraries” can attract people from every work of life to the street (Jacobs, 1995: 297). By this means, the diverse uses of the buildings in terms of “economically

and physically" liven up the area and the street brings different people for different purposes. The presence of the promenading, eating or drinking attracts people to the streets (Jacobs, 1995: 56-57).

One of the prominent timely policies of creating active street life is to create a 24-hour city. The diversity of the area in terms of living, working, shopping, schooling, and socializing must coexist in close proximity (Duany et al., 2010: 5.2). The diversity of the area also contributes to safety provided by active street life. "*Reducing crime and vandalism is a must for an attractive place*" (Akit, 2004:31). Rarely used spaces increase anxiety in terms of security and safety, as it is seen attractiveness and safety of place complement each other.

As another aspect, generally, the retail stores prefer to the front parking lots to attract pedestrians, whereas the attractiveness of a place may be enable by one-to-one relationship between the shops and pedestrians, as also supported by Duany et al. (2010:10.7) as follows:

> … for retail to attract pedestrians, the shops must open directly onto the sidewalk, with parking lots located to the rear or elsewhere. Shops with rear parking should avoid placing customer entrances directly facing those lots, as they turn the back of the building into a competing storefront. Instead, the rear parking lots should provide easy access to the street through pedestrian passage. Off-street shopping arcades and urban malls are an idea whose time has passed.

For example, in Boston's Lafayette Place, as all shops, all traffic activities both cars and pedestrians turned their backs to the streets around them, dead zones are created that cause increasing crime rates (Duany et al., 2010:10.7). Showing quite a few failure examples about "the practice of converting shopping streets into pedestrian malls", Duany et al. (2010:10.7) also claim that "most stores thrive only when fronted by complete streets containing both pedestrians and slow-moving cars".

According to Jacobs (1995:285) the best streets edges where including a quality of transparency can create meeting among the public realm of the street and the less

public, often private realm of property and buildings. So that, the presence of transparency makes significant contribution to the attractiveness by inviting people to the streets.

Briefly put, the attractiveness is a wide issue encompassing various factors. As shown in table 2-3, a number of issues are involved in the attractiveness of urban spaces, including attractiveness and convenience of street network, existence of pedestrian amenities and facilities with a particular attention to vulnerable groups (disabled and aged people, parents with young children and babies and young children), regular maintenance and c*leanliness* of walking paths, planting, the existence of interesting urban scene (including historic streetscape, good-looking and well-maintained shop fronts) and a variety and diversity of land-use activities and events.

Figure 2-4: Attractive street life, Copenhagen (Time-Saver Standards for Urban Design, 2003: 6-3-11)

2.3.2. Connection to Open Space

Natural elements, meeting places, gathering places and unique features have always played an important role in the discourse of walkability. In order to provide livable communities, it is essential to connect street network to natural elements, meeting and gathering places, and places with unique features.

In most cities, the open spaces composed of parks, playgrounds, schoolyards, nature reserves, birds sanctuaries, lakes, rivers, trails and pathways are desirable amenities to live near or access (Lambert, 2005:25). The accessibility of these public space amenities has crucial foci in the context of livable and walkable environment.

Public green spaces and water areas are of great importance for city life. Playgrounds, fields and gardens provide recreational opportunities for the public, create ecologically healthy environment by filtering the noise, light and air of the city and provide views and landscape image by framing development sites (Montgomery, 1998:111). Additionally, parks and open areas provide people with the opportunity to stroll about, have lunch or dinner, watch concerts and other cultural events, and socialize (Montgomery, 1998:111). Thus, such open space areas should also connect as often as possible to the more urban public realm (Montgomery, 1998:111).

Public spaces within each neighborhood, such as open spaces and gathering places, are key factors to create livable communities. Gehl (1995, cited in Montgomery 1998:110) claims that " the streets are undoubtedly the most important elements in a city's public realm, the network of spaces and corners where the public are free to go, to meet and gather, and simply to watch one another". He (1995, cited in Montgomery, 1998:110) adds that "the public realm in a city performs many functions, not only by providing meeting places but also in helping to define the built environment, offering spaces for local traditions and customs such as festivals and carnivals, and representing meaning and identity. "Successful cities are in part shaped by the relationship of built form to space, and the range, variety and characteristics of the spaces made available: outdoor rooms, civic spaces promenading routes, night-strips, quiet gardens, and little corners to rest awhile, favorite meeting places" (Montgomery, 1998:110).

Moreover, Akkar (2007:116) stated that the public space that is significant component of the city in various forms streets, squares, and parks and so on. Streets and other connections as the networks of the city provide movement 'between objects, people and information from one sector to another'. Furthermore, public spaces provide the satisfaction of daily needs with 'variety' and 'diversity' of activities (Akkar, 2007: 116). Thus, it is essential to connect the street networks to such public spaces and to make easily accessible by the pedestrians to create a walkable and livable community.

Places with unique features and visual interest also enhance walkability. Portland in Oregon, which is a city with a long tradition of pedestrian access, is a good example in this sense. To "enhance the environment occupied by Portland's pedestrians, to enrich these places with designs that express the pleasure and to hold the pleasant surprises of urban living" are some the primary policy objectives of the Portland Pedestrian Master Plan to increase walkability in the city (City of Portland, Office of Transportation, 1998b). The City of Portland carried out many projects to enhance the pedestrian path network including imaginatively designed fountains, bus shelters, manhole covers, lighting, and street art that also help create city identity. As such, the plan developed a typology of walkways for different pedestrian path types: pedestrian district, city walkway, local service walkway and off-street path (Southworth, 2005: 250). As can be seen from the example of Portland, it is important to connect the street network with the places accommodating unique features and visual interests. Also, streets can be designed to create some visual interest for pedestrians. In this way, walking on streets becomes a very enjoyable activity for people on foot.

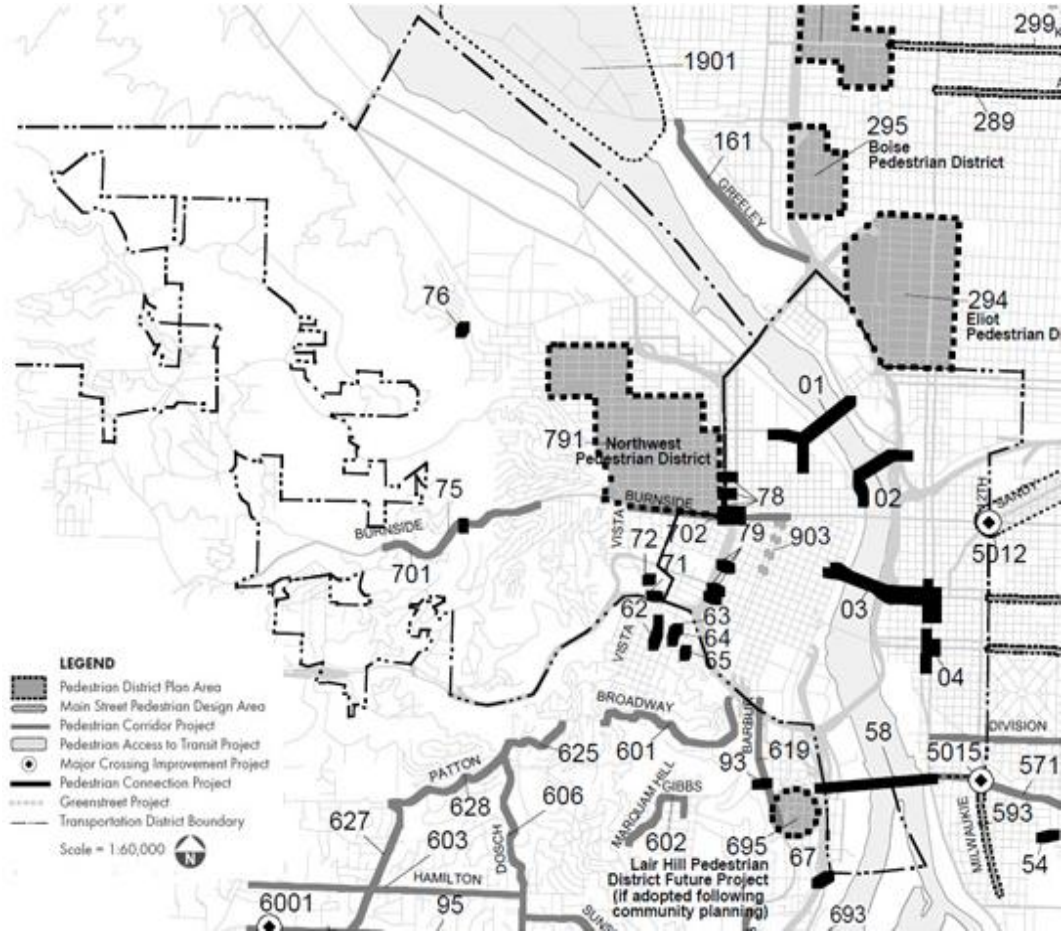


Figure 2-5: Pedestrian districts, Main street pedestrian design areas, Pedestrian corridors and Pedestrian access (Portland pedestrian master plan 1998)

To summarize, a street network which is connected to natural elements, amenities, gathering and meeting places, places with unique features and visual interest is essential to create a livable and walkable urban space (table 2-3).

2.3.3. Safety

A walkable street should be able to provide safety and comfort of pedestrians. According to Southworth (2005:250), the best understood and most fully developed aspect of walkability is pedestrian safety. It is related with many issues, such as traffic and street crime, handicapped needs, placement and length of crosswalks, traffic speeds, pedestrian and traffic control signs and signals, sidewalk width, sidewalk condition, path

surveillance and night lighting (Southworth, 2005: 250)(table 2-3). At that point, Rapoport (1987: 84) indicates the vulnerable character of pedestrians to the factors on urban environment, such as distance, weather, topography, as well as crime and traffic on the street. In defined context, safety can be examined in two folds: actual safety and perceived safety.

2.3.3.1. Actual Safety

'Actual safety' means a 'safety' achievable through safe physical properties in urban spaces. Design features, such as street widths and enclosure, traffic calming measures and natural surveillance, have direct effects on the physical safety of neighborhoods (Lambert, 2005:78). Walkable environment is primarily required safe walking. According to Jacobs, safe walkways and sidewalks should

> "permit people to walk at varying paces, including most importantly a leisurely pace, with neither a sense of crowding nor of being alone, and that are safe, primarily from vehicles" (Jacobs,1995: 272)

Besides, traffic is one of the key aspects of the safety in a walkable city. Safe traffic movement for pedestrians and vehicles is possible through traffic calming programs which aim to separate pedestrian and vehicular traffic, to create safe crossings and to slow down traffic.

Appleyard (1981: 283,284) points out synchronized stop lights to control speeds, signals at traffic crossings to cross safely without having to run and narrow streets to slow down traffic as the three issues to slow vehicular traffic and improve pedestrian safety.

There are many traffic calming elements that make streets more pedestrian-friendly by slowing down traffic, such as chokers, speed bumps, raised crosswalks, narrowed streets, rough paving, traffic diverters, roundabouts, and landscaping (Southworth, 2005:250). Also, curbs and sidewalks can be designed to enhance pedestrian safety. As another issue, aligned trees through sidewalk create a buffer zone/safe zone and visual walls providing distinct edges between pedestrian path and traffic flow.

The elements of traffic calming are adapted from; Rapoport (1987), Appleyard (1981), Southworth and Eran, (2003), Akit (2004), VTPI (2011), Traffic Calming, (2011);

- Speed Humps are rounded-raised areas placed across the roadway. They are generally 3 to 4 meters long (in the direction of travel), making them distinct from the shorter “speed bumps” found in many parking lots, and are 7 to 10 cm high (Figure 2-6).
- Traffic Signals are used to manage traffic and pedestrians at heavily use extremely hazardous or complex intersection:
- Textured Pavement: Special pavement textures (cobbles, bricks, etc.) and markings to designate special areas (Figure 2-6).
- Raised Crosswalk/ Speed Tables are typically marked with high visibility crosswalk designs or may be surfaced with special paving. Also they improve safety for both pedestrians and vehicles and if designed well, they can have positive aesthetic value. Ramped surface should be above roadway, 7-10 cm high, 3-6 meters long (Figure 2-6)
- Choker is a device that physically narrows the street by reducing the width of intersection approaches.
- Narrow streets provide slow traffic. Parking arrangements, the provision of green strips or play spaces, or simply widening the sidewalks are ways of narrowing streets (Figure 2-6).
- Signs are used to reduce conflicts between pedestrians and vehicles.
- Separation: Sidewalks, medians, boulevards, on-street parking, and parallel routes that allow pedestrians to avoid arterials. All work to separate people from vehicles.
- Safe Crossings: Crossings should be well-designed, frequent and have short crossing distances. Pedestrian crossing lights must be placed in places of heavy traffic (Figure 2-6).
- Slow Traffic: Element to slow traffic include on-street parking, engineered traffic calming measures (for example, speed bumps), visual complexity and narrow roads (Figure 2-6).

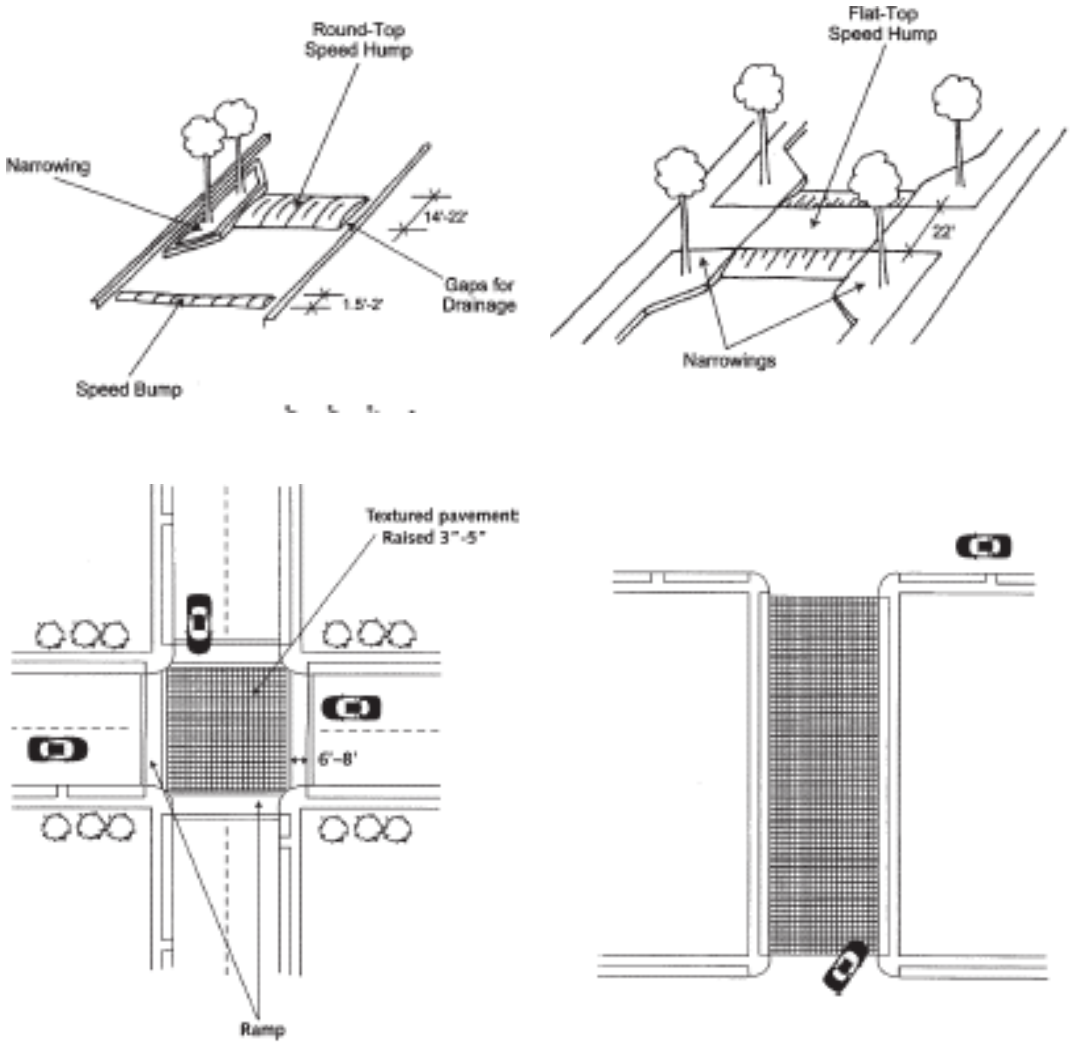


Figure 2-6: Traffic Calming Elements; speed hump, narrowings, speed bump and textured pavements. (Time-Saver Standards for Urban Design, 2003: 7-2-2 / 7-2-3)

Additionally, trees are used for traffic calming so to effectively separate “pedestrians from machines”, “machines from machines”, and “people from people” , in such a way that planted in lines along a curb or even in the cart way (Jacobs,1995:293). Traffic calming elements which are very effective in slowing travel speeds, also According to Litman (1999, cited in VTPI, 2011) increasing road safety, comfort for non-motorized travel, neighborhood interaction, community livability, property values and reducing automobile impacts, are the advantages of traffic calming.

Street width and enclosure also effect on the actual safety of pedestrians. Wider streets limit the sense of movement experienced by a driver and increase the urge to travel faster (Greenbie, 1981 cited in Lambert, 2005:21). Moreover, narrow streets help to slow vehicular traffic, reduce neighborhood "cut through" traffic and improve the walkability and general safety of streets (Steuteville,2001 cited in Lambert 2005: 21)

As for the natural surveillance, it can be achievable by creating a lively street life. This is explained in detail in the following section.

2.3.3.2. Perceived Safety

Perceived safety means the protection of pedestrians from the feeling of crime or the danger of vehicular traffic. Perceptual safety is different from physical safety. For example, the separation of sidewalk from vehicular route is the concern of physical safety, while fear on the streets because of traffic or crime which makes people anxious is related to the perceptual safety (Evans, 2009:365-385; Wheeler, 2001:35, 38, 62). In addition, the perception of safety is one of the components determining whether people will walk in their neighborhood or not (CDC, 2001 cited in Kolody, 2002: 4-7).

Moreover, Barlas (2006:84) indicates significant role of the enclosure of street on perceived safety by stating that:

> "… the need for protection against unwanted intrusions: this involves the sensory or symbolic control of a space, some of some of which we have discussed in the category of psychological needs. It refers to the control of private spaces and largely emerges from territorial instinct. (Barlas, 2006:84).

He adds that the wall and the intermediary spaces such as courtyards, cortiles, balconies etc. are components of control (Barlas, 2006:84).

Furthermore, traffic and crime are two issues which should be discussed within the scope of perceptual safety. Appleyard (1981:35) argues that traffic has negative

influence on the sense of personal territory, personal and family privacy, and people's sense of responsibility for their street.

A well-designed street can help keep pedestrians safe from both crime and vehicular traffic (Kolody, 2002:4-8). In this context, as mentioned at the actual safety, design elements become a part of an activity to provide safety for pedestrians from traffic. For example, although it is not create a full sense of safety, curbs and sidewalks may physically separate. Also, if trees closely located at the curb line, they can create a pedestrian zone that makes pedestrian feel safe (Jacobs, 1995:273).

According to Jacobs (1989: 51), keeping the public peace –sidewalk and street peace- is primarily done by inhabitants' complicated, almost unconscious, network of voluntary controls and standards. She (1989:54) notes that when a public place loses the vitality, danger begins. A well-used city street is tend to be safe, in other words, an empty street is usually unsafe (Jacobs, 1989: 54).

Active street life enables a livable and walkable environment in terms of safety. Jacobs (1989: 55) describes three main qualities for successful city neighborhoods to handle strangers and to create public order from their presence. The first one is **the existence of certain boundary between public space and private space**. The second one is **the existence of "eyes on the street",** providing a sense of safety for people on streets. Buildings in a street should be oriented towards the street. They should not turn their backs to the streets and leave it blind. The third is **the existence of users on streets at all times,** both to increase the number of eyes on the street and to induce the people in buildings along the street to watch the sidewalks in sufficient number. Also, the quality of transparency enhances the safety of street by providing for eyes to look into the street through the street wall (Jacobs, 1995: 286)

2.3.4. Street Patterns

According to Southworth and Owens (1993:279), street patterns have contributions especially to the quality and character of a community: the length of streets and the number of intersections, cul-de-sacs, and loops in each unit of land.

Moreover, Jacobs (1995:202) indicates complexity, available choices, and the nature of spaces, street and block patterns that reflect differences among cities, and they have a contribution to the time period when the city was built, to geography, to differing cultures, to city functions or purposes, to design or political philosophies, and to technological demands, to name some of the more obvious.

Southworth and Owens indicate significant role of street patterns (Figure 2-7) by stating that:

> …the clarity, orientation, and topographic sensitivity of street patterns significantly shape a community's self-image and sense of place (Southworth and Owens, 1993:273).

	Gridiron (c. 1900)	Fragmented Parallel (c. 1950)	Warped Parallel (c. 1960)	Loops and Lollipops (c. 1970)	Lollipops on a Stick (c. 1980)
Street Patterns					
Intersections					
Lineal Feet of Streets	20,800	19,000	16,500	15,300	15,600
# of Blocks	28	19	14	12	8
# of Intersections	26	22	14	12	8
# of Access Points	19	10	7	6	4
# of Loops & Cul-de- Sacs	0	1	2	8	24

Figure 2-7: The evolution of street pattern since 1900 (Southworth and Owens, 1993:280)

Southworth and Owens chronologically classify street patterns into five groups according to planning approaches following as: grid iron, fragmented parallel, warped parallels, loops and lollipops, lollipops on a stick (Southworth and Owens, 1993:279-281);

- **Grid iron system** is formed from two series of parallel streets crossing at right angles to create a pattern of equal-sized square or rectangular blocks.
- **Fragmented Parallel System** composes of long, narrow rectangles and L-shaped blocks. The streets, rather than being carried through, tend to be truncated at T intersections and sometimes make L corners.
- **Warped Parallel System** has a more rural character due to the long, narrow blocks, T intersections, and L corners of the fragmented parallel pattern warped into a parallel curvilinear pattern. Although warped parallel system is similar to the fragmented parallel system in terms of the degree of connection, route choices, and access points, the curving streets make user orientation more confusing in these neighborhoods. However warped parallel pattern is comparatively more unified and reflects a clearer conceptual basis than the fragmented parallel approach.
- **Loops and Lollipops:** In this system the parallel structure turns into the loops and cul-de-sacs that increase auto trips and concentrate them on the few existing arterials, which result in unprecedented traffic congestion in streets. Therefore, this pattern is proving undesirable for both the automobile driver and the pedestrian at the community scale.
- **Lollipops on a Stick system** is completely different from grid iron system in terms of limited intersections, route choices, and access points. However in this system privacy is maximized.

Table 2-2: The advantages and disadvantages of street pattern types (Adapted from, Southworth and Owens, 1993)

	Advantages	Disadvantages
Grid Iron	— Non-hierarchical (democratic), strongly interconnected, readily expandable — offers the shortest trip lengths and the largest number of route choices of any of the patterns — creates the most walkable neighborhood.	— maximizes infrastructure costs
Fragmented Parallel	— the long narrow blocks provide optimal frontage for residential building lots	— limits the degree of interconnection, the choices of routes through a neighborhood, and the number of access points in and out. — reveals the diminishing value of pedestrian access and growing interest in longer blocks to provide more frontage for house lots. — reduced number of access points suggests an emerging trend toward the self-contained private subdivision and a disregard of the connectedness of the public town
Warped Parallels	— the pattern seems more unified and reflects a clearer conceptual basis than the fragmented parallel approach	— the curving streets make user orientation more confusing
Loops and Lollipops	— succeeds in creating quiet streets that are relatively safe for children with its higher percentage of lots on short streets	— creates a non-directional pattern of streets that tend to loop back on themselves — interconnection is limited to several through streets not readily apparent in the plan. — blocks tend to be odd-shaped and frequently penetrated by street stubs. — increased privacy is accompanied by limited route choices and few access points, and the maze-like pattern is disorienting
Lollipops on a stick	— privacy is maximized	— interconnection is very limited. — blocks are few and large. — a repeated parallel pattern of penetrating street stubs provides access to block interiors. — intersections, route choices, and access points are all very limited

As can be seen in the table 2-2, grid iron system provides easy movement for pedestrians and vehicular traffics. The systems with cul-de-sacs and lollipops can provide the greatest amount of traffic safety, privacy, and area for safe play in neighborhood scale. However these systems create a very limited connection, intersections, route choices and access points. Briefly, grid iron system has the most advantages among other typologies with offering strong interconnections, the shortest trip lengths and the largest number of route choices in terms of walkability.

2.3.5. Quality of Path

One of the most inhospitable pedestrian paths is the car-oriented commercial street without trees, dominated by several lanes of noisy traffic, polluted air, glaring lights, and garish signs (Southworth and Lynch, 1974). Such street has generally few or no designated crosswalks and is much too wide for a pedestrian to cross safely (Southworth and Lynch, 1974). “The chaotic frontage is poorly defined, lined by blank big boxes, large parking lots, and drive-in businesses” (Southworth and Lynch, 1974). The sidewalk, which is constantly interrupted by driveways to businesses, is dominated by haphazard utility poles and boxes, street lights, traffic control signs, hydrants, mail boxes, and parking meters (Southworth and Lynch, 1974). Therefore, the quality of the path itself is essential to walkability (Southworth and Lynch, 1974).

The appropriate use of width, paving, street furniture, lighting are all significant aspects to enhance the quality of path to set a walkable environment (table 2-3).

2.3.5.1. Sidewalk Width

The walkable streets should provide ideal balance on sidewalk width for use and location of path. Adequate widths of the street should be determined according to feature and use of area in terms of residential or commercial. A path should be at least wide enough for 2–3 people to pass one another or to walk together in groups (Figure 2-8 and Figure 2-9), and much wider in very urban situations (Emery, 2003 and Gassaway, 1992, cited in Southworth, 2005: 251). Furthermore, Duany et al. (2010: 9.1) identify

design standards to create a walkable environment, stating that all thoroughfares apart from rural roads and highways should include place to walk for pedestrians. The sidewalk width should be:

- at least 10 feet (equal to 3 meters) in more urban areas,
- 15 to 25 feet (equal to 4,5-7,5 meters) from building to curb on active retail streets having outdoor dining,
- 5 feet (equal to 1,5 meters), allows two people to walk abreast in more suburban areas (Duany et al, 2010:9.1).

They (2010: 9.1) add that "wider sidewalks are appropriate for more sociable promenades along boulevards or public spaces". Because, widened sidewalk can provide to the street more room for people to walk, and for trees and other street facilities, and also it can create the distinction between pedestrian and traffic realms.

Moughtin and Mertens (2003:141) emphasize that the ratio of width of street to height of enclosing buildings is critical for good street design, also they state that;

> …the narrow pedestrianized city streets with continuous enclosing walls slightly higher than street width are most successful for their purpose as well as being an attractive place.

Pedestrian volumes, the roadside environment, land use setting, traffic characteristics, adjacent development, the characteristics of pedestrians using the facility, available funding levels, and local preferences influence the width of sidewalks (Pedestrian & Streetscape Guide, 2003:94). Besides, the width of the street should be designed depending on vulnerable groups by adequate sidewalk width that providing pedestrian flow and activity. Therefore, the minimum width of sidewalks should be 6 feet (equal to 1,8m) to allow two wheelchairs to pass each other (Figure 2-9) (Pedestrian & Streetscape Guide, 2003:94).

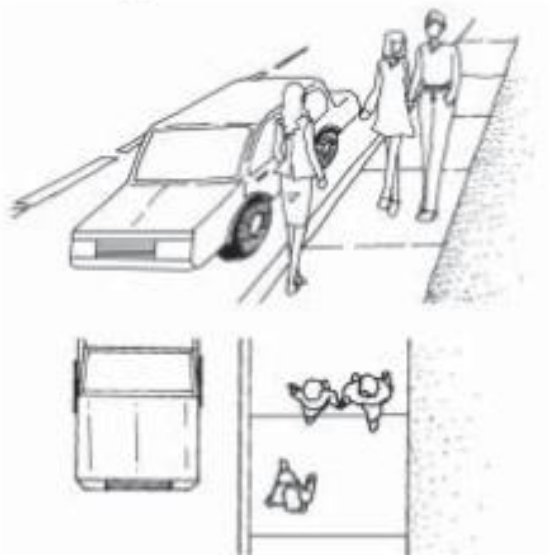


Figure 2-8: Passing standards for sidewalk (Pedestrian & Streetscape Guide, 2003, Figure 4)

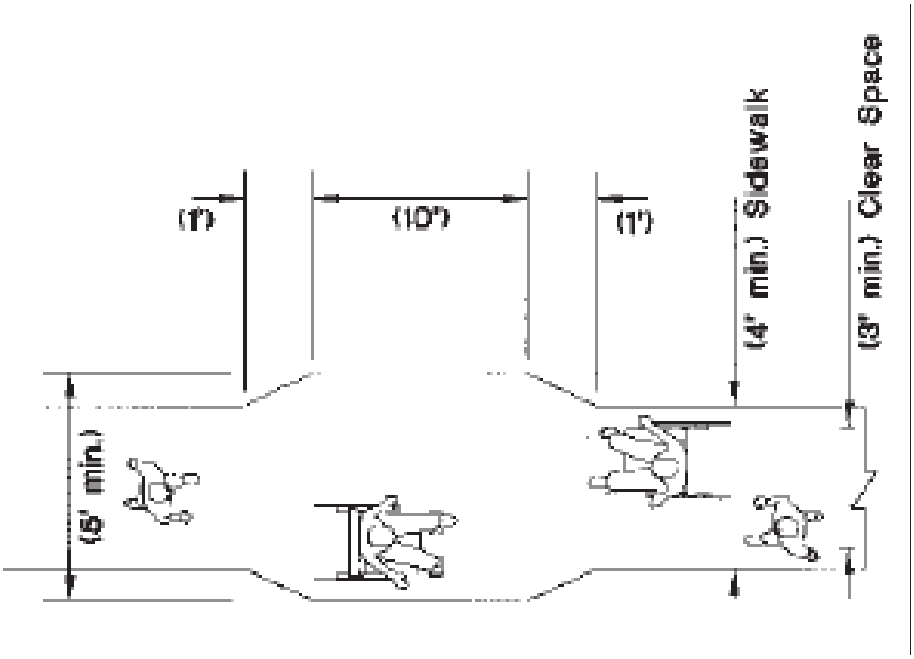


Figure 2-9: Accessible passing area (Pedestrian & Streetscape Guide, 2003, Figure 10)

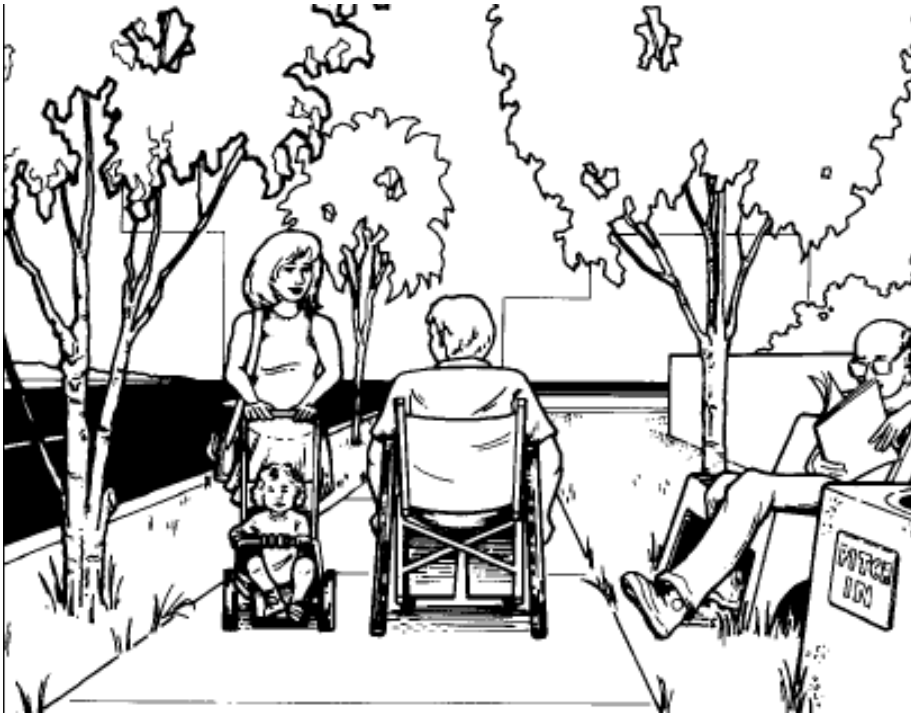


Figure 2-10: Accessible passing area (Burden, 1995: 1)

2.3.5.2. Paving Quality

Moughtin et al. (1999: 90-93) indicate three main functions of pavements:

- provide a “hard, dry, non-slippery surface” which will carry the traffic load, both wheeled and pedestrian, without early disintegration,
- provide a sense of direction which is to guide and give meaning to the rhythm, pace and pattern of movement,
- strengthen the character of place which is determined partly by the materials used, be they brick, stone slabs, cobbles, concrete or macadam (Moughtin et al., 1999).

For instance, a change of traffic may require a change of flooring material, and where this change occurs; careful use of materials offers an opportunity to create a decorative

edge (Moughtin et al., 1999: 90-93). The most common edge between vehicular and pedestrian traffic is the ubiquitous granite or concrete curb with a drop in pavement level of 10 to 15 centimeters (Moughtin et al., 1999:90-93).

The treatment of the pavement can vary depending on location (rural-to-urban areas, or commercial, residential, business districts, etc). Paving and surfacing materials should be durable in the long-term, safe for all, increase the accessibility of the public space. The cost and maintenance also are the most important criteria on selecting paving and surface materials (Pedestrian & Streetscape Guide, 2003:82).

The design and construction quality of footways and street surfaces are vital to the character of an area by providing a context within which the buildings are seen. For example, the historic street pavements differentiate from general street pavements in terms of the historical value, character and appearance of streets. Therefore, respecting local details is fundamental in the process of maintaining and restoring historic paving. On the other hand, the pavement of streets helps accentuate the visual continuity of street. For instance, the small square paving slabs and block or brick paving reduce the sense of continuity and lead to the fragmentation of the streetscape. Damaged or inappropriate paving can have an adverse effect on the entire streetscape (English Heritage, 2000: 2). They also decrease the walkability of the street for all.

Briefly put, the ideal pedestrian pavement should provide for the comfort and safety of pedestrians of varied ages and physical abilities. Walkable path should be continuous, without gaps and should have a relatively smooth surface without pits, bumps, or other irregularities that could make walking and wheelchair access difficult or hazardous (Emery, 2003 and Gassaway, 1992 cited in Southworth, 2005: 251). Successful paving must be appropriate for its use and accomplish the primary functions of comfort.

2.3.5.3. Street Furniture

The selection and placement of street furniture are the key factors to create walkable street. Because its placement and selection that should be based on an understanding of existing and desired patterns of use, will not only help strengthen the quality of sidewalk,

but also provide sculptural interest (Crankshaw, 2009:187). The form, location and surrounding space of the street furniture can create a vital and decorative place in the city (Moughtin et al., 1999:131).

Street furniture serves for various functions, including a rubbish bin collecting trash, a bench helping people to sit down and rest on the street. Khairi (2008: 99) claim that street furniture:

- should be functionally and aesthetically pleasing;
- must be viewed as elements to strengthen the image of an area/street;
- could be developed as sub-modes or points where other activities can be anchored around them;
- should be well-designed, arrange and with good lighting facilities;
- should also be used as elements of traffic management; i.e., to demarcate pedestrian walkway with that of vehicular traffic.

Street furniture -benches, newspaper racks, pedestrian information kiosks, bicycle racks, bus shelters, and pedestrian lighting- should be properly located in urban space, particularly on sidewalks to create walkable environment. On the sidewalks, they should be located on the 'curb zone'[1] to create a buffer between pedestrians and moving vehicles (Los Angeles Walkability Checklist, 2008: 9). Street furniture should not be located on the pedestrian path of travel. Otherwise, it will reduce walkability capacity by constricting the pathway or blocking crossings (Emery, 2003 and Gassaway, 1992, cited in Southworth, 2005: 251).

[1] A typical sidewalk has three zones: the building zone, the path of travel and the curb zone.Successful streetscape designs accommodate a clear path of travel, typically in the center of the sidewalk. The curb zone, on the outer edge of the sidewalk, is typically the location of streetscape amenities (Steiner and Butler, 2007: 286).

Terrain is another important factor in walkability, especially in cities with snow and ice. Steep hills, for example, may require steps or even railings in sections to assist pedestrians.

The choice of sets of compatible street furniture can contribute to the image of a street, district or city, and it therefore may contribute to the walkability of public spaces. In historic sites, street furniture offers tangible connections to the past and sculptural potential, so it has great value in streetscape design (Crankshaw, 2009: 187). Moughtin et al (1999:131) claim that all street furniture should establish, support or strengthen the "genius loci" of a place. They define 'genius loci' as follows:

> "…the genius loci, is a mythological person taken over from antiquity and given a new meaning. The genius loci, if we put it in modern terms, is the character of the site, and the character of the site is, in a town, not only geographical but also historical, social and especially the aesthetic character." (Pevsner,1955, cited in Moughtin et al., 1999:127)

The street furniture which is selected according to the character of the city or the place, or the existing street furniture in historic sites will create an interesting and attractive streetscape and will encourage people to use the space. This can also increase the walkability capacity of the urban space.

Above all, to create walkable environment, each element for the use of a public entity should be designed and constructed to provide particularly the accessibility and utility of individuals with disabilities.

Crankshaw (2009), Duany et al (2010) and ADA (2010) underlines the general principles of the street furniture in terms of style and placement as follows:

- evaluate extant historic street furniture for its ability to serve.
- use compatible contemporary elements that should be compatible in scale and color with existing architectural and landscape features, instead of reproduction of historic furnishings

- transformers, lift stations, utility meters, cable TV boxes, and other such machinery should not be located in the streetscape front, they should locate out of sight such as rear alleys and midblock parking lots
- street furnishing should not obstruct pathways (Figure 2-11 and Figure 2-12)
- emphasize functionalism in placement instead of placing furnishings only to create patterns of design elements
- use benches and other seating to create functional seating groups in downtown parks or other pleasant places to sit
- consolidate the location of newspaper boxes, mailboxes, and similar functional elements on sidewalks wherever possible (Figure 2-11)
- do not allow express delivery service drop-offs and similar elements to cause the removal of parking spaces or narrowing of the sidewalk
- design and placement of street furniture should involve both aesthetic and safety considerations.
- all street furniture, such as telephones, drinking fountains, should be accessible to and usable by individuals with disabilities
- street furniture should be designed and placed according to the Americans with Disabilities Act (ADA).

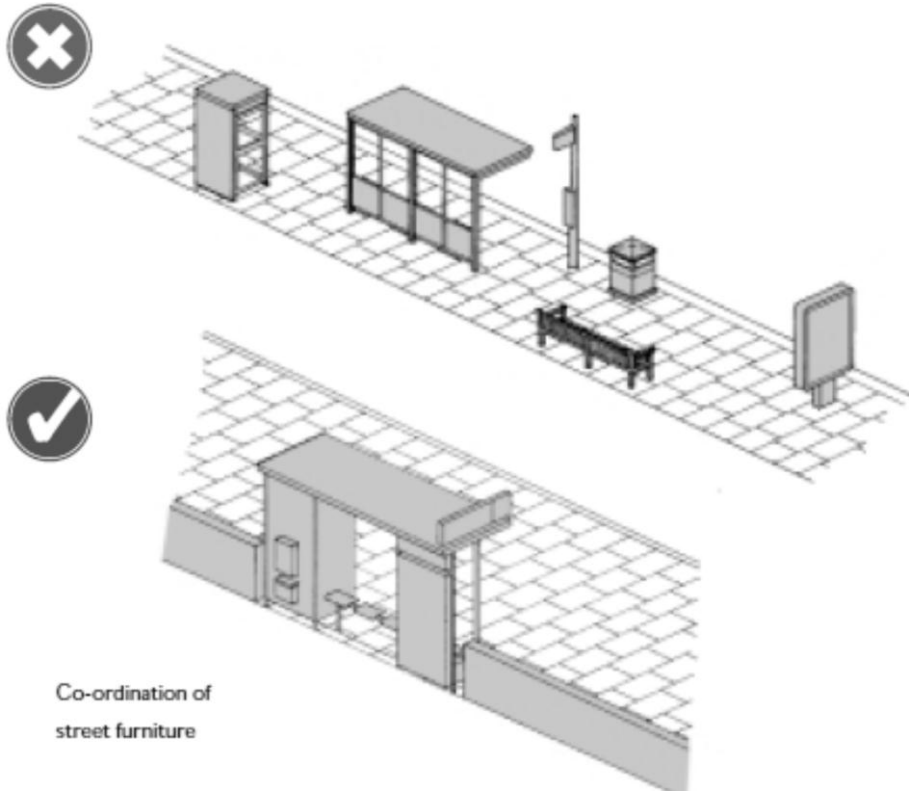


Figure 2-11: Co-ordination of street furniture for a clear walking zone (English Heritage, 2000: 27)

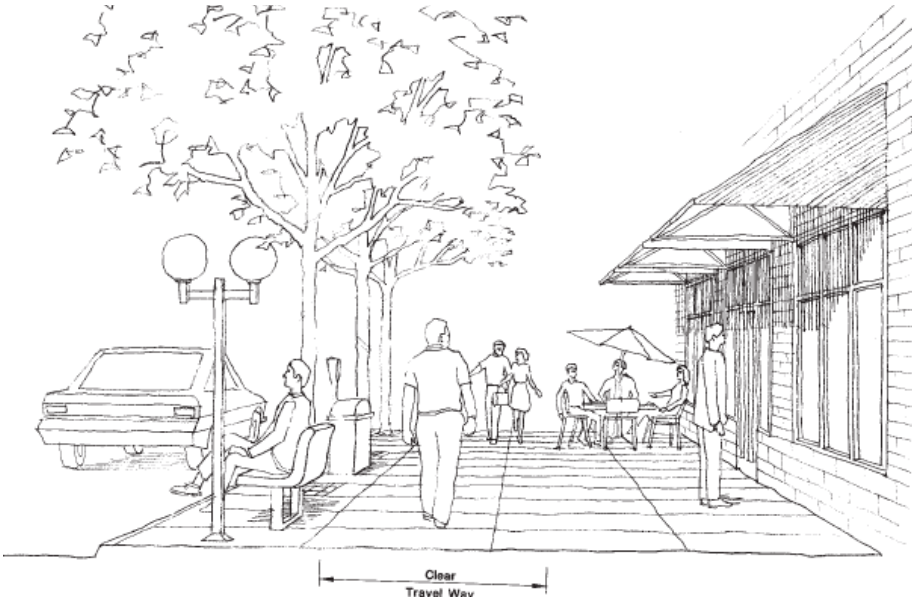


Figure 2-12: Pedestrian travel way, clear of obstructions (Pedestrian & Streetscape Guide, 2003, Figure 71)

2.3.5.4. Street Signs

Street signs are a form of graphic design in terms of color, style, communication and placement. They also contribute to the complexity and variety in street environments. In a sense, signs need to provide identity (a symbol or logo); to improve traffic flow (parking, stop, crosswalk and direction signs); to provide information on the direction or location of activities, and to identify commercial facilities (an overall appropriate context) (Rubenstein, 1992: 67 cited in Akit, 2004: 38).

Street signs can be classified into two groups: private and public signs. Private signs are used to advertise businesses and to attract the attention of customers. Public signs, however, provide the information and rules for the use of the public spaces. Some directdrivers, others direct pedestrians or help way finding (Crankshaw, 2009: 189).

Private sector signs should contribute to the aesthetics of public space and enhance the attractiveness of space. The attractiveness of public spaces is one of the qualities that enhance walkability. Following principles on private street signs are used to increase the attractiveness of streetscape:

- Sign design should be compatible with the unique features;
- The scale of signs should be read by both pedestrians and automobile drivers;
- Sign characteristics would lead to greater cohesion in the zone include size, height, distance from the street right of way, quantity of information, and placement relative to street trees, light standards, and other features;
- Sign characteristics should be compatible with the other features of the street and building, in terms of color, shape and graphic elements;
- In historic sites;
    - Sign bands should be utilized where available.
    - Larger shopfront panels above the first floor windows may be the most appropriate place for signs on single-story buildings.

- The transom location may be appropriate for placing a sign and offers a generous area.
- Functional fabric awnings are traditional locations for business identification. Narrow-width plastic awnings signs are incompatible with historic buildings;
- Window signs may be more appropriate than a sign that intrudes or architectural features. Window signs should preserve transparency (Appleyard, 1981; Southworth, 2005; Crankshaw, 2009; Guideline of English Heritage, 2000).

As for public sector signs, they should be located on the curb site, if they are to be placed on the sidewalk. If there is no space on the sidewalk, it is also possible to place these signs onto existing lamp columns, posts or buildings, where appropriate. For example, street lights and signs can be attached to buildings; other signs can be grouped on a post or column, and traffic signals can be fixed to lamp columns. Beside such measures, old signs can be retained to reinforce local character and to create a sense of historical continuity. Such qualities, like in the case of street furniture, will create an interesting and attractive streetscape and will encourage people to use the space. This can also increase the walkability capacity of the urban space. Some way-finding signs are particularly important for the accessibility and walkability of disadvantage groups. Unnecessary signs on sidewalks should be removed to reduce clutter and increase the walkability capacity of the space.

2.3.5.5. Street Lighting

Street lighting is one of the important elements to create walkable street in terms of quality of path. Especially in a commercial district, street lighting has several purposes: to light travel lane, to illuminate and accentuate building surfaces, signs and other features, to light sidewalks providing pedestrian illumination and to light parking areas, alleys and public spaces (Crankshaw, 2009: 181).

Streetlights emphasize the linearity of the street by means of their regularity and location. They form lines, usually of receding poles marked with a fixture on top, that the eyes grasp and follow (Jacobs, 1995: 299). In addition, lighting has an important role in the streetscape design and quality in terms of "light color", "light levels" and "invariability of light".

But more important than that, pedestrian-scaled path lighting can enhance night-time walking and provide a greater sense of safety (Emery, 2003 and Gassaway, 1992, cited in Southworth, 2005: 251). Thus, adequate lighting can raise the attractiveness of the street environment and also it makes big contribution to creating walkable environment.

The design of street lighting contributes to the scale of street and pedestrian. Therefore the style, height and placement of lighting are important factors which contribute to create identity and connectivity in street environment.

Style

In terms of style, it is important to:

- choose or design light poles to illuminate directional or way finding signs, banners, traffic signals or other fixtures to reduce clutter along sidewalk
- use the historic fixture in manner similar to its original purposes, locations and quantities, respect local designs in historic areas.
- select the style of lighting as compatible in scale and color with the existing streetscape and architectural features (Appleyard, 1981; Southworth, 2005; Crankshaw, 2009; Guideline of English Heritage, 2000).

Height and Placement of illumination:

- The height of streetlights should be less than 15-20 feet (4,5-6 meters);
- Lighting levels should be achieved by increasing the number of lights, not their voltage or height;
- In urban centers and retail areas, street lights should be frequent- approximately 30 feet (9 meters) - in support of nighttime activity;

- Light pollution, which could disturb near inhabitants, should be avoided;
- Street lighting should be considered in conjunction with other light sources, such as shop fronts and private buildings (Appleyard, 1981; Southworth, 2005; Crankshaw, 2009; Guideline of English Heritage, 2000).

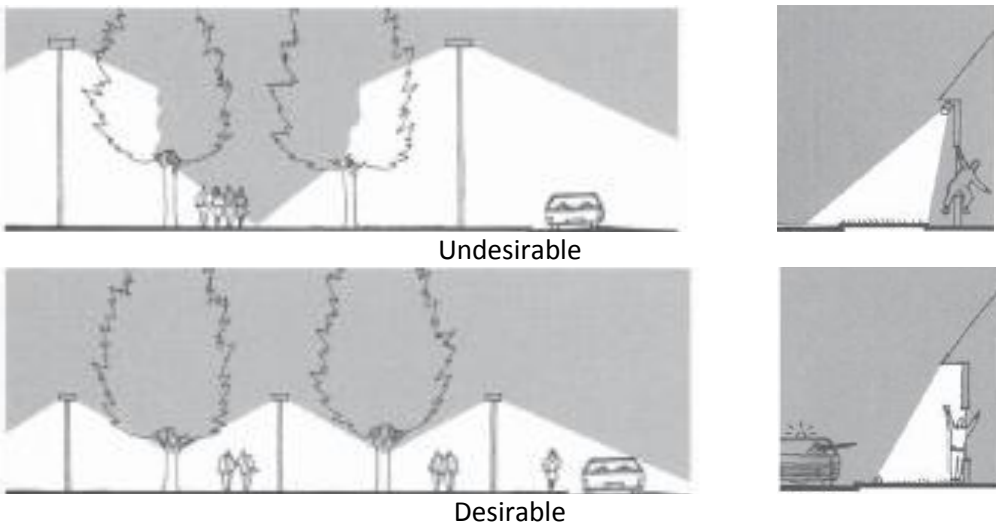


Figure 2-13: Pedestrian walkway lighting (Time-Saver Standards for Urban Design, 2003: 7-10-2 / 7-10-5)

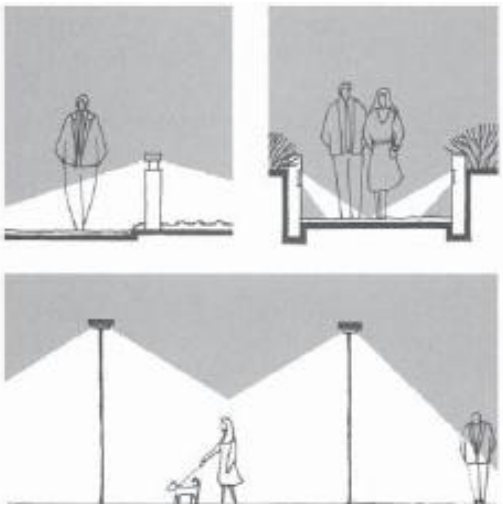


Figure 2-14: Lighting, vertical distribution overlap (Time-Saver Standards for Urban Design, 2003: 7-10-2 / 7-10-5)

2.3.5.6. Street Trees

Street trees are natural design elements that can be used to create walkable environments, to raise the quality of pedestrian areas and to define streetscape. It is claimed that (Emery, 2003 and Gassaway, 1992, cited in Southworth, 2005:251) landscape elements, such as planted verges, insulate pedestrian from moving traffic, protect pedestrians from sun and define the street space (Figure 2-15).

Moreover, Appleyard (1981: 40) indicates positive features of street trees as follows: providing shade, making the street more alive by their movement and richness, soothing to the eyes, purifying the air and increasing the oxygen content, hiding buildings, adding sense of privacy, let to contact with nature and giving warmth as opposed to the hardness of cold concrete, cutting down on noise, being able to make the streets look neat and providing residents with an opportunity to show that they care for them and creating an identity if they are unique. On the other hand, he (1981:40) underlines the negative features of street trees as: blocking the view, creating maintenance problems, taking up parking space, creating a potential hiding place for muggers and giving a feeling of claustrophobia.

Despite these negative features, they considerably contribute to the walkability capacity of urban environment by shading walkways, giving a sense of spatial buffer from street traffic, providing linear continuity and textural variety. They can also enable psychological rest with their color, as well as by moving and modulating the light and by separating pedestrians from machine (cars) with closely and regularly planted on the curb (Jacobs, 1995: 282).

> Street trees should be planted on the curb site to create a clear walking path. Trees should be planted as deciduous and canopy type to allow for shade in the summer and sunlight in the winter (Appleyard, 1981; Southworth, 2005; Crankshaw, 2009; Guideline of English Heritage, 2000). They should be spaced at a distance equal to the mature crown width to create canopies; and they should be tall enough at maturity so that the canopy is above shop windows and awnings (Appleyard, 1981; Southworth, 2005; Crankshaw, 2009; Guideline of

English Heritage, 2000). In practice, the most effective tree spacing is from 15 to 25 feet (4,5 to 7,5 meters) (Jacobs, 1995: 282). However, in the street corners, trees should be planted after 40 or 50 feet (12 to 15 meters) to provide auto safety (i.e. sight distance for safety) (Jacobs, 1995: 282).

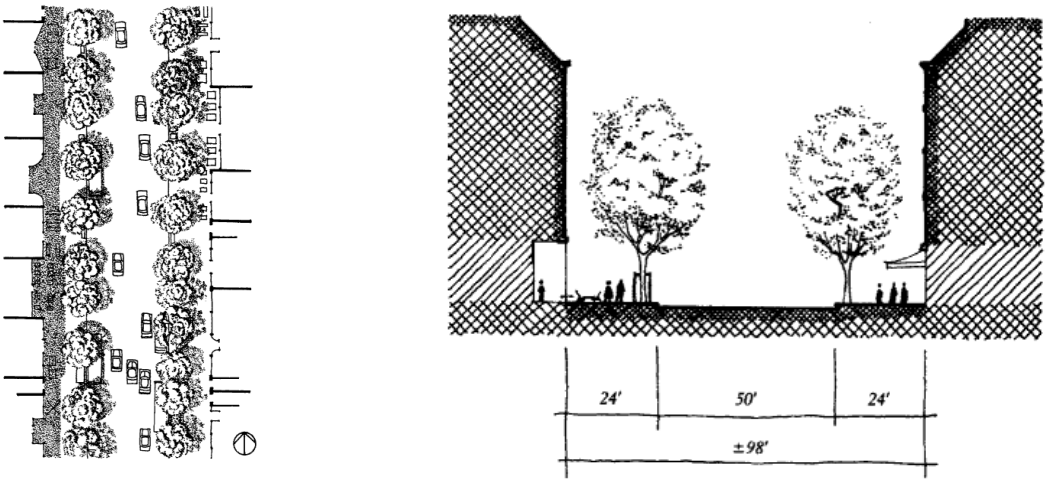


Figure 2-15: Linear continuity and spatial buffer from street traffic (Time-Saver Standards for Urban Design, 2003: 6-3-12)

2.3.6. Linkage with Other Transportation Modes

Besides having an internally well-connected pedestrian network, the accessibility and convenient links to other modes (such as bus, streetcar, subway, or train) within a reasonable time-distance is essential to provide the relationship between the larger city and region (Southworth, 2005:251). Duany et al. (2010: 3.2) claim that the transportation planning initially should be made regarding the land-use features to contribute to the effective and equitable use of all modes by all citizens. Additionally, to increase the walkability capacity, the pedestrian network should be connected with all other transportation modes. In this way, one can travel within a city without any problem from foot to trolley or subway to train or airplanes without difficulty (Garbrecht, 1981 cited in Southworth, 2005:251).

Duany et. al. (2010: 3.2) argue that car should not be prioritized among other modes of transport, and claiming:

> "…effective transit attracts pedestrians more than drivers, who must shift from one vehicular mode to another. The path from the sidewalk to the streetcar, train or bus must be direct and pleasant, not across parking lots or other dead zones." (Duany et al., 2010: 3.5)

To sum up, providing linkage of the pedestrian network with other transportation modes increases the pedestrian activity, reduces the need for car use and car parking in city centers, and connects pedestrians with the major gathering places of the city, such as the public spaces, stations, and bus stops. This is essential to create a livable and walkable environment.

2.3.7. Connectivity of Path Network

When considered walking as a mode of transportation, connectivity of path network becomes an important component of walkability. The connectivity of path network refers to the continuous and well-maintained sidewalks. It is essential for walkability, as "*interruptions in the path... discourage pedestrian travel*" (Calthorpe, 1993: 101, cited in Kolody, 2002). Burden (2000:15) defines 'connectivity' as the connection of places (such as, where people live, work, attend school, and shop) by healthy streets and by having more than one route for pedestrians, bicyclists, and wheelchair users to get to their destinations.

The Victoria Transport Policy Institute (VTPI), which is an independent research organization on transportation problems, defines 'connectivity' in terms of the number of connections in path or road network and the directness of links;

> "…a well-connected road or path network has many short links, numerous intersections, and minimal dead-ends (cul-de-sacs). As connectivity increases, travel distances decrease and route options increase, allowing more direct travel between destinations, creating a more "Accessible" and "Resilient" system.

> Connectivity can apply both internally (streets within that area) and externally (connections with arterials and other neighborhoods)" (VTPI, 2011).

Moreover, connection of path network provides walking from one place to another without encountering major obstacles. Also, pedestrian network links key trip origins and destinations between different routes.

The presence of sidewalks and other pedestrian paths, the continuity of these sidewalks and paths (i.e., the absence of significant barriers for walkers on these sidewalks and paths) also determine the connectivity of the path network (Southworth, 2005: 249). Connectivity of path network can vary according to street pattern types, as explained briefly below:

> "…as patterns become finer grained and more interconnected, blocks become smaller with higher connectivity of paths, and the ratio of access for the "crow fly" measure to actual walking distance approaches one. In addition to path distances to various points, it is important to examine the amount of path choice. Density of path intersections and block sizes can be revealing: a high density of intersections and small block sizes usually correlates with a high degree of connectivity. Barriers to pedestrian access such as cul-de-sacs and dead end streets, or busy arterials, railroad or power line rights-of-way, rivers, or topographic features must be minimized. … Cul-de-sacs might be connected to provide a continuous bicycle and pedestrian system (Southworth and Ben-Joseph 2003, 2004; cited in Southworth, 2005:249,250).

> According to Duany et al. (2010: 9.6), providing clear zones on sidewalks for walking to minimize pedestrian inconvenience is also essential to create "continuous and well-maintained sidewalks". In other words, walking zone (also called 'pedestrian travel zone' or 'path of travel') is the place between the furnishing zone and frontage zone and it should be kept clear to create a walkable environment (Figure 2-16). Furnishing zone (also called 'fixture', 'planting' or 'curb' zone) is used to place trees, streetlights, mailboxes, trash receptacles, and other permanent obstructions from impeding pedestrian flow

in the walking zone next to it. On the other hand, it should provide minimum clearance for vehicle doors to open. Frontage zone (also called 'building zone') is the space along the building face. This is the place for temporary obstructions, such as sidewalk dining and merchandise displays, which are ideally located under awnings. Outdoor dining should not be allowed to push pedestrians too far from adjacent shop windows.

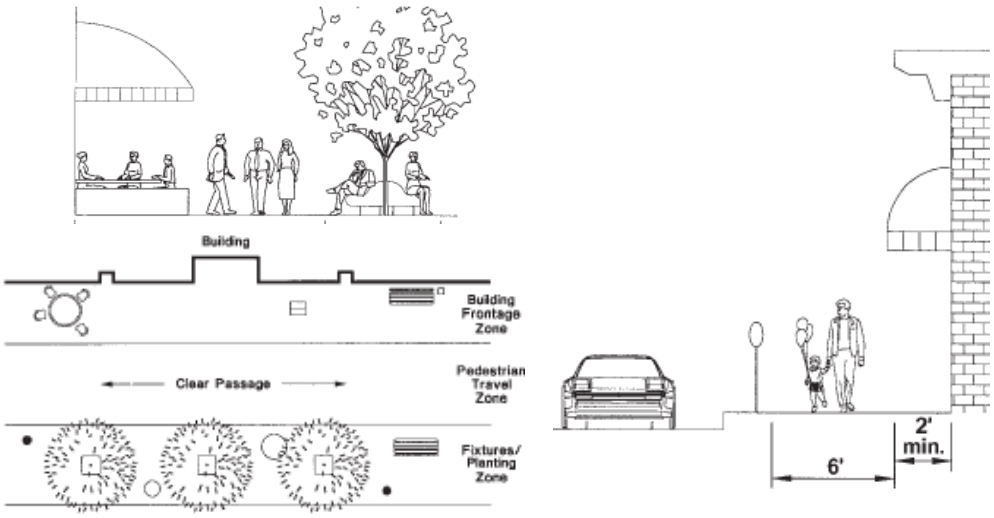


Figure 2-16: Urban streetside zones and shy distance between building and walkway (Pedestrian and Streetscape Guide, 2003: 107)

2.3.8. Accessibility

Accessibility is another crucial component that contributes to a walkable environment. It is related to "the physical dimension of the spaces" (Lotfi and Koohsari 2009: 419). Jacobs (1995: 302) defines 'accessibility' as a matter of public access to places along the street by intersecting or crossing streets or public ways. Lynch (1953, cited in Banerjee and Southworth, 1995: 68) defines the accessibility as "*low cost of movement or communication between activity locations".*

The presence of the ease of movement is also a key factor in terms of accessibility of path networks. The streets provide the connection between one place to another for pedestrians or vehicles. Also, the link facilitates "the movement of goods to sustain the wider market and some particular uses" within the street (Moughtin and Mertens, 2003: 131). Within this defined context, access to public transport, parking, orientation and unimpeded movement are the aspects of accessibility (figure 2-17) (table 2-3).

Figure 2-17: An example of a walkable street and traffic flow (Ref: http://www.pps.org/are-complete-streets-incomplete/)

2.3.8.1. Access to Public Transport

Accessibility of public transport amenities (bus stops, railway station) is another essential variable of accessibility. Primarily, the walking distance to the public transit stops or station is important. According to Southworth (2005:251), "*stations need to be spaced frequently enough to allow pedestrian access for residential and commercial zones, usually 1/4 – 1/2 min., or a 10–20 min. walk*". The bus and minibus stops should be located in highly visible and convenient areas to ease of accessibility, in addition these stops should include pedestrian shelters to protect pedestrians from all weather conditions. Moreover, the walkways should be continuous and accessible for all pedestrians to provide access to public transport for pedestrians. Another important point is that, safe access to these places should be provided at any time of the day.

2.3.8.2. Parking

Parking is an important component of accessibility and it is the dominant factor of the street space. Jacobs (1995: 305) claims that people with automobiles would like to park as close as possible to their destinations.

Street space lacks enclosure due to the parking and service zone which create discontinuity on pedestrian movement (Crankshaw, 2009:75). However, this enclosure and discontinuity on streets can be reduced by appropriate design of car parking areas. More specifically, first, the area that provides parking lots should be conducive to pedestrian movement. In other words, the presence of parking zones can enhance well-maintained and safe pedestrian areas. Second, dropped curbs or other necessary features should be provided for better accessibility. By the way, consolidating entrances and continuing walkways across entrances minimize the negative effects of curb cuts for driveways and parking lot entrances on pedestrian movement (Crankshaw, 2009:75)

On-street parking helps reducing vehicle speeds by narrowing the appearance of streets, and it creates a buffer zone between the roadway and sidewalk. Also, parked cars can be physical obstruction between pedestrians and moving car and add to pedestrians' sense

of security. However, in some cases, on street parking causes problems when there is not enough space for people to safely get out of their cars or walk between cars. Also, it leads to lack of visibility of pedestrians entering the roadway from between parked cars (Crankshaw, 2009: 94, Pedestrian & Streetscape Guide, 2003: 111). For this reason, on-street parking should be designed to be set back from intersections and crossings to allow pedestrians to see oncoming traffic (Pedestrian & Streetscape Guide, 2003:111,112).

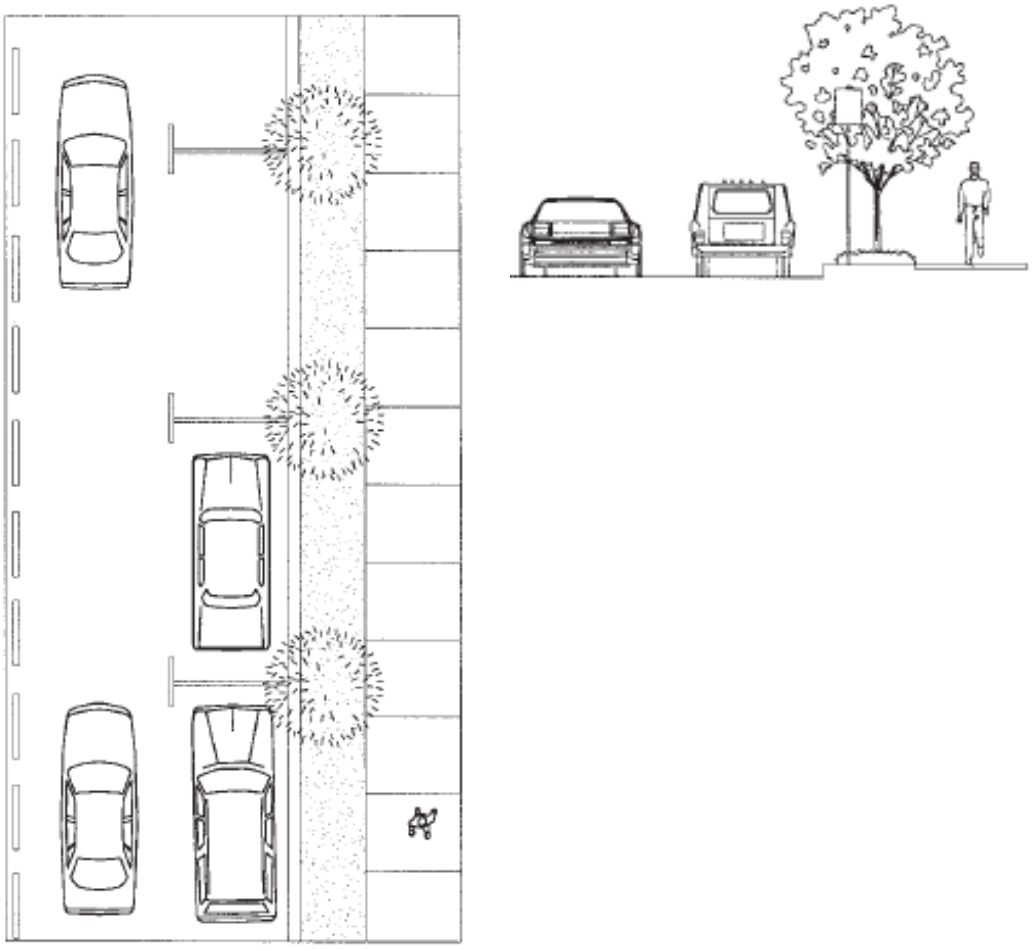


Figure 2-18: On-street parking as a buffer between street and pedestrian walkway (Pedestrian and Streetscape Guide, 2003: 111)

Figure 2-19: On-street parking and pedestrian walkway (Time Saver Standards for Urban Design, 2003: 5-1-9)

2.3.8.3. Orientation

Lynch (1953, cited in Banerjee and Southworth, 1995:135-137) argues that orientation gives the sense of clear relation of the observer with the city and its parts, and it is largely achieved by:

- **Directed lines**: strongly organized lines, with a visible or felt direction, concentrating transport and intensive uses, from which other points can be related as from a spine or axis.
- **Sequences**: also linear but not necessarily directed: the memory of a sequence of detail, of which the mind can absorb a vast amount if the sequence is maintained
- **Landmarks**: isolated objects of peculiar form associated with key locations, and to which observers can be radially oriented by sight. The power is increased where the structures are expressive, monumentally or functionally.
- **Spaces or areas**: several locations which have key importance and are of significant form such as spatial, topographical and character of structure.

- **Grid systems:** give compass directions and a basis for measure of distance and location by coordinates.
- **Diffuse**: compass orientation only, from various effects
- **Topographic**: orientation from the slope and configuration of ground in the city
- **Symbolic**: use of maps, street signs, numbers, shop signs, directional symbols, etc. They must be as clear, simple and bold as possible and not in conflict with others.

Besides, Moughtin et al. (1999:14) remark that as the symbolic dimensions, decoration such as;

- decorative skylines which help individuals to know where they are and how to get where they want to go,
- the highly decorative street corner which acts as landmark,
- the growing intensity and complexity of floorscaping patterns that direct the foot along the path to journey send,
- the concentration of decorative work on the shopfront which indicates the entrance points

…plays an important role on orientation.

In addition, legibility and permeability play a crucial role in accessibility in terms of orientation. Permeability is the extent to which an environment allows people a choice of access through it, from place to place (Bendey et al., 1985: 12, cited in Kolody, 2002: 4-5). All trips require people to navigate their way through their community using the street network. Also, legibility is the ability to read the neighborhood and to understand its layout (Bendey, 1985: 42, cited in Kolody, 2001: 4-5). Permeability enables short and direct route choices for pedestrians so that legible street pattern provides permeability by means of easily perceived street pattern by pedestrians.

Therefore, the components of orientation are directed lines, sequences, landmarks, spaces or areas, diffuse, topographic and symbolic dimensions and decoration. They are

all essential in creating an image for the user and in assisting with the reading and understanding of the city.

2.3.8.4. Unimpeded Movement

People must be able to move on the street with ease (Jacobs, 1995: 302). Creating walkable environment is primarily possible by providing ease of movement. This is possible with;

> "…a continuous corridor of accessible travel, threading its way along sidewalks and across driveways and roadways, free of abrupt changes in level, within clear width of at least 60 inches (152.4 cm) and a clear height of at least 80 inches (203.2 cm) and assures access for all sidewalk travelers, from those who use wheelchairs or push strollers to those who find their way with a cane" (Pedestrian and Streetscape Guide, 2003: 82).

Also, accessibility for handicapped can be provided with ramps on the necessary places of streets (Figure 2-20) (Jacobs, 1995:303).

A clear width of passages without obstacles, such as signs, newspaper stands, lights, benches and trash receptacles, can create walkable streets for people and also people with disabilities. Moreover, waiting and resting areas along walkways provide welcome relief to fulfill the accessibility of vulnerable people.

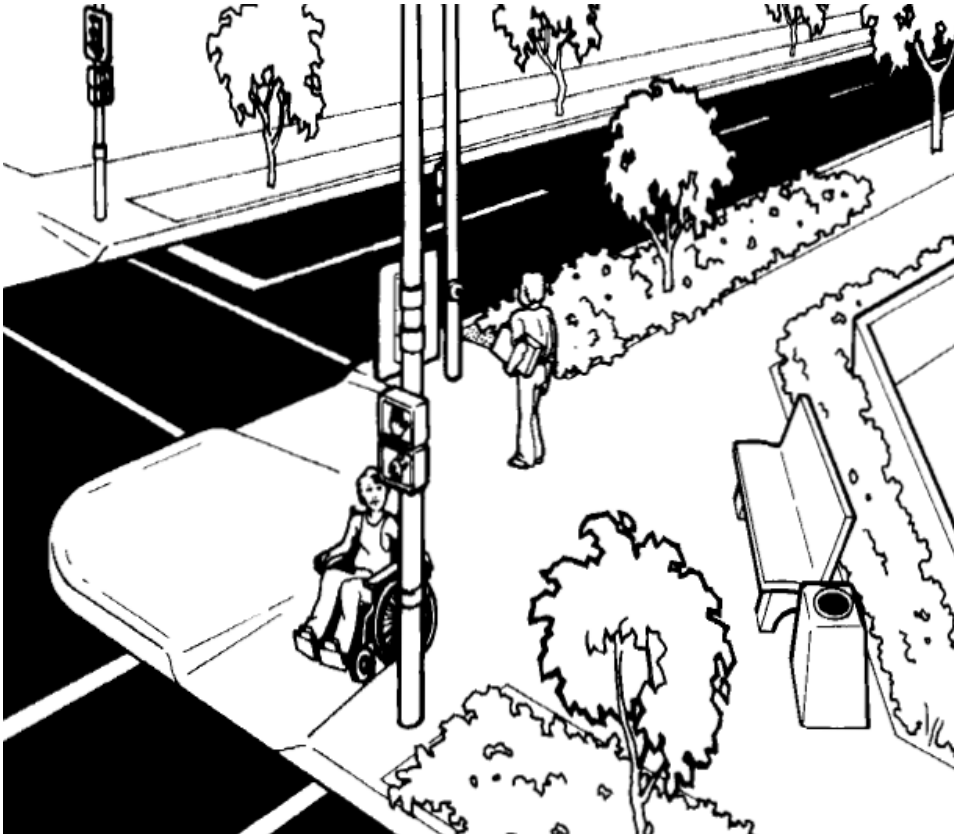


Figure 2-20: Unimpeded movement for everyone (Burden, 1995: 4)

The principles of accessibility to provide more walkable environments are as follows: (adapted from Appleyard (1981), Jacobs (1995), Guideline of English Heritage (2000), Pedestrian & Streetscape Guide (2003), Crankshaw (2009), and Duany et al. (2010));

- Parking areas should be located close to the public realm and public buildings
- Drop-off zones should be located close to the primary entrance of buildings.
- Curb cuts and ramps should be provided on paths where necessary (Figure 2-20)
- Site entrances should be well defined and conveniently located in relation to the site and the building.
- Signage system should be readable and clear for pedestrians (Figure 2-21)

- Public facilities (restrooms, phones, drinking fountains) should be located near entryways and accessible routes.
- Overhead shelters or awnings next to buildings should be provided for protection from extreme weather conditions.
- Adequate seating and lighting should be provided, and rest areas should be provided for pedestrians who must walk long distances.
- Benches and other furnishings should not obstruct walkways.
- Surfaces should be firm and leveled.
- Accessible walkways should be continuous (not dead-ends).
- Transit stops should be located in highly visible and convenient areas.

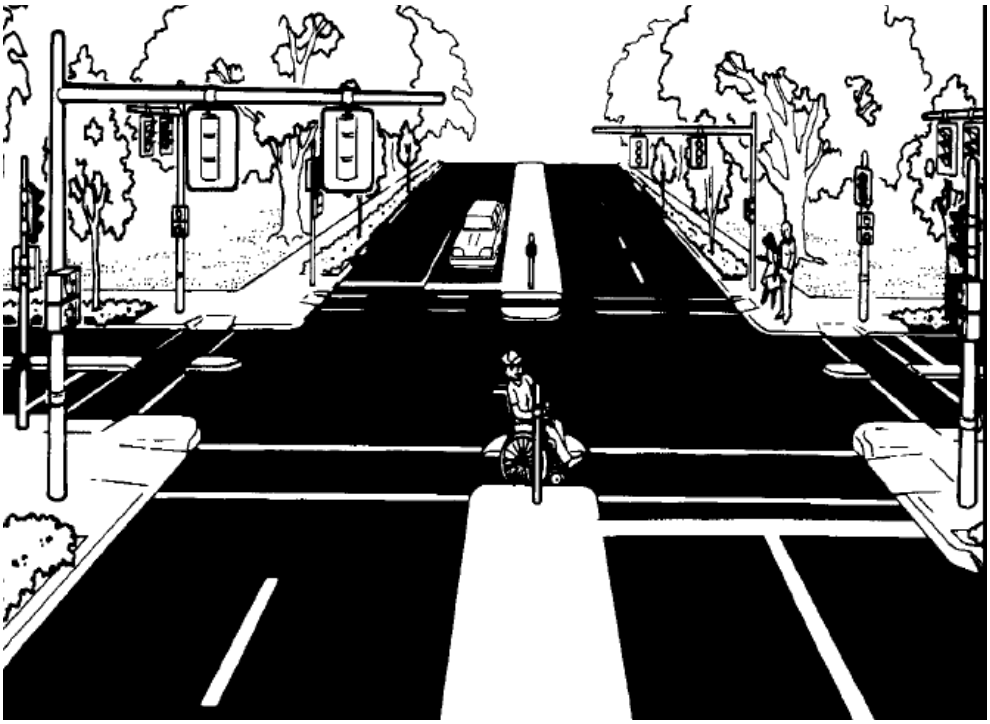


Figure 2-21: Signal placement for unimpeded movement (Burden, 1995: 5).

Table 2-3: The indicators of walkability

1) Attractiveness and convenience	– Maintenance and cleanliness of walking paths – Existence and quality of facilities for blind and disabled people – Pedestrian amenities – Availability of crossings along major roads – The existence of interesting urban scenes – A variety and diversity of land-use activities
2) Connection to open space	– The connection of street network to natural elements – The connection of street network to meeting and gathering places – The connection of street network to places with unique features and visual interest
3) Safety	– Actual safety o Street width and enclosure o Traffic safety – Perceived safety
4) Street pattern	– Grid pattern -the most advantages pattern in terms of walkability – Cul-de-sacs and lollipops – the least advantages pattern in terms of walkability
5) Quality of path	– Sidewalk width – Paving quality – Street furniture – Street signs – Street lighting – Street trees
6) Linkage with other transportation modes	– Well-connected pedestrian networks with other transit modes – Well-planned transportation plan
7) Connectivity of path network	– Having short links, numerous intersections and minimal dead-ends – Continuity of sidewalks and other pedestrian paths without significant barriers – The presence of alternative path choices to go to destinations – Providing clear zones on sidewalks for walking to minimize pedestrian inconvenience
8) Accessibility	– Access to public transport – Parking – Orientation – Unimpeded movement

CHAPTER 3

RESEARCH METHOD

This chapter explains the research method of the study based on a case study approach. The chapter compromises two main sections as research tools related with data collection and method of analysis regarding walkability. Atatürk and Uray Streets that are inter-related mixed-use streets of the historic city center of Mersin are selected as the case study areas as briefly explained in chapter two.

The streets were the major commercial streets until the beginning of the 20th century, and they are known as “the Port Streets”. Likewise, Uray and Atatürk Streets have been featured by their cosmopolitan commercial, cultural and historic characters. Case study area containing significant landmarks, such as Latin Catholic Church, Arab Orthodox Church, Atatürk House, Sursok Khan, Taş Khan and Mersin Culture Center (Old Public House) have been essential meeting and socializing places in the historic city center of Mersin. Despite these characteristics, pedestrian and vehicular traffic congestion in both Uray and Atatürk Streets generates a chaotic urban space. Especially dominance of vehicular traffic in certain parts of these streets and intersecting roads put particular difficulties on the pedestrian circulation. Thus, both streets constitute important cases to show the significance of the walkability, and therefore, livability of city centers.

Uray and Atatürk Streets significantly contribute to the image of the city. So, it is crucial to maintain their positive urban design characteristics, one of which is their walkability capacity. Today, many regeneration and conservation projects seek to improve the walkability capacity of historic city centers in order to improve the quality of urban environment, and to increase the attractiveness of these places for daily users, tourists,

visitors, investors and developers. Even in some projects, increasing the walkability of the historic centers has been considered and pursued as a part of city-branding and marketing strategies. Assessing the walkability of these public spaces and their surroundings, thus the livability of the historic city center, will therefore provide rich empirical outcomes to be used for the enhancement of the urban design quality of these streets and the historic quarter of Mersin. It should be also noted that both streets have not been subject to any research from this perspective.

This chapter explains the data gathering stages followed by the characterization of zones of the case study area, and assessment of data indicated in Figure 3-1.

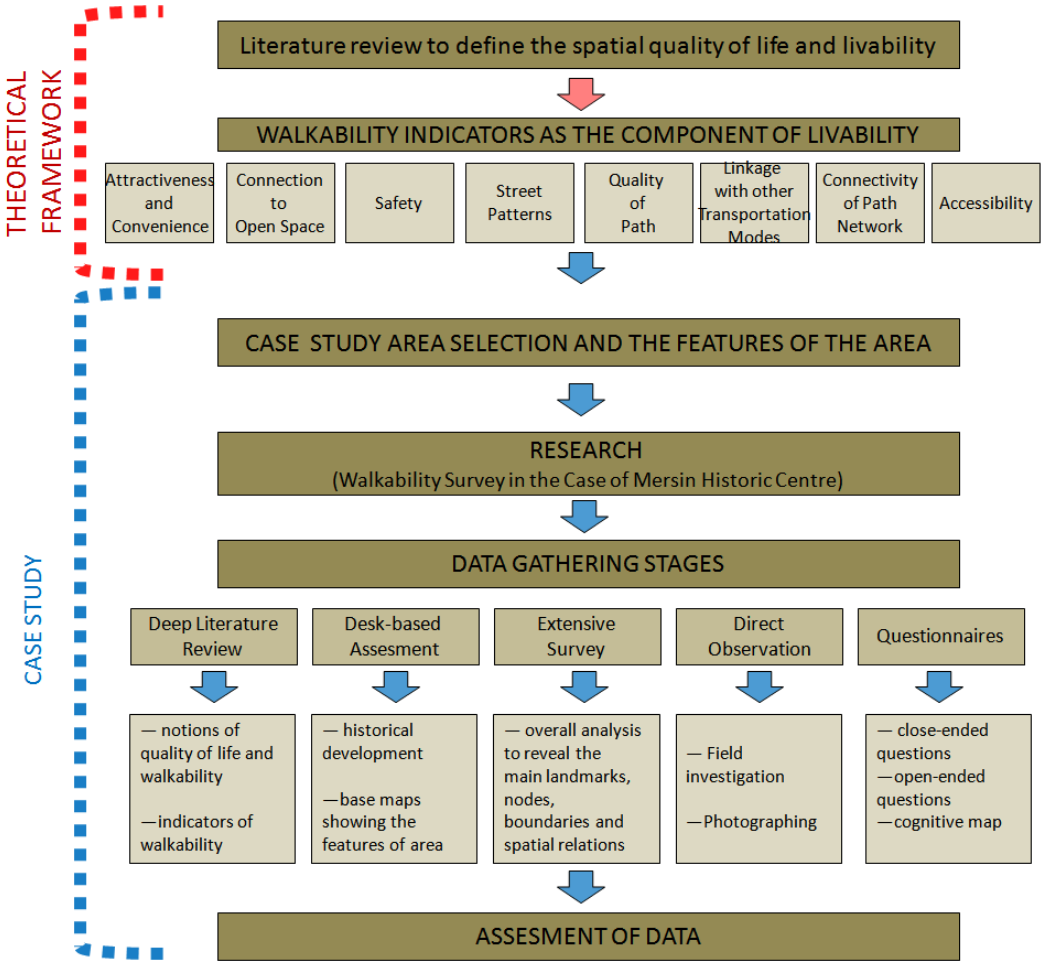


Figure 3-1: The flowchart indicating the method of the study.

3.1. Research Tools

The research followed five data gathering stages to study the walkability capacity of Atatürk and Uray Streets in Mersin. These are: literature review, desk-based assessment, extensive survey, direct observation and questionnaires.

- **Literature review**; the literature review, which includes the relationship of livability and walkability, was carried out to determine the indicators of walkability for livable environment and explained in details in Chapter 2.

- **Desk-based assessment;** desk-based assessment is the part of data gathering that includes three stages of examination. The first stage investigates the historical development of the case study area and its environs to understand its characteristics as the spine of historic city center. The second one is the evaluation of current base maps showing land-use and the characteristics of walkability. The last one includes a subjective observation revealing the walkability indicators relating to urban design principles and daily use of the case study area.

- **Extensive survey**; extensive survey was carried out to examine the case study area with its environs in a wider context of historic city center. The extensive survey in Mersin Historic City Center is crucial to define 'character zones' by an overall analysis and to reveal the main landmarks, nodes, boundaries and spatial relations.

- **Direct observation;** to find out the positive and negative factors which contribute to, or reduce the walkability quality, and to reveal the similarities and differences between character zones in terms of walkability capacity are investigated by direct observations in Uray and Atatürk Streets. Direct observations were carried out by several visits to Uray and Atatürk Streets and taking photos. The survey and observations helped to analyze pedestrian

facilities and street elements and provided primary data set on walkability indicators.

- **Questionnaires**; questionnaires were used to reveal the perception of the streets' users (i.e., visitors, pedestrians, shoppers and working population - employers and employees-). The survey includes 64 questions / statements and responses required less than 20 minutes to maximize responses (Appendix-A). There are two types of questions / statements as open-ended and close-ended. Close-ended questions are prepared according to the Likert Scale. In addition to questions, respondents are kindly invited to draw a cognitive map to measure perception of pedestrians in case study area.

In details, close-ended questions are assessed according to Likert Scale, rated on four degrees, scoring as *agree*, *partially agree*, *disagree* and *no idea*. In Likert scale, the respondents are asked to respond to each statement in terms of several degrees (usually 3-7 degrees) of agreement or disagreement that provides with the opportunity of comparing the respondent's score with a distribution of scores from well defined group (Kothari, 2006: 84-86).

Questionnaires were conducted with user groups from different age, gender, education and occupation groups in order to reach varying perceptions. Three 'age' groups were identified as the questionnaire respondents; young people between 16-34 years old, middle-aged people between 35-59 years old and elderly people who are older than 60 years old.

These age groups are identified according to the walkability capacity of people. It is possible to assume that the age group between 16 and 34 years old are more active on the street than other groups. They tend to walk and use the streets more than other age groups. People between 35 and 59 years old and people older than 60 years old tend to walk less than the people between 16 and 34.

In this context, 72 questionnaires were conducted in Atatürk and Uray Streets. The number of questionnaires was determined based on the estimated user numbers in the case study area. In a week day, the number of users was counted for an half an hour in six different time-intervals of the day. The total number of streets users in a weekday was determined accordingly table 3-1 indicates the number of pedestrians passing from the street in half an hour and the approximate number of people in time period determined according to peak and rush hours for the case study area. Especially, the beginning and ends of working hours and lunch break hours were observed as peak hours (Figure 3-2).

The approximate number of people using the case study area is 7186 at 07.00 to 22.00, when the streets are vital and actively used. The study accepted that 479 people (7186people/15 hours (07.00-22.00)) use the streets per hour. Thus, approximately 15% (72*100/479) sampling was done by 72 questionnaires.

Table 3-1: The counting results in case study and approximate number of people in time periods.

Periods	**The number of people in half an hour** *(counted numbers)*	**Approximate number of people in time period** *(counted number X N[2])*
07.00-09.00	263	(263 x 4) =1052
09.00-12.00	120	(120 x 6) =720
12.00-13.30	812	(812 x3) =2436
13.30-17.00	152	(152 x7) =1064
17.00-19.00	381	(381 x4) =1524
19.00-22.00	65	(65x6) =390
	Total:	**7186 people**

[2] "N" is the number of half an hour in each period. For example, the first period (07:00-09:00) includes 4 half an hour. So, total (average) number of pedestrians is calculated by multiplying the counting result with 4.

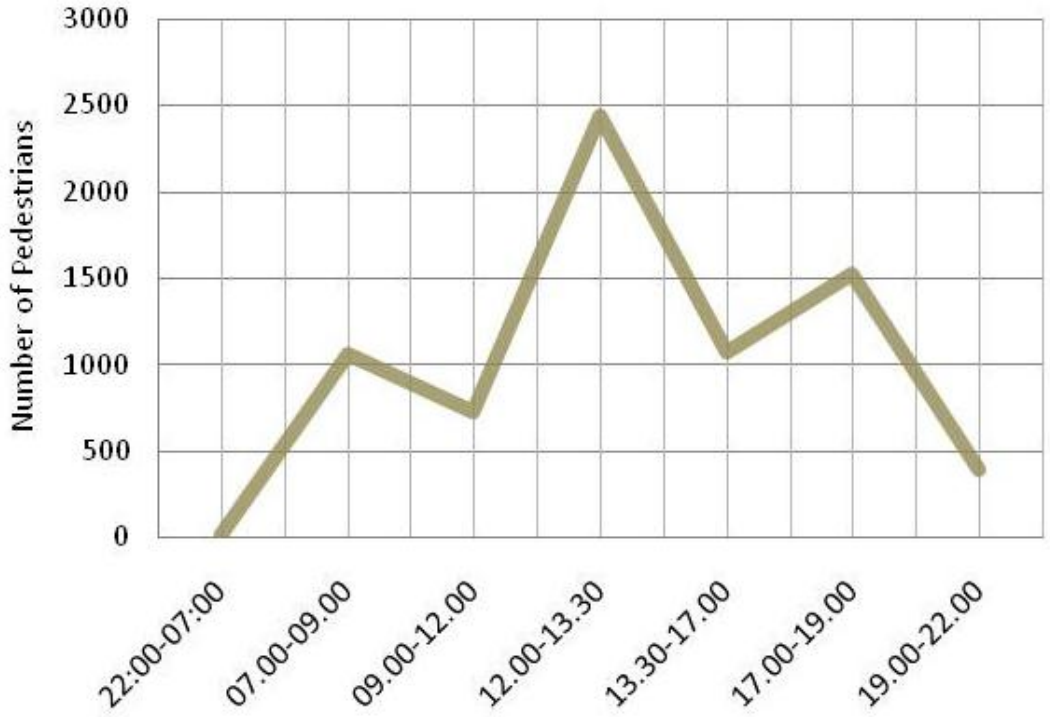


Figure 3-2: Peak and rush hours for pedestrian movements in case study area.

As seen in the table 3-2 among the respondents, 44% were young, 43% middle-aged and 13% elderly. Also, to achieve a substantial representation of the respondent groups, the questionnaires were conducted with twelve pedestrians from vulnerable groups. Furthermore, more specifically, the respondents are composed of various occupations; shop assistants (11%), shopkeepers (18%), pedestrians (47%), officers (15%) and street vendors (9%).

Table 3-2: The distribution of respondents according to age groups, occupation and gender

		GENDER		NUMBER OF RESPONDENTS	
		Female	**Male**	**Number**	**%**
AGE GROUPS	16-34	15	17	32	44%
	35-59	13	18	31	43%
	+60	1	8	9	13%
	Total	**29**	**43**	**72**	**100%**
OCCUPATION	Shop assistants	6	2	8	11%
	Shopkeepers	4	9	13	18%
	Pedestrians	14	20	34	47%
	Officers	4	7	11	15%
	Street vendors	1	5	6	9%
	Total	**29**	**43**	**72**	**100%**

The results of close-ended questions are examined in SPSS program to provide information about characteristics of the sample in each zone of the case study area. Descriptive statistical analyses, cross tables and frequencies, were conducted in SPSS version 11.01 to evaluate answers of questionnaire for each zone as a spatial statistical evaluation. The details of the questions in the questionnaire are explained in the following section regarding the indicators of walkability.

At that point, it is necessary to note that, in addition to close-ended questions, which provide choices of answers to the respondents (such as, 'agreed', 'partially agreed', 'disagreed' and 'no idea'), there are open-ended questions which let the respondents to claim their opinions with their own words. Especially, the opinions of respondents about pedestrian zones, the width of streets and traffic congestions were asked with the questions 10, 14 and 15 (Appendix-A), such as "What part of case study area could be designed as pedestrian zone?".

Furthermore, at the end of the questionnaire, the respondents are kindly requested to draw a cognitive map of Atatürk and Uray Streets to understand their spatial cognition about the case study area. Especially, their foci, landmarks, nodes, zones, edges and

paths, as defined by Lynch (1960), are investigated to understand their perception. Such examples of cognitive maps obtained through questionnaires are presented in Appendix-B.

Cognitive maps are used to understand the spatial cognition of individuals; in other words, how places are arranged in people's mind to successfully navigate through an environment, to estimate distances, to recognize route cues, to able to make and read maps, and generally to understand the relative location in space of different places" (Gifford, 1987: 32). Cognitive maps are used to understand how far a space is legible in people's mind. Thus, legibility which means "the ease with which a setting may be recognized and organized by people" is also a key concept in terms of cognition (Gifford, 1987: 33). It is very important while assessing the walkability capacity of urban spaces.

3.2. Method of Analysis Regarding Walkability Indicators

The walkability indicators, explained in detail in Chapter 2, and used for the study of walkability capacity of Atatürk and Uray Streets, are: *attractiveness and convenience, connection to open space, safety, street patterns, quality of path, linkage with other transportation modes, connectivity of path network and accessibility*.

This section explains in detail each walkability indicator and the research tools that were used to understand it, while analyzing the case study area.

- Attractiveness and convenience: Attractive and convenient street network makes the streets more walkable by inviting pedestrians to the street. According to literature review:

- the existence and good quality of pedestrian amenities and facilities for all pedestrians, but particularly for vulnerable groups,
- the regular maintenance and cleanliness of walking paths,
- planting, the existence of interesting urban scene and transparency of well-maintained shop fronts,

- the variety and diversity of land-use activities and events, making the public space attractive, and
- the availability of crossings along major roads.

…enhance the attractiveness of the streets. For the assessment of this indicator, the related questions in the questionnaire presented in table 3-3 and research tools indicated in table 3-8 are used. It is important to note that "*the cleanliness of walking paths*" is a variable of not only 'attractiveness and convenience', but also 'quality of path' and 'actual safety' indicators. Therefore, it is investigated under the indicators of "quality of path" and "actual safety".

Moreover, the questions related to the part of "availability of crossings along major roads" are only asked in Uray Street zones "Z1, Z2", because Atatürk Street is a pedestrianized area that naturally accommodates no pedestrian crossings.

Table 3-3: Attractiveness and convenience

	VARIABLES OF INDICATOR	Related Questions and Statements in Questionnaire
ATTRACTIVENESS-CONVENIENCE	Maintenance and cleanliness of walking paths	- Uray and Atatürk Streets are clean and well-maintained streets
	Existence and quality of facilities for blind and disabled people	- There are enough arrangements and facilities for blind and disabled people - Bumps, traffic lights and pedestrian crossings are designed by taking into consideration of disabilities.
	Pedestrian amenities (coverage, benches, public toilets)	- There are enough sheltering provided by building canopies for pedestrians to be protected from sun light, rain, snow and wind - There are enough benches and rest places for pedestrians along Uray and Atatürk Streets
	Availability of crossings along major roads	- There are sufficient street crossing along Uray Street - The street crossings along Uray Street are well-situated - The street crossings along Uray Street are located on easily accessible places - The street crossings along Uray Street are easily visible

Table 3-3: continued

	VARIABLES OF INDICATOR	Related Questions and Statements in Questionnaire
ATTRACTIVENESS-CONVENIENCE	The existence of interesting urban scene	- Where are the focal points and interesting places of Uray and Atatürk Streets?
	A variety and diversity of land-use activities	- The variety of activities on Uray and Atatürk Streets arouse people's interest

- Connection to open space: The existence of natural elements, meeting and gathering places, unique features and visual interest and their physical connections with Uray and Atatürk Streets are the measures to understand the connection between open spaces and the case study area. Table 3-8 (research tools table) summarizes the issues to be examined and the research tools under this indicator.

- **Safety:** Livable and walkable urban space requires safety of pedestrians. Safety of streets is analyzed in two parts; 'actual safety' and 'perceptual safety'. Street width / enclosure and traffic safety (with the help of traffic calming measures) are the measures of 'actual safety'. On the other hand, active street life (the presence of natural surveillance) and the usage of buildings are the measures of 'perceived safety'. Table 3-4 presents the questions and statements related to safety in the questionnaire. The research tools and elements of street pattern are indicates in table 3-8.

The questions and statements in the questionnaire related to the "street width and enclosure";

- Uray Street is wide enough for both vehicular and pedestrian traffic
- Do you think, some parts of Uray Street's sidewalks should be widened? Which parts?
- Do you think, some part/s of Uray Street should be pedestrianized? Which parts?

…are only asked in Uray Street "Z1, Z2", because Atatürk Street is a pedestrianized street and does not have any specific sidewalk.

Likewise, as Atatürk Street is already a pedestrianized street, the following statements related to “traffic safety” are only asked for Uray Street “Z1 and Z2”;

- It is difficult to cross the street for me in Uray Street
- Crosswalks are safe for old people, disabled people, children and parents with young children in Uray Street

Table 3-4: Safety

	VARIABLES OF INDICATOR		Related Questions and Statements in Questionnaire
SAFETY	Actual Safety	- Street width and enclosure	- Uray Street is wide enough for both vehicular and pedestrian traffic - Which part/s of Uray and Atatürk Streets can you walk easier and more comfortably - Which part/s of Uray and Atatürk Streets you can walk more difficult and uncomfortably - Do you think, some parts of Uray Street’s sidewalks should be widened? Which parts? - Do you think, some part/s of Uray Street should be pedestrianized? Which parts?
		- Traffic safety	- The vehicular traffic disturbs the pedestrian movement - Car drivers should drive slower - It is difficult to cross the street for me in Uray Street - Crosswalks are safe for old people, disabled people, children and parents with young children in Uray Street - Pedestrian ways are safe for old people, disabled people, children and parents with young children in Uray and Atatürk Streets - On-street car-parking disturbs the pedestrian movement
	Perceived Safety		- It is a noisy street - Noise is resulted from car traffic - Facilities open until late night (restaurants, cafes, bars, night clubs etc) make the street safer at night - It will be a much safer street if there are more residential uses

- Street pattern: Street pattern is examined by the questions and statements in the questionnaire and street pattern map of Uray and Atatürk Streets and their environs. Table 3-5 presents the related questions with street pattern in questionnaire to be answered. The research tools and elements of street pattern are indicated in table 3-8.

Table 3-5: Street Pattern

	VARIABLES OF INDICATOR	Related Questions and Statements in Questionnaire
STREET PATTERN	Grid pattern Cul-de-sacs and lollipops	- It is easy and comfortable to walk along the avenue - It is an easily accessible avenue from other places by walking - Vehicular traffic on the street is a problem for pedestrians to access to different parts of Uray and Atatürk Streets - Vehicular traffic on the parallel streets is a problem for pedestrians to access to Uray and Atatürk Streets

- Quality of path:

Ideal sidewalk width, quality of pavement, right location and sufficient number of street furniture, the placement of street signs, street trees and street lightning are the measures of 'quality of path'. For the assessment of path quality, the related questions and statements to be answered are shown in table 3-6 and the other research tools are shown in table 3-8.

Table 3-6: Quality of Path

	VARIABLES OF INDICATOR	Related Questions and Statements in Questionnaire
QUALITY OF PATH	Sidewalk width	- Sidewalks are wide enough for pedestrians
	Paving quality	- There is no interruption for pedestrians along sidewalks - The pavement slabs are well-laid out and do not disturb pedestrian movement - Level variations along the sidewalks pavement (ramps, etc) are adequately safe for pedestrians - Pavement slabs along the sidewalks are not deformed or broken - There is no unusual obstacle for pedestrians along the sidewalks

Table 3-6: continued

	VARIABLES OF INDICATOR	Related Questions and Statements in Questionnaire
QUALITY OF PATH	Street furniture	- Street furniture provided along the street is sufficient - The location of street furniture obscure the pedestrian movement
	Street signs	- Store signs on the streets aesthetically disturb pedestrians - Traffic signs on the streets are sufficient
	Street lighting	- It is a well-lit street at night - It is a safe street at night - Cumhuriyet Square is a well-lit square at night - Cumhuriyet Square is safe at night - Ulu Bazaar Square is a well-lit square at night - Ulu Bazaar Square is safe at night
	Street trees	- Street trees disturb pedestrian movement - The flower pots on streets disturb pedestrian movement

- The linkage with other transportation modes: This indicator helps us to examine whether the pedestrian network is well-connected with other transportation modes and whether the transportation plan of Uray and Atatürk Streets is well-planned.

These questions are answered by examining the stops and stations of the public transit modes and their availability and accessibility to pedestrians. The transportation plan of the case study areas is also studied to answer these questions in spatial base (table 3-8).

- Connectivity of Path Network: There are four issues to be examined regarding this indicator: i)alternative path choices, ii) short links, numerous intersections and minimal dead ends, iii) continuity of pedestrian network and other pedestrian paths without significant barriers, and iv) providing clear zones on sidewalks for walking to minimize pedestrian inconvenience. The first two measures are examined through the map analysis. The latter two measures are already studied under the indicator of 'quality of path', as indicated in table 3-6.

- Accessibility: Access to public transport, parking, orientation and unimpeded movement are the measures to examine the accessibility of Uray and Atatürk Streets. Access to public transport is investigated by desk-based assessment, extensive survey and photographing. The assessment of parking is made through the questionnaires (table 3-7) and intensive survey, direct observation and photographing (table 3-8). In order to analyze the orientation of Uray and Atatürk Streets in terms of legibility and landmarks, the informants are asked to draw cognitive (mental) maps on Uray and Atatürk Streets. Finally, unimpeded movement is investigated under the two sub-measures of attractiveness and convenience which are "existence and quality of facilities for blind and disabled people" and "pedestrian amenities" as indicated in table 3-3.

Table 3-7: Accessibility

	VARIABLES OF INDICATOR	Related Questions and Statements in Questionnaire
ACCESSIBILITY	Parking	- On-street car-parks disturbs pedestrian movement
	Orientation (direct lines, sequences, landmarks, spaces or areas, diffuse, topographic and symbolic dimensions and decoration)	- Cognitive maps through the following question: Please draw a map of Uray and Atatürk Streets showing its connected streets with lines and memorable buildings with nodes
	Unimpeded movement	*Examined with the questions of "existence and quality of facilities for blind and disabled people" and "pedestrian amenities".*

As mentioned above, literature review, desk-based assessment, extensive survey and direct observations are used as the research tools, in addition to the questionnaires. These research tools are presented together within the context of variable of walkability indicators in table 3-8.

Table 3-8: Research Tools

		METHOD OF ANALYSIS					
		Research Tools					
	VARIABLES OF INDICATORS	Literature Review	Desk-based Assessment	Extensive Survey	Direct Observations		Questionnaires
					Field Investigation	Photographing	
ATTRACTIVENESS AND CONVENIENCE	Maintenance and cleanliness of walking paths				+	+	+
	Existence and quality of facilities for blind and disabled people				+	+	+
	Pedestrian amenities (coverage, benches, public toilets)				+	+	+
	Availability of crossings along major roads				+	+	+
	The existence of interesting urban scene		+		+	+	+
	A variety and diversity of land-use activities		+		+	+	+
CONNECTION TO OPEN SPACE	The connection of street network to natural elements		+	+	+	+	
	The connection of street network to meeting and gathering places		+	+	+	+	
	The connection of street network to places with unique features and visual interest		+	+	+	+	

Table 3-8: continued

			METHOD OF ANALYSIS					
			Research Tools					
	VARIABLES OF INDICATORS		Literature Review	Desk-based Assessment	Extensive Survey	Direct Observations		Questionnaires
						Field Investigation	Photographing	
SAFETY	Actual Safety	Street width and enclosure	+	+	+	+	+	+
		Traffic Safety	+	+	+	+	+	+
	Perceived Safety		+			+		+
STREET PATTERN	Grid Pattern Cul-de-sacs and lollipops		+	+	+			+
QUALITY OF PATH	Sidewalk width		+	+		+		+
	Paving quality		+	+		+	+	+
	Street furniture		+	+		+	+	+
	Street signs		+	+		+	+	+
	Street lightning		+	+		+		+
	Street trees		+	+		+	+	+

Table 3-8: continued

		METHOD OF ANALYSIS					
		Research Tools					
	VARIABLES OF INDICATORS	Literature Review	Desk-based Assessment	Extensive Survey	Direct Observations		Questionnaires
					Field Investigation	Photographing	
LINKAGE WITH OTHER TRANS.MODES	Well-connected pedestrian network with other transit modes	+	+	+	+		
	Well-planned transportation plan	+	+				
CONNECTIVITY OF PATH NETWORK	- Having short links, numerous intersections and minimal dead-ends - The presence of alternative path choices	+	+	+	+		
	- Continuity of sidewalks and other paths without significant barriers - Providing clear zones on sidewalks for walking	+					+
ACCESSIBILITY	Access to public transport	+	+	+	+	+	
	Parking	+	+			+	
	Orientation	+	+		+	+	
	Unimpeded movement	+	+			+	+

CHAPTER 4

URAY AND ATATÜRK STREETS IN MERSİN

This chapter studies the historical development of Mersin, morphological development of the historic city center and historical development of the case study area in details to determine current issues and dynamics in Uray and Atatürk Streets that positively or negatively affect the quality of life in terms of walkability. The first section evaluates socio-economical dynamics, commercial activities and transportation networks as the factors effecting development of Mersin as a Mediterranean Port City. After that, it investigates the historical development of Mersin regarding urban planning activities to get overall information about macroform of the city. The second section explains the morphological development of the historic city center to understand crucial position of Uray and Atatürk Streets within the historic characteristics of Mersin. Moreover, it discusses the recent issues about the central business district (CBD) of the city within the context of commercial dynamics in Mersin. Then, the third section examines the historical development of Uray and Atatürk Streets by means of significant structures and networks in city center to analyze different dimensions of case study area. After that, the general features of the case study site are summarized for better understanding. The fourth section investigates the essential characteristics of the case study area and its environs. Finally, it briefly explains the reasons to choose case study area within the context of Mersin historic city center.

4.1. Historical Development of Mersin as a Mediterranean Port City

4.1.1. Socio-economical Development

Mersin, which has been an important trade city in Turkey, emerged in the 19th century, when new world economy and urban dynamics caused significant impacts on the port cities, and has been rapidly integrated into the world of capitalism (Adıyeke and Adıyeke, 2004: 69, Selvi Ünlü, 2007: 286).

The city has many similarities with the Middle Eastern port cities that have been developed in the same period. Because, similar to Alexandria, Beirut, Hayfa, Sayda and many other port cities in Eastern Mediterranean coasts, Mersin has been a focal point by means of the capitalist economy and historic events that caused increasing commercial activity (Selvi Ünlü, 2007: 266).

Similarly, socio-spatial characteristics of the Eastern Mediterranean port cities like the forms of residential districts, religious buildings, schools and domestic architecture could be followed in Mersin as the outcomes of cosmopolitan culture (Beyhan and Uğuz, 2002: 105).

Transportation networks are the most essential factor causing development of Mersin as a crucial port in history. In the 19th century, Tarsus (Berdan) River sediment had made the port of Tarsus impossible to use. After the piers of Tarsus and Kazanlı lost the function of the port, Mersin has been developed more (Adıyeke ve Adıyeke, 2004; Selvi Ünlü, 2007). The pier of Mersin has been the main port connecting Tarsus to the sea and being a place frequently mentioned by the Consuls (Ulutaş, 2006: 32, cited in Selvi Ünlü 2009: 7).

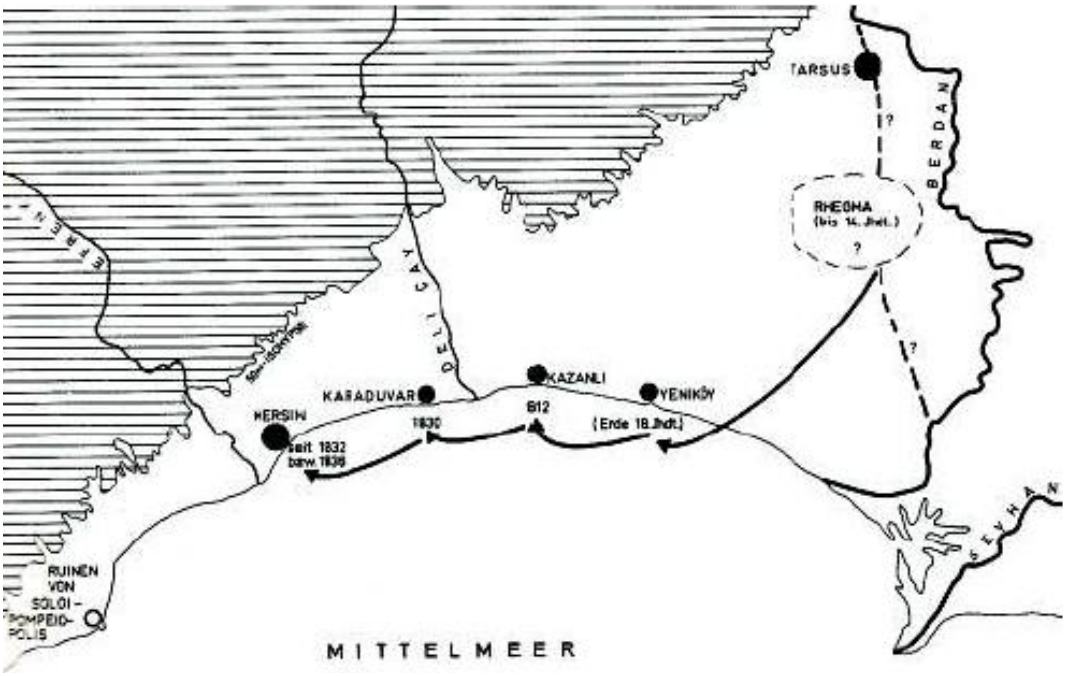


Figure 4-1: Displacement of the port from Tarsus (Rhegma Lake) to Mersin (Rother, 1971:67, cited in SelviÜnlü and Ünlü, 2009: 16)

In summary, Mersin has been emerged as an Eastern Mediterranean port city by means of changing role and functions of Tarsus in Çukurova Region. In addition, changing geographical conditions, economic dynamics and transportation facilities have enhanced significant position of Mersin.

Selvi Ünlü (2007) enumerates reasons of development of Mersin as: increasing cotton production in Çukurova due to American Civil War, migration from Eastern Mediterranean cities and near environment to Mersin, use of timbers from the Taurus Mountains to build the Suez Canal and railway construction in the second half of the 19th century.

Especially, Mersin has been rapidly developed as a crucial port city by cotton production in Çukurova and related transportation network in the region. Developing commercial capacity and transportation facilities caused increasing population. In that period, maritime trade agencies were established. Then, the Consuls of many countries had been moved from Tarsus to Mersin (Durak, 2006: 60). As a result of socio-economic

development, Mersin gained a cosmopolitan socio-economic structure, where especially non-Muslims preferred to live in the center.

Aforementioned transportation facilities are the macadam road between Mersin-Adana constructed in 1873, the railway between Mersin-Adana constructed in 1886 and the road between Mersin-Silifke-Mut-Karaman constructed in the beginning of the 20th century. The railway had significant effects on the socio-economic and spatial development of Mersin by increasing accessibility. Therefore, Mersin became an essential center for not only maritime trade but also commercial relations with near environment and the south-eastern Anatolia.

In Mersin, the industrialization period started with the spinning factory, which was opened in 1888, and the soap factory, which was established in 1892 (Akkaya, 2004: 338). So, the industrial production started in Mersin where only transit commodities had been traded by the port.

As a result of aforementioned development, the population of Mersin increased. At the end of the 19th century, there were seven neighborhoods –Lazkiye(Kiremithane), Medrese (Hamidiye), Çardak (Bahçe), Hristiyan, Frenk (Yeni) and Cami Kebir neighborhoods- in Mersin (Adıyeke and Adıyeke, 2004:78). The urban population of Mersin included Muslim, who came from near environs, Rums (Turkish Greeks), Armenians, Christian Arabs from Syria, Marunis (Catholic Arabs), Jewish, Frenks and traders who came from Cyprus, Crete and Rhodes (Yorulmaz, 2002: 6). The macroform of the City was determined by these neighborhoods settled around the port and railway station.

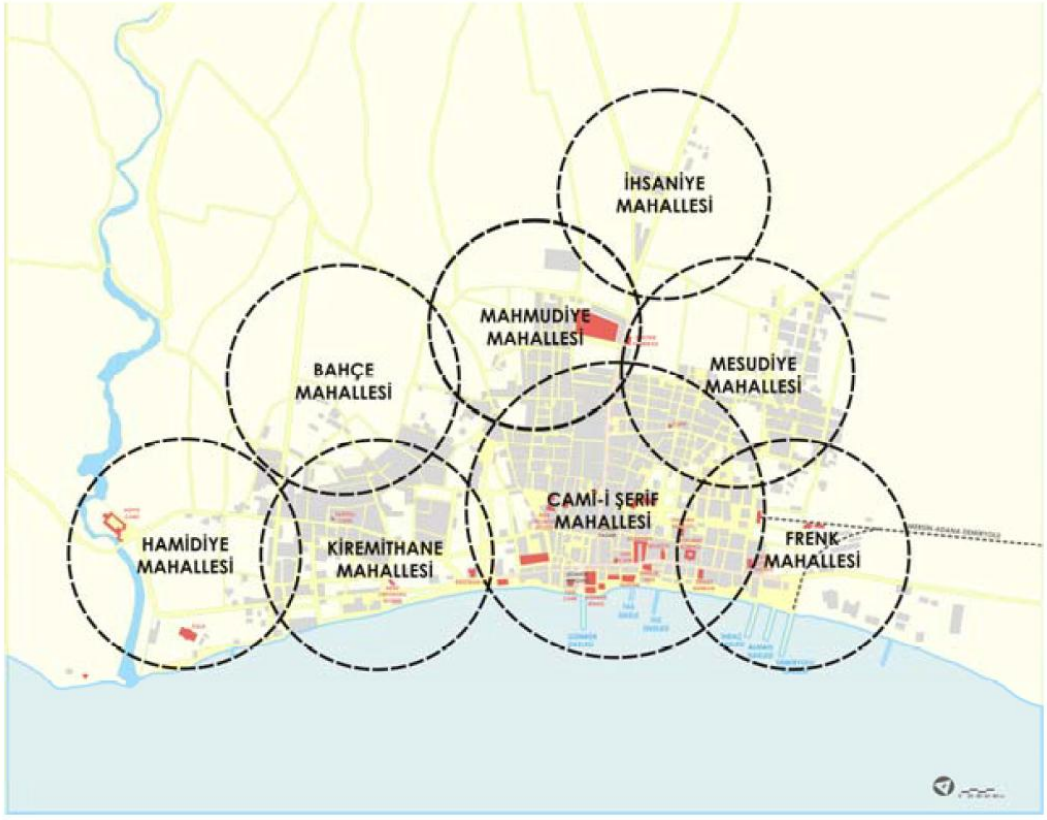


Figure 4-2: Neighborhoods in Mersin (Selvi Ünlü, 2007:229)

The development through western axes continued in the 20th century. Because of climatic conditions, the street pattern of Mersin was developed in the north-south direction; i.e., from mountains to sea, to let to air streams. However, the recent planning works and developments ignore these characteristics of Mersin (Adıyeke and Adıyeke, 2004: 79).

Migration is the most essential factor affecting on the recent spatial character or the macroform of the city. After the Turkish War of Independence, Rums migrated from Mersin and Turks from Thessaloniki and Crete moved to, and settled around Mersin that is turning point in the social structure of the city (Adıyeke and Adıyeke, 2004: 79).

Enforced migrations from South-eastern and Eastern Anatolia regions have increased the population of the city, bringing along squatter housing in the east and northeast of the City. Ongoing migration especially causes economical problems in Mersin.

Economical segregations cause spatial segregations in the city: mid-high income groups have moved to northern and western boundaries, while low-income groups have settled at the northeastern and eastern boundaries of the City (Aydoğan, 2011: 52).

Modern port of Mersin has been operated since 1961 and large-scale industries in the road of Mersin-Tarsus-Adana let to increasing number of commercial units and offices (Develi, 2001: 177). The most essential effect of the port is that, the location of port supports east-west development axes. In addition, Uray Street, which had facades to coastline till the 1930s, today is located approximately five hundred meters far away from the coastline because of fillings along coastline, where a boulevard, parks and recreational areas were constructed. Therefore, coherence and integrity between sea and city had been lost in the historic city center.

As a result, the sea is the most significant factor on the establishment of Mersin and development of Mersin as a metropolitan city from a coastal town. Mersin, has 150 years history, lets the region of Çukurova to open through Mediterranean world. And so, Mersin has developed with essential economic, social and spatial transformations since the second half of the 19th century. The macroform of the city has formed around a single center of growth and development. Therefore, Uray Street that was commercial center during the establishment of Mersin and it is still the heart of the CBD of Mersin.

In the next section, the spatial development of Mersin is evaluated by means of urban planning studies in details.

4.1.2. Historical Development of Mersin in terms of Urban Planning Studies

The historical development of Mersin's macroform could be investigated by the planning periods. *Ebniye Nizamnameleri*[3]*,* which was primarily implemented in İstanbul in 1848-

[3] *"Ebniye Nizamnameleri"* were regulations determined by the Ottoman Empire to control urban development.

49, had been implemented in all cities after 1864. Yenişehirlioğlu et al. (1995: 21) underline that the development of Mersin during unplanned period would be formed by these regulations.

In these regulations that especially includes terms about roads, gridiron structured urban development was aimed (Akçura, 1981; Çelik, 1998 cited in Ünlü, 2009: 30). Therefore, the spatial form / urban pattern of Mersin was developed on a grid-iron street pattern in the 19th century (Ünlü, 2009: 30).

In 1938, the first plan of Mersin was prepared by Herman Jansen. At that period, the conservation of urban context and controlled development were the matters, on which Jansen was expected to address (Ünlü, 2009: 32). Jansen was influenced by Camillo Sitte ve Garden City planning approaches (Tankut, 1993 cited in Ünlü, 2009: 32). Emphasizing the historical and natural values and integrating them into to urban life were essential features of these approaches (Ünlü, 2009: 32, 33). Jansen Plan underlined two significant characteristics of Mersin: the port which could empower the city by commercial activities, and the sea which would let Mersin to be a "Coastal City" (Ünlü, 2009: 33).

The area between İstiklal Street and Efrenk *(Müftü)* Stream were formed by the decisions of Jansen Plan. However, the plan could not respond to the rapidly increasing urban population and urban development. Nevertheless, the vision of Jansen Plan which envisaged the development of "commercial city", "coastal city" and "the relation between sea and city" and was enhanced by pedestrian ways and promenade, let Mersin to gain an identity and the plan stands a significant position in urban development and planning history (Ünlü, 2007: 429).

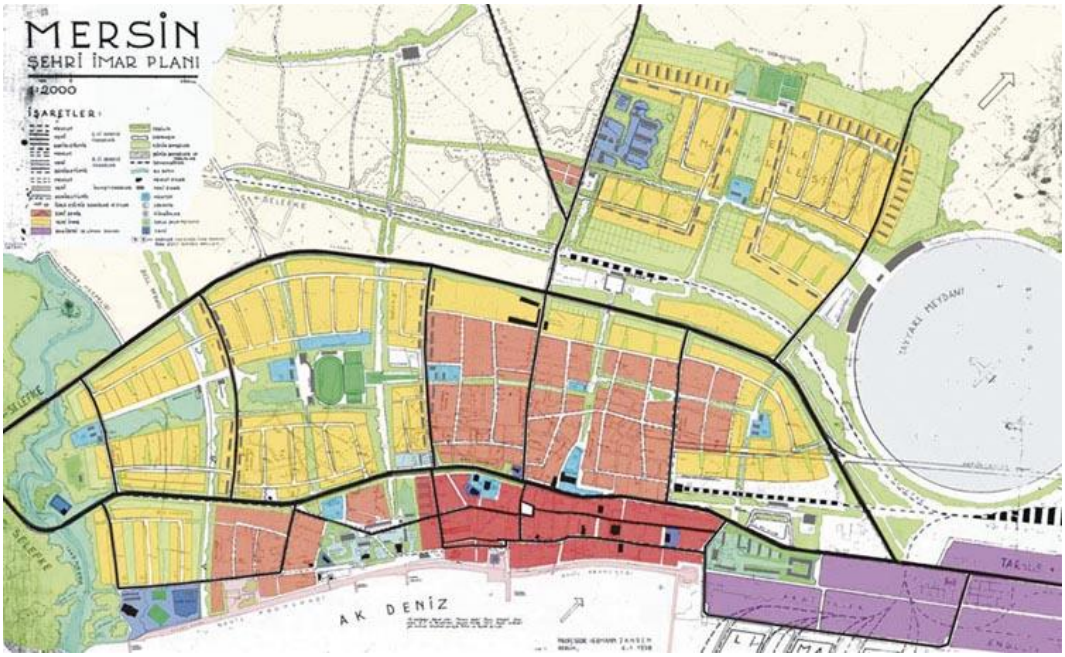


Figure 4-3: Jansen Plan - 1938 (Ünlü, 2007: 429)

The plan prepared by the Bank of Provinces *(İller Bankası)* was the first comprehensive plan of the city. The plan proposed a western development through İstiklal, Silifke and Atatürk Streets. In this plan, the macroform of the city was determined as a compact city including residential districts with decreasing density from the city center to the peripheries (Ünlü, 2008: 1009). This plan decided about two crucial factors affecting the macroform of Mersin: first, the functions relating with the Port, and second, Ring Road around the city. The location of the port determined the land-use decisions about industrial activities, warehouses and low-income groups (Hisarlı, 1988: 26).

In addition, the plan decreed the transformation of arable area in the west of center into residential districts. So, the city was developed as a linear-form. On the other hand, in the built up areas of city, especially in historic city center, density increased according to terms of regulations. Because the Regulations caused increases in building heights, parallel to the width of streets (Ünlü, 2008: 1009, 1010). Therefore, the spatial development in Mersin historic city center has been decreed by the regulations instead of development and regeneration plans since 1963. Moreover, there were approximately 240 applications for the modification in plans between 1963 and 1980

(The Municipality of Mersin, 1980: 36). The applicability of the plan is moderately low as followed from the applications including modifications.

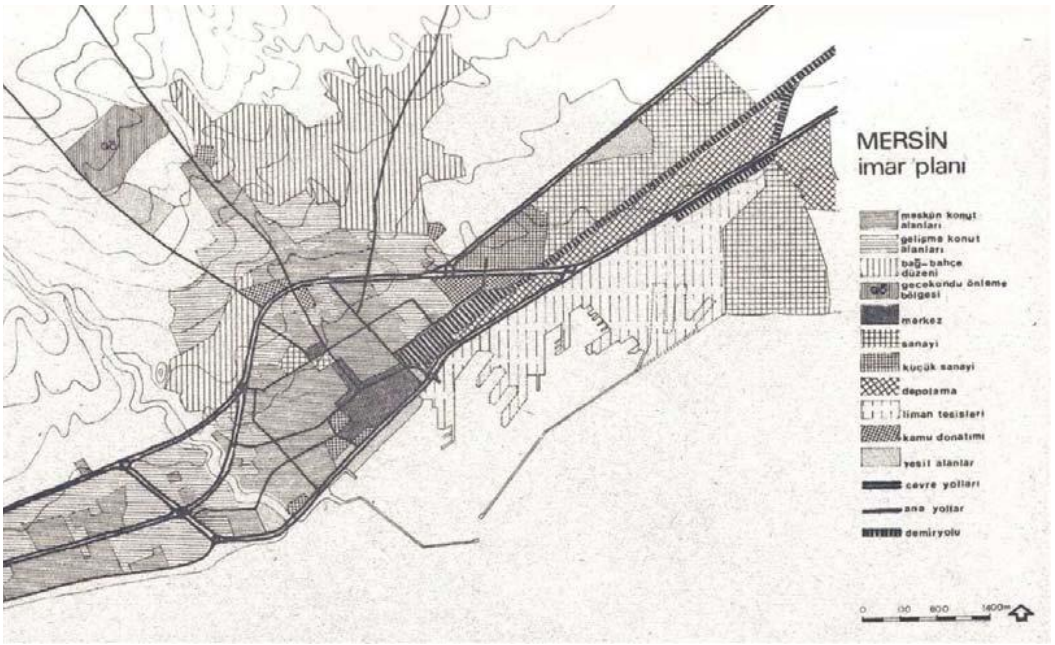


Figure 4-4: The plan prepared by the Bank of Provinces (İller Bankası) (Akçura, 1981:175, cited in Ünlü, 2009: 36)

The plan that prepared by the Bank of Provinces was revised in 1976, but revised decisions could not control urban development. In 1980, the Ministry of Urban Development and the Municipality of Mersin co-operated to prepare urban environmental development plan in 1/25.000 scale (Özgür, 1987 cited in Hisarlı, 1988, 31). The plan aimed to block east-west linear development and let to development through northern site of Mersin. Moreover, enhancement of relation with sea and development of the second business district at the west of Efrenk Stream were the main objectives of the Plan. However, that plan could not control or guide the rapid urbanization dynamics of Mersin, either. The population in 1983 exceeded the projections of the 2000s in relation with Free-zone Area which was established next to the Port (Özgür, 1987, cited in Hisarlı, 1988: 32).

The Act No: 3194 (Urban Development Law / 1985) gave the authority of planning from the central government to local authorities. After that, in Mersin, there have been so

much partial planning activities, but that partial plans could not established a wider context and comprehensive approach for Mersin (Ünlü, 2007: 431,432).

As a result, most of the Plans prepared for Mersin could not sufficiently consider the characteristics of the city and could not predict the development tendencies and differences in localities. During the planned period, the changes in Mersin adversely affected the identity of city and deteriorate the characteristics of Mersin (Ünlü, 2009: 41).

Lastly, 1/25.000 scaled Master Plan that prepared by the Metropolitan Municipality of Mersin in 2008 aimed to relieve pressure on the CBD and develop the Center as an Eastern Development Corridor towards the Port. In addition, the plan envisages the revitalization of historic city center, focusing on Uray Street. However, currently, there is no implemented project on the historic city center.

In this section, the historic development of Mersin has been investigated as a macro-space analysis including main transportation networks, city center, industrial activities, the development of port and residential districts to evaluate recent dynamics and issues in case study area in a wider context of city. The next section examines the morphological development of the historic city center of Mersin to get detailed information about the case study area.

4.2. Morphological Development of Historic City Center

This section examines the morphological development of historic city center is by investigating the land-use transformation by means of spatial references and a “Meso-Space Analysis”. In other words, while investigating Uray and Atatürk Streets that are the most essential commercial focuses of Mersin from its establishment, evaluating the development of historic city center would determine current dynamics. As mentioned above, the Port and port-related commercial activities have significant effects on the establishment and development of Mersin.

In the 19th century, modernization changed the production of raw materials, market relations and maritime trade systems in Mediterranean Basin (Selvi Ünlü and Ünlü, 2009: 76). As seen in many Middle Eastern port cities, a second commercial focus or city center could not be developed in Mersin (Selvi Ünlü, 2007: 268). The commercial spine of the city, Uray Street and related focuses -Gümrük Meydanı (The Square of Custom) and Yoğurt Pazarı (The Bazaar of Yoghurt) - created a triangular network. Commercial network was developed near the sea and the related piers, and so another city center far away from the sea could not be developed in Mersin (Selvi Ünlü, 2007: 268).

The piers were the essential aspects influencing the city center development. In the second half of the 19th century, Mersin became one of the most important ports of Eastern Mediterranean; so many piers were constructed in various locations (Selvi Ünlü and Ünlü, 2009: 76). There are detailed and regular records of Gümrük İskelesi (*The Pier of Custom*) at the main square of the city, Taş İskele (*Stone Pier*) in front of Taş Han (*Stone Khan*) and Demiryolu İskelesi (*The Pier of Railway*) at the end of railway (Selvi Ünlü, 2007: 139, 140). People from varying cultures and geography had selected locations parallel to sea from the Railway Station till to the building of Custom for their commercial activities (Mersin Yerel Tarih Grubu, 2001: 6).

The city had been developed between the east-west direction, on Uray Street, and the south-north direction from the sea through the mountains (on Hastane Street). In the 1930s, Çakmak Street determined the eastern boundary and Efrenk (Müftü) Stream determined the western boundary of city. The neighborhood known as Cami Şerif that is one of the oldest districts was the core of the city, and all commercial buildings and structures were built in this neighborhood. There were not only commercial buildings, like Khans, Banks, Piers or Stores, but also administrative buildings, and the buildings with other functions, such as the Government House, Churches Mosques and residential buildings (Yenişehirlioğlu, 2004: 181).

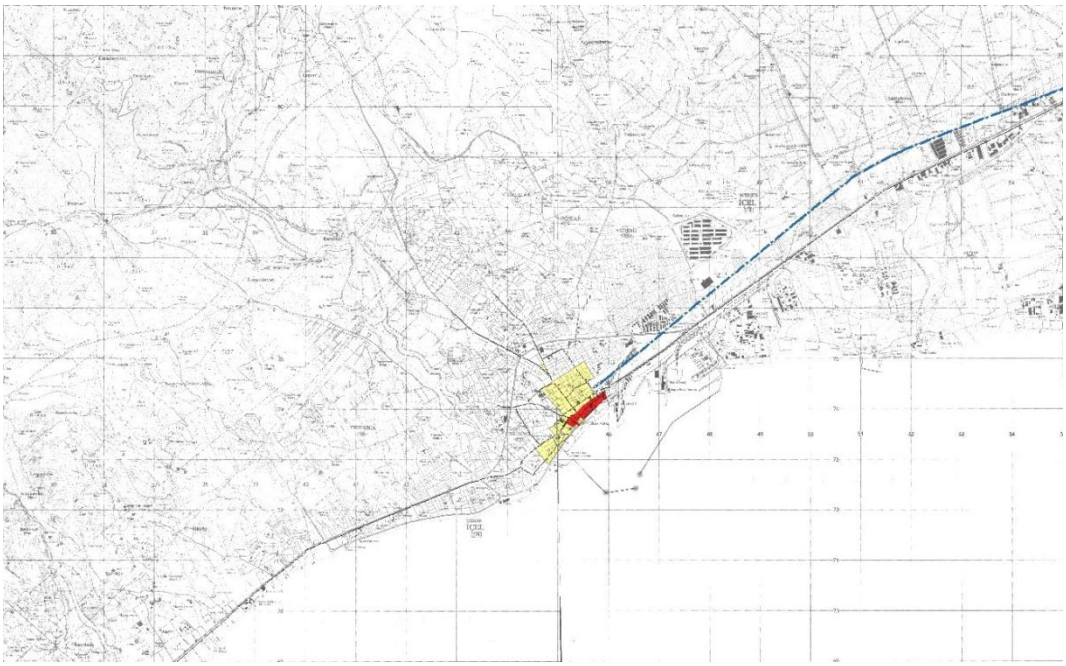
Jansen Plan determined the historic city center as “commercial city – old city”, and proposed the conservation of its characteristics. However, the plan of the Bank of Provinces (1963) did not intervene to the historic city center and developed some

guidelines to control the development activities. Therefore, the development of historic city center had been controlled in terms of general regulations. After 1963, when general principles of regulations were in force, the height of buildings and general density were increased more and more.

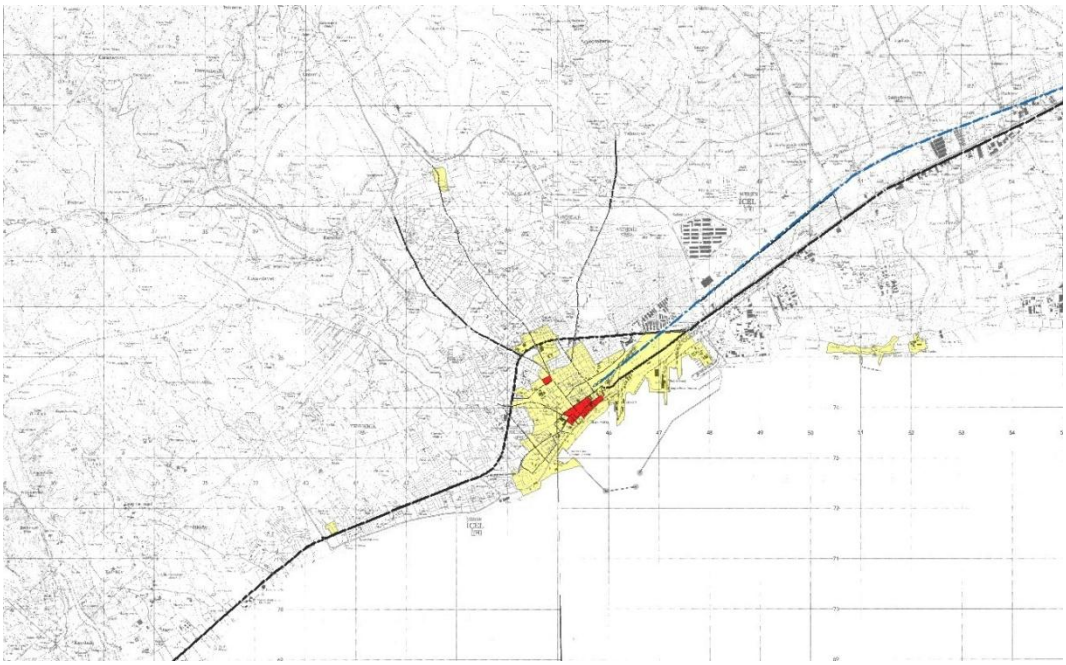
As mentioned above, the center of Mersin had been developed parallel to Uray Street between 1930 and 1960. However, the commercial activities in Uray Street, where the first trading activities began, had expanded towards Hastane and Çakmak Streets perpendicular to Uray Street and Silifke and İstiklal Streets parallel to Uray Street. In defined context, commercial activities in historic city center of Mersin developed along the main streets. Figure 4-5 indicate the development of the macroform, historic city center and transportation networks.

Some major landmarks which used to complement the identity of Mersin, such as Azakhan, Gümrük Binası and Yeni Cami, were demolished after the plan of the Bank of Provinces. At the same time, new high-rise buildings, like Yaşat İşhanı and Mersin Otel, were built in the historic city center. Therefore, the significant characteristics of historic city center based on human scale and spatially coherent silhouette were disrupted by high-rise developments (Ünlü, 2008: 1012).

Since the early-2000s, commercial activities along the main streets have been expanded into whole building lots. Today, the historic city center around Uray Street and its near environment still conserve its unique characteristics, but lost its dynamics and commercial potential. Changing consumption habits, huge scale store investments and shopping malls have caused deterioration process in historic city center. Especially, Forum Shopping Mall (2007) at the west of old city that known as Pozcu Neighborhood and recently opened Marina Shopping Mall have negatively affected commercial potential in historic city center.

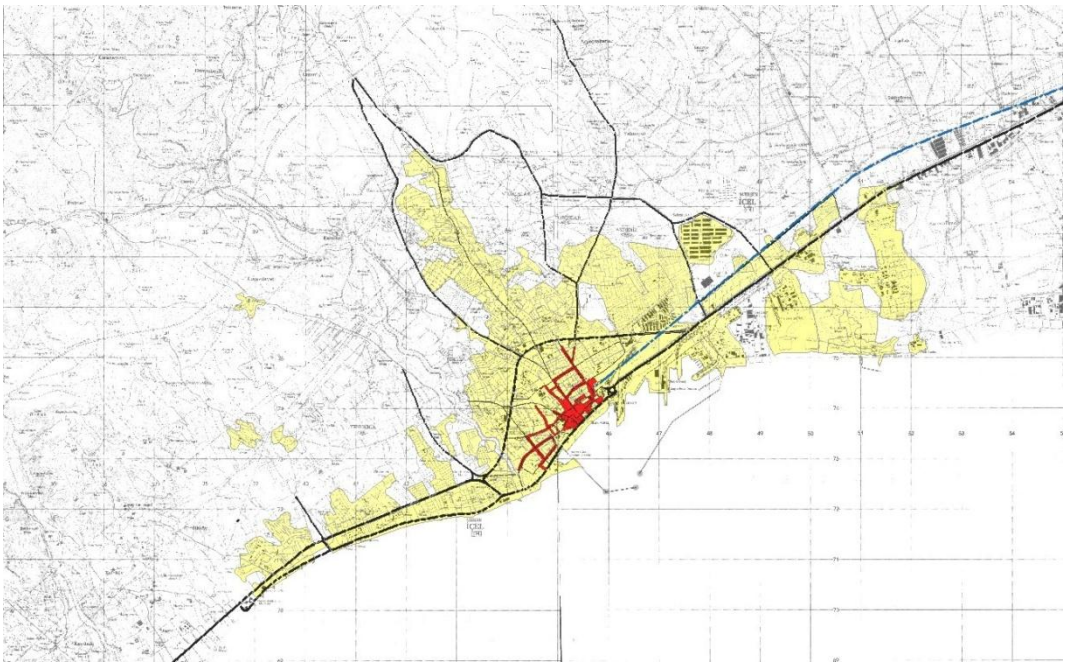


a.1930

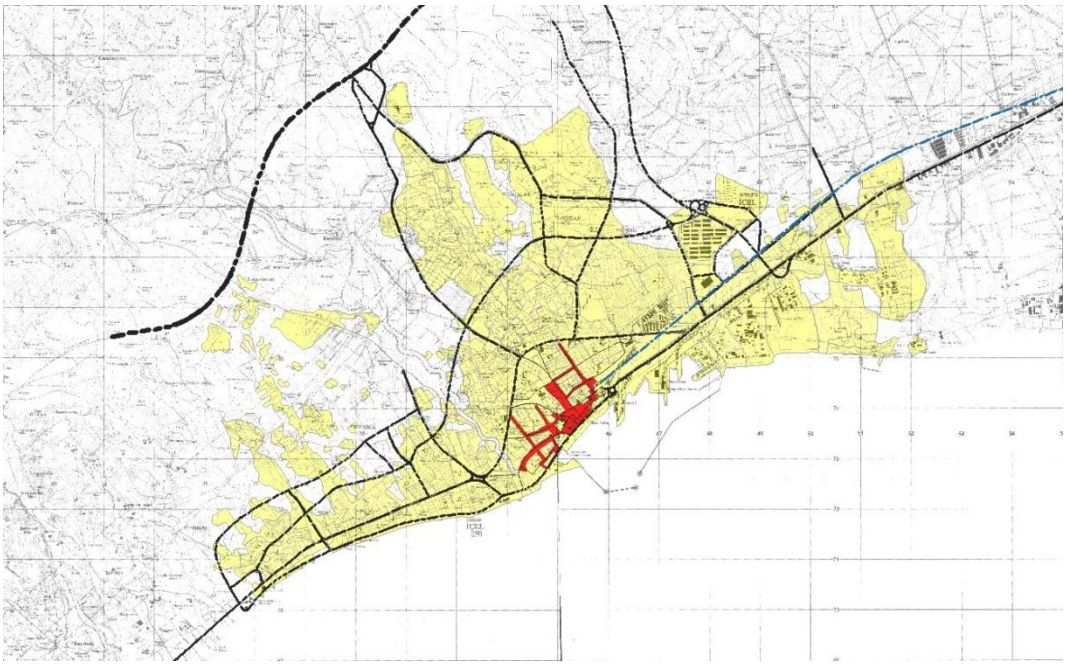


b.1960s

Figure 4-5: Historical development of Mersin and the CBD between 1930 and the 1960s (prepared by Z.S.Belge using 1/25.000 scaled recent base map from, base maps and reports prepared by the Municipality for planning activities from the archive of the Center for Mediterranean Urban Studies, Mersin University).



c.1985



d.2000

Figure 4-6: Historical development of Mersin and the CBD between the 1960s and the 2000s (prepared by Z.S.Belge using 1/25.000 scaled recent base map from, base maps and reports prepared by the Municipality for planning activities from the archive of the Center for Mediterranean Urban Studies, Mersin University).

4.3. Historical Development of Uray and Atatürk Streets

As mentioned in Section 4.1.2, in the 19th century, the spatial form of Mersin had been guided by *Ebniye Nizamnameleri* in terms of grid-iron axes that are Uray, Hastane, Çakmak and Silifke Streets (Ünlü, 2007: 426). Uray Street has been the main spine of the center of Mersin since the 19th century. So, banks, khans, offices and stores were settled in Uray Street by means of commercial relations (Ünlü, 2007: 426).

There are underlying studies[4] that evaluate the development of Uray Street within the context of Mersin. The following detailed spatial evaluation is prepared by means of these studies. Furthermore, this study enhances the context of Uray Street with recently completed field investigations and spatial analysis to determine current potential and issues in historic city center.

Uray Street was primarily known as "İstasyon *(Railway Station)* Street" and "Hükümet *(Government)* Street". After the 1920s, the street was called "Uray *(the Municipality)* Street" in relation with the Municipality Building (Mersin Yerel Tarih Grubu, 2001:6). Uray Street connecting the Railway Station to Gümrük Meydanı *(Square of Custom)*, as mentioned above, is the first axis where the city was developed. Today, there are many historic artifacts that are the witnesses of the history of Mersin on Uray Street and Cami Şerif Neighborhood.

The first building at the eastern boundary of Uray Street is the Railway Station. Then, there is the Latin Catholic Church that was constructed in 1846, and is still actively used for not only religious purposes, but also cultural events, like concerts. Continuing towards westward on Uray Street, there is the Old House of Government as a significant historic entity. That building had been used as the Directorate of Provincial Health Issues, but the building has been conserved by on-going restoration project. After the project is

[4] Selvi Ünlü and Ünlü, 2009, Develi, 2001, Yenişehirlioğlu, 2004, Ülkü, 2004, Mersin Yerel Tarih Grubu, 2001.

completed, the building is going to be used as the Governorship. At the western side, there is another essential entity, Sursok Khan, which was used a complex of warehouses and stores and Mersin Palas Otel, is currently used as a branch of shopping market and few stores. Taş Khan, which was constructed in 1871, is located at the west of Sursok Khan. Opposite to Sursok Khan, there is empty and un-used space, where Azakhan was located. The khan that was one of the most vital commercial centers was demolished in 1988 to build a high-rise building and parking lots. However, the construction process was suspended by Regional Conservation Council. Eski Cami on Uray Street was constructed in 1870. The fountain in front of Eski Cami, is known as "Valide Sultan Çeşmesi" is still used by citizens. In addition to historic entities along Uray Street, there are significant structures from the Republican Period such as the building of Türkiye İş Bankası, T.C. Merkez Bankası and Garanti Bankası. At the west end of Uray Street, where Atatürk Street begins, north-south axis that is known as Hastane Street includes main commercial activities in historic city center. In addition to ongoing trading dynamics, Yoğurt Pazarı (*Yoghurt Bazaar*) that is conserved as a park is located in Hastane Street. Metropol Skyscraper is also located as another *"significant"*[5] landmark in Hastane Street.

At the junction of Hastane and Uray Streets, there was Gümrük Meydanı and its Pier (*Gümrük İskelesi*) at the southern side. The square was the most essential transfer point of commodity and passenger at the end of the 19th century. Today, there is Ulu Cami and Ulu Bazaar at the area of Gümrük Meydanı. In the 19th century, the boundaries of the city started from Railway Station at the east and ended with Gümrük Meydanı at the west. The street starting from Gümrük Meydanı and continuing through "Kışla – *Military Quarter"* was called as Kışla Street that was a narrow street paved with small stones. As another essential issue in the development of Uray and Atatürk Street as the spine of historic city center, a tramway line was constructed in 1910. The line started from Gümrük Meydanı, then continued from the south of Old Bazaar Area to Mersin Bazaar, then continued through Atatürk Street and turned to Silifke Street at the next of Atatürk

[5] Metropol Skyscraper (52 floors) is a visible landmark that would be seen from far distances. However, its structure, height and scale negatively disturbed human scale-urban pattern and causes traffic and rental pressure in near environment.

Museum and ended with Müftü Stream. The line re-turned to Gümrük Meydanı along another axe, which passed through Military Quarter then Atatürk Street. However, the line was demolished and re-constructed from Gümrük Meydanı to Railway Station for only commodity carrying along Uray Street in 1921 during French Control. In 1931, the line wholly was de-constructed (Develi, 2001: 81,82). There was varying scaled stores between Gümrük Meydanı and Atatürk Museum. At the opposite of Atatürk House (Museum) there was "Akkahve" *(the name of a traditional coffee / tea house)* that also provided a place for urban social life. There is the building of the Metropolitan Municipality of Mersin at the place of "Akkahve". At the west of Atatürk House (Museum), there was an open area known as "Millet Bahçesi" that is called as "Cumhuriyet Meydanı *(the Square of Republic)",* where cultural events were made. Today's, there is Mersin Culture Center that was "Halkevi" on this area.

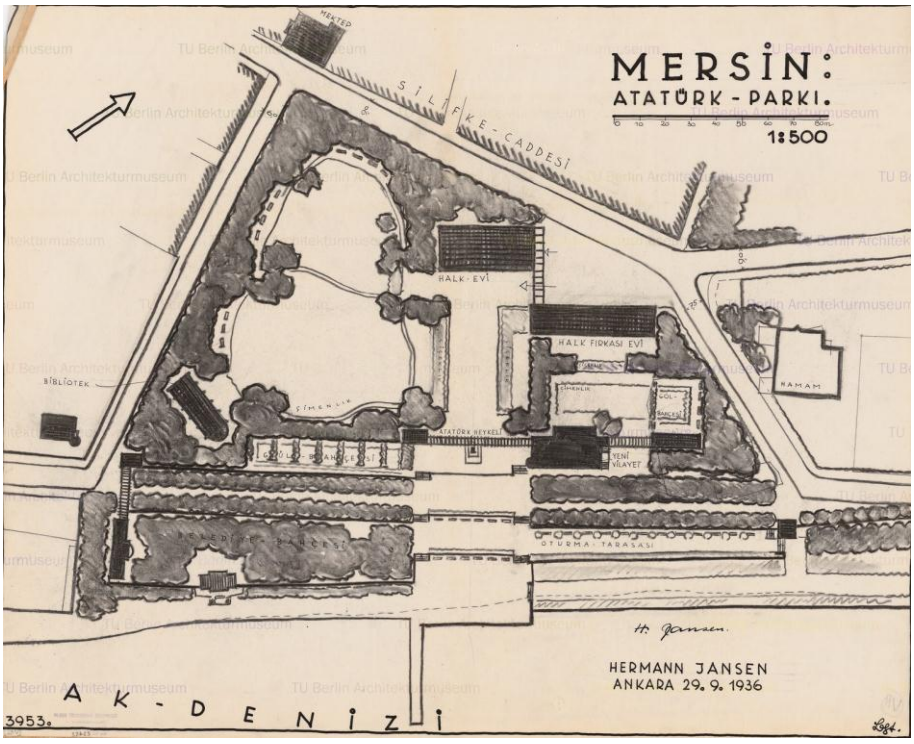


Figure 4-7: The Plan of Atatürk-Parki indicating "Halk Evi" prepared by Herman Jansen (TU Berlin Architekturmuseum, Inv. Nr. 23452- http://architekturmuseum.ub.tu-berlin.de/index.php?set=1&p=79&Daten=157805)

At the west of the square, there is Arab Orthodox Church. Moreover, Kasap Bazaar, which was constructed by Italians as an Early Republican historic entity, is used as Balık Pazarı (Fish Bazaar) at the north of Atatürk Street, a pedestrian axe. At the west of Atatürk Street, Çamlıbel Neighborhood, one of the oldest districts of Mersin, is located. Atatürk Street continues along Çamlıbel Neighborhood till to Müftü Stream. Figure 4-8 indicates aforementioned historic entities and public spaces with their photographs (Selvi Ünlü and Ünlü, 2009:50, 51). Figure 4-9 and related photographs (Figure 4-10 / 11 / 12 and 13) present recent condition of aforementioned historic entities and public spaces.

This section explains the historical development of Uray and Atatürk Streets by means of spatial references. It describes the functional changes in the historic city center and its main uses and activities. According to micro-space analysis, significant characteristics of Uray and Atatürk Streets are determined as the aspect of the identity of Mersin and its collective memory. This collective memory is still conserved in the historic city center with public spaces and Uray and Atatürk Streets. In the next section, general features of Uray and Atatürk Streets are presented to get detailed potentials, problems and issues in the case study area.

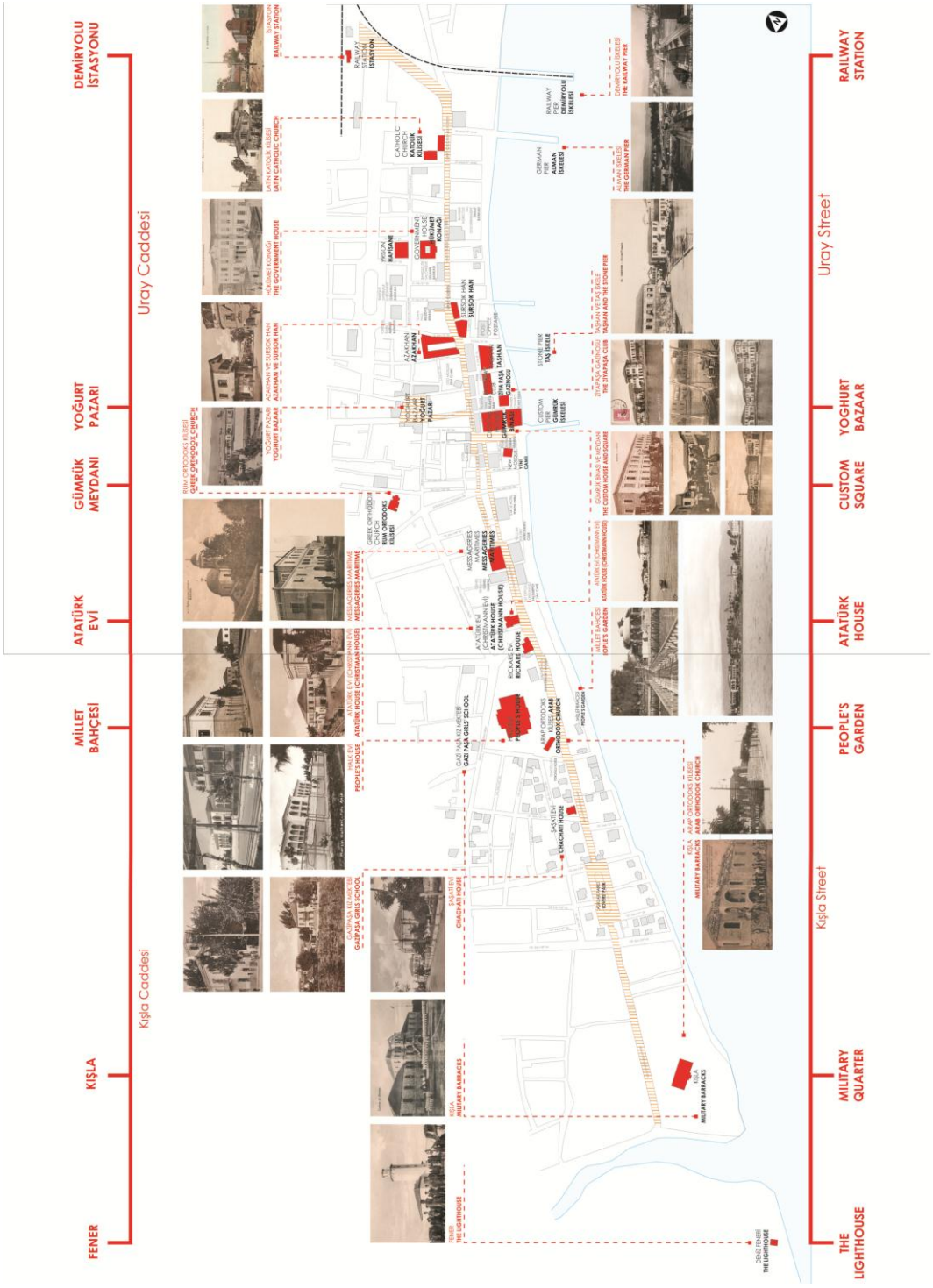


Figure 4-8: Uray and Atatürk Streets as the spine of historic center of Mersin (Selvi Ünlü and Ünlü, 2009:50, 51)

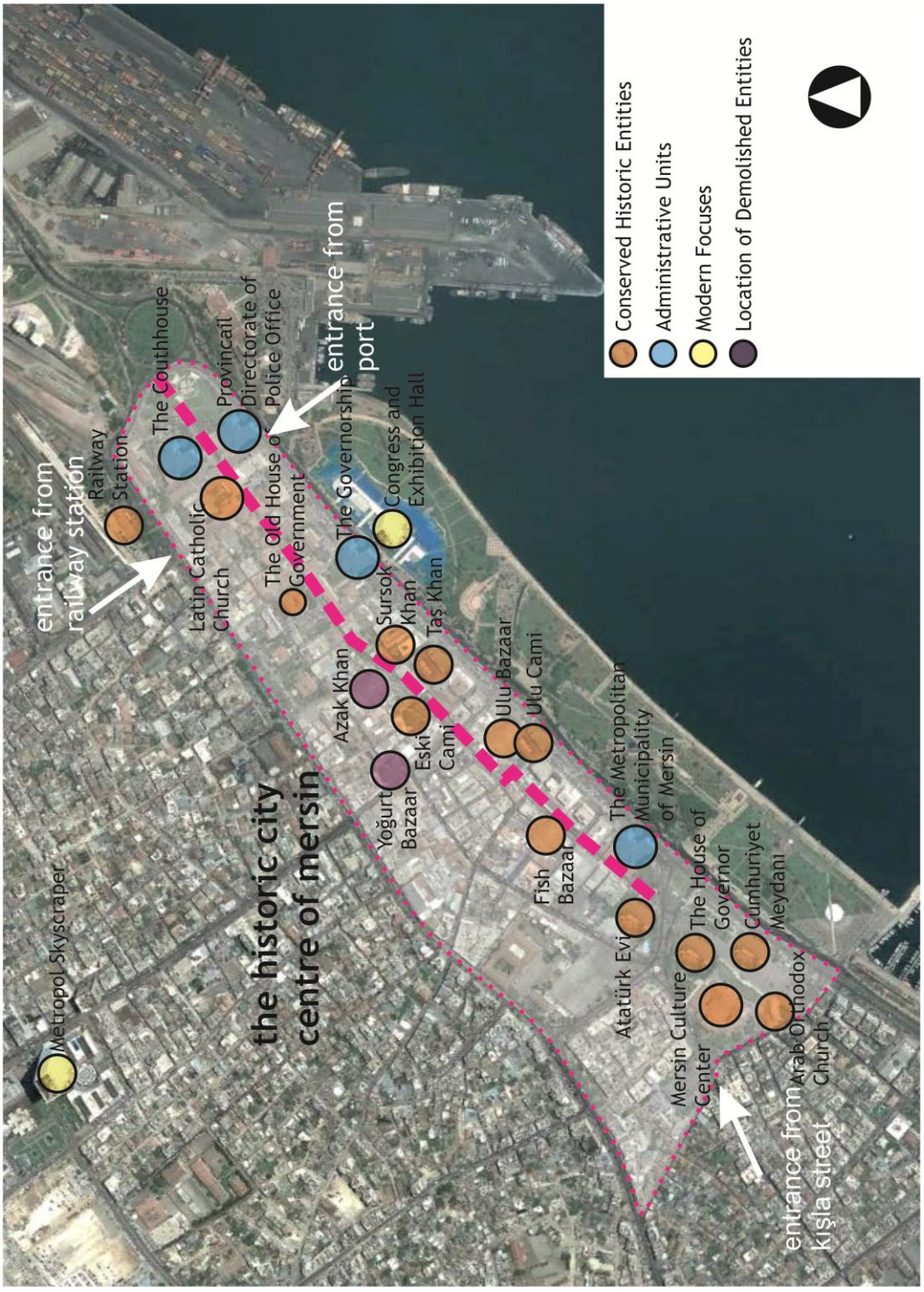


Figure 4-9: *Landmarks and meeting places around Uray and Atatürk Streets (prepared by Z.S. Belge)*

The Courthouse

The Latin Catholic Church

The Old House of Government

Sursok Khan

The Governorship

The Location of Azak Khan

Figure 4-10: *Recent photographs of significant landmarks and meeting places (indicated in Figure 4-9) around Uray and Atatürk Streets (Personal archive of Z.S.Belge).*

Eski Cami and the Fountain of Valide Sultan

the Fountain of Valide Sultan

Ulu Cami and Bazaar

Ulu Bazaar

Yoğurt Bazaar

Figure 4-11: *Recent photographs of significant landmarks and meeting places (indicated in Figure 4-9) around Uray and Atatürk Streets (Personal archive of Z.S.Belge).*

Hastane Street (Metropol Skyscraper is seen at the end of street)

The entrance of Fish Bazaar from Atatürk Street

Atatürk Evi

The Metropolitan Municipality of Mersin

Cumhuriyet Meydanı

The Square in front of The Metropolitan Municipality

Figure 4-12: *Recent photographs of significant landmarks and meeting places (indicated in Figure 4-9) around Uray and Atatürk Streets (Personal archive of Z.S.Belge).*

Cumhuriyet Square and Mersin Culture Center

Hastane Street between Metropol Skyscraper and Ulu Bazaar

Cumhuriyet Square and Atatürk Park

Figure 4-13: *Recent photographs of significant landmarks and meeting places (indicated in Figure 4-9) around Uray and Atatürk Streets (The official website of the Metropolitan Municipality of Mersin).*

4.4. General Features of Uray and Atatürk Streets

As briefly mentioned, the macroform of Mersin has been linearly formed along the sea-side since the 1960s. Today, the boundaries of the Metropolitan Municipality of Mersin reached 20km radius circle, its center is the building of Governorship, with the revised Act no. 5226 on the Metropolitan Municipalities in 2004. As seen in Figure 4-14, residential districts are located at the north and west of the CBD. In other words, the center of Mersin is located at the east of settled area, and at the east there are commercial and industrial functions and The International Port of Mersin. The historic city center and implicitly Uray and Atatürk Streets are still core of the CBD. The Governorship of Mersin, the Metropolitan Municipality of Mersin, the Courthouse, Provincial Directorates of Banks and related administrative units are still chosen to stay in the CBD. Furthermore, Mersin Culture Center and Mersin Congress and Exhibition Hall are significant aspects in the historic city center. In summary, the historic city center is still administrative and cultural core of the city.

However, recently opened Forum Shopping Mall in the district known as Pozcu, where there are especially building stocks from the 1970s and the 1980s, has negatively affected the historic city center. Especially, brand stores addressing mid-high income groups have caused more deterioration in the historic city center. As another shopping focus, Mersin Marina (2011) becomes an alternative for brand stores and cultural events.

Nowadays, there are on-going projects aiming to revitalize and to conserve historic entities in Uray and Atatürk Streets. The Governorship of Mersin has prepared a preliminary draft project for Uray Streets. In addition, the Municipality of Akdeniz has supported the Governorship for revitalization. However, there is no crucial intervention that would create a synergy. Only there is an on-going restoration project for the building of Old House of Government, which has been used by the Provincial Directorate of Health.

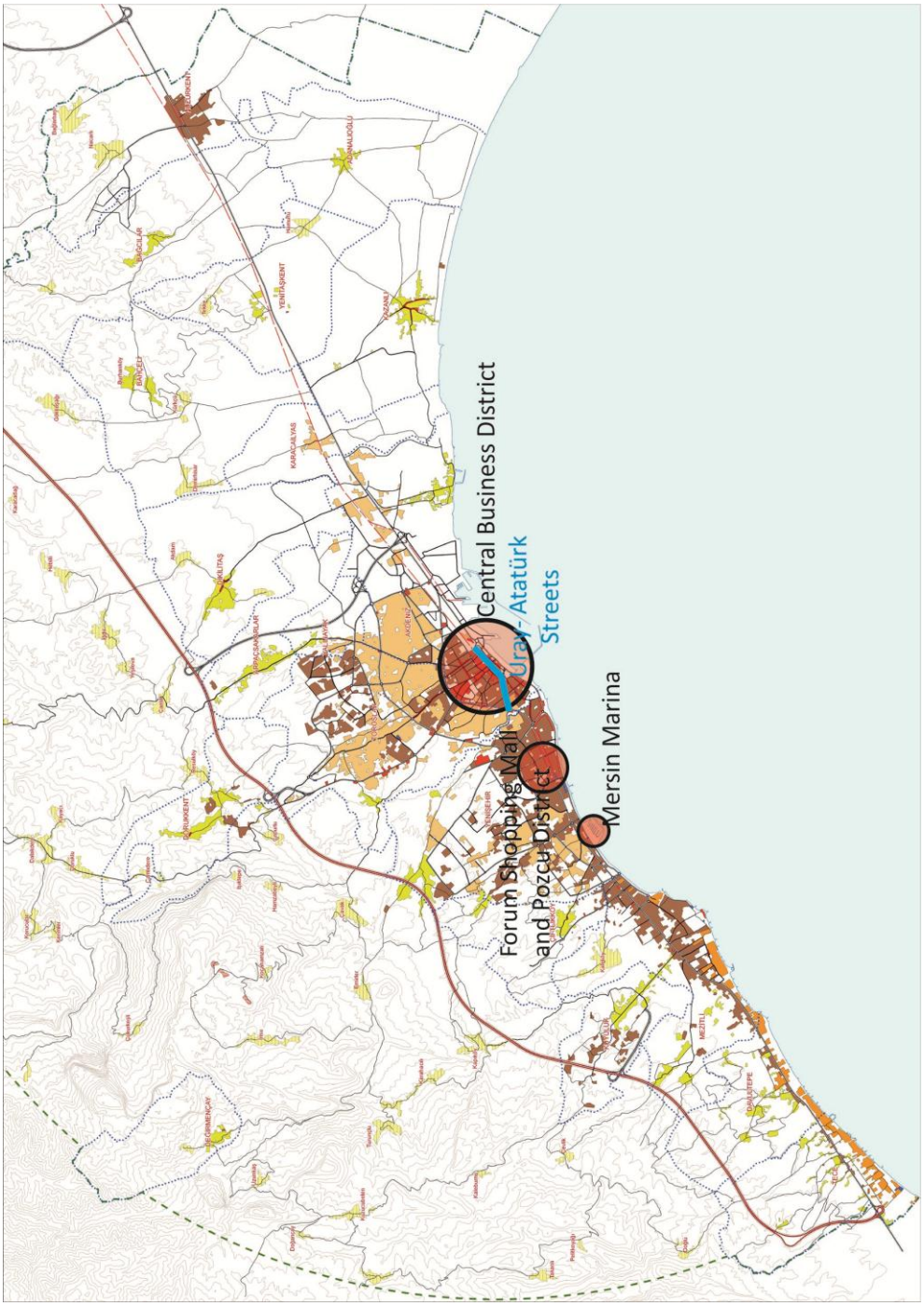


Figure 4-14: Uray and Atatürk Streets in Mersin (prepared by Z.S. Belge by the map of Residential Districts in the boundaries of Metropolitan Municipality of Mersin – Ref: The Metropolitan Municipality of Mersin).

In detail, there are mainly two groups of land-use activities around the case study area. The first group includes the functions that cannot create a pedestrian traffic in the historic city center. The second-group activities, directly or indirectly, enhance pedestrian movement in the historic city center (Figure 4-15).

The International Port of Mersin could be evaluated in the first group. The port is located at the east of historic city center. Although the port attracts a high number of people and commercial activities, there is no direct or indirect pedestrian relation between Uray Street and the port area. As mentioned above, there is Atatürk Park between case study area and sea. There is the Congress and Exhibition Hall in Atatürk Park that would enhance socio-cultural life in the historic city center. However, the Hall is used as a closed-complex, there are parking areas around the Hall and there is no direct pedestrian flow from those foci into historic city center.

On the other hand, the historic city center has still potential of cultural, administrative and commercial activities. In addition, the railway station is an essential focus for the historic city center because of efficiently used Adana-Tarsus-Mersin railway.

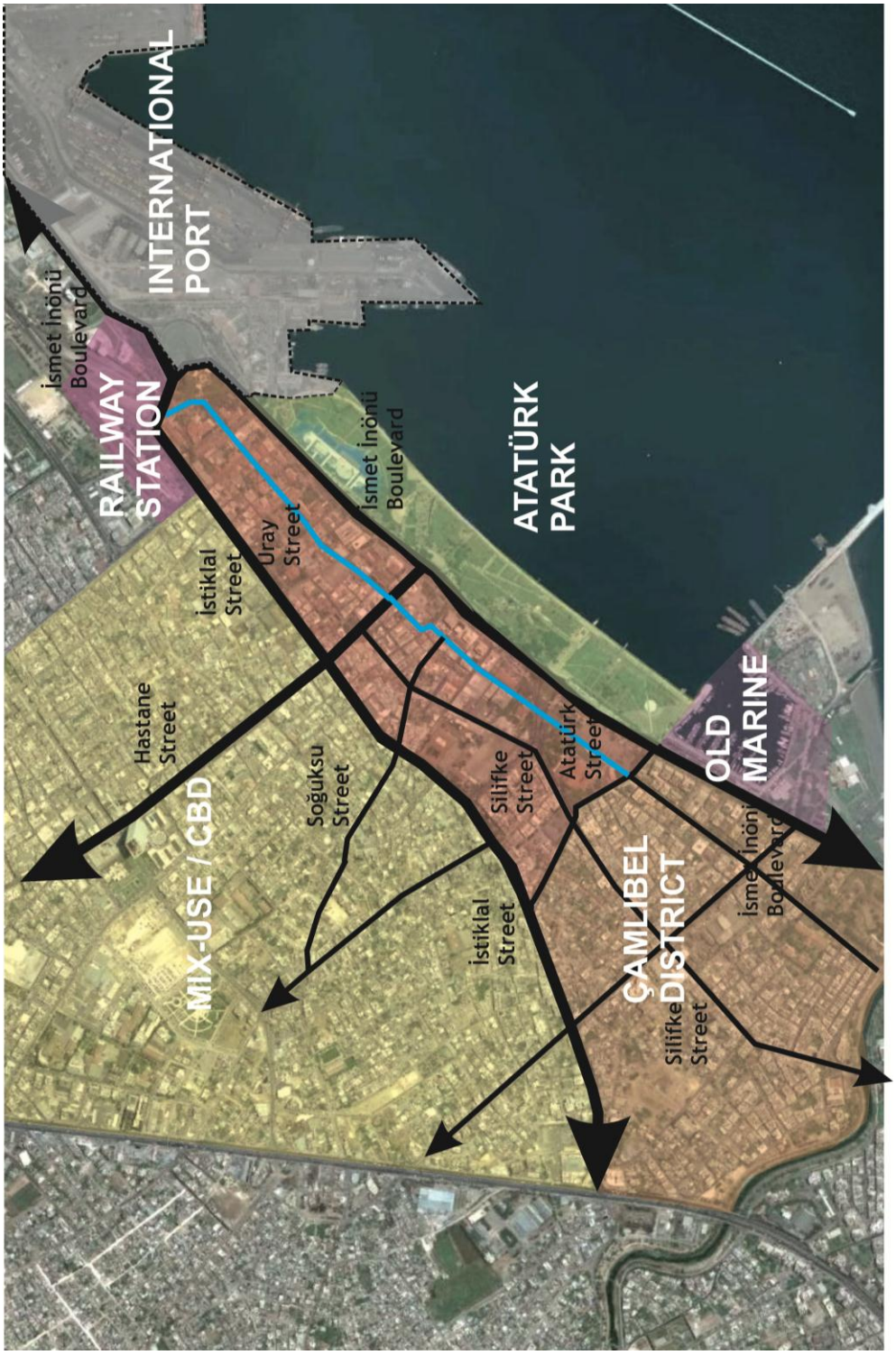


Figure 4-15: General layout, main roads and general land-use patterns around Uray and Atatürk Streets (prepared by Z.S. Belge).

In addition to evaluation of general land use pattern around case study area, the current land use functions in Uray and Atatürk Streets are investigated by the field study to determine positive and negative spaces and attractive foci.

In Uray Street, at the eastern end of Z1, there is the Courthouse and the Provincial Directorate of Police Office. The Governorship of Mersin defines the western end of Z1. Clearly, Z1 is an administrative focus in the historic city center. There are open-parking lots and unoccupied areas in Z1. However, there is high potential of pedestrian movement in Z1 in a relation with administrative functions, railway station and bus stops on İsmet İnönü Boulevard. Therefore, stores in good-condition are used by scriveners (Figure 4-16).

In Z2, there are gastronomic functions, like fresh fruit juice sellers and traditional tea-houses. In addition, Migros is a significant shopping focus that attracts people from different income groups. In addition, north-south axis between Sursok Khan and Taş Khan represents varying opportunities with existing functions from mobile-phone sellers to barbers or from taxi point to café. There are travelling agencies, telecommunication services and exchange offices at the ground floors of southern side of Z2 till Hastane Street. At the upper floors, there are offices. However, on the other side, there are empty stores and unoccupied areas that are used as parking area. At the northern side of Z2, there was Yoğurt Bazaar that is conserved as an unoccupied park (Figure 4-16 / Figure 4-17).

In Z3, Ulu Cami and Ulu Bazaar could be described as dominant functions. Especially outer side of Ulu Bazaar presents alternatives of gastronomic activities. There are leather clothing stores and jewelries at the inner side that facing towards the seaside. At the northern side of Ulu Bazaar, there are 5-7 stored buildings. The ground floors of these buildings are used as clothing stores of known brands, up floors are occupied as offices or private education centers (Figure 4-18 / Figure 4-19).

Z4 is the most vital and diversified part of case study area. The ground floors of buildings are used as perfumery, clothing stores of known brands, exchange offices, jewelries, and banks. In addition to facades looking to Atatürk Street, there are arcades presenting

traditional and modern commodities else one from varying age groups and gender. Upper floors are used by educational centers, like language or university courses, offices and a few gastronomic activities. Furthermore, there are varying alternatives of shopping and gastronomic services in the Fish Bazaar and mixed-uses areas at the north of Atatürk Street (Figure 4-18 / Figure 4-19).

As a result of overall land-use discussion, Uray Street could be defined as administrative foci and official side of the historic city center, while Atatürk Street should be determined as conserved commercial and cultural center of the historic city center.

Detailed field investigations in the case study area indicate that the administrative buildings, which are the Courthouse and Provincial Directorate of Police Office, are higher than four floors, but the other buildings – the Latin Catholic Church, conserved traditional entities, the Old House of Government and the Governorship of Mersin- enhances human scale in Z1. In Z2, although there are historic artifacts, like Sursok Khan and Taş Khan, modern office buildings that are higher than 3-4 floors disturb human scale and traditional characteristics of Uray Street.

In Z3 that includes Ulu Bazaar, Ulu Cami and their near surrounding, because of junction of Uray, Atatürk and Hastane Street, there are buildings higher than 4-5 floors. In addition, buildings lie parallel to İsmet İnönü Boulevard are higher than 10 floors. In Z4, although it is a pedestrianized street, the most of buildings are higher than 3-4 floors and there is a coherence between them (Figure 4-20).

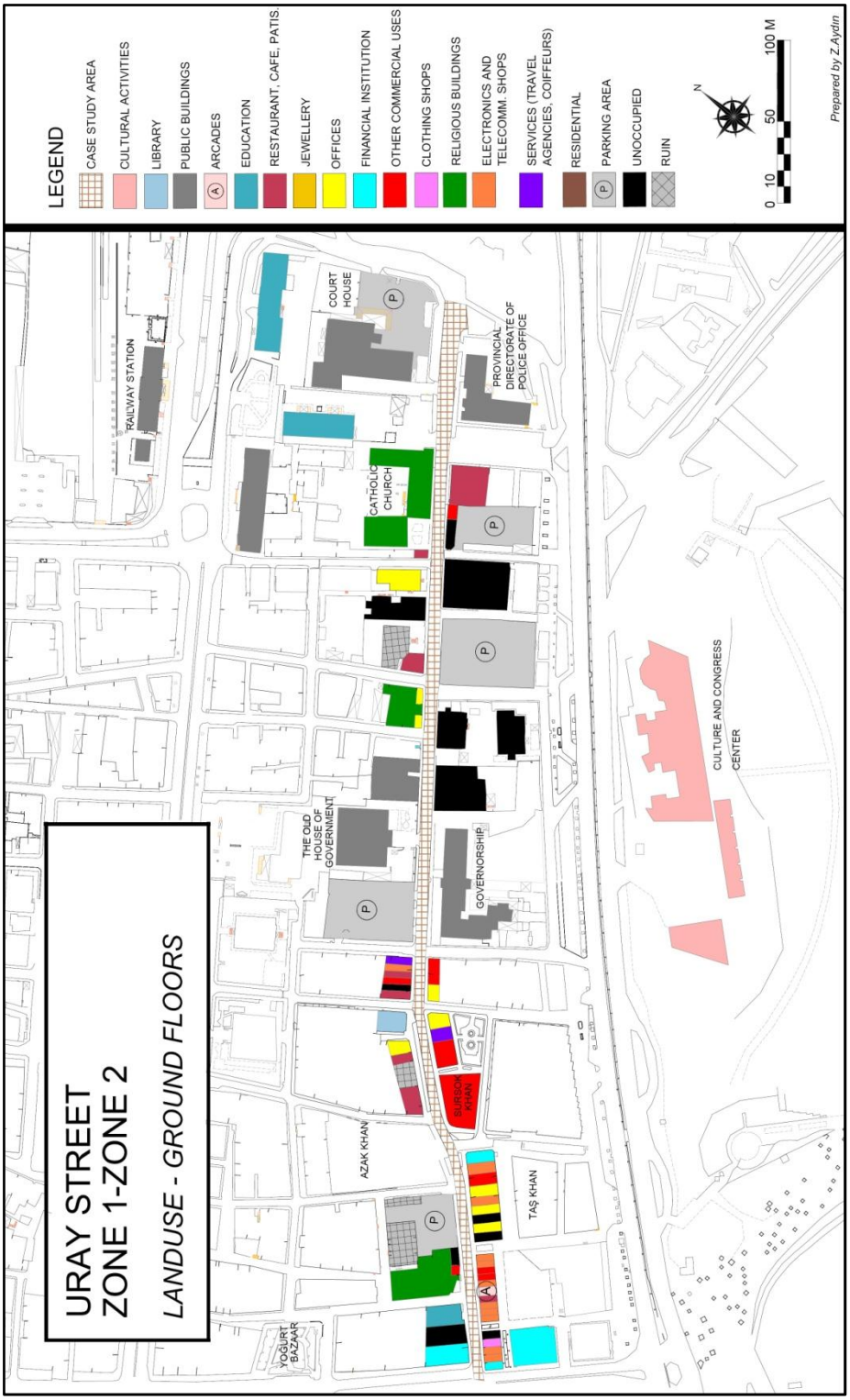


Figure 4-16: Land use / ground floors in Uray Street

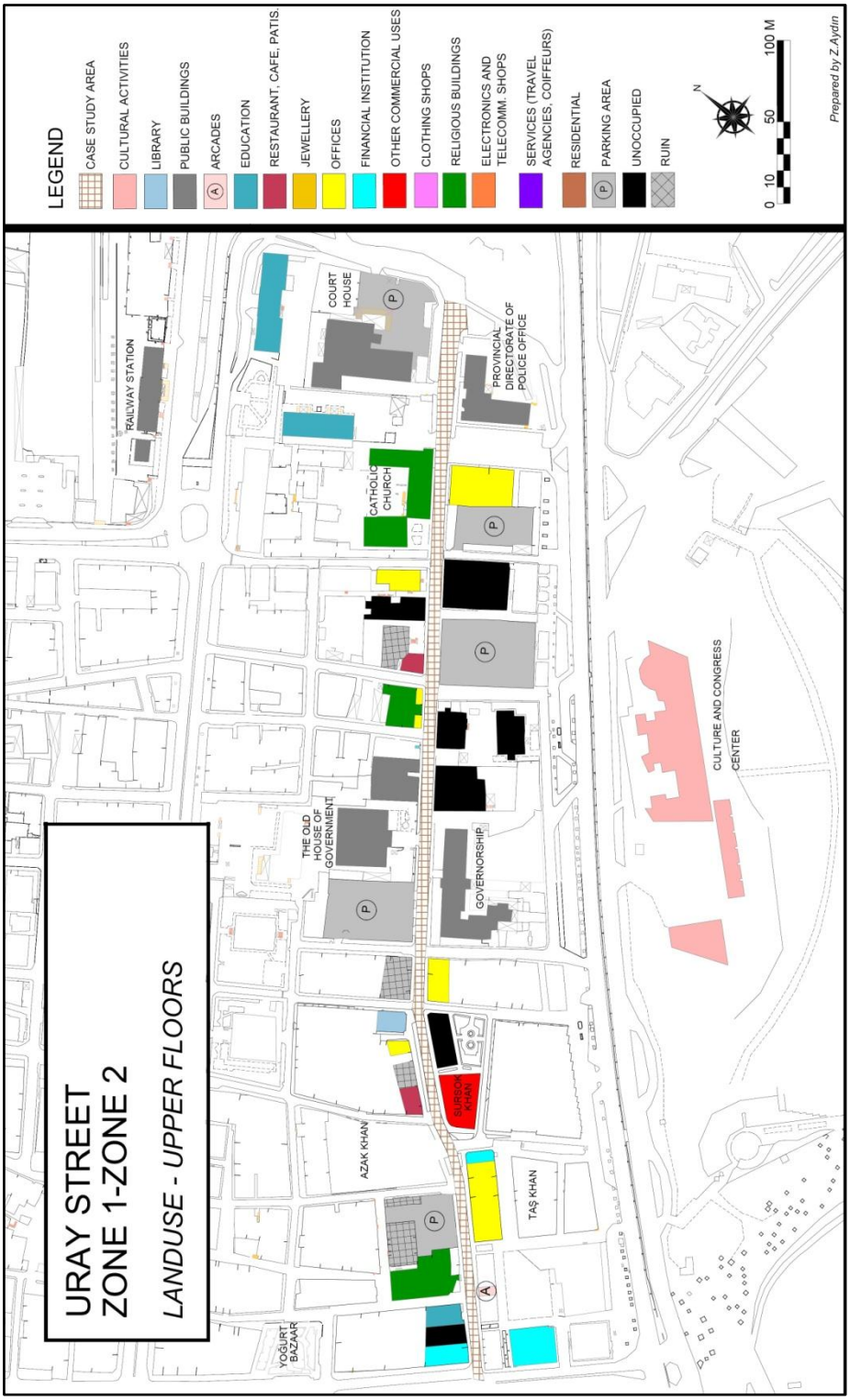


Figure 4-17: Land use / upper floors in Uray Street

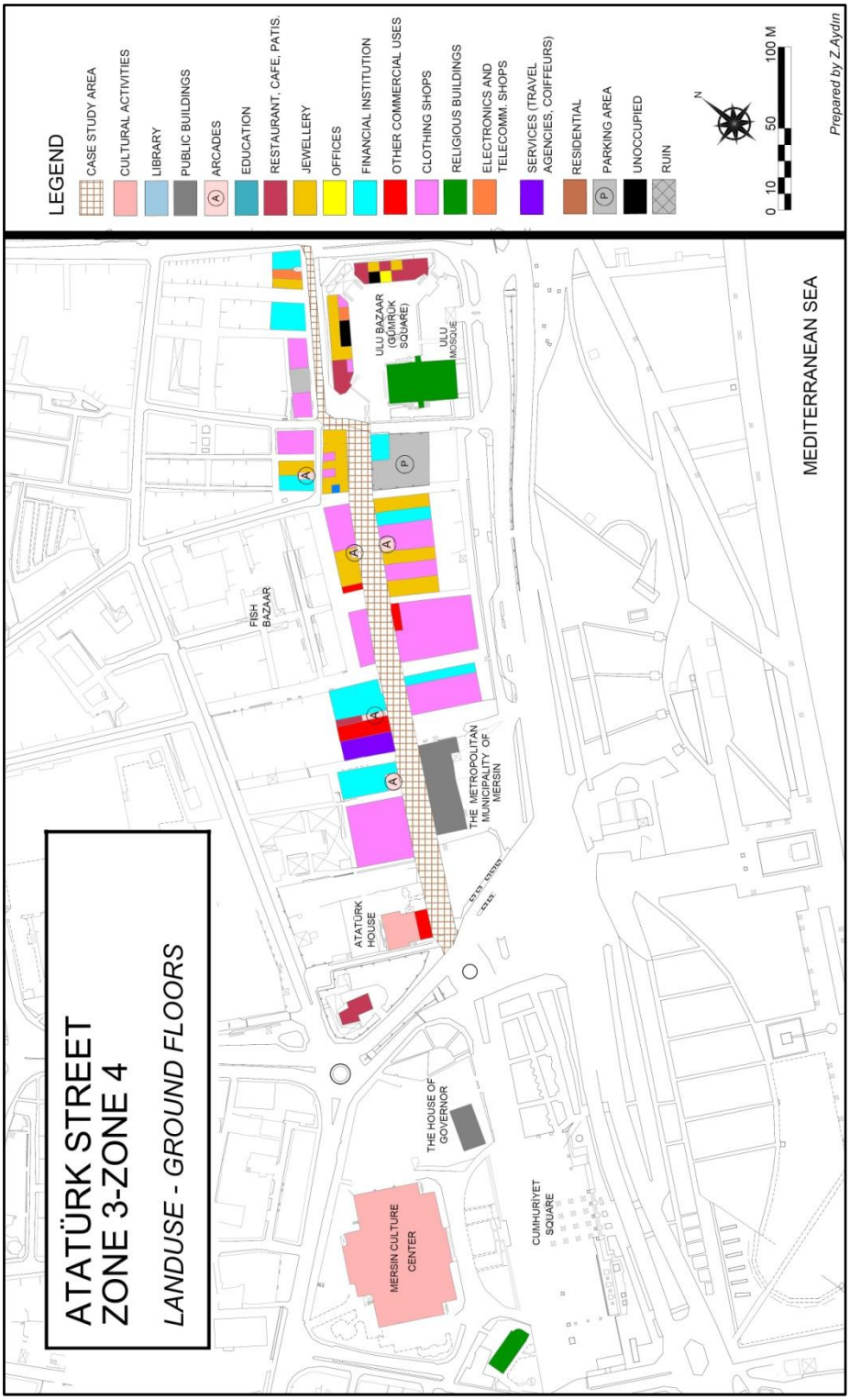


Figure 4-18: Land use/ ground floors in Atatürk Street

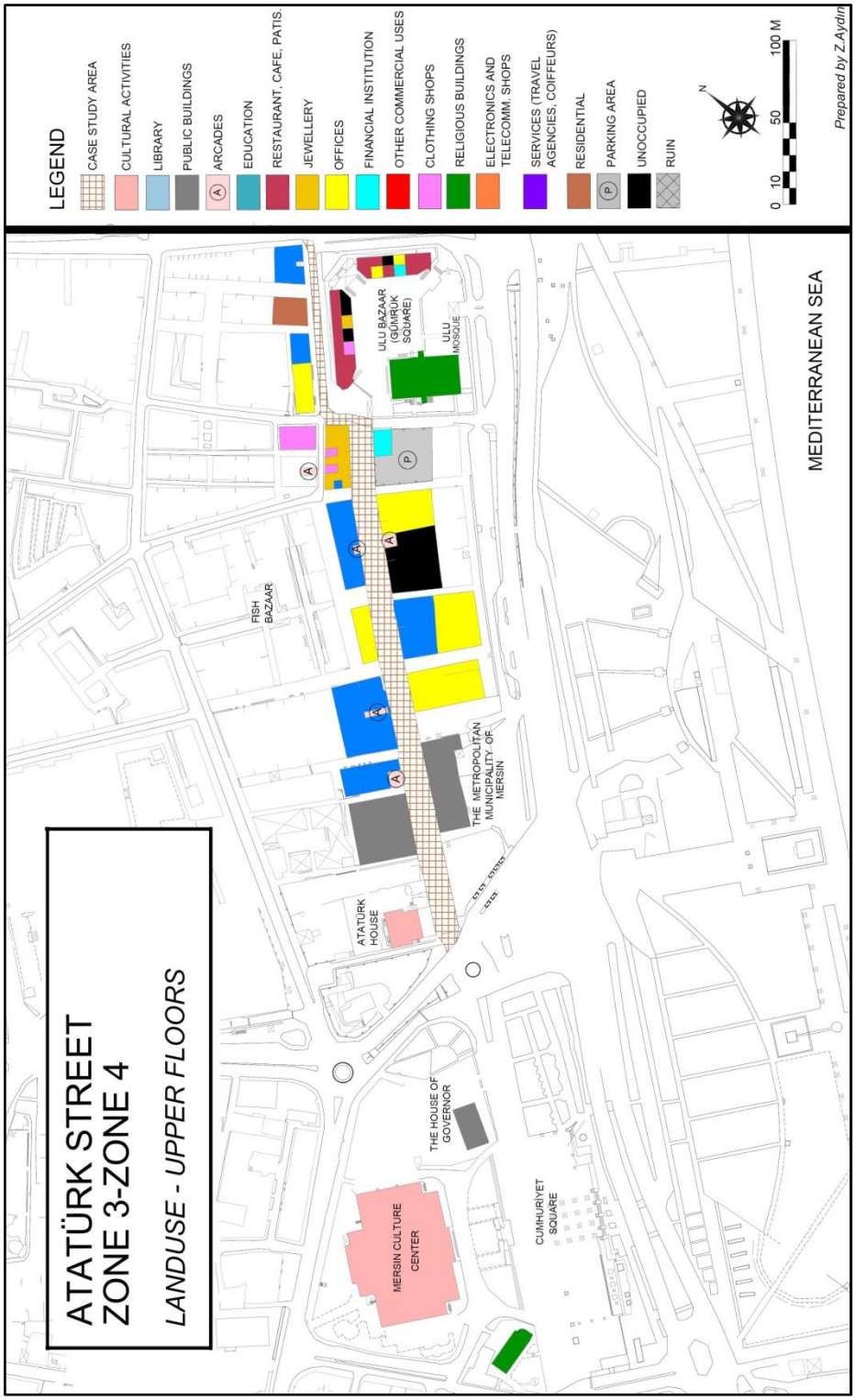


Figure 4-19: Land use/ upper floors in Atatürk Street

Figure 4-20: The height of buildings in Uray and Atatürk Streets

4.4.1. Character Zones in Uray and Atatürk Streets

Based on the aforementioned spatial analysis of the general features of Uray and Atatürk Streets, changing factors like current land-use, number of floors, street pavements and traffic management indicate that there are four character zones in Uray and Atatürk Streets.

It is crucial to identify these zones as each has different spatial characteristics in terms of vehicular and pedestrian traffic regulations which affect the walkability capacity. One should note that Atatürk and Uray Streets are interconnected streets. They connect each other as a linear form along which squares and parks are integrated and create some opportunities of openness and enclosures. By means of extensive survey, this research identified four character zones on Uray and Atatürk Streets which are interconnected and following each others as the spine of the historic center. Four character zones are determined as shown in Figure 4-21.

- ***Zone 1(Z1)*** starts from the east of Uray Street and ends with the Governorship building of Mersin. There are public administration uses and governmental buildings, like the Provincial Directorate of Security. Also, there are listed buildings. Moreover, there is a historic Catholic Church within this zone. This zone especially provides a link between the railway station and the coast. The material of pavement is asphalt and it has narrower sidewalks than other zones.

- ***Zone 2(Z2)*** lies between the Governorship of Mersin and the square of Ulu Bazaar at the west of Uray Street. The vehicular traffic in this zone is slower than the first zone due to the basalt stone pavement and narrower road way. Also, the sidewalks are wider so it provides greater pedestrian spaces.

- ***Zone 3(Z3)*** is a transition zone between the entrance of Ulu Bazaar and the beginning of Atatürk Street. It also includes the square of Ulu Bazaar -a two-storey arcade. The two streets with vehicular traffic that lie between the north-south direction and link the coast to the northern part of the city center determine the boundaries of this zone.

- ***Zone 4(Z4)*** is the only pedestrianized area, known as Atatürk Street. Generally, vehicles are only permitted to enter early in the morning and late in the evening for service. However, in some parts of this zone, pedestrians are disturbed by parked cars, especially over the weekends.

These four zones are used in the following sections of the study to assess the walkability capacity of these zones and their comparison between each other. Therefore, the success and handicaps of current system in the case study area will be investigated in details in the next chapter. Zones are used with their initials as Z1, Z2, Z3 and Z4.

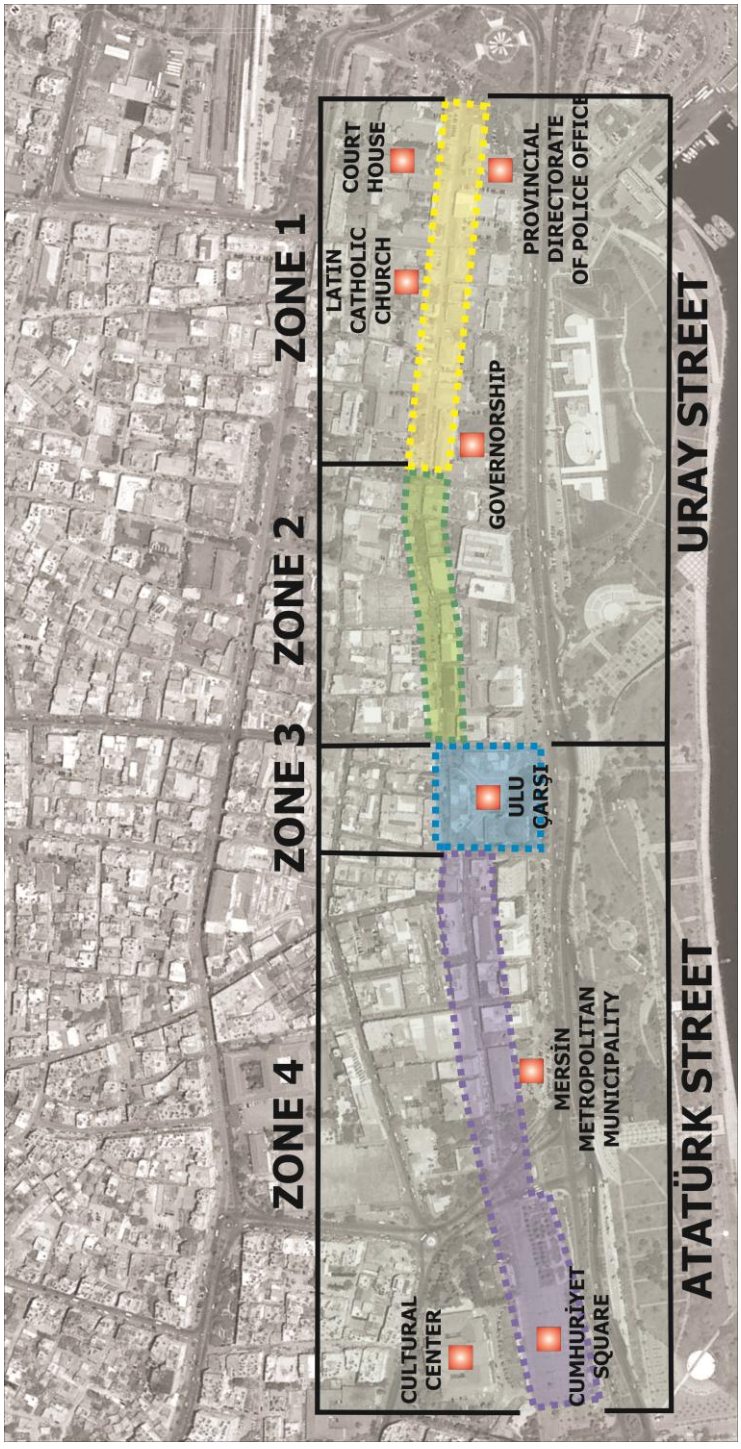


Figure 4-21: The zoning map of Atatürk and Uray Streets (prepared by Z.S. Belge).

4.5. The Selection of Case Study Area

Uray and Atatürk Streets have historically constituted the major spine of Mersin Historic City Center that has a cosmopolite structure as a “Port City” at past and present. Commercial and administrative functions have created attractive foci in the case study area lying on the east-west direction parallel to the seaside in the CBD.

However, infill developments and huge recreational areas along the seaside caused to lose the characteristic of Mediterranean Port City. Moreover, especially commercial and residential historic entities have lost their functions parallel to deprivation of prestige / attractiveness in the historic city center. That caused a deterioration process in historic districts and detriment of urban heritage by modern needs.

As mentioned in Section 4.1, the development of international port and related transportation infrastructure has caused a rapid increase in population and urbanization. However, planning authorities could not efficiently control or guide that process, so deterioration in the historic city center has continued. As a result, case study area, although there are on-going commercial potential Uray and Atatürk Streets, the center has preserved its character with administrative functions.

Nowadays, high density, development pressure and implicitly vehicular traffic in the historic city center disturb pedestrian movements in relation with lack of livable spaces. Naturally, citizens tend to choose more livable and comfortable areas, so commercial dynamics and potential move from historic city center to shopping malls. Consequently, Mersin historic city center, the most significant characteristic of Mediterranean Port City, could not sustain or enhance its identity.

In the historic city center, vehicular and pedestrianized streets are lying parallel to seaside. Thus, interconnections between pedestrians and the sea are interrupted. Moreover, Atatürk Park that is located on the infill area does not include facilities for pedestrian movements. There is no effectively connected pedestrian axis from Uray and Atatürk Streets into Atatürk Park. Especially İsmet İnönü Boulevard and parking areas in Atatürk Park create barriers for north-south directed movements. Furthermore,

negative spaces in the historic city center and lack of transportation facilities cause loses in public spaces networks, so functional efficiency of the historic city center and significant characteristics are harmfully affected.

Due to these factors, Mersin historic city center has lost its characteristics, roles, vital dynamics and its identity. Therefore, the historic city center should immediately revitalize to sustain its significant character and authenticity by urban design strategies based on strategies in wider context of the city. Attracting citizens to the historic city center is essential to comprehensively address historic city center as a livable foci and to revitalize commercial, social and cultural life in the historic city center. In defined context, the historic city center has to be revitalized as a walkable space.

In the next chapter, aforementioned four zones determined in Section 4.4.1. are evaluated in terms of walkability indicators defined in Chapter-2 and Chapter-3. This study bases on a comparative structure to understand not only factors effecting walkability, but also perception of citizens. And so, general evaluation in case study area is guided to determine exact urban design strategies that enhance revitalization process.

CHAPTER 5

THE ANALYSIS OF WALKABILITY IN URAY AND ATATÜRK STREETS, MERSIN

This chapter examines Uray and Atatürk Streets within the context of walkability indicators that are defined in Chapter-2 in detail. Each indicator is discussed with its variables. Firstly, the results of questionnaire are presented to get an overall context about users' perceptions according to character zones of the case study area described in Chapter 3. After that, each indicator of walkability is analyzed with descriptive observations, desk-based assessments and visual analysis, which are defined in the method of study.

In defined context, the walkability indicators, **attractiveness and convenience, connection to open space, safety, street pattern, quality of path, the linkage with other transportation modes, connectivity of path network and accessibility** are evaluated in details.

5.1. Attractiveness and Convenience

As mentioned in Chapter 2, attractive and convenient streets should provide attractive and convenient street network, pedestrian amenities and facilities for vulnerable groups (disabled and aged people, parents with young children and babies and young children), regular maintenance and cleanliness of walking paths, planting, interesting urban scene (including historic streetscape, good-looking and well-maintained shop fronts) and a variety and diversity of land-use activities and events. In the following sections, each variable is discussed in details.

5.1.1. Maintenance and Cleanliness of Walking Paths

According to extensive surveys and direct observations, cleaning and maintenance of Uray and Atatürk Streets are serious problems, especially street cleaning is particularly a problem for Z3 because of gastronomic activities. The street cafes and restaurants carelessly use this part of Ulu Bazaar and pollute near environs. Z1, Z2 and Z4 are relatively clean because of the public authorities' buildings such as the Provincial Directorate of Police Office, the Governorship, the Metropolitan Municipality of Mersin and the Culture Center of Mersin. These parts of the streets are also well-maintained.

The streets' users were asked whether "*these streets are clean and well maintained"* and the results are presented in Figure 5-1. Briefly put, although in Z1 and Z3, the respondents partially agreed that the streets were clean and well-maintained, the majority of the respondents did not find these streets clean and well-maintained.

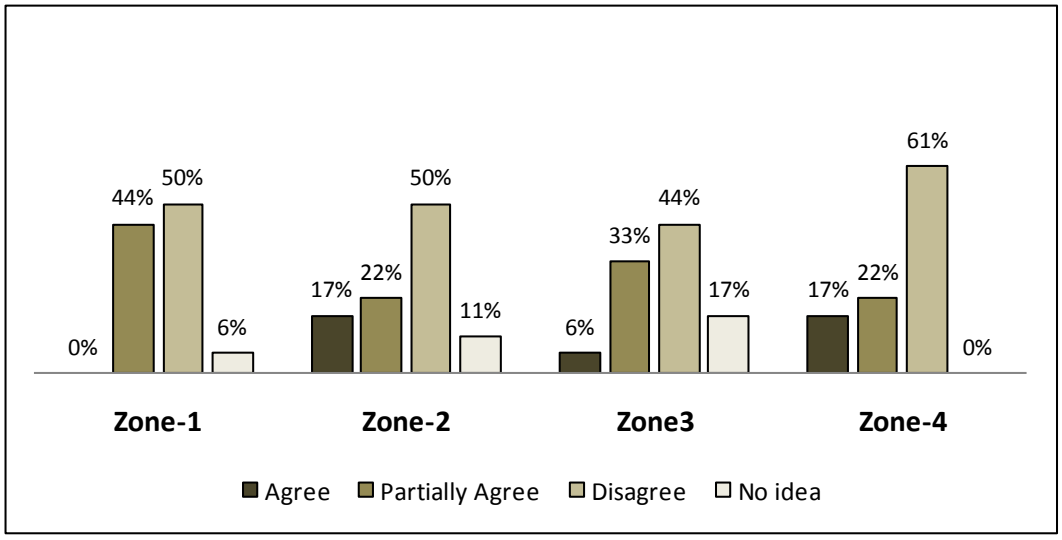


Figure 5-1: The questionnaire results for the maintenance and cleanliness of Atatürk and Uray Streets.

In details, cleanliness of walking paths is provided because of public buildings like the Governorship building, but there is a lack of maintenance of walking paths and there are ruins and unmaintained buildings in Z1 (Figure 5-2). In Z2, street pavements are different from Z1, but there is a lack of maintenance of walking paths in Z2 like Z1. As mentioned above, in Z3, due to gastronomic activities, there is dirtiness on walking paths. Although Z3 comprises a square that is one of the largest gathering points in historic center, there is a lack of cleanliness and maintenance. Also, vehicular traffic around Z3 negatively affects pedestrians. In Z4, pedestrianized area of the case study area, cleanliness and maintenance of walking path is better than other zones because of the building of the Metropolitan Municipality, the Culture Center, the House of Governor and "Atatürk Evi" (Figure 5-3).

Clean walking path along the Governorship

A ruin and low quality walking path

Figure 5-2: Photographs related with maintenance and cleanliness in Z1 (Personal archive of Z.S.Belge).

Clean walking path along the building of Metropolitan Municipality

Clean walking path along Atatürk Evi

Figure 5-3: Photographs related with maintenance and cleanliness in Z4 (Personal archive of Z.S.Belge).

5.1.2. Existence and Quality of Facilities for Blind and Disabled People

As discussed in Chapter 2, attractive and convenient streets should include public amenities and facilities designed with a particular attention to vulnerable groups. In defined context, the pedestrians were asked two questions related to the variable; existence and quality of facilities for blind and disabled people. Regarding the first question, *"whether there are enough arrangements and facilities for blind and disabled people",* the results are presented in Figure 5-4, the great majority of respondents thought that there are no enough arrangements and facilities for vulnerable groups in the case study area.

Regarding the other question, *"whether bumps, traffic lights and pedestrian crossings are designed by taking into consideration of disabilities",* is only asked in Uray Street zones "Z1, Z2", because Atatürk Street (Z3, Z4) is pedestrianized area. In Z1; all respondents claimed that bumps, traffic lights and pedestrian crossings are designed without considering disabilities. Furthermore, most of the respondents disagreed with this statement (Figure 5-5).

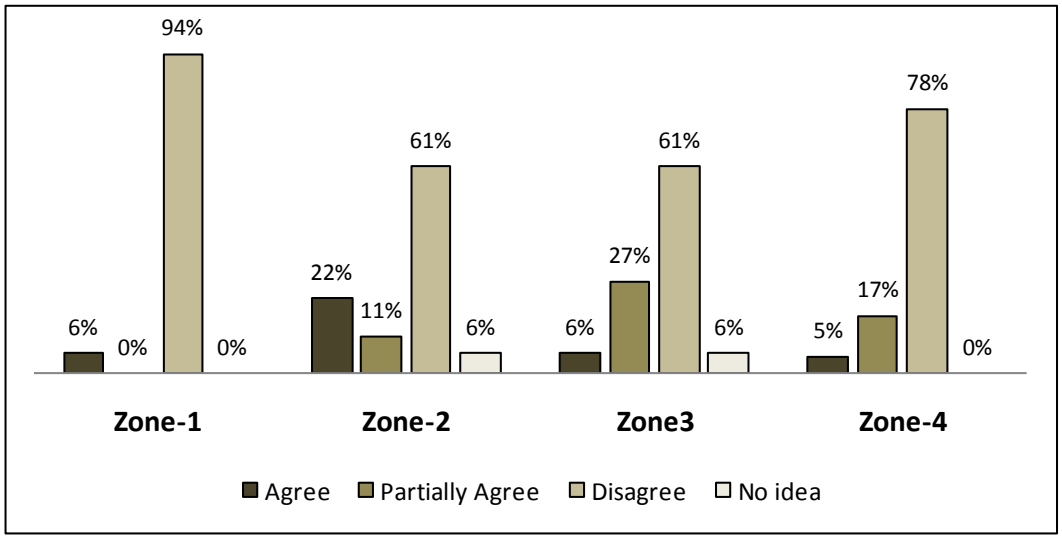


Figure 5-4: The questionnaire results for the statement of "whether there are enough arrangements and facilities for blind and disabled people in Atatürk and Uray Streets".

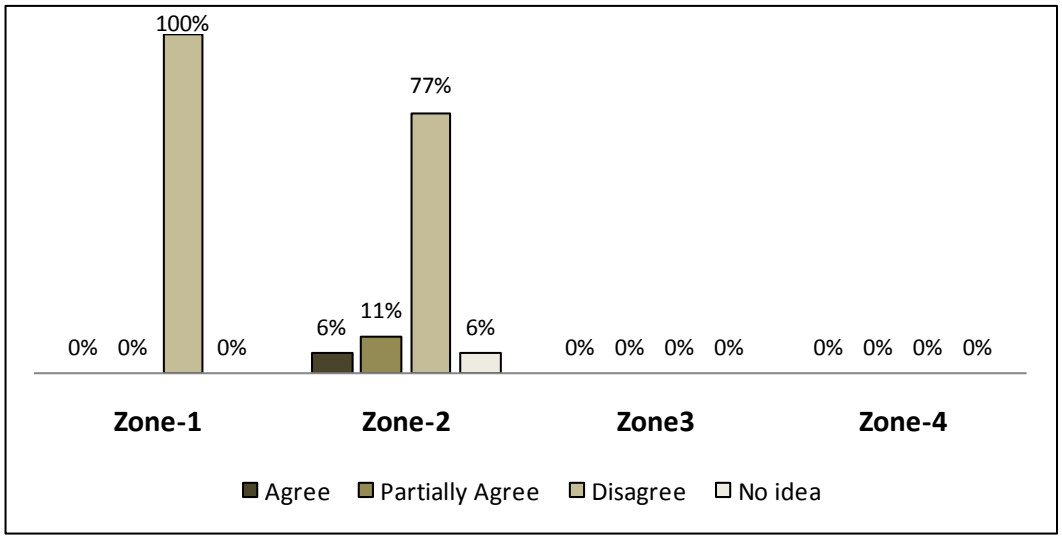


Figure 5-5: The questionnaire results for the statement of "whether bumps, traffic lights and pedestrian crossings are designed by taking into consideration of disabilities in Atatürk and Uray Streets".

The answers of questions show that in Z1, Z2, Z3 and Z4, the respondents generally find insufficient arrangements and facilities for vulnerable groups. Moreover, the majority of the pedestrians did not think that bumps, traffic lights and pedestrians crossing carefully designed for vulnerable groups.

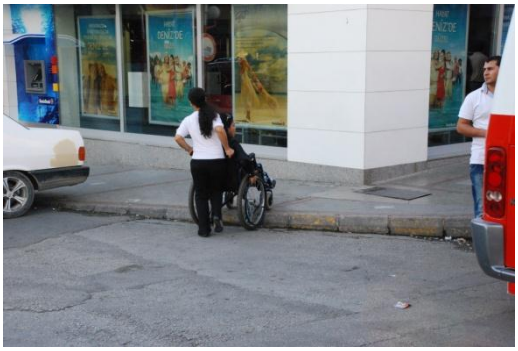
According to direct observations, Z1, Z2, and Z3 do not have pedestrian amenity or facility with a particular attention to vulnerable groups. In Z1, there are deformed ramps and the width of walking path is not enough for wheelchair users, also there is no traffic light for pedestrians crossing from one side to another of the street (Figure 5-6). Despite of becoming a pedestrian zone, the level of walking path and traffic road is not equal in Z3, and this causes difficulty for the movement of disadvantage groups on the street. In addition vehicular traffic and the absence of ramps obstruct vulnerable group's passes to pedestrianized area Z4 (Figure 5-7). Similarly, passing from Culture Center to Z4 is so difficult for not only vulnerable groups but also all pedestrians, because of crossroad and absence of traffic light and pedestrian pass (Figure 5-8).

Deformed ramps

Deformed ramps and insufficient width of walking paths for wheelchair.

Figure 5-6: Photographs related with existence and quality of facilities for blind and disabled people in Z1 (Personal archive of Z.S.Belge).

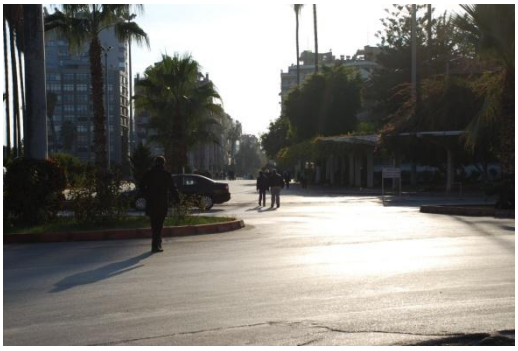
Over level between pedestrian way and traffic road



Over level between pedestrian way and traffic road, no ramp

Figure 5-7: Photographs related with existence and quality of facilities for blind and disabled people in Z3 (Personal archive of Z.S.Belge).

No traffic light or pedestrian pass from Cumhuriyet Square to Z4



No traffic light or pedestrian pass from Cumhuriyet Square to Z4

Figure 5-8: Photographs related with existence and quality of facilities for blind and disabled people in Z4 (Personal archive of Z.S.Belge).

5.1.3. Pedestrian Amenities (Coverage, Benches, Public Toilets)

Pedestrian amenities improve pedestrian conditions and encourage pedestrian activity by enhancing functionality and vitality to the pedestrian realm. Moreover, accessibility of pedestrian amenities would enrich the attractiveness. In defined context, two questions related to the variable; pedestrian amenities were asked pedestrians.

Regarding the question of *"whether there are enough sheltering provided by building canopies for pedestrians to be protected from sun light, rain, snow and wind"*, the great majority of respondents thought that there is no sufficient sheltering for pedestrians in the case study area. In Z3, the rate of agreed pedestrians is more than other zones because of arcades along Ulu Bazaar (Figure 5-9).

The second question is *"whether there are enough benches and rest places for pedestrians along Uray and Atatürk Streets"*. Similar to the findings of the first question, great majority of respondents thought that there are not sufficient benches and rest places for pedestrians in the case study area (Figure 5-10).

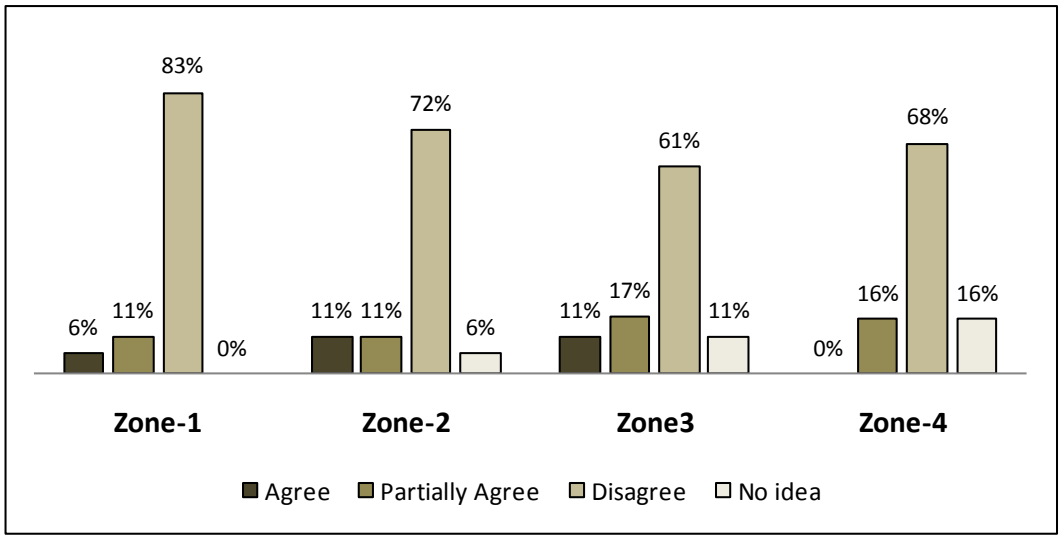


Figure 5-9: The questionnaire results for the statement of "whether there are enough sheltering provided by building canopies for pedestrians to be protected from sun light, rain, snow and wind in Atatürk and Uray Streets".

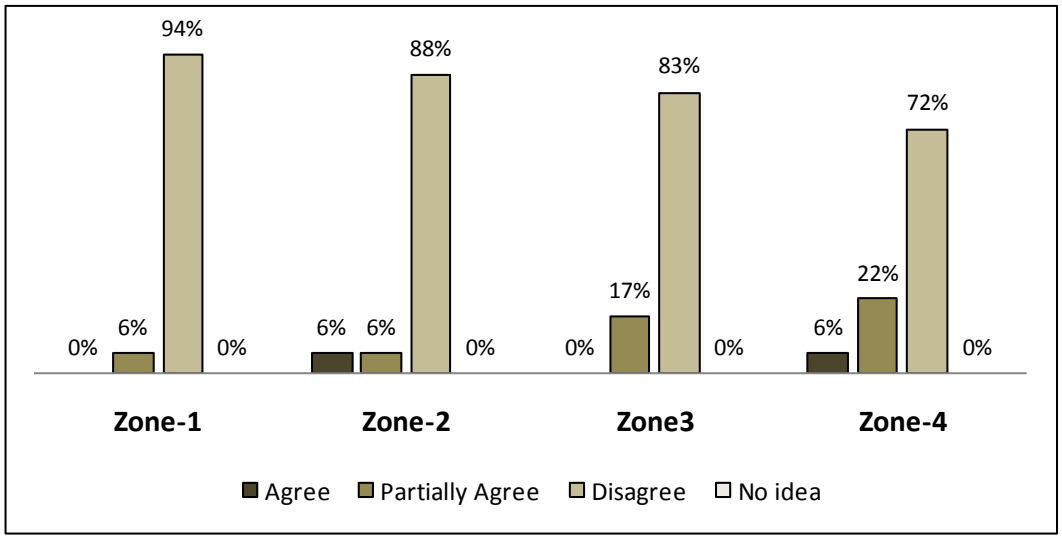


Figure 5-10: The questionnaire results for the statement of "whether there are enough benches and rest places for pedestrians in Atatürk and Uray Streets".

To sum up, according to direct observations, availability of sufficient pedestrian amenities plays a fundamental role in walkable environment. In Z1, Z2 and Z3, the number of pedestrian amenities is quite insufficient and existing amenities are highly in poor condition. In Z1, Z2 and Z4, shopfronts do not include tent or coverage to protect pedestrians from external factors like sun, rain or wind. Also, there are no amenities like coverage, bench or public toilet for pedestrians. Z4 is relatively comfortable because of the pedestrianized area. However, pedestrian uses tree root barrier for sitting and dining in Z4 (Figure 5-11). In Z3, there are arcades of Ulu Bazaar to protect pedestrians from sun and rain. Although Z3 is a public square mostly, only there are two banks for pedestrians (Figure 5-12). So, varying points are used for sitting like staircase or pavements of the Mosque and there is only one public toilet, the Mosque's one, for pedestrians.

Tree root barriers

Tree root barriers

Figure 5-11: Photographs related with pedestrian amenities in Z4 (Personal archive of Z.S.Belge).

Arcades in the northern side of Ulu Bazaar

Arcades in the inner side of Ulu Bazaar

Figure 5-12: Photographs related with pedestrian amenities in Z3 (Personal archive of Z.S.Belge).

5.1.4. Availability of Crossings along Major Roads

The assessment of "availability of crossings along major roads" is another variable of "attractiveness and convenience" indicator. Four related questions were only asked to the pedestrians in Uray Street zones - "Z1, Z2".

The first question is *"whether there are sufficient street crossings along Uray Street";* and the respondents relatively claimed that there are more sufficient street crossings in Z1 than Z2 (Figure 5-13). Secondly, the users of Uray Street were asked *"whether the*

street crossings along Uray Street are well-situated". Regarding this statement, the responses are close to each other in Z1 and Z2 (Figure 5-14).

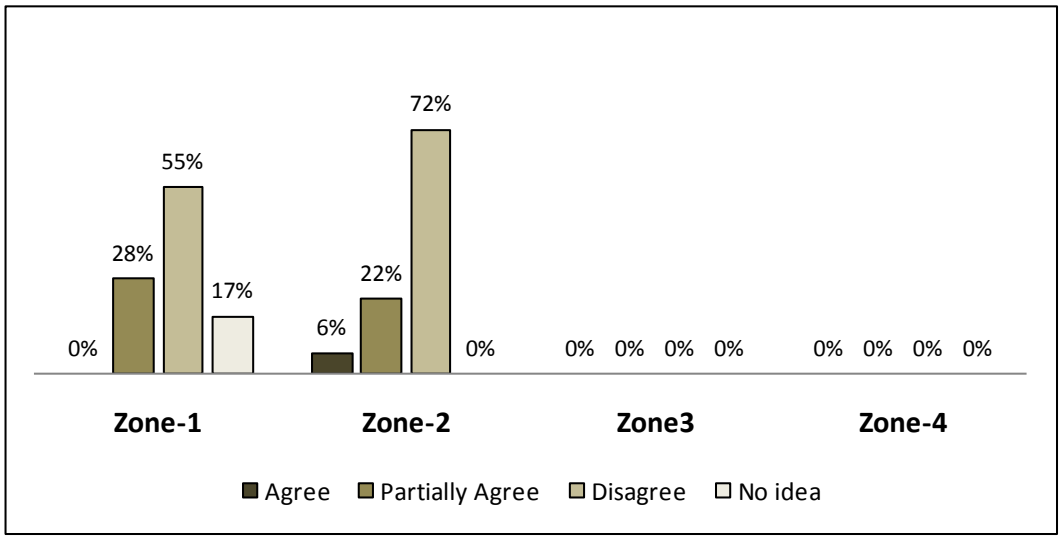


Figure 5-13: The questionnaire results for the statement of "whether there are sufficient street crossings along Uray Street".

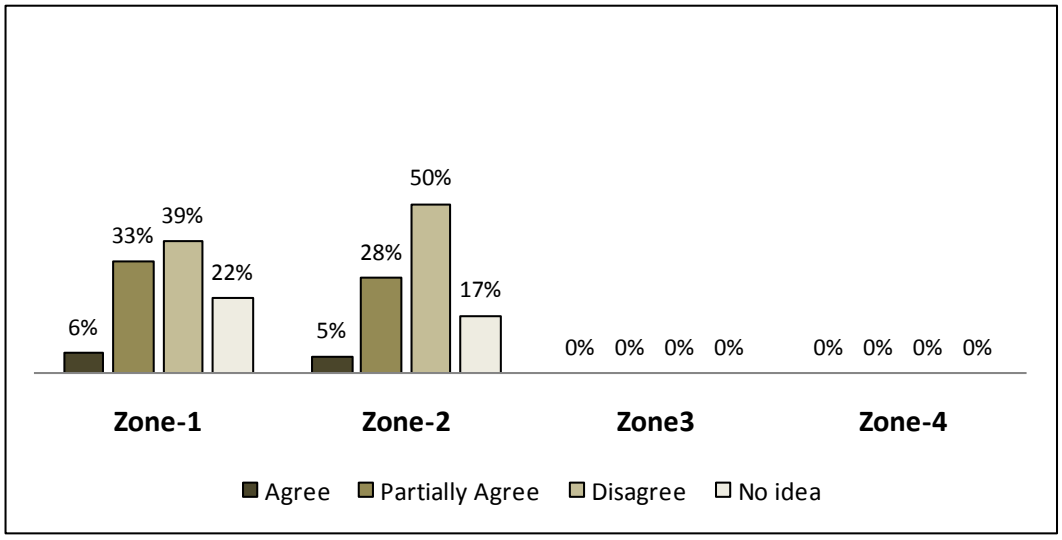


Figure 5-14: The questionnaire results for the statement of "whether the street crossings along Uray Street are well-situated".

Thirdly, the users of Uray Street were asked *"whether the street crossings along Uray Street are located on easily accessible places"* (Figure 5-15). After that, the last question related to "availability of crossing roads" asked to the pedestrians is *"whether the street crossings along Uray Street are easily visible"* (Figure 5-16). The results present that, there is a lack of street crossings in both Z1 and Z2.

In addition to the outputs of questionnaire, direct observations clearly indicate that there is no pedestrian pass/crossing in Z1, although there are schools and administrative buildings in near environs. Moreover, Z2 includes two traffic lights that are not designed for disabled people. The pedestrian passes/crossings are not clear and the traces on pavements are disappeared. Therefore, ease of crossings could not be exactly provided for vulnerable groups.

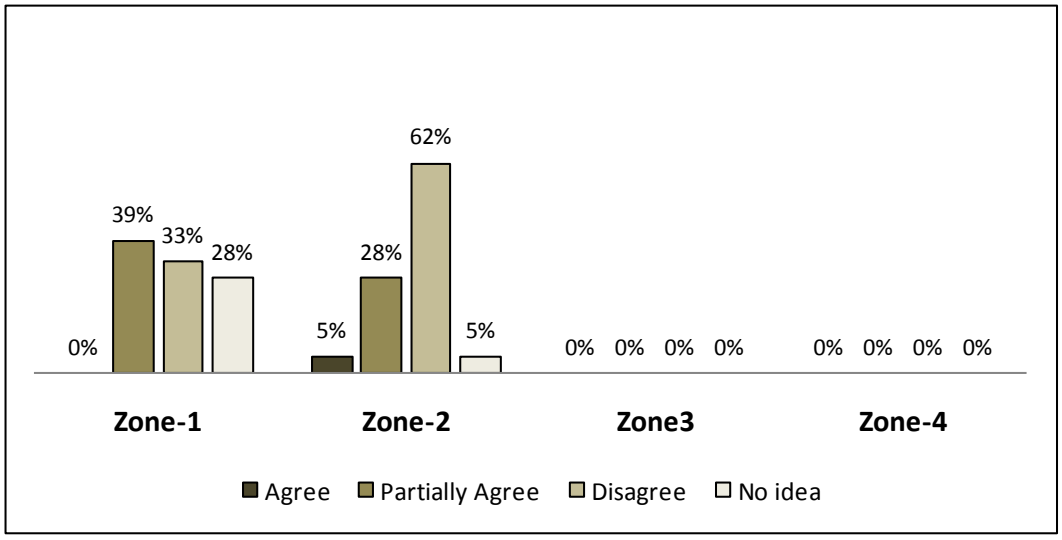


Figure 5-15: The questionnaire results for the statement of "whether the street crossings along Uray Street are located on easily accessible places".

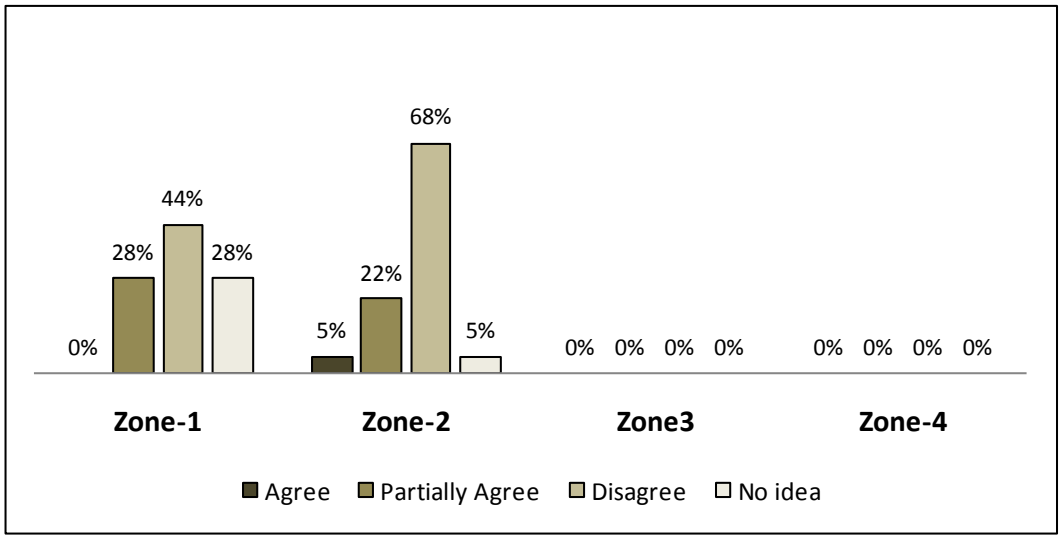


Figure 5-16: The questionnaire results for the statement of "whether the street crossings along Uray Street are easily visible"

5.1.5. The Existence of Interesting Urban Scene

The existence of interesting urban scenes such as historic streetscape, good-looking and well-maintained shop fronts especially make places attractive. The case study area has various and diversified urban scene because of its historical feature. More specifically, Z1 and Z2 has more interesting urban scene and characteristics with historical buildings; however, Z4 is more preferable than other parts of Uray and Atatürk Streets because of including historic streetscape, good-looking and well-maintained shop fronts all together. As shown in Figure 5-17, the building of Metropolitan Municipality and Atatürk House in Z4 are the most preferred foci and interesting places of the case study areas. This figure shows that overall the case study area is known and used by pedestrian.

Briefly put, although there is no attractive shops or similar use in Z1, historic entities and their settings (the old building of Governorship that was used as the Provincial Directorate of Health till to near past, the old building of Ziraat Bank) with historical importance of Uray Street provide interesting scene and streetscape. However, the lack of maintenance of historic entities and settings reverses streetscape. The Latin Catholic Church enriches Z1 and attracts people by means of cultural activities. There are historic

entities and traditional Mersin's houses in 118th Street at the west of Latin Catholic Church (Figure 5-18).

On the other hand, the transparency of shops that could attract pedestrians is negatively blocked by shop signs in Z2. However, historic entities and settings like Sursok Khan, Taş Khan and Eski Cami enhance the attractiveness of Z2. Although, there is a lack of maintenance and cleanliness, street dining facilities along the crossing roads enhance street uses in Z2 (Figure 5-19).

There is coherence manner in jewelry signs and facades that create a transparency to attract people. In addition, Z3 comprises a square (one of the largest gathering points in case area), but the quality of the built environment and uses are too low to attract more people. Mostly, Z3 is used by people comes for Ulu Cami (Figure 5-20).

On the other hand, in Z4, the transparency of facades, the facades and signs of shops are relatively better and more maintained than other zones. Also, perfumeries and jewelry shops use a similar facade design that positively differentiates Z4 than others. The Old Public House used as the Culture Center, The House of Governor, The Building of Municipality, Atatürk House and The Fish Bazaar are the characteristics enriching Z4 (Figure 5-21).

Differently from aforementioned questionnaire statements, attractive foci of the case study area were asked to the respondents by an open-ended question, *"Where are the focal points and interesting places of Uray and Atatürk Streets?"* According to the results of questionnaire, the building of Mersin Metropolitan Municipality, Atatürk House, Ulu Cami, Cumhuriyet Square, Ulu Bazaar, the Latin Catholic Church, The Fish Bazaar and historic entities in Z1 and Z2 are the most attractive foci of the case study areas (Figure 5-17).

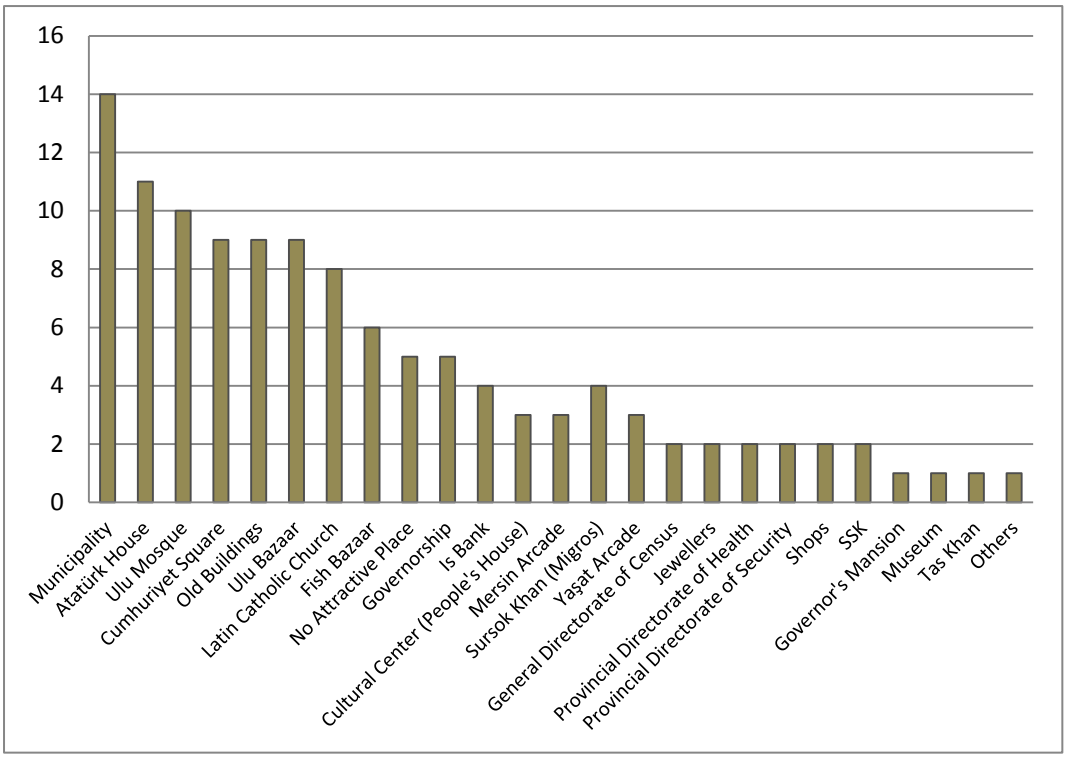


Figure 5-17: The most attractive foci of Uray and Atatürk Streets according to questionnaire results.

The Old House of Governor

The Latin Catholic Church

Tradition houses

The Old Building of Ziraat Bank

Figure 5-18: Photographs related with interesting urban scenes in Z1 (Personal archive of Z.S.Belge).

Sursok Khan

Eski Cami

Figure 5-19: Photographs related with interesting urban scenes in Z2 (Personal archive of Z.S.Belge).

Ulu Cami

Ulu Bazaar (Old Square of Gümrük (Custom))

Figure 5-20: Photographs related with interesting urban scenes in Z3 (Personal archive of Z.S.Belge).

The Metropolitan Municipality of Mersin

Cumhuriyet Square

The Fish Bazaar

Atatürk Evi

Figure 5-21: Photographs related with interesting urban scenes in Z4 (Personal archive of Z.S.Belge).

5.1.6. A Variety and Diversity of Land-Use Activities

As explained in Chapter 2, the diversity and variety of activities increases pedestrian vitality in street. Therefore, the diversity of buildings and land-use activities plays fundamental role to create walkable and livable environment. For the assessment of variety and diversity of land-use activities, the question of *"whether the variety of activities on Uray and Atatürk Streets arouse people's interest"* was asked to the pedestrians in the case study area. Most users in the case study area did not agree with this statement. However, in Z1 and Z4, the rate of agreed users is more than other two zones because of public buildings, historic entities and shopping facilities (Figure 5-22).

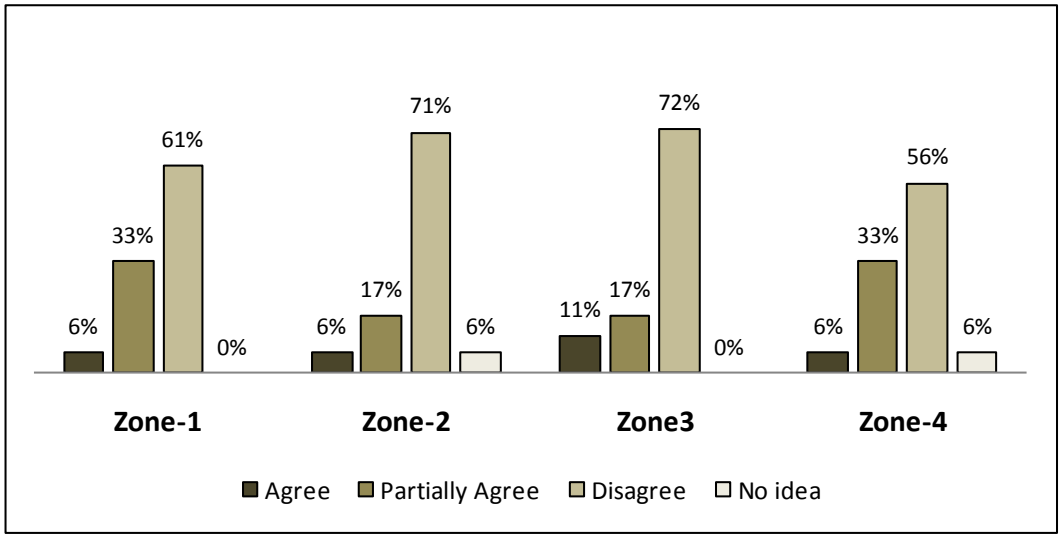


Figure 5-22: The questionnaire results for the statement of "whether the variety of activities on Uray and Atatürk Streets arouse people's interest"

To sum up, Z1 could not provide the diversity of land-use because of unoccupied buildings and ruins, despite of the presence of the foci, like the old house of Governorship, the old building of Ziraat Bank and the Latin Catholic Church. However, the public buildings, such as the Provincial Directorate of Police Office, the Courthouse and the Governorship, increase the rate of use.

In Z2, there are mainly banks, stores of mobile phone companies, exchange offices and training centers that provide a diversity of land-use. So, Z2 is more vital than Z1 because of the diversity of land-use and training centers. Z2 has foci, like Sursok Khan, Taş Khan, Eski Cami and Office Blocks.

As seen in land-use maps (Figure 4-18 and Figure 4-19), there are office uses and clothing stores, beside jewelries and gastronomic activities that set diversity in land-use in Z3. Besides the facilities of being a public square, the Mosque increases the use of Z3 during especially worships.

Moreover, Z4 has more qualified and diversified uses and spaces than other zones. There are focuses like The Old Public House (*Halkevi)* that uses as Culture Center, the House of Governor, the Building of Metropolitan Municipality, Atatürk House, The Fish Bazaar, Shopping Arcades known as "*Entel* Bazaar" and Office Blocks.

5.1.7. The Evaluation of Attractiveness and Convenience in the Case Study Area

In this section, as a result of aforementioned discussion based on variables of indicators, the perceptions of users in the cases study are re-evaluated by means of direct observations and desk-based assessments. After that, characteristic zones of the case study area - Z1, Z2, Z3 and Z4- are compared each other with a simple scale from (-) to (*), which includes relative comparison of indicators of walkability.

In table 5-1, zones are presented with columns and each related statement / questions of questionnaire are grouped within each indicator and presented along rows. In the following table, some initiations are also used to define indicators; **AaC.1;** means "Maintenance and Cleanliness of Walking Paths", **AaC.2** means "Existence and Quality of Facilities for Blind and Disabled People" **AaC.3** means "Pedestrian Amenities (Coverage, Benches, Public Toilets)" **AaC.4** means "Cleanliness of Walking Paths" **AaC.5** means "Availability of Crossings along Major Roads", **AaC.6** means "the Existence of Interesting Urban Scene" and **AaC.**7 means "Variety and Diversity of Land-Use Activities".

Table 5-1: The evaluation of questionnaire results in character zones of the case study area according to relative comparisons in terms of attractiveness and convenience.

	QUESTIONS/STATEMENTS	Z1	Z2	Z3	Z4
AaC.1	It is a clean and well-maintained street	Disagree	Disagree	Disagree	Disagree
AaC.2	There are enough arrangements and facilities for blind and disabled people	Disagree	Disagree	Disagree	Disagree
	Bumps, traffic lights and pedestrian crossings are designed by taking into consideration of disabilities	Disagree	Disagree		
AaC.3	There are enough sheltering provided by building canopies for pedestrians to be protected from sun light, rain, snow and wind	Disagree	Disagree	Disagree	Disagree
	There are enough benches and rest places for pedestrians along Uray and Atatürk Streets	Disagree	Disagree	Disagree	Disagree
AaC.5	There are sufficient street crossing along Uray Street	Disagree	Disagree		
	The street crossings along Uray Street are well-situated	Disagree	Disagree		
	The street crossings along Uray Street are located on easily accessible places	Agree	Disagree		
	The street crossings along Uray Street are easily visible	Disagree	Disagree		
AaC.7	The variety of activities on Uray and Atatürk Streets arouse people's interest	Disagree	Disagree	Disagree	Disagree

In brief, attractiveness and convenience is crucial component that contributes to a walkable environment. The results of questionnaire show that pedestrians do not find

Uray and Atatürk Streets as attractive and convenience. However, the field investigation and direct observation show that Z4 is more attractive and convenience than other zones, with well-maintained and clean walking paths, even in poor conditions existing facilities for vulnerable groups and interesting urban scene and diversity of activity. Therefore, Z4 is more walkable than other zones in terms of attractive and variable features. Furthermore, the case study area is quite attractive in terms of historic setting of city center (table 5-2).

Table 5-2: The evaluation characteristics zones of the case study area in terms of attractiveness and convenience.

	Zone-1	Zone-2	Zone-3	Zone-4
1. Maintenance and cleanliness of walking paths	+	+	-	*
2. Existence and quality of facilities for blind and disabled people	-	-	-	+
3. Pedestrian amenities (coverage, benches, public toilets)	-	-	+	-
4. Availability of crossings along major roads	-	-		
5. The existence of interesting urban scene (including historic streetscape, good-looking and well-maintained shop fronts)	+	+	+	+
6. A variety and diversity of land-use activities	-	+	*	*
(*) Good / (+) Fairly good / (-) Poor				

5.2. Connection to Open Space

The open spaces are places where citizens could interact, meet, stand, or talk. A walkable environment is primarily possible by providing social interaction among public and place of social interaction in the open spaces. As mentioned in Chapter-3, the variables of connection to open space are “the connection of street network to natural

elements", "the connection of street network to meeting and gathering places" and "the connection of street network to unique features and visual interest" that are the measures to understand the connection between open spaces and the case study area.

5.2.1. The Connection of Street Network to Natural Elements (parks, playgrounds, schoolyards, nature reserves, sea, lakes, rivers, and pathways)

The sea is a natural element with its primary importance in the development of Mersin since its establishment as mentioned in Chapter-4 in details. Uray and Atatürk Streets, which were along the seaside in the past, nowadays need connection of street network to natural elements because of filling area. In addition to the seaside and Atatürk Park, İnönü Park at the opposite of the Railway Station, Yoğurt Bazaar, Ulu Bazaar and Cumhuriyet Square are essential natural elements of the case study area.

The results of the content analysis show that Z1 has one connection with İnönü Park opposite to Railway Station and has two connections with the Seaside however the form and location of Congress and Exhibition Hall block the connection between historic city center and sea (Figure 5-23). Also, there are poorly designed four street connections with the Seaside and Atatürk Park in Z2. There is small-scale gathering point at the back side of Sursok Khan and there is only one connection with Yoğurt Bazaar in Hastane Street, which is a cultural and historic setting (Figure 5-23).

In Atatürk Street, Z3 has two connections with the Seaside and Atatürk Park at the east and west of Ulu Bazaar. There is a green area at the southern side of Ulu Bazaar, at the north of İsmet İnönü Boulevard (Figure 5-23). Z4 has four connections with the Seaside and Atatürk Park. Due to nearness to Atatürk Park, usage of those connections is more than other zones. There is a passive green area next to the Municipality Building and an active green area next to Atatürk Park and a street at the east of Atatürk House that arranges an active green connection and an actively used tea garden opposite to Atatürk House (Figure 5-23).

5.2.2. The Connection of Street Network to Meeting and Gathering Places

Gehl (2010: 145) indicates that all staying activities in urban edge zones, sidewalk cafés play particularly a significant role in the modern city landscape. While sidewalk cafés were once the province of Mediterranean cities and cultures, the idea has caught on in cities throughout the economically developed part of the world. Also, he adds that the real justification and attraction of sidewalk cafés are precisely “life on the sidewalk”. The opportunity to rest and have refreshments and coffee is also an excuse to watch city life go by (Gehl, 2010: 146). Therefore, well-constructed connection of street network to meeting and gathering places increases social interaction for the community.

The public buildings, such as the Provincial Directorate of Police Office, the Courthouse and the Governorship, are the most commonly used buildings in Z1. In addition, Latin Catholic Church is essential meeting and gathering place with cultural events and organizations. Furthermore, there are two connections with the Congress and Exhibition Hall and Atatürk Park that are important meeting places (Figure 5-23). The street network in Z1 lets to connections with Railway Station, İnönü Park and Public Library. Z2 has many gathering places, such as Sursok Khan, sidewalk dining activities, the Congress and Exhibition Hall and Atatürk Park in a relation with zone. However, in Z2, gathering places cannot attract people due to lack of urban design principles and diversified land-use.

Ulu Cami and Ulu Bazaar are important gathering and meeting places in Z3, also trees around Ulu Cami enrich this zone. In Z4, there are two crucial public squares, Cumhuriyet Square in front of the Culture Center and Ulu Bazaar Square next to Ulu Cami. Cumhuriyet Square is more maintained and qualified than other one. Other gathering and meeting places in Z4 is Atatürk House, the building of Metropolitan Municipality and Kıbrıs Bazaar, between Silifke Street and the case area. Moreover, sidewalk dining areas enhance the connections of Z4.

5.2.3. The Connection of Street Network to Places with Unique Features and Visual Interest

Unique features and visual interest offers an aesthetic experience that enhances the experience for pedestrians. Also, the connectivity between places with visual interest helps (create) to empower community's heritage and provides attractive environments and sustain characteristic of place by unique features.

Historic entities, monumental structures, like the sculpture of İsmet İnönü opposite the Railway Station or the sculpture in front of the Provincial Directorate of Police Office, enhance the identity of Uray Street. Moreover, two connections with Silifke Street that are efficiently used by Café' sidewalk dining, in addition street trees on these connections provide a pleasure to Z1. Street trees in front of the Governorship enrich streetscape and identify the street. However, walkways reaching to the unique features and visual interest are suffering from lack of maintenance and quality in Z1. Historic entities enrich Z2, but unoccupied and unmaintained buildings reverse visual interest of pedestrians. The connections with Silifke Street and Yoğurt Bazaar are efficiently used by Café' sidewalk dining and street trees on these connections provide a pleasure to Z2. Park areas at the south of Sursok and Taş Khans enrich Z2 by street activities, although the lack of maintenance and quality reduces the attractiveness of the zone. Compared to Z3 when the area was used as the Square of Gümrük (Custom), unfortunately, the recent condition and uses of the square is quite poor. The small fountain in front of Ulu Bazaar that is used as an advertising board also, visually disturbs pedestrians. Moreover, there is an unmaintained decorative pool in the mid of Bazaar. In comparison with other zones, there are many unique features in Z4, like Atatürk Monument, Independence Sculpture, Orange Sculpture and public arts that create visual interest. Z4 has decorative pools and water elements in Cumhuriyet Square and in front of the Metropolitan Municipality visually enrich zone. The connections with Silifke Street and Kıbrıs Bazaar are efficiently used by Café' sidewalk dining. The connections with the seaside are also efficiently used by Café' sidewalk dining and street sellers. Those connections can be considered as livable public spaces. As in other zones, street trees on these connections provide a pleasure to Z4 .

Weak connection with the seaside in Z1

Weak connection with the seaside in Z1

Loose connection with the seaside in Z2

Pedestrian pass in Z2 to Atatürk Park

Weak connection at the west of Ulu Cami

Opening in front of the building of Metropolitan Municipality

Street at the east of Atatürk House that arranges an active green connection

Passive green area next to the building of Metropolitan Municipality

Figure 5-23: Photographs related with connections to open space in the case study area (Personal archive of Z.S.Belge).

5.2.4. The Evaluation of Connection to Open Space in the Case Study Area

Open spaces are social gathering spaces, which play a crucial role in the identity of walkable place and functionality of public place. Uray and Atatürk Streets have potentials to improve the network (and relations) among open spaces, natural elements and amenities. According to direct observations in the case study area, the connectivity of path network to natural elements in Z3 and Z4 is relatively better than Z1 and Z2. Moreover, Z4 includes more lively public space than other zones due to pedestrianized area. The connectivity of Z4 with meeting and gathering places is relatively improved than Z1 and Z3. Despite of Z2's many gathering places, they cannot attract people due to lack of diversity of land-use and maintenance. Z4 has many public arts and visually interesting assets, compared to the other zones. Therefore, Z4 is more walkable in terms of the connection of pedestrian path network with the places accommodating unique features and visual interest (Figure 5-24 and Figure 5-25).

Table 5-3: The evaluation characteristics zones of the case study area in terms of connection to open space

	Zone-1	**Zone-2**	**Zone-3**	**Zone-4**
1. The connection of street network to natural elements (parks, playgrounds, schoolyards, nature reserves, sea,	-	-	+	+
2. The connection of street network to meeting and gathering places	+	-	+	*
3. The connection of street network to places with unique features and visual interest	+	+	-	*
(*) Good / (+) Fairly good / (-) Poor				

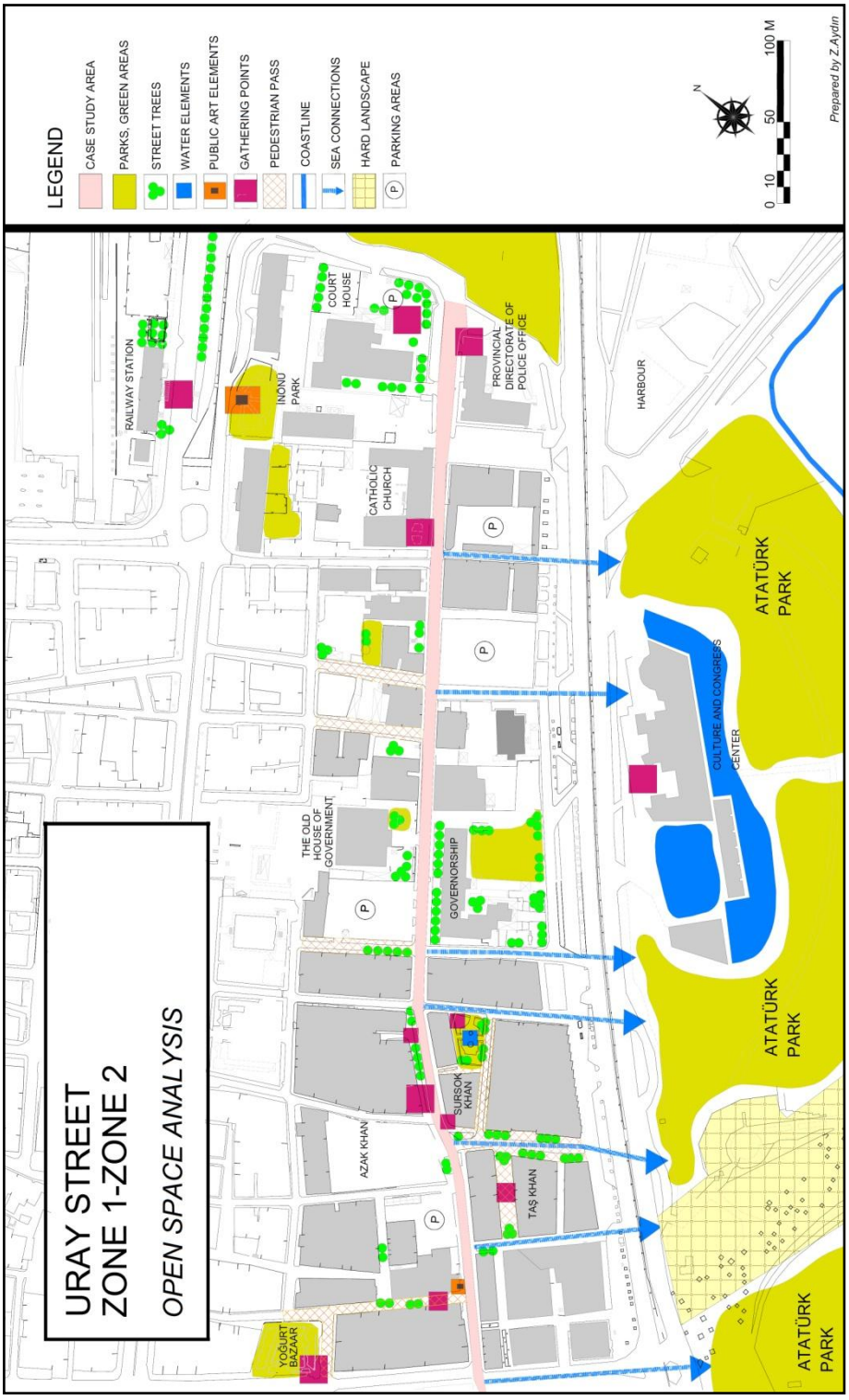


Figure 5-24: Open Space Analysis / Uray Street

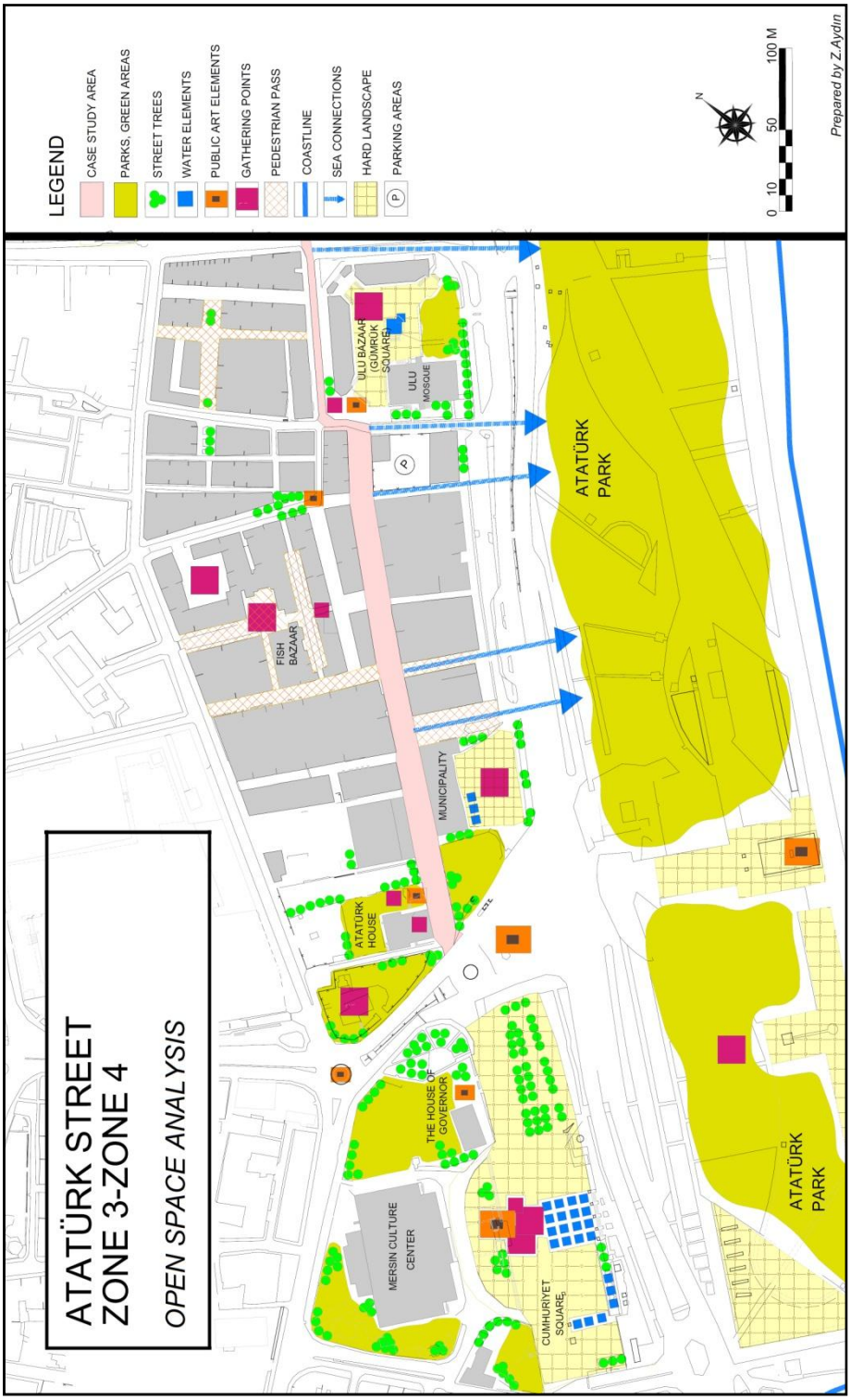


Figure 5-25: Open Space Analysis / Atatürk Street

5.3. Safety

Creating walkable environment is primarily possible by providing safe and comfortable streets. The safety of a street definitely plays an important role in bringing people to the street. Life and people themselves make the city more inviting and safe in terms of both experienced and perceived safety (Gehl, 2010:91). In this study, safety is examined under two titles as actually and perceptually.

5.3.1. Actual Safety

As mentioned in literature review, wider street limits the sense of movement; similarly, narrow streets help to slow down vehicular traffic so that narrow streets improve the walkability and general safety. However, narrow streets limit the pedestrian movement and ease of movement in some cases. In defined context, a harmony should be set to achieve pedestrians' ease of movement without effecting vehicular traffic. In this way, pedestrians would feel safety. Briefly put, the proportion of street width to sidewalk width plays a crucial role for pedestrian safety (as discussed in Section 5.5 in detail). Safety can be achieved through the ease of pedestrian movement. Also, the control of vehicular traffic is another essential component for pedestrian safety that is possible with traffic calming policies. The following sections discuss "street width and enclosure" and "traffic safety" is as the measures which examine actual safety (i.e., a variable of safety indicator).

- **Street Width and Enclosure**

As discussed in Chapter 2, street width and enclosure of streets are essential for feeling physically and perceptually safe. The narrow streets are safer than wider streets because of helping to slow down traffic.

For the assessment of "street width and enclosure", six related questions / statements were asked to the pedestrians in the case study area. As mentioned in the method of study, the following questions were only asked in Uray Street zones - Z1, Z2- because

Atatürk Street is a pedestrianized street and does not have any specific sidewalk. These questions are:

- Uray Street is wide enough for both vehicular and pedestrian traffic
- Do you think, some parts of Uray Street's sidewalks should be widened? Which parts?
- Do you think, some part/s of Uray Street should be pedestrianized? Which parts?

The first question is *"which part/s of Uray and Atatürk Streets you can walk easier and more comfortably"*. Regarding this statement, 46% of all respondents claimed that walking in the pedestrianized area of Atatürk Street (Z4) is easier and more comfortable than other zones. In addition, 42% respondents maintained that they can walk easier and more comfortable in and around Ulu Bazaar in Atatürk Street (Z3). The responses of this statement show that pedestrians prefer walking in Atatürk Street's zones to walking in Uray Street's zones (Figure 5-26).

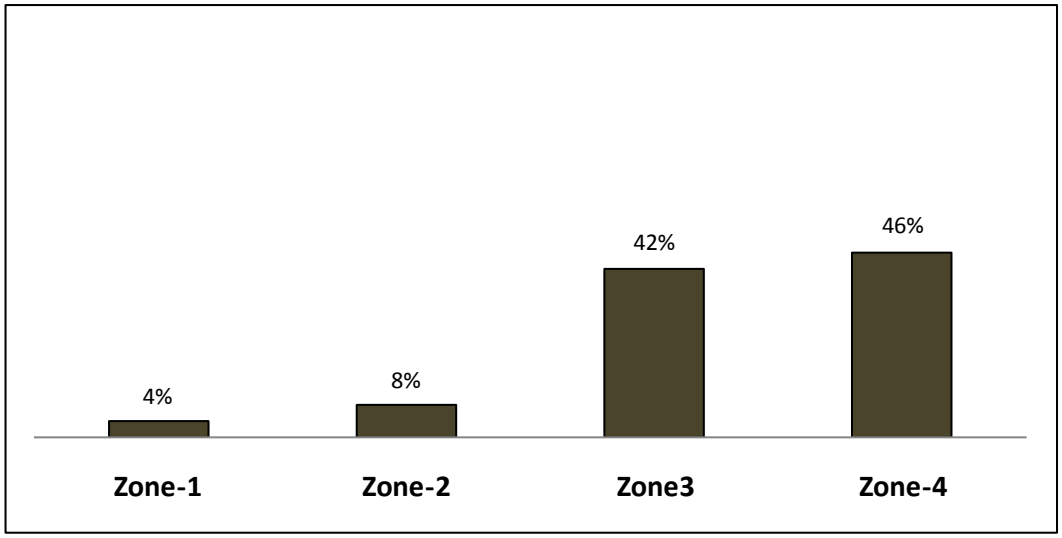


Figure 5-26: The outcome of "which part/s of Uray and Atatürk Streets you can walk easier and more comfortably" according to sub-zones

Regarding “street width and enclosure” measure of actual safety, the second question seeks to understand *“which part/s of Uray and Atatürk Streets pedestrians can walk more difficult and uncomfortably”*. According to the responses of this statement, walking in Z1 is more difficult and uncomfortably than other zones. Pedestrians easily and comfortably walk in Z4 compared to other zones. Also, Z3 is relative more walkable for pedestrians than Z1, and Z2. There is a great role of being pedestrianized area of Z3 and Z4 to select these parts of the case study area (Figure 5-27).

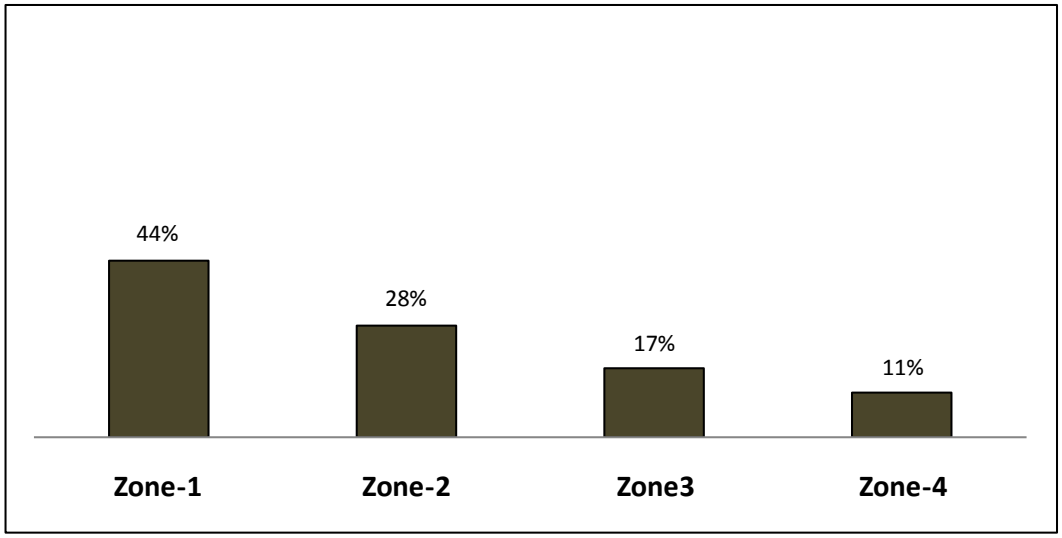


Figure 5-27: The outcome of “which part/s of Uray and Atatürk Streets you can walk more difficult and uncomfortably” *according to sub-zones*

Also open-ended questions are asked to pedestrians to evaluate their views about street width and enclosure in terms of actual safety. The majority of the respondents claimed that Uray Street (Z1, Z2)’s sidewalks should be widened, and also these parts of the case study area should be pedestrianized. They added that sidewalks are narrow and they feel unsafe when walking on Uray Street.

Lastly, the users of Uray Street were asked *“whether Uray Street is wide enough for vehicular and pedestrian traffic”*. In Z1 and Z2, the most of users claimed that the width of Uray Street is not sufficient for vehicular and pedestrian traffic (Figure 5-28).

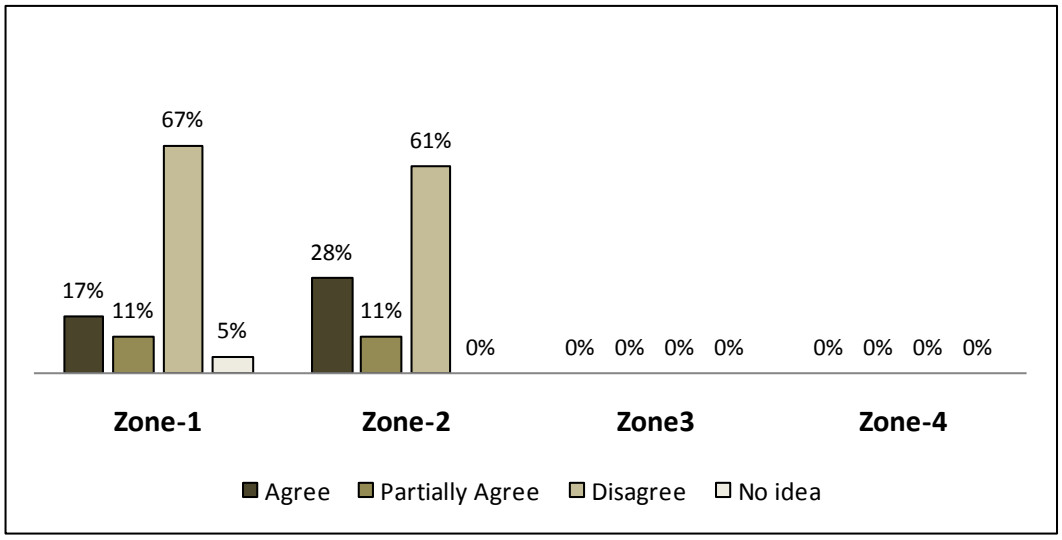


Figure 5-28: The outcome of "whether Uray Street is wide enough for vehicular and pedestrian traffic" according to sub-zones

Direct observations and desk-based assessments of current digital map of the case study area reveals that the width of pedestrian sidewalks (between 1.08-3.46m, Figure 5-29) is not enough to provide pedestrians with a site to walk with a leisurely pace or with a sense of safety, by being far from vehicles and vehicular road. However, the width of vehicular traffic zone is between 5.30-7.20 meters in Z1 and Z2. Traffic zone is approximately 10-15 meters in the area between the Provincial Directorate of Police Office and the Courthouse. The sidewalks are narrow, therefore insufficient in terms of giving a sense of safety for pedestrians in both zones are low to sense safety in both two zones.

In Z3, the loss of boundaries of square cannot provide a sense of enclosure or human scale, so no sense of being safe. The northern side of square, Atatürk Street, is safer than Z1 and Z2 because of protection from vehicular traffic, however the pedestrianized area is not physically determined (Figure 5-32). In Z4, the width of sidewalk which is approximately 15 meters (Figure 5-31) and enclosure provides pedestrians with a safe environment. Therefore, Z4 is safer than other zones with its being a pedestrianized site (Figure 5-32).

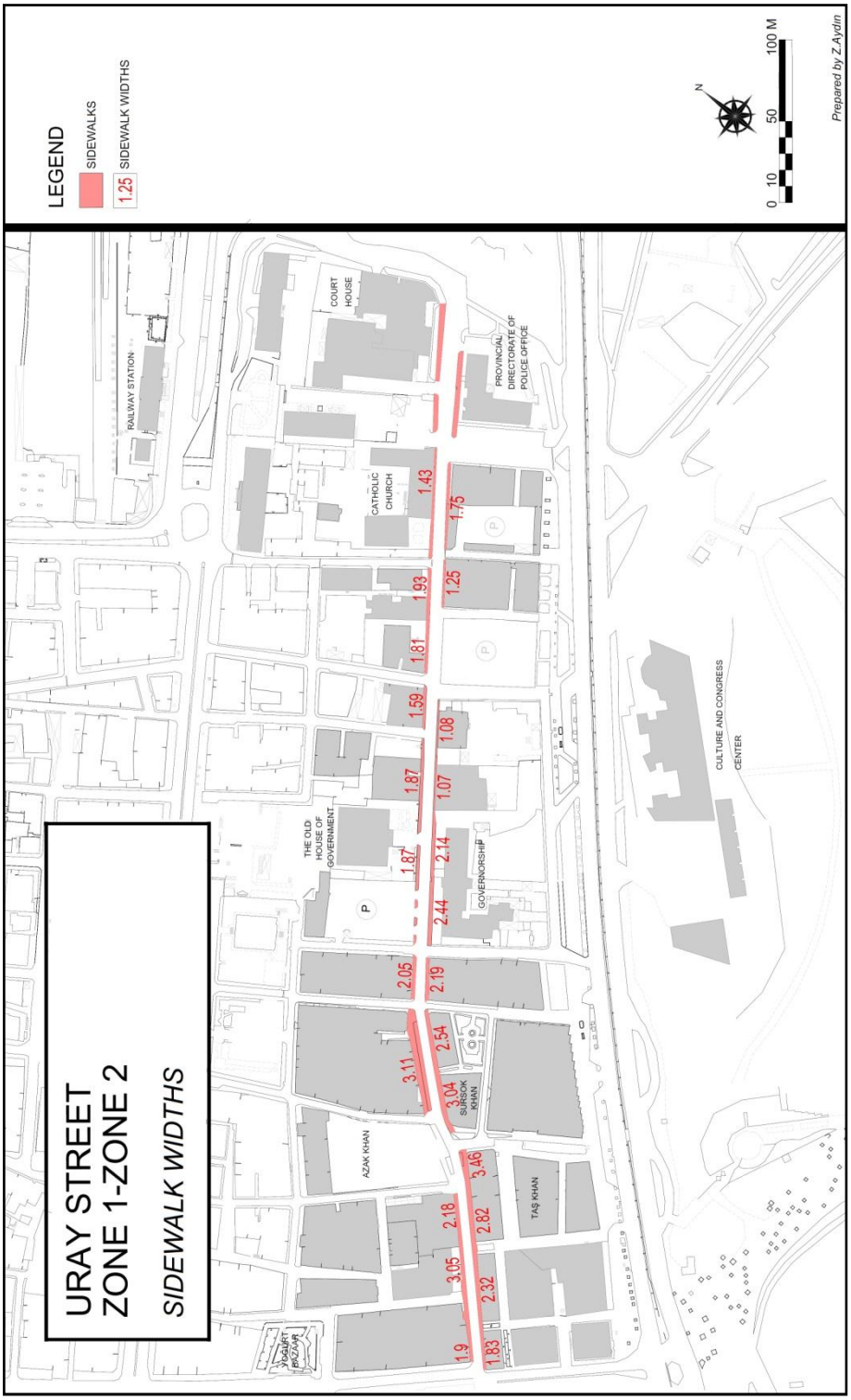


Figure 5-29: Sidewalk Widths of Z1 and Z2

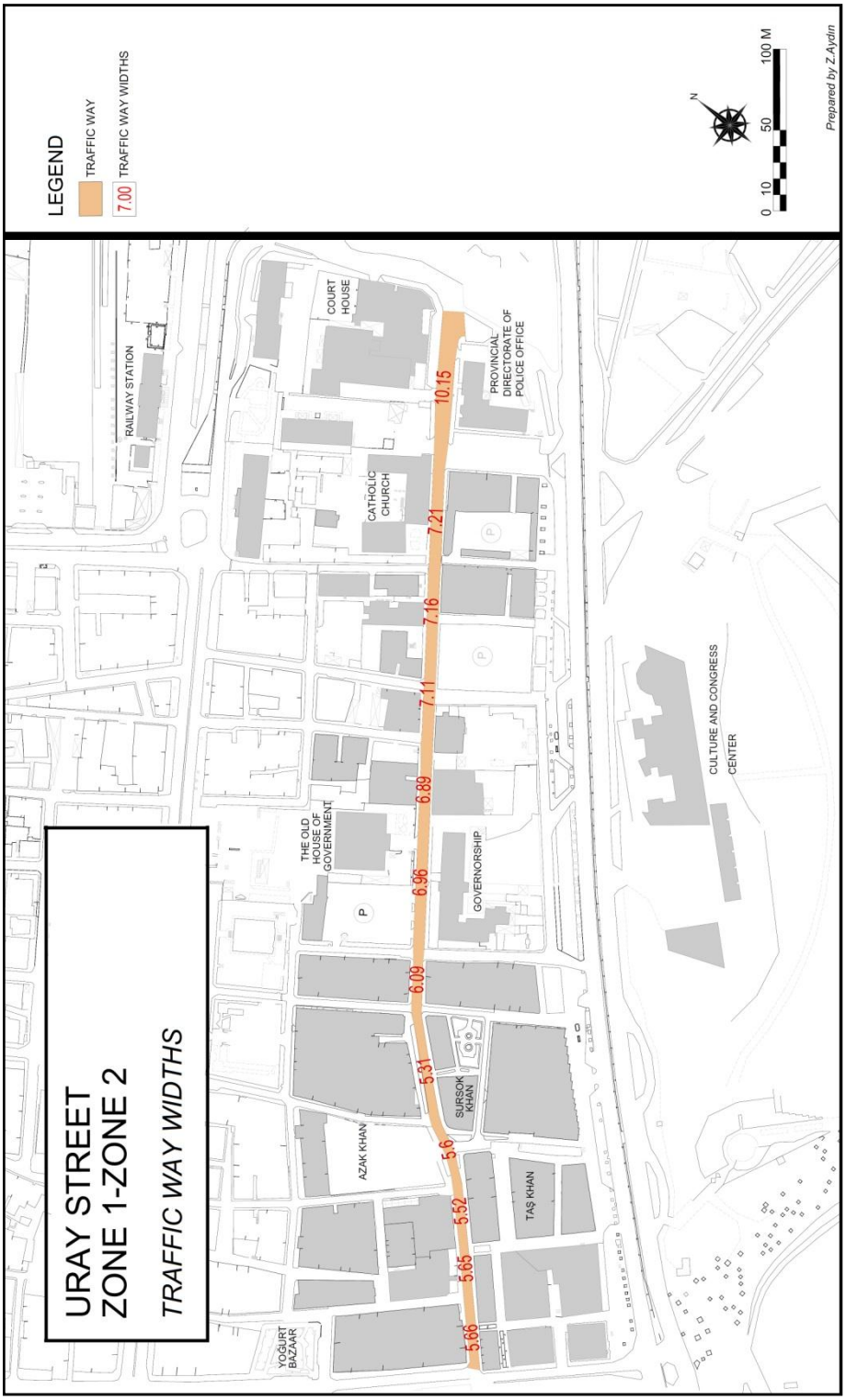


Figure 5-30: Traffic Way Widths of Z1 and Z2

Figure 5-31: Sidewalk Widths of Z3 and Z4

Pedestrianized walkway in Z3

Pedestrianized walkway in Z3

Pedestrianized walkway in Z4

Pedestrianized walkway in Z4

Figure 5-32: Photographs related with actual safety provided by pedestrianized ways in Z3 and Z4 (Personal archive of Z.S.Belge).

- **Traffic Safety**

Traffic safety is another measure of actual safety. As discussed in Chapter 2, increased walkability occurs if pedestrians feel safe alongside vehicular traffic. By using common traffic calming tools to slow down vehicular traffic, pedestrians could feel safer in streets. There are six related questions / statements were asked to the users of Uray and Atatürk Streets to examine traffic safety. As mentioned in the method of study, the questions were only asked in Uray Street zones. These questions are:

- It is difficult to cross the street for me in Uray Street
- Crosswalks are safe for old people, disabled people, children and parents with young children in Uray Street

The first question is *"whether the vehicular traffic disturbs the pedestrian movement"*. The most of users claimed that their movement is disturbed by the vehicular traffic in the case study area (Figure 5-33).

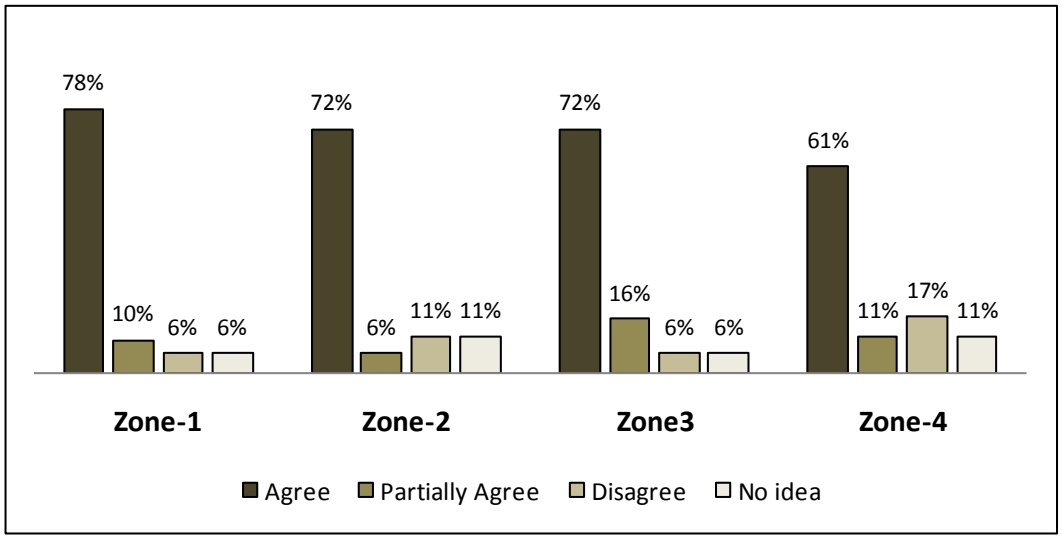


Figure 5-33: The outcome of "whether the vehicular traffic disturbs the pedestrian movement" according to sub-zones

Regarding 'traffic safety', the second question is *"whether car drivers should drive slower*". This question asked for all zones, because vehicles can also enter the pedestrianized area (Z3, Z4) on weekdays' evenings and weekends. The most users agreed that car-drivers ought to drive slower. At that point, high rates in Z1 indicate traffic calming problems in Uray Street (Figure 5-34).

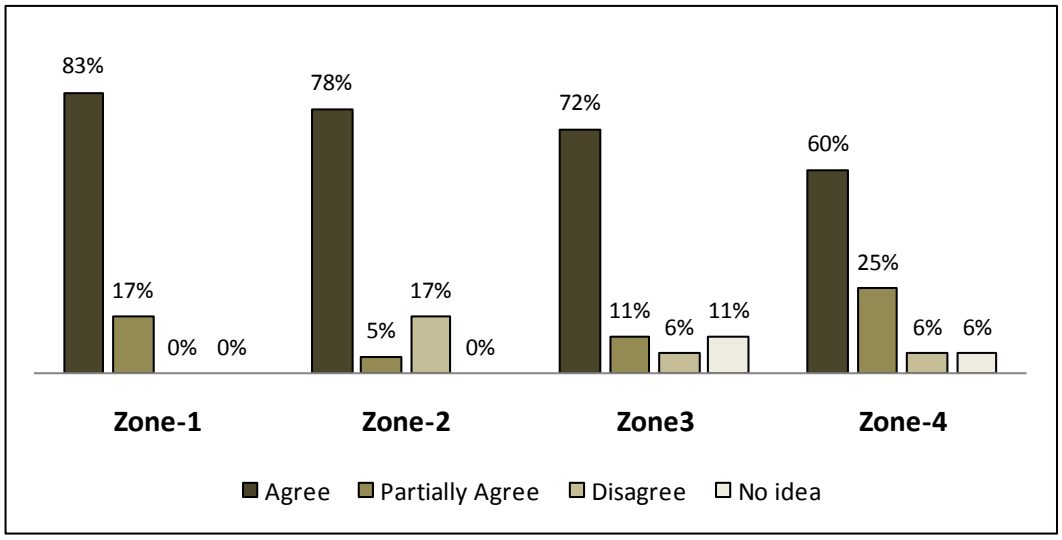


Figure 5-34: The outcome of "whether car drivers should drive slower" according to sub-zones

Third question regarding traffic safety is *"whether it is difficult to cross the street for pedestrians in Uray Street"*. The users claimed that they had difficulties while crossing Uray Street (Figure 5-35). Another question of traffic safety measure is "*whether crosswalks are safe for old people, disabled people, children and parents with young children in Uray Street"*. A great majority of users stated that crosswalks are unsafe for vulnerable groups in Uray Street (Figure 5-36). One question regarding traffic safety is *"whether pedestrian ways are safe for old people, disabled people, children and parents with young children in Uray and Atatürk Streets"*. Similarly, the great majority of streets' users stated that pedestrian ways are unsafe for vulnerable groups (Figure-5-37).

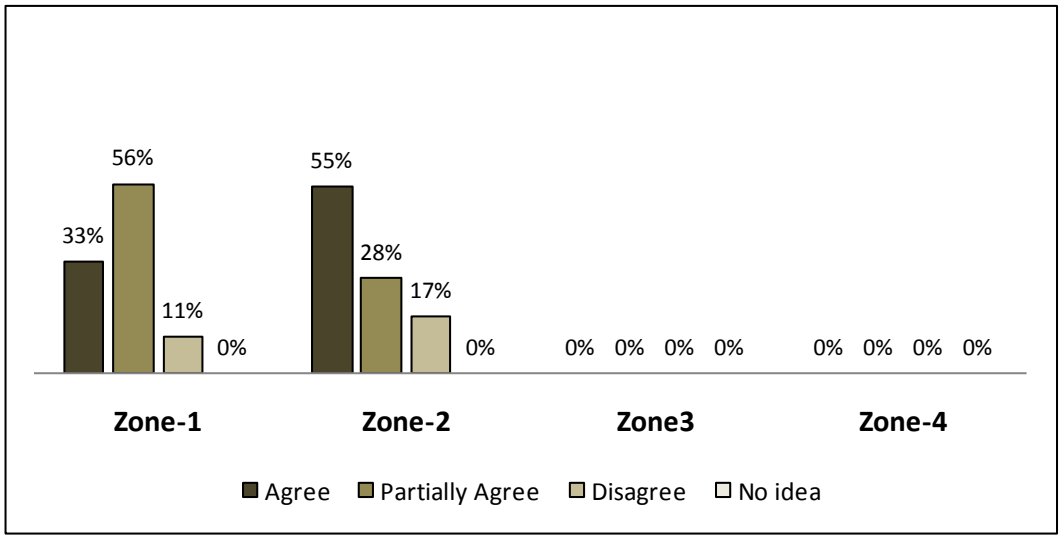


Figure 5-35: The outcome of "whether it is difficult to cross the street for me in Uray Street" according to sub-zones

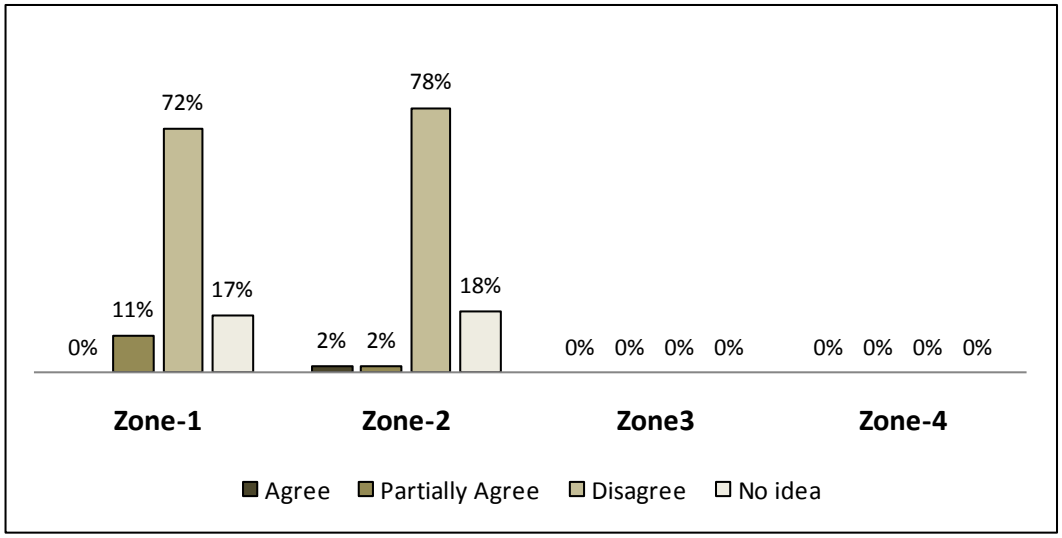


Figure 5-36: The outcome of "whether crosswalks are safe for old people, disabled people, children and parents with young children in Uray Street" according to sub-zones

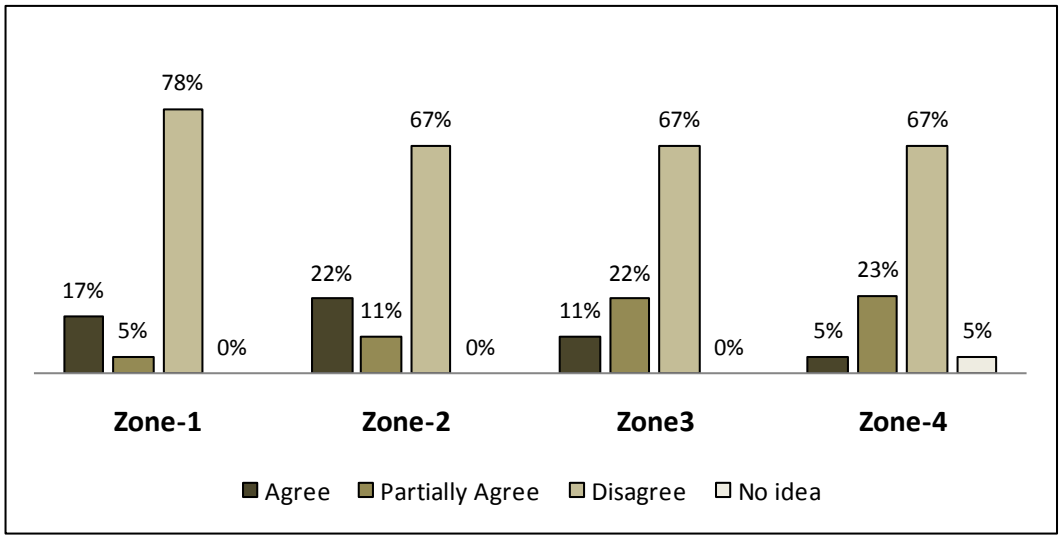


Figure 5-37: The outcome of "whether pedestrian ways are safe for old people, disabled people, children and parents with young children in Uray and Atatürk Streets" according to sub-zones

Regarding 'traffic safety', the last question is *"whether on-street car-parking disturbs the pedestrian movement"*. This question asked in all zones, as vehicles are allowed to drive on the pedestrianized area (Z3, Z4) on weekdays' evenings and weekends (Figure 5-38). According to the questionnaire results, although the elements of traffic calming are not sufficient, vehicular traffic is relatively slow than other streets due to narrowness in Z4.

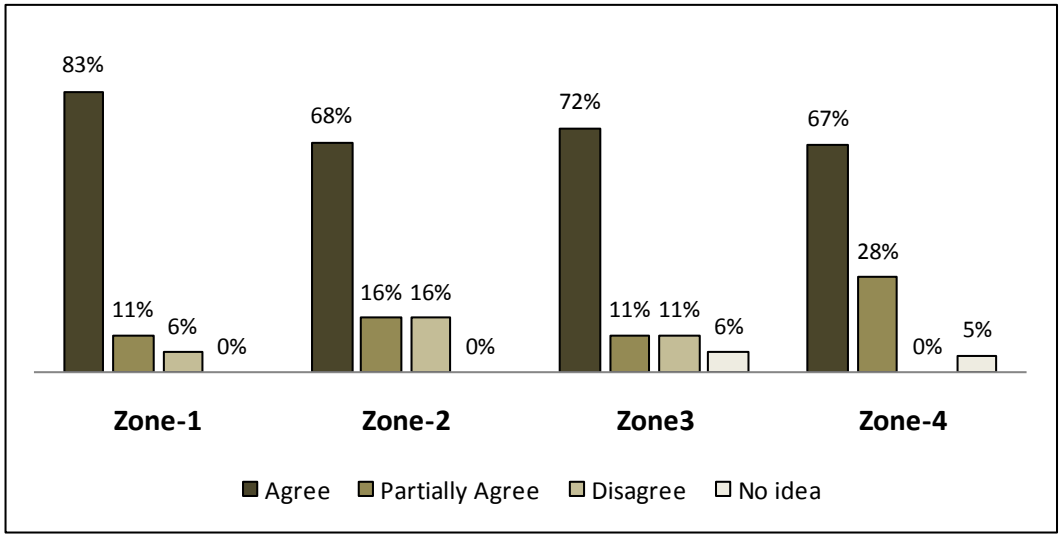


Figure 5-38: The outcome of "whether on-street car-parking disturbs the pedestrian movement" according to sub-zones

5.3.2. Perceived Safety

Being able to walk safely in streets is a prerequisite for creating inviting well-functioning cities for people. Experienced as well as perceived safety is crucial for life in the city (Gehl, 2010: 97). As discussed in Chapter 2, a sense of safety for people on streets is provided by the existence of certain boundary between public space and private space and the existence of *"eyes on the street"* (Jacobs, 1995: 286). It is obvious that the attractiveness and vital spaces provide perceived safety.

For the assessment of perceived safety, four related questions were asked to the pedestrians in the case study area. The first question is "*whether Uray and Atatürk Streets are noisy streets"***.** Regarding this statement, a great majority of all respondents claimed that the case study area is a noisy area (Figure 5-39). The second question related with the first question (36) of perceived safety is *"whether noise is resulted from car traffic in Uray and Atatürk Streets"*. The great majority of respondents thought that it is a noisy street and this noise is resulted from car traffic (Figure 5-40).

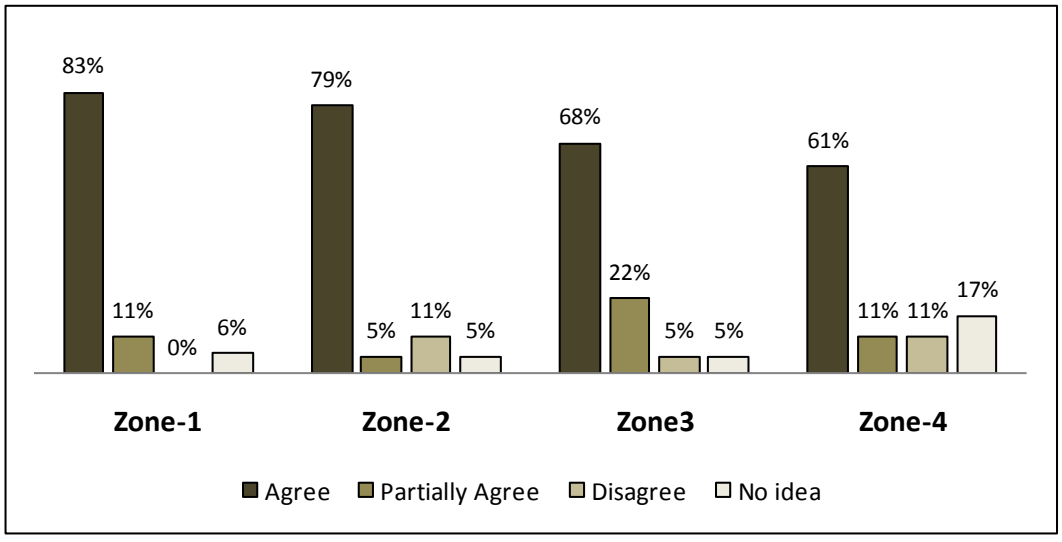


Figure 5-39: The outcome of "whether Uray and Atatürk Streets are noisy streets" according to sub-zones

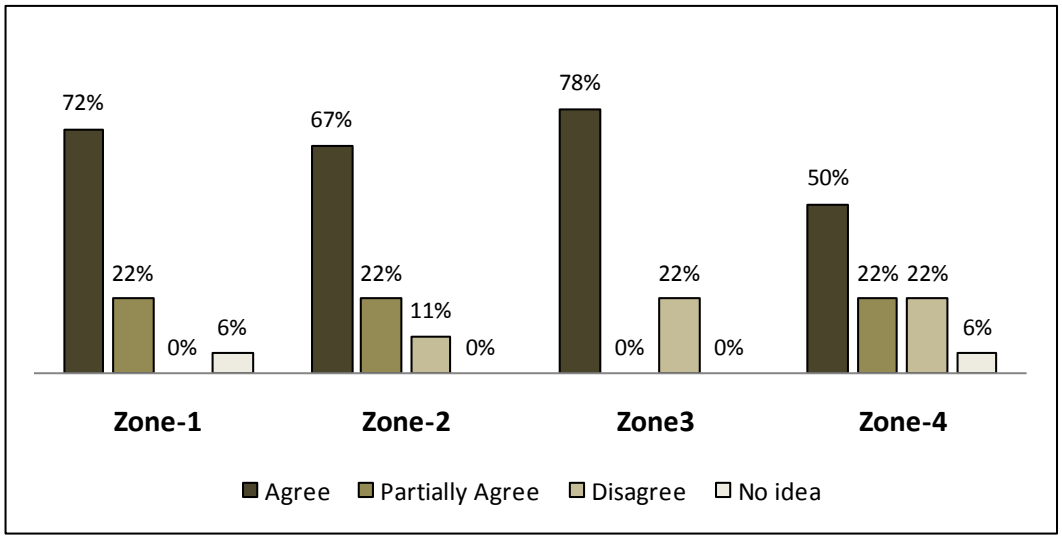


Figure 5-40: The outcome of "whether noise is resulted from car traffic in Uray and Atatürk Streets" according to sub-zones

Regarding 'perceived safety', the third question is *"whether facilities open until late night (restaurants, cafes, bars, night clubs etc) make the street safer at night".* Most respondents stated that facilities open until late night, make the street safer at night. However, in only Z2, respondents disagree the statement because of low-quality night clubs disturbing pedestrians (Figure 5-41).

The last question relayed to perceived safety is *"whether it will be a much safer street if there are more residential uses"*. In especially Z4, respondents mostly agree the statement that street will be much safer if there are more residential uses (Figure 5-42). The results of questions clearly indicate that differentiated character of Z2 is based on commercial activities, banks and training centers.

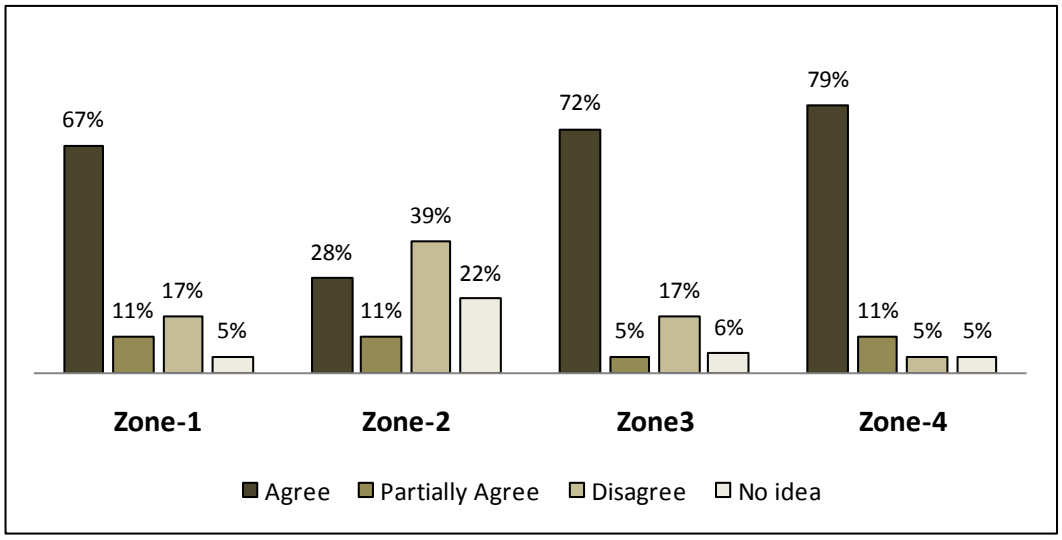


Figure 5-41: The outcome of "whether facilities open until late night (restaurants, cafes, bars, night clubs) make the street safer at night" according to sub-zones

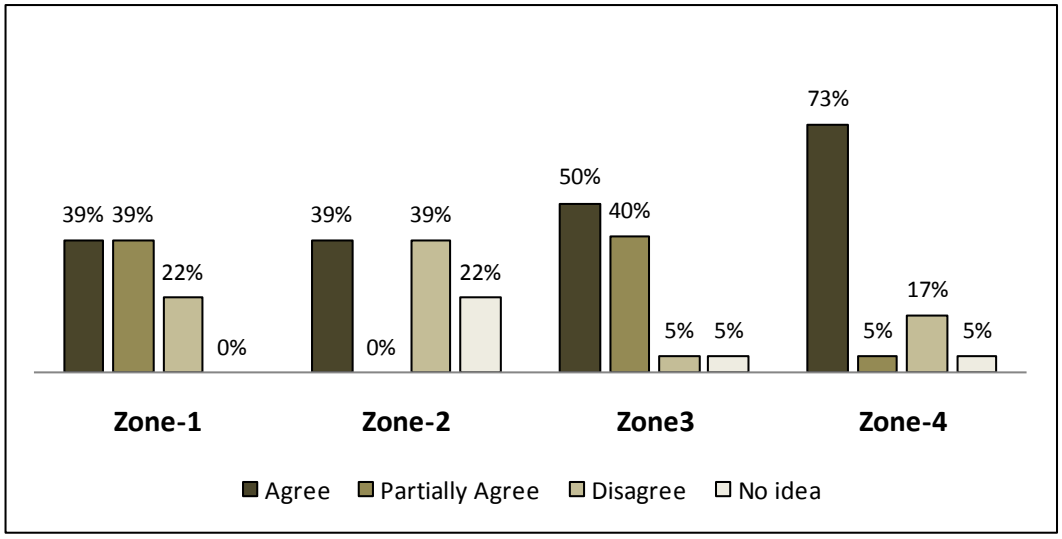


Figure 5-42: The outcome of "whether it will be a much safer street if there are more residential uses" according to sub-zones

5.3.3. The Evaluation of Safety in the Case Study Area

This section discusses actual and perceived safety in the case study area, based on aforementioned indicators, and by means of direct observations and desk-based assessments. Then, it compares the characteristic zones of the case study area - Z1, Z2, Z3 and Z4- between each other with a simple scale from (-) to (*), which includes relative comparison of indicators of walkability.

In table 5-4, zones are presented with columns and each related statement / questions of questionnaire are grouped within each indicator and presented along rows. In the following table, some initiations are also used to define the indicators:

- **AS.1;** (Actual Safety – Indicator 1) means “Street Width and Enclosure”.
- **AS.2;** (Actual Safety – Indicator 2) means “Traffic Safety”
- **PS.1;** (Perceived Safety – Indicator 1) directly means as usual

Table 5-4: The evaluation of questionnaire results in character zones of the case study area according to relative comparisons in terms of safety.

	QUESTIONS/STATEMENTS	Z1	Z2	Z3	Z4
AS.1	Uray Street is wide enough for both vehicular and pedestrian traffic	Disagree	Disagree		
AS.2	The vehicular traffic disturbs the pedestrian movement	Agree	Agree	Agree	Agree
	Car drivers should drive slower	Agree	Agree	Agree	Agree
	It is difficult to cross the street for me in Uray Street	Partially Agree	Agree		
	Crosswalks are safe for old people, disabled people, children and parents with young children in Uray Street	Disagree	Disagree		
	Pedestrian ways are safe for old people, disabled people, children and parents with young children in Uray and Atatürk Streets	Disagree	Disagree	Disagree	Disagree
	On-street car-parking disturbs the pedestrian movement	Agree	Agree	Agree	Agree
PS.1	It is a noisy street	Agree	Agree	Agree	Agree
	Noise is resulted from car traffic	Agree	Agree	Agree	Agree
	Facilities open until late night (restaurants, cafes, bars, night clubs etc) make the street safer at night	Agree	Disagree	Agree	Agree
	It will be a much safer street if there are more residential uses	Agree / Partially Agree	Agree / Disagree	Agree	Agree

As a result of aforementioned discussions, Z1 and Z2 are not wide enough for both vehicular and pedestrian movements. Z4 is the safest part of the case study area in terms of street width, enclosure and traffic safety because of being pedestrianized area and having sufficient width (15 meters).

Moreover, traffic calming elements are not sufficient in Z1 and Z2 where vehicular traffic generally disturbs the pedestrian movement because of lack of crossings. The movement of pedestrians with wheelchair is impossible in Z1 and Z2 because of insufficient traffic calming elements and narrow and discontinuous sidewalks. In Z3, sidewalks are high and without ramps despite of being a pedestrianized area (Figure 5-6 and Figure 5-7 in Section 5.1.2). In Z2 and Z4, on-street car parking disturbs pedestrian movements more than in Z1, Z3. The findings of field investigation reveal that Z3 is relatively safer than Z1, Z2. However, Z4 is safer than other zones, as it is a pedestrianized area.

Z4 is vital, but at the evenings, perceived safety is decreased in a relation with *"Eyes on the Street"*. Also, during the opening hours of shops, and lighting increases perceived safety in Z2 and Z3. However, perceived safety decreases after the closing hours of shops (i.e., after 21.00 o'clock). In Z2, private parking areas and a few night clubs negatively affect perceived safety. In Z3, unoccupied shops in the inner facade of Ulu Bazaar and lack of street lightening in the square lessen the perceived safety. In Z1, perceived safety is low because of lack of street lightening. Also, public buildings that are closed after 18.00 o'clock and lack of shops decrease perceived safety in a relation with "Eyes on the Street". In contrast, Z4 is safer than other zones due to street lightening and it is densely use by people. However, in all of zones, there is no residential use which provides eyes on the street at any moment.

Table 5-5 clearly indicates the evaluation characteristics zones of the case study area in terms of safety by means of direct observations.

Table 5-5: The evaluation characteristics zones of the case study area in terms of safety.

		Zone-1	Zone-2	Zone-3	Zone-4
1. Actual Safety	Street width and enclosure	-	-	+	*
	Traffic safety	-	-		
2. Perceived Safety		-	-	-	+
(*) Good / (+) Fairly good / (-) Poor					

5.4. Street Pattern

As mentioned in Chapter 2, type of street pattern which is one of the main urban design qualities, directly improves the walkability of a public space. For the assessment of 'street pattern', four related questions were asked to the pedestrians in the case study area. The first question of street pattern is "*whether it is easy and comfortable to walk along the avenue".* Regarding this statement, the great majority of all respondents claimed that they cannot easily and comfortably walk in Uray Street, but Atatürk Street is more affordable for pedestrians (Figure 5-43).

Regarding street pattern, the second question is "*whether it is an easily accessible avenue from other places by walking".* The great majority of all respondents stated that they can easily access to Uray and Atatürk Streets from other places by walking (Figure 5-44). The third question of street pattern is *"whether vehicular traffic on the street is a problem for pedestrians to access to different parts of Uray and Atatürk Street".* Most users see vehicular traffic as an issue, which creates a problem for pedestrians to access to different parts of Uray and Atatürk Streets (Figure 5-45). The last question regarding street pattern is *"whether vehicular traffic on the parallel streets is a problem for pedestrians to access to Uray and Atatürk Streets".* The great majority of respondents claim that vehicular traffic on the parallel streets of the case study area is an essential problem to access Uray and Atatürk Streets. Only, nearness of Z4 to Atatürk Park has a positive effect on direct accesses (Figure 5-46).

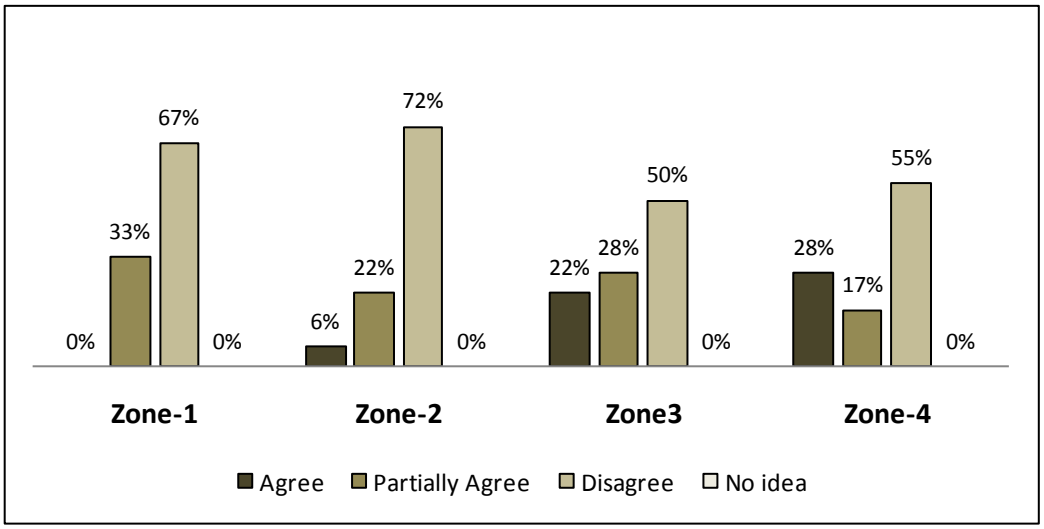


Figure 5-43: The outcome of "whether it is easy and comfortable to walk along the avenue" according to sub-zones

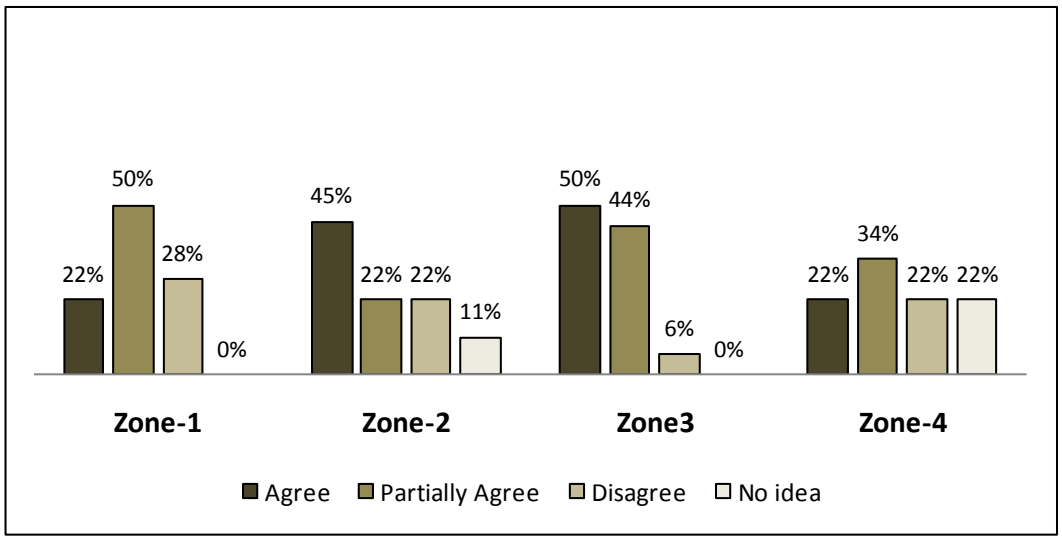


Figure 5-44: The outcome of "whether it is an easily accessible avenue from other places by walking" according to sub-zones

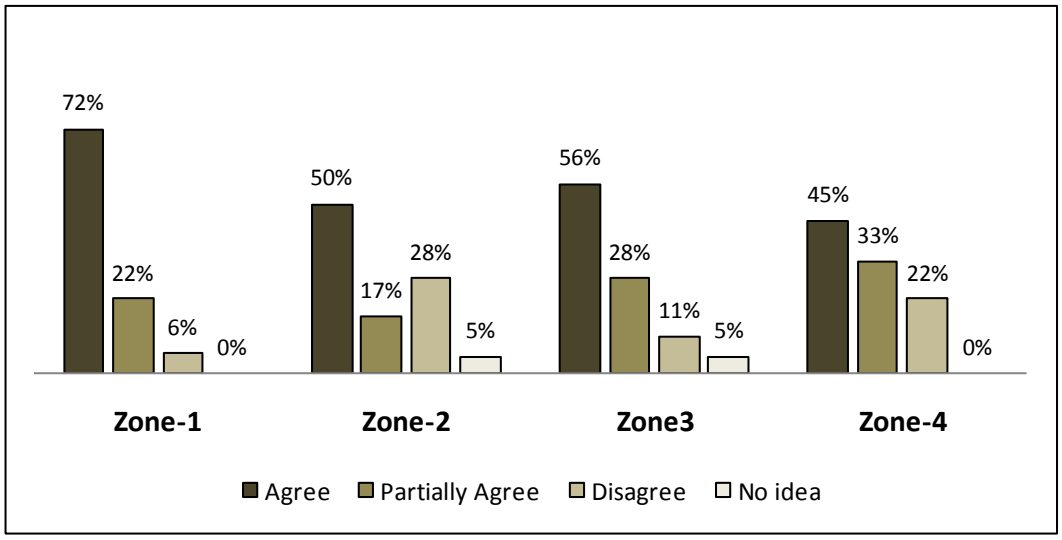


Figure 5-45: The outcome of "whether vehicular traffic on the street is a problem for pedestrians to access to different parts of Uray and Atatürk Street" according to sub-zones

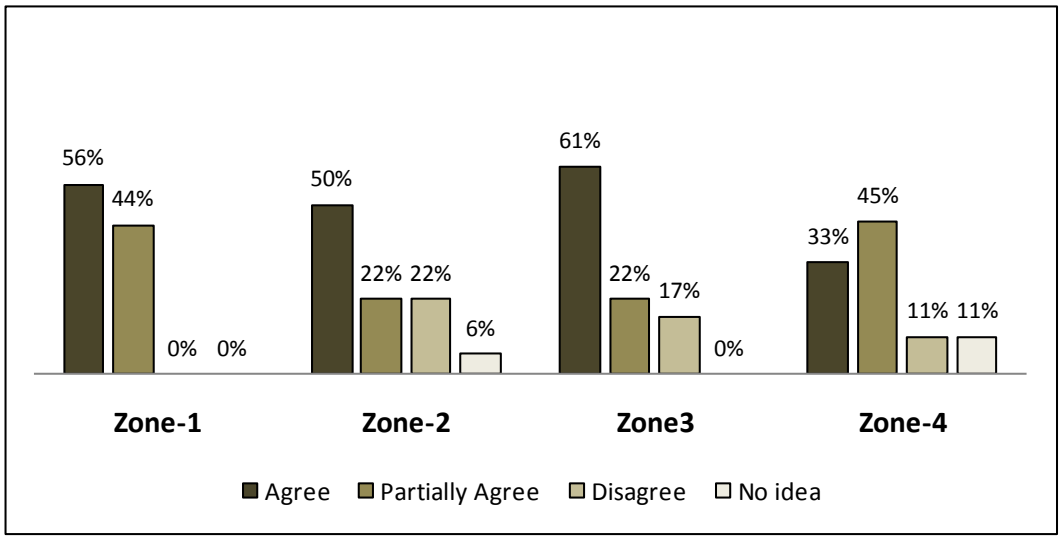


Figure 5-46: The outcome of "whether vehicular traffic on the parallel streets is a problem for pedestrians to access to Uray and Atatürk Streets" according to sub-zones

5.4.1. The Evaluation of Street Pattern in the Case Study Area

This section discusses the quality of street pattern in the case study based on aforementioned indicators and by means of direct observations. Then, it compares the characteristic zones of the case study area - Z1, Z2, Z3 and Z4- between each other with a simple scale from (-) to (*), which includes relative comparison of indicators of walkability.

Street pattern is assessed by related questions and street pattern map of Uray and Atatürk Streets and their environs. Table 5-6 presents the evaluation of street pattern according to questionnaire in terms of Lykert-scale method. In the following table, “SP.1” initiation is used for Street Pattern

Table 5-6: The evaluation of questionnaire results in character zones of the case study area according to relative comparisons in terms of street pattern.

	QUESTIONS/STATEMENTS	Z1	Z2	Z3	Z4
SP.1	It is easy and comfortable to walk along the avenue	Disagree	Disagree	Disagree	Disagree
	It is an easily accessible avenue from other places by walking	Partially Agree	Agree	Agree	Partially Agree
	Vehicular traffic on the street is a problem for pedestrians to access to different parts of Uray and Atatürk Streets	Agree	Agree	Agree	Agree
	Vehicular traffic on the parallel streets is a problem for pedestrians to access to Uray and Atatürk Streets	Agree	Agree	Agree	Partially Agree

Street patterns reveal the character of community within the length of streets and the number of intersections, cul-de-sacs, and loops in each unit of land (Southworth and Owens, 1993: 279) as discussed in Chapter 2. Grid iron is the most walkable system by offering strong interconnections, the shortest trip lengths and the largest number of route choices. As mentioned in Section 4.1.2, in the 19th century, the spatial form of Mersin had been guided in terms of grid-iron axes that are Uray, Hastane, Çakmak and Silifke Streets (Ünlü 2007: 426).

The results of questionnaire indicate that none of the zones are easily and comfortably walkable for pedestrians. In addition, in all zones, vehicular traffic disturbs them in terms of accessing to different parts of Uray and Atatürk Streets. However, they think that it is easy to access the case study by walking. Briefly put, pedestrians can easily access different parts of the case study areas by walking, however vehicular traffic on Z1 and Z2 and the parking on street -Z3, Z4- create problem on accessibility.

As seen in Figure 5-47, the street pattern system around Uray and Atatürk Streets is modified grid system and this street pattern lets to choice many route, provide direct and shortened travels for pedestrians. Despite of maximizing infrastructure costs, the grid system provides non-hierarchical (democratic), strongly interconnected, readily expandable street network; it also offers the shortest trip lengths and the largest number of route choices of any of the patterns; and it creates the most walkable neighborhood.

To sum up, the case study area within the modified grid system provides a more walkable and livable environment for pedestrians; however, the vehicular traffic and parking problems discourage pedestrians to walk in and around Uray and Atatürk Streets.

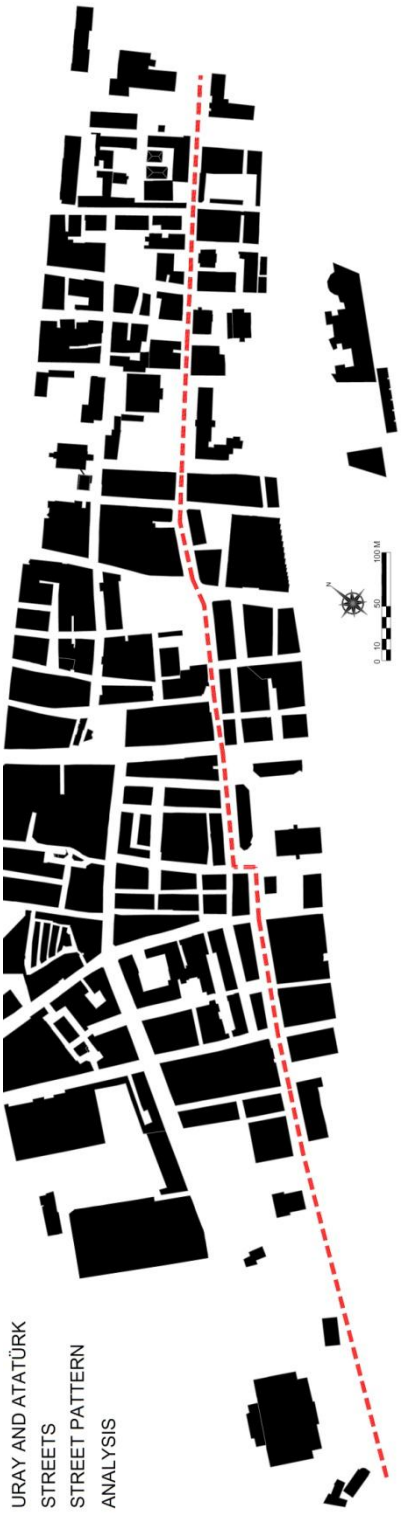


Figure 5-47: Street Pattern Analysis / Uray and Atatürk Streets

5.5. Quality of Path

As mentioned in Chapter 2, enhancing the quality of path is a significant aspect to set a walkable environment. “Sidewalk width”, “paving quality”, “street furniture”, “street signs”, “street lightning” and “street trees” are the measures to examine the quality of path indicators. The following sections discuss each of these variables in details.

5.5.1. Sidewalk Width

Sidewalk width is an essential key component of quality of path for comfortable trip and so for walkable environment. As mentioned in Section 5.3, efficient street width enables one to feel physically and perceptually safe. Besides, wider sidewalk width creates more rooms for street facilities. For the assessment of ‘sidewalk width’, pedestrians were only asked the question of is *“whether sidewalks are wide enough for pedestrians”* (Figure 5-48).

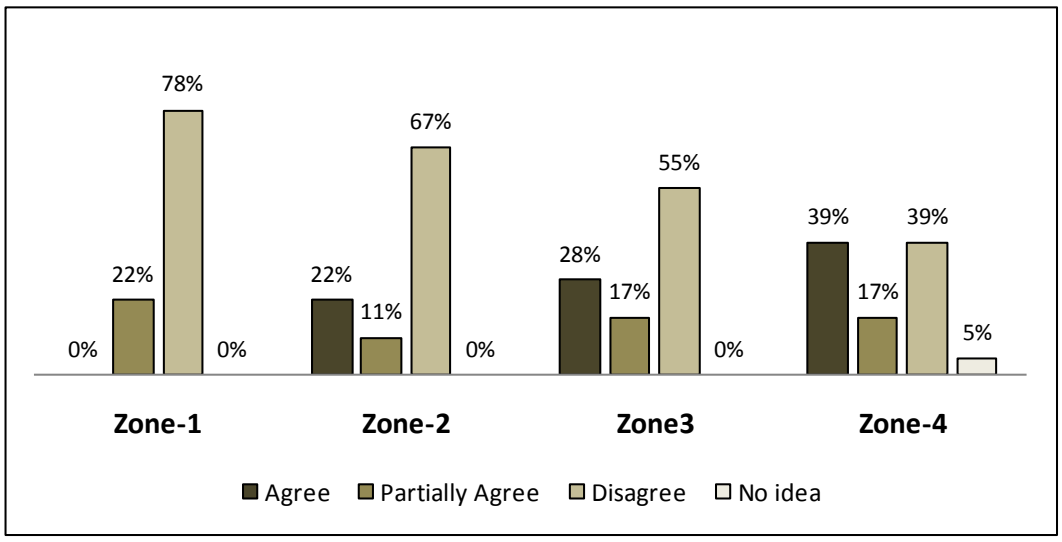


Figure 5-48: The outcome of “whether sidewalks are wide enough for pedestrians” according to sub-zones

Ideal “walking zone width” allows passing 2-3 people together; and/or passing 2 wheelchairs (6ft/1.8meters) together. However, in Z1 and Z2, sidewalk widths vary from 1.08 to 3.46 meters (Figure 5-29). The widths of sidewalks are not equal, even in both sides of the street along Z1 and Z2. In so much that, there are no sidewalk in many parts of the Z1 and Z2. In addition, there is no or too thin sidewalk along the connections with the seaside and Silifke Street. Only the width and ramps along the connections with Silifke Street opposite to the Governorship are sufficient for pedestrians and vulnerable groups. Moreover, in Z1 and Z2, there are no clear sidewalks which obstruct the movement of pedestrians. Except walking zone (should be 1.8meters), frontage zone (is the place for temporary obstructions, such as sidewalk dining and merchandise displays) width is not sufficient across Sursok Khan in Z2 for sidewalk dining. In Z3, the northern side of square, Atatürk Street, is wider than Z1 and Z2. The width of sidewalk is appropriate due to pedestrian zone and no vehicular traffic. However, the leveling in the street is not equal for pedestrian use especially for pedestrian with wheelchairs in Z3. In Z4, the width of sidewalk which is approximately 15 meters (Figure 5-31) is wider and more comfortable than other zones, also Z4 enables more walkable street for pedestrians.

5.5.2. Paving Quality

Paving quality is another measure of quality of path. Pavement plays an essential role in comfortable and safe streets for all. As mentioned in Chapter 2, ideal path should be continuous, without gaps and should have a relatively smooth surface without pits, bumps, or other irregularities that could make walking and wheelchair access difficult or hazardous (Emery, 2003 and Gassaway, 1992, cited in Southworth, 2005:251). Also ideal pavement should support the character of streets. There are five related questions were asked to the users of Uray and Atatürk Streets to examine paving quality.

The first question is *“whether there is no interruption for pedestrians along sidewalks”*. The great majority in Z1 thought that there are obstructions for pedestrians along sidewalk. On the other hand, approximately half or respondent in Z4 stated that there is no or few interruption for pedestrians along sidewalk (Figure 5-49).

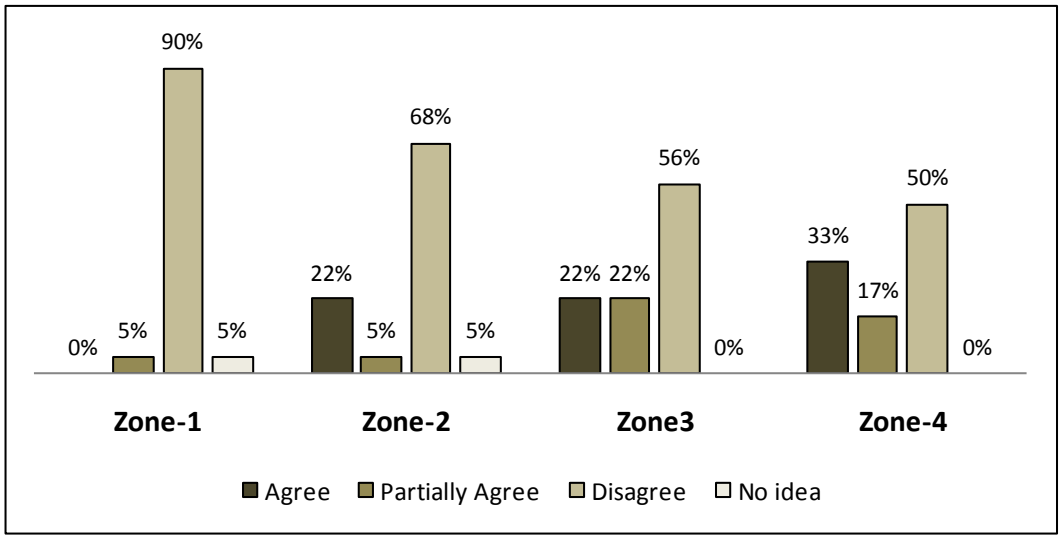


Figure 5-49: The outcome of "whether there is no interruption for pedestrians along sidewalks" according to sub-zones

Regarding paving quality, the second question is "*whether the pavement slabs are well-laid out and do not disturb pedestrian movement"*. The most of respondents in Uray and Atatürk Streets disagreed well-laid out street pavements. Only in Z3, the rate of respondents, who stated that the pavement slabs are well-paved and do not disturb the movement of pedestrian, is moderately higher than other zones (Figure 5-50). Another question of paving quality is *"whether level variations along the sidewalks* pavement (ramps, etc) are adequately safe for pedestrians". The respondents moderately thought that level variations along the sidewalks pavement are not adequately safe for pedestrians (Figure 5-51). The fourth question of paving quality is *"whether pavement slabs along the sidewalks are not deformed or broken".* The majority of respondents thought that pavement slabs along the sidewalks are deformed or broken in Uray and Atatürk Streets (Figure 5-52). Regarding 'paving quality' measure of quality of path, the last question is *"whether there is no unusual obstacle for pedestrians along the sidewalks".* The most of respondents stated that unusual obstacles along the sidewalks exist in the case study area. Only in Z3, the rate of users claiming there is no obstacle is slightly higher than other zones because of width of public square (Figure 5-53).

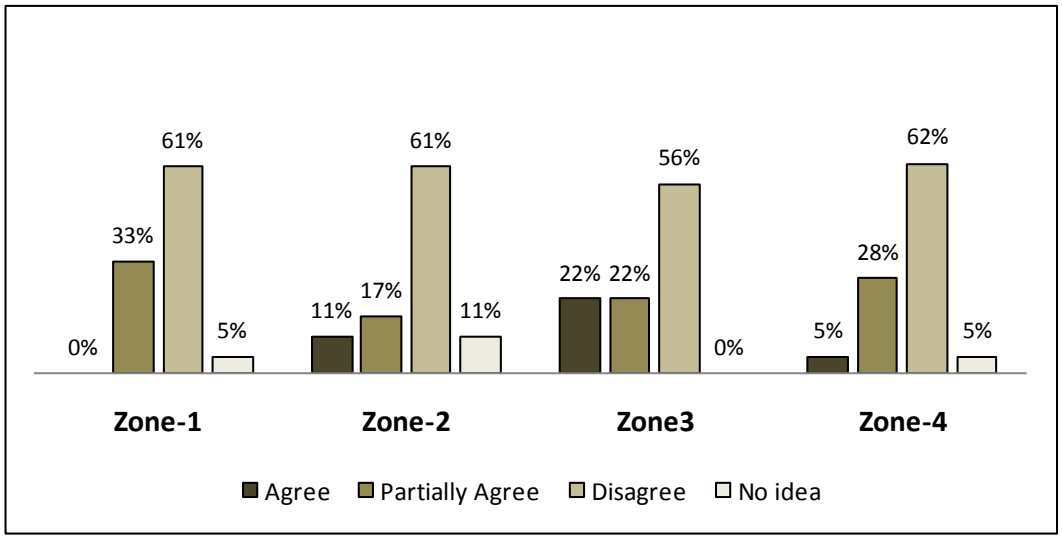


Figure 5-50: The outcome of "whether the pavement slabs are well-laid out and do not disturb pedestrian movement" according to sub-zones

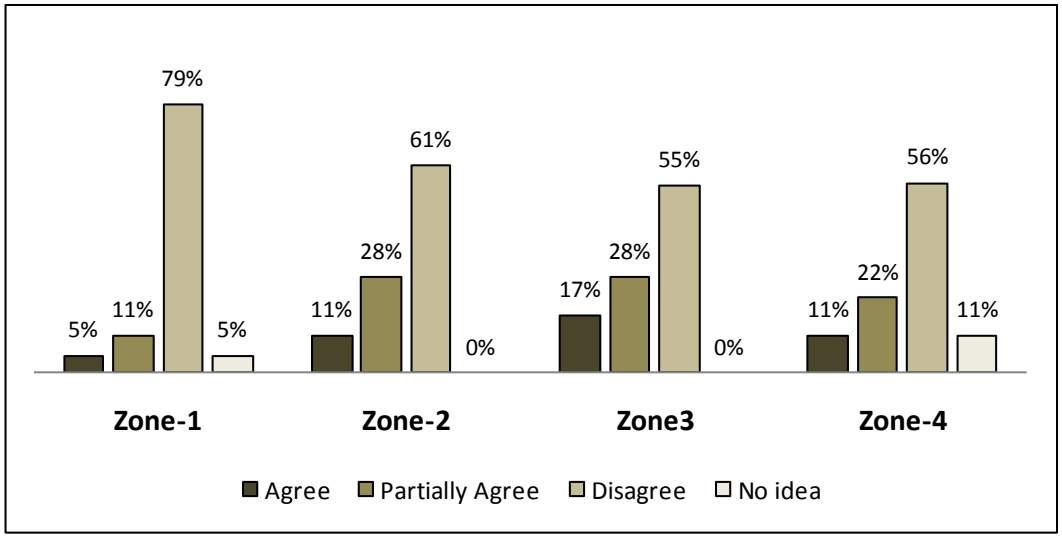


Figure 5-51: The outcome of "whether level variations along the sidewalks pavement (ramps, etc.) are adequately safe for pedestrians" according to sub-zones

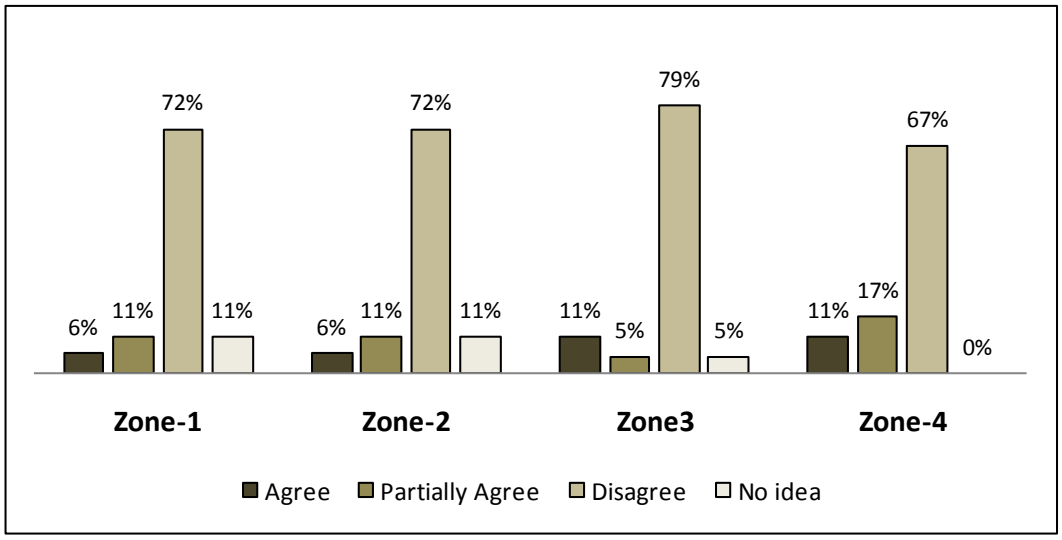


Figure 5-52: The outcome of "whether pavement slabs along the sidewalks are not deformed or broken" according to sub-zones.

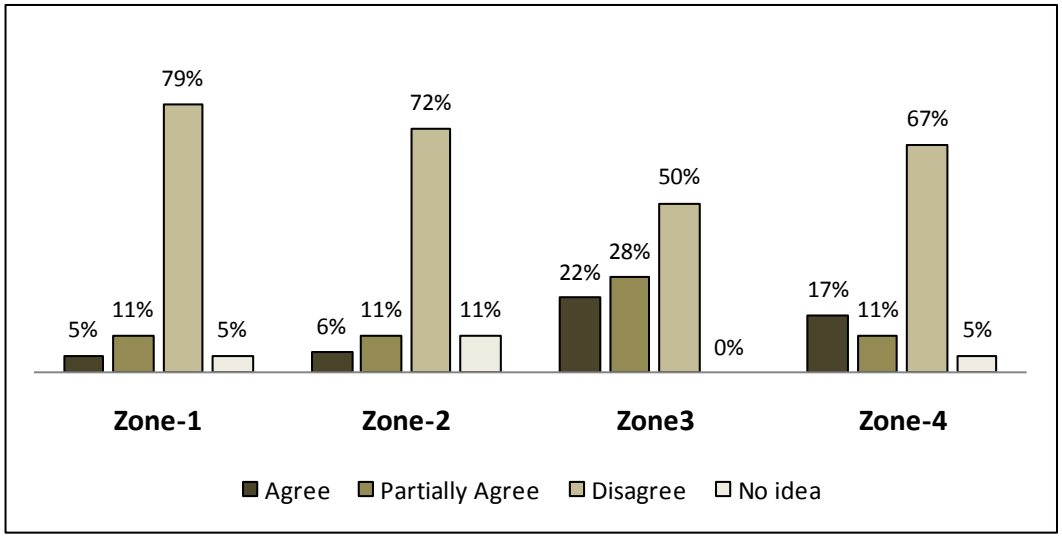


Figure 5-53: The outcome of "whether there is no unusual obstacle for pedestrians along the sidewalks" according to sub-zones

According to direct observation in the case study area, the sidewalk pavements on both sides are different in Z1. The pavement –asphalt- on the side along the Catholic Church is appropriate for all pedestrians, because the asphalt pavement of road let ease walking. However, southern side (seaside) paved with small stones obstructing walking. The pavements of ramps are not appropriate for vulnerable groups. There are key block pavements along the opening to seaside. Those are visually disturbed pedestrians. Also, the pavements along the connections with Silifke Street are appropriate for pedestrians groups in Z1. Besides, in Z2, both pavements of sidewalk and road, stone block pavement, is different from Z1. Although there are unqualified maintenance or patch along the sidewalk, the walkability is better than Z1. There are ramps for pedestrian and vulnerable groups, but they are in low quality. The pavement of road provides slowing vehicle traffic, but the maintenance of pavement is insufficient. In addition, the connection with seaside along Taş Khan paved with a different texture that enrich zone and indicate diversity in Z2 (Figure 5-54).

There is asphalt pavement between the boundaries of Z2 and Z3. Z3 is a pedestrian zone, but pavement is inappropriate for such a use. Because the pavement in Z3 is similar to Z2 that obstructs pedestrians. Moreover, the texture of pavement in Ulu Bazaar is pink-small key blocks that do not obstruct pedestrian flow. There is no ramp in the beginning of Z3 for vulnerable groups; there is only one ramp at the west side. However, this level variation along the sidewalk pavements such as ramps is not sufficient for pedestrian safety and comfort, so that Z1, Z2 and Z3 are not walkable streets in terms of paving quality.

Although Z4 is a pedestrianized zone, the pavement of walking zone –coble stone- is not smooth and well compacted, thus it is not appropriate for pedestrians with wheelchairs and other vulnerable groups, and court shoes. However, the pavement of Z4 is well-maintained than other zones.

Paving in Z1

Paving in Z1

Paving in Z2

Paving in Z2

Paving in Z3

Paving in Z3

Paving in Z4

Paving in Z4

Figure 5-54: Photographs related with paving quality in the case study area (personal archive of Z.S.Belge).

5.5.3. Street Furniture

Street furniture plays a crucial role to create walkable street with appropriate type of street furniture places at eligible location. Street furniture increases functionality and vitality of pedestrian realm. As explained in Chapter-2, with sufficient and efficient street furniture, the pedestrian experiences and enables the communicative/interactive spaces. For the assessment of "appropriate location and sufficient number of street furniture", two related questions were asked to the streets' users in the case study area. The first question is *"whether street furniture provided along the street is sufficient"*. In only Z4, the half of pedestrians stated that pedestrianized area of Atatürk Street has sufficient number of street furniture along street. In other zones, the majority of respondents claim that the number of street furniture is insufficient (Figure 5-55).

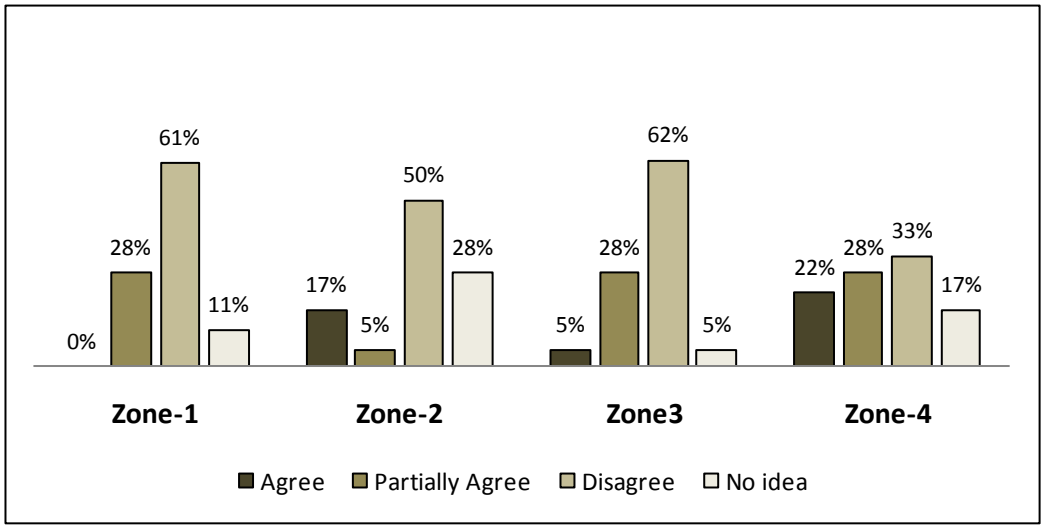


Figure 5-55: The outcome of "whether street furniture provided along the street is sufficient" according to sub-zones

The last question of street furniture is *"whether the location of street furniture obscures the pedestrian movement".* The most of users in Z1, Z2 and Z3 stated that the location of street furniture along the street obscures pedestrian movements. On the other hand, in Z4, approximately one third of respondents thought that the location of street furniture obscures the pedestrian movement (Figure 5-56).

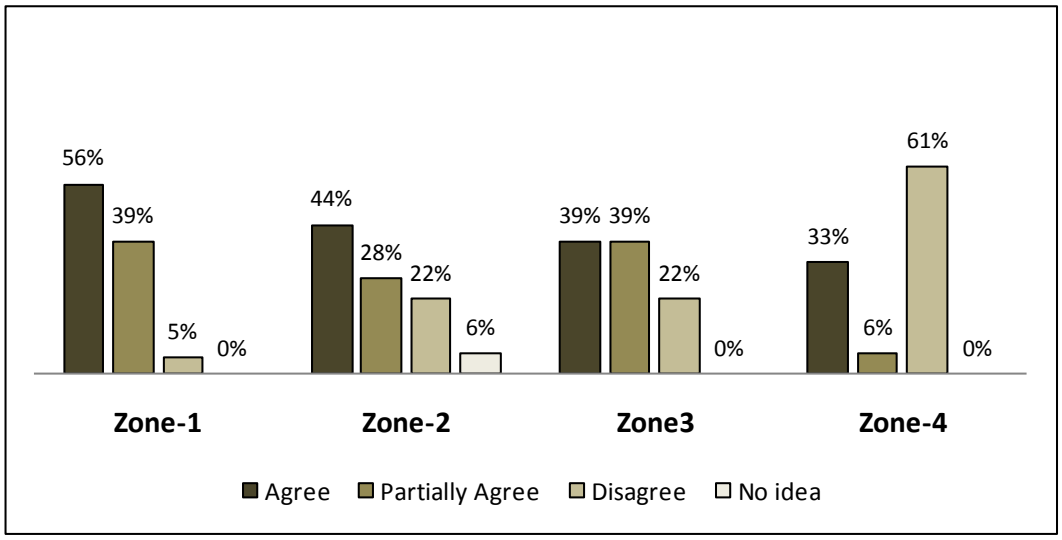


Figure 5-56: The outcome of "whether the location of street furniture obscures the pedestrian movement" according to sub-zones

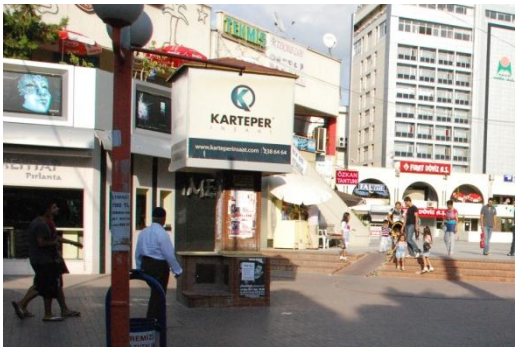
Direct observations in the case study area reveal that, the number of street furniture is not sufficient in Z1, Z2 and Z3. There is only one rubbish bin in Z1 and its location is not appropriate for pedestrian flow/movement. Although, some of street furniture is fixed at correct places, they obstruct pedestrian flow due to the widths of sidewalks in Z1. The design and shape of street furniture are not appropriate and unique for Z1 and Z2. Especially telephone and electric boxes are fixed at misplace. Moreover, there are no benches or sitting materials in Z1 and Z2. However, there are sidewalk dining facilities across the Governorship and across Sursok Khan in Z1 and Z2 which enrich the Uray Street and create gathering spaces. Street furniture, especially advertising board in front of Sursok Khan, creates visual pollution and obstruction for pedestrians in Z2. However, the fountain in front of Eski Cami enriches zone with historical setting and appropriate

use. Likewise, street furniture, especially advertising board in front of Ulu Bazaar creates visual pollution and obstruction for pedestrians (Figure 5-57).

In Z3, there is only one rubbish bin at the beginning of Atatürk Street. According to Gehl (2010: 162) benches should be located at regular intervals every 100 meters (330ft) in a good city. However, there are no regularly placed benches on the case study area. In addition, Z3 is a public square mostly, only there are two benches for pedestrians. So, varying points are used for sitting like staircase or pavements of the Mosque. The fountain in front of Ulu Bazaar that is used as advertising board also, is visually disturbed pedestrians. Besides, the design and shape of street furniture are not appropriate and unique for Z3, similarly telephone and electric boxes are fixed at misplace.

The numbers of rubbish bins are sufficient, but benches are insufficient. Thus, pedestrians use tree root barrier for sitting and dining. There are only benches next to the building of Metropolitan Municipality and Cumhuriyet Square. Flower pots in front of Ulu Bazaar (between Z3 and Z4) disturb pedestrian movement. On the other hand, water elements in front of the building of Metropolitan Municipality and Cumhuriyet Square enrich zone (Figure 5-11 and Figure 5-12 Section 5.1.3).

Advertising board and telephone box in front of Sursok Khan



Advertising board in front of Ulu Cami

Figure 5-57: Photographs related with advertising boards in Z2 and Z3 (personal archive of Z.S.Belge).

5.5.4. Street Signs

Street signs are one of the visual components of streetscape. Street signs are investigated in two groups in Chapter 2. These are private signs –i.e., advertising boards and shop signs- using to attract people, and public signs –i.e., routing signals and way-finding signs-information boards-, providing information and rules for the use of the public spaces and helping way finding. The style, placement, uniqueness of street signs is essential for walkable environment to increase attractiveness, to enhance the identity and imageability of streets scenes.

For the evaluation of street signs of the case study area, two related questions were asked to pedestrians. The first question is *"whether store signs on the streets aesthetically disturb pedestrians".* The great majority of pedestrians claimed that they are aesthetically disturbed because of store signs in Z1, Z2 and Z3. Only in Z4, a few pedestrians stated that store signs on the streets are aesthetic (Figure 5-58). The last question of street signs is *"whether traffic signs on the streets are sufficient"*. The respondents in Uray Street claimed that traffic signs on the street are not sufficient, while most respondents in Atatürk Street thought that the traffic signs are sufficient (Figure 5-59).

In brief, the analysis and survey results show that the design and shape of signs are not appropriate and unique for Z1 and Z2, especially signs of gastronomic activities and private parking areas (east side of Eski Cami) in Z2. In Z1, there are few advertising boards and shop signs because of public buildings. Also, there is a coherence manner in signs indicating street names in Z1. Besides, the advertising boards and shop signs are not aesthetically designed in Z2. Due to increasing numbers of telephone shops, blue, red and orange are the dominant colors along Z2, especially west side of Sursok Khan. The information signs and boards are insufficient both Z1 and Z2.

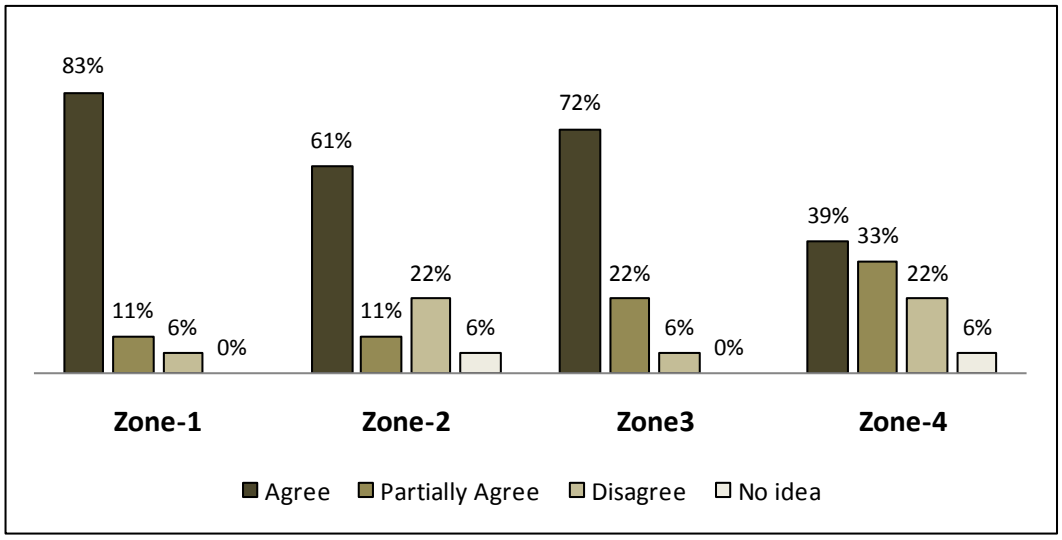


Figure 5-58: The outcome of "whether store signs on the streets aesthetically disturb pedestrians" according to sub-zones

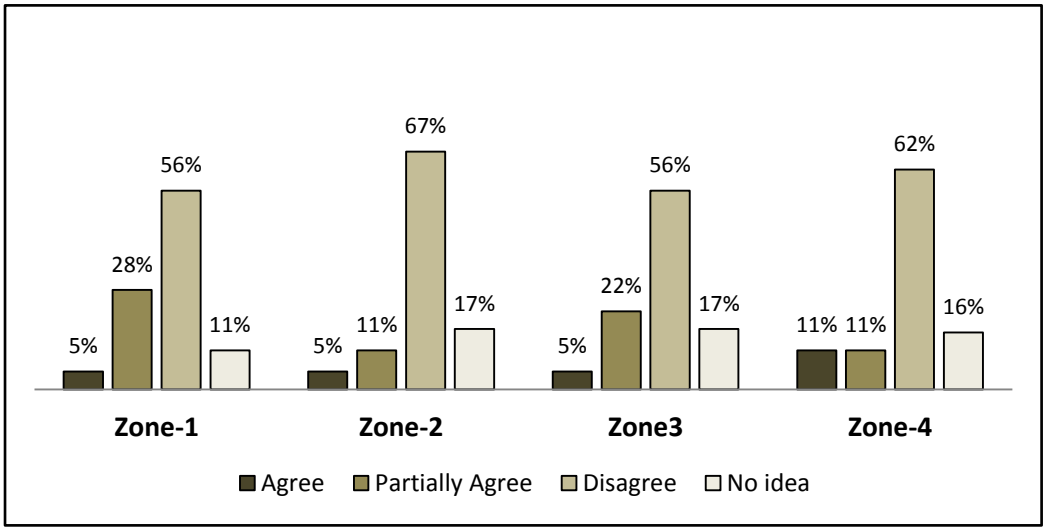


Figure 5-59: The outcome of "whether traffic signs on the streets are sufficient" according to sub-zones

In Z3, the advertising boards and shop signs in inner side of Ulu Bazaar are not aesthetically designed. Advertising board in front of Ulu Bazaar creates obstruction for pedestrians (Figure 5-57). There is coherence manner in jewelry signs and facades that create a transparency to attract people. However, the shop fronts of gastronomic

activities disturb coherence. Although two traffic signs in zone are correctly fixed, those obstruct pedestrian movement due to insufficient width of sidewalks in Z3.

In Z4, the transparency of facades is better than other zones in a relation with clothing stores and gastronomic activities. But there is a chaos due to signs of upper floor uses. The facades and signs of shops are better and more maintained than other zone. Furthermore, perfumeries and jewelry shops use similar facade design that positively differentiates Z4 than others (Figure 5-60). There are few advertising boards along zone that are fixed at correct locations. Even in sufficient number of signs, there are information and orientation signs which are correctly located along Z4. In addition, there are traffic signs to control the entrances of vehicular traffic from Cumhuriyet Square during service hours, but insufficient.

Facades of jewelry in Z4

Facades of perfumeries

Facades of perfumeries

Facades of perfumeries

Figure 5-60: Photographs related with similar shop-front design in Z4 (Personal archive of Z.S.Belge).

5.5.5. Street Lighting

Street lightning is an essential component of quality of path to create a safe street for pedestrians. A well-lit street could encourage more pedestrian activity. Lightning increases pedestrian's safety, comfort and encourages walking, also streetlights emphasize the linearity of the street and it is an important part of streetscape design. The placement, height and style are the measures of lightning.

For the assessment of 'street lightning', six related questions were asked to the pedestrians in the case study area. The first question is *"whether it is a well-lit street at night".* The results indicate that, approximately the half of the respondents do not think that the case study area is a well-lit street at night (Figure 5-61).

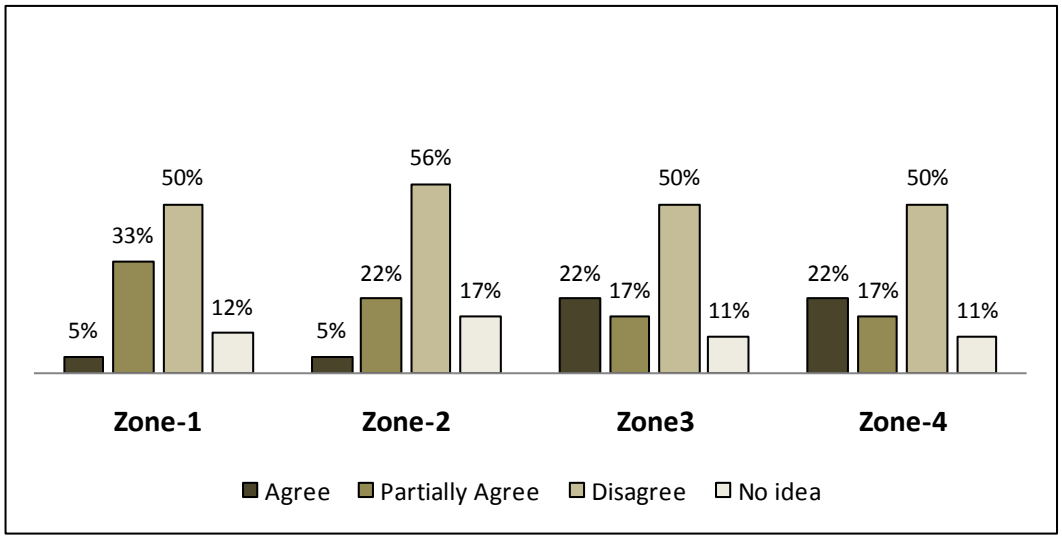


Figure 5-61: The outcome of "whether it is a well-lit street at night" according to sub-zones

Regarding the effect of street lightning to the safety of street, the second question is *"whether it is a safe street at night".* The great majority of respondents claimed that Uray and Atatürk Streets are not safe at night (Figure 5-62).

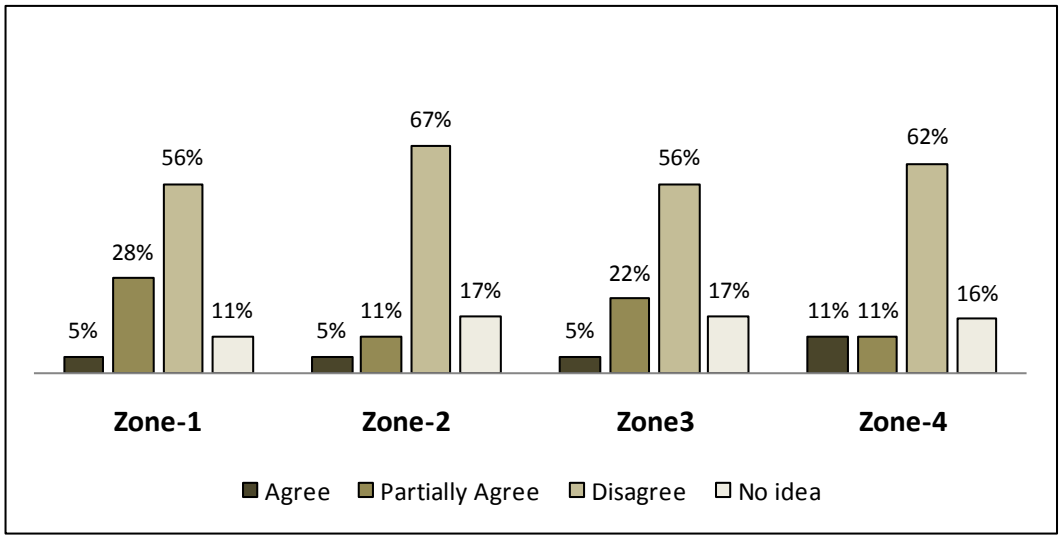


Figure 5-62: The outcome of "whether it is a safe street at night" according to sub-zones

Moreover, there are two squares in the case study area, Cumhuriyet Square is in front of the Mersin Culture Center and the other one is Ulu Bazaar next to Ulu Cami. In order to assess the lighting and safety of squares in the case study area, four questions were asked to the pedestrians;

- *"Whether Cumhuriyet Square is a well-lit square at night".*
- *"Whether Cumhuriyet Square is safe at night".*
- *"Whether Ulu Bazaar Square is a well-lit square at night."*
- *"Whether Ulu Bazaar Square is safe at night".*

Although, more than half of the respondents stated that Cumhuriyet Square is well-lit square at night, they did not think that it is a safe public space at night. Similarly, the respondents see Ulu Bazaar as unsafe public space at night (Figure 5-47).

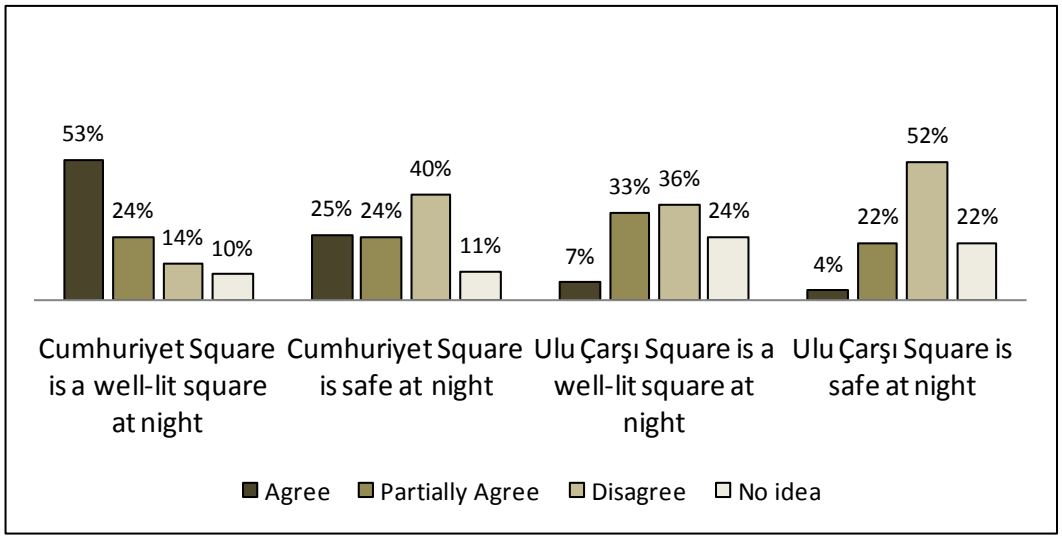


Figure 5-63: The outcome of question related with lightening of public squares

As mentioned in Chapter 2, in city centers and retail areas, street lights should be placed at intervals of 9 meters. In addition, the height of street lights should be less than 4, 5-6 meters. In Z1, there are 10 street lights along the zone with varying distance between them from 36 to 54 meters and the height of streetlight is 7.5 meters. As clearly seen, there is a problem of safety due to lack of street lighting in Z1, as they are insufficient in numbers and inaccurate in heights.

In Z2, street lights are changed after Z1 with shorter and five lamped ones. Although the height of street light is approximately 3.2 meters that is not ideal for pedestrian flow, the scale of street light in front of Sursok Khan is more appropriate for human scale. If the street lights are kept in well-maintained, the illumination of them is better than Z1 due to style of street lights including five circular lamps. However, most of the lamps are broken or poorly lit. The distance between most street lights are around 16 meters. However, there are only 3 ones after Sursok Khan till to Atatürk Street. Therefore, perceived safety is low after the closing hours of shops. At the evenings, only shop lights enlighten area, although there are training centers. There are 8 street lights in a relation with the use of Sursok Khan indicating unequal distribution of public service.

Illumination in Z3 is better than Z1 and Z2. However, there is a quality and variety problems in street lights that are obviously different from each other and some of them

are overdesigned causing visual pollution (Figure-5-64). In addition to low height lights and overdesign lights in the northern part of Ulu Bazaar (Atatürk Street part) area, the height of street lights are high, and thus they are able to enlighten larger area in Ulu Square.

In Z4, the heights of street lights are appropriate to enlighten pedestrian zone. There are 7,5 meters between each street light and equally distributed along Z4. Also, illumination in Cumhuriyet Square is sufficient to provide safety.

High street lights in Z1

Street lights along Sursok Khan in Z2

Street lights in Z3

Street lights in Z4

Figure 5-64: Photographs of street lights in the case study area (personal archive of Z.S.Belge).

5.5.6. Street Trees

According to Gehl (2010: 179), trees landscaping and flowers play a key role among the elements in city space. Closely planted trees to sidewalks provide visually narrowed street that use in traffic calming and so enhance pedestrian safety. In addition, trees could play crucial role in streetscape design with its visual features. Two related questions were asked to the pedestrians in order to investigate the views of users about "location and number of street trees" in the case study area.

The first question of street trees measure is *"whether street trees disturb pedestrian movement"*. In the case study area, most users claimed that street trees do not disturb their movements. Especially in Z4, the majority of respondents disagreed with the statement*, "street trees disturb pedestrian movement"* (Figure 5-65). Regarding the street trees of the case study area, the second question is *"whether the flower pots on streets disturb pedestrian movement"*. Especially, the great majority of respondents claimed that the flower pots in Z4 do not disturb pedestrian movement. Similarly, the most of users stated that the flower pots in other zones do not obstruct pedestrians (Figure 5-66).

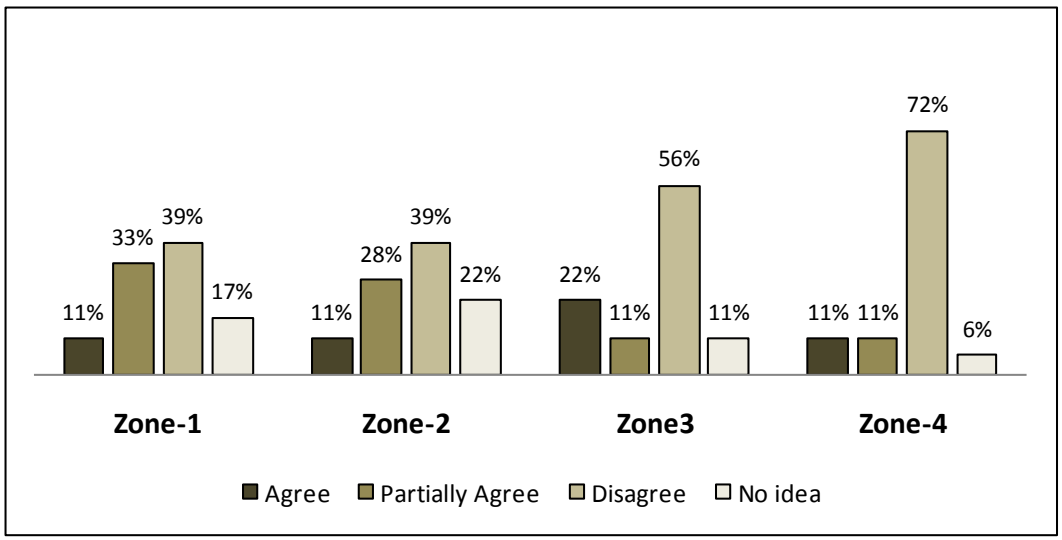


Figure 5-65: The outcome of "whether street trees disturb pedestrian movement" according to sub-zones

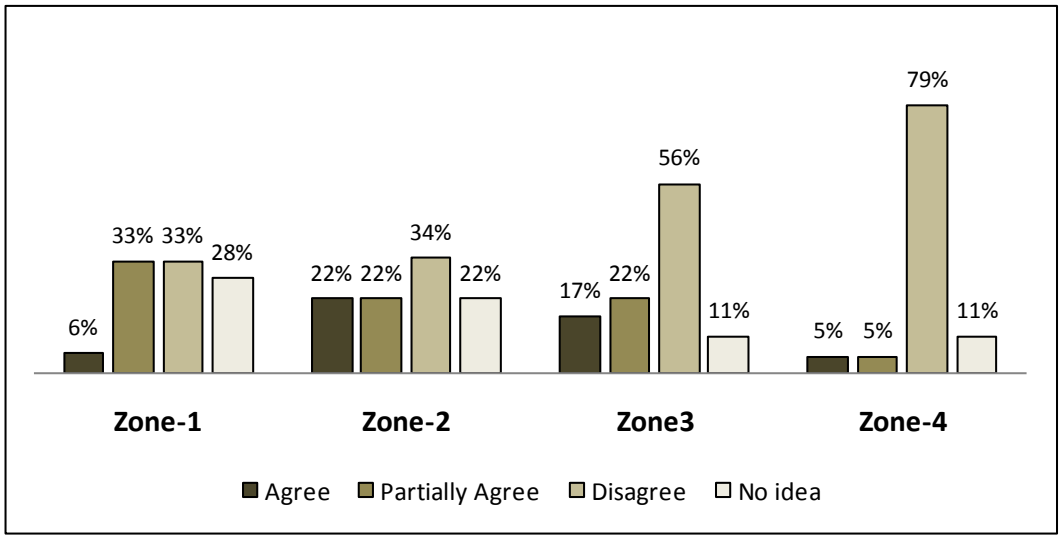


Figure 5-66: The outcome of "whether the flower pots on streets disturb pedestrian movement" according to sub-zones

To create a clear walking path on sidewalk, street trees should be planted on the curb zone. As mentioned on Chapter-2, the most effective tree spacing is from 4,5 meters to 7,5 meters (Jacobs, 1995: 282).

In Z1, street trees are generally located around public buildings. There are only 7 trees from Latin Catholic Church to the Governorship through 320 meters. However, 18 bergamot trees with 3 meters separation between them enrich the area in front of the Governorship with their appropriate locations.

In Z2, there are few trees in the court of Sursok Khan and Tea Garden. Also, there are 12 trees with 4,5 meters separation between them opposite side of Sursok Khan. In addition, trees are located in Curb Zone, so they do not obstruct pedestrian flow.

There are a few trees from Sursok Khan to the beginning of Z3. Although tree root barriers are loosely designed, there are sufficient street trees in appropriate locations, curb zones in Z3.

There are sufficient numbers of tree with 7,5 meters separation through Z4 and they are mostly located 3,5 meters away from buildings which are a sufficient width for pedestrians' facilities. However, tree root barriers are too high, thus obstruct vulnerable

people. On the other hand, root barriers are used for sitting and dining due to lack of sufficient benches (Figure 5-66 and Figure 5-67).

5.5.7. The Evaluation of Quality of Path in the Case Study Area

In brief, condition of path quality makes the streets more livable and walkable by encouraging pedestrians to walk. More specifically, path quality of Uray and Atatürk Streets is analyzed in six sections. In table 5-7, each variable of quality of path is indicated with an initial; sidewalk width as QoP.1, paving quality as QoP.2, street furniture as QoP.3, street signs as QoP.4, street lightning as QoP.5 and street trees as QoP.6. After the evaluation of questionnaire results, characteristic zones of the case study area are comparatively analyzed.

Table 5-7: The evaluation of questionnaire results in character zones of the case study area according to relative comparisons in terms of quality of path

	QUESTIONS/STATEMENTS	Z1	Z2	Z3	Z4
QoP.1	Sidewalks are wide enough for pedestrians	Disagree	Disagree	Disagree	Agree/Disagree
QoP.2	There is no interruption for pedestrians along sidewalks	Disagree	Disagree	Disagree	Disagree
	The pavement slabs are well-laid out and do not disturb pedestrian movement	Disagree	Disagree	Disagree	Disagree
	Level variations along the sidewalks pavement (ramps, etc) are adequately safe for pedestrians	Disagree	Disagree	Disagree	Disagree
	Pavement slabs along the sidewalks are not deformed or broken	Disagree/ Par.Agree	Disagree	Disagree/ Par.Agree	Agree
	There is no unusual obstacle for pedestrians along the sidewalks	Disagree	Disagree	Disagree	Disagree

Table 5-7: Continued

QoP.3	Street furniture provided along the street is sufficient	Disagree	Disagree	Disagree	Disagree
	The location of street furniture obscure the pedestrian movement	Agree	Agree	Agree/Par. Agree	Agree
QoP.4	Store signs on the streets aesthetically disturb pedestrians	Agree	Agree	Agree	Agree
	Traffic signs on the streets are sufficient	Disagree/ Par.Agree	Disagree	Disagree/ Par.Agree	Agree
QoP.5	It is a well-lit street at night	Disagree	Disagree	Disagree	Disagree
	It is a safe street at night	Disagree	Disagree	Disagree	Disagree
QoP.6	Street trees disturb pedestrian movement	Disagree	Disagree	Disagree	Disagree
	The flower pots on streets disturb pedestrian movement	Disagree/ Par.Agree	Disagree	Disagree	Disagree

In line with the field investigation findings, the sidewalk widths of Z1 and Z2 are not sufficient for ease of walk. Z3 is pedestrianized area and there is no vehicular traffic, so that the sidewalks are wider than Z1 and Z2. Conversely, the width of sidewalk of Z4 is the most appropriate part for walking that enables the pedestrian walkability.

Paving quality is also play a crucial role on path quality in terms of providing comfortable walking for pedestrians. Direct observations reveal that the paving quality of Z1 is the worst of all. Conversely, Z2 and Z3 are better than Z1 in terms of quality of path, despite of lack of maintenance and low-quality and unsafe level-variations. Although the pavement is not suitable for vulnerable groups, Z4 is relatively more walkable street part of the case study area in terms quality of path because of pedestrianized zone.

Street furniture is another factor affecting walkability in terms of quality of path. The survey and direct observations show that, placement of street furniture obstructs pedestrian movement due to the widths of walking paths in Z1 and Z2. The design and shape of street furniture are not appropriate and unique for all zones. However in Z4

the walking zone and curb zone is accurately defined, so that the utilities of street enrich zone. To sum up, Z4 is relatively more walkable street in terms of the placement and the sufficient number of street furniture.

Moreover, street signs are essential for streetscape in terms of visually and orienteering pedestrians. The transparency of shops and signs of clothing stores and restaurants are relatively better than other zones in terms of aesthetically and visually, although there is a chaos due to signs of up-floor uses.

In addition, well-lit street increases the pedestrian activity especially on safety. Street lightning in the case study area is analyzed according to placement, height and style in this study. Regarding street lightning, the height of street light on Z1 is not suitable for illumination of streets because of too long. In addition, Z2 has unequal distribution of street lights. Thus, illumination in Z3 is relatively better than Z1 and Z2, however, street lighting quality in Z4 is better than other zones in terms of well-proportioned height, correct placement of lights and of course illumination.

Furthermore, the analysis for street trees shows that location of the flower pots between Z3 and Z4 are not suitable for walking. In addition, the location and condition of trees in Z4 are better than other zones that enhance the pedestrian walkability. However, unique trees such as bergamot enrich the case study area especially Z1 and Z2. Similarly, the location and distribution of trees are appropriate to create ease of movement.

To sum up, the survey and direct observations show that, Z3 is relatively more walkable street in terms of quality of path compared to the Z1, Z2. However, Z4 is the most convenient part to walk in terms of quality of path (table 5-8).

Table 5-8: The evaluation characteristics zones of the case study area in terms of quality of path

	Zone-1	Zone-2	Zone-3	Zone-4
1. Sidewalk width	-	-	*	*
2. Paving quality	-	+	+	*
3. Street furniture	-	-	+	
4. Street signs	-	-	-	
5. Street lightning	-	-	+	+
6. Street trees	+	+	*	+
(*) Good / (+) Fairly good / (-) Poor				

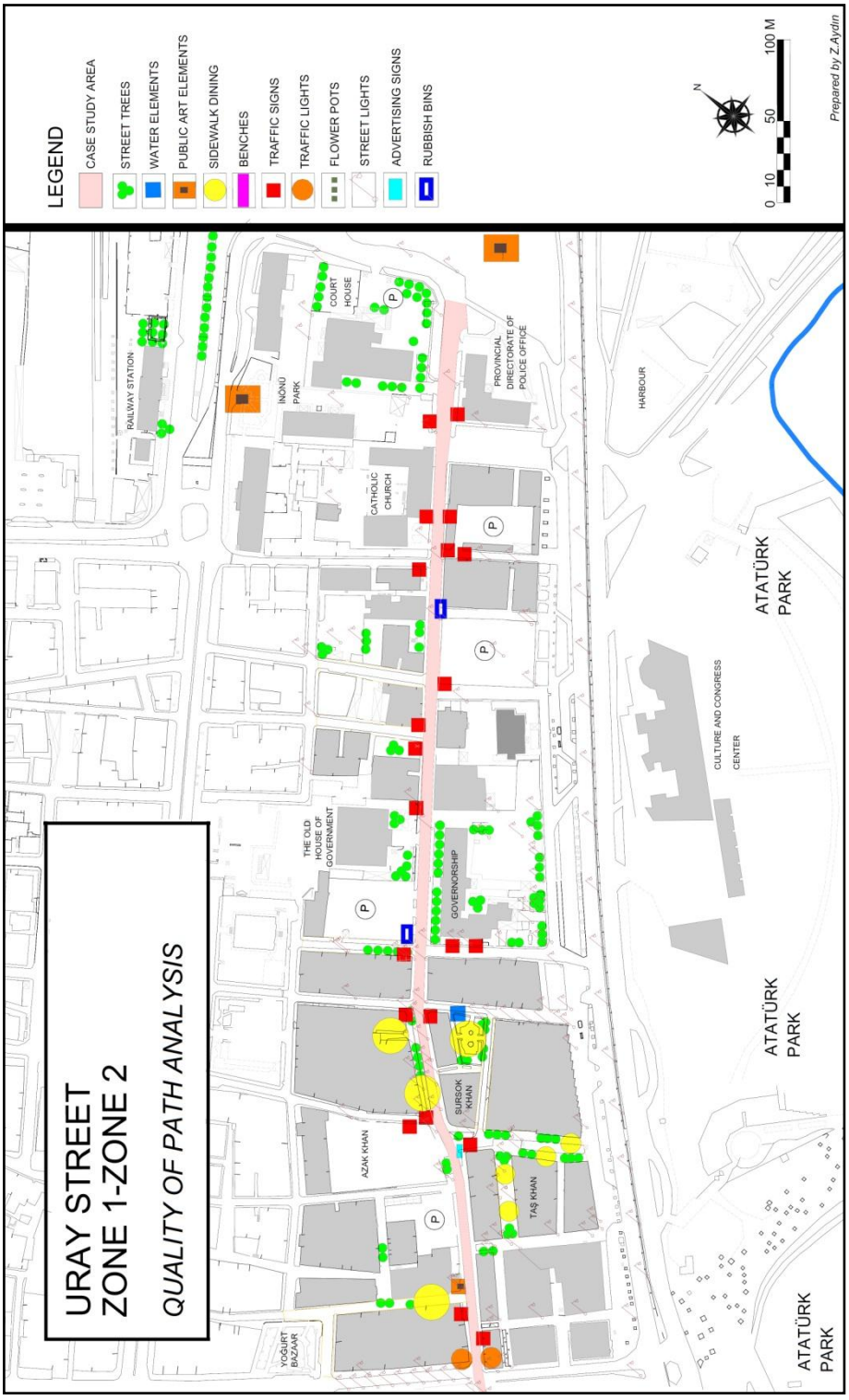


Figure 5-67: Quality of path analysis / Uray Street

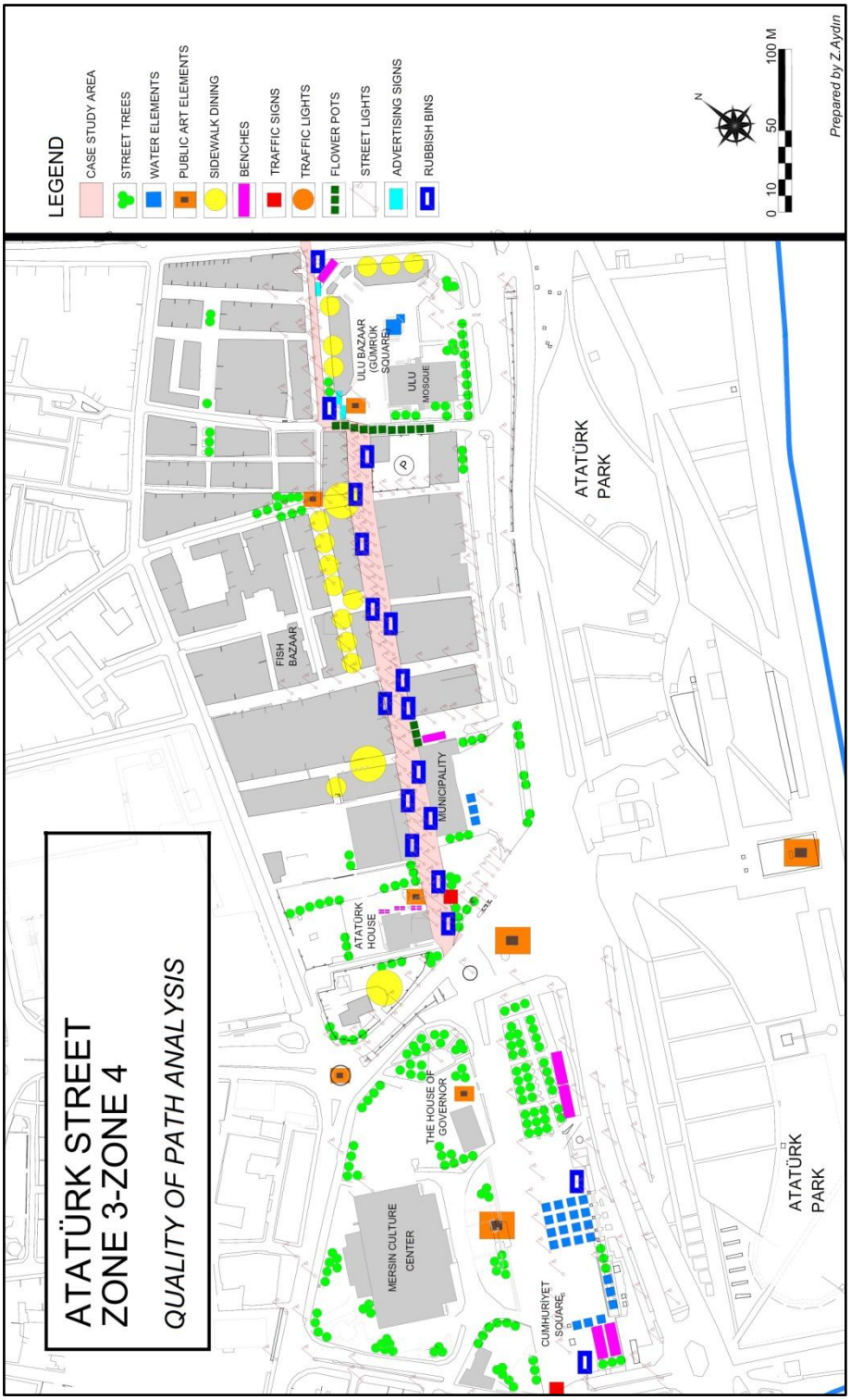


Figure 5-68: Quality of path analysis / Atatürk Street

5.6. The linkage with other transportation modes

Designing streets to accommodate all modes of transportation is essential for walkable environment. Historic city center of Mersin can be accessed by bus, minibus and private car from other parts of the city. There are two main bus stops on İsmet İnönü Boulevard and the entrance of Z4. The public buses and minibus provide uncomfortable and unsafe trips because of size of vehicles, climatic features and problems in their schedule. Thus, pedestrians generally prefer to travel by private car or by bus. However, the improvement of recent conditions of mass transportation and the preparation of well-planned transportation plan could increase livability and walkability of the case study area. Moreover, a light rail system in the case study area or near environs will enhance the walkability in historic city center.

In addition, railway station is located on Silifke Street and the entrance of Uray Street. Walking from railway station to the case area takes five minutes. Also, people can park their private cars in front of station when they want to travel by train.

To sum up, multi-mode transportation and well-planned transportation plan are key factors to create accessible and so walkable and livable environment.

5.7. Connectivity of Path Network

Providing connections between gathering points, open spaces and landmarks within shortened trips and convenient access at the same time provides connectivity of path network in a positive manner.

The connectivity of path network in Uray and Atatürk Streets are examined regarding “alternative path choices”, “short links, numerous intersections and minimal dead ends”, “continuity of pedestrian network” and “clear zones on sidewalks”. These indicators are investigated under the headings of “street pattern” and “quality of path”.

As mentioned in street pattern, Section 5.4, the street pattern of the case study area is modified grid which provides alternative path choices and direct and shortened travels for pedestrians. Moreover, modified grid presents short path links and many intersections on street network. In the case study area, there is no dead-ends, cul-de-sacs or lollipops. Therefore, connectivity of path network of Uray and Atatürk Streets provides a high level of walkability in terms of path choices routes, short links, numerous intersections (Figure 5-47 in Section 5.4).

In addition, as discussed in quality of path, Section 5, in the case study area and near environs, pedestrians and vulnerable groups are negatively affected from the lack of well maintained and continuous sidewalks. Moreover, especially in the northern parts of case area, there is no walking zone, furnishing zone and frontage zone on the sidewalks because of insufficient sidewalk width (Figure 5-29, Figure 5-30 and Figure 5-31 in Section 5.3.1).

In addition, all street furniture randomly placed on the sidewalks. Thus, there is no walking zone to provide continuity of pedestrian network in Z1, Z2 and Z3. However, Z4 is the most walkable street part in the case study area in terms of continuous and well maintained sidewalks. In this part furnishing zone (including trees, streetlights, mailboxes, trash receptacles, and other permanent obstructions) and walking zone (providing pedestrian flow) are relatively defined.

5.8. Accessibility

Accessibility (or just Access) refers to the ability to reach desired goods, services and activities (Litman 2003b, cited in http://www.vtpi.org/walkability.pdf). As mentioned in Chapter 2, accessibility has significant effects on walkability by encouraging pedestrians to ease of movement. Accessibility of urban facilities, amenities and transportation facilities help to create walkable and pedestrian-friendly environment within equity. “Access to public transport”, “parking”, “orientation”’ and “unimpeded movement” that are the measures to examine the accessibility indicator.

5.8.1. Access to Public Transport

As mentioned in the linkage with other transportation modes part, there are two stops of bus and mini-bus on İsmet İnönü Boulevard and the entrance of the Z4 (between Cumhuriyet Square and the building of Metropolitan Municipality). Continuous, well-maintained and well-lit sidewalks play a key role in order to create accessible places. The field investigations show that going to the station is not safe at the evening hours from all zones in terms of lack of well-lit streets, even though in the case study area has direct access to station. Besides, there is available good access to public transit stops for all zones during the day in terms of safety. In addition, in Z1, Z2 and Z3 and their connections have occasionally interrupted sidewalks, and the vehicular traffic and parking on street create problem on accessibility. However, pedestrians can easily access public transit points because continuity of path network is possible within modified grid pattern feature in terms of short distance and be reached in a short time by walking. In brief, Z4 is the most walkable street part in the case study area in terms of available access to public transport within continuous and well maintained sidewalks and being relatively well-lit zone.

5.8.2. Parking

As mentioned in Chapter 2, parking is crucial part of accessibility in terms of site selection. Parking has both positive and negative effects on pedestrian movement and streetscape. More specifically, on-street car parking creates a buffer zone between a roadway and sidewalk; however it decreases safety of pedestrian due to decreasing visibility that disturbs pedestrians' movement and crossing. One of the fundamental issues in the case study area in terms of accessibility is that people want to park the closest place to their destinations. For the assessment of 'car-parking', two related questions were asked to the pedestrians in the case study area. The first question is *"whether on-street car-parking disturbs the pedestrian movement"***.** Regarding this statement, a great majority of all respondents claimed that on-street car-parking disturbs their movement on all zones (Figure 5-69). The second question of parking is *"whether there are enough parking areas for vehicles in Uray and Atatürk Streets".*

Regarding this statement, the majority of the respondents did not find the parking areas of the case study areas sufficient (Figure 5-70).

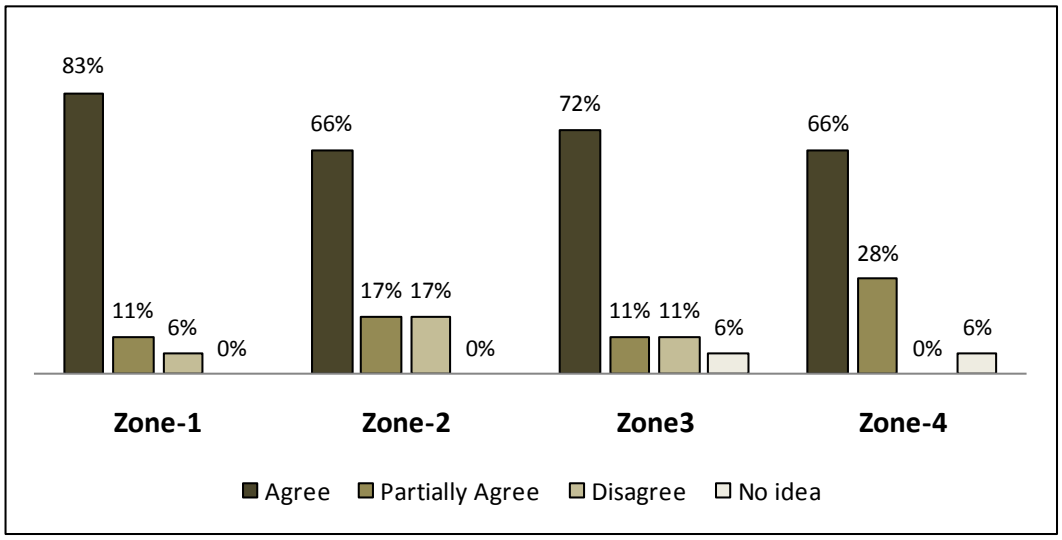


Figure 5-69: The outcome of "whether on-street car-parking disturbs the pedestrian movement" according to sub-zones

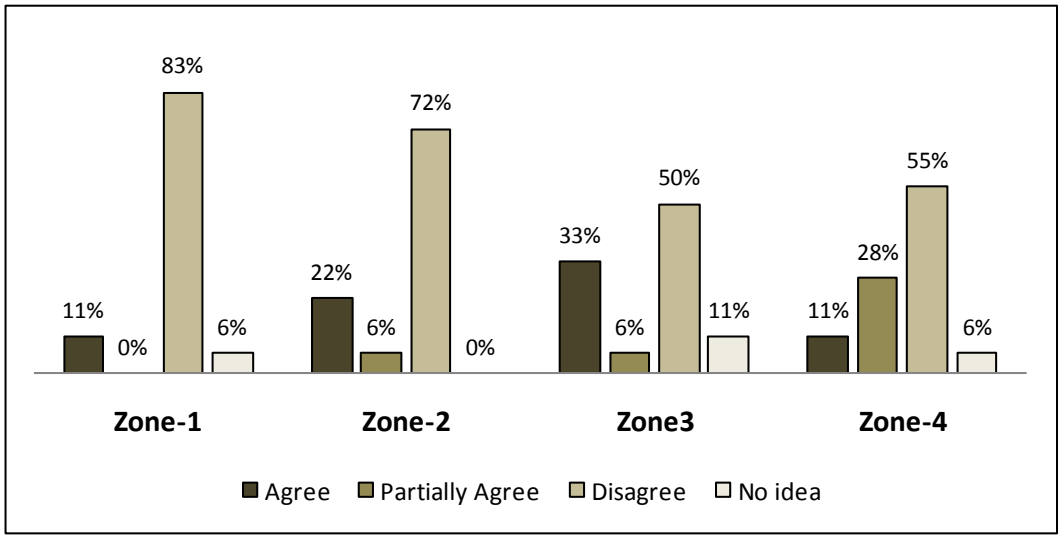


Figure 5-70: The outcome of "whether there are enough parking areas for vehicles in Uray and Atatürk Streets" according to sub-zones

In brief, the analysis and survey results show that there is no street car-parking due to lack of diversity and variety of functions, and public buildings which have their own parking areas in Z1. The parking areas of public buildings or private parking areas are mostly used in Z1 (Figure 5-71).

Moreover, although the width of road is narrow and there are varying parking facility around zone, on-street parking is one of the most important problems in Z2. On-street car-parking is especially used by customers of telephone stores and gastronomic activities. Pedestrian passes and crossing along Z2 is also negatively affected by on-street parking that limit vehicular traffic (Figure 5-71).

In Z3, there is no on-street car parking. There is a closed-parking area behind Ulu Bazaar, but it is out of order because of pedestrianized entrance of garage and infrastructure problems. The southern part of Hastane Street is used for on-street parking that was controlled by personnel of the firm established by the Metropolitan Municipality. Especially in peak hours, traffic junctions and parking obstruct pedestrian movements (Figure 5-71).

Furthermore, in Z4 as a pedestrian zone, there are on-street parking opportunities after 6 p.m. and at the weekends in Z4. After 6 p.m. and at the weekends, vehicular traffic uses this zone not only service, but also transit traffic that obstructs pedestrian movements. In addition, Cumhuriyet Square is used as parking area, when cultural events are arranged in the Culture Center. That cause misuse and visually pollute of public square. Also, the lack of parking area caused on-street parking along main axis of historic city center and so traffic problems occurs (Figure 5-71).

Private parking area in Z1

Private parking area in Z2

On street parking in Z2

Private parking area in Z2

On street parking in Z4

On street parking in Z4

Figure 5-71: Photographs of parking in case study area (personal archive of Z.S.Belge).

5.8.3. Orientation (direct lines, sequences, landmarks, spaces or areas, diffuse, topographic and symbolic dimensions and decoration)

According to Lynch (1953, cited in Banerjee and Southworth, 1995:135-137), directed lines, sequences, landmarks, spaces or areas, diffuse, topographic and symbolic dimensions and decoration are essential on orientation by means of reading the city.

Orientation can be evaluated with street pattern revealing the features of place in terms of permeability and legibility.

For the assessment of orientation of the case study area, the street pattern map and the cognitive maps drawn by respondents are examined. Moreover, as mentioned in attractiveness, section 5.1, respondents were asked the question of *"what the focal points and interesting places of Uray and Atatürk Streets are"*. Landmarks enable orienting pedestrians, assisting them to read the city. More specifically, a street is memorable and familiar with landmarks (Figure 5-10 in Section 5.1.6).

In addition to oral responds, users are kindly invited to draw a map of Uray and Atatürk Streets showing its connected streets with lines and memorable buildings with nodes as their cognitive maps. In this context, the analysis of cognitive maps which are drawn by respondents shows that many pedestrians can read the pattern of the case study area. They drew the links and connections of Uray and Atatürk Streets, so many pedestrians could perceive the legibility of the case study area.

In addition, as seen in Figure 5-72 (the distribution of landmarks determined by cognitive maps), the Provincial Directorate of Police Office, the Governorship, Latin Catholic Church and the Old House of Government are commonly used landmarks of Z1. Besides, Sursok Khan and Azak Khan are well-known landmarks although Azak Khan was demolished in Z2.

UIu Mosque and Ulu Bazaar are one of the most important landmarks that are used for not only gathering place, but also orienteering pedestrians in Z3. In addition, the building of Metropolitan Municipality and Atatürk House in Z4 are the most preferred landmarks of the case study area. Besides, Fish Bazaar, Shopping Arcades and Cumhuriyet Square (Public House) are other preferred locations for respondents.

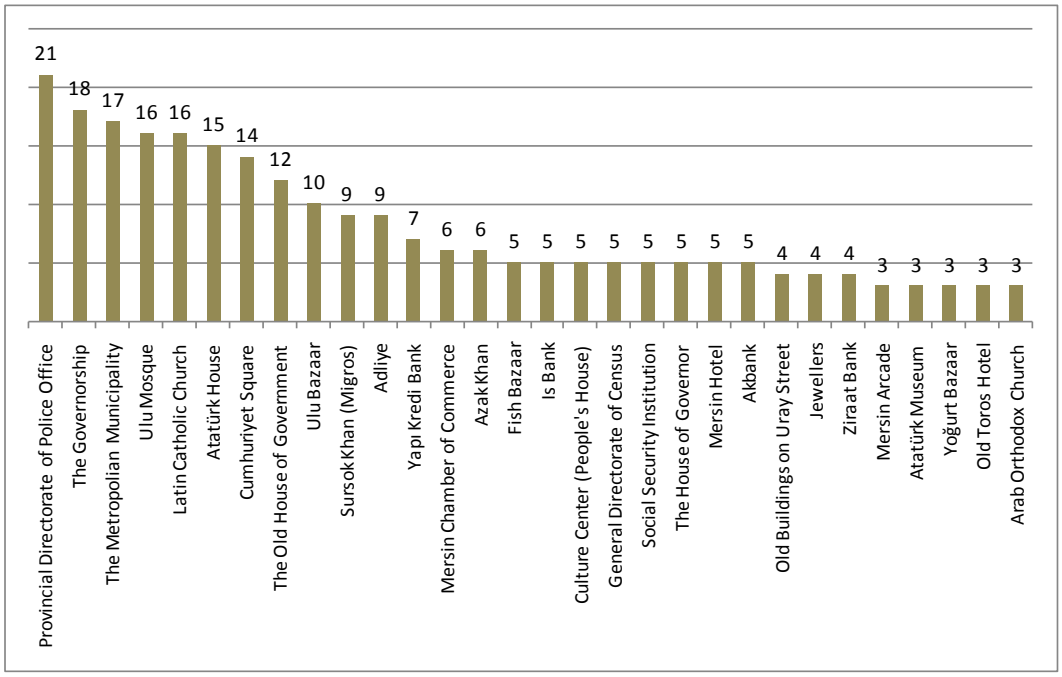


Figure 5-72: The foci that are indicated by the respondents' cognitive maps.

5.8.4. Unimpeded Movement

The acceptable walking distance for most people in ordinary daily situations has been found to be around 400 to 500 meters. For children, old people, and disabled people, the acceptable walking distance is often considerably less (Gehl, 2010: 137). In addition, the quality of road, pavement and amenities play essential roles on acceptable walking distance.

The results of the direct observation reveals that the width of sidewalks, pavements, information and orientation signs, sitting and dining amenities and illumination are inappropriate and insufficient in Z1, Z2 and Z3. In addition, the locations of street furniture obstruct unimpeded movements, and also there is no crossing designed for unimpeded movement in Z1, Z2 and Z3. Also, there are only 2 benches for dining in Z2. On the other hand, in Z4, the pavement of walking path is moderately appropriate for vulnerable groups because of tree roots barriers, and illumination is sufficient for them.

However, the lack of sitting and dining facilities decrease accessibility of Z4, and thus decrease the walkability of street.

5.8.5. The Evaluation of Accessibility in the Case Study Area

As mentioned in Chapter 2, a walkable street should provide accessibility for everyone to provide free circulation with unobstructed, well-lit and well-maintained sidewalks, also, direct and convenient access to amenities for pedestrians and pedestrians with disabilities. In table 5-9, questionnaire results for parking area (A.2) is comparatively evaluated according to characteristic zones of the case study area.

Table 5-9: The evaluation of questionnaire results in character zones of the case study area according to relative comparisons in terms of accessibility.

	QUESTIONS/STATEMENTS	Z1	Z2	Z3	Z4
A.2	On-street car-parking disturbs the pedestrian movement	Agree	Agree	Agree	Agree
	There are enough parking areas for vehicles in Uray and Atatürk Streets	Disagree	Disagree	Disagree	Disagree

In line with the field investigation findings, the accessibility of public transport facilities from Z4 is more enhanced than other zones. To sum up, street pattern type of the case study area provide a lot of advantageous by means of accessibility, however problems in design and maintenance eliminate these advantageous. The maintenance in accordance with urban design qualities can create accessible and so walkable and livable environment.

In addition, parking also plays a key role on pedestrian accessibility. The survey findings and direct observations reveal that, in Z2, the vehicular traffic is denser than other zones because of connections with Hastane Street and İsmet İnönü Boulevard. Conversely, vehicular traffic and on-street car-parking obstructs the pedestrian movements and

negatively affects transparency of shops at certain times of the day in Z4. To sum up, Z1 and Z3 are relatively more walkable zones in terms of the on-street car-parking.

Orientation is another essential factor affecting walkability in terms of accessibility. In this context, well-oriented places are easily adapted that possible with accessible network. The cognitive maps indicate that the street pattern's legibility is perceived by respondents. Moreover, by increasing legibility of the case study area, landmarks are able to orient pedestrians, also they increase the visual identity of area.

In addition, walkable environment could not be designed without unimpeded movement, fundamental right for everyone. Unimpeded movement includes a lot of factors such as floor quality, accessibility of amenities. The most appropriate zone for ease of movement for vulnerable groups is Z4. However, the case study area does not provide facilities for vulnerable groups, the accessibility of other parts of the case study area is quite problematic due to lack of arrangements such as ramps, level-variations, pavements and signs designed for them (Figure 5-73 and Figure 5-74).

To sum up, as shown in table 5-10, Z3 is relatively more walkable street in terms of quality of path compared to the Z1, Z2. However, Z4 is more accessible part of the case study area in terms of access to public transport, orientation and unimpeded movement. However, Z3 is relatively more walkable zone by means of on street car parking than other zones.

Table 5-10: The evaluation characteristics zones of the case study area in terms of accessibility

	Zone-1	**Zone-2**	**Zone-3**	**Zone-4**
1. Access to Public Transport	+	+	+	*
2. Parking	+	-	*	+
3. Orientation	+	+	+	*
4. Unimpeded Movement	-	-	-	+
(*) Good / (+) Fairly good / (-) Poor				

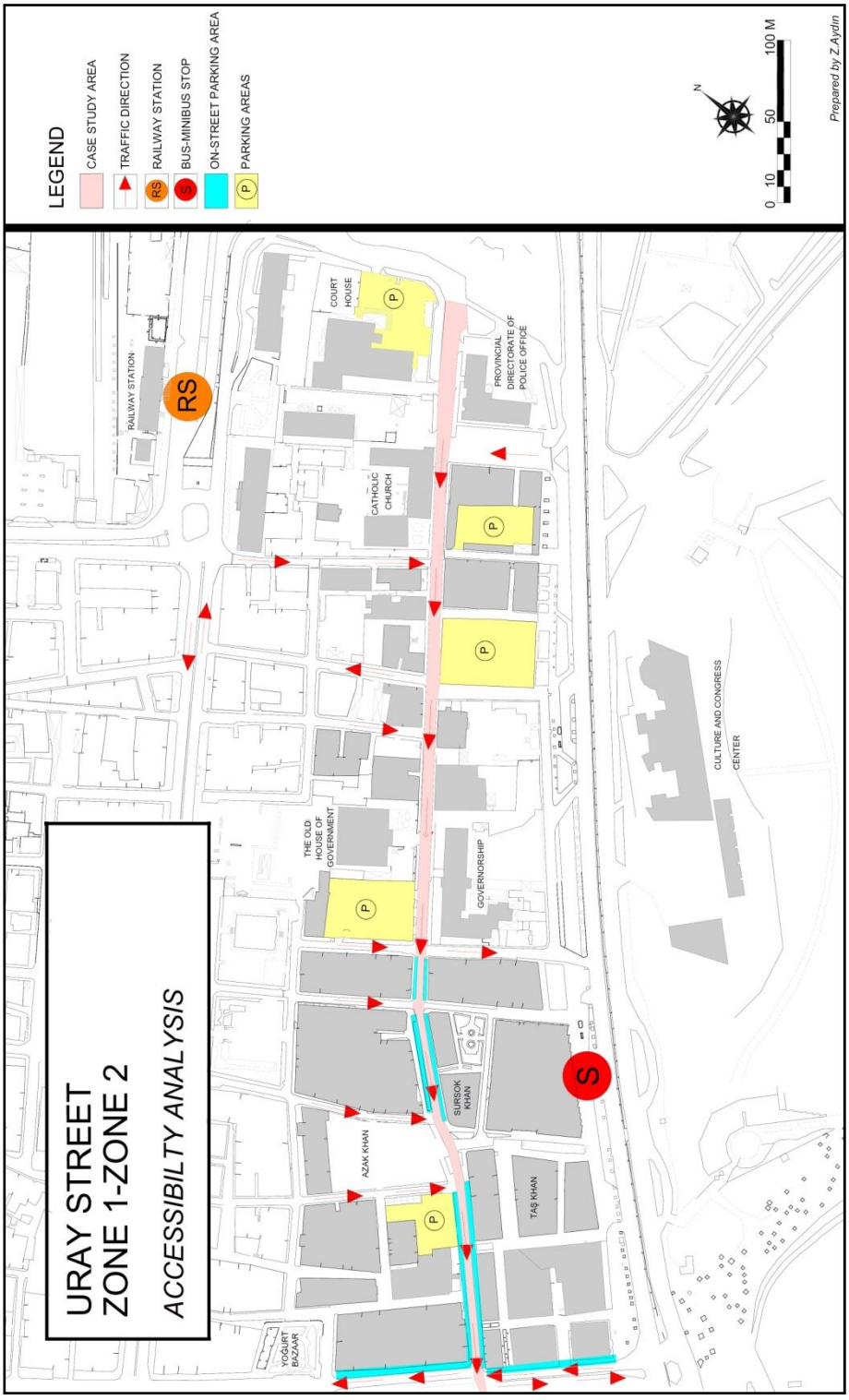


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Figure 5-73: Accessibility Analysis / Uray Street

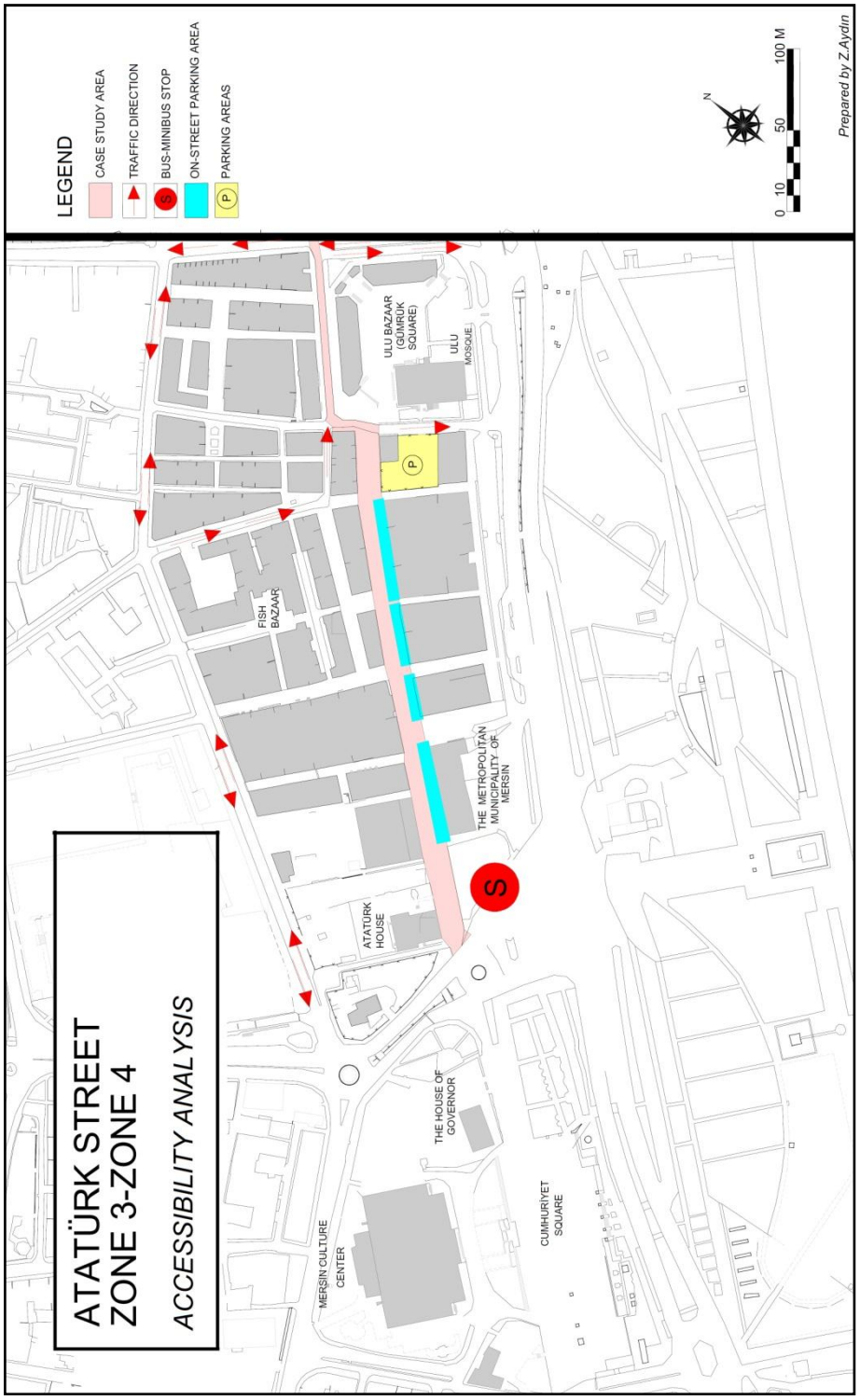

Figure 5-74: Accessibility Analysis / Atatürk Street

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

Livable pedestrian environment is essential to create a livable historic city center. In other words, walking is one of the main pedestrian-friendly modes of transportation. Walkable environment strengthens local community interaction and increases the facility use. This research investigated the walkability capacity of two major streets of the historic city center, i.e., Uray and Atatürk Streets. Walkability indicators were defined based on literature review. The case study site includes different sections and four character zones are identified. The research comparatively assessed the walkability capacities of these four character zones of Uray and Atatürk Streets. Literature review, desk-based assessment, extensive survey, direct observation (the researcher's direct observations and spatial analyses) and questionnaires (regarding the users and inhabitants' perceptions and assessments) were used as research tools to assess the walkability capacity of Uray and Atatürk Streets.

The research findings for each character zones were compared to each other to show the differences and similarities between the walkability capacities of character zones. Likewise, the research findings have shown the strengths and weaknesses of four character zones of Atatürk and Uray Streets in terms of walkability in order to develop urban design strategies to revitalize Mersin Historic City Center, where a deterioration process has been seen. Therefore, walkability and its indicators were evaluated in the context of urban design elements stating in several researches.

In defined context, in the following section, character zones in the case study area were comparatively evaluated in terms of walkability indicators to get detailed portrait of

Uray and Atatürk Streets in Mersin Historic City Center. Then, general evaluations are developed for the case study area for each feature of walkability. All design elements can not work well in different places. Therefore, design recommendations have to be specified and unique for the characteristic of the area.

There are various indicators to evaluate walkability capacity. In the study, the indicators, which are determined in varying categories of completed or ongoing researches, are re-evaluated in spatial context. A wide literature is available discussing the components of walkability, and also all the components of walkability examined in the study specified on the case study area. However, general indicators are not adequate to completely discuss the problem. In defined context, the effects of climatic conditions and seasonal cycles on walkability capacity of the case study are investigated.

6.1. Comparative Evaluation of Character Zones

As mentioned above, the major concern of the study is to reveal the strengths and weaknesses, problems and potentials of the case study area in terms of its walkability capacity. The major assumption behind this analysis is that increasing walkability of streets can help the regeneration of the deteriorated historic city centers. Thus, by revealing strengths and weaknesses of the streets, it is possible to develop urban design strategies for the revitalization scheme of Mersin Historic City Center.

Table 6-1 provides a comparative evaluation of character zones of Uray and Atatürk Streets in terms of each walkability indicator to show essential differences and similarities, as well as potentials and problems. In table 6-1 three leveled scale is used to compare character zones;

Table 6-1: Comparative evaluation of character zones according to walkability indicators

	Z1	Z2	Z3	Z4
Attractiveness and Convenience	-	-	+	*
Connection to Open Space	+	-	+	*
Safety	-	-	+	*
Street Pattern	+	+	+	*
Quality of Path	-	-	+	*
The Linkage with Other Transportation Modes	+	+	+	+
Connectivity of Path Network	+	+	+	*
Accessibility	-	-	+	*

*	Significantly better than other zones	+	Fairly better than other zones	-	Inadequate walkable

Attractiveness and convenience is one of the most important indicators to enable a walkable environment. Variables which help the assessment are: "*maintenance and cleanliness of walking paths*", "*existence and quality of facilities for disabled people*", "*existence of pedestrian amenities*", "*availability of crossings along major roads*", "*the existence of interesting urban scene*" and "*a variety and diversity of land-use activities*".

With regard to Uray and Atatürk Streets, Z3 is more attractive and convenient than Z1 and Z2, but there are problems in terms of cleaning and maintenance. Ulu Bazaar, where there is no motor-traffic, including a large square, is the most essential gathering point in the case study, and it makes this zone more attractive and convenient for pedestrians. On the other hand, there is a significant potential of historic features to attract people in

Z1 and Z2. Briefly put, Z4 is more attractive and convenient for pedestrians compared to other character zones in all aspects of variables, even though it is not entirely adequate. In this respect, being a pedestrianized area, starting with a square, Ulu Bazaar, ending with another square, Cumhuriyet Square, and its historic features are significant characteristics of Z4 to be attractive and convenient.

Providing **connection to open spaces** is another walkability indicator of this research. It is measured in terms of existing "*the connection of street network to natural elements*", "*the connection of street network to meeting and gathering places*" and "*the connection of street network to unique features and visual interest*". All these variables have a significant role in creating livable environment by encouraging social interaction.

Regarding Uray and Atatürk Streets, Z1 and Z3 are relatively more vivid spaces than Z2 and Z4. Z2 lacks diversity and maintenance but has some historic buildings, such as Sursok Khan and Taş Khan. Open space connections, visual richness, unique features, connections to sea, parks and gathering places in Z4 make it a more walkable and livable part of the case study area than other zones. Overall integration with the sea is a significant factor for public spaces and the findings show that this was not effectively utilized in the design of the case study area.

Safety of pedestrians in 'perceived' and 'actual' terms is a major component of walkable and livable environment. Safe streets encourage pedestrians to walk and so enabling increase in the vitality of the street. In the case study area, Uray and Atatürk Streets, Z3 is safer than Z1 and Z2 in terms of appropriate street width and enclosure. Furthermore, traffic safety is considerably inadequate for pedestrians in Z1 and Z2. In brief, Z4 provides more livable environment to pedestrians in terms of actual and perceptive safety than other zones.

The characteristic of **street pattern,** which contributes the identity of a community, directly affects the capacity of walkability, and of course, livability. Street pattern also plays a crucial role on attractiveness, ease of movement and safety of environment within its features. In regard to the case study area, the research findings reveal that the pattern of historic city center of Mersin is modified grid which offers more route choices

and legible network. Although the vehicular traffic and on-street car-parking issues create problems on pedestrian movement, the characteristic of street pattern of the case study area provides walkable and livable environment for pedestrians.

The path quality is another walkability indicator, directly related to physical design quality of the street. It is essential to enhance comfortable pedestrian environment. More specifically, "*sidewalk width*", "*paving quality*", "*street furniture*", "*street signs*", "*street lightning*" and "*street trees*" are components of quality of path. The research indicates that, Z3 has relatively better than Z1 and Z2 in terms of sufficient sidewalk width, existing street furniture, right placement of furniture, sufficient number and style of street lightning, and street trees. In addition, quality of pavement is in better situation in Z2 and Z3 than Z1. On the other hand, Z4 is the most walkable and livable part of the case study area within paving quality, street signs and street lightning.

The availability of the linkage of transportation modes, such as non-motorized transport, public transport or private car, is an essential factor on improving access to destinations to set walkable environment. The locations of railway station and bus-mini bus stops are accurate to accommodate transportation modes as bus, walking and railway. In addition, the feature of street pattern -modified grid- provides opportunities on connectivity of all modes of transportation in terms of ease of movement. In the case study area, connections between different transportation modes are relatively available; however, the opportunities of public transportation in the case study area are not sufficient. In any case, light rail system is an essential requirement to enable the connectivity between Mersin Historic city center and its environs.

Connectivity of path network is primarily related to the street pattern type of space, and secondly related to the clear walking zones on sidewalks. Existing alternative several routes, existing short links of street network and continuity of sidewalks without significant barriers are all essential on comfortable and ease of walking. Although the case study area as a whole provides path choices routes, short links, numerous intersections due to modified grid pattern, Z1, Z2 and Z3 do not have clear walking

zones due to inadequate sidewalk width. On the other hand, the walking zone of Z4 is relatively clear than other zones by means of path network connectivity for pedestrians.

Access to goods, public amenities, activities and gathering places is a key criterion for livable and walkable environment. In defined context, access to public transport, orientation, parking and unimpeded movement are the measures of **accessibility.** Regarding Uray and Atatürk Streets, pedestrians walk more comfortable in Z1 than in Z2 due to undisturbed street car parking. However, Z3 is relatively more walkable than Z1, Z2 and Z4 in terms of parking. In brief, Z4 creates a more walkable environment than other zones in terms of access to public transport, orientation, and unimpeded movement. However, there are not any arrangements for disabled people in both streets. Therefore, the case study area is not totally walkable in terms of unimpeded movement. On the other hand, the cognitive maps reveal that the legibility of street network is quite strong. In addition, visually appealing landmarks on the case study area create familiar and memorable environment for pedestrians to perceive the streets.

The results show that, Z4 is the most walkable and livable part of the case study area. Pedestrian areas, existing interesting scene and streetscape, historic entities, existing facilities and amenities have great importance on this situation.

6.2. Recommendations for the Case Study Area

One should note that revitalization strategies of a historic city center include various components, such as physical, social, economic, and environmental components. Walkability is one of these components which are regarded within the physical aspects of revitalization strategies. It should be noted that it is not possible to regenerate places by only considering one aspect of regeneration. A comprehensive and integrated approach is necessary for a sustainable regeneration of such historic sites. For example, without comprehensive urban transportation strategies regarding the whole historic city center that will connect it to the rest of the city, it is not possible to revitalize it solely by improving its walkability capacity. The economic, social and ecological aspects of regeneration are of great importance for completing this complex issue. In other words,

besides area-based policies, there should be also integrated sector based strategies for regenerating historic sites.

Nevertheless, as this research has examined in-depth the walkability aspects of public spaces to increase the vitality and viability of city centers, it might be possible to develop urban design strategies and recommendations pertaining to the case study area, after all these detailed analyses. In defined context, main problems of the case study area are spatially determined to evaluate the walkability capacity in terms of **S**patial **C**ontext **(SC)**, **B**uilding **C**ontext **(BC)** and **T**ransportation / **R**elations **(TR)** (Figure 6-1). And then, recommendations are numerated within the order of walkability indicators.

- **SC1 -** Mersin North: Unplanned and shortsighted development
- **SC2 -**Mersin West: Unplanned development with over population
- **SC3-** Çamlıbel Neighborhood, one of the oldest districts of Mersin, inadequate relationship with historic city center due to negative spaces
- **SC4-** Eliminating the perpendicular relationship between historic city center and sea
- **SC5 -** Mersin East: Undefined places and relations between Adana - Tarsus and Mersin, development is unconscious and uncontrolled
- **BC1:** There is the Congress and Exhibition Hall that's form and location block the perpendicular pedestrian flow between historic city center and sea
- **TR1:** İsmet İnönü Boulevard create barrier for perpendicular relations between historic city center and sea, also does not have any arrangements for pedestrians
- **TR2:** There is no perpendicular relationship between Uray Street and sea because of the location of the Congress and Exhibition Hall in Atatürk Park
- **TR3 -**Kurtuluş Square : Railway and highway gate that linking Adana and Tarsus to Mersin, undefined spatial relationship, negative space, not understand entering to the historic city center

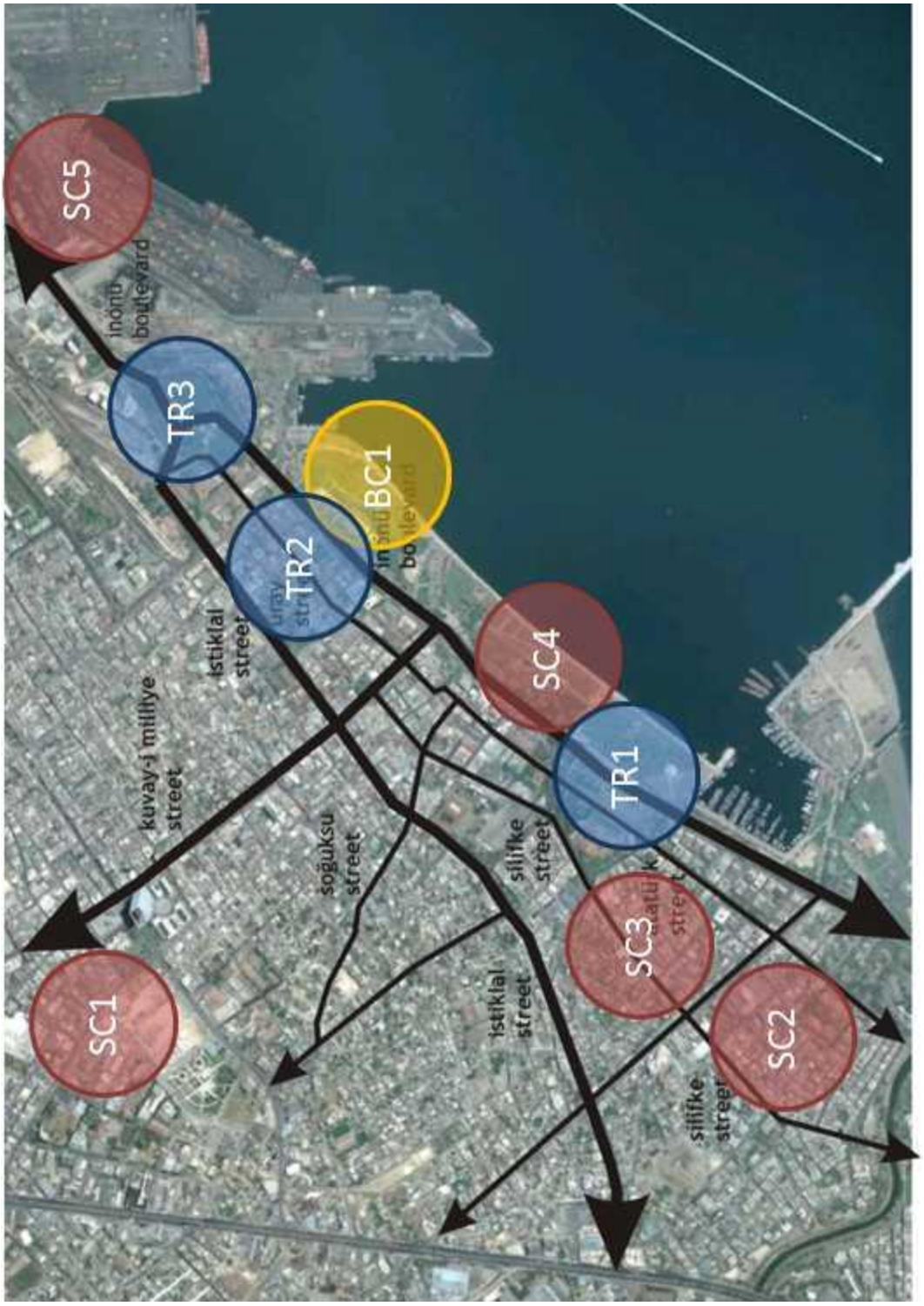

Figure 6-1: Main spatial problems in the case study area effecting walkability capacity.

— **Attractiveness and Convenience**

- The walking paths near the gastronomic facilities of Z3 should be maintained and kept clean.
- In Z1 and Z2, the sidewalks should be repaired and kept clean and the historic entities should be restored to increase attractiveness of the street.
- Bumps, traffic lights and pedestrian crossings might be designed by taking into consideration of disadvantaged groups in all zones.
- Designing the traffic way in terms of traffic calming elements, such as traffic lights, pedestrian path and crossroad for all pedestrians between Cumhuriyet Square and Ataturk Street's pedestrianized zone, would enhance attractiveness of the case study area.
- Shelters for protection from sun light, rain, snow and wind for pedestrians should be provided in Z1, Z2 and Z4.
- Pedestrian amenities have to be increased for comfortable walking to enhance attractiveness especially in Z1, Z2 and Z3 (figure 6-14).

— **Connection to open space**

- There should be perpendicular connections between Uray and Atatürk Streets and the sea coast (figure 5-24, figure 5-25 and figure 6-1).
- The maintenance of walkways to reach sea, unique features and gathering places would create ease of pedestrian movement in all zones.
- The conditions of sidewalk dining activities should be improved in terms of urban design principles and streetscape design especially in Z2 and Z3 to attract pedestrians.
- The number of sidewalk dining cafés has to be increased for livable public spaces in all zones (figure6-2).
- The connectivity of open space system with transportation plan should be designed (set) in Mersin historic city center.

— **Safety**

- Pedestrian areas in Uray Street, Z1 and Z2 should be designed to enable the safety of pedestrians with sufficient width for pedestrian movement.
- Pedestrian crossings on Z1 and Z2 should be designed to create perceptually and actually safe environment (figure 6-4).
- Traffic calming elements should be introduced to the design of Z1 and Z2 to slow down vehicular traffic that will enable the safe movement for all (figure 6-4).
- Increasing number of eyes on the street and the safety of the case study area would correspondingly increase the vitality of case study area (figure 6-9 and figure 6-10).

— **Quality of Path**

- The walking zone width has to be widen to allow passing two wheelchairs together in Z1 and Z2 (figure 6-2).
- The sidewalk width should be also widen to introduce street furniture and other amenities for pedestrians in Z1 and Z2.
- In Z1 and Z2, the width of two sides of the sidewalk should be equalized and also the sidewalks must be built where there are not the sidewalks on Z1 and Z2.
- The same height of sidewalk and path in Z3 especially for pedestrian with wheelchairs (leveling in the street is not equal though pedestrianized area) would provide ease of movement (figure 6-12).
- The street pavements have to be regularly maintained according to special characteristics of street especially on Z1 and Z2.
- The streets should be paved and designed based on usage, enrich and indicate diversity with different texture (figure 6-15 and figure 6-16).
- The case study area should be paved with smooth surfaces and well-compacted for comfort and safety of pedestrians of varied ages and physical abilities (figure 6-2).

- Street furniture must be located compatible, appropriate and unique in scale, style and color with architectural and streetscape features in all zones (figure 6-13).
- The street furniture, street signs and lightings on the furnishing zone have to be located to avoid the obstruction of pedestrian movement especially in Z1, Z2 and Z3, as to do this, sidewalk width could be enlarged (figure 6-3 and figure 6-6).
- Sufficient street furniture, such as benches, bins, telephone and electric boxes, flower pots, etc. should be introduced into the public spaces that will create comfortable environment for all.
- The placement of the way finding signs, information boards, routing signs in appropriate location of all zones would help people finding their way and enable orienting pedestrians (figure 6-6).
- The present shop signs have to be removed; a coding specific to shop signs have to be developed; and shop signs and advertising boards should be renewed to create a transparency to attract people especially in Z2 and Z3 (figure 6-9).
- Adequate traffic signs will be placed to regulate the vehicular traffic on Z1 and Z2, also to decrease the chaos of street car parking and vehicular traffic on Z4 (figure 6-4 and figure 6-5).
- Sufficient illumination especially on Cumhuriyet and Ulu Square will be provided to improve the safety of pedestrians in Z1, Z2 and Z3 (figure 6-9 and figure 6-10).
- The visual pollution of overdesigned street lights will be removed and a scheme regarding appropriate height and design of street lights will be prepared according to character and scale of Uray and Ataturk Streets.
- The plant street trees and other landscape elements on the curb site could create a clear walking zone for ease of pedestrian movement in Z1 and Z2.
- The flower pots on the furnishing zone must be appropriately re-placed between Z3 and Z4 to avoid the obstruction of pedestrian movement.

- **The linkage with other transportation modes**
    - Well-planned transportation plan could help accommodating all modes of transport for street users.
    - The access to all transportation modes could provide continuity of pedestrian network.
    - A light rail system in the case study area and near environs will enhance the walkability in historic city center (figure 6-8).

- **Connectivity of path network**
    - A pedestrian network should be established.
    - Walking zone, furnishing zone and frontage zone in Uray and Ataturk Streets has to be maintained for clear walking sidewalks within relatively defined.
    - The connections between gathering points, public amenities, and landmarks with alternative path choices and convenient access (such as pedestrianization of sea connections and also connections of open spaces and amenities) should be developed.

- **Accessibility**
    - The opportunities of pedestrian amenities, such as bus stops and railway station, should be improved to enable access to public transport for all zones.
    - The opportunities of pedestrian amenities, such as bus stops and railway station, has to prevent the obstruction of the location of car parking especially on Z2 and Z4 to the pedestrian movements, passes and crossings and also vehicular traffic.
    - The parking areas should be located according to design standards in Uray and Atatürk Streets.
    - The precautions to avoid parking along shop fronts would increase pedestrian movement and transparency of shops in Z4.

- To enable accessibility for all, widening the walking zones (figure 6-4) according to pedestrians with wheelchairs, increasing facilities and arrangements for vulnerable groups are necessary for Uray and Ataturk Streets (figure 6-2).
- The curb ramps at all intersections and crossings will be redesigned to create accessible street for people with wheelchairs.

Figure 6-2: Street activities create more livable places (http://www.city-data.com/picfilesv/picv11447.php)

Figure 6-3: Defined walking zone, furnishing zone and frontage zone providing ease of movement (http://switchboard.nrdc.org/blogs/kbenfield/made_in_the_shade_trees_and_wa.html)

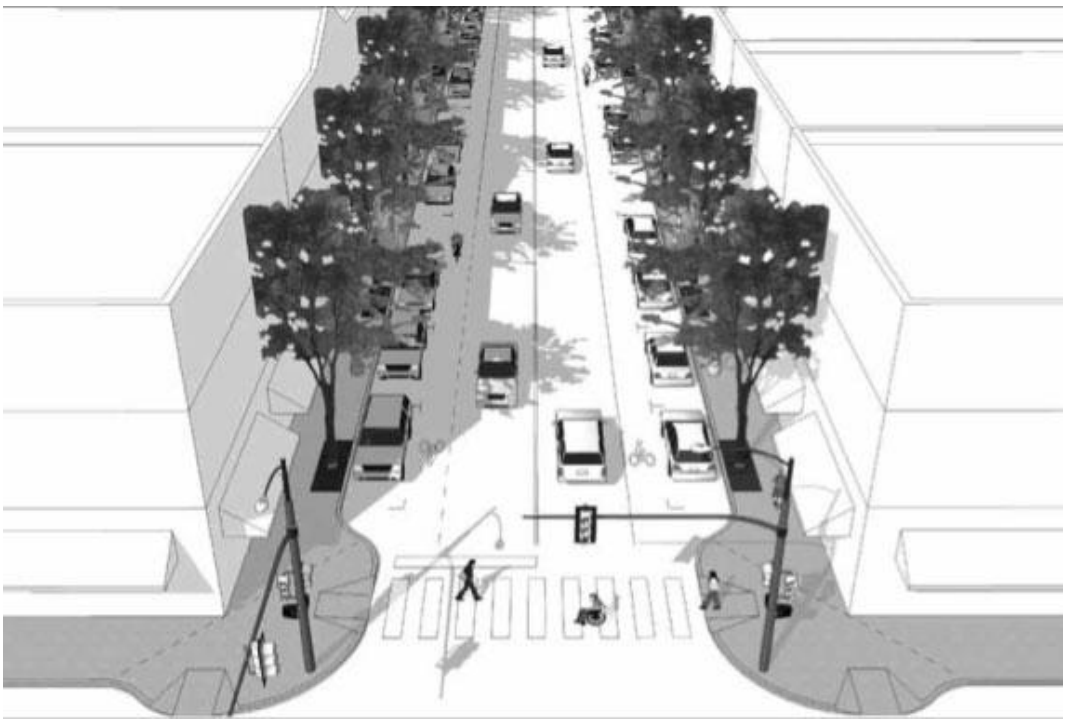

Figure 6-4: Traffic calming elements such as curb extensions, textured crosswalks, bollards, and plantings that encourage pedestrians to walk around within slowing vehicular traffic, and disabled people to increase their ease of movement and accessibility. (http://www.streetsblog.org/2010/04/08/making-streets-for-walking-dan-burden-on-reforming-design-standards/)

Figure 6-5: The traffic lights and signs regulating pedestrian and vehicular traffic movement (http://bettercities.net/walkable-streets)

Figure 6-6: The appropriate location of street furniture, traffic signs, street trees and street lights create clear walking zones (http://ealscoalition.org/2010/05/18/us-urban-planning-holy-grail-portland-or/).

Figure 6-7: The street light rail system is an essential transportation mode to provide connectivity between street and its environs (http://ealscoalition.org/2010/05/18/us-urban-planning-holy-grail-portland-or/).

Figure 6-8: An example from Glasgow: the illumination both from houses and street lights create safer and so livable streets
(http://www.paisleycolour.co.uk/photo_7679136.html#photos_id=7679136)

Figure 6-9: The street lights enabling a vivid night life in Rhodes (personal archive of Z.S.Belge and B.Belge)

Figure 6-10: The street lights enabling a vivid night life in Rhodes (personal archive of Z.S.Belge and B.Belge)

Figure 6-11: An example from İstiklal Street
(http://www.beyoglu.bel.tr/beyoglu/beyoglu_rehberi.aspx?SectionId=72)

Figure 6-12: An example from Vienna City Center (personal archive of Z.S.Belge and B.Belge)

Figure 6-13: An example from Vienna City Center (personal archive of Z.S.Belge and B.Belge)

Figure 6-14: An example from Vienna City Center (personal archive of Z.S.Belge and B.Belge)

Figure 6-15: An example from Ghent, Belgium (personal archive of Z.S.Belge and B.Belge)

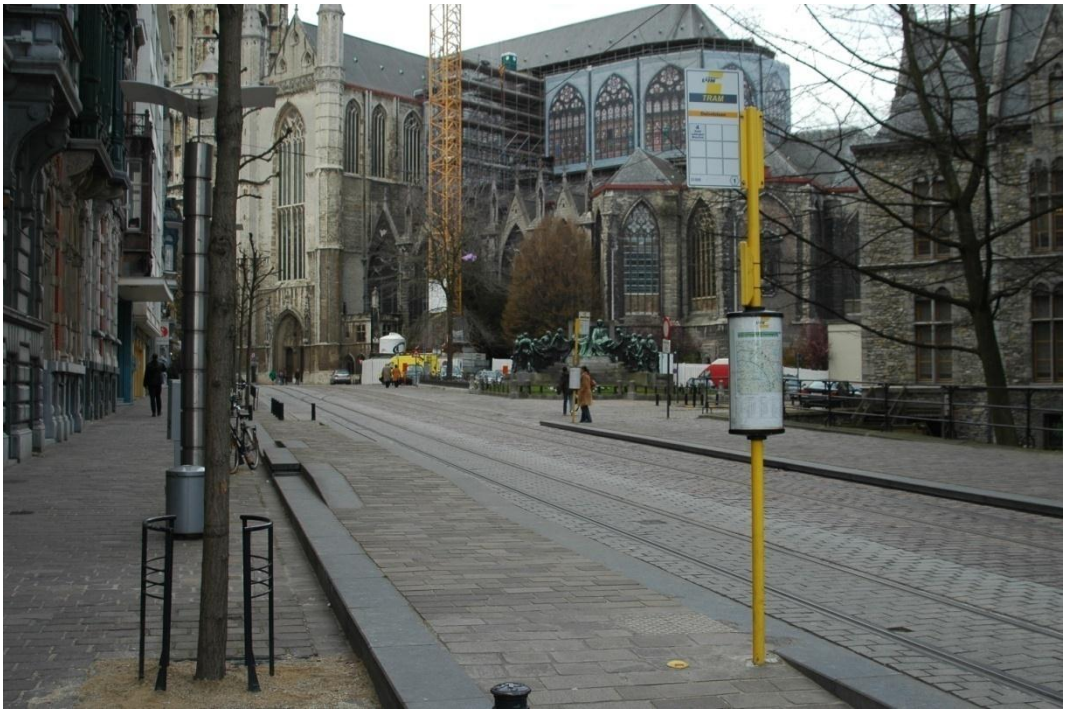

Figure 6-16: An example from Ghent, Belgium (personal archive of Z.S.Belge and B.Belge)

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APPENDIX -A

QUESTIONNAIRE FORM

<table>
<tr><td colspan="5">"Bu anket çalışması Orta Doğu Teknik Üniversitesi'nde Züleyha Sara BELGE tarafından yürütülmekte olan "Mersin Tarihi Kent Merkezindeki Uray ve Atatürk Caddelerinde Yürünülebilirlik İlkelerine Göre Yaşanılabilirliğin Değerlendirilmesi" başlıklı yüksek lisans tez çalışması ile ilgili olarak yapılmaktadır. Anket kapsamında vermiş olduğunuz cevaplar sadece akademik çalışmalar kapsamında kullanılacak olup, kesinlikle üçüncü şahıs ve kurumlarla paylaşılmayacaktır. Çalışmaya göstermiş olduğunuz destek, ayırdığınız zaman ve ilgi için teşekkür ederiz"</td></tr>
<tr><td colspan="2">Züleyha Sara BELGE

Orta Doğu Teknik Üniversitesi
Mimarlık Fakültesi
Şehir ve Bölge Planlama Bölümü</td><td colspan="3">Y.Doç. Dr. Müge AKKAR ERCAN
Tez Yöneticisi
Orta Doğu Teknik Üniversitesi
Mimarlık Fakültesi
Şehir ve Bölge Planlama Bölümü</td></tr>
<tr><td colspan="2">Anketin Yapılma Tarihi:</td><td colspan="3">ANKET NO:</td></tr>
<tr><td colspan="5">ANKET BÖLGE</td></tr>
<tr><td>B-1: Uray Caddesi / Emniyet Müdürlüğü – Valilik</td><td>B-2: Uray Caddesi / Valilik – Ulu Bazaar</td><td colspan="2">B-3: Atatürk Caddesi / Ulu Bazaar ve çevresi</td><td>B-4: Atatürk Caddesi / Ulu Bazaar – Cumhuriyet Meydanı</td></tr>
<tr><td colspan="5">A. GENEL BİLGİLER</td></tr>
<tr><td colspan="2">1. Cinsiyet</td><td colspan="2">Erkek</td><td>Kadın</td></tr>
<tr><td>2. Yaş:</td><td>16-34</td><td colspan="2">35-59</td><td>60-üstü</td></tr>
<tr><td colspan="5">3. Eğitim Durumunuz:</td></tr>
<tr><td>Okula Gitmedim</td><td>İlkokul</td><td>Ortaokul</td><td>Lise</td><td>Yüksek Öğrenim</td></tr>
<tr><td colspan="5">4. Meslek:</td></tr>
<tr><td colspan="5">5. Nerede Yaşıyorsunuz?</td></tr>
<tr><td colspan="5">B. URAY VE ATATÜRK CADDELERİNİN KULLANIMI - ULAŞIM:</td></tr>
<tr><td colspan="5">6. Genellikle Uray ve Atatürk Caddelerini hangi amaç ile kullanıyorsunuz?</td></tr>
<tr><td>Gezme-dolaşma</td><td>Arkadaşlar ile buluşma, Kafe, vb. yerlere gitme</td><td>Günlük mutfak alışverişi</td><td colspan="2">Kişisel alışveriş</td></tr>
<tr><td>Yeme – içme</td><td>Eve veya başka bir yere gitme</td><td>Valilik, Adliye, Emniyet Müdürlüğü gibi idari yerlere gitmek için</td><td colspan="2">Diğer</td></tr>
</table>

7. Ne kadar sıklıkla Uray ve Atatürk Caddelerine geliyorsunuz?					
Ayda 1-2 kere	*Haftada 1-2 kere*	*Haftada 3-4 kere*	*Hafta içi her gün*	*Her hafta sonu*	*Her gün*

8. Uray ve Atatürk Caddeleri'nin en çok hangi bölümlerini kullanıyorsunuz?			
B-1: *Uray Caddesi / Emniyet Müdürlüğü – Valilik*	***B-2:*** *Uray Caddesi / Valilik – Ulu Bazaar*	***B-3:*** *Atatürk Caddesi / Ulu Bazaar ve çevresi*	***B-4:*** *Atatürk Caddesi / Ulu Bazaar – Cumhuriyet Meydanı*

9. Hangi ulaşım aracı ile geliyorsunuz?			
Özel Araç	*Yürüyerek*	*Otobüsle / Minibüsle*	*Trenle*

10. Özel araç ile geliyorsanız, aracınızı nereye park ediyorsunuz?
11. Sizce bu cadde yayalara uygun bir cadde mi? Evet Hayır
12. Uray ve Atatürk Caddeleri'nin hangi bölümünde daha rahat ve kolay yürüyebiliyorsunuz?

B-1: *Uray Caddesi / Emniyet Müdürlüğü – Valilik*	***B-2:*** *Uray Caddesi / Valilik – Ulu Bazaar*	***B-3:*** *Atatürk Caddesi / Ulu Bazaar ve çevresi*	***B-4:*** *Atatürk Caddesi / Ulu Bazaar – Cumhuriyet Meydanı*

13. Uray ve Atatürk Caddeleri'nin hangi bölümünde daha zor yürüyorsunuz?			
B-1: *Uray Caddesi / Emniyet Müdürlüğü – Valilik*	***B-2:*** *Uray Caddesi / Valilik – Ulu Bazaar*	***B-3:*** *Atatürk Caddesi / Ulu Bazaar ve çevresi*	***B-4:*** *Atatürk Caddesi / Ulu Bazaar – Cumhuriyet Meydanı*

14. Sizce Uray Caddesi'nin kaldırımlarının bazı bölümleri genişletilebilir mi? Nereleri?
15. Sizce Uray Caddesi'nin bazı bölümleri yayalaştırılabilir mi? Nereleri?

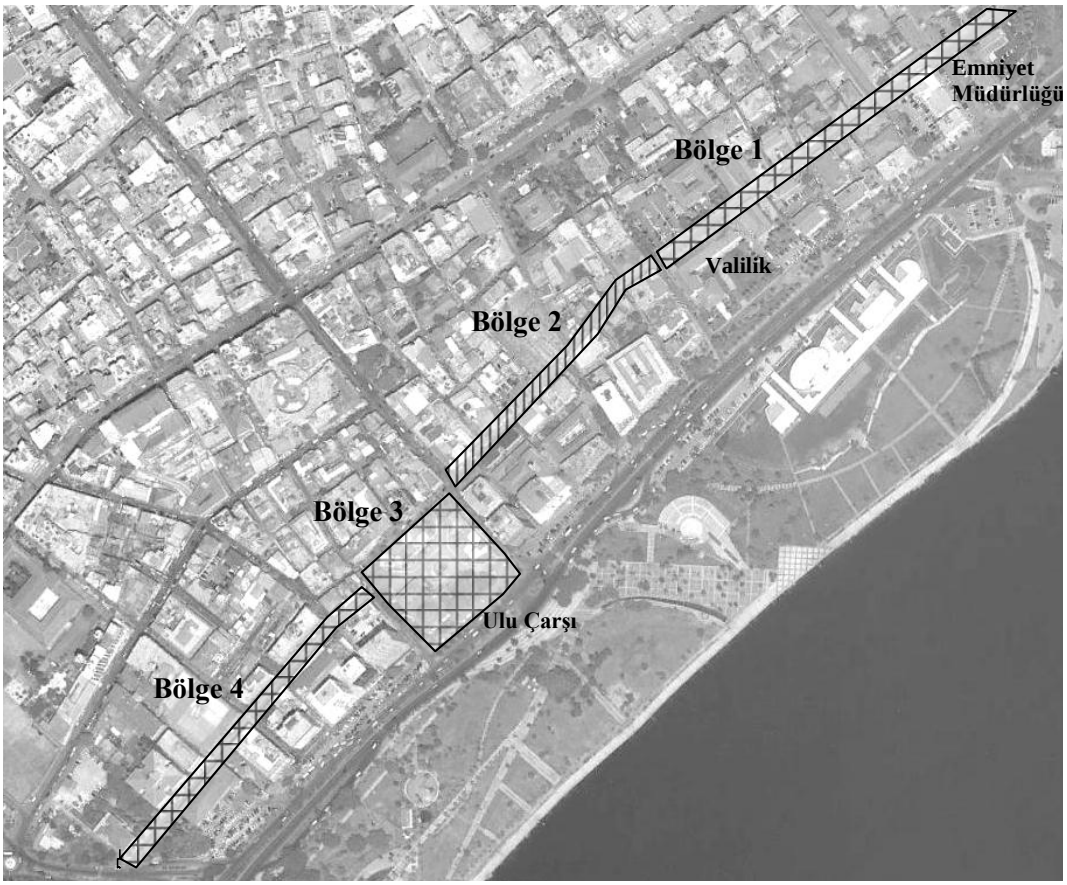
C. YÜRÜNÜLEBİLİRLİK DEĞERLENDİRME	***Katılıyorum***	***Kısmen Katılıyorum***	***Katılmıyorum***	**Fikrim Yok**
16. Bu caddeler temiz ve bakımlıdır.				
17. Bu caddelerde engelli insanlar için yeterince düzenlemeler (rampalar, özel yer döşemeleri, vs) bulunmaktadır.				
18. Uray Caddesi'ndeki tümsekler, trafik ışıkları ve yaya geçitleri engellileri de düşünerek tasarlanmıştır. *(B1-B2)*				
19. Bu caddelerdeki binaların tenteleri, yayaları güneşten, yağmur ve rüzgardan korur.				
20. Bu caddelerde yayalar için yeterince bank ve dinlenme yeri bulunmaktadır.				
21. Uray Caddesi'nde yeterince yaya geçidi bulunmaktadır. *(B1-B2)*				
22. Uray Caddesi'nde yaya geçitleri doğru yerlerdedir. *(B1-B2)*				

23. Uray Caddesi'ndeki yaya geçitleri kolayca ulaşılabilir yerlerdedir. *(B1-B2)*				
24. Uray Caddesi'ndeki yaya geçitleri kolayca görülebilmektedir. *(B1-B2)*				
25. Bu caddelerdeki kullanım ve aktivitelerin çeşitliliği herkesin ilgisini çekebilecek düzeydedir.				
26. Uray Caddesi araç trafiği için yeterince geniştir. *(B1-B2)*				
27. Bu caddeler, yaya trafiği için yeterince geniştir.				
28. Araç trafiği, yayaların hareketini engelliyor.				
29. Caddedeki araçlar daha yavaş gitmeli.				
30. Uray Caddesi'nde yaya geçitleri, yayalar için güvenlidir. *(B1-B2)*				
31. Uray Caddesi'nde, karşıdan karşıya geçerken zorlanıyorum. *(B1-B2)*				
32. Uray Caddesi'ndeki yaya geçitleri, yaşlılar, engelliler, çocuklar ve bebekli ve küçük çocuklu ebeveynler için güvenlidir. *(B1-B2)*				
33. Yaya yolları, yaşlılar, engelliler, çocuklar ve bebekli ve küçük çocuklu ebeveynler için güvenlidir.				
34. Bu caddelerde park eden araçlar yaya trafiğini engelliyor.				
35. Bu caddelerde arabalar için yeterince park yeri var.				
36. Bu caddeler, gürültülüdür.				
37. Gürültü, öncelikle araç trafiğinden kaynaklanmaktadır.				
38. Geceleri açık olan dükkanlar, caddeyi daha güvenli hale getiriyor.				
39. Daha fazla konut kullanımı olsa, daha güvenli caddeler olur.				
	Katılıyorum	***Kısmen Katılıyorum***	***Katılmıyorum***	**Fikrim Yok**
40. Kolay ve rahat yürünebilir caddelerdir.				
41. Başka yerlerden, yürüyerek kolaylıkla ulaşılabilen caddelerdir.				
42. Araç trafiği, bu caddelerin farklı yerlerine ulaşmak açısından yayalar için sorundur.				

43. Bu caddelerin paralelindeki sokaklardaki araç trafiği, bu caddelere yayaların ulaşması açısından sorundur.				
44. Yayalar için yaya yolları yeterince geniştir.				
45. Yaya yollarında yayaları engelleyici, aksaklık yaratıcı bir şey bulunmamaktadır.				
46. Kaldırım taşları, iyi inşa edilmiş ve yayaların hareketini ve yürümelerini engellemiyor.				
47. Kaldırım düzeyindeki farklılaşmalar (özellikle rampalar) yayalar için güvenlidir.				
48. Kaldırım taşları kırık değildir ya da deforme olmamıştır.				
49. Yayalar için kaldırımlarda beklenmedik engel yok.				
50. Bu caddelerdeki sokak mobilyaları (çöp kutusu, banklar, yol babaları, elektrik direkleri, gazete kioskları, vs) yayaların yürümesini engelliyor.				
51. Bu caddelerdeki tabelalar estetik açıdan rahatsız edicidir.				
52. Bu caddelerdeki trafik tabelaları yeterlidir.				
53. Geceleri iyi ışıklandırılmış caddelerdir.				
54. Geceleri güvenli caddelerdir.				
55. Cumhuriyet Meydanı, geceleri iyi ışıklandırılmıştır.				
56. Cumhuriyet Meydanı, geceleri güvenlidir.				
57. Ulu Bazaar, geceleri iyi ışıklandırılmıştır.				
58. Ulu Bazaar, geceleri güvenlidir.				
59. Bu caddelerdeki ağaçlar, yayaların hareketini engelliyor.				
60. Bu caddelerdeki çiçek saksıları yayaların hareketini engelliyor.				
61. Cadde üzerindeki sokak mobilyaları yeterlidir.				
62. Sizce Atatürk ve Uray Caddelerinde odak noktaları – ilgi çekici yerler nerelerdir?				
63. Konu ile ilgili eklemek istediğiniz başka bir şey var mı?				

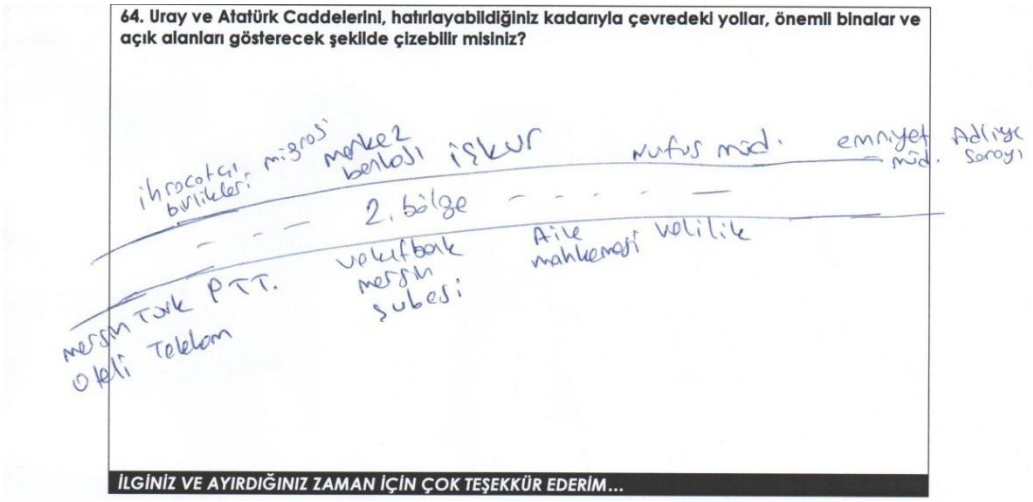
64. Uray ve Atatürk Caddelerini, hatırlayabildiğiniz kadarıyla çevredeki yollar, önemli binalar ve açık alanları gösterecek şekilde çizebilir misiniz?

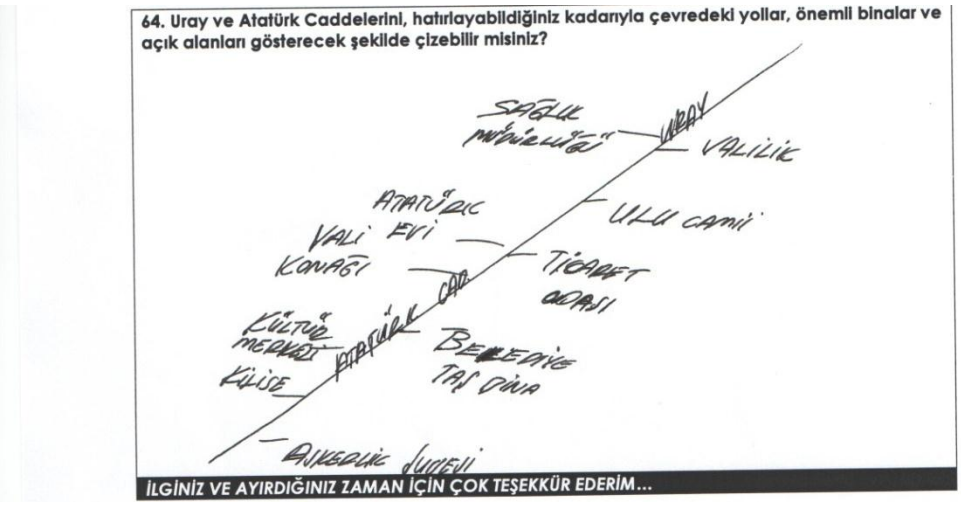
İLGİNİZ VE AYIRDIĞINIZ ZAMAN İÇİN ÇOK TEŞEKKÜR EDERİM…



APPENDIX -B

COGNITIVE MAPS

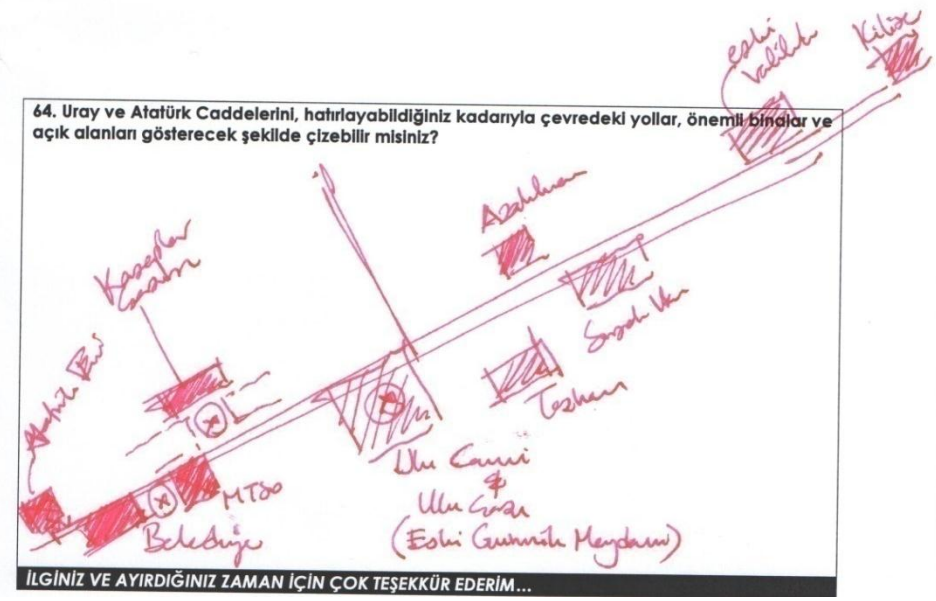




64. Uray ve Atatürk Caddelerini, hatırlayabildiğiniz kadarıyla çevredeki yollar, önemli binalar ve açık alanları gösterecek şekilde çizebilir misiniz?

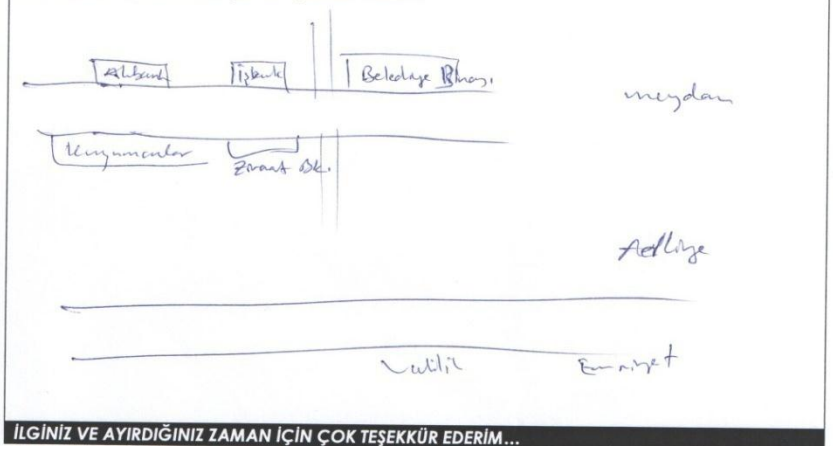
İLGİNİZ VE AYIRDIĞINIZ ZAMAN İÇİN ÇOK TEŞEKKÜR EDERİM...

64. Uray ve Atatürk Caddelerini, hatırlayabildiğiniz kadarıyla çevredeki yollar, önemli binalar ve açık alanları gösterecek şekilde çizebilir misiniz?



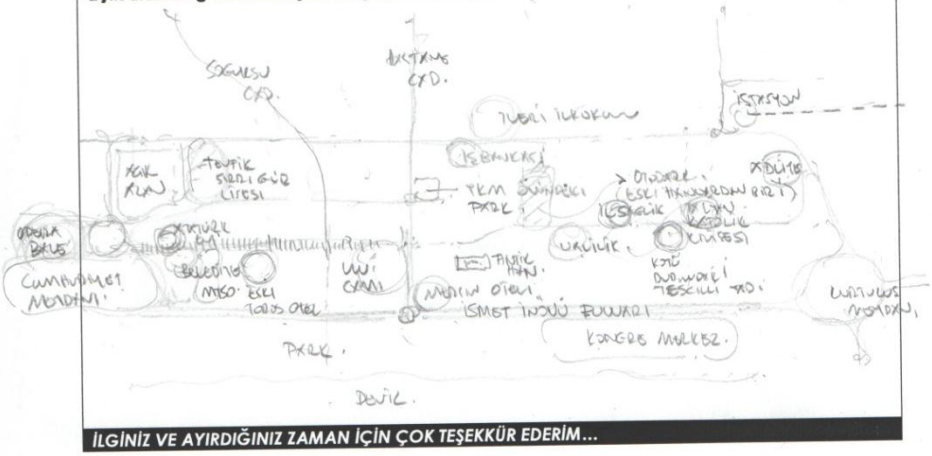
İLGİNİZ VE AYIRDIĞINIZ ZAMAN İÇİN ÇOK TEŞEKKÜR EDERİM...

64. Uray ve Atatürk Caddelerini, hatırlayabildiğiniz kadarıyla çevredeki yollar, önemli binalar ve açık alanları gösterecek şekilde çizebilir misiniz?

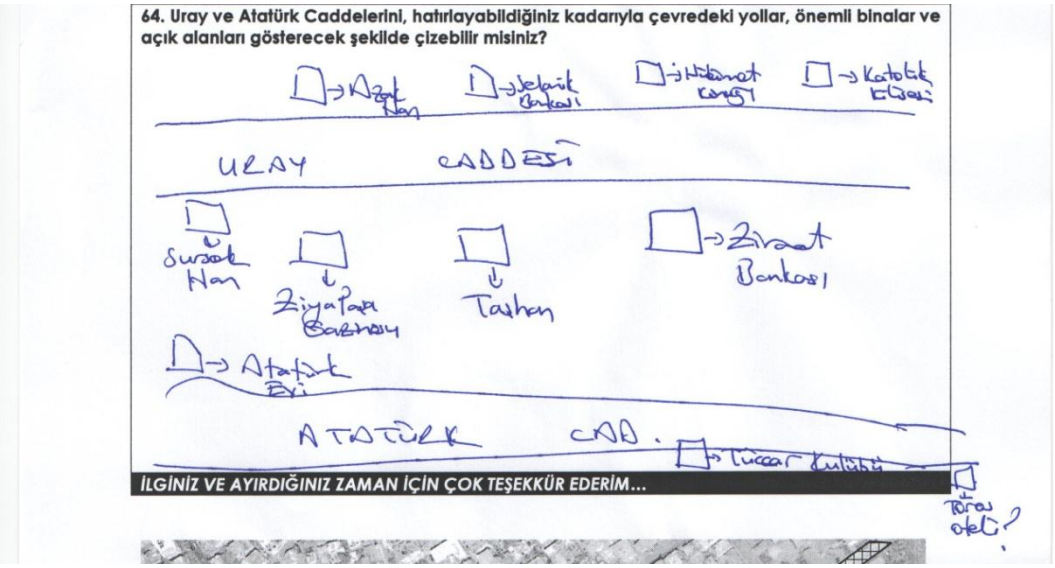


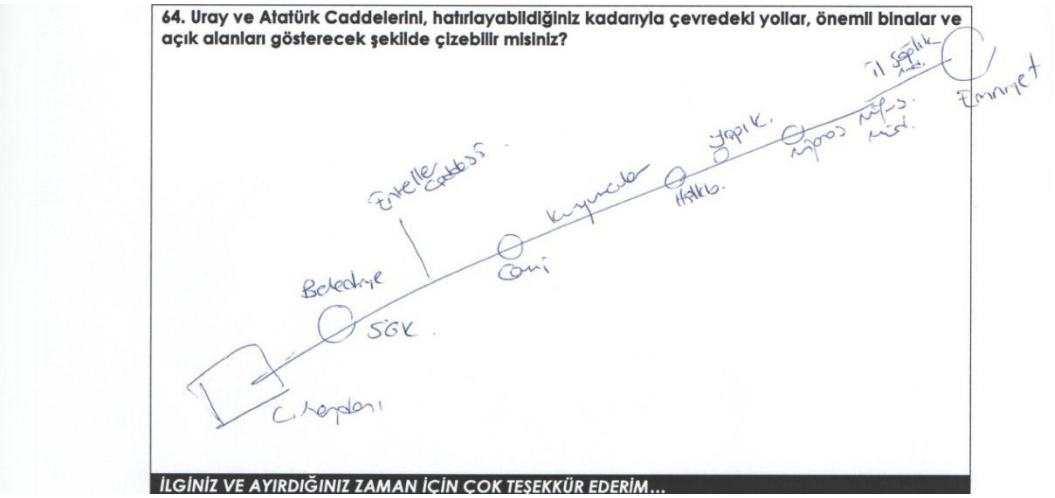
İLGİNİZ VE AYIRDIĞINIZ ZAMAN İÇİN ÇOK TEŞEKKÜR EDERİM...

64. Uray ve Atatürk Caddelerini, hatırlayabildiğiniz kadarıyla çevredeki yollar, önemli binalar ve açık alanları gösterecek şekilde çizebilir misiniz?

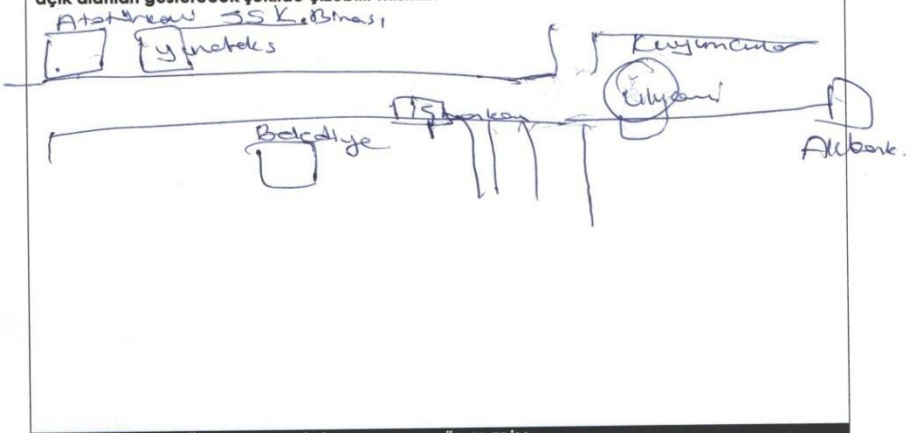


İLGİNİZ VE AYIRDIĞINIZ ZAMAN İÇİN ÇOK TEŞEKKÜR EDERİM...


64. Uray ve Atatürk Caddelerini, hatırlayabildiğiniz kadarıyla çevredeki yollar, önemli binalar ve açık alanları gösterecek şekilde çizebilir misiniz?
URAY
Ziraat Bankası
Tarhan
ATATÜRK
İLGİNİZ VE AYIRDIĞINIZ ZAMAN İÇİN ÇOK TEŞEKKÜR EDERİM...


64. Uray ve Atatürk Caddelerini, hatırlayabildiğiniz kadarıyla çevredeki yollar, önemli binalar ve açık alanları gösterecek şekilde çizebilir misiniz?
Belediye
SGK
Cami
İLGİNİZ VE AYIRDIĞINIZ ZAMAN İÇİN ÇOK TEŞEKKÜR EDERİM...

64. Uray ve Atatürk Caddelerini, hatırlayabildiğiniz kadarıyla çevredeki yollar, önemli binalar ve açık alanları gösterecek şekilde çizebilir misiniz?



İLGİNİZ VE AYIRDIĞINIZ ZAMAN İÇİN ÇOK TEŞEKKÜR EDERİM...