NON-MOTORIZED TRANSPORT FOR MOBILITY PLANNING IN CITY CENTRES: AN ASSESMENT OF OPPORTUNITIES FOR TRANSFORMING ANKARA, TUNALI HİLMİ STREET INTO A PEDESTRIAN-FRIENDLY AREA

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Approval of the Graduate School of Social Sciences

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ABSTRACT

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Car dependency which corresponds to excessive and inappropriate usage of the car itself is becoming a major problem all around the world. It shapes urban areas in such a way that the overall urban form as well as individual activities all develop to accommodate cars. However, "introducing non-motorized modes" is seen as a remedy to overcome the car dependency. It offers a chance for retrieving healthy urban environments and healthy social lives and also for revitalizing/enhancing public spaces in cities. This means increasing the quality and quantity of pedestrian areas which have been receiving increasing emphasis all around the world. In this thesis, it is intended to show that pedestrianization can be, and should be, a valid transport policy in growing metropolitan areas that are becoming more and more car-oriented, such as Ankara. As a case study, this study assesses potentials and possibilities for creating a pedestrian environment in Ankara, Tunalı Hilmi Street. To do so, detailed pedestrian surveys/analyses including

pedestrian counts, pedestrian movement analysis, pedestrian static analysis and pedestrian space analysis throughout the street and questionnaires with potential stakeholders including pedestrians, shop-owners and taxi-drivers are carried out. Through these analyses, it is assessed whether Tunalı Hilmi Street is suitable for such an arrangement in terms of pedestrianization or not. As a result, this thesis makes an emphasis on non-motorization and pedestrianization as a method of preventing increasing car-oriented arrangements and revitalizing city centre for the case of Tunalı Hilmi Street.

Keywords: Car dependency, non-motorization, street, pedestrianization, pedestrian survey/analysis.

ÖZ

KENT MERKEZLERİNDE MOTORSUZ ULAŞIM PLANLAMASI:
ANKARA, TUNALI HİLMİ CADDESİ'NİN
YAYA DOSTU BİR ALANA DÖNÜŞTÜRÜLME FIRSATLARININ
ARAŞTIRILMASI

OKULU, Senem Gökçe

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Arabanın aşırı ve uygunsuz kullanımı anlamına gelen araba bağımlılığı tüm dünyada büyük bir sorun olagelmektedir. Araba bağımlılığı, kentsel alanları, sadece bireysel aktivitelerin değil aynı zamanda tüm kentsel dokunun da arabalara göre düzenlenmesi biçiminde şekillendirir. Ancak, motorsuz ulaşım biçimleri söz konusu araba bağımlılığına bir çare olarak görülmektedir. Motorsuz ulaşım, kentlerde kaybolmakta olan sağlıklı kentsel alanların ve sağlıklı sosyal yaşam biçimlerinin geri getirilmesi ve kentlerde kamusal alanların yeniden canlandırılması/iyileştirilmesi için önemli bir fırsattır. Bu, tüm dünyada gittikçe önem kazanmakta olan kentlerdeki yaya alanlarının nitelik ve niceliksel olarak geliştirilmesi anlamına gelmektedir. Bu tezde, Ankara kentinde olduğu gibi, gittikçe büyüyen ve daha çok araba öncelikli hale gelen metropoliten alanlarda, yayalaştırmanın geçerli bir ulaşım politikası olabileceğini, olması gerektiğini göstermek amaçlanmaktadır. Alan çalışması olarak, bu tez Ankara, Tunalı Hilmi Caddesi'nde bir yaya alanı oluşturulmasının olanak ve potansiyellerini araştırmaktadır. Bunun için sokak boyunca yaya sayımlarını, yaya hareket analizlerini, yaya statik analizlerini ve yaya alan analizlerini içeren

detaylı yaya incelemeleri ve sokaktaki yayalar, dükkân sahipleri ile taksi sürücülerinden oluşan potansiyel hak sahipleriyle anketler yapılmıştır. Bu analizlerle, Tunalı Hilmi Caddesi'nin yayalaştırma için uygun olup olmadığı araştırılmaktadır. Sonuç olarak, bu tez artan otomobil öncelikli düzenlemeleri önleyen ve Tunalı Hilmi Caddesi örneğinde kent merkezlerini yeniden canlandıran bir yöntem olarak motorsuz ulaşıma ve yayalaştırmaya vurgu yapmaktadır.

Anahtar kelimeler: Araba bağımlılığı, motorsuzlaştırma, sokak, yayalaştırma, yaya analizi.

To anonymous pedestrian…

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CHAPTER 1

INTRODUCTION

The main focus of this thesis is to highlight the increasing emphasis on non-motorized travel modes around the world. Within this scope, first, the roots of this increasing emphasis are searched. Therefore, this opens the way of discussing how the car has become the inherent part of people's vital activities, how people have become dependent on it, and how the excessive and inappropriate usage of it affects the cities and urban life. "Introducing non-motorized modes" is seen as a remedy to overcome the car-dependency and to reclaim the healthy environments and healthy social lives and revitalize/enhance public spaces in cities.

Car dependency is becoming a major problem all around the world. The automobile machine is gradually becoming the inherent part of people's vital activities. However, the excessive and inappropriate usage of the automobile brings all its side effects besides its benefits. It threatens not only the relation between human and nature, but also the relation among human beings. The more car usage, the more car-oriented investments; in return, the more car-oriented investments, the more car usage. This shapes urban areas in such a way that the overall urban form as well as individual activities all develop to accommodate cars. This in turn encourages more car usage, resulting in high levels of petrol dependency, traffic congestion, air pollution, climate change and loss of urban streets to moving or parked cars. Moreover, due to intense traffic, congestion and increased distances between activities, it is becoming

increasingly difficult to use public transport, to bike and to walk in the city. Reducing car dependency, therefore, is necessary not only for reducing oil dependency, traffic congestion and air pollution, but also for improving the quality of life in urban areas, for claiming back streets and other public places, and for celebrating the power of human being's social existing. Communities need a replacement for cars to take back the social area that they once owned. This means increasing the quality and quantity of pedestrian areas which have been receiving increasing emphasis all around the world. Pedestrianization and cycling opportunities well integrated with a qualified public transport is one of the most important criterions of liveability in cities. In this thesis, it is intended to show that pedestrianization can be, and should be, a valid transport policy in growing metropolitan areas that are becoming more and more car-oriented, such as Ankara.

The aim of this study is to bring to the core of transport policy arguments the importance of non-motorized transport options and particularly pedestrian areas/streets in city centres through the review of other studies and cases in the world. In this context, it is also significant to assess potentials and possibilities for creating a pedestrian environment in Ankara. To do so, it is necessary to highlight the importance of transport studies/surveys that focus on pedestrian traffic and movement in central areas in cities. Within the context of this thesis, it is intended to search for the possibility of creating a pedestrian environment in Ankara, Tunalı Hilmi Street by doing detailed pedestrian surveys/analyses throughout the street and questionnaires with potential stakeholders including pedestrians, shop-owners and taxi-drivers. Through these analyses, it is assessed whether Tunalı Hilmi Street is suitable for such an arrangement in terms of pedestrianization or not. For the case of Tunalı Hilmi Street, it is assumed that there is growing awareness for the

need to increase non-motorized modes and pedestrianization in particular in this neighbourhood, Kavaklıdere, which has recently been subject to a number of excessive road investments, helping create a public mood against such road programmes. It is assumed that the street has the ability to get different genders and ages of people together in the basis of community interaction. It is assumed that there is growing awareness by users regarding the traffic problems in the area and the need for better pedestrian environments. It is also assumed that because of the already high density of pedestrians in shopping street, the shop-owners will also support an arrangement that is more pedestrian-friendly. To search for the validity of these assumptions and to analyze potentials for pedestrianization of Tunalı Hilmi Street, a detailed framework for analysis is developed. The main aim is to discover the pedestrianization opportunities within the case study area.
Urban planning and also transport planning mostly tend to undervalue pedestrian traffic. In transport planning, vehicle traffic counts are carried out, but surveys aimed at pedestrian traffic counts and pedestrian movement analysis are very limited. This thesis also aims to fill this gap by making use of various pedestrian analysis methods in the case study area, Tunalı Hilmi Street, Ankara.

The Second and Third Chapters of this thesis include literature review. In the second chapter, evolution of transport policy is presented. While aiming to trace the origins of existing transport problems in cities, this thesis goes back to the advent of car, how it has become the main mode of transport and how people have become dependent on it. In this chapter, it is stated that car dependency is at the root of existing transport problems. Car dependency corresponds to excessive and inappropriate usage of the car itself. This changes its benefits into costs in terms of social, environmental, and

economic harms. Loss of urban life, loss of public safety; oil vulnerability, urban sprawl, toxic emissions, traffic problems such as noise and severance; and accidents and their costs, high infrastructure costs, congestion costs are only some of them. In order to prevent these costs, promoting non-motorized modes, such as walking and cycling (well integrated with the public transport), have received increasing emphasis all around the world. In this chapter, various recent movements and approaches known as New Urbanism, Smart Growth, Carfree Cities, World Squares for All and Reclaiming Streets, questioning the viability of existing transport patterns, are reviewed.

In the Third Chapter, pedestrianization planning principles are explored. As Torlak (1983, 70) states, "the main aim of pedestrianization is to increase the opportunities for every citizen to enjoy the richness of urban life". Pedestrianization has the ability to overcome car dependency particularly in streets in city centres due to the fact that these places are mostly pedestrian-oriented with their dense and mixed use opportunities. In this chapter, city centre pedestrianization principles including minimal requirements for streets to make people feel comfortable are stated. In this chapter, traffic management and traffic calming are explored as pedestrianization methods. After that, good-practice pedestrianization case studies from different locations of the world are analyzed. Copenhagen's (DENMARK) 10 step pedestrianization program, Honk Kong's (CHINA) pedestrianization program, employing three different categories of streets, London's (ENGLAND) walking plan, and Rome's (ITALY) forthcoming pedestrianization project are presented together with supporting visual material, such as maps and photographs. Pedestrianization experiences in Ankara including historical process, current condition and deficiencies in

implementation is also given within this chapter.

Methodology is given in Chapter Four. The reasons of selection of Tunalı Hilmi Street as a case study, hypothesis on case study area, and methods of data collection are stated in this chapter. Tunalı Hilmi Street is considered as it holds the character and potential of being pedestrian-friendly. It carries a city centre character but does not have a task as primary as Kızılay and Ulus have within the motorized transport system in Ankara. It has the ability to bring different ages and genders of people within its contexture. There is growing awareness against recent car-oriented arrangements such as grade-separated junctions by public. The main hypothesis to be tested for this case study area are whether the area is suitable for pedestrianization with its capacity as a place of social interplay; whether there is growing awareness by users for pro-pedestrian solutions in this area; and whether a pedestrianization project would receive support from users as well as shop-owners along the street. Data collection consists of detailed pedestrian survey including pedestrian counts, pedestrian movement analysis, static analysis and pedestrian space analysis; and questionnaires with pedestrians who are users of the street and those with first-storey shop-owners of shops along the street and with taxi-drivers of taxi ranks along the street.

In the fifth chapter, all collected data are assessed and final maps are constituted. Quantitative results are assessed together with the qualitative vision.

Finally, with reference to contextual and spatial analysis made, the final and overall assessment of literature and collected data are carried out to make a contribution to decision-making processes in terms of transportation system

in Ankara. Accordingly, this thesis makes an emphasis on non-motorization and pedestrianization as a method of preventing increasing car-oriented arrangements and revitalizing city centre for the case of Tunalı Hilmi Street. As a result, it is desired that this thesis lays groundwork for further regulations for the benefit of pedestrians in Ankara.

CHAPTER 2

CONTEMPORARY TRANSPORT POLICY:

THE INCREASING EMPHASIS ON NON-MOTORIZED TRANSPORT

2.1. Interaction between Transportation and Urban Development: From Pedestrian-Oriented to Car-Based Cities

Looking at the relation between urban spaces and transportation, it is seen that this relation is reciprocal. At first, city, structure of it, urban activities and locations of and distances between them, create the need for transportation. To meet this need, transportation infrastructure and technology evolves. But, on the other hand, the transportation system, technology and infrastructure determine the form and structure of city, urban activities and locations of and distances between them. Although this reciprocity exists, the first part of this cause-and-effect relation, that is the urban form determining the transport needs, usually not taken into consideration. As a result, approaches such as "transport makes the city" dominate the planning practice. In the basis of this expression, there is the understanding that the city is being shaped with the advent of each mode of transportation (Babalık-Sutcliffe, 2005, 58). But, in this process, it is also seen that the ever-expanding transport infrastructure and resulting increase in distances create extra pressure on cities. While coming from the pedestrian-oriented cities to car-oriented ones, on the one hand, cities developed, but, on the other hand, they became extremely dependent on the car, at the expense of almost all other modes. It is discussed that, considering the current car-

oriented developments in most cities, transport not only makes the city, but also breaks the city. A short glance at the historical process can help understand these effects of transport investments on cities.

In the early ages "man's locomotive capabilities shaped the first primitive encampments and rudimentary cities. Walking distances determined their location, shape and size" (Fruin, 1971, 2). Pedestrian movement was the main stream in the city during these ages. In Classical Athens, the determining factor in locating buildings and other urban elements was the pedestrian viewpoint. In Roman cities main wide roads were for the carriages and secondary roads were reserved for pedestrians. Come to the medieval city, pedestrian access in narrow and twisted streets gained significance. Carriages for transportation of goods took the secondary place, no wide streets were necessary. The streets pursued the natural contour. Plazas and squares were designed as places only for pedestrians to interrelate and were banned for carriages. In the Renaissance, priority in access was still for pedestrians. The pedestrian centre was important as an attraction point. Plazas were the most important part of the city. But, later, streets were widened in drivers' favour. This resulted in the separation of street users. Mumford (quoted in the Torlak, 1983, 21) describes this as "the rich drive, the poor walk". In the Baroque, wide pedestrian walkways lined with (shaped) trees were built. Horse-drawn vehicles determined the distances for the city to grow. In time, they also started to cause traffic congestion and various accidents. For this reason, vehicle speed limitations were tried to be implemented for pedestrian safety. Come to the 19th century, horse-drawn vehicles were everywhere (Torlak, 1983, 1-27).

In the late 19th century, rail transportation systems were introduced as the main public transport mode with the significantly higher speed provided by the rail technology. Cities went beyond the walking distances. Suburbanization started as an important urban development pattern. This development increased speed of travel, and hence distances that urban areas could develop over. However, settlement patterns were still high-density and rail system and stations were well integrated with pedestrian areas and routes. This balance changed with the introduction of automobile in the early 1900s and its widespread use after World War II.

In the 1900s, automobile was seen as a solution. As Newman and Kenworthy (1999, 31) determines "beginning before the Second World War, but really accelerating after it, the automobile progressively became transportation technology that shaped the city". In 1945, "European cities were faced with a new migration wave after the War. Centres of these cities, which were tried to be rebuilt among the ruins of War were designed for automobiles" because automobile was seen as the most required invention of the past century (Torlak, 1983, 3). Compared with the rail system, "automobile was clean, quiet, took less place than carriages and wagons, and carried at least twice as much load; so, it would be a certain solution for the chaos in the city" (Torlak, 1983, 31). It made it attainable to reach any direction which was impossible before. This means, "For the first time in history, houses and businesses could be located almost anywhere, because personalized transportation could be used to join them together" (Newman and Kenworthy, 1999, 64). In this way, urban spaces were spread out. Automobiles and urban spaces became the part and parcel of each other. Cities excessively became the places of automobiles. Distances increased. The car and the city, each of them were seen as impeccable. But, "the car and the

city, as wonderful as each is, the two do not always mix well" (Durning, 1996, 4). Directly, owing to the advent of automobile "the city began to decentralize and disperse. As a result, "the transportation-land use connection was broken, and automobile dependency became established. In this way, the *Auto City* was born". (Newman and Kenworthy, 1999, 31)

2.2. Problems of Automobile Dependency

2.2.1. Automobile Dependency

Automobile dependency is defined by Newman and Kenworthy (1999, 60) as "a situation in which a city develops on the assumption that automobile use will predominate so that it is given priority in infrastructure and in the form of urban development". This assumption includes the supply of authorities that purvey the infrastructure and make the urban form. Per contra, the other side of the coin is that the automobile dependency is a situation in which people's lives are organized in such a way that the car is an inherent part of their activity. These two sides shape urban areas in such a way that the overall urban form as well as individual activities all develop to accommodate cars.

This in turn encourages more car usage, resulting in high levels of petrol dependency, traffic congestion, air pollution, urban noise, dissocial lifestyles and loss of urban streets to moving cars or parked cars. Moreover, due to intense traffic congestion and increased distances between activities, the difficulty of using public transport or to cycle and to walk is increasing in the city, even in city centres which reflect the historical and cultural characteristics of a city. This situation can be clearly seen in Figure 1 below:

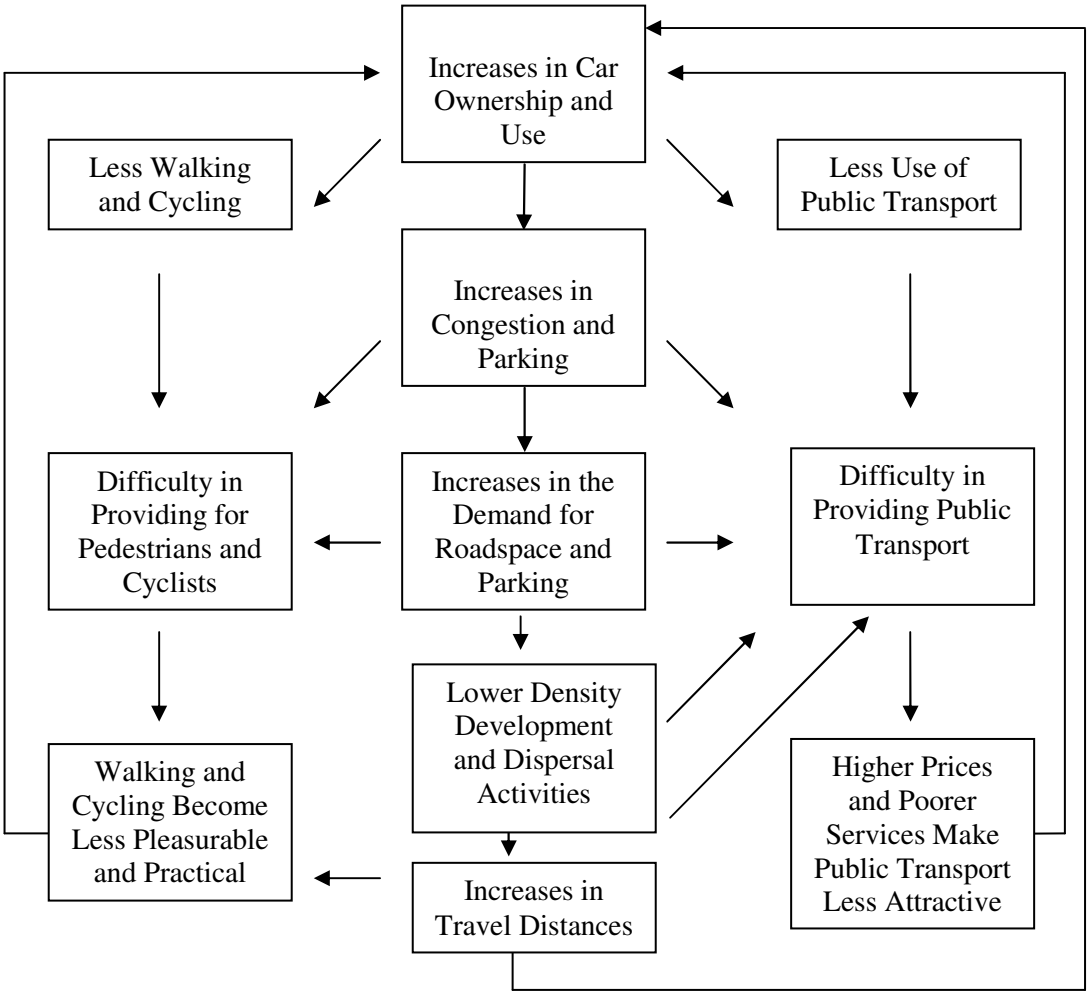

Figure 1: The interaction of forces behind car-dependency (Adopted from Stead and Banister, 2001, 319)

Until the 19th century, cities were the extensions of human being as living organisms. They were the places of meeting and communicating with each other. Streets were the extensions of houses. People were still feeling as if they were at their houses. The relation between inside and outside of the houses was not broken. However, due to the increase number of motor vehicles, streets were turned into just outsides (Engwicht, 1993).

As a result, it can be said that, today, the roads in the city centre have become places for merely motor vehicles. They lost their character to be places for meetings of human beings (Torlak, 1983).

2.2.2. Problems of Creating an Urban Transport System Based on Private Car Movement

As Wickham and Lohan (1999, 1) state "cars are part of a wider system, which ranges from the roads to the many social institutions which car transport involves. It is the car system, rather than the car itself, which really matters". The car system rapidly becomes integral parts of city dwellers' lives. This is not only because of dwellers' preference, but also that of public service providers. In other words, "the extent of car dependency is not just the result of the car usage itself. It also depends on the public transport system and the form of land use" (Wickham and Lohan, 1999, 1). Land-use planning, urban policies, the dominance of traditional traffic engineering approach, acceptance of existing structure without questioning are shaping car dependency in cities.

Because of the way the cities are built, most people have no preference but to drive to their work, shops, or leisure and cultural activities. Car-oriented land use planning, urban and transport policies that aim at improving conditions for automobile drivers reinforce car dependency. But, this is unacceptable over the long term. It is not sustainable to create an urban transport system based on private car usage. This needs to be questioned.

> [Formerly] t*he automobile appeared to offer freedom in space and time. However, unfortunately for the engineers and those who felt transportation utopia had arrived, it was never possible to truly achieve this freedom. Road and parking requirements became bottomless pit that seemed to absorb any traffic solution and replace it with a new set of congestion constraints.* [Later] on*, the unfettered Auto City 'dream' soon became a 'nightmare' of traffic.* (Newman and Kenworthy, 1999, 59)

Automobile entered into urban life with all its disadvantages besides advantages. The excessive car usage process affected the cities unfavourably at social, environmental and economic levels as set out in Table 1:

Table 1: The impacts of automobile dependence (Newman and Kenworthy, 2001)

Environmental	**Economic**	**Social**
Oil vulnerability	External costs from accidents and pollution	Loss of street life
Photochemical smog	Congestion costs, despite endless road building	Loss of community
Toxic emissions such as lead and benzene	High infrastructure costs in new sprawling suburbs	Loss of public safety
High greenhouse gas contributions	Loss of productive rural land	Isolation in remote suburbs
Urban sprawl	Loss of urban land to bitumen	Access problems for car-less and those with disabilities
Greater storm-water problems from extra hard surfaces		
Traffic problems such as noise and severance		

This classification helps us to become aware of the main results of automobile dependency. One of these is oil depletion. Campbell (1991) shows that "between 1950 and 2050 we will have consumed 80 percent of the world's oil and we move to the end of golden century of oil" (Peter and Kenworthy, 1999, 49, 142). This means that there is a need to learn how to sustain lives without relying on oil in the near future. However, many cities continue to sprawl for miles through building suburbs. It can be said that, the more urban sprawl the more oil depletion, and vice versa. Urban sprawl also causes isolation and loss of liveability in cities and it blocks the usability of non-motorized transport alternatives such as walking and cycling. Walking and cycling have the ability to substitute for driving and to reduce oil consumption and dependency on it. The other undesirable result of auto-

dependency is loss of urban life. According to Engwicht (1993, 17) "cities were invented to facilitate exchange of information, friendship, material goods, culture, knowledge, insight, skills, and also the exchange of emotional, psychological and spiritual support". All these facilities are interrelated and there is a strong relation among them. But, through excessive and inappropriate automobile usage, this relation is broken. Cities are becoming complex machines rather than being living organisms, and people living in cities are becoming atomized by getting around in metal capsules. As it is stated in the BBC News[1] dated 20 June 2006, it is expected that "by 2050, the majority of the human population will be found in urban areas; the projection is that in 50 years' time, two-thirds of humanity will live in cities". This means, two-thirds of humanity will be segregated by means of automobiles. The tragedy is that, people generally see cities as places to escape from one day to nature which is quiet, serene, clean, green, pleasurable, and so forth. Ironically, many prefer to escape by cars.

One of the most important components of socialization in cities is pedestrian movement. But, as Engwicht (1993, 39) states "we have turned places into destinations or converted them into movement corridors. We have forgotten that transportation can be more than just a means of getting to a place; it can be experience of place itself". Transportation can be experience of place itself first by applying pedestrian movement. As Mumford (quoted in Torlak, 1983, 1) puts it, "every urban transportation plan should put the pedestrian at the centre of all proposals". That is because, "pedestrianization brings new vitality and order to our cities where walking and cycling becomes convenient, more enjoyable, and more efficient" (Torlak, 1983, 1). Walking and cycling help people to interact with each other, to feel the atmosphere, to touch the trees and stones, to communicate by human language not by honk,

[1] http://news.bbc.co.uk/2/hi/5094602.stm 11.06.07

to believe in public safety and so forth. In brief, "walking and cycling allow us to experience the places we pass through in the present" (Engwicht, 1993, 35).

As a result, since the cities started to be developed in favour of automobiles, there has been a struggle between pedestrian and motor vehicle. For now, automobiles seem to win this case, but, there is growing recognition that vehicles, which turn its occupants into pedestrians, even disadvantaged persons, stand at the root of our liveability problems in cities. So, it is not possible to solve sustainability in cities without first addressing automobile and dependency on it (Newman and Kenworthy, 1999, 334).

2.3. Transport Planning Approaches to Promote Alternatives to the Car

The traditional predict-provide policy, which puts automobile at the root and includes creating an urban transport system based on private car movement, corresponds to planning for supply, giving priority for motor vehicles, building new motorways, increasing capacity, enabling uncontrolled growth of private car ownership. But, it is professionally accepted[2] that new road capacity creates new demand for travel. In addition, new roads encourage development for new suburban areas at further and further distances. These long distances create the need for new roads again. As Litman (2007, 15) states, "if roadway capacity increases, people will take additional peak-period trips, including some that represent overall increase in vehicle mileage (as opposed to simply shifts in travel time and route)".

2 Standing Advisory Committee on Trunk Road Assessment, 1994, Chapter 9 (Referenced at Goodwin, P. B. (2001) Traffic Reduction, Handbook of Transport Systems and Traffic Control (ed. K. J. Button, d. A. Hensher), Elsevier Science Ltd., pp. 22.

This additional vehicle travel called "*generated traffic* consists of *diverted travel* (trips shifted in time and route), and *induced travel* (increased total motor vehicle travel)…This stimulates sprawl" (Litman, 2007, 3). As Peter and Kenworthy (1999, 54) exemplifies, "the situation in Los Angeles illustrates this well. Los Angeles has the most extensive freeway system the world has ever seen, yet the city has huge traffic problems". In this way, the demand for road space condition can be simulated as "a never-ending spiral" (Peter and Kenworthy, 1999, 38). This can be seen in Figure 2 below:

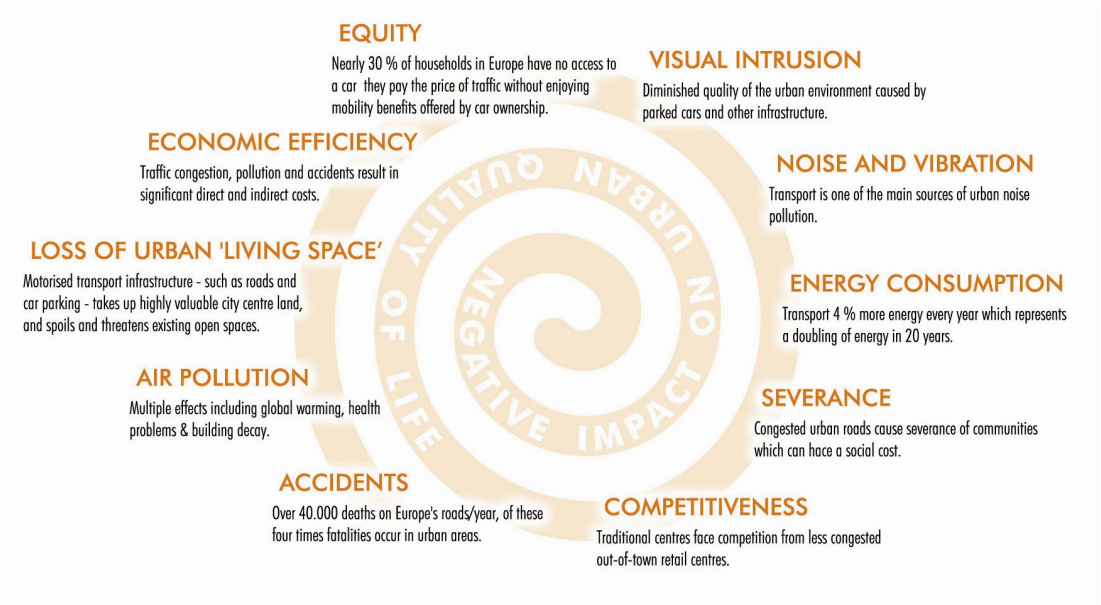

Figure 2: Never-ending spiral (Adopted from European Commission Handbook, 2002)

2.3.1. New Realism: Rethinking the Demand for Transportation

The UK national road traffic forecast in the early 1990s showed that, "road traffic will increase up to 142 percent by the year 2025 and such traffic could not be accommodated on the existing road network or indeed any conceivable future network" (Tolley and Turton, 1995, 339). As Tolley and Turton (1995, 339) sets out, "as a result, there grew a widespread realization amongst planners and the public that there is no possibility of increasing

road supply at a level which approach the forecast increases in traffic". Therefore, the outworn transport viewpoint has changed. "This change in public attitude has been referred to as the *'new realism'*[3], which is the title of the Rees Jeffreys Road Fund 'Transport and Society' project published in 1991" (Tolley and Turton, 1995, 339).

This project states the principle problems as the intolerable imbalance between expected trends in road-based mobility and the capacity of the transport system; detrimental reflexions of these to society and environment and human liveability; growth in reliance on car use, impossibility of providing sufficient road capacity to meet unrestrained demand for movement (Tolley and Turton, 1995, 341). At this point, it is important to note that, city centres are the zones, which are mostly exposed to these problems.

As a result, two main objectives have been introduced from the perspective of this new viewpoint; "to match the demand to supply and; to encourage the use of environmentally beneficial and economically efficient methods of achieving personal access and freight distribution" (Tolley and Turton, 1995, 341).

Until the 90's, building new roads or increasing the capacity of existing roads were seen as solutions to the transport problem. But, as it is stated below, it has been seen that supply cannot meet the demand, on the contrary, it creates additional demand.

As Meyer (1999, 575) emphasizes "beginning in the early 1970's, urban transportation policy in the US at the federal and local levels introduced a

3 First coined by Professor Phil Goodwin in a report in 1991 entitled as **Transport: The New Realism**

relatively new concept into urban transportation planning". The main question was as Meyer (1999, 575) states "how an existing urban transportation system can be better managed so that increasing travel demand could be satisfied without building more capacity?"

Thus, thanks to the perspective of contemporary transport planning, demand is being considered as a limitable concept through the strategy named as *travel demand management (TDM).* Travel demand management is a strategy to encourage more efficient transportation patterns and to create sustainable transport system by constraining increase in demand for car use, and supplying car-free or non-motorized zones, particularly in city centres. Tolley and Turton (1995, 342) determines TDM as "the art of modifying travel behaviour in order to reduce the number of trips or modify their nature". TDM controls the demand for more road space. It simply comprises methods to discourage car usage and encourage green modes of transport, i.e. public transport, cycling and walking, particularly in city centres.

TDM is an important component of contemporary transport planning which replaces *demand* by *supply*. The overall differences between contemporary and conventional predict-provide transport planning are stated as below:

Table 2: Differences between contemporary and conventional planning approaches on transport (Adopted from Litman, 2007)

Conventional Transport Planning		Contemporary Transport Planning
Supply		Demand
Mobility		Accessibility
Priority for automobiles		Priority for pedestrians
Increasing capacity	⇨	Efficient use of existing capacity
Short-term solutions		Long-term solutions
Congestion reduction		Traffic reduction
Private car use		Public transport
Motorization		Non-motorization

TDM uses some policy measures generally to upgrade or totally change the existing patterns in cities. As it is stated in Garling (2001, 60), "TDM measures may be feasible ways of implementing car-use reduction policies in metropolitan areas". These measures are:

- Taxation of cars and fuels
- Closure of city centres for car traffic
- Road pricing
- Parking control
- Decreasing speed limits
- Avoiding major new road infrastructure
- Teleworking, land use planning encouraging shorter travel distances
- Traffic management reallocating space between modes and vehicles (e.g. bus and high occupancy vehicle lanes)
- Park and ride schemes
- Improved public transport (e.g. frequency, comfort, retrievability of information about public transport, no price increases)
- Improved infrastructure for walking and biking
- Public information campaigns about the negative effects of driving

- Social modelling where prominent public figures use alternative travel modes (Garling, 2007, 144).

2.3.2. New Regulations Based on the TDM Measures

As described earlier, cities are becoming more and more car-oriented. Living in these cities can sometimes become difficult and intolerable. Car use in city centres, where traffic levels are highest, exceeds the carrying capacity of cities. Existing urban transport system is not adequate to overcome automobile dependence. With the rise of automobile and road supply inefficient travel modes become dominant and traffic problem appears with all of its additional effects at environmental, social and economic levels. This problem requires an alternative and efficient transport planning with better management policies. These policies also come to an agreement with the measures of TDM. They are categorized as follows:

- The promotion of urban forms that minimize the need to travel
- The restrictions of car usage generally in cities, particularly in city centres
- The promotion of new environmentally-friendly, efficient transport systems and new technologies such as electric car, solar car etc.
- The promotion of ICT (Information & Communication Technologies) to reduce travel into city centres
- The promotion of public transport
- The integration of different travel modes
- The promotion of nonmotorized alternatives such as walking and cycling.

'Alternatives to motorization' is the main focus in the scope of this thesis because it is well-known that from now on "we need a replacement for cars. The transition away from cars can be accomplished by greatly increasing the supply of non-motorized travel modes"[4].

To meet the increasing demand, it is necessary to encourage non-motorized travel modes. Non-motorized modes welcome all needs of today's cities especially in terms of creating sustainable environments and liveable urban spaces. In brief, walking and cycling are old but new solutions to car dependency by being replacements for cars.

2.4. Increasing Emphasis in Transport Planning on Non-Motorized Travel Modes

As it is stated above, one of the ways to change the dynamics of transportation system was considered to be increases in the road and vehicle capacity. But, it is obviously seen that the level of automobile use has arrived at maximum risk point in terms of environmental responsibility, economic efficiency and human liveability. At that risk point, there are oil vulnerability (oil shocks), greenhouse gases, smog, sprawl impact, traffic impacts as environmental impacts; infrastructure costs, transportation costs, time costs, land waste, housing waste, inequities in being car-less as economic impacts; and, loss of community, loss of urban vitality, loss of urban safety as social impacts (Peter and Kenworthy, 1999, 46). The total picture shows that, from now on, it is inevitable to change the dynamics of existing transportation approach in other ways.

[4] http://www.newurbanism.org/newurbanism.html 08.04.07

As Kenworthy states (1999, 65) "these costs of automobile dependence are today forcing a widespread rethinking of the way cities are built. It demands to consider how to reconnect land use with transportation to reduce costly and destructive levels of automobile travel". In this context, improving non-motorized travel modes seems as a remedy. Non-motorized transport modes (also named as *active transport, human powered transport or green modes* including walking, cycling and manual wheelchairs) have the ability to reduce all these environmental, social and economic damages which take its root from car dependency.

Non-motorized modes, walking and cycling, in particular, deserve a stronger emphasis and priority in urban transport planning. That is because the only energy that these non-motorized modes require is provided directly by the traveller. They do not need oil. They do not make noise. They do not damage the nature. As Pucher and Dijkstra (2000, 3) state, "Neither walking nor cycling requires much space". Pedestrians enhance the liveliness of urban environments, making these places safer and more interesting. "Moreover, they are economical, costing much less than the auto and public transport, both in direct user costs and public infrastructure costs" (Pucher and Dijkstra, 2000, 3). According to Litman (2002, 5) the summary of non-motorized travel benefits are as following:

Table 3: The summary of non-motorized travel benefits (Litman, 2002, 5)

Personal benefits	Community benefits of substituting walking and cycling for short car trips
• Mobility, particularly important for non-drivers (including children and the elderly) • Financial savings • Exercise, leading to increased health and well being (reduced heart disease, stroke, hypertension, obesity, diabetes, colon cancer, osteoporosis, stress, and depression) • Increased social interaction, opportunities to meet neighbours. • Enjoyment	• Reduced traffic congestion • Road and parking facility savings • Reduced air, water, and noise pollution • Improved public health • More liveable communities • Increased community interaction, which can result in safer streets • Increased appeal and access for tourists • More efficient land use (reduced sprawl), by encouraging infill development • Commercial benefits for shop-owners in pedestrianized areas

2.4.1. Walking

Walking is the fundamental component of all transport modes. Litman (2004, 6) defines walking as "an important form of access, both by itself and in conjunction with other modes of travel". In fact, "Walking is one of the first things that people learn to do and one of the last things that people want to give up[5]". In this way, "being able to drive, although useful, is less essential than the ability to walk" (Litman, 2004, 2). But, it is overpassed by many people as an effective way of travelling. Planners, decision-makers, local

[5] http://www.livingstreets.org.uk/news_and_info/walkability_campaign_news.php?id=511 31.05.07

authorities, even public tend to undervalue walking. Indeed, often, the best way to improve another form of transportation is to improve walkability (Litman, 2004, 2). According to Litman (2004, 5) "decision-makers often seem to assume that walking can take care of itself but, therefore, areas with poor walkability tend to have significantly less walking and more driving than more walkable areas".

"Walking and walkability (the quality of walking conditions, including safety, comfort and convenience) serves variety of benefits" for physical and mental health including physical exercise and relaxation (Litman, 2004, 1). Walking is a social and recreational activity supplying facilities below:

- *Basic mobility*
- *Improved fitness and public health*
- *Efficient land use*
- *Consumer cost savings*
- *External cost savings (road and parking facilities, traffic congestion, crash risk, and environmental damages)*
- *Community liveability*
- *Economic development and support for equity objectives. It is also important for people who are transportation disadvantaged such as people with disabilities, elders, children and people with low income* (Litman, 2004, 1)

"Conventional transport evaluation indicates that automobile travel is far more important than non-motorized transport, providing 15 times as many person-trips and 50 times as many person-miles as non-motorized travel" (Litman, 2003, 4). From this perspective, walking and cycling are seen as minor modes of travel, and so, deserves only modest public support. This line of thought resulted in "wide roads, high traffic speeds and large parking facilities creating barriers to walking" (Litman, 2004, 3). This situation eventuates in automobile dependency. But, here, it is important to note that

"environments that are conducive to walking are conducive to people" (Litman, 2004, 2).

Walking is the main buttress of the community liveability. The most important way to enhance community liveability is to give emphasis to pedestrian streets because only streets can get people together. Litman (2004, 10) describes the relation between walking, community liveability and streets as below:

> *Walking improves community liveability which includes safety and health (traffic safety, personal security, and public health), local environmental quality (cleanliness, noise dust, air quality, and water quality), community cohesion (neighbourliness, respect, and community identity), opportunities for recreation and entertainment, aesthetics, and the existence of unique cultural and environmental resources (e.g., historic structures, mature trees, traditional architectural styles).* In this way, *streets are the major portion of the public realm, that is, places where people interact with their community. More attractive, safe and walkable streets increase community liveability.* (Litman, 2004, 10)

Although it has several benefits, walking is generally underestimated. According to Litman (2004, 5), one of most important indicators of this is that "travel surveys often collect little information on total walking activity. As a result, most walking is invisible to transportation planners". In order to make emphasis on walking as a transportation mode, it is necessary to count walking trips and search for the potentiality of pedestrian demand. That's why in this thesis, pedestrian counts and pedestrian movement analysis will be carried out.

According to Walkable Communities which was organized in the State of Florida to express purposes to help communities become more walkable and pedestrian friendly;

> *Walkability is the cornerstone and key to an urban area's efficient ground transportation. Every trip begins and ends with walking. Walking remains the cheapest form of transport for all people, and the construction of a walkable community provides the most affordable transportation system any community can plan, design, construct and maintain. Walkable communities put urban environments back on a scale for sustainability of resources (both natural and economic) and lead to more social interaction, physical fitness and diminished crime and other social problems. Walkable communities are more liveable communities and lead to whole, happy, healthy lives for the people who live in them.* (www.walkable.org, 27.06.07)

2.4.2. Cycling

As mentioned by Herlihly in the introduction of the book **The Bicycle** by Pryor Dodge, "a century ago – at the dawn of the automobile age – the two-wheeler truly ruled the road" (Herlihly, 1996, 6). About 1890, the bicycle, "a personal road vehicle both faster and cheaper than horse, not constrained by the route and timetable limitations of rail, but limited in carrying capacity" (Forester, 2005, 1) was introduced into peoples' lives. However, after twenty years, about 1910, the automobile, "a personal road vehicle much faster than anything else, unconstrained by the route and schedule limitations of rail, and capable of carrying nearly every load" quickly superseded the bicycle (Forester, 2005, 2). "The greater speed of the automobile, its greater and more flexible carrying capacity, its suitability for multi-purpose, multi-stop trips, its ease and comfort, all caused bicycle riders to switch to motoring all trips" (Forester, 2005, 2). With the advent of automobile, first, the urban form transformed from a radial pattern to a network pattern, and second, travel distances increased (Forester, 2005, 2).

Although it is seen as an improvement for the furtherance of welfare by many at the beginning and even today, automobile usage has

transformed into automobile dependency and it also became the most significant reason of the social, economic and environmental damages described earlier.

As Litman (1994, 134) sets out, cycling, compared with driving a car, has many advantages including "reducing traffic congestion, alleviating air pollution, reducing parking demand, conserving energy, creating mobility for non-drivers, promoting health, and sustaining urban development[6]". "It requires minimal space roadway wear. Cycle paths are relatively inexpensive to build and maintain. Up to 20 bicycles can be stored in the space required for one automobile" (Litman, 2004, 10). It can be simulated as below:

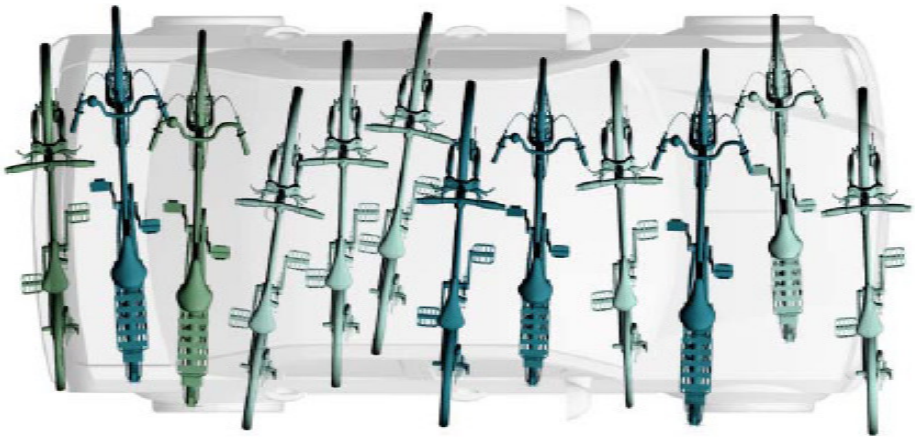

Figure 3: Matching the storage of a car and bicycles (Personal imagination, 2007)

Moreover, "cycling does not produce air pollution and noise and it also imposes minimal risk to other road users" (Litman, 2004, 13).

Illich (1974) in his book **Energy and Equity** emphasizes the important place of bicycle and bicycle speed in peoples lives. According to him, "bicycles let

6 http://pubsindex.trb.org/document/view/default.asp?lbid=414852 25.05.07

people move with greater speed without taking up significant amounts of scarce space, energy, or time".

Illich (1974) describes qualifications of bicycle as below:

> *The bicycle is the perfect transducer to match man's metabolic energy to the impedance of locomotion. Equipped with this tool, man outstrips the efficiency of not only all machines but all other animals as well. Bicycles are not only thermodynamically efficient, they are also cheap. In the bicycle system, engineered roads are necessary only at certain points of dense traffic, and people who live far from the surfaced path are not thereby automatically isolated as they would be if they depended on cars or trains. The bicycle has extended man's radius without shunting him onto roads he cannot walk. Where he cannot ride his bike, he can usually push it. The bicycle also uses little space. Eighteen bikes can be parked in the place of one car, thirty of them can move along in the space devoured by a single automobile. Cyclists can get the benefit of technological breakthroughs without putting undue claims on the schedules, energy, or space of others. They become masters of their own movements without blocking those of their fellows. Their new tool creates only those demands which it can also satisfy. Every increase in motorized speed creates new demands on space and time. The use of the bicycle is self-limiting. It allows people to create a new relationship between their life-space and their life-time, between their territory and the pulse of their being, without destroying their inherited balance.* (Illich, 1974)

As a result, it can be said that, even if automobile seem as the thing that open our way to the future, in fact, it is just an illusion. Freedom including sustainable life for us and next generations is on our feet, not in an "accelerating individual capsule" (Illich, 1974).

The benefits of non-motorized travel are detailed above. Nevertheless, these non-motorized modes are increasingly being neglected: any investments or projects for these non-motorized modes, and particularly for pedestrian areas, are considered unnecessary because of increasing distances in

metropolitan cities; and therefore, investments to make driving easier are opted for at the expense of pedestrians.

On the other hand, people start to become aware of changing patterns all around the world. "There is a growing awareness of the need for non-automobile-dependent planning" (Newman and Kenworthy, 1999, 143). As a result, pedestrian transport comes into question again. Goodwin (2001, 22) explains the factors that cause this change of view as below:

> *Growth in traffic*
>
> *Growth in traffic always seemed to outpace the provision of road capacity. So, this resulted in increased travel time costs and road infrastructure costs; reduced quality of life, reduced interest for public transport and after; reduced quality of service in public transport, and therefore encouraged private car usage.*
>
> *Environmental damage*
>
> *Transport sector became as one of the major causes of environmental damage, both in terms of land take for road building and also in terms of emissions, use of fuel, noise, etc.*
>
> *Unstable shift in public mood*
>
> *In the early stages the opening of a new motorway had been a unifying and popular symbol of progress, but they increasingly became symbols of dissent and division.*
>
> *Traffic accidents*
>
> *Traffic accidents at a world level, became higher and higher in the lists of sources of violent death or disablement, greater in importance than many of the world's diseases*[7]*.* (Goodwin, 2001, 22)

7 Road accident statistics (Continued on next page)

Indeed, this change of view was just a reflexion of deeper thought. People have started to become aware of the change of the meaning of their life. It was shifting from being sensitive, meaningful and intense to being callous, stolid, and absurd. They were becoming just the extensions of machines.

Recently, various movements and approaches emerged, questioning the viability of existing patterns in transportation system. Mostly, they start as local reactions and then, spread over the world. Within this thesis, movements known as The New Urbanism, Smart Growth, Carfree Cities, World Squares for All and Reclaiming Streets are reviewed below.

2.5. Growing Community Awareness for Non-Motorized Transport

According to Ankara İl Gazetesi (dated as May 1, 2007), in the January and February, 2007, 373 people died because of traffic accidents in Turkey. In April, 21 people died in the same way in Ankara.

http://www.who.int/world-health-day/2004/infomaterials/world_report/en/index.html 11.06.07 Road traffic injuries are a major but neglected public health challenge that requires concerted efforts for effective and sustainable prevention. Of all the systems with which people have to deal every day, road traffic systems are the most complex and the most dangerous. Worldwide, an estimated 1.2 million people are killed in road crashes each year and as many as 50 million are injured. Projections indicate that these figures will increase by about 65% over the next 20 years unless there is new commitment to prevention.

http://www.bobulous.org.uk/articles/road_traffic_accident.html 11.06.07 Road traffic accidents end hundreds of thousands of lives across the world every year. The cost to the economy is huge, and the financial effect of personal injury can ruin families. Something that can't be measured is the emotional cost to family members and friends when a person is killed or injure.

2.5.1. New Urbanism

In 1991, a group of people comprises of architects and city planners were invited to help draft principles for community planning in California by the director of Local Government Commission for presenting those principles (named as *Ahwahnee Principles)* to elected officials. Later on, this general framework was structured and used to organize three larger meetings, which were named the Congress for New Urbanism (CNU), held in Alexandria (1993), Los Angeles (1994), and San Francisco (1995) (Moule, 2002, 24). "The CNU has grown to more than 2,000 members. It held its fourteenth congress in 2006 in Providence, Rhode Island, which included applying New Urbanist principles to the city" [8].

As stated in the Charter of New Urbanism[9], it is a movement to restructure public policy and development to support the following principles:

- *Neighbourhoods should be diverse in use and population;*
- *Communities should be designed for the pedestrian and transit as well as the car;*
- *Cities and towns should be shaped by physically defined and universally accessible public spaces and community institutions;*
- *Urban places should be framed by architecture and landscape design that celebrate local history, climate, ecology, and building practice.* (Byrd, 2002, 40)

According to Moule (2002, 24) "these principles are based on a scepticism about the longstanding American belief that technology can be the single tool for solving problems". As Newman and Kenworthy (1999, 143) states, "this movement rediscovers how planning and design can better incorporate less

[8] http://en.wikipedia.org/wiki/New_urbanism 19.04.07

[9] The Congress for the New Urbanism in Byrd W. T. et al. (2002) The Seaside Debates, A Critique of the New Urbanism, Rizzoli International Publications, Inc. New York, pp. 40.

automobile-dependent land use, particularly in the layout of streets as well as in density and mix of activities"

Barnett (2000, 5) sets out the problems of cities as;

- *Disinvestment in central cities*
- *The spread of placeless sprawl*
- *Increasing separation by race and income*
- *Environmental deterioration*
- *Loss of agricultural lands and wilderness*
- *The erosion of society's built heritage as one interrelated community building challenge.* (Barnett, 2000, 5)

According to Barnett (2000, 6) "what is new about the New Urbanism is the assumption that solutions to these problems require that they be worked out together".

Arrington (2000, 59) sets out that "the New Urbanism is not anti-car. It's about civilizing transportation system. It's about rewarding the typical trip by offering choices for getting around." From the New Urbanist point of view, in cities people need fewer big highways and more small roads to reconnect. Walking is the best way to reconnect. "By making our regions more walkable, we will take a huge step towards making them more liveable, drivable, and friendly to bicycles and pedestrians" (Arrington, 2000, 59). "Being able to walk to a mix of shops, restaurants, newsstands, coffeehouses and open-air markets within car-free neighbourhoods and work centres delivers the highest quality of life, and adds great variety and vitality to an area"[10].

[10] http://en.wikipedia.org/wiki/New_urbanism 19.04.07

The **Charter of the New Urbanism** book concludes as follows (Barnett, 2000, 10): "we dedicate ourselves to reclaiming our homes, blocks, streets, parks, neighbourhoods, districts, towns, cities, regions and environment".

2.5.2. Smart Growth

"The growing popularity of new urbanism in the late 1990s captured the interest of politicians. Political leaders particularly in North America looked for strategies to make growth more acceptable" (Grant, 2006, 64). New urbanist principles were adapted to a strategy for desirable patterns of growth: "Smart Growth". Smart Growth "is an urban planning and transportation theory that concentrates growth in the centre of a city to avoid urban sprawl; and advocates compact, transit-oriented, walkable, bicycle-friendly land use, including mixed-use development with a range of housing choices"[11]. This theory suggests that "if growth is properly managed and the correct principles applied, then growth can help to create better communities" (Grant, 2006, 64).

From the Smart Growth point of view, growth is unavoidable but controllable and manageable. Advocates say, "The problem with post-war growth is that it was handled badly". Experiences show that this caused "uncontrolled sprawl, exclusionary policies, long commutes to work, and high housing prices" (Grant, 2006, 64). Sprawl is the most important result of uncontrolled growth[12].

[11] http://en.wikipedia.org/wiki/Smart_growth 27.05.07

12 Lessons from United States

There are several principles that are set by The Smart Growth Network about how to solve sprawl and what makes a community or a development 'smart'.

- *Mix land use*
- *Take advantage of compact neighbourhood design*
- *Create housing opportunities and choices*
- *Create walkable communities*
- *Foster distinctive, attractive communities with a strong sense of place*
- *Preserve open space, farmland, natural beauty, and critical environmental areas*
- *Strengthen and direct development toward existing communities*
- *Provide a variety of transportation choices*
- *Make development decisions predictable, fair, and cost-effective*
- *Encourage community and stakeholders' collaboration in development decisions* (Benfield et al., 2001, 4).

Facts about Sprawl

Sprawl's rapid land consumption cannot be explained away by population growth only

Between 1969 and 1990, the amount of developed land in metro areas more than doubled while the population grew by less than half.

Sprawl creates automobile dependence and longer driving distances

Total vehicle use more than tripled between 1960 and 1995 to more than 2.4 trillion miles per year.

Despite technological improvements, highway vehicles are still responsible for about 60 percent of total carbon monoxide emissions in the United States, 30 percent of chemicals that cause urban smog and 50 percent of carcinogenic and toxic air pollutants. Transportation contributes 32 percent of total U.S. emissions of carbon dioxide, the most prevalent greenhouse gas.

Sprawl irrevocably damages natural resources

Sprawl leads to habitat loss, fragmentation, and even the extinction of species.

Between 1982 and 1992, the United States lost an average of 400,000 acres of "prime" farmland (the land with the best soils and climate for growing crops) to development every year.

Source: Benfield F. K. et al. (2001)

As it is stated at the Smart Growth Network (SGN)[13] "one of the key components of those Smart Growth principles is walking because walkable communities are desirable places to live, work, learn, worship and play". From the perspective of Smart Growth, to create walkable communities, it is necessary to mix land use and build compactly by offering safe pedestrian corridors. But, conversely, within the last fifty years public and private actions often created obstacles to walkable communities through investments and regulations that made walking less convenient.

However, personal and societal benefits of pedestrian-friendly communities such as greater social interaction, improved personal and environmental health, lower transportation costs are calling upon the public and private sector to facilitate the development of walkable places. "By building places with multiple destinations within close proximity, where the streets and sidewalks balance all forms of transportation, communities have the basic framework for encouraging walkability" (SGN).

In brief, the main assertion of Smart Growth is that "development will occur somewhere as long as the population is growing; instead of allowing growth to occur in a haphazard, we can encourage it to take place in or adjacent to existing communities" (Benfield et al., 2001, 11).

2.5.3. Carfree Cities

Carfree Cities is a concept that proposes a utopian solution to the troubles of urban spaces with automobiles: to remove cars and trucks from cities. This

13 In 1996, the U.S. Environmental Protection Agency joined with several non-profit and government organizations to form the Smart Growth Network (SGN). SGN formed in response to increasing community concerns about the need for new ways to grow that boost the economy, protect the environment, and enhance community vitality (for details: http://www.smartgrowth.org/sgn/default.asp)

concept is envisioned by the writer J. H. Crawford in the book **Carfree Cities** in 2000. He has seen Venice as the only city that has escaped from the damages of car about the quality of urban life. For him, Venice is the answer to the question whether carfree cities are possible or not. "Venice, the largest existing example, is loved by almost everyone and is an oasis of peace despite being one of the densest urban areas on earth"[14].

The main idea is that any plan to improve the car or ameliorate its impacts does not represent the sustainable solution. Crawford (2000, 18) explains this as: "I do not doubt that cars will become more efficient, cleaner, and safer, but none of these improvements can ever restore the function of streets as social spaces". This social damage is the basis of his argument: "urban cars are anti-human".

According to Crawford (2000, 18), "the automobile is the most extreme example of a useful technology that has been inappropriately applied". What car brought to cities can be explained from the Carfree City viewpoint as below:

> *The car brought with it major unanticipated consequences for urban life and has become a serious cause of environmental, social, and aesthetic problems in cities. The urban automobile kills street life, damage the social fabric of communities, isolates people, fosters suburban sprawl, endangers other street users, blots the city's beauty, disturbs people with its noise, causes air pollution, slaughters thousands every year, exacerbates global warming, wastes energy and natural resources and impoverishes nations.* (www.carfree.com/intro_cfc.html, 24.04.07)

Carfree city advocators believe that "the four billion inhabitants of the developing world seem eager to adopt Western patterns of car use. They

[14] http://www.carfree.com/intro_cfc.html 24.04.07

should be advised of the costs and encouraged to think about better solutions (Crawford, 2000, 18)". Otherwise, by the end of the 21st century, due to energy constraints, they will have to achieve it without configuring the infrastructure. Advocators assert that "we should begin now to prepare for the change, which is an opportunity to build urban environments superior to any ever known" (Crawford, 2000, 18).

There needs some infrastructure alterations to achieve carfree city. Crawford (2000, 126) states that, urban planners must fulfil the following principles to go forward in terms of liveability:

- *Support vigorous, diverse, sustainable economics*
- *Reduce consumption of energy & resources*
- *Minimize construction & operating costs*
- *Create a high quality of life*
- *Build beautiful urban areas*
- *Establish natural areas near the city*
- *Provide quick, inexpensive passenger transport*
- *Deliver freight promptly & cheaply*
- *Generate pedestrian traffic to assure safe, lively streets*(Crawford, 2000,126)

At this point, it is necessary to remind that in car-based cities, "victims of mostly hasty drivers are defenceless bicyclists and pedestrians who have no choice but to use the streets. In Britain, pedestrians represent a shocking one-third of all road deaths" (Crawford, 2000, 71).

Crawford (2000, 71) criticizes the imbalance between a pedestrian and a car driver: "If anything goes wrong, the pedestrian is likely to be injured or killed. Nothing can rectify this fundamental injustice, and many drivers still act like schoolyard bullies when they encounter a pedestrian".

He asserts that, there are resistances to carfree city because people cannot

imagine how to live without cars and, besides, particularly in America, vast majority of people believes that "you are what you drive" (Crawford, 2000, 226). However, as he states (2000, 227) "recognition of the costs of automobile is growing. Thanks to the New Urbanism, there is a return to early 20th century US patterns of town and city building, in the years just before cars changed everything".

It may not be possible to implement the Carfree City concept completely; however, it helps to show how people started to react to the negativities of car-dependent lives and how solutions started to include measures to abandon cars entirely from our lives.

2.5.4. World Squares for All

The World Squares for All[15] study was begun in 1996 by a number of organisations that now form the World Squares for All Steering Group. The Chair of this membership is Great London Authority. Its aim is to develop a master plan to redefine the heart of London - specifically Trafalgar Square, Parliament Square and the Whitehall conservation area. They apply wide range of analysis including:

- Monitoring pedestrian movement
- Surveying traffic and transport, incorporating factors such as noise and air pollution
- Analyzing urban design and the impact of public art within its environment

The first phase of this regeneration project was transformation of Trafalgar Square. The successful transformation of Trafalgar Square[16] was completed in July 2003. The details of this pedestrian transformation are explained in the Case Studies Chapter, under section 3.3.3.

The second forthcoming project is transformation of Parliament Square[17]. This square has lost the connection with its cultural and historical heritage, although it has been a world-famous public square in terms of historical, political, religious and cultural richness and importance. But, today it is not more than a traffic island. To make this square reconnect with its own character, a project will be implemented. The vision of the project is to enhance and expand public space through improvements in traffic management and pedestrian facilities.

[15] http://www.london.gov.uk/mayor/parliament_square/wsfa.jsp 06.07.07
[16] http://www.london.gov.uk/trafalgarsquare/transform/ 06.07.07
[17] http://www.london.gov.uk/mayor/parliament_square/regeneration.jsp 06.07.07

2.5.5. Reclaim the Streets

Reclaim the Streets[18] *(RTS)* is a collective movement with a shared ideal of community ownership of public spaces. Collective is described by participants as 'a resistance movement opposed in general, to the dominance of corporate forces in globalization, and in particular, to the car as the dominant mode of transport'. As it is stated at the online TDM Encyclopaedia[19] "it is a process for increasing the social, cultural, recreational and economic activity in neighbourhood streets". The aim is to encourage people to use public streets and to involve in their community.

Reclaim the Streets began in London in the 1990s and soon spread throughout the United Kingdom. "The philosophy of RTS is that it is vehicle traffic, not pedestrians, who are causing the obstruction and that by occupying the road they are in fact opening up public space[20]".

The primary benefits of the street reclaiming process are as below:

- *Decreased automobile traffic with fewer automobile accidents and less smog*
- *Reduced summer temperatures due to less asphalt and more green spaces*
- *Increased pedestrian traffic which also increases social and commercial opportunities*
- *Increased gardening space for urban residents*
- *Better support for co-housing and infirm residents, e.g. suburban eco-villages built around former streets*
  (http://en.wikipedia.org/wiki/Street_reclaiming, 26.06.07)

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18 http://en.wikipedia.org/wiki/Reclaim_the_Streets 26.06.07
19 http://www.vtpi.org/tdm/tdm30.htm 26.06.07
20 http://en.wikipedia.org/wiki/Reclaim_the_streets 26.06.07

"Street Reclaiming is based on the assumption that each community resident must take responsibility for their contribution toward traffic problems by reducing car use and speeds in their own and other neighbourhoods" [21]. Street Reclaiming activities include":

- *Revitalizing streets*
- *Incorporating design features that encourage community interaction into sidewalk areas*
- *Physically reclaiming street space by changing materials (e.g., from asphalt to brick)*
- *Psychologically reclaim street space, by engaging in social and recreational activities along and within streets, to encourage residents and visitors to consider it an outdoor living space.*
- *Creating local activity centres, including pocket parks, bus shelters and corner stores.*
- *A commitment by residents to reduce their car use and speeds.*
- *Traffic reduction and exchange of treaties – setting up sister-relationships with other streets in the city with exchange of agreements to put less traffic in each other's neighbourhood.*
- *Promoting specific techniques which residents can use to reduce their car use.*
- *Improving neighbourhood services and alternative travel options.*
- *Traffic calming and traffic speed reduction programs.* (www.vtpi.org/tdm/tdm30.htm, 27.06.07)

2.6. Concluding Remarks: From Car-Based to Pedestrian-Oriented Cities

It was shown throughout this chapter that advanced in transport technology and particularly car technology dominated the way our cities were shaped. Many cities in the world developed in car-oriented patterns, and many communities lead car-dependent lives, with no effective travel alternatives to the car. However, various negative environmental, economic, and social effects of car-dependency are recognized today, and politicians, planners and

[21] http://www.vtpi.org/tdm/tdm30.htm 27.06.07

communities are increasingly becoming aware of the need to improve alternatives to the car. Non-motorized modes of travel, in particular, has received significant emphasis recently, and planning walkable cities and pedestrian areas, and designing pedestrian-friendly streets have become increasingly important in planning policy, supported by various community-based movements. The next chapter focuses on planning for pedestrian area, highlighting planning and implementation principles as well as reviewing good-practice case studies.

CHAPTER 3

STREETS AND PEDESTRIANIZATION

3.1. Pedestrianization: Planning Principles

According to Modernity ideal, the city was a complex machine. As a result of this ideal, the city of tomorrow was seen as a space "with no human scale, without a fundamental understanding of human nature and social behaviour, and with public streets that were no more than traffic channels" (Southworth, Ben-Joseph, 1996, 73). This could be probably because "the expression of modernism was directed primarily towards buildings" (Southworth, Ben-Joseph, 1996, 73). In this context, Le Corbusier, the modernist architecture, explained traffic as a river; "traffic can be thought of as obeying the same laws as rivers do" (quoted in Southworth, Ben-Joseph, 1996, 74). However, now, "traffic is being referred to not as a liquid that flows where it is directed, but as a gas that expands to fill all available space" (Newman and Kenworthy, 1999, 140).

With the advent of machine transportation, namely, that of automobile, people had the ability to go anywhere. Distances increased by means of turning wheel. Existing roads did not meet the needs to go anywhere. Cars penetrated into every cavity under the name of traffic. Consequently, today, automobiles are everywhere, even on our streets which means our social liveability is in danger.

"More than a channel of movement, the street has been a space for human activity, buying and selling, socializing, providing visual orientation and symbolizing community character" (Torlak, 1983, 69). Since streets are not simply corridors for traffic, "we must look at them as complex community settings that serve a variety of functions and also environments used for walking, bicycling, and jogging, for socializing, and for children's play" (Southworth, Ben-Joseph, 1996, 132). As Engwicht (1993, 94) sets out, "for over 10000 years, streets in cities belonged to the people for social interaction, recreation and to provide access to people, goods and places". Ironically, as Duany (quoted in Southworth, Ben-Joseph, 1996, 131) emphasizes "the street, which is the public realm of America, is now a barrier to community life".

What automobiles do to people, especially to the ones who are not in them, is to kill or maim them; to disturb them through noise, dust and fumes; to make them lost their sense of community; to make them feel marginal and second-class. When the car takes possession of streets, decline in the proportion of daily social life appears. "Increasingly, the street is recognized for its transit capabilities rather than for its ability to provide a setting for a range of rich and diversified human behaviours" (Levitas, 1986, 232); although the street is the largest assemblage of public space in any and every city. Indeed, as Newman and Kenworthy (1999, 130) ask, "Why use a car if you can walk or ride more quickly and conveniently?"

As Torlak (1983, 69) states,

> *People have the right to walk to work, to school, to stores, or, in short, to places under safe, pleasant and healthy conditions, to converse with friends without the noise or threat of cars, to escape summer heat in tree-shaded avenues and to rest while doing these.* (Torlak, 1983, 69)

Only improving non-motorized modes can help people to experience all these facilities. Moreover, "the capital and operating costs of non-motorized mode infrastructure are very modest when compared to road budgets, so there seems little justifiable impediment to improving these modes in all cities" (Newman and Kenworthy, 1999, 164). But, on the contrary, narrowed sidewalks are mostly invaded by parking cars, shouts and horns which means "get out of my way!" (Torlak, 1983, 117) As soon as one steps on the road, waiting for cars to let him cross the street makes the pedestrian abstain and recessive. As a result, the pedestrian, the privileged user of the street, lost his ability to use and enjoy the street. But, "the pedestrian must regain the freedom on the streets which he has lost from the time motor vehicles have captured the environment" (Torlak, 1983, 69). Streets also must be available for all the people; including disabled, people without cars, children, elder. For this reason, there is a need for increasing emphasis on pedestrian planning and pedestrianization projects. As stated by Torlak (1983, 70):

> *The main aim of pedestrianization is to increase the opportunities for every citizen to enjoy the richness of urban life… It helps increase in urban recreational facilities, urban green areas, and open public spaces for gathering ceremonies, and to develop cultural and social events. Urban man has the right to experience trees, plants and flowers along city streets. Relieving of the traffic and segregated pedestrian system reduce accidents. Pedestrianization radically reduces the quantity of the remaining traffic by regulations. Noise on city streets decreases and sound of human voices replace vehicular noise. Pedestrians have the right to breathe fresh air free from the harmful fumes of vehicles. Decrease in air pollution provides them this opportunity.* (Torlak, 1983, 70)

Pedestrianization mostly becomes available in city centres all around the world due to the fact that "these places have walking oriented characteristics, that is, dense, mixed land uses with urban design, conducive to face-to-face activity" (Goodwin, 2001, 116). So, in the city centres, it is possible to make

short trips on foot without a car.

The introduction of pedestrian areas tends to overcome the automobile and pedestrian conflict in streets. It is also beneficial for the shopkeepers. O'Flaherty (1997, 479) explains this as:

> *Most existing shopping and commercial centres grew up along main traffic routes and as their intersections. They thrived, mainly because of the then ease of their accessibility. Now, as the traffic congestion increases, the attractiveness of many of these older centres is diminishing.* (O'Flaherty, 1997, 479)

The removal of vehicle traffic from city centres creates more civilized, healthy, active, liveable urban lives and also revitalizes urban spaces. Revitalization associates with serving activity opportunities to human on streets. A pedestrian street should serve facilities, such as cinemas, theatres, concert halls, restaurants, pubs, clubs, hotels, libraries, museums, spaces for sports, shops, bikeways and so forth. People should relax, sing, listen, watch, discuss, gather, feel, drink, eat, play, court, read, chat, wait, and laugh and so on (Torlak, 1983, 118). All these largely depend on whether the street covers the minimal requirements or not. So, what are these minimal requirements for streets to make people feel comfortable? Such a list of requirements was introduced in the Portland Pedestrian Master Plan in 1998, named as *city centre pedestrianization principles*[22]:

> *City centre pedestrianization principles*
>
> *The pedestrian environment should be safe: Sidewalks, pathways, and crossings should be designed and built to be free of hazards and to minimize conflicts with external factors such as noise, vehicular traffic, and protruding architectural elements.*

[22] Litman T. et al. (2002) Pedestrian and Bicycle Planning, A Guide to Best Practices, pp. 32. (available at http://www.vtpi.org/nmtguide.doc)

The pedestrian network should be accessible to all: Sidewalks, pathways and, crosswalks should ensure the mobility of all users by accommodating the needs of people regardless of age or ability.

The pedestrian network should connect to places people want to go: The pedestrian network should provide continuous direct routes and convenient connections between destinations, including homes, schools, shopping areas, public services, recreational opportunities, and transit.

The pedestrian environment should be easy to use: Sidewalks, pathways, and crossings should be designed so people can easily find a direct route to a destination and delays are minimized.

The pedestrian environment should provide good places: Good design should enhance the look and feel of the pedestrian environment. The pedestrian environment includes open spaces such as plazas, courtyards, and squares, as well as the building facades that give shape to the space of the street. Amenities such as street furniture, banners, art, plantings, and special paving, along with historical elements and cultural references, should promote a sense of place.

The pedestrian environment should be used for many things: The pedestrian environment should be a place where public activities are encouraged. Commercial activities such as dining, vending, and advertising may be permitted when they do not interfere with safety and accessibility.

The pedestrian environment should be economical: Pedestrian improvements should be designed to achieve the maximum benefit for their cost, including initial cost and maintenance cost as well as reduced reliance on more expensive modes of transportation. Where possible, improvements in the right-of-way should stimulate, reinforce, and connect with adjacent private improvements. (Litman, 2002, 32)

So, it should be perceived that streets can belong to pedestrians for laden with happiness, ease and peace in cities in future. "Motorists have highways and arterials where the car is king, but when entering a neighbourhood, the automobile must be calmed" (Southworth, Ben-Joseph, 1996, 142).

3.2. Traffic Management and Traffic Calming to Support Pedestrian Traffic

Pedestrianization is an attractive, safer, user-friendly but extreme method of calming. As O'Flaherty (1997, 480) sets out "the full pedestrianization of a street or a group of streets means that displaced traffic, especially through vehicles, must be handled by other links in the road network". Pedestrianization options ranges from full to partial, or multistage pedestrianization can be carried out. There are various methods to pedestrianize streets. If it is not available to pedestrianize all street, traffic management and/or traffic calming can be used to discourage traffic growth on the street. These traffic-calming schemes or traffic management strategies limit private transportation besides selective pedestrianization arrangements (Newman and Kenworthy, 1999, 164). These methods are often significant components of non-motorized planning integrating transport improvements that foster non-motorized modes for basic access. *Traffic management* tries to accommodate the existing traffic without making new investment, through street layouts, traffic routing, and traffic control devices. It aims to minimize accidents, congestion and emissions and includes strategies to control the amount of traffic on particular streets through some measures (Litman et al., 2002, 57). These are "speed limits, restrictions on left-turns, one-way streets, tidal-flow operation, waiting restrictions and parking control[23]". It also uses traffic calming as a physical method of traffic control.

Traffic calming as Hass-Klau (1990) defines is "a transport policy concept which includes a strong promotion of pedestrian, public and bicycle transport, as well as a reduction in average speeds in built-up areas". Its objectives are reducing vehicle speeds, creating road conditions for encouraging motorists to drive carefully and calmly, removing unnecessary vehicles from the road, improving amenity and enhancing the environment,

23 Ela Babalık-Sutcliffe, METU, The Department of City and Regional Planning Urban Transport Planning (CRP 351) Lecture Notes, 2007

reducing accident and severity numbers (O'Flaherty, 1997, 465-466). "It provides safer street environments more conducive to pedestrians, cyclists, shoppers, and residential life" (Newman and Kenworthy, 1999, 145).

Traffic calming is a method of overcoming pedestrian and vehicle conflict in residential or shopping areas or in streets. It uses some instruments as shown below[24]:

- Road humps / bumps / speed tables
- Build-out (a feature extending into the road on one side, narrows the road)
  - Road narrowing/throttles/chokers (a build-out with planted material or traffic signs – if two build-outs are constructed opposite each other, then throttle or choker)
  - Footway build-out (a build-out combined with a pedestrian crossing)
- Central islands
- Road markings and different surface treatments

These traffic calming instruments are shown in Figure 4 below:

24 Ela Babalık-Sutcliffe, METU, The Department of City and Regional Planning Urban Transport Planning (CRP 351) Lecture Notes, 2007

Figure 4: Traffic calming instruments (www.bikewalk.org)

In practice, reducing the speed of motor vehicles enhance the quality of life.

> *The lower the traffic speed (down to about 30 km/h) the lower the noise levels. Further, at 30 km/h or below, vehicles do not need as much road space as when driven at high speed. This 'spare' space can often be reclaimed and planted, or, given over for use by public transport, cyclists or pedestrians.* (O'Flaherty, 1997, 466)

Low speed also reduces air pollution due to the fact that the number of cars per minute reduces.

3.3. Case Studies: Good – Practice Pedestrianization Cases

There is growing sensitivity in terms of increasing the quality of life in urban areas. Many cities are scrutinized again all around the world. Planners, local authorities and communities are becoming aware of creating places for people rather than focusing on the needs of automobiles. This awareness results in reducing car dependency particularly in city centres, and promoting liveable environments for pedestrians. Copenhagen, DENMARK; Hong Kong, CHINA; Trafalgar Square, ENGLAND; Rome, ITALY are good-practice cases, which will be analyzed below.

3.3.1. Copenhagen, DENMARK

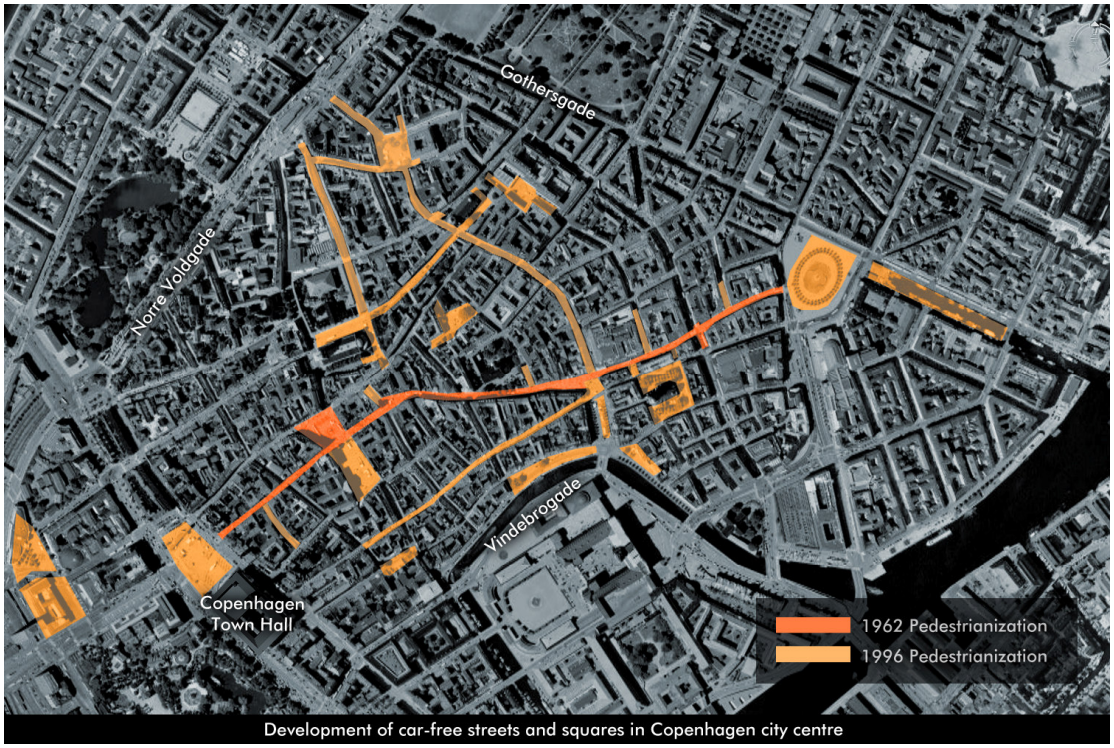

Figure 5: Copenhagen (Adopted from European Commission Handbook, 2002). Background Image is taken from Google Earth

Copenhagen is one of the cities in the world that experienced a radical transformation in terms of pedestrianization. Although some difficulties exist, the city has improved the quality of its street life in the course of time. "In the 40 years since Copenhagen's main street was turned into a pedestrian thoroughfare, city planners have taken numerous small steps to transform the city from a car-oriented place to a people-friendly one" [25].

[25] http://www.eltis.org/study_sheet.phtml?study_id=441&lang1=en 03.07.07

Figure 6: Pedestrian area in Copenhagen (left) (Google Earth by user danielmeyer)
Figure 7: Bicycle parking in Copenhagen (right) (Google Earth by user ncatalin)

Figure 5 helps to highlight the pedestrianization processes that Copenhagen went through in 1962 and 1996. Copenhagen's strategies for transforming the city from car-based to pedestrian-based are summarized in Table 4 below:

Table 4: Copenhagen's strategies for overcoming automobile dependence (Newman and Kenworthy, 1999)

Traffic Calming	*Favouring Alternate Modes*	*Economic Penalties*	*Non-auto-dependent Land Uses*
Regional traffic calming but extensively pedestrianize in city centre. Extensive thirty kilometre-per-hour zones. Enforcement of car restraint.	Emphasis on bike lanes and pedestrianization. No extra road capacity and reduction of parking by 3 percent per years for fifteen years. Culture of respect for bicyclists.	Usual European fuel tax and very high vehicle registration costs. No congestion pricing. High parking fees.	Corridors of growth. Urban villages around rail lines. Mixed use centres.

10 step program was set in Copenhagen with the consultancy of Jan Gehl who is a Danish architect and urban designer focusing on improving the quality of pedestrian urban life. Here is Copenhagen's program for a more pedestrian-friendly city[26]:

1. Convert streets into pedestrian thoroughfares
The city turned its traditional main street, Stroget, into a pedestrian thoroughfare in 1962. In succeeding decades they gradually added more pedestrian-only streets, linking them to pedestrian-priority streets, where walkers and cyclists have right-of-way but cars are allowed at low speeds.

2. Reduce traffic and parking gradually
To keep traffic volume stable, the city reduced the number of cars in the city centre by eliminating parking spaces at a rate of 2-3 percent per year. Between 1986 and 1996 the city eliminated about 600 spaces.

3. Turn parking lots into public squares
The act of creating pedestrian streets freed up parking lots, enabling the city to transform them into public squares.

4. Keep scale dense and low
Low-rise, densely spaced buildings allow breezes to pass over them, making the city centre milder and less windy than the rest of Copenhagen.

5. Honour the human scale
The city's modest scale and street grid make walking a pleasant experience; its historic buildings, with their stoops, awnings, and doorways, provide people with impromptu places to stand and sit.

6. Populate the core
More than 6,800 residents now live in the city centre. They've eliminated their dependence on cars, and at night their lighted windows give visiting pedestrians a feeling of safety.

7. Encourage student living
Students who commute to school on bicycles don't add to traffic congestion; on the contrary, their active presence, day and night, animates the city.

26 http://www.eltis.org 03.07.07

8. Adapt the cityscape to changing seasons
Outdoor cafes, public squares, and street performers attract thousands in the summer; skating rinks, heated benches, and gas lit heaters on street corners make winters in the city centre enjoyable.

9. Promote cycling as a major mode of transportation
The city established new bike lanes and extended existing ones. They placed bike crossings – using space freed up by the elimination of parking – near intersections. Currently 34 percent of Copenhageners who work in the city cycle to their jobs.

10. Make bicycles available
The city introduced the City Bike system in 1995, which allows anyone to borrow a bike from stands around the city for a small coin deposit. When finished, they simply leave them at any one of the 110 bike stands located around the city centre and their money is refunded. (www.eltis.org)

After all, Copenhagen can be considered as a leader of liveable cities in the world due to the qualification of the transport system in pedestrian's favour. As Beatley states in his paper **Sustainable Planning in European Cities**,

Copenhagen is perhaps the best example of a successful and continual effort to pedestrianize its centre. It began this process in 1962, when it pedestrianized its main shopping street, Stroget. Each year since, the city has maintained a steady course of expanding the pedestrian areas. By 1996, it had increased by 6 times the amount of pedestrian space (Gehl and Gemzoe, 1996). In total, it has set aside some 96,000 square meters of pedestrian space (including "pedestrian priority" streets, where cars are allowed, but at slow speeds). Despite the scepticism the pedestrian streets and squares have been wildly successful and highly used. The numbers of people walking along Stroget on a summer day is an amazing 55,000 (about 145 pedestrians per minute), and even during the winter months a high of 25,000 is seen. Moreover, a large percentage is getting there by public transit.
(http://www.socsci.umn.edu/~bongman/urbansustainability/BEATLEYP.htm, 21.04.07)

Probably, what makes the Copenhagen case the best example is making transforms gradually. Each year Copenhagen reduced central area parking by 2-3 percent. Each year the city pedestrianized more streets. Each year the city introduced more enjoyable street life. The result has been not only a reduction in traffic, but growth in vitality of the city area socially, environmentally and economically (Newman and Kenworthy, 1999, 204). As Beatley states, "rather than sweeping proposals to make the entire centre car-free, change has been incremental and slow enough to defuse potential opposition, and to allow residents of the city to see the benefits". As a result, Copenhagen and its city centre became a trend in terms of pedestrianization that has been followed by many other cities in Europe.

3.3.2. Hong Kong, CHINA[27]

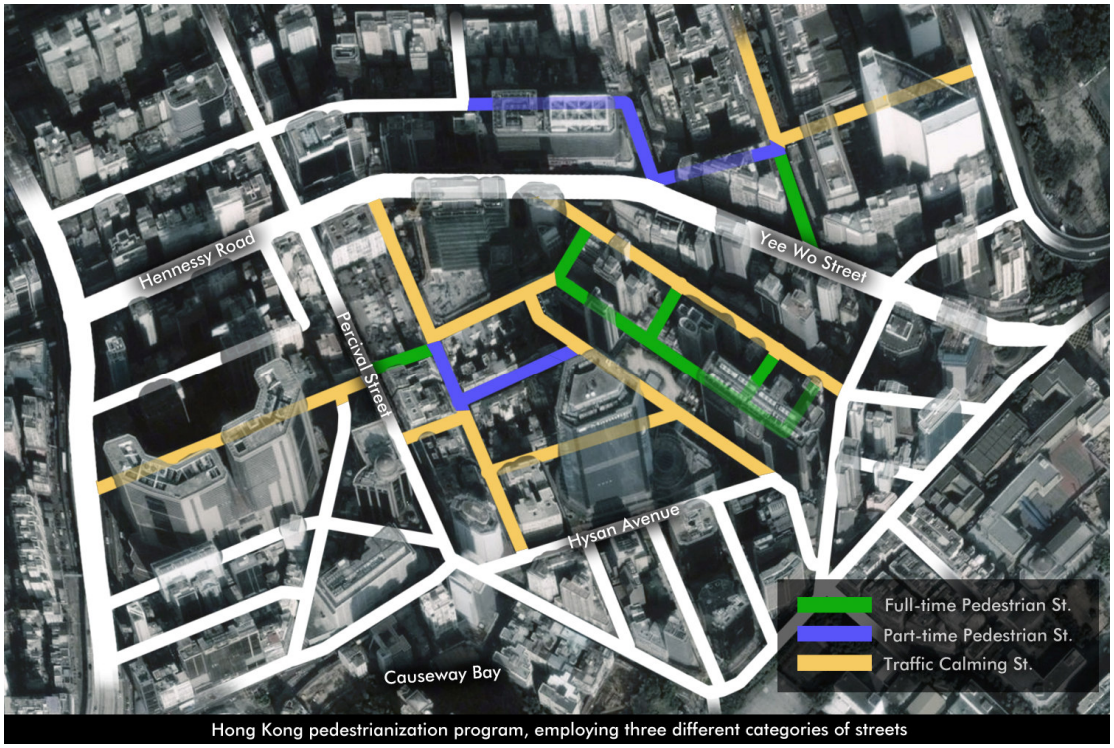

Figure 8: Hong Kong (Adopted from http://www.td.gov.hk/transport_in_hong_kong/pedestrianisation/pedestrianisation/causeway_bay_/index.htm, 10.08.07). Background Image is taken from Google Earth

In 2000, Hong Kong started a forward-thinking project for full or partial pedestrianization to improve pedestrian safety and mobility, to encourage more people to walk, to discourage access for non-essential vehicles, to improve the city's air quality and overall pedestrian environment. Thanks to this project Hong Kong is one of the most pedestrian-oriented cities in the world.

[27] http://www.td.gov.hk/transport_in_hong_kong/pedestrianisation/pedestrianisation
http://www.urbanphoto.net/blog/2007/01/23/pedestrian-streets-hong-kong-style/ 29.07.07

Figure 9: Pedestrian area in Hong Kong (left) (http://www.urbanphoto.net/blog/2007/01/23/pedestrian-streets-hong-kong-style/, 10.08.07)
Figure 10: Pedestrian crossing in Hong Kong (right) (Google Earth by user kuo71)

Hong Kong pedestrianization program includes three different categories of streets. Figure 8 shows the Hong Kong pedestrianization program, employing these three different categories. First, full-time pedestrian streets give absolute priority to pedestrians and allow vehicular access for specific activities such as deliveries only at certain times of the day. Second, part time pedestrian streets are closed to vehicles for specific periods of the day. And the last, traffic calming streets give more space to pedestrians with wider sidewalks, reducing the amount of space given over to cars and saving pedestrians from wheezy traffic. There is no restriction to vehicular access in traffic calming streets. However, vehicles are slowed down through the use of traffic calming measures, such as speed tables, kerb build-outs, sharpened corners, road narrowings, gateways, etc.

When considering whether or not to pedestrianize a street, Hong Kong's transport planners asked a few crucial questions:

- Is the pedestrian traffic heavy enough?
- Is there the right mix of street elements, such as subway entrances, markets, shops, or schools, to attract people to the area?
- How would pedestrianization affect traffic circulation? Would it make the neighbourhood more pleasant?

Within this project, planners are aware of the fact that, whilst pedestrianization is desirable from pedestrian and environment standpoint, it is imperative that the design of any pedestrian scheme would not create serious traffic problems on other roads in the vicinity. Otherwise it would only be shifting traffic and environmental problems from one location to another without net gain to the community.

At last, Hong Kong's pedestrianization project works because it's straightforward, assertive and, above all, flexible. More than 16,000 pedestrians take the advantage of this gradual program. It doesn't try to impose a one-size-fits-all model on the city; inversely Hong Kong's different levels of pedestrianization are designed with an ear tuned to the specific needs of different streets and neighbourhoods. As Fischler[28], the professor of urban planning at McGill University, sets out, "the most important element in the Hong Kong policy is the use of a *variety* of options to make streets more pedestrian-friendly, from total closure to relatively light redesign". In just five years, the transport department has revamped dozens of streets, aggressively using pedestrianization as a tool to promote walking and discourage driving.

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[28] http://www.urbanphoto.net/blog/2007/01/23/pedestrian-streets-hong-kong-style/ 29.07.07

3.3.3. Trafalgar Square, ENGLAND[29]

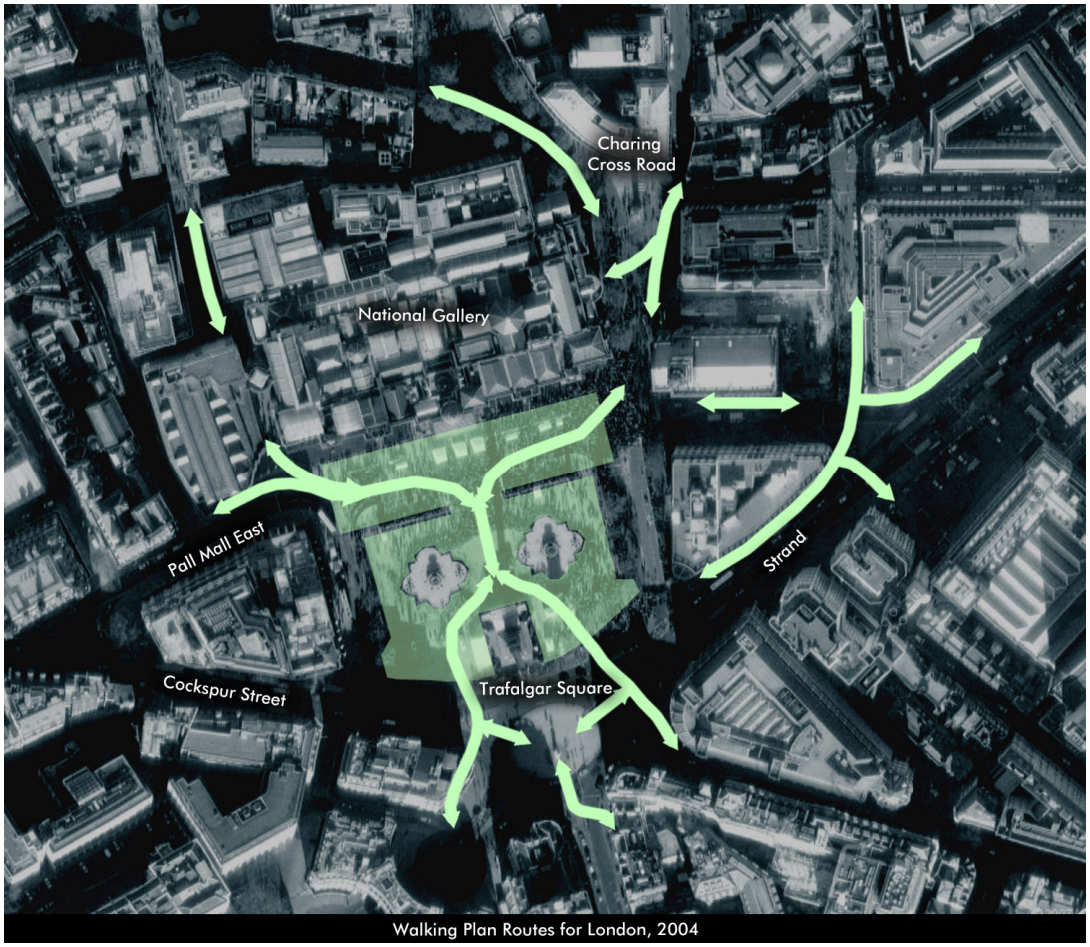


Figure 11: Trafalgar Square (Adopted from http://www.london.gov.uk/trafalgarsquare/docs/traff_flow_map_02.pdf, 10.08.07) Background Image is taken from Google Earth

The Walking Plan for London identified the actions required for improving walking conditions. Its aim was to increase walking as a transport mode by promoting it as a viable, alternative, healthy and environmentally friendly activity. The plan included six strategic walking routes; London Outer Orbital Path, Capital Ring, Thames Path National Trail, Jubilee Walkway, South-East Green Chain and Lee Valley Walk. There is also a walking route information service named as *Walkfinder*. Figure 11 shows these strategic walking routes.

[29] http://www.london.gov.uk/mayor/transport/walking.jsp 20.07.08

The pedestrianization of Trafalgar Square, which is London's first World Square, was completed in June 2003. Transport for London (TfL) and the London boroughs aim to make London's streets more amenable and attractive for walking, with less pollution, congestion and crime.

The project involved the removal of traffic from the north side of the square and improvements to the wider area. The pedestrianized north terrace now links the square to the National Gallery, with the central staircase a popular new feature. The changes also include a cafe, public toilets and lifts for disabled access. Within this project, access for disabled people, new pedestrian routes and new traffic flow system were accomplished.

In terms of road safety, there is also a campaign named as teen road safety. "In 2003, 717 young pedestrians involved in accidents in London". (http://www.tfl.gov.uk/corporate/2297.aspx, 20.07.07) It aims to reduce the number of teenagers killed or seriously injured on London's roads.

Figure 12: Trafalgar Square in London (left) (Google Earth by user schipol)
Figure 13: Trafalgar Square in London (right) (Google Earth by user adiel)

The aim of the project was to make London one of the most walking friendly cities for pedestrians by 2015. Almost 7 million walking journeys on foot are made in London every day and walking accounts for 80% of all trips under 1 mile. Walking is free, accessible, healthy and sociable. Walking is also an important means of getting to and from public transport services and is involved in most other journeys, such as to catch the bus or train.

There is also a project in terms of cycling[30] in London. TfL sees cycling as a convenient and low cost way to get around and it lets people fit exercise into their daily routine. TfL explains that a four mile trip in London takes on average 40 minutes by car, 30 minutes by public transport and 22 minutes by bicycle. They serve maps for free including cycle journeys. These maps show the best routes for cycling. TfL has invested in cycling in the last seven years by building and extending the cycling network; improving greenways and providing extensive cycle parking on the street, at railway and underground stations, in schools and in workplaces across London.

[30] http://www.tfl.gov.uk/modalpages/972.aspx 20.07.08

3.3.4. Rome, ITALY[31]

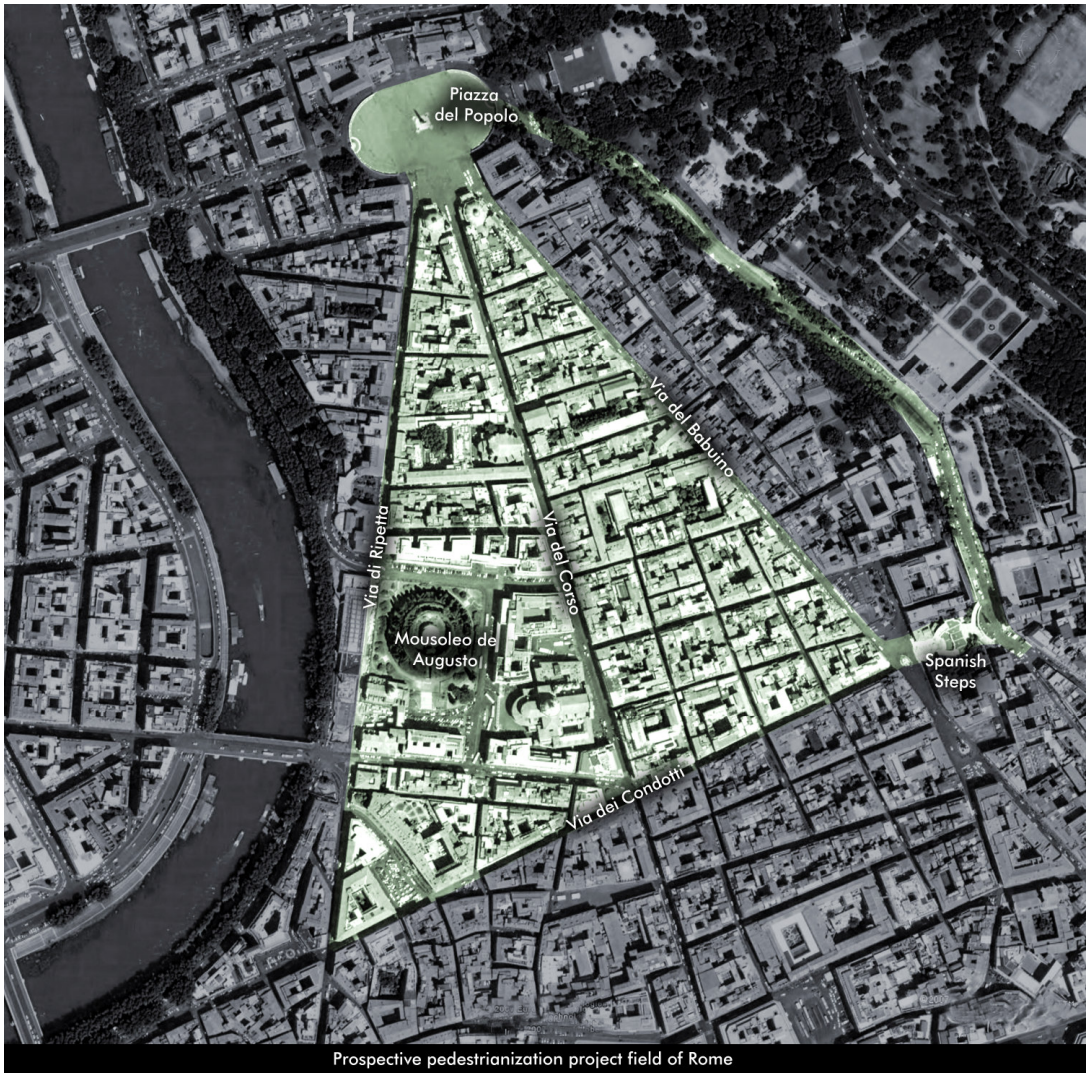


Figure 14: Rome (Adopted from http://archrecord.construction.com/news/daily/archives/070710rome.asp 10.08.07)
Background Image is taken from Google Earth

A project recently started in June, 2007 for the pedestrianization of Rome. A historic section of streets and piazzas in Rome are being "pedestrianized", or altered so that it will be an area where the primary mode of transportation will be walking, where private cars and will not be allowed. They are slowly

31 http://archrecord.construction.com/news/daily/archives/070710rome.asp 20.07.08
http://www.planetizen.com/node/25663 20.07.08

exorcised from the city's centre; the asphalt is being replaced by the historic *sanpietrini*, or cobblestones, on major traffic arteries. The old *sanpietrini* will be used to resurface streets and piazzas that will be handed over to pedestrians at the project's end.

Figure 15: Spanish steps in Rome (left) (Google Earth by user ozgurunsac)
Figure 16: Piazza Popolo in Rome (right) (Google Earth by user morethomase)

Some of the areas in the city centre bounded by Via di Ripetta, Via del Babuino, and Via dei Condotti will become pedestrian-only. Figure 14 show this prospective pedestrianization project field. Visitors will be able to access the cobblestone streets by foot, bicycle, bus, or taxi. Those who choose to drive will be required to leave their vehicles in a newly created 700-spot parking lot by the Pincio Hill, which began construction in June. To support this pedestrianization, some streets will be designated for various forms of public transportation.

The city also began installing 36 new *nasoni*, Rome's ubiquitous large-nosed drinking fountains, whose design dates to 1874. It is also rebuilding the minute sidewalks along many asphalted streets—this time wide enough to be walked upon. The total project is expected to be completed by 2009.

3.4. Pedestrianization Experiences in Ankara

At the beginning of the 20th century, before the Declaration of Turkish Republic, the population of Ankara was around 28.000-32.000. At this time, "the majority of trips were made on foot, and the modest demand for vehicular trip was met by horse carts and later by a limited number of cars and small buses operated by private owners" (Parsons Brinckerhoff International, 1997, 22). After War of Independence, following its proclamation as the capital of Turkey on 13th of October, 1923, Ankara experienced rapid growth. The new city formed not as a continuation of old city, but as a completely different new city "YENİŞEHİR" according to a plan realized by Prof. Herman Jansen in 1928 as a result of an international competition (Altındağ Belediyesi, 1987, 9). Although Jansen anticipated the population of the city would reach to 300.000 people in 1978, the city reached to this number in the early 1950's. (Kızılay Kent Merkezi Çalışma Grubu, 2004, 10, 11). With rapid urbanization, targets were exceeded. "Illegal housing developments began to spring up outside the boundaries of the plan, usually with insufficient road infrastructure" (Parsons Brinckerhoff International, 1997, 22). Therefore, a new plan was required. Nihat Yücel and Raşit Uybadin, who have won the competition in 1957, prepared a plan. As the Jansen Plan, their assumption on the population growth of Ankara for 2000 year was exceeded before 1965. In the 1950s and 1960s after the increase of uncontrolled migration, urbanization problems such as insufficient infrastructure and transport increased. Traffic congestion was first seen in the 1960's. "Solutions to the emerging congestion problem were usually sought through physical measures such as enlarging roads, redesigning intersections and building new roads" (Parsons Brinckerhoff International, 1997, 23). At the end of the 1970's, a new policy emphasizing public transport

and pedestrian schemes was adopted by the municipality. In 1978, a pedestrianization project for Sakarya Street and its surroundings was approved and applied by Ankara Municipality. However, after a short while, the scheme was abandoned and Sakarya Street was opened for vehicle traffic due to complaints from local businesses here, stating that their sales would decrease. Once they noticed that pedestrianization brings them opportunities and enhances economic turnover, they demanded the street to be pedestrianized again, and the street was pedestrianized. In this period, EGO fleet was improved; an exclusive busway serving the east-west corridor through the CBD was implemented and a network of pedestrian streets was established in the city centre.

An analysis was carried out by the General Directorate of EGO in 1982 regarding pedestrian regions. As it is seen on the Figure 17 below, in addition to Sakarya Street and its surroundings, İzmir Street and its surroundings (Fevzi Çakmak I and II, Sümer I and II, Menekse I and II, and Sehit Adem Yavuz Streets) with Yüksel Street and its surroundings (Konur I and Karanfil I Streets) were proposed to be pedestrianized. Although proposals of Fevzi Çakmak I, Sümer I, Menekse I, Karanfil I, Konur I were approved, they could not be implemented.

Figure 17: Existing and approved pedestrianized areas in Kızılay (Kızılay Kent Merkezi Çalışma Grubu, 2004)
(Note: Dark green areas indicate existing pedestrian areas; while light green donates areas approved for pedestrianization that still remain as traffic roads)

İzmir and Yüksel Streets were pedestrianized in that period. These two regions are still considered as an important part in the urban transport and pedestrian system of the city (Kızılay Kent Merkezi Çalışma Grubu, 2004, 12-14). These pedestrianized streets are heavily used by pedestrians today although they present certain problems in terms of image, cleanliness, spatial quality, etc. Some of these areas are seen in the figures below:

Figures 18, 19, 20: Sakarya Street and surroundings (Personal Archive, 2007)

Figures 21, 22, 23: İzmir Street, Yüksel Street, Karanfil Street (from top to bottom) (Personal Archive, 2007)

In 1994, a Transport Master Plan was prepared and approved by Ankara Transportation and Coordination Centre (UKOME). Standardization of roads, improvement of urban infrastructure, preventing pavements from car invasion, pedestrianization schemes well-integrated with public transport were the main objectives of this plan. This plan, which provided the basis of Ankara's current urban rail systems, also proposed to increase pedestrian areas in the city centre. The plan did not introduce a full pedestrianization of the city centre, but proposed a pedestrian priority corridor from Kavalıdere to Dışkapı, where a more pedestrian friendly approach was to be adapted in traffic planning. In the late 1990s, another transport study was carried out in Ankara. As a requirement for solving increasing traffic problems in the city centre, proposals for urban transportation were developed with the name of "Ankara Transportation and Traffic Improvement Study (ATTIS)" in 1998 through World Bank funding. In this study, under the name of "Pedestrian Transportation Improvement Program", the following proposals were made.

- Improvement for implementation of existing legal structures regarding pedestrian areas and transportation
- Improvement and application of pedestrian security campaigns
- Improvement of design standards for pedestrian areas
- Improvement of disabled pedestrian facilities
- Improvement for pedestrian network in CBD (Central Business District)
- Preparing pedestrian plans for pedestrian areas out of CBD
- Encouraging non motorized modes such as cycling
- Integration of pedestrian areas with public transport
- Integration of pedestrianization plans with planning processes of land use

Despite all these researches, proposals could not be implemented, except for some design improvements and parking restrictions in İzmir Street in Kızılay in 2003 (Kızılay Kent Merkezi Çalışma Grubu, 2004, 16, 29).

Although the above transportation plans and studies reveal that there has been a certain level of awareness in Ankara in terms of the need to improve non-motorized modes and especially pedestrian systems in the city centre, recent approaches, policies and projects represent a much different attitude in transport planning. While many countries in the world are becoming aware of problems associated with traditional traffic planning approaches and car-oriented and motorized solutions to traffic problems, it is seen that such approaches are still seen as solutions in Turkey, particularly in Ankara. While vast investment is being made for vehicle traffic roads and junctions to make vehicle flows easier and faster throughout the city, an increasingly anti-pedestrian environment is created by the metropolitan municipality. Many roads in the city centre, such as Meşrutiyet, Necatibey Streets and Atatürk Boulevard have transformed into major traffic arteries that accommodate non-stop vehicle flows. Pedestrians are directed to use pedestrian bridges or underground subways, which have become the main elements of pedestrian circulation in the city centre.

An extreme example of this anti-pedestrian attitude in the city centre was implemented in 2003, when it has been decided to restrict pedestrians to cross through Atatürk Boulevard (the main road passing through the city centre) and physical barriers were brought to prevent pedestrians from even approaching the road and its crossing. Pedestrians were directed to use metro underground passages, which were designed to provide access to metro platforms and not to be used as a subway crossing. Results of this implementation, which had to be abandoned due to severe public reaction,

are shown in the figures below:

Figures 24, 25, 26: Barriers to pedestrians in Kızılay city centre (Erhan Öncü Personal Archive, 2003)

Figures 27, 28, 29: Pedestrians directed to use metro underground passage in Kızılay city centre (Erhan Öncü Personal Archive, 2003)

Car-oriented transport planning approach of the Ankara Metropolitan Municipality still continues however. Building new roads and more grade-separated junctions, enlargement of existing roads, direction of pedestrians into pedestrian bridges and underground passes are still seen as the main transport solutions to traffic problems in the city. Whereas pedestrians should be the privileged users of city, they are neglected in almost all projects. As it is seen on the Figures 30 and 31 below, Kuğulu Park grade-separated junction (a road underpass) is the current example of this anti-pedestrian attitude. Kuğulu Park is in central city, and connected to Tunalı Hilmi Street, which is an important shopping street, representing various characteristics of a city centre. Building a grade-separated junction at this central location clearly contradicts with contemporary transport policy, which emphasizes the need to discourage and reduce car traffic in city centres.

Figure 30: Kuğulu Park grade-separated junction (Personal Archive, 2007)

Figure 31: Kuğulu Park grade-separated junction (Personal Archive, 2007)

The intense investments for grade-separated junctions in Ankara not only encourage car traffic in the city, but create severe accessibility problems for pedestrians too. For example, in order to build the Kuğulu Park grade-separated junction, pedestrian sidewalks were narrowed; pedestrian crossings were removed throughout the boulevard in order to accelerate the traffic flow and speed. Previous experiences in many cities in the world showed that encouraging, enabling and accelerating traffic flow in city centres are not solutions to traffic problems; on the contrary they create more traffic. Tunalı Hilmi Street is one of the central areas that became a victim of this kind of pro-car approach in Ankara. The street, which is a vibrant shopping area with intense pedestrian traffic, is suffering severely from car traffic, now.

These transport solutions create serious problems of accessibility and mobility in the city centre; and these problems result in the decline of traditional city centres in Ankara, including the Tunalı Hilmi Street. Increasing investment for new shopping centres around the city also contributes to the decline of the centres, and promotes more car usage since

such shopping centres are best accessed with motorized modes and particularly the private car.

Both these planning approaches and the increasing flow and speed of vehicle traffic in city centres result in the removal of pedestrians from these centres. Lack of imagination in terms of liveability in cities led the city lose its character. At this point, pedestrianization is an abstract policy recommendation to regain this imagination ability. Liveability in cities can be reclaimed only if there is a high level of accessibility by all users, and especially the pedestrians. Remembering that walking is the most desired form of transport to attain environment, community and health related objectives, it is clear that pedestrian mobility should be improved and encouraged in cities. Pedestrianization and other possible pro-pedestrian policies are not only a vital part of any transport planning approach, but they are also the healthiest, most efficient and also aesthetic way of revival of declining city centres.

CHAPTER 4

METHODOLOGY

4.1. Introduction: The Scope of the Thesis

This thesis focuses upon, first the problem of automobile dependency in cities; second, increasing emphasis on non-motorized travel opportunities as a method of overcoming automobile dependency; and the last, the significance of streets and pedestrianization in terms of social and environmental benefits. (In particular, it discusses whether pedestrianization can be a tool of creating socially healthy cities or not). In other words, this thesis discusses the alternative modes to automobile-based travel such as walking and cycling that are mostly undervalued; pedestrianization principles as a demand management strategy; and recent urban and transport planning approaches that promote pedestrian-friendly urban environments.

While aiming to trace the origins of existing transport problems in cities, this thesis goes back to the advent of car and how it became the main mode of transport. In this thesis, it is intended to show that pedestrianization can be, and should be, a valid transport policy in growing metropolitan areas that are becoming more and more car-oriented, such as Ankara. It is accepted that it is not possible to promote or apply projects as radical as "car-free city" concept in metropolitan areas; however, it is possible to reclaim city centres, public squares, and certain streets with intense pedestrian traffic with a view to create socially healthy and pedestrian-friendly environments, which may

also be integrated with bicycle lanes for cyclists.

The study focuses on Ankara, Tunalı Hilmi Street. In this thesis, it is assessed whether Tunalı Hilmi Street is suitable for such an arrangement in terms of pedestrianization or not. The main aim is to discover the pedestrianization opportunities within the case study area.

4.2. Context and Statement of the Problem

Automobile dependency is becoming a major problem all around the world. The automobile machine is gradually becoming the inherent part of people's vital activities. However, the excessive and inappropriate usage of the automobile brings all its side effects besides its benefits. It threatens not only the relation between human and nature, but also the relation among human beings. The more car usage, the more car-oriented investments; in return, the more car-oriented investments, the more car usage. This shapes urban areas in such a way that the overall urban form as well as individual activities all develop to accommodate cars. This in turn encourages more car usage, resulting in high levels of petrol dependency, traffic congestion, air pollution, climate change and loss of urban streets to moving cars or parked cars. Moreover, due to intense traffic, congestion and increased distances between activities, it is becoming increasingly difficult to use public transport, to bike and to walk in the city. Reducing car dependency, therefore, is necessary not only for reducing oil dependency, traffic congestion and air pollution, but also for improving the quality of life in urban areas, for claiming back streets and other public places, and for celebrating the power of human being's social existing.

Communities need a replacement for cars to take back the social area that they own. This means increasing the quality and quantity of pedestrian areas, which have been receiving increased emphasis all around the world. Pedestrianization and cycling opportunities well integrated with a high-quality public transport is one of the most important criterions of liveability in cities. That's because the only energy that these non-motorized modes require is provided directly by the traveller. They do not need oil. They do not make noise. They do not damage the nature. Neither walking nor cycling requires much space. Moreover, they are economical, costing much less than the auto and public transport. Nevertheless, they are mostly undervalued in transportation planning; traffic surveys generally overlook pedestrians and bicycles. However, both planners and members of communities become increasingly aware of the significance of non-motorization and pedestrianization. It is gradually recognized that pedestrian-friendly streets are the places for bringing people together. In this thesis too, non-motorization/pedestrianization is seen as a solution to recreate liveable cities. There are three main reasons why non-motorized transport is chosen as the focus of this thesis:

- Urban planning and also transport planning mostly tend to undervalue pedestrian traffic. In transport planning, vehicle traffic counts are carried out, but surveys aimed at pedestrian traffic counts and pedestrian movement analysis are very limited. This thesis helps to fill this gap by making use of various pedestrian analysis methods in the case study area, Tunalı Hilmi Street, Ankara.
- Community awareness in terms of the need to reverse automobile dependency is increasing all over the world. In this thesis, it is

believed that, there is also growing public awareness in Ankara, and that this may particularly be the case for users, shop-owners and other potential stake-holders in Tunalı Hilmi Street. This research aims to test the validity of this thesis regarding growing public awareness in Tunalı Hilmi Street by applying questionnaires to users/pedestrians, shop-owners, and taxi drivers.

- As public spaces, streets have a very significant role to strengthen the relation between people. Streets are the basis of community interaction in cities. They have the ability to get different genders and ages of people together. Social relations are much intensified in streets. It is the claim and starting point of this research that as a street with high volume of pedestrian flow, Tunalı Hilmi Street in Ankara already has these features; i.e. intensified social relations, a meeting place for different genders and ages of people. Therefore, pedestrianization or other pro-pedestrianization solutions may be appropriate for Tunalı Hilmi Street.

4.3. Aims and Objectives

Within the theoretical framework described above and problems defined, the main aims of the thesis are as follows:

- To show, through the review of other studies and cases in the world, the importance of non-motorized transport options and particularly pedestrian areas/streets in city centres.
- To assess potentials and possibilities for creating a pedestrian environment in Ankara.

Following these aims, the objectives of the study can be identified as:

- To test whether there are potentials for creating a pedestrian environment in Ankara
- To identify, through the assessment of current pedestrian movements and volume, land-use and physical characteristics that streets must have in order to be considered as good candidates for pedestrianization
- To develop a framework to analyze potentials for pedestrianization of certain streets.
- To carry out a detailed survey on a selected street in Ankara, for which both pedestrian potential and public awareness are assumed to be at a high level.
    - Pedestrian surveys including pedestrian counts, follows and static analysis.
    - Questionnaires with users, retail/shop-owners and taxi drivers of taxi ranks along the street.

4.4. Case Study

Figures 32, 33: Case study area: Tunalı Hilmi Street
Background Image from Google Earth

4.4.1. Case Study Selection

As mentioned earlier, this thesis focuses on Ankara, where recent transport projects and investments have been increasingly car-oriented, creating extremely difficult urban areas and street systems for pedestrian movement. In this thesis, effectiveness and validity of pedestrian areas, potentiality of existing roads for transforming into pedestrian areas are analyzed. Thus, as shown in Figure 32, Tunalı Hilmi Street is chosen as a case study area. There are many reasons for selection of this space:

1. Kızılay or Ulus as being centres of the city can also be considered for pedestrianization; however, they also have a key position in the city's transportation network. The main corridor that carries a major load of public transport of the city passes through these centres. Therefore, to study pedestrianization in these areas requires a more comprehensive transport planning approach and a reorganization of existing public transport system. Studying reorganization of vehicular traffic is considered to be beyond the scope of this thesis. Tunalı Hilmi Street, on the other hand, also holds the character of being a city centre, and although it carries high levels of traffic, it does not have the task as primary as Kızılay has within the city's transport, particularly public transport system. Moreover, it carries a significant volume of pedestrians because of its location and of the diverse land-use components it accommodates.
2. Tunalı Hilmi Street seems to have the ability to attract people and bring people from different ages and gender together. It is assumed that existing diverse uses, such as shops, cafes, restaurants, sport centres, and various leisure trip opportunities, have an important role to play. The analysis of differences in pedestrian movement and flow

with regards to different land-uses in different parts of the street is also believed to provide a better understanding of the land-use factors that can support pedestrianization.

3. Within the last one year, there have been new arrangements around the street such as grade-separated junctions. It is assumed that these investments and their negative impacts on pedestrian movement created a public awareness and public mood for non-motorization options.
4. There is a local community organization named as Kavaklıderem Derneği in this area, which endeavours for promoting more liveable environments and for increasing public awareness in the Kavaklıdere neighbourhood. Tunalı Hilmi Street is the main street of this neighbourhood. Many shop-owners of this street are also members of this organization. In other words, members of this organization are dominantly shop-owners. It may be expected that shop-owners are aware of the problems of liveability in this neighbourhood.

4.4.2. Hypothesis on the Case Study Area

This thesis puts forward the hypothesis below:

1. It is assumed that Tunalı Hilmi Street has the ability to get different ages and genders of people together in the basis of community interaction. It provides opportunities to match the demand for social interplay; and therefore can be a proper candidate for a pedestrianization project.
2. It is assumed that there is growing awareness by users/pedestrians regarding the traffic problems in the area and the need for better pedestrian environments; therefore it is assumed that a

pedestrianization project would receive support from users.

3. It is assumed that because of the already high density of pedestrians in shopping street, the shop-owners will also support an arrangement that is more pedestrian-friendly.

Following these main hypothesis, other minor hypothesis and concerns in this research are as follows:

- It is also assumed in this research that pedestrian activity and density may significantly change across the street: Tunalı Hilmi Street can be categorised into two sub-sections as the north part (with a limited level of diversity of land uses and a slight topography) and the south part (a high level of diversity of land-uses and suitable topographic conditions for walking); and it is assumed that there may be significant differences in pedestrian activity and level of utilisation in these two different sections/parts, which can help guide future pedestrianization projects.
- It is also assumed that when pedestrian analysis is carried out, conflicts will be observed with vehicular traffic. It is expected that at times of high vehicular traffic flow, pedestrian movement, particularly when crossing the street, would be constrained and limited.
- It is particularly assumed that constraints to movements by the vehicular traffic will be seen for the case of elderly pedestrians.
- It is assumed that cycling is not considered as an effective transport policy and planning tool for Tunalı Hilmi Street and only teenagers will support to apply bicycle lanes.

4.5. Methods of Data Collection

Field work is the main data collection method in this study. Books, journals, newspapers and online materials such as web sites and e-thesis are benefited throughout the thesis as secondary sources. Two different data collection methods are to be carried out in the field, that is, Tunalı Hilmi Street. *Pedestrian survey* including pedestrian counts, pedestrian movement analysis and static analysis; and *questionnaires* including those with pedestrians who are users of the street and those with first-storey shop-owners of shops along the street, and with taxi drivers of the taxi ranks located in the case study area.

Within the field study, first, it is concentrated on understanding the public character of the Tunalı Hilmi Street, and as a public space the relation between the street and pedestrians, and second, the possibility of creating pedestrian environment in the selected space. So, it is important to analyze the pedestrian capacity and potential of the street.

4.5.1. Pedestrian Survey

In carrying out the field study, primarily five basic questions were intended to be answered:

1. How is the pedestrian circulation density (pedestrian flow rate - volume) in the street?
    a. Are there differences along the street in terms of pedestrian volume?
    b. What factors account for such differences?

c. How does the pedestrian traffic volume and circulation change according to gender and age throughout the different times of the day and different days of the week?

2. What is the relation between pedestrian traffic and car traffic? Does the car traffic act as a barrier for the full utilisation and free circulation of certain pedestrian groups, such as the elderly or children for example?
3. What is the distribution of static activities along the street?
4. What are the most frequent static activities in the street?

To answer these questions the pedestrian survey is executed in three stages in which different methods of "pedestrian circulation and spatial use analysis" are exploited. Given the assumption that the pedestrian traffic volume and spatial uses may differ on weekdays and weekends, the survey is executed both on weekdays and weekend between the predetermined hours.

The ideal time for monitoring walking activity is chosen as September and October for Ankara, because of working, school and weather conditions. These months are usually linked to good weather, existence of maximum population in city counter to the summer months, and longer hours of daylight compared to the winter months.

Before explaining the schedule of the surveys, there is a need to explain some terms about pedestrian capacity terminology related to the analyses. These terms are used for evaluating pedestrian capacity and are documented in the **Highway Capacity Manual.**

- *Pedestrian flow rate* is the number of pedestrians passing a point per unit time (*pedestrian volume*).
- *Pedestrian space* is the average area provided for each pedestrian in a walkway.

The definition and schedule of all three stages are specified below (width of the street is enlarged representatively in all figures to see the results clearly):

1st stage (Pedestrian counts): This is performed to assess pedestrian flow rate (volume) with regards to gender and age in predetermined times. Counting was performed on Wednesday, Thursday, Saturday and Sunday between 08:30-09:30, 10:30-11:30, 12:30:13:30, 15:00-16:00 and 17:30-18:30, in addition on Saturday between 20:30-21:30. Each category of women, men, teenager, children and elderly (65+) was counted separately for 3 minutes within these decided hours on predetermined count stations, with a focus on their direction of flow. These detailed tables are given in Appendix A. The count stations and directions are shown in the Figure 34 below:

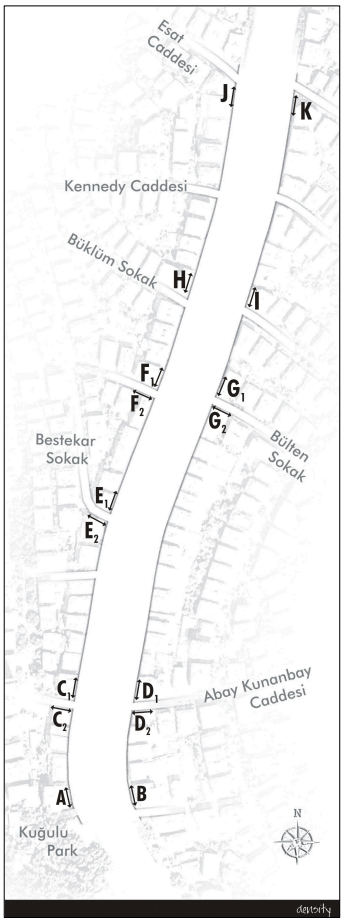


Figure 34: Count Stations

2nd stage (Pedestrian movement analysis): This is performed to assess the usage of and circulation in the street. Starting from three arranged stations (Figure 35), the routes of randomly selected 120 pedestrians consisting of 30 women, 30 men, 30 teenagers and 30 elderly (65+) was traced with a focus on the frequency of their crossing the street and their interactions with the motorized traffic. The activities of the pedestrians during their walk through the street (standing, queuing in front of cash machines, sitting, interacting, taking photograph, window-shopping) were also marked on the map. Route tracing was executed on Thursday as a weekday between 15:00-16:00 and 17:30-18:30, and Saturday as a weekend between 15:00-16:00 and 17:30-18:30. Follow-up starting points and directions are shown on the Figure 35 below:

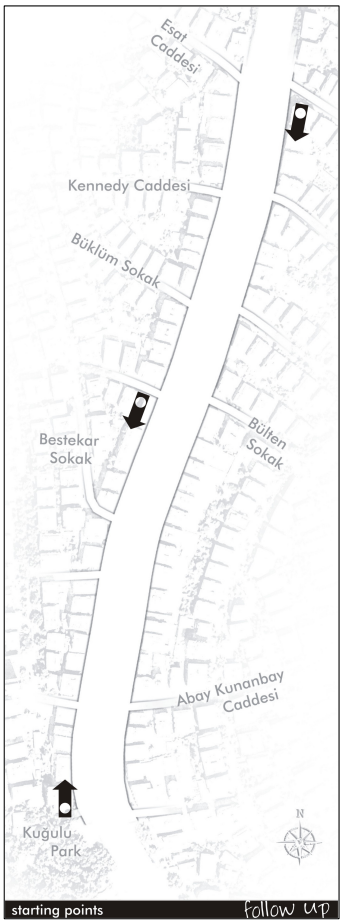


Figure 35: Follow-up starting points and directions

3rd stage (Static analysis): This is performed to assess the type, density and distribution of lingering pedestrians' static activities on the street. At this stage these activities are categorized under "standing, queuing in front of cash machines, sitting, taking photograph, window-shopping". Activities that require interaction are also specified. This study was conducted on Thursday as a weekday between 12:30-13:30 and 16:30-17:30, and Saturday as a weekend between 12:30-13:30 and 16:30-17:30. Pedestrians are shown on the map according to their being women, men, teenager and elderly (65+).

4.5.2. Questionnaires

In addition to monitoring pedestrians, it is also necessary to understand the viewpoints of joint users of the street, that is, pedestrians, shop-owners and taxi-drivers. To do so, three different categories of questionnaires that have common questions were applied to pedestrians, shop-owners/managers, and taxi drivers. Because of the practical problems of asking questions to car drivers on the street, a question was included in the pedestrian questionnaire to identify whether the person interviewed is a car driver or not; and hence, car-owners' points of view are also included in the research to a certain extent. Samples of questionnaire sheets are given in Appendix B.

Pedestrian questionnaire: 90 (45 women, 45 men) randomly selected pedestrians consisting of 30 teenagers, 30 young and middle aged and 30 old aged (65+) have filled out the questionnaire.

Shop-owner/manager questionnaire: 80 shop-owner/managers who accepted to poll have filled out the questionnaire. %85 of this sampling group is located on the street (with a direct entrance from Tunalı Hilmi Street) and %15 of it is located in the passages.

Taxi-driver questionnaire: 15 taxi-drivers working for taxi-stands (Kavaklıdere Taxi-stand, Bestekar Taxi-stand, Tunalı-Bülten Taxi-stand Tunalı-Büklüm Taxi-stand, Kennedy Taxi-stand) deploying along the street have filled out the questionnaire.

CHAPTER 5

THE ANALYSES IN TUNALI HİLMİ STREET

5.1. General Information and Land Use of Tunalı Hilmi Street

Tunalı Hilmi Street is one of the most well known streets of Ankara, attracting high number of users to its various shops, cafés, as well as offices. Hence the street also holds the character of being a city centre. This city centre has the distinct mixed land use patterns different from the surrounding area: major brand retails/shops, cafés, restaurants, sport centres, and various leisure activity opportunities. It has high concentration of car traffic, but, unlike Kızılay or Ulus city centres, it does not have the primary task to carry the city's major transport load, particularly in terms of public transport system. Moreover, it carries a significant volume of pedestrians because of its city centre character, location and diversity of land-uses. It has the base for interaction between different ages and genders of people and it is dense in terms of pedestrian capacity.

Tunalı Hilmi Street had a partial pedestrianization experience in the past. In the late 1990s, a scheme had been implemented to close the street to vehicular traffic in the weekend days in the afternoon. The scheme covered only the area between Kuğulu Park on the south end of the street and Bülten Street, which intersects Tunalı Hilmi Street. Although local activities were also organized during these pedestrian hours, the scheme was abandoned after a short while. Most transport schemes afterwards were vehicle traffic oriented and sought to ease and increase the car traffic along this axis.

Vehicle traffic indeed increased here and today it is one of the most congested corridors, creating a real bottleneck for the traffic system. In spite of this, pedestrian traffic is also significantly high in this street, due to the central location and attractive land-uses here. As a result, the street witnesses a major conflict of pedestrian and vehicular traffic everyday, and it remains to be seen how this conflict is to be resolved.

Different land-uses along the street also help to understand the unique character of Tunalı Hilmi Street and its pedestrian potential. As Litman (2007, 3) states, "land use and transportation are two sides of the same coin". Both of them affect each other and they are affected by anything together with. In brief, they are complementary rather than contradictory (Litman, 2007, 3). Litman (2007, 3) arranges land use factors affecting and are affected by travel as following: Density, mix, regional accessibility, centeredness, connectivity, roadway design and management, parking supply and management, walking and cycling conditions, transit quality and accessibility, site design and mobility management.

It is clear that location and type of land uses influence how and when walking trips are generated. The provision of walking facilities therefore needs to be considered in conjunction with the location of different land uses. Looking at the Figure 36, it can be said that, there are two basic subsections on Tunalı Hilmi Street; from Bülten Sokak to Kuğulu Park (first section) and from Bülten Sokak to Esat Caddesi (second section).

The most important factors leading to the categorization of the street into two are dispersal of density, mix of uses and topography. As it is seen on the Figure 36, this street is mostly a shopping street. But the first section

accommodates various and more diverse leisure activities in addition to shopping. Also retail characteristics of shopping places are different among first and second parts. In the first part, shops provide a variety of different retail categories (clothes fashion shops, shoe shops, jewellery and accessories, opticians/fashion eyewear, watch shops, camera stores, gift shops, perfume shops, various beauty parlours) and numerous cafes and patisseries. This section represents well known and high-image brands and shops. Other uses, such as banks are limited here. In the second part, shops are small-scale, represent less well-known brands, and provide more affordable and family goods, varying from low-budget children's clothing and gift shops to home ware such as electronics and white goods. Particularly the latter type of retail represents rarely used shops (These kinds of shops are represented as transparent red on Figure 36). These kinds of differences lead pedestrians to use the first section more frequently. In addition to these land-use factors, the fact that, the second section is on an incline may also act as a barrier for pedestrians to further use this part.

This separation between two sections is revisited when interpreting the results of the pedestrian survey analyses.

Figure 36: Land Use on Tunalı Hilmi Street

Notes to Land Use Figure:

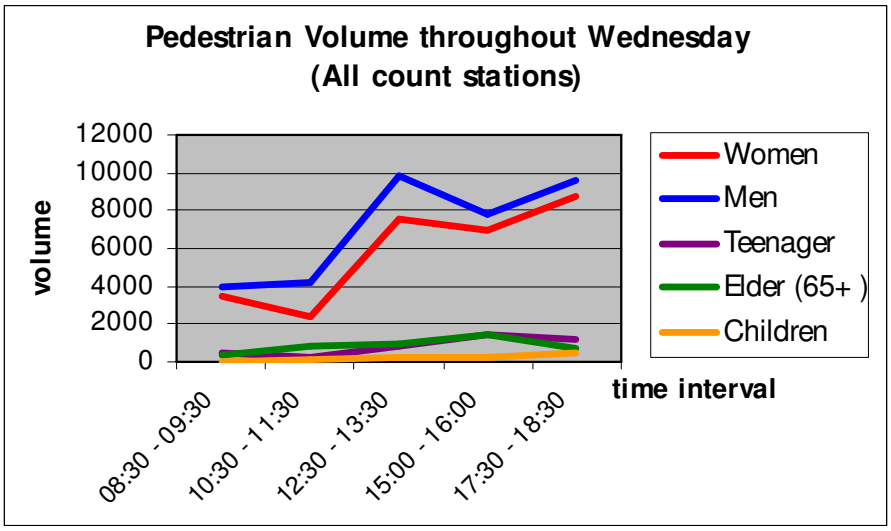
- On the visual, all shops are shown as red. Some of them are transparent than the other. Transparent ones represent the shops selling lower-budget goods. Others represent fashion item and brand shops that generally belong to a chain of shops and attract users/visitors from the rest of the city.
- Work place category includes offices (health centres, doctors' surgeries, law firms, real estate, tourism offices and other businesses).
- Even though it is not seen on the map, the street leading to Esat Street becomes steep.

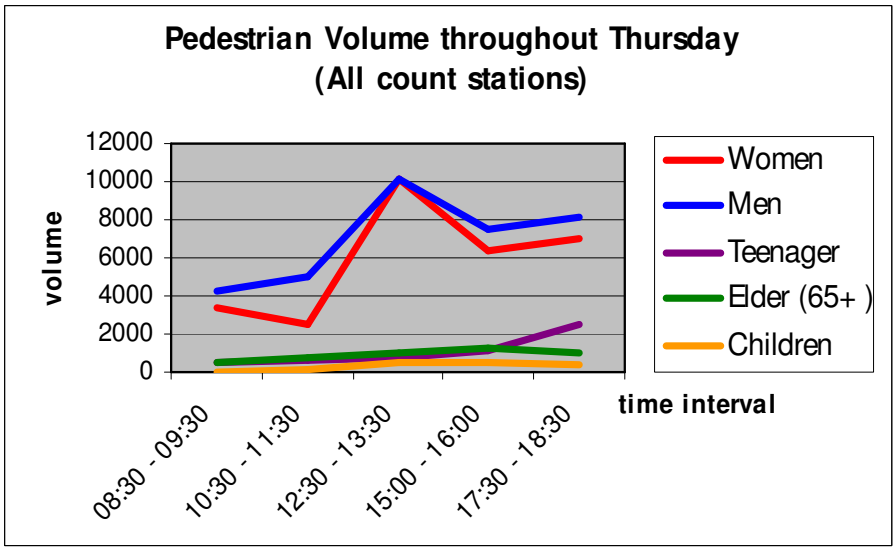
5.2. Pedestrian Survey

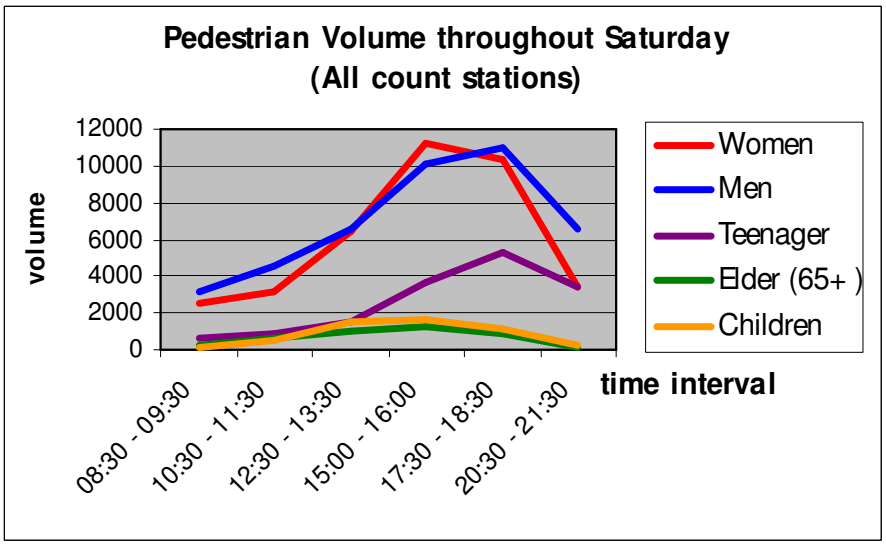
5.2.1. Pedestrian counts (1st stage)

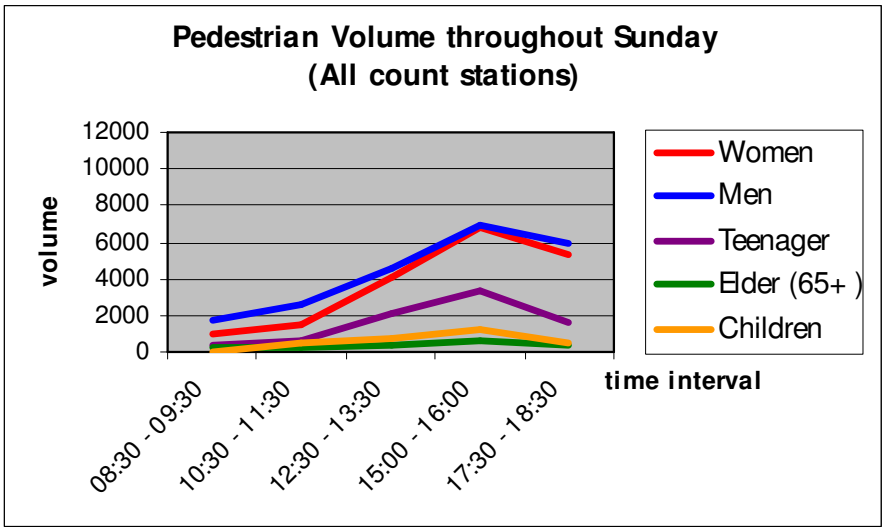
When total pedestrian volume for all count stations in an hour is calculated by taking the hourly average of 3 minutes counts for each count day, four main charts are formed, representing the four count days in the week.

Tables 5, 6, 7, 8: Hourly average volumes





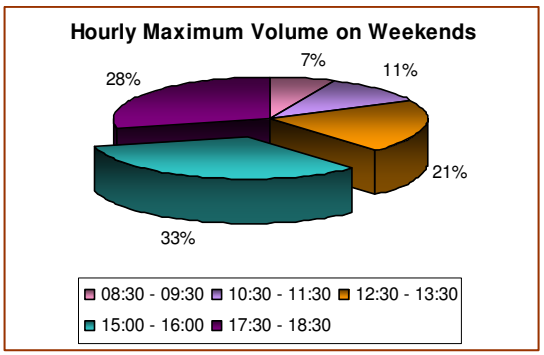


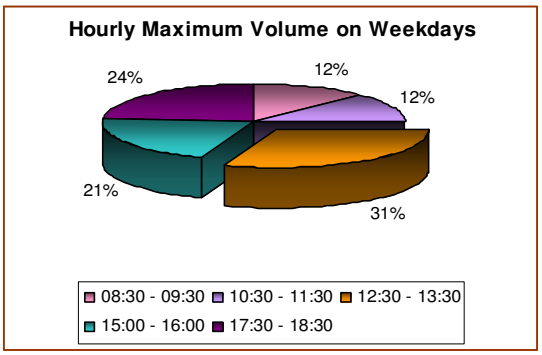


As it is seen, on weekdays total volume of pedestrians reaches a peak at noon time exceeding 10000 pedestrians per hour (including all four different pedestrian categories). Come to the weekend, Saturday and Sunday is very different from each other. Saturday is the most crowded day (reaching 12000 pedestrians/hour when all categories are included), and Sunday is significantly less crowded. On Saturday number of pedestrians (all categories) passing through "B" station reaches 40 pedestrian in 1 minute. On weekdays volume value of men and women is nearly parallel, between 12:30-13:30, that is lunch time, each category of women and men volume suddenly increases. For each category of people, this kind of increase is seen

between 15:00-16:00 on weekends, which can be best described as a time for leisure and recreation activities. On weekdays and on Saturday, total volume is high in the evening rush hour between 17:30-18:30. Maximum volume hours on weekdays and weekends can be seen in charts below:

Tables 9, 10: Hourly maximum volumes





The charts indicate that in weekdays the street becomes most crowded during the lunch break hour, and hence it may be possible to suggest that it is utilized mostly by those who work in the vicinity. In the weekend, on the other hand, the street becomes most crowded in the afternoon, suggesting that shopping trips as well as trips to cafes or cultural and other uses dominate the usage of the street in the weekend.

Teenagers come to Tunalı Hilmi mostly on weekends not surprisingly because of school conditions. Except for Saturday, men volume is more than women volume. On Saturday, especially between 13:30-16:00, women volume increases because of shopping activity, as it will be shown in static analysis later on. Saturday evening, while the number of male pedestrians is high in Tunalı Hilmi, number of women becomes lower. Children mostly come to Tunalı Hilmi on weekends with their family. In all days, volume of elderly pedestrians increases between 15:00-16:00, which may also suggest a recreation/leisure or shopping trip, and possibly a desire to avoid vehicle traffic peaks.

Counts also give the pedestrian flow rate in every count station. Figures including counts with their day and hour information are shown below (It was decided to present only Thursday flow for the weekdays since Wednesday and Thursday volumes and concentration in space are somewhat similar):

Figure 37: Pedestrian flow rate on Thursday between 08:30-09:30 (left)
Figure 38: Pedestrian flow rate on Thursday between 12:30-13:30 (right)

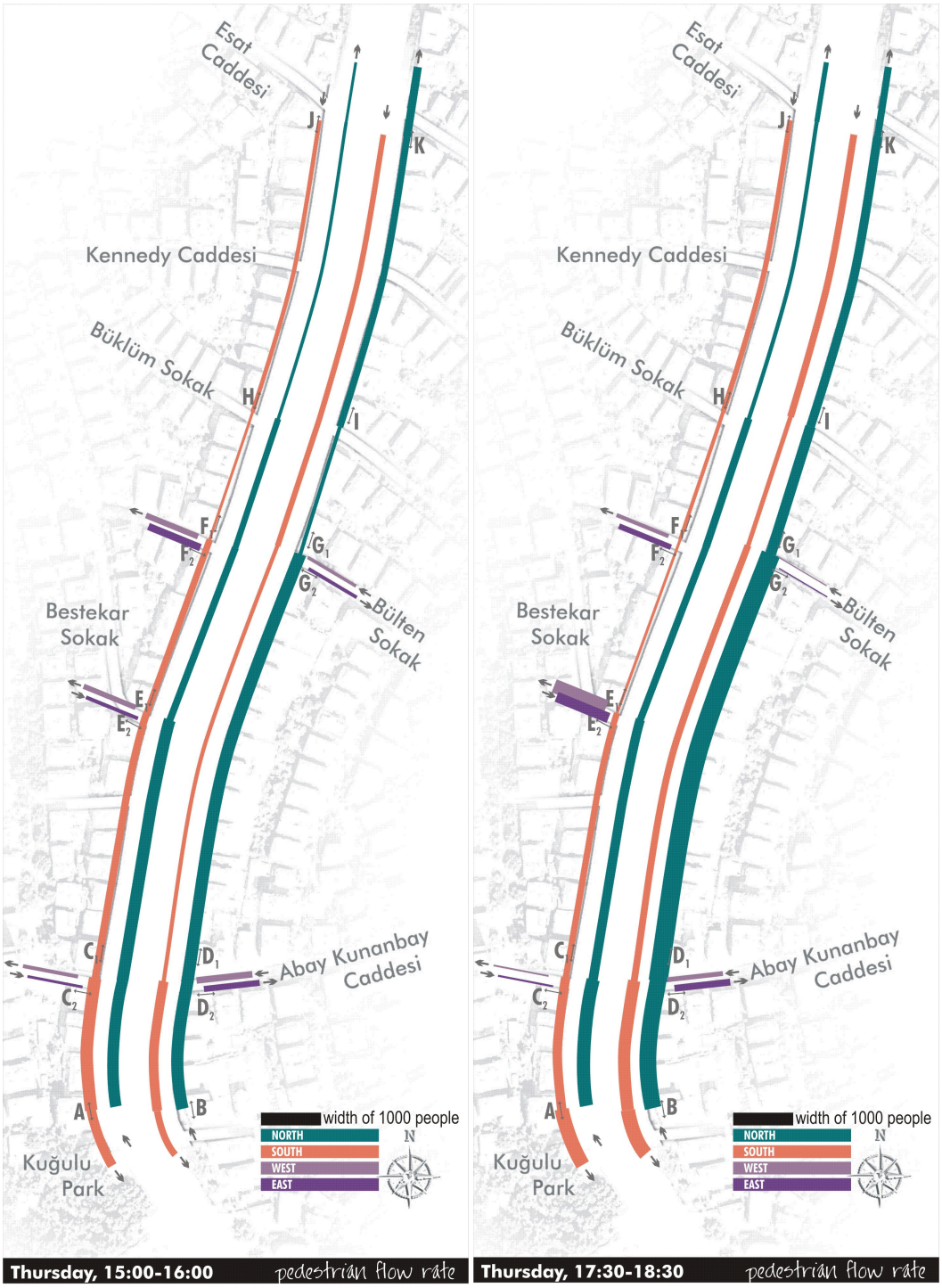


Figure 39: Pedestrian flow rate on Thursday between 15:00-16:00 (left)
Figure 40: Pedestrian flow rate on Thursday between 17:30-18:30 (right)

Figure 41: Pedestrian flow rate on Saturday between 08:30-09:30 (left)
Figure 42: Pedestrian flow rate on Saturday between 12:30-13:30 (right)

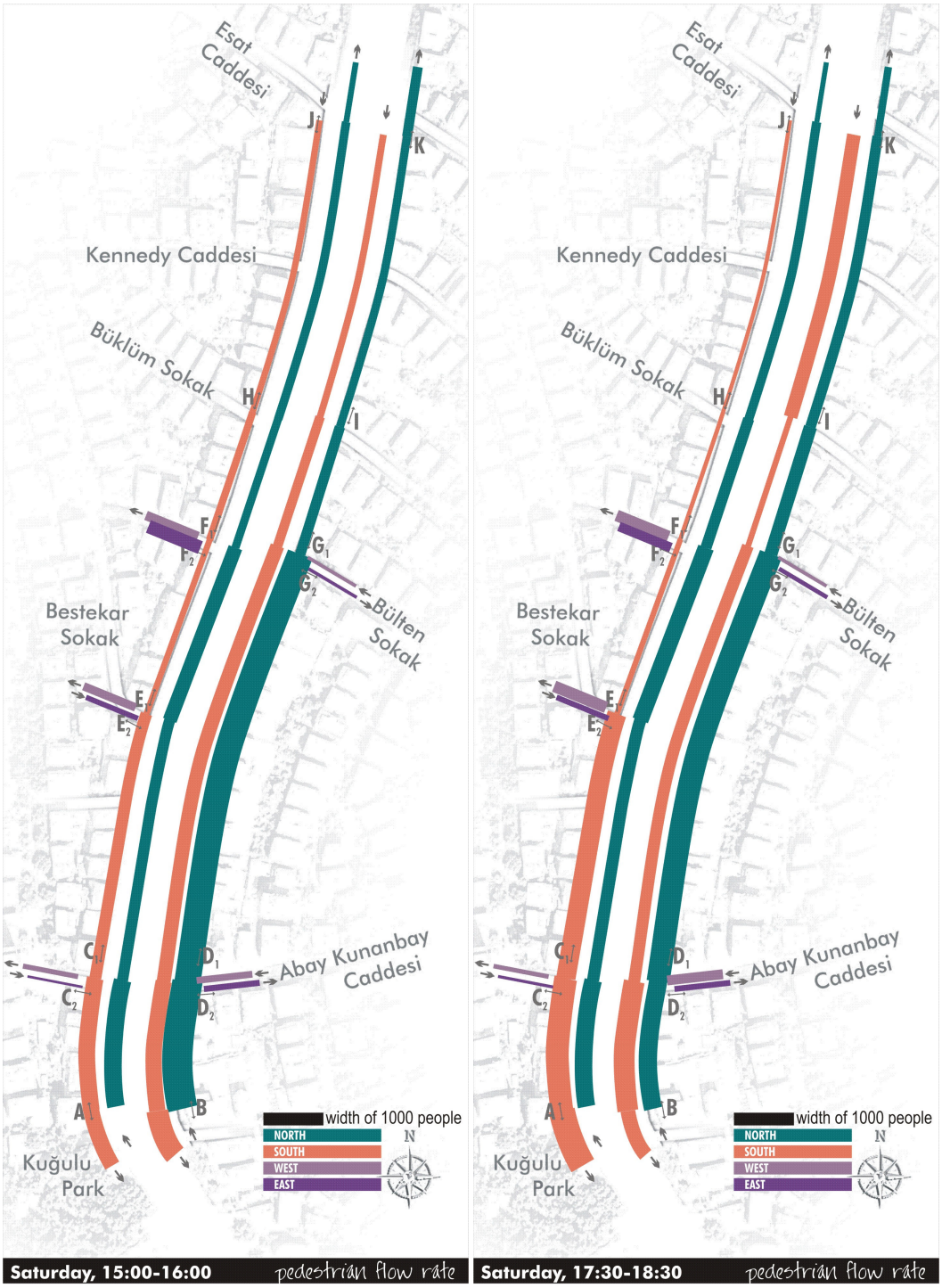


Figure 43: Pedestrian flow rate on Saturday between 15:00-16:00 (left)
Figure 44: Pedestrian flow rate on Saturday between 17:30-18:30 (right)

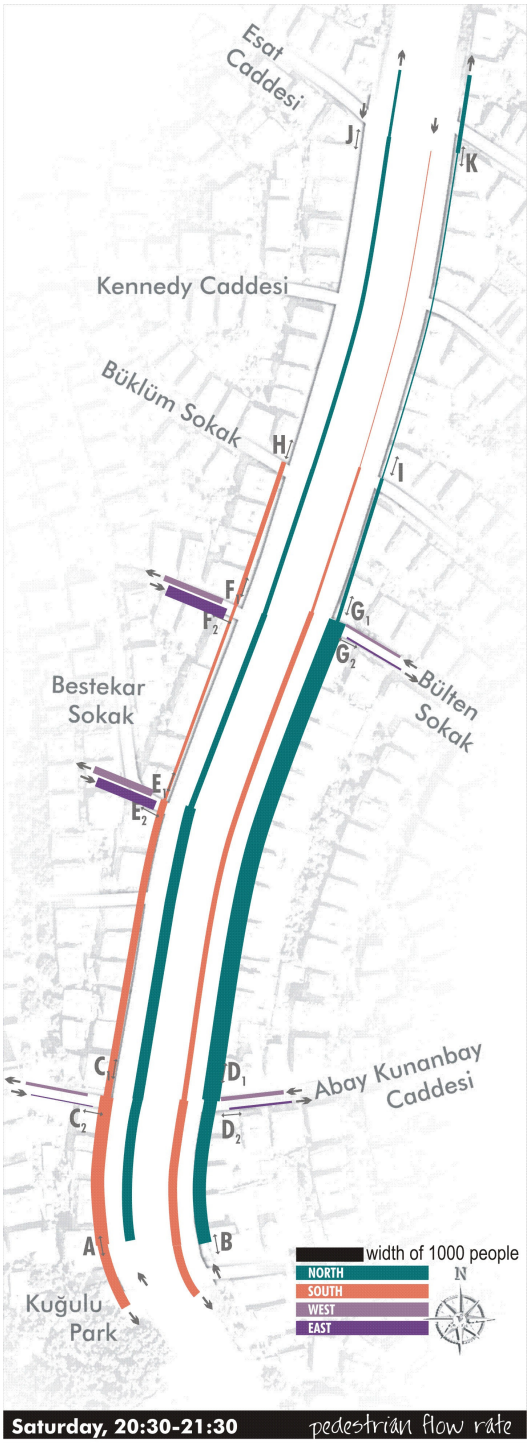
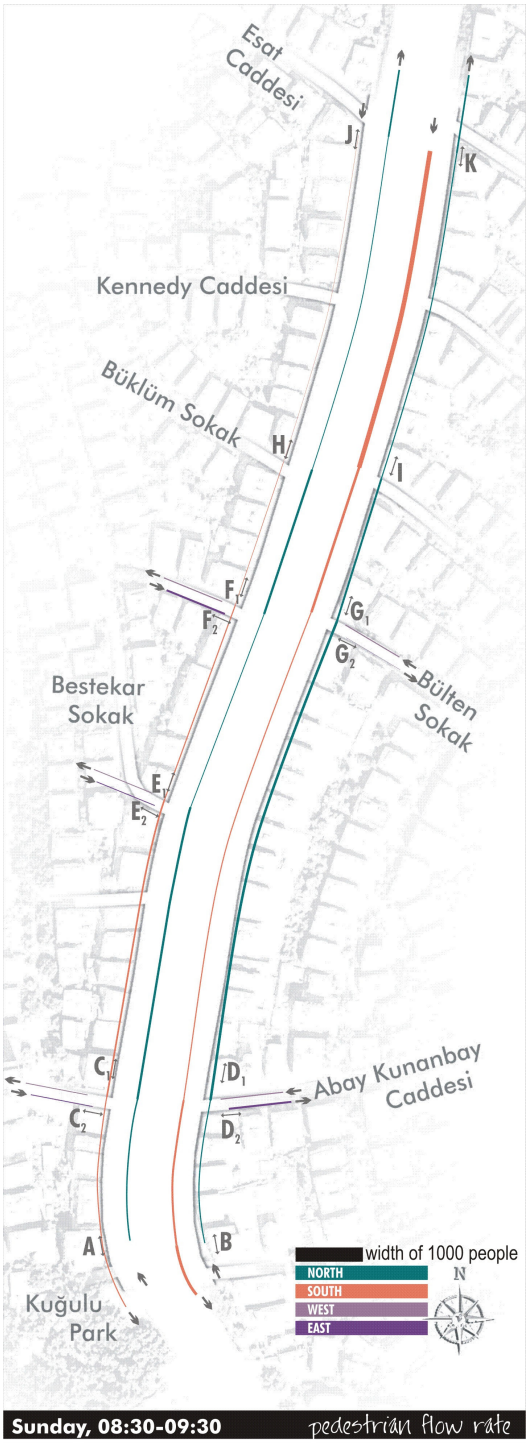


Figure 45: Pedestrian flow rate on Saturday between 20:30-21:30



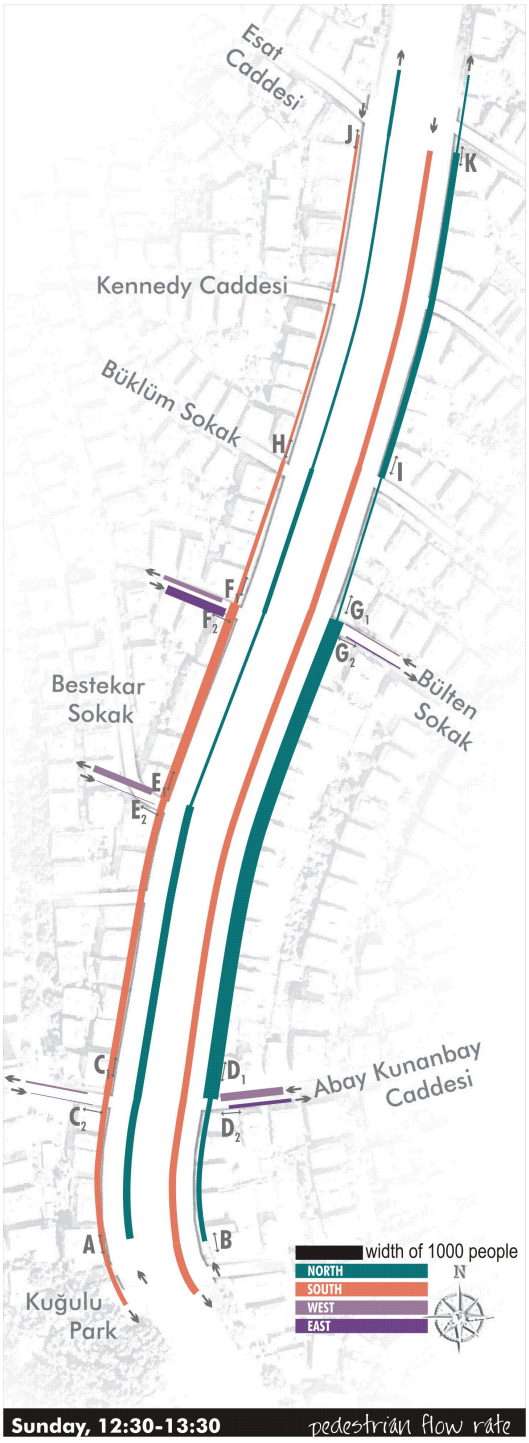


Figure 46: Pedestrian flow rate on Sunday between 08:30-09:30 (left)
Figure 47: Pedestrian flow rate on Sunday between 12:30-13:30 (right)

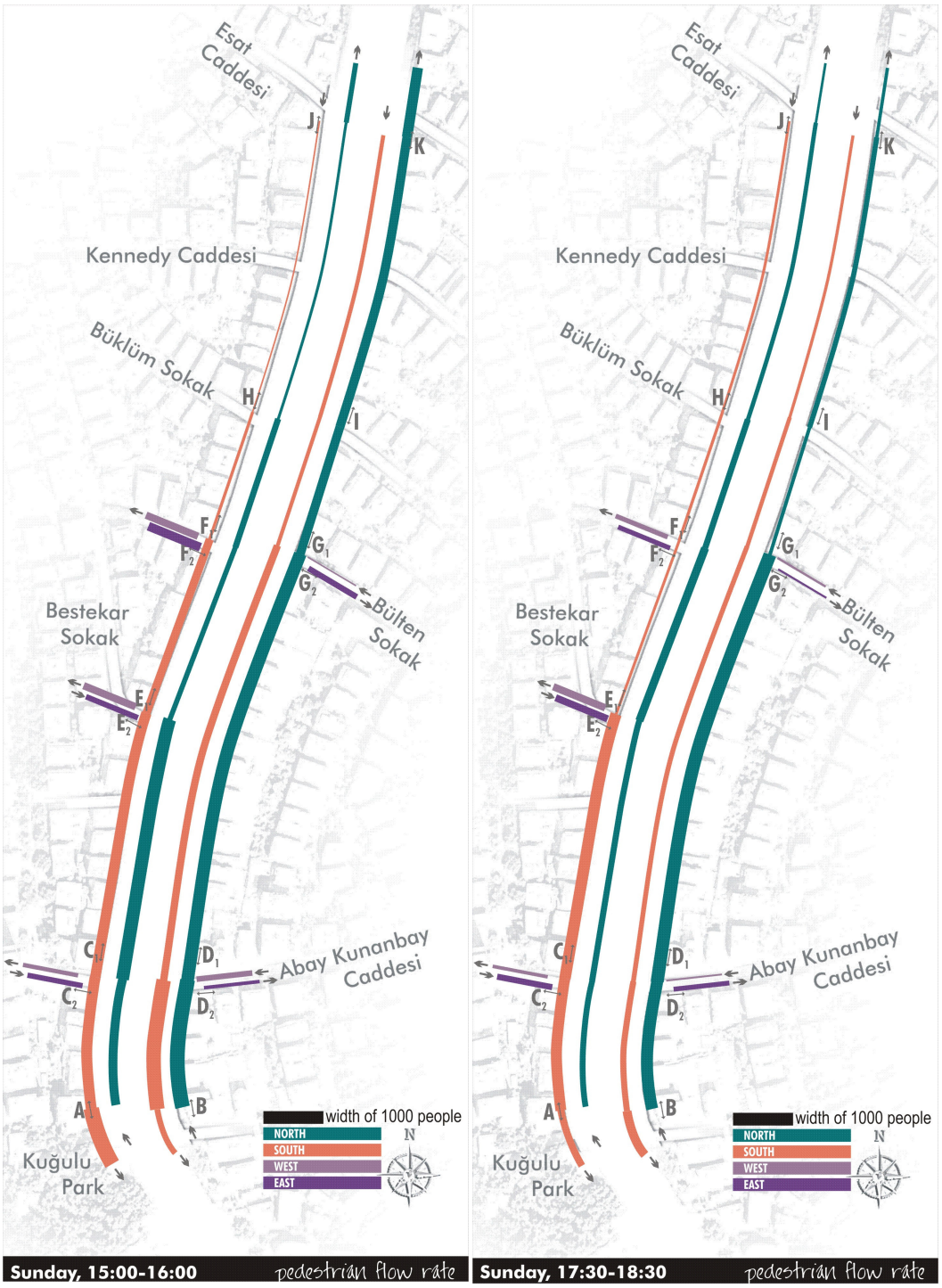


Figure 48: Pedestrian flow rate on Sunday between 15:00-16:00 (left)
Figure 49: Pedestrian flow rate on Sunday between 17:30-18:30 (right)

Pedestrian flow rate figures not only show the volume of pedestrians but also land use of the street with regards to days and hours. Two subsections are apparently seen in these figures, this differentiation is distinguished in next chapters, too. As it is seen on the figures, on weekdays between 12:30-13:30, increase is observed in two sections proportionally regarding to their own potentials. But, west side of the second section is not affected by this increase. This death part of the street shows itself also on the follow-up and static analyses. In the first section, east side is denser than the west almost for all days and hours, but mostly on Saturday between 15:00-16:00 and 17:30-18:30 surely because of land use factors.

Main entrance and exit doors of the street are on the south end in front of the Kuğulu Park and opposite of it. North end is not characteristic as much as the south. Secondary doors are on the intersection of Tunalı Hilmi Street and Bülten Street, Tunalı Hilmi Street and Bestekar Street.

The most sparse day and hour is Sunday between 08:30-09:30. There is no car traffic, and some people use the street to sport (walking, running). Throughout the day, pedestrian volume increases but do not reach to levels as much as other days do. Sunday is the day which carries the less volume between other days in terms of pedestrians.

5.2.2. Pedestrian movement analysis (2nd stage)

Figure 50: Follow-up on Thursday between 15:00-16:00 (left)
Figure 51: Follow-up on Thursday between 17:30-18:30 (right)

Figure 52: Follow-up on Saturday between 15:00-16:00 (left)
Figure 53: Follow-up on Saturday between 17:30-18:30 (right)

For all days it is interesting to see that elderly people mostly use the second section. This may be to avoid the more crowded first section. It is also possible that elderly come to the street to use the banks which are mostly on

this section, as well as to make use of lower-budget shops here. The finding does not reveal much regarding the utilisation of the street for elderly, since their coming to the street may be because of household duties (banks, shopping), but it is equally possible that the reason may be a daily routine and a need to exercise and walk. In either case, a certain number of elderly people use the street and this is an extremely positive finding regarding the social landscape and the potential of a central street / public area to bring different ages together. It is also possible that after a pedestrianization or a pedestrian improvement scheme, elderly would use the entirety of the street more often, which currently is crowded and possibly creating a feeling of insecurity for them.

Teenagers are mostly on the first part, which is not surprising considering the high number of fashion shops and cafes here. Women also use the first section and particularly the east side of the street, possibly because of the existence of mostly well-known brand marks here. Men mostly use west side of the street. On Thursday between 17:30-18:30, it seems that second section also becomes crowded because of being rush hour but not as much as first section. It seems that topographic separation between two section affect the circulation on the street as expected before.

In this stage, it is important to note that, pedestrian and car traffic almost navigates with same rates. This condition causes the conflicts between pedestrian and car traffic. It was seen that along the street, each pedestrian whose circulation was noted crossed over the street only once. On crowded days and between crowded hours, it becomes more difficult to cross over the street due to the fact that car traffic blocks the pedestrian crossing (It was observed that, in these crowded periods, one car becomes closer to the other,

and traffic still flows, not stop, hence, it becomes difficult to cross over between them). Rate of crossing in every follow-up are as follows: Thursday 15:00-16:00: 18/30, Thursday 17:30-18:30: 20/30; Saturday 15:00-16:00: 10/30, Saturday 17:30-18:30: 13/30. Rates show that, on Saturday which is the most crowded day regarding pedestrian and car traffic, the number of crossing over is decreased. Furthermore, as it is seen on the Figure 36 (land use), there are only three traffic lights along the street and two of them are on the second section.

5.2.3. Static analysis (3rd stage)

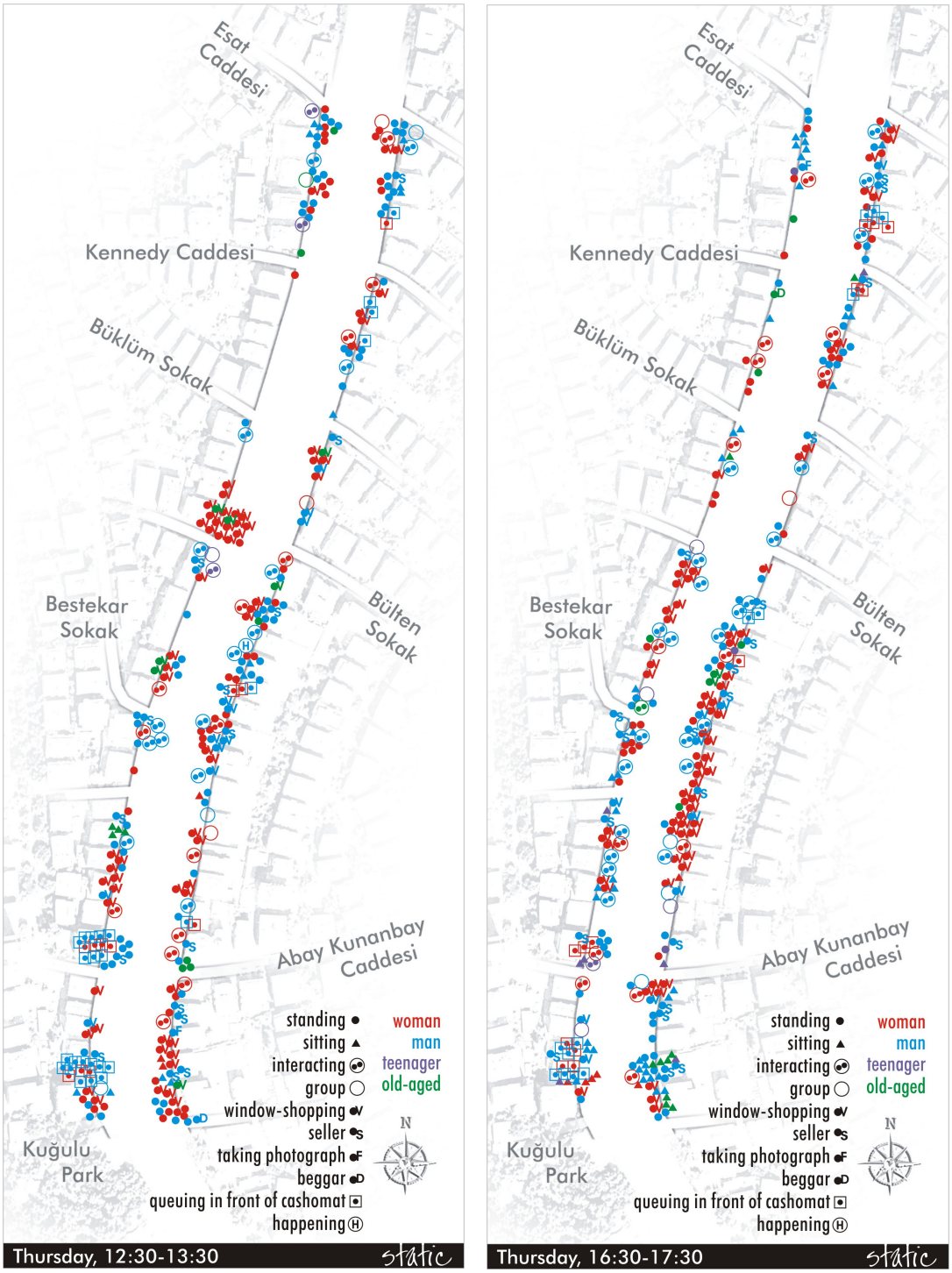


Figure 54: Static analysis on Thursday between 12:30-13:30 (left)
Figure 55: Static analysis on Thursday between 16:30-17:30 (right)

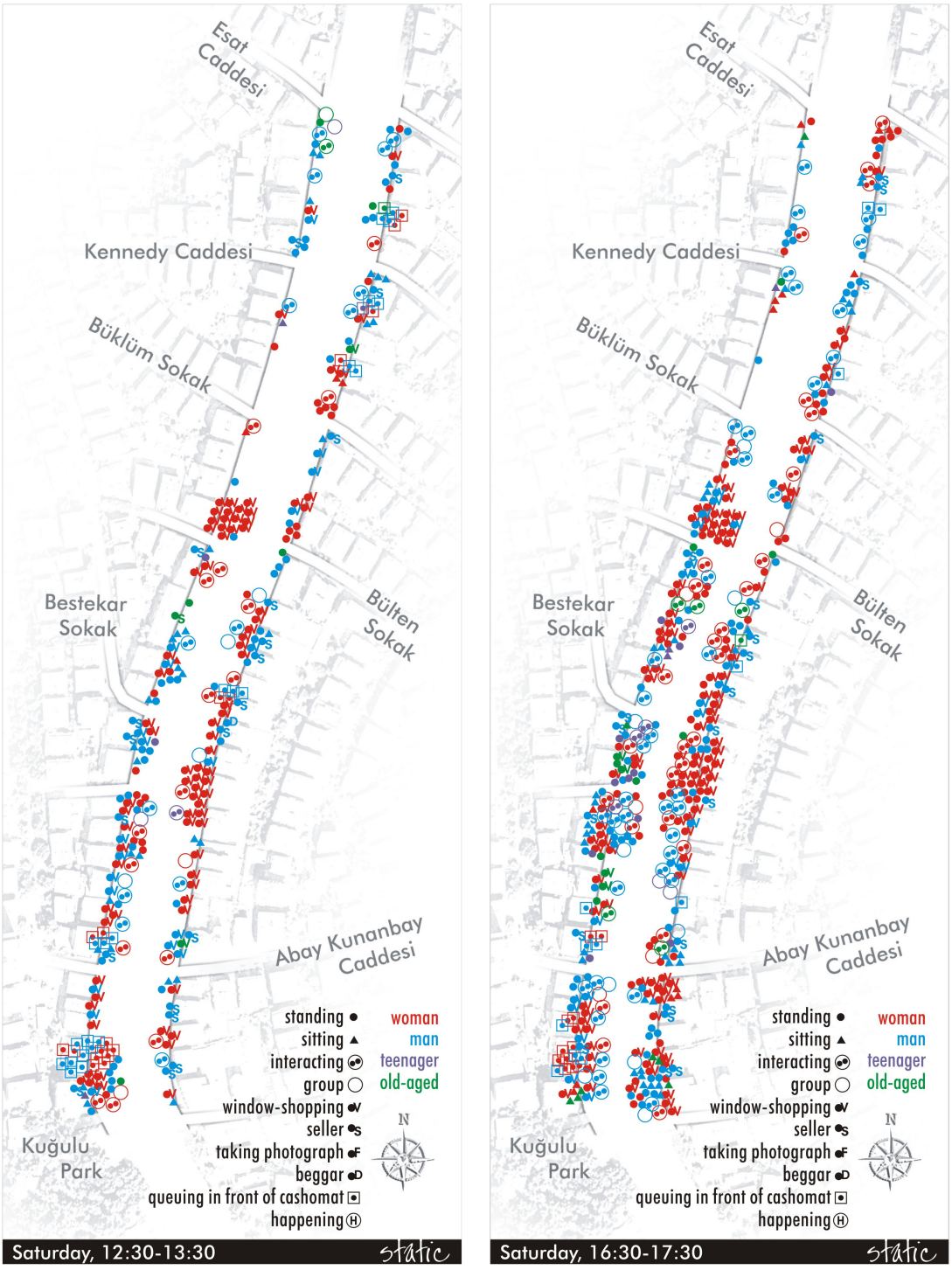


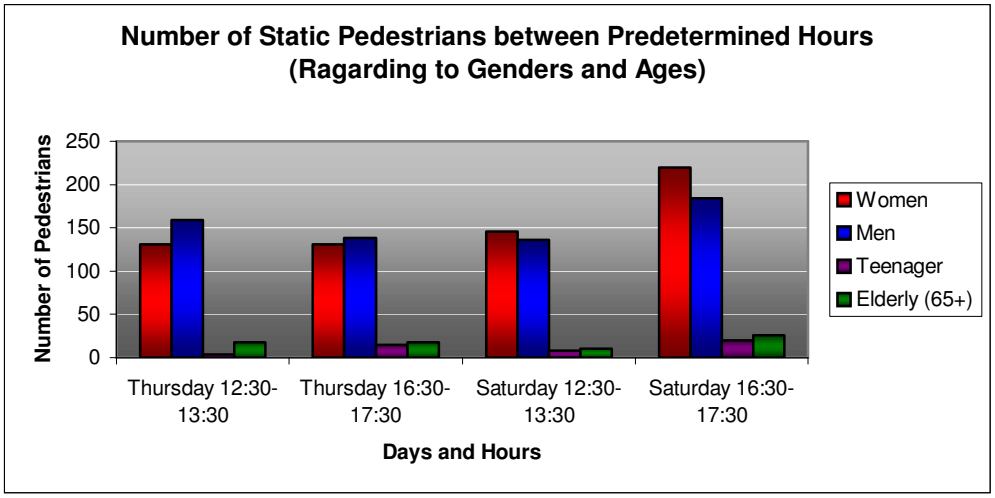
Figure 56: Static analysis on Saturday between 12:30-13:30 (left)
Figure 57: Static analysis on Saturday between 16:30-17:30 (right)

These figures clearly show the differentiation between sections according to days and hours. For both days, it is observed that there are various static activities at different levels of density. As it is expected before the analysis,

density of activities is more in the first section than the second one because of the factors mentioned in the land use chapter. Each figure shows that west side of the second section is not used even as much as the east side. Density of static activities is more than weekdays on weekends. It is observed that particularly on Saturday, between 16:30-17:30 women volume increases because of shopping character of the street. It is clear that window-shopping is the most salient activity.

As it is seen on the Table 11, it is noticed that the number of teenagers and elderly people is much lower than that of women and men. Both of them increase on weekend compared to weekday.

Table 11: Number of static pedestrians



Sitting activity mostly happens due to the fact that shop-owners put chairs on the pavements and less of them are on banks on the pavements with limited number or directly on the concrete floor.

Figures 58, 59: Sitting activities on Tunalı Hilmi Street (Personal Archive, 2007)

Figures 60, 61: Sitting activities on Tunalı Hilmi Street (Personal Archive, 2007)

While flow increase on weekday between lunch time, numbers of static activities decrease. Number of interaction increases on weekends but total interaction rate for all days is less than expected before the analyses. Interaction becomes available only on the places widening in front of the shops or patisseries as the extension of the pavements. As a result, these social interaction points and their frequency were observed to be rather limited: People get together, walk and leave the street. This is probably because there is not enough place to stop and linger particularly during crowded times and rush hours. People become just a part of the flow.

5.2.4. Pedestrian Space

After all these analyses, two points one being dense, the other being sparse are designated. At these points, the space per unit pedestrian is calculated by photography method between 17:30-18:30 on Saturday. Therefore the pavement levels of service at these points are identified. Before giving the field study data, the standards are given below regarding pedestrian space.

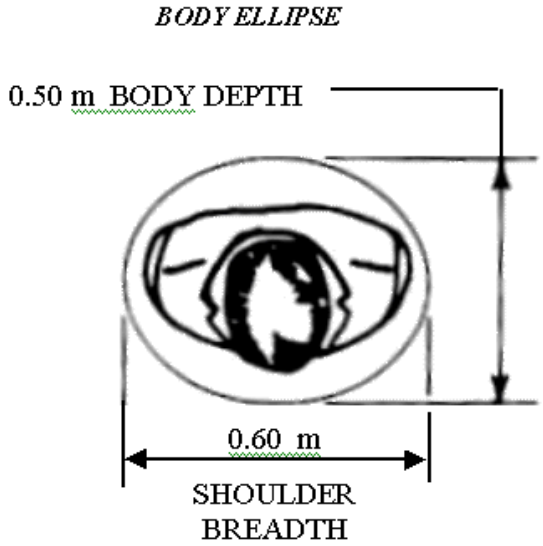


Figure 62: Required space per person (TRP, 2000)

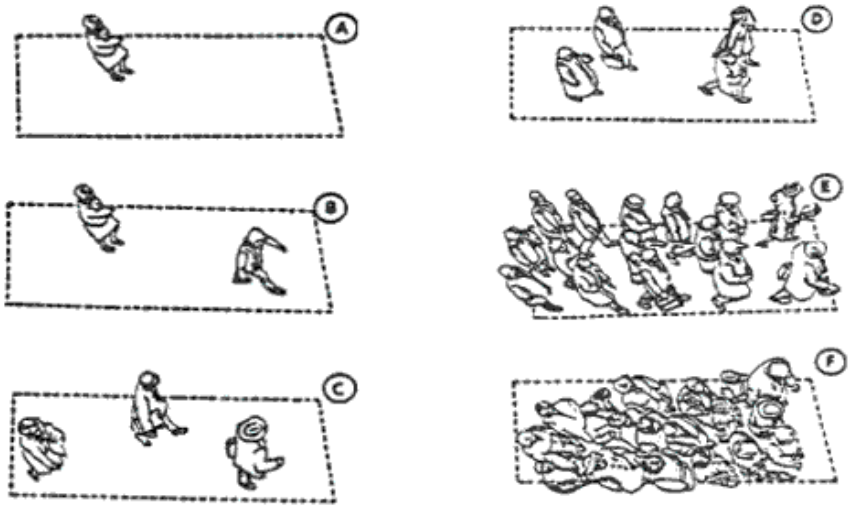


Figure 63: Illustration of walkway levels of service (TRP, 2000)

Table 12: Description of walkway levels of service (TRP, 2000)

LEVEL OF SERVICE	Pedestrian Space	Description
A	≥ 12.1 m2/ped (130 ft2/ped)	Walking speeds are freely selected; conflicts with other pedestrians are unlikely.
B	≥ 3.7 m2/ ped (40 ft2/ped)	Walking speeds are freely selected; pedestrians become aware of others and respond to their presence.
C	≥ 2.2 m2/ped (24 ft2/ped)	Walking speeds are freely selected; passing is possible in unidirectional streams; minor conflicts will exist for reverse or crossing movements.
D	≥ 1.4 m2/ped (15 ft2/ped)	Freedom to select desired walking speeds and to pass others is restricted; high probability of conflicts for reverse or crossing movements.
E	≥ 0.6 m2/ped (6 ft2/ped)	Walking speeds and passing ability are restricted for all pedestrians; foreword movement is possible only by shuffling; reverse or cross movements are possible only with extreme difficulties; traffic volumes approach limit of walking capacity.
F	≤ 0.6 m2/ped (6 ft2/ped)	Walking speeds are severely restricted; frequent, unavoidable contact with others; reverse or cross movements are virtually impossible; flow is sporadic and unstable.

Photographs covering 25 m² space that are taken from dense and sparse (pedestrian volume) points of Tunalı Hilmi St. are shown below with their time and day information:

Figure 64: Sparse and dense spaces in Tunalı Hilmi Street (left)
Figure 65: Sparse pedestrian space on Saturday between 17:30-18:30 (right, top) (Personal Archive, 2007)
Figure 66: Sparse pedestrian space on Saturday between 17:30-18:30 (right, bottom) (Personal Archive, 2007)

While in the sparse space the area per pedestrian is 3 m² (Level B), in the dense space, the value is 1.19 m² (Level E). But, for the street it is hard to categorize the levels of service because of the variability of pavement widths. Some of pavement widths are shown in Figure 67 below. Their variability is noticeable.

Figure 67: Pavement widths in Tunalı Hilmi Street (left)
Figures 68, 69, 70: Various pavements (right, from top to bottom) (Personal Archive, 2007)

Although it is difficult to provide an overall level of service assessment for the entire street, the analysis helps to identify certain areas as those with very low levels of service, and hence in urgent need of a pro-pedestrian action or scheme. Some of these areas are shown above through photographs. It is clear that full or partial pedestrianization or widening of pavements would significantly benefit pedestrian movement, and help improve the quality of pedestrian areas /pavements in these places.

5.3. Questionnaires

5.3.1. Pedestrian Questionnaire

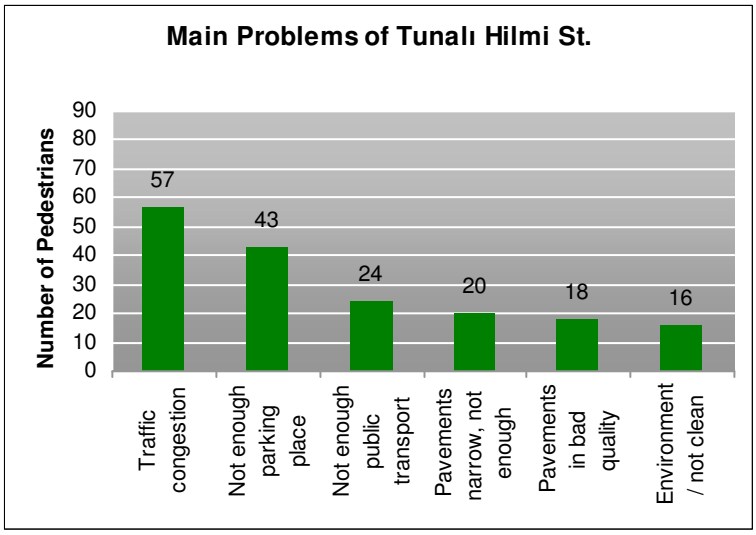
90 pedestrians have filled out the questionnaire. 43% of them were on Tunalı Hilmi Street for walking around, 16% were there to attend a school/course, 14% for clothes shopping and 14% for eating out. The results strongly indicate leisure activity as the purpose of trips to Tunalı Hilmi Street.

Tunalı Hilmi Street carries different ages and genders of people from various neighbourhoods of the city such as Kavaklıdere, Seyranbağları, Gaziosmanpaşa, Çankaya, Birlik Mahallesi, Yıldız Mahallesi, Oran Sitesi, Batıkent, Etlik, Kızılay, Oran, Yeni Mahalle, Kurtuluş, Cebeci, Akdere, Mamak, Dikmen, Eryaman, Elvankent, Çayyolu, Söğütözü, Örnek Mahallesi, Subayevleri, Tandoğan, Balgat, 100. yıl, Çukurambar, ODTU, Emek, Bahçelievler)

Of those who attended the questionnaire, 31% visit the street everyday, 24% twice-thrice in a week. 18% comes to Tunalı Hilmi Street from Küçükesat and others from various districts of Ankara. 77% does not own a car. 76% of pedestrians who own a car did not drive it to Tunalı Hilmi Street.

The pedestrians were asked what they thought the primary issues and problems were in Tunalı Hilmi Street. The answers are shown below (Numbers existing on the top of the columns on the tables give the number of applicant, percentages are given in the text):

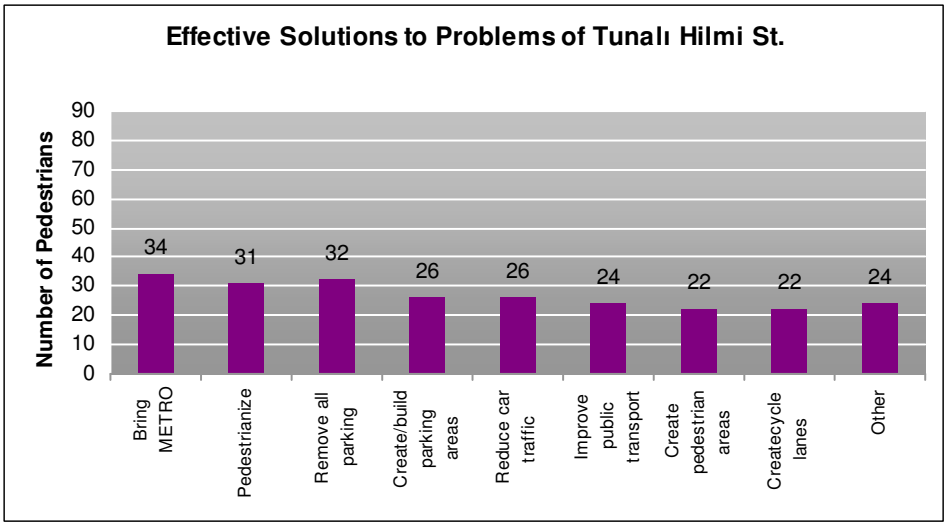
Table 13: Main problems in Tunalı Hilmi Street (pedestrian view)



According to pedestrians, main problems of the street are mostly "traffic congestion" (63%) and lack of enough parking place (48%).

When they were asked what they thought the effective solutions would be to the problems of Tunalı Hilmi Street, their answers were as follows:

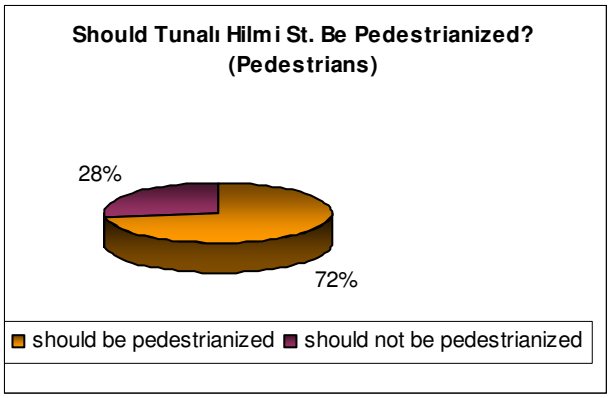
Table 14: Effective solutions (pedestrian view)



According to pedestrians, effective solutions to the problems of the street are mostly "bringing metro" (38%), "removing all parking along the street" (36%) and "pedestrianization" (34%). It is interesting to see that pedestrians recognise policies and investments to improve alternatives to the car as the most effective. With the exception of those suggesting more car parking areas, pedestrians mostly stated strategies to improve more sustainable modes of transport, and reduce car traffic. While this is promising from the point of public awareness regarding transport issues, it is perhaps not surprising since the majority of those who attended the questionnaire did not own a car.

When the pedestrians were asked to state their view regarding a full pedestrianization of Tunalı Hilmi Street, 72% of them stated that they would like to see the street pedestrianized. This is also a promising high rate. However, it appears that although they would support such a pedestrianization scheme, an important proportion of them find it impossible to implement: 61% of the pedestrians interviewed stated that it was not possible to pedestrianize the street when existing vehicle traffic was taken into consideration.

Table 15: Pedestrianization (pedestrian view)

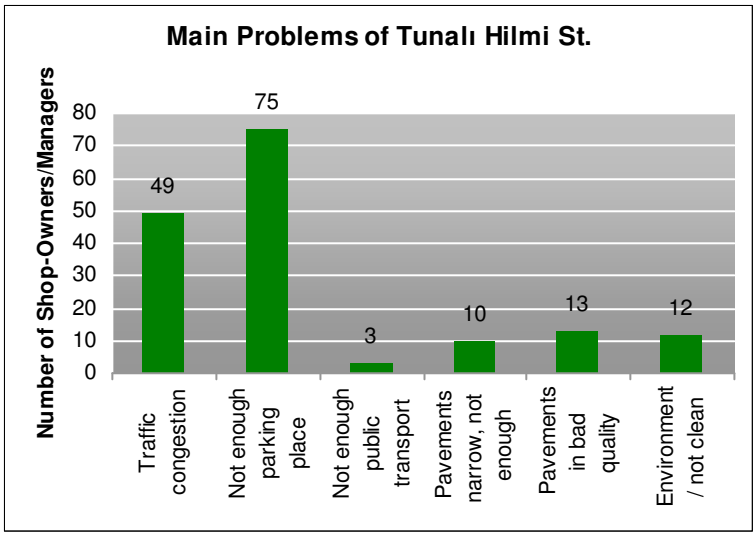


5.3.2. Shop-owner/manager questionnaire

80 shop-owners/managers along the street have filled out the questionnaire. 66% of them are tenants and the rest are owners. 66% come to their shop by the car, 18% by public transport and 16% of them by walking. 26% have had a shop on the street for 10-19 years, 20% for 5-9 years, 19% for 1-4 years, 18% for 20-29 years, 14% for 30-49 years and 3% for 50+ years. 26% of the shop-owners/managers that were interviewed were members of Kavaklıderem Derneği.

The main problems of Tunalı Hilmi Street, stated by the shop-owners/managers, are shown below:

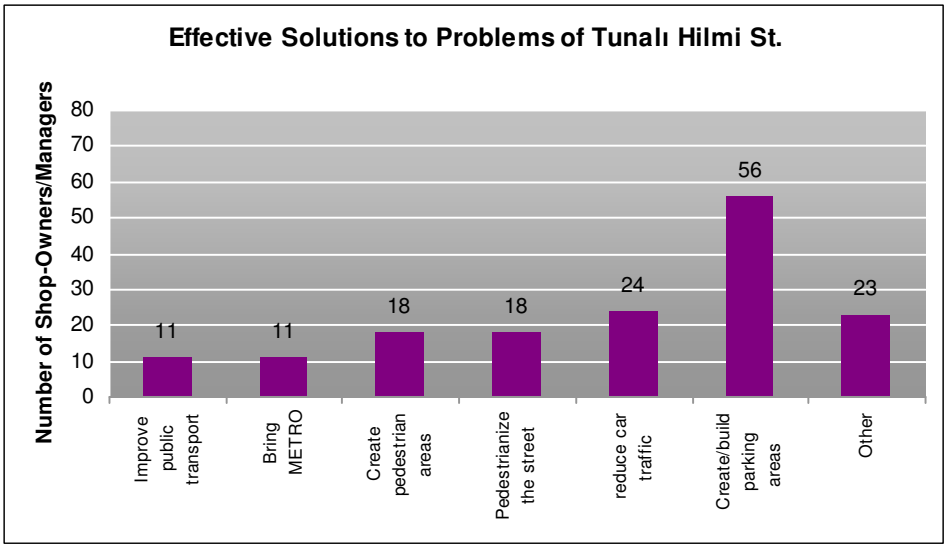
Table 16: Main problems of Tunalı Hilmi Street (shop owner/manager view)



According to shop-owners/managers, the major problem of the street is the lack of enough parking place (94%), which is not surprising since the majority of them drive their cars when coming to work. Secondly, traffic congestion is stated as an important (61%). 15% express the "environmental pollution" that heavy car traffic and garbage on the street cause as an important problem, while 13% stress the poor quality of pavements.

When the shop-owners/managers were asked to comment on what effective solutions can be developed to solve the problems of Tunalı Hilmi Street, they answered as follows:

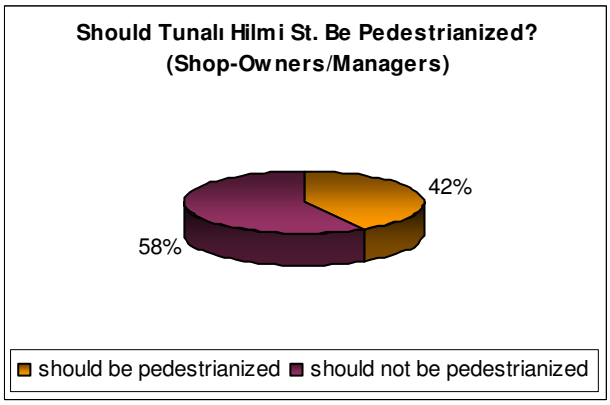
Table 17: Effective solutions (shop owner/manager view)



According to them, effective solutions to the problems of the street are mostly "creating more parking areas around the street" (70%) and "reducing car traffic" (30%). The two strategies would clearly be contradicting; however, they reflect what the shop owners see as priority issues in need of a solution. "Creating more pedestrian areas" and "pedestrianizing the street" are seen as solutions by only 18% of them.

Views of shop-owners/managers about pedestrianization of the street are shown below:

Table 18: Pedestrianization (shop owner/manager view)

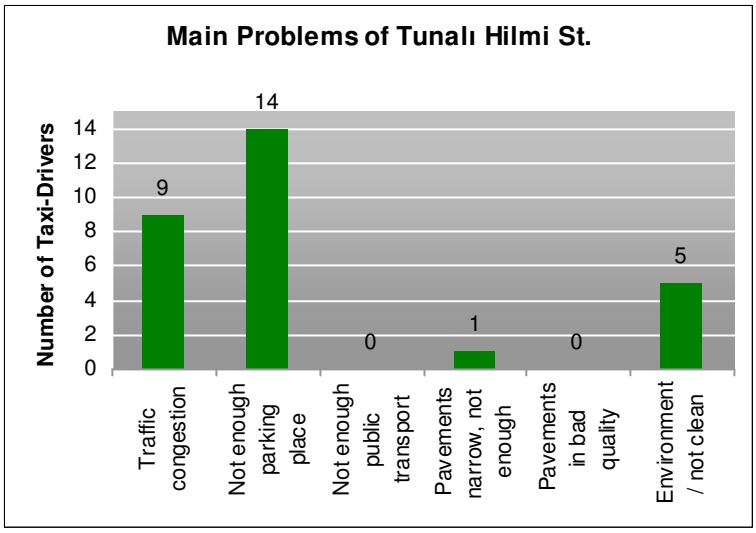


42% of 80 shop-owners/managers want the street to be pedestrianized and 58% does not want. 55% of 80 shop-owners/managers believe that it is not possible to pedestrianize the street when existing vehicle traffic (grade-separated junctions, traffic flow direction and so forth) is taken into consideration. The proportion of those who are in favour of pedestrianization is lower when compared to the results of the pedestrian questionnaire; nevertheless, 42% is quite a significant rate, showing that although the majority of the shop owners have a general negative reaction to pedestrianization as is the case in most places in the world, the proportion of them who would support such a scheme is also quite high, remaining slightly less than half. It is also interesting that while 61% of pedestrians were sceptical about the possibility of a pedestrianization scheme, this rate is only 55% for the shop owners. In other words, almost half of the shop owners believe that it would be possible to pedestrianize the street regardless of the current vehicular traffic demand.

5.3.3. Taxi-driver questionnaire

15 taxi-drivers along the street have filled out the questionnaire. Regarding the main problems of Tunalı Hilmi Street the taxi-drivers gave the following answers:

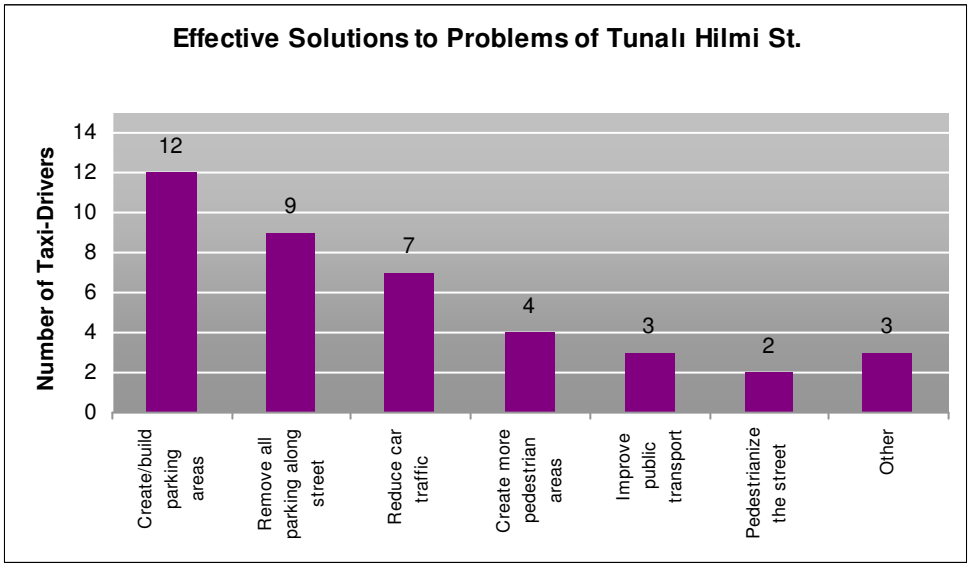
Table 19: Main problems of Tunalı Hilmi Street (taxi-driver view)



93% of them stated the lack of enough parking place as a major problem, and 60% emphasised traffic congestion as the main problem of the street.

When they were asked to state effective solutions to problems of Tunalı Hilmi Street, they answered as follows:

Table 20: Effective solutions (taxi-driver view)

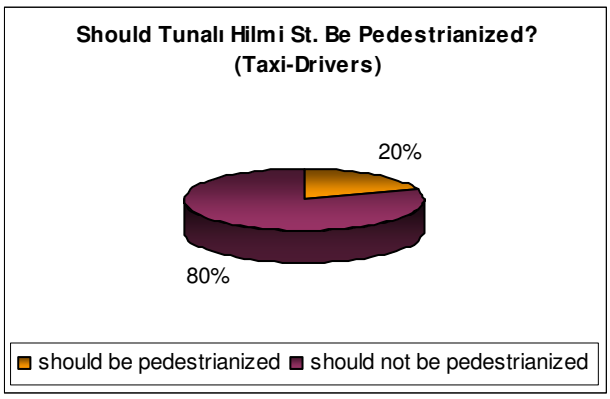


According to them, the most effective schemes to solve the problems of Tunalı Hilmi Street are related with car parks. 80% stated that creating more

parking areas around the street is crucial, while 60% stated that all parking along the street should be removed. It appears that the taxi drivers believe car parking should not be on street, but provided in other areas of Tunalı Hilmi Street. In addition, taxi drivers consider "reducing car traffic" as an important strategy to solve the problems here (47%). The results are not surprising and represent the priorities of taxi drivers, which are mostly related to them moving and manoeuvring freely along the street to serve their customers in the most effective way.

Consequently, views of taxi-drivers about the pedestrianization of the street are not positive, as shown below:

Table 21: Pedestrianization (taxi-driver view)



80% 15 taxi-drivers do not want the street to be pedestrianized, since they believe that such an arrangement would diminish their business. 54% believe that it is not possible to pedestrianize the street when existing vehicle traffic is taken into consideration.

Awareness of bicycle usage as a non motorized transport option is also inquired in the questionnaires. Only 13% of all applicants see bicycle as an effective solution to existing transport problems. 11% are pedestrian

applicants. Although the proportion of those who are in favour of cycling is low, majority of them (59%) are teenagers as would be expected. This finding reflects the reality of existing transportation approach.

5.4. Summary of Case Study Findings

5.4.1. Results of Land use Analysis

- Tunalı Hilmi Street has the distinct mixed land use patterns and city centre character different from its immediate surrounding area. These land-use characteristics provide opportunities for a pro-pedestrian approach, as seen in the results of the pedestrian surveys.
- The street carries a significant volume of pedestrians because of its city centre character, location and diversity of land uses.
- Based on its land-use characters, the street can be categorised into two different subsections: first section is the area between Kuğulu Park on the south end of the street and Bülten Street, which intersects Tunalı Hilmi Street; and the second section is the area between Esat Street on the north end of Tunalı Hilmi Street and Bülten Street. The distinction is due to the differences in the land-use types, as well as types of retail, and the level of diversity of different uses. The first section represents a higher diversity of land-uses and retail types. In addition it has a more suitable topographic condition for pedestrian activity. Probably due to both factors (diversity of land-use and topography) the first section has the highest volume of pedestrians.
- Main entrance and exit doors of the street are on the south end in front of the Kuğulu Park and opposite to it.
- North end is not as heavily used as the south.

- Secondary doors are on the intersection of Tunalı Hilmi Street and Bülten Street, Tunalı Hilmi Street and Bestekar Street.

5.4.2. Results of the Pedestrian Survey

- Saturday is the most crowded day in terms of pedestrian volume in the street.
- For each category of people, pedestrian volume increases between 15:00-16:00 on weekends, which can be best described as a time for leisure and recreation activities.
- On weekdays between 12:30-13:30, increase is observed in both sections of the street proportionally regarding to their own potentials. But, west side of the second section is not affected by this increase. This rather "dead" part of the street shows itself on each survey stage.
- On weekdays the street becomes most crowded during the lunch break hour. Total volume is also heavy in the evening rush hour between 17:30-18:30 on weekdays but not as much as lunch break hour.
- On Saturday, total volume is the highest between 15:00-16:00 due to this period is preferred for leisure/recreation/shopping activities.
- Except for Saturday, pedestrian volume for men is more than the pedestrian volume for women.
- On Saturday, especially between 12:30-17:30, pedestrain volume created by women increases due to shopping activity.
- Saturday evening, while the number of male pedestrians is high in Tunalı Hilmi, number of women decreases.
- In the first section, east side is denser than the west almost for all days and hours, but mostly on Saturday between 15:00-16:00 and 17:30-

18:30. This can be clearly linked to the higher variety of uses and existence of high-end retail shops at this part of the street.

- The most sparse day and hour is Sunday between 08:30-09:30. There is also limited car traffic, and some people use the street to sport (walking, running).
- Throughout Sunday, pedestrian volume increases but do not reach to levels as much as other days do. Closing of some of the shops on Sunday seems to be the reason behind this.
- In all days, volume of elderly pedestrians increases between 15:00-16:00. For all days they mostly use the second section. This may be to avoid the more crowded first section. It is also possible that elderly come to the street to use the banks which are mostly on this second section, as well as to make use of lower-budget shops here. The finding does not reveal much regarding the utilisation of the street for elderly, since their coming to the street may be because of household duties (banks, shopping), but it is equally possible that the reason may be a daily routine and a need to exercise and walk. In either case, a certain number of elderly people use the street and this is an extremely positive finding regarding the social landscape and the potential of a central street / public area to bring different ages together.
- Teenagers are mostly on the first part, which is not surprising considering the high number of fashion shops and cafes here.
- Women use the first section and particularly the east side of the street, possibly because of the existence of well-known high-end brand marks here.
- On weekdays between 17:30-18:30, second section also becomes crowded because of rush hour but not as much as the first section. It

seems that topographic separation between the two sections affect the circulation on the street as expected before conducting the analyses.

- The rates of pedestrians crossing the vehicle road are as follows according to the follow-up survey: Thursday 15:00-16:00: 18/30, Thursday 17:30-18:30: 20/30; Saturday 15:00-16:00: 10/30, Saturday 17:30-18:30: 13/30. Rates show that, on Saturday, which is the most crowded day regarding pedestrian and car traffic, the number of crossing over decreases.
- Each pedestrian whose circulation was noted crossed over the street once at most (either did not cross or crossed only once). On crowded days and crowded hours, it becomes more difficult to cross over the street due to the fact that car traffic blocks the pedestrian crossing (It was observed that, in these crowded periods, cars become closer to each other, and while traffic slows down it still flows, without stopping, and the limited areas between queeing cars do not provide an adequate and safe passage for the pedestrians. Hence, it becomes difficult to cross the street).
- There was not a significant difference between different genders or age groups in terms of their crossing the street. As would be expected, elderly were the most reluctant to cross the street; however, the fact that other groups also crossed the street seldomly may indicate the negative and limiting effect of vehicle traffic on pedestrian movement and mobility.
- Density and variety of static activities is more in the first section than the second one.
- Density of static activities is more on weekends than weekdays.
- Window-shopping is the most salient activity among all static activities and mostly performed by women.

- The number of teenagers and elderly people is much lower than that of women and men. Both of them increase on weekend compared to weekday.
- There are few benches on the street, almost always used by pedestrians but are very limited and hence never meet the demand. Some shops put their own chairs on the street but pedestrians mostly hesitate to use these, as they are not public street furniture.
- Sitting activity mostly happens due to the fact that shop-owners put chairs on the pavements. To a lesser degree, pedestrians sit on the benches as mentioned above.
- While flow increase on weekday between lunch time, numbers of static activities decrease. This is understandable since the high pedestrian flow make it difficult to linger or stop frequently.
- Number of interaction increases on weekends, but overall interaction between pedestrians is less than expected before the analyses.
- Interaction has been noted only on places widening in front of the shops or patisseries as the extension of the pavements. This shows that the limited width of pedestrian pavements particularly in the first section may be a factor hindering further social interaction.
- Pavement quality and service levels vary throughout the street. Many points provide poor standards and cannot cope with the pedestrian flow.

5.4.3. Questionnaires

- Nearly all applicants of the questionnaires stressed the car traffic as a major problem in Tunalı Hilmi Street.
- Tunalı Hilmi Street carries different ages and genders of people from

various neighbourhoods of the city such as Kavaklıdere, Seyranbağları, Gaziosmanpaşa, Çankaya, Birlik Mahallesi, Yıldız Mahallesi, Oran Sitesi, Batıkent, Etlik, Kızılay, Oran, Yeni Mahalle, Kurtuluş, Cebeci, Akdere, Mamak, Dikmen, Eryaman, Elvankent, Çayyolu, Söğütözü, Örnek Mahallesi, Subayevleri, Tandoğan, Balgat, 100. yıl, Çukurambar, ODTU, Emek, Bahçelievler)

- Pedestrian questionnaire revealed that pedestrains are aware of the necessity of pedestrianization of the street; and would support such a scheme. That is probably not surprising since the majority of them do not own a car and hence do not drive there. However, it is important to note that 61% of pedestrians who own a car also support pedestrianization in the street. This is such a positive finding, too.
- Pedestrians recognise policies and investments to improve alternatives to the car (public transport, non-motorized options) as the most effective.
- Although the majority of the shop owners have a general negative reaction to pedestrianization as is the case in most places in the world, the proportion of them who would support such a scheme is also quite high (42%), remaining slightly less than half.
- Shop owners complain about the lack of enough parking place (94%), which is not surprising since the majority of them drive their cars when coming to work.
- Shop-owners also complain about the current parking ban application on the street which is not surprising when their priorities are taken into consideration. They state that this application causes their sales to decrease. They want either lifting of the ban or creating more parking areas around the street.
- While 61% of pedestrians were sceptical about the possibility of a

pedestrianization scheme in Tunalı Hilmi Street, this rate is only 55% for the shop owners. In other words, almost half of the shop owners believe that it would be possible to pedestrianize the street regardless of the current vehicular traffic demand.

- Taxi-drivers complain about the traffic congestion in the street (60%) and according to them all parking along the street should be removed (60%). They believe car parking should not be on street, but provided in other areas of Tunalı Hilmi Street. The results are not surprising and represent the priorities of taxi drivers, which are mostly related to their vehicles moving and manoeuvring freely along the street to serve their customers in the most effective way.
- The majority of the taxi drivers have a general negative reaction to pedestrianization as is the case in most places in the world. They believe that such an arrangement would diminish their business.
- Only 13% of all applicants see bicycle as an effective solution to existing transport problems. 11% are pedestrian applicants. Although the proportion of those who are in favour of cycling is low, majority of them (59%) are teenagers as would be expected. This finding reflects the reality of existing transportation approach.

CHAPTER 6

CONCLUSION

This thesis aimed at highlighting the increasing emphasis on non-motorized transport modes in urban transport planning around the world. In this context, the study assessed potentials, possibilities and opportunities for creating a pedestrian environment in Ankara, Tunalı Hilmi Street. For this purpose, detailed pedestrian surveys/analyses throughout the street and questionnaires with potential stakeholders including pedestrians, shop-owners and taxi-drivers were carried out. Through these analyses, it was assessed whether or not Tunalı Hilmi Street is a suitable area for pro-pedestrian arrangements. The main findings of these analyses have been presented in the previous chapter. In the light of these findings, more general outcomes are discussed in the following sections, which revisit the hypotheses of the research and outline some possible policy and planning recommendations for pro-pedestrian approaches.

6.1. Reassessment of Hypotheses

After the analyses, the hypothesis can be reassessed as following:

1. It was assumed that Tunalı Hilmi Street has the ability to get different ages, and genders of people together in the basis of community interaction; and that it provides opportunities to match the demand for social interplay; and therefore can be a proper candidate for a pedestrianization project. After the analyses, it is seen that Tunalı Hilmi Street indeed provides a base for social interaction

although this may not be as strong as expected before the analyses.

a. There is a significant pedestrians flow in this street throughout the week (except for Sundays when most of the shops are closed)
b. Most pedestrian activity seem to be leisure/recreation related; especially on Saturday afternoons the street witnesses a strong pedestrian existence, with movements focusing around shops and cafes
c. While a diversity can be seen in the genders of those using the street, the diversity is limited and less than expected in terms of different age groups: it is seen that elderly use the street less than expected. The fact that they prefer the less crowded section of the street, may suggest that if pedestrian conditions are improved and pavement capacities increased, they may feel more comfortable using the entire street.
d. Social interaction points and their frequency were observed to be rather limited: People get together, walk and leave the street. This is probably because there is not enough place to stop and linger particularly during crowded times and rush hours. People become just a part of the flow.

2. It was assumed that there is growing awareness by users in terms of pedestrianization; and therefore it was assumed that a pedestrianization project would receive strong support from users. After the analyses, this hypothesis is confirmed. %72 of the pedestrian applicants supports any pedestrian-friendly arrangement on the street. But, they are mostly (%61 of all pedestrian applicants) sceptical, believing that it is impossible to apply pedestrian-friendly arrangements into the street due to current car traffic.

3. It was assumed that because of the already high density of pedestrians in shopping street and the existing neighbourhood organization Kavaklıderem Derneği (majority of members consist of shop-owners along the street), the shop-owners will also have a high level of awareness of pro-pedestrian solutions and their benefits, and hence support such arrangements. After the analyses, it is seen that shop-owners do not have a very high level of awareness regarding pedestrian solution. The proportion of those who are in favour of pedestrianization (42%) is lower when compared to the results of the pedestrian questionnaire; nevertheless, it is not a very low rate either, showing that only slightly more than half of the shop owners would oppose a pedestrianization scheme while almost half of them would support such a scheme.

Following these main hypotheses, reassessment of other minor hypothesis and concerns in this research are as follows:

- It was also assumed in this research that pedestrian activity and density may significantly change across the street: Tunalı Hilmi Street can be categorised into two sub-sections as the north part (with a limited level of diversity of land uses and a slight topography) and the south part (a high level of diversity of land-uses and suitable topographic conditions for walking); and it was assumed that there may be significant differences in pedestrian activity and level of utilisation in these two different sections/parts, which can help guide future pedestrianization projects. All pedestrian analyses show that, this kind of distinction is very clear. The first section (the area between Kuğulu Park on the south end of the street and Bülten Street, which intersects Tunalı Hilmi Street) accommodates various and more

diverse leisure activities in addition to shopping. Here, shops provide a variety of different retail categories (clothes fashion shops, shoe shops, jewellery and accessories, opticians/fashion eyewear, watch shops, camera stores, gift shops, perfume shops, various beauty parlours) and numerous cafes and patisseries. This section represents well known and high-image brands and shops. Other uses, such as banks are limited here. The second section (the area between Esat Street on the north end of Tunalı Hilmi Street and Bülten Street) include small-scaled shops. These shops represent less well-known brands, and provide more affordable and family goods, varying from low-budget children's clothing and gift shops to home ware such as electronics and white goods which are small-scaled. As a result, retail characteristics of shopping places are different among first and second sections. These kinds of differences lead pedestrians to use the first section more frequently. In addition to these factors, the sloping nature of the second section may also cause pedestrians to avoid using this part.

- It was also assumed that when pedestrian analysis is carried out, conflicts will be observed with vehicular traffic. It is expected that at times of high vehicular traffic flow, pedestrian movement, particularly when crossing the street, would be constrained and limited. After the analyses, it is seen that crossing the street is limited almost at all times. However, particularly on crowded days and crowded hours, it becomes more difficult to cross over the street due to the fact that solid but moving car traffic blocks the pedestrian crossing.
- It was particularly assumed that constraints to movements by the vehicular traffic will be seen for the case of elderly pedestrians. After the analyses, it is seen that elderly pedestrians mostly use the second

section where pavements are wider than the first section. Therefore, they do not get exposed to both pedestrian and car traffic. It is seen that each pedestrian whose circulation was noted crossed over the street only once. Rate of elderly crossing over is lower than other pedestrian groups; however, the overall finding is that almost all pedestrians avoid crossing the street. It can be concluded that the vehicle traffic in Tunalı Hilmi Street is limiting the movement and mobility of not only the elderly but all other pedestrian groups.

- It was assumed that cycling is not considered as an effective transport policy and planning tool for Tunalı Hilmi Street and only teenagers would support bicycle lanes. After the analyses, it is seen that only 13% of all applicants see bicycle as an effective solution to existing transport problems. 11% are pedestrian applicants. Although the proportion of those who are in favour of cycling is low, they are mostly teenagers (59%).

6.2. Planning and Policy Recommendations

Analyses show that Tunalı Hilmi Street has walking oriented characteristic. It has mixed land uses such as shops, cafes, restaurants, sport centres, and various leisure trip opportunities; it has the base for interaction between different ages and genders of people and it is dense in terms of pedestrian capacity. This means that it is a walking street; and not just a passageway for cars. Average trip distances are very proper for pedestrians to walk on the street. Unfortunately, there is conflict between pedestrian and car traffic in the street due to the fact that both of them are heavy and their density and hourly dispersal are similar to each other. But, this similarity affects pedestrians more than car-owners due to the fact that their movement and

mobility are greatly limited and threatened by the vehicle traffic. Existing heavy traffic creates barriers to walking, and makes it unpleasant and unsafe to walk due to noise, speed and visual effects.

The prevailing car-oriented transport planning approach of the Ankara Metropolitan Municipality further strengthens these barriers to walking in Ankara, and in this case Tunalı Hilmi Street. While many countries in the world are becoming aware of problems associated with traditional traffic planning approaches and car-oriented/motorized solutions to traffic problems, it is seen that such approaches are still seen as solutions in Ankara. The metropolitan municipality still continues to make vast investments for vehicles in the city centre to create non-stop vehicle traffic. Pedestrians are directed to use pedestrian bridges or underground subways, which have become the main elements of pedestrian circulation in the city centre. In the case of Tunalı Hilmi Street too, although the street represents various strong city centre characteristics, it is rapidly becoming a passageway only for vehicles. Building a grade-separated junction at the vicinity of this central location clearly proves the anti-pedestrian attitude of the municipality. These junctions not only encourage car traffic in the city, but create severe accessibility problems for pedestrians too. Through the Kuğulu Park grade-separated junction, pedestrian crossings were removed throughout the boulevard. This junction also shifts the traffic to Tunalı Hilmi Street, which is now suffering severely from car traffic. Negative effects of this heavy vehicle traffic, combined with new shopping centres built outside the city, cause the Tunalı Hilmi Street to lose its pedestrian potential, which has been found to be significant in this study. Unfortunately, the local government and decision-makers lack the imagination and vision that liveability in cities can only be reclaimed by accommodating pedestrians and integrating the non-

motorized options with public transport.

Learning from the previous experiences in the world around, pedestrians should be the privileged users of the city centres. This is inevitable for Tunalı Hilmi Street, too. In order to regain this important city centre, a pedestrianization scheme should be enabled here. It would be one of the most effective alternatives to revitalize this street, by helping increase the quality of life in this neighbourhood and also in the city. This would lead to create greater social interactions, improved personal, social and environmental health. Experiences in the world show that commercial activities can also be revitalized by pedestrianization schemes.

Walking as a non-motorized transport is becoming increasingly important, and many cities in the world are rediscovering the benefits of fully or partially pedestrian areas through pedestrianization projects. However, such schemes that ban vehicular traffic are not always easy to implement, particularly due to oppositions from local shop owners. For the case of Tunalı Hilmi Street too, there appears to be a reluctance of shop-owners for a pedestrianization project; however, this finding should be treated with caution. Local trade and shop owners tend to be reluctant in supporting pedestrianization projects. However, once such a scheme is implemented, it is generally seen in the world as well as in previous experiences in Ankara, that economic activity improves and the shop owners' sales increase. Hence it is very important to increase shop owners' awareness regarding the benefits of similar project experiences. It is seen that public awareness in not as high as expected. However, it is possibly higher than other places in Ankara, since having 42% of shop owners supporting a pedestrian-friendly scheme should not be underestimated.

It is important to note that, it is not enough to just pedestrianize these

areas. Connections with other parts of the city by public transport not just by car should be provided. Car parks should be created either around this street, or more preferably at the stations/stops of public transport systems that provide access to the street.

Pedestrian surveys in Tunalı Hilmi Street revealed that at many points along the street, pavement standards were poor and unable to meet the demand. By analysing only the changing pavement widths and standards, it is clear that a pedestrian/pavement improvement is required in Tunalı Hilmi Street. However, this need becomes more acute when high volumes of pedestrian traffic are taken into account. Especially Saturdays appear as the most crowded days, when the pedestrian facilities (from pavements to street furniture) become inadequate. Intense pedestrian flow particularly on Saturdays and certain times in the weekdays support the assumption that pedestrianization or other pro-pedestrian schemes in this street are necessary.

The finding that pedestrian flow decreases on Sundays should not be interpreted as a low potential for pro-pedestrian arrangements. In fact, vehicle traffic was also observed to diminish on Sundays. A probable pedestrian-friendly arrangement can attract pedestrians to come to the street on this day too, especially when supported with various vitalising applications such as street festivals, street exhibitions, street concerts and so forth.

It is evident that such pro-pedestrian schemes together with additional urban activities can help capture the potential that is already carried by the street. If such schemes are not introduced, the current (and already reducing) potential will be lost, and Tunalı Hilmi Street will inevitably become just a passageway for cars. This is an undesirable result for the city; and

when assessed from the point of view of different stakeholders in this street, this result would also be undesirable and disadvantageous for pedestrians, for shop owners and even for the taxies.

Improving the city centres is the main policy to sustain urban life. Tunalı Hilmi Street should increasingly accommodate a variety of activities. This street is not a place designed to maximize motor vehicle traffic volume and speed. It is necessary to adopt a multi directional management approach including *parking management* (parking areas outside the street accessed by walking or public transport), *traffic management* (car usage restrictions on the street, traffic calming to reduce speeds and improve safety, and possible full-pedestrianization to remove the entire vehicle traffic), *public transport management* (frequency, comfort, affordability, retrievability of information about public transport), *nonmotorized transport management* (improved infrastructure for walking and cycling, emphasis on public realm, decreased speed limits again by traffic calming, well integrated with public transport services), *pricing management* (a possible congestion charging in the central area of Ankara or even in the Tunalı Hilmi Street, affordable public transport connections) and *land use management* (more mixed use development, pedestrian-friendly planning and design, walkable pavements).

For the case of Tunalı Hilmi Street, the aim should be to increase walking as a transport mode by promoting it as a viable alternative, and a healthy and environmentally friendly activity. Tunalı Hilmi Street has the base for any pedestrianization project. The pedestrian traffic is heavy enough there. There is diversity of mix uses. Any arrangement related to pedestrianization can make this neighbourhood, this city centre more pleasant.

At the beginning, the actions required for improving walking conditions should be identified. There can be a number of pedestrianization

approaches: Full-time pedestrianization only open for pedestrians; pedestrianization that allows public transport vehicles (and in some cases taxis) only; part-time pedestrianization closed to vehicles for specific periods of the day; and traffic calming with no restriction to vehicular access in street, giving more space to pedestrians with wider sidewalks (where vehicles are slowed down through the use of traffic calming measures, such as speed tables, kerb build-outs, sharpened corners, road narrowings, gateways, etc.) The secret of success in good pedestrianization projects are, first, to meet the "specific need" of the street and second, make this "gradually".

Any pedestrianization scheme in Tunalı Hilmi Street should be carried out gradually according to specific needs of the street and subsections of it. The most encountered fault is trying to impose one-size-fits-all model on the street. Transformation from a car-oriented place to a pedestrian-friendly one requires detailed surveys, small steps and continual afford by city planners, decision-maker and all stakeholders. Resistances and reluctances should be domesticated by awareness raising campaigns. Such campaigns would also be extremely important in the Tunalı Hilmi Street case. Although the studies revealed a certain level of awareness regarding vehicle traffic as the major problem here and pro-pedestrian solutions as effective alternatives, awareness raising campaigns, information leaflets, and possible community-municipality meetings can help increase support for future pedestrianization schemes. In addition to Tunalı Hilmi Street, the city of Ankara in general would greatly benefit from such campaigns that can help transform the car-oriented approach and understanding towards a pedestrian-oriented one.

Here, it is also important to note that, any pedestrian scheme should not create serious traffic problems on other roads in the vicinity. Otherwise it would only be shifting traffic and environmental problems from one location

to another.

In order to convert streets into pedestrian thoroughfares, minimal requirements should be supplied such as safety, accessibility, connectivity, usability, variability and being economical.

For the case of Ankara, as it is mentioned in previous sections, since the mid-1990's, traffic problems have always been solved by traditional road investment approaches. Roads have been enlarged; new roads and grade-separated junctions have been built; pedestrians have been excluded from roads and streets. But, these road programmes did not, and cannot, solve the traffic problem. Instead, more roads have created more traffic.

Alternatives to existing motorization are to be found and applied. This is the main focus in the scope of this thesis because it is well-known that from now on we need alternatives to the car. The transition away from cars can be accomplished by greatly increasing the supply of non-motorized travel modes.

Reorganization of the city centre transport network by providing for more non-motorized travel modes can also help improve and revitalize the city centre. Such an improved city centre can capture the potential of pedestrians on the street, which is threatened by increasing car traffic.

6.3. Future Research

In this thesis it was intended to highlight the importance of walking as a non-motorized travel mode. In order to make emphasis on walking as a travel mode, it was considered necessary to count walking trips and carry out other

pedestrian surveys that could highlight the existing potentials and pedestrian demand. The significance of this research is that it includes predominantly these pedestrian surveys (walking count, follow-up, static analyses), which are mostly undervalued in traffic surveys by planners, decision-makers, local authorities, even public. All these surveys and questionnaires were carried out to search for the pedestrian potential and capacity.

This study presents an example for further studies in terms of data collecting and mapping method, in other words, research technique. Besides, the research included the attitudes and opinions of the users, shop-owners and taxi-drivers of the street to negotiate between diverse interest groups who have the rights to be part of any new arrangement on the street. These data can facilitate further studies such as before/after analyses on Tunalı Hilmi Street for a probable pedestrian-friendly arrangement.

This thesis aims at searching and displaying the pedestrian potential and capacity of this street with a view to bring the findings of analyses to a new and enlarged platform, to bring to the core of transportation approaches the importance of this street as a pedestrian corridor in Ankara. The findings and discussions throughout the study are intended to contribute to decision-making processes, to increase awareness regarding the necessity and potentials of pro-pedestrian approaches and to show that pedestrian traffic should not be undervalued because it is one of the most important components of sustainable cities.

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APPENDIX A

TABLES OF PEDESTRIAN COUNTS FOR 3 MINUTES REGARDING THE STATIONS AND DIRECTIONS

A.1. Wednesday Count Tables

A station		Pedestrian Counts				Wednesday (17.10.2007)
Weather	North (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	8	12	0	1	0
20°C / ☼	10:30 – 11:30	4	8	0	2	0
19°C / ☼	12:30 – 13:30	17	35	0	7	0
18°C / ☼	15:00 – 16:00	12	17	3	2	0
18°C / ☼	17:30 – 18:30	22	29	1	3	3
Weather	South (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	4	4	0	1	0
20°C / ☼	10:30 – 11:30	4	11	0	0	0
19°C / ☼	12:30 – 13:30	24	24	1	5	1
18°C / ☼	15:00 – 16:00	13	22	3	2	0
18°C / ☼	17:30 – 18:30	8	16	0	4	0

B station		Pedestrian Counts				Wednesday (17.10.2007)
Weather	North (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	7	12	0	4	0
20°C / ☼	10:30 – 11:30	5	11	0	2	0
19°C / ☼	12:30 – 13:30	19	25	3	1	0
18°C / ☼	15:00 – 16:00	17	15	2	3	0
18°C / ☼	17:30 – 18:30	23	21	6	4	0
Weather	South (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	4	3	0	0	0
20°C / ☼	10:30 – 11:30	4	3	0	2	0
19°C / ☼	12:30 – 13:30	13	16	1	4	1
18°C / ☼	15:00 – 16:00	14	10	0	2	0
18°C / ☼	17:30 – 18:30	12	22	4	3	0

C1 station		Pedestrian Counts				Wednesday (17.10.2007)
Weather	**North (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
13°C / ☼	08:30 – 09:30	10	12	1	0	0
20°C / ☼	10:30 – 11:30	8	14	4	3	0
19°C / ☼	12:30 – 13:30	24	42	0	3	0
18°C / ☼	15:00 – 16:00	1	19	3	3	1
18°C / ☼	17:30 – 18:30	16	18	66	0	0
Weather	**South (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
13°C / ☼	08:30 – 09:30	2	3	0	1	0
20°C / ☼	10:30 – 11:30	1	7	0	1	0
19°C / ☼	12:30 – 13:30	12	28	2	1	0
18°C / ☼	15:00 – 16:00	14	10	3	7	1
18°C / ☼	17:30 – 18:30	11	20	4	4	1

C2 station		Pedestrian Counts				Wednesday (17.10.2007)
Weather	**East (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
13°C / ☼	08:30 – 09:30	4	4	1	0	0
20°C / ☼	10:30 – 11:30	2	6	0	0	0
19°C / ☼	12:30 – 13:30	8	12	0	0	0
18°C / ☼	15:00 – 16:00	6	9	0	1	0
18°C / ☼	17:30 – 18:30	6	5	1	0	0
Weather	**West (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
13°C / ☼	08:30 – 09:30	8	8	0	2	0
20°C / ☼	10:30 – 11:30	1	4	1	0	0
19°C / ☼	12:30 – 13:30	8	10	2	3	3
18°C / ☼	15:00 – 16:00	5	8	0	1	0
18°C / ☼	17:30 – 18:30	11	11	2	0	1

D1 station		Pedestrian Counts				Wednesday (17.10.2007)
Weather	**North (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
13°C / ☼	08:30 – 09:30	2	10	5	0	0
20°C / ☼	10:30 – 11:30	9	6	0	5	0
19°C / ☼	12:30 – 13:30	31	32	4	2	1
18°C / ☼	15:00 – 16:00	15	8	5	3	1
18°C / ☼	17:30 – 18:30	32	18	0	4	0
Weather	**South (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
13°C / ☼	08:30 – 09:30	2	4	0	1	0
20°C / ☼	10:30 – 11:30	4	8	0	1	0
19°C / ☼	12:30 – 13:30	22	16	3	1	0
18°C / ☼	15:00 – 16:00	6	12	0	2	1
18°C / ☼	17:30 – 18:30	29	23	1	1	1

D2 station		Pedestrian Counts				Wednesday (17.10.2007)
Weather	East (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	4	5	0	0	0
20°C / ☼	10:30 – 11:30	4	3	0	2	0
19°C / ☼	12:30 – 13:30	10	5	0	3	1
18°C / ☼	15:00 – 16:00	9	5	2	0	0
18°C / ☼	17:30 – 18:30	9	15	1	1	0
Weather	West (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	7	8	0	1	0
20°C / ☼	10:30 – 11:30	2	8	0	1	0
19°C / ☼	12:30 – 13:30	8	14	0	3	1
18°C / ☼	15:00 – 16:00	10	6	0	2	0
18°C / ☼	17:30 – 18:30	12	10	0	1	0

E1 station		Pedestrian Counts				Wednesday (17.10.2007)
Weather	North (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	2	4	0	0	0
20°C / ☼	10:30 – 11:30	9	5	0	1	0
19°C / ☼	12:30 – 13:30	23	17	2	3	0
18°C / ☼	15:00 – 16:00	13	13	1	4	0
18°C / ☼	17:30 – 18:30	22	22	6	1	1
Weather	South (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	4	3	0	2	0
20°C / ☼	10:30 – 11:30	1	6	0	1	0
19°C / ☼	12:30 – 13:30	10	9	0	1	0
18°C / ☼	15:00 – 16:00	15	13	4	2	1
18°C / ☼	17:30 – 18:30	14	15	1	0	2

E2 station		Pedestrian Counts				Wednesday (17.10.2007)
Weather	East (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	3	0	1	0	0
20°C / ☼	10:30 – 11:30	0	2	0	2	0
19°C / ☼	12:30 – 13:30	7	5	0	0	0
18°C / ☼	15:00 – 16:00	4	7	10	0	0
18°C / ☼	17:30 – 18:30	10	9	2	0	0
Weather	West (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	3	4	1	0	0
20°C / ☼	10:30 – 11:30	1	11	1	0	0
19°C / ☼	12:30 – 13:30	9	13	0	0	0
18°C / ☼	15:00 – 16:00	13	15	1	1	0
18°C / ☼	17:30 – 18:30	13	16	1	0	0

F1 station		Pedestrian Counts				Wednesday (17.10.2007)
Weather	North (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	3	1	0	0	0
20°C / ☼	10:30 – 11:30	3	4	0	0	0
19°C / ☼	12:30 – 13:30	13	17	1	0	1
18°C / ☼	15:00 – 16:00	6	7	1	1	0
18°C / ☼	17:30 – 18:30	7	13	0	0	1
Weather	South (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	7	13	0	0	0
20°C / ☼	10:30 – 11:30	1	2	2	1	0
19°C / ☼	12:30 – 13:30	6	7	1	0	0
18°C / ☼	15:00 – 16:00	9	10	1	5	0
18°C / ☼	17:30 – 18:30	12	10	2	0	1

F2 station		Pedestrian Counts				Wednesday (17.10.2007)
Weather	East (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	3	4	1	1	0
20°C / ☼	10:30 – 11:30	4	1	1	1	0
19°C / ☼	12:30 – 13:30	25	17	1	0	1
18°C / ☼	15:00 – 16:00	8	14	0	2	0
18°C / ☼	17:30 – 18:30	11	18	3	0	0
Weather	West (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	7	6	1	0	0
20°C / ☼	10:30 – 11:30	2	7	0	0	0
19°C / ☼	12:30 – 13:30	20	11	3	0	1
18°C / ☼	15:00 – 16:00	9	22	4	3	0
18°C / ☼	17:30 – 18:30	9	15	4	0	1

G1 station		Pedestrian Counts				Wednesday (17.10.2007)
Weather	North (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	4	2	0	0	0
20°C / ☼	10:30 – 11:30	5	10	0	0	0
19°C / ☼	12:30 – 13:30	12	15	6	1	0
18°C / ☼	15:00 – 16:00	13	8	3	5	0
18°C / ☼	17:30 – 18:30	21	15	4	2	4
Weather	South (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	10	18	0	0	0
20°C / ☼	10:30 – 11:30	4	10	0	2	0
19°C / ☼	12:30 – 13:30	13	9	3	1	0
18°C / ☼	15:00 – 16:00	6	12	2	0	0
18°C / ☼	17:30 – 18:30	21	11	1	1	1

G2 station		Pedestrian Counts				Wednesday (17.10.2007)
Weather	East (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	5	0	1	0	0
20°C / ☼	10:30 – 11:30	2	1	1	0	0
19°C / ☼	12:30 – 13:30	2	8	1	0	0
18°C / ☼	15:00 – 16:00	3	1	2	1	0
18°C / ☼	17:30 – 18:30	6	6	3	0	1
Weather	West (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	7	6	0	0	0
20°C / ☼	10:30 – 11:30	5	3	0	0	0
19°C / ☼	12:30 – 13:30	5	3	1	0	1
18°C / ☼	15:00 – 16:00	1	4	1	0	0
18°C / ☼	17:30 – 18:30	5	9	1	0	0

H station		Pedestrian Counts				Wednesday (17.10.2007)
Weather	North (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	0	3	0	0	0
20°C / ☼	10:30 – 11:30	2	2	0	2	1
19°C / ☼	12:30 – 13:30	9	11	0	0	0
18°C / ☼	15:00 – 16:00	8	3	0	1	0
18°C / ☼	17:30 – 18:30	27	21	2	0	3
Weather	South (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	11	3	1	0	0
20°C / ☼	10:30 – 11:30	2	5	0	1	0
19°C / ☼	12:30 – 13:30	10	9	2	1	0
18°C / ☼	15:00 – 16:00	6	15	3	2	0
18°C / ☼	17:30 – 18:30	9	17	2	0	0

I station		Pedestrian Counts				Wednesday (17.10.2007)
Weather	North (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	3	4	1	0	0
20°C / ☼	10:30 – 11:30	3	5	0	2	1
19°C / ☼	12:30 – 13:30	6	8	3	1	1
18°C / ☼	15:00 – 16:00	11	10	5	5	0
18°C / ☼	17:30 – 18:30	10	8	0	0	1
Weather	South (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	15	18	2	0	1
20°C / ☼	10:30 – 11:30	4	3	0	4	0
19°C / ☼	12:30 – 13:30	5	16	1	0	0
18°C / ☼	15:00 – 16:00	12	12	3	1	1
18°C / ☼	17:30 – 18:30	7	11	1	2	0

J station		Pedestrian Counts				Wednesday (17.10.2007)
Weather	**North (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
13°C / ☼	08:30 – 09:30	2	4	3	0	0
20°C / ☼	10:30 – 11:30	2	7	1	0	0
19°C / ☼	12:30 – 13:30	9	20	1	1	0
18°C / ☼	15:00 – 16:00	9	7	8	3	0
18°C / ☼	17:30 – 18:30	20	22	1	0	1
Weather	**South (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
13°C / ☼	08:30 – 09:30	3	3	0	0	0
20°C / ☼	10:30 – 11:30	0	10	0	1	0
19°C / ☼	12:30 – 13:30	7	5	1	1	0
18°C / ☼	15:00 – 16:00	8	9	1	3	1
18°C / ☼	17:30 – 18:30	6	2	1	1	1

K station		Pedestrian Counts				Wednesday (17.10.2007)
Weather	**North (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
13°C / ☼	08:30 – 09:30	6	6	0	0	0
20°C / ☼	10:30 – 11:30	10	6	1	5	0
19°C / ☼	12:30 – 13:30	7	21	0	0	1
18°C / ☼	15:00 – 16:00	13	12	0	3	0
18°C / ☼	17:30 – 18:30	7	19	0	1	0
Weather	**South (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
13°C / ☼	08:30 – 09:30	13	12	3	2	1
20°C / ☼	10:30 – 11:30	10	19	0	2	0
19°C / ☼	12:30 – 13:30	8	15	0	0	0
18°C / ☼	15:00 – 16:00	19	20	4	4	3
18°C / ☼	17:30 – 18:30	10	12	0	0	0

A.2. Thursday Count Tables

A station		Pedestrian Counts				Thursday (18.10.2007)
Weather	**North (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
14°C / ☼	08:30 – 09:30	6	10	0	0	0
22°C / ☼	10:30 – 11:30	21	13	0	0	2
21°C / ☼	12:30 – 13:30	16	22	2	5	1
20°C / ☼	15:00 – 16:00	21	21	0	1	2
19°C / ☼	17:30 – 18:30	24	18	6	2	2
Weather	**South (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
14°C / ☼	08:30 – 09:30	3	4	0	1	0
22°C / ☼	10:30 – 11:30	3	7	2	0	0
21°C / ☼	12:30 – 13:30	33	20	8	5	0
20°C / ☼	15:00 – 16:00	13	21	1	2	1
19°C / ☼	17:30 – 18:30	22	26	5	2	1

B station		Pedestrian Counts				Thursday (18.10.2007)
Weather	**North (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
14°C / ☼	08:30 – 09:30	6	8	2	1	0
22°C / ☼	10:30 – 11:30	3	12	2	3	0
21°C / ☼	12:30 – 13:30	40	17	1	4	0
20°C / ☼	15:00 – 16:00	17	23	1	7	0
19°C / ☼	17:30 – 18:30	28	28	8	1	1
Weather	**South (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
14°C / ☼	08:30 – 09:30	5	10	2	0	0
22°C / ☼	10:30 – 11:30	3	4	0	1	0
21°C / ☼	12:30 – 13:30	25	22	4	5	0
20°C / ☼	15:00 – 16:00	13	9	2	3	0
19°C / ☼	17:30 – 18:30	25	25	3	0	3

C1 station		Pedestrian Counts				Thursday (18.10.2007)
Weather	**North (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
14°C / ☼	08:30 – 09:30	15	11	1	4	0
22°C / ☼	10:30 – 11:30	5	13	1	1	0
21°C / ☼	12:30 – 13:30	26	33	0	1	2
20°C / ☼	15:00 – 16:00	16	21	4	5	1
19°C / ☼	17:30 – 18:30	9	21	5	2	0
Weather	**South (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
14°C / ☼	08:30 – 09:30	7	9	0	2	0
22°C / ☼	10:30 – 11:30	0	11	1	1	0
21°C / ☼	12:30 – 13:30	25	27	3	1	1
20°C / ☼	15:00 – 16:00	20	24	3	1	1
19°C / ☼	17:30 – 18:30	14	13	4	6	0

C2 station		Pedestrian Counts				Thursday (18.10.2007)
Weather	**East (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
14°C / ☼	08:30 – 09:30	0	3	0	0	0
22°C / ☼	10:30 – 11:30	1	5	0	0	0
21°C / ☼	12:30 – 13:30	9	12	0	0	0
20°C / ☼	15:00 – 16:00	0	6	2	1	2
19°C / ☼	17:30 – 18:30	4	0	4	0	0
Weather	**West (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
14°C / ☼	08:30 – 09:30	4	4	2	0	0
22°C / ☼	10:30 – 11:30	1	1	0	0	0
21°C / ☼	12:30 – 13:30	8	12	3	1	0
20°C / ☼	15:00 – 16:00	5	7	2	1	0
19°C / ☼	17:30 – 18:30	2	2	1	2	0

D1 station		Pedestrian Counts				Thursday (18.10.2007)
Weather	**North (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
14°C / ☼	08:30 – 09:30	10	15	2	1	0
22°C / ☼	10:30 – 11:30	9	9	0	1	1
21°C / ☼	12:30 – 13:30	31	19	0	5	7
20°C / ☼	15:00 – 16:00	18	18	3	5	4
19°C / ☼	17:30 – 18:30	34	31	6	2	2
Weather	**South (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
14°C / ☼	08:30 – 09:30	6	7	0	2	0
22°C / ☼	10:30 – 11:30	3	9	2	1	1
21°C / ☼	12:30 – 13:30	42	22	0	2	1
20°C / ☼	15:00 – 16:00	11	17	3	6	1
19°C / ☼	17:30 – 18:30	20	19	3	6	0

D2 station		Pedestrian Counts				Thursday (18.10.2007)
Weather	**East (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
14°C / ☼	08:30 – 09:30	3	7	3	1	0
22°C / ☼	10:30 – 11:30	0	4	2	1	0
21°C / ☼	12:30 – 13:30	5	10	2	3	0
20°C / ☼	15:00 – 16:00	8	7	3	6	0
19°C / ☼	17:30 – 18:30	4	19	2	1	1
Weather	**West (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
14°C / ☼	08:30 – 09:30	5	1	1	1	1
22°C / ☼	10:30 – 11:30	6	8	0	2	0
21°C / ☼	12:30 – 13:30	10	9	0	2	1
20°C / ☼	15:00 – 16:00	4	19	0	3	0
19°C / ☼	17:30 – 18:30	8	7	2	0	1

E1 station		Pedestrian Counts				Thursday (18.10.2007)
Weather	**North (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
14°C / ☼	08:30 – 09:30	5	7	0	2	0
22°C / ☼	10:30 – 11:30	4	10	2	2	0
21°C / ☼	12:30 – 13:30	15	16	4	3	0
20°C / ☼	15:00 – 16:00	15	11	0	0	2
19°C / ☼	17:30 – 18:30	4	16	2	4	2
Weather	**South (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
14°C / ☼	08:30 – 09:30	2	1	0	0	0
22°C / ☼	10:30 – 11:30	1	11	0	0	1
21°C / ☼	12:30 – 13:30	36	19	0	2	0
20°C / ☼	15:00 – 16:00	15	12	0	2	0
19°C / ☼	17:30 – 18:30	12	10	4	0	1

E2 station		Pedestrian Counts				Thursday (18.10.2007)
Weather	**East (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
14°C / ☼	08:30 – 09:30	3	3	0	1	0
22°C / ☼	10:30 – 11:30	1	5	0	0	0
21°C / ☼	12:30 – 13:30	7	12	0	0	0
20°C / ☼	15:00 – 16:00	5	8	0	1	1
19°C / ☼	17:30 – 18:30	9	17	14	1	0
Weather	**West (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
14°C / ☼	08:30 – 09:30	3	4	0	1	0
22°C / ☼	10:30 – 11:30	3	4	3	1	0
21°C / ☼	12:30 – 13:30	11	6	1	0	2
20°C / ☼	15:00 – 16:00	3	8	9	0	1
19°C / ☼	17:30 – 18:30	13	19	19	4	0

F1 station		Pedestrian Counts				Thursday (18.10.2007)
Weather	**North (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
14°C / ☼	08:30 – 09:30	5	3	0	0	0
22°C / ☼	10:30 – 11:30	4	6	0	0	0
21°C / ☼	12:30 – 13:30	12	15	0	2	0
20°C / ☼	15:00 – 16:00	10	9	2	2	1
19°C / ☼	17:30 – 18:30	12	15	1	2	0
Weather	**South (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
14°C / ☼	08:30 – 09:30	6	6	0	0	0
22°C / ☼	10:30 – 11:30	6	9	0	0	0
21°C / ☼	12:30 – 13:30	8	11	0	0	0
20°C / ☼	15:00 – 16:00	8	14	2	1	1
19°C / ☼	17:30 – 18:30	3	8	0	0	0

F2 station		Pedestrian Counts				Thursday (18.10.2007)
Weather	**East (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
14°C / ☼	08:30 – 09:30	2	5	0	1	0
22°C / ☼	10:30 – 11:30	4	9	2	1	0
21°C / ☼	12:30 – 13:30	37	33	0	0	0
20°C / ☼	15:00 – 16:00	9	12	7	1	0
19°C / ☼	17:30 – 18:30	6	14	0	2	0
Weather	**West (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
14°C / ☼	08:30 – 09:30	10	10	5	1	0
22°C / ☼	10:30 – 11:30	4	4	3	2	0
21°C / ☼	12:30 – 13:30	11	26	2	1	1
20°C / ☼	15:00 – 16:00	7	12	4	0	0
19°C / ☼	17:30 – 18:30	8	7	1	0	0

G1 station		Pedestrian Counts				Thursday (18.10.2007)
Weather	**North (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
14°C / ☼	08:30 – 09:30	4	7	0	0	0
22°C / ☼	10:30 – 11:30	2	7	1	4	0
21°C / ☼	12:30 – 13:30	6	17	0	3	0
20°C / ☼	15:00 – 16:00	5	6	2	1	1
19°C / ☼	17:30 – 18:30	16	15	8	3	0
Weather	**South (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
14°C / ☼	08:30 – 09:30	10	8	0	0	0
22°C / ☼	10:30 – 11:30	10	9	1	2	0
21°C / ☼	12:30 – 13:30	15	20	0	0	1
20°C / ☼	15:00 – 16:00	8	6	1	1	0
19°C / ☼	17:30 – 18:30	12	13	1	0	1

G2 station		Pedestrian Counts				Thursday (18.10.2007)
Weather	**East (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
14°C / ☼	08:30 – 09:30	2	7	1	1	0
22°C / ☼	10:30 – 11:30	1	5	0	0	0
21°C / ☼	12:30 – 13:30	3	6	0	0	3
20°C / ☼	15:00 – 16:00	5	6	2	0	1
19°C / ☼	17:30 – 18:30	1	3	1	0	0
Weather	**West (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
14°C / ☼	08:30 – 09:30	5	13	0	1	0
22°C / ☼	10:30 – 11:30	2	6	0	1	1
21°C / ☼	12:30 – 13:30	2	7	0	1	2
20°C / ☼	15:00 – 16:00	5	6	0	2	0
19°C / ☼	17:30 – 18:30	2	1	2	0	0

H station		Pedestrian Counts				Thursday (18.10.2007)
Weather	**North (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
14°C / ☼	08:30 – 09:30	1	1	0	0	0
22°C / ☼	10:30 – 11:30	1	7	0	0	0
21°C / ☼	12:30 – 13:30	2	7	0	0	1
20°C / ☼	15:00 – 16:00	4	5	1	0	3
19°C / ☼	17:30 – 18:30	4	8	4	0	0
Weather	**South (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
14°C / ☼	08:30 – 09:30	10	5	0	0	0
22°C / ☼	10:30 – 11:30	1	7	0	2	0
21°C / ☼	12:30 – 13:30	17	6	0	1	0
20°C / ☼	15:00 – 16:00	4	7	0	0	0
19°C / ☼	17:30 – 18:30	7	4	3	0	1

I station		Pedestrian Counts				Thursday (18.10.2007)
Weather	**North (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
14°C / ☼	08:30 – 09:30	2	6	2	0	0
22°C / ☼	10:30 – 11:30	0	4	0	0	0
21°C / ☼	12:30 – 13:30	15	21	2	2	0
20°C / ☼	15:00 – 16:00	15	11	0	1	0
19°C / ☼	17:30 – 18:30	12	17	4	2	0
Weather	**South (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
14°C / ☼	08:30 – 09:30	12	15	0	0	0
22°C / ☼	10:30 – 11:30	10	13	2	0	0
21°C / ☼	12:30 – 13:30	5	18	0	1	0
20°C / ☼	15:00 – 16:00	15	5	1	1	0
19°C / ☼	17:30 – 18:30	5	9	3	0	1

J station		Pedestrian Counts				Thursday (18.10.2007)
Weather	**North (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
14°C / ☼	08:30 – 09:30	1	1	1	0	0
22°C / ☼	10:30 – 11:30	1	7	0	3	0
21°C / ☼	12:30 – 13:30	7	8	2	0	0
20°C / ☼	15:00 – 16:00	2	7	0	2	0
19°C / ☼	17:30 – 18:30	5	14	0	0	1
Weather	**South (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
14°C / ☼	08:30 – 09:30	4	4	0	0	0
22°C / ☼	10:30 – 11:30	4	6	2	3	0
21°C / ☼	12:30 – 13:30	2	5	1	0	0
20°C / ☼	15:00 – 16:00	9	7	0	1	0
19°C / ☼	17:30 – 18:30	5	7	6	3	0

K station		Pedestrian Counts				Thursday (18.10.2007)
Weather	**North (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
14°C / ☼	08:30 – 09:30	5	2	0	1	1
22°C / ☼	10:30 – 11:30	4	9	3	2	0
21°C / ☼	12:30 – 13:30	13	11	3	1	1
20°C / ☼	15:00 – 16:00	17	10	1	4	0
19°C / ☼	17:30 – 18:30	9	16	0	1	2
Weather	**South (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
14°C / ☼	08:30 – 09:30	9	17	0	1	0
22°C / ☼	10:30 – 11:30	8	14	0	2	1
21°C / ☼	12:30 – 13:30	12	15	1	0	0
20°C / ☼	15:00 – 16:00	8	11	0	3	0
19°C / ☼	17:30 – 18:30	9	17	0	1	0

A.3. Saturday Count Tables

A station		Pedestrian Counts				Saturday (20.10.2007)
Weather	North (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	20	20	3	3	0
20°C / ☼	10:30 – 11:30	7	10	6	1	0
19°C / ☼	12:30 – 13:30	20	16	8	4	6
18°C / ☼	15:00 – 16:00	34	21	7	2	7
18°C / ☼	17:30 – 18:30	26	18	21	3	1
16°C / ☼	20:30 - 21:30	13	17	5	0	0
Weather	South (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	5	4	1	0	0
20°C / ☼	10:30 – 11:30	6	6	1	3	1
19°C / ☼	12:30 – 13:30	20	12	2	2	2
18°C / ☼	15:00 – 16:00	20	24	9	4	6
18°C / ☼	17:30 – 18:30	36	39	20	4	4
16°C / ☼	20:30 - 21:30	10	11	13	0	2

B station		Pedestrian Counts				Saturday (20.10.2007)
Weather	North (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	6	5	2	0	0
20°C / ☼	10:30 – 11:30	9	13	4	0	0
19°C / ☼	12:30 – 13:30	20	17	8	1	6
18°C / ☼	15:00 – 16:00	54	28	20	8	9
18°C / ☼	17:30 – 18:30	25	27	16	4	0
16°C / ☼	20:30 - 21:30	12	12	21	0	1
Weather	South (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	3	7	0	0	0
20°C / ☼	10:30 – 11:30	4	6	1	0	0
19°C / ☼	12:30 – 13:30	12	12	2	6	2
18°C / ☼	15:00 – 16:00	34	26	15	6	5
18°C / ☼	17:30 – 18:30	26	16	13	1	2
16°C / ☼	20:30 - 21:30	6	19	3	1	0

C1 station		Pedestrian Counts				Saturday (20.10.2007)
Weather	**North (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
13°C / ☼	08:30 – 09:30	5	3	3	0	0
20°C / ☼	10:30 – 11:30	6	3	1	1	0
19°C / ☼	12:30 – 13:30	25	15	4	6	8
18°C / ☼	15:00 – 16:00	26	25	5	4	4
18°C / ☼	17:30 – 18:30	12	27	5	4	0
16°C / ☼	20:30 - 21:30	8	20	9	0	1
Weather	**South (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
13°C / ☼	08:30 – 09:30	1	2	1	0	2
20°C / ☼	10:30 – 11:30	3	7	4	2	0
19°C / ☼	12:30 – 13:30	14	10	4	5	3
18°C / ☼	15:00 – 16:00	27	18	16	1	4
18°C / ☼	17:30 – 18:30	28	35	17	4	6
16°C / ☼	20:30 - 21:30	19	15	12	1	0

C2 station		Pedestrian Counts				Saturday (20.10.2007)
Weather	**East (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
13°C / ☼	08:30 – 09:30	2	2	0	0	0
20°C / ☼	10:30 – 11:30	3	3	0	0	3
19°C / ☼	12:30 – 13:30	6	5	2	0	3
18°C / ☼	15:00 – 16:00	4	4	1	1	0
18°C / ☼	17:30 – 18:30	5	5	0	1	1
16°C / ☼	20:30 - 21:30	0	1	3	0	0
Weather	**West (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
13°C / ☼	08:30 – 09:30	2	1	0	0	0
20°C / ☼	10:30 – 11:30	1	5	0	2	0
19°C / ☼	12:30 – 13:30	2	6	1	1	1
18°C / ☼	15:00 – 16:00	4	5	8	2	1
18°C / ☼	17:30 – 18:30	5	10	2	0	1
16°C / ☼	20:30 - 21:30	2	4	5	0	0

D1 station		Pedestrian Counts				Saturday (20.10.2007)
Weather	**North (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
13°C / ☼	08:30 – 09:30	3	9	1	2	1
20°C / ☼	10:30 – 11:30	21	13	2	0	1
19°C / ☼	12:30 – 13:30	19	15	8	1	3
18°C / ☼	15:00 – 16:00	42	31	16	6	8
18°C / ☼	17:30 – 18:30	36	21	24	6	4
16°C / ☼	20:30 - 21:30	15	27	18	0	2
Weather	**South (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
13°C / ☼	08:30 – 09:30	2	8	1	0	0
20°C / ☼	10:30 – 11:30	13	17	2	0	3
19°C / ☼	12:30 – 13:30	13	8	2	5	5
18°C / ☼	15:00 – 16:00	23	15	15	6	5
18°C / ☼	17:30 – 18:30	34	34	10	3	1
16°C / ☼	20:30 - 21:30	7	14	10	0	0

D2 station		Pedestrian Counts				Saturday (20.10.2007)
Weather	**East (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
13°C / ☼	08:30 – 09:30	1	4	0	1	0
20°C / ☼	10:30 – 11:30	2	9	3	0	0
19°C / ☼	12:30 – 13:30	7	7	1	1	2
18°C / ☼	15:00 – 16:00	11	5	2	3	3
18°C / ☼	17:30 – 18:30	9	11	3	0	0
16°C / ☼	20:30 - 21:30	3	5	0	0	0
Weather	**West (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
13°C / ☼	08:30 – 09:30	1	8	3	0	0
20°C / ☼	10:30 – 11:30	2	10	0	1	0
19°C / ☼	12:30 – 13:30	5	7	2	1	2
18°C / ☼	15:00 – 16:00	12	6	7	0	2
18°C / ☼	17:30 – 18:30	11	10	14	0	4
16°C / ☼	20:30 - 21:30	3	10	1	0	1

E1 station		Pedestrian Counts				Saturday (20.10.2007)
Weather	**North (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
13°C / ☼	08:30 – 09:30	9	4	2	1	0
20°C / ☼	10:30 – 11:30	7	6	0	0	2
19°C / ☼	12:30 – 13:30	10	18	2	2	0
18°C / ☼	15:00 – 16:00	26	19	8	2	1
18°C / ☼	17:30 – 18:30	21	27	13	0	3
16°C / ☼	20:30 - 21:30	5	15	1	0	0
Weather	**South (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
13°C / ☼	08:30 – 09:30	1	2	2	0	0
20°C / ☼	10:30 – 11:30	3	4	2	1	0
19°C / ☼	12:30 – 13:30	8	8	2	2	2
18°C / ☼	15:00 – 16:00	24	15	2	4	2
18°C / ☼	17:30 – 18:30	33	28	8	4	3
16°C / ☼	20:30 - 21:30	8	11	6	1	0

E2 station		Pedestrian Counts				Saturday (20.10.2007)
Weather	**East (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
13°C / ☼	08:30 – 09:30	0	2	0	0	0
20°C / ☼	10:30 – 11:30	0	5	1	0	0
19°C / ☼	12:30 – 13:30	4	3	1	0	3
18°C / ☼	15:00 – 16:00	3	7	10	1	0
18°C / ☼	17:30 – 18:30	1	3	18	0	0
16°C / ☼	20:30 - 21:30	1	12	20	0	1
Weather	**West (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
13°C / ☼	08:30 – 09:30	2	0	0	0	0
20°C / ☼	10:30 – 11:30	1	5	0	1	0
19°C / ☼	12:30 – 13:30	3	16	2	0	1
18°C / ☼	15:00 – 16:00	5	13	14	1	0
18°C / ☼	17:30 – 18:30	5	10	29	0	2
16°C / ☼	20:30 - 21:30	3	13	10	0	0

F1 station		Pedestrian Counts				Saturday (20.10.2007)
Weather	North (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	1	4	0	0	0
20°C / ☼	10:30 – 11:30	3	5	1	0	2
19°C / ☼	12:30 – 13:30	8	9	0	0	1
18°C / ☼	15:00 – 16:00	13	17	2	0	0
18°C / ☼	17:30 – 18:30	20	20	1	0	3
16°C / ☼	20:30 - 21:30	7	8	0	0	1
Weather	South (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	5	6	2	0	1
20°C / ☼	10:30 – 11:30	8	13	1	0	2
19°C / ☼	12:30 – 13:30	11	10	0	0	4
18°C / ☼	15:00 – 16:00	13	9	0	0	2
18°C / ☼	17:30 – 18:30	9	9	1	0	3
16°C / ☼	20:30 - 21:30	1	8	2	0	0

F2 station		Pedestrian Counts				Saturday (20.10.2007)
Weather	East (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	1	6	0	1	0
20°C / ☼	10:30 – 11:30	3	7	0	2	0
19°C / ☼	12:30 – 13:30	11	6	3	2	1
18°C / ☼	15:00 – 16:00	20	30	2	0	1
18°C / ☼	17:30 – 18:30	9	20	5	0	4
16°C / ☼	20:30 - 21:30	9	13	17	0	0
Weather	West (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	5	9	0	1	0
20°C / ☼	10:30 – 11:30	1	4	2	0	0
19°C / ☼	12:30 – 13:30	7	14	8	0	5
18°C / ☼	15:00 – 16:00	19	14	0	2	3
18°C / ☼	17:30 – 18:30	10	22	14	0	0
16°C / ☼	20:30 - 21:30	4	15	2	0	0

G1 station		Pedestrian Counts				Saturday (20.10.2007)
Weather	**North (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
13°C / ☼	08:30 – 09:30	9	4	2	1	0
20°C / ☼	10:30 – 11:30	3	6	4	1	1
19°C / ☼	12:30 – 13:30	15	9	2	0	6
18°C / ☼	15:00 – 16:00	17	18	3	1	2
18°C / ☼	17:30 – 18:30	24	16	7	1	4
16°C / ☼	20:30 - 21:30	3	7	2	1	0
Weather	**South (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
13°C / ☼	08:30 – 09:30	8	11	4	1	1
20°C / ☼	10:30 – 11:30	8	5	1	1	4
19°C / ☼	12:30 – 13:30	12	10	1	0	0
18°C / ☼	15:00 – 16:00	26	22	2	1	4
18°C / ☼	17:30 – 18:30	19	19	8	1	0
16°C / ☼	20:30 - 21:30	8	10	1	0	0

G2 station		Pedestrian Counts				Saturday (20.10.2007)
Weather	**East (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
13°C / ☼	08:30 – 09:30	2	4	0	0	1
20°C / ☼	10:30 – 11:30	5	1	1	0	0
19°C / ☼	12:30 – 13:30	4	4	0	0	1
18°C / ☼	15:00 – 16:00	3	9	0	0	1
18°C / ☼	17:30 – 18:30	6	4	7	0	0
16°C / ☼	20:30 - 21:30	1	6	0	0	0
Weather	**West (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
13°C / ☼	08:30 – 09:30	3	4	2	0	1
20°C / ☼	10:30 – 11:30	1	7	0	0	1
19°C / ☼	12:30 – 13:30	9	6	1	0	1
18°C / ☼	15:00 – 16:00	8	3	2	0	1
18°C / ☼	17:30 – 18:30	8	4	1	0	1
16°C / ☼	20:30 - 21:30	4	5	0	0	1

H station		Pedestrian Counts				Saturday (20.10.2007)
Weather	North (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	0	0	0	1	0
20°C / ☼	10:30 – 11:30	1	5	1	0	0
19°C / ☼	12:30 – 13:30	10	10	0	2	2
18°C / ☼	15:00 – 16:00	16	13	1	1	3
18°C / ☼	17:30 – 18:30	18	13	1	1	3
16°C / ☼	20:30 - 21:30	2	11	2	0	0
Weather	South (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	6	3	0	0	0
20°C / ☼	10:30 – 11:30	5	6	0	1	1
19°C / ☼	12:30 – 13:30	2	11	0	1	3
18°C / ☼	15:00 – 16:00	9	14	3	0	3
18°C / ☼	17:30 – 18:30	4	9	1	2	1
16°C / ☼	20:30 - 21:30	5	9	3	0	0

I station		Pedestrian Counts				Saturday (20.10.2007)
Weather	North (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	1	2	0	0	0
20°C / ☼	10:30 – 11:30	1	4	0	0	1
19°C / ☼	12:30 – 13:30	7	12	0	0	0
18°C / ☼	15:00 – 16:00	12	17	1	1	1
18°C / ☼	17:30 – 18:30	17	21	0	1	3
16°C / ☼	20:30 - 21:30	2	3	0	0	0
Weather	South (3 minutes)	Women	Men	Teenager	Elderly	Children
13°C / ☼	08:30 – 09:30	9	5	0	0	1
20°C / ☼	10:30 – 11:30	9	10	0	2	1
19°C / ☼	12:30 – 13:30	9	8	1	0	0
18°C / ☼	15:00 – 16:00	14	17	1	3	3
18°C / ☼	17:30 – 18:30	13	7	1	1	1
16°C / ☼	20:30 - 21:30	4	6	0	0	0

J station		Pedestrian Counts				Saturday (20.10.2007)
Weather	**North (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
13°C / ☼	08:30 – 09:30	1	1	1	0	0
20°C / ☼	10:30 – 11:30	3	4	1	1	2
19°C / ☼	12:30 – 13:30	3	23	2	7	0
18°C / ☼	15:00 – 16:00	5	14	3	0	1
18°C / ☼	17:30 – 18:30	6	14	0	0	0
16°C / ☼	20:30 - 21:30	3	5	2	0	0
Weather	**South (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
13°C / ☼	08:30 – 09:30	4	2	1	0	0
20°C / ☼	10:30 – 11:30	3	7	0	4	0
19°C / ☼	12:30 – 13:30	7	8	2	2	0
18°C / ☼	15:00 – 16:00	9	13	1	0	2
18°C / ☼	17:30 – 18:30	4	8	3	1	0
16°C / ☼	20:30 - 21:30	0	0	0	0	0

K station		Pedestrian Counts				Saturday (20.10.2007)
Weather	**North (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
13°C / ☼	08:30 – 09:30	2	3	0	1	0
20°C / ☼	10:30 – 11:30	3	11	0	1	0
19°C / ☼	12:30 – 13:30	6	5	3	0	3
18°C / ☼	15:00 – 16:00	19	16	1	2	1
18°C / ☼	17:30 – 18:30	15	12	0	0	2
16°C / ☼	20:30 - 21:30	2	12	1	0	0
Weather	**South (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
13°C / ☼	08:30 – 09:30	5	12	1	1	0
20°C / ☼	10:30 – 11:30	15	9	2	4	2
19°C / ☼	12:30 – 13:30	10	11	1	1	2
18°C / ☼	15:00 – 16:00	9	15	2	1	0
18°C / ☼	17:30 – 18:30	26	23	3	1	1
16°C / ☼	20:30 - 21:30	1	2	0	0	0

A.4. Sunday Count Tables

A station		Pedestrian Counts				Sunday (21.10.2007)
Weather	**North (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
15°C / ☼	08:30 – 09:30	3	2	0	0	0
20°C / ☼	10:30 – 11:30	2	8	1	0	2
19°C / ☼	12:30 – 13:30	10	13	3	0	0
18°C / ☼	15:00 – 16:00	12	12	6	2	3
18°C / ☼	17:30 – 18:30	11	12	0	0	0
Weather	**South (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
15°C / ☼	08:30 – 09:30	2	2	0	0	0
20°C / ☼	10:30 – 11:30	2	6	1	0	2
19°C / ☼	12:30 – 13:30	6	4	2	2	1
18°C / ☼	15:00 – 16:00	24	20	10	5	2
18°C / ☼	17:30 – 18:30	5	20	1	2	0

B station		Pedestrian Counts				Sunday (21.10.2007)
Weather	**North (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
15°C / ☼	08:30 – 09:30	3	1	0	0	0
20°C / ☼	10:30 – 11:30	7	8	1	1	6
19°C / ☼	12:30 – 13:30	8	8	0	1	1
18°C / ☼	15:00 – 16:00	29	26	3	0	1
18°C / ☼	17:30 – 18:30	1	17	10	0	1
Weather	**South (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
15°C / ☼	08:30 – 09:30	3	3	3	1	0
20°C / ☼	10:30 – 11:30	2	1	0	0	1
19°C / ☼	12:30 – 13:30	4	16	6	1	0
18°C / ☼	15:00 – 16:00	14	1	8	0	0
18°C / ☼	17:30 – 18:30	12	18	3	0	2

C1 station		Pedestrian Counts				Sunday (21.10.2007)
Weather	**North (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
15°C / ☼	08:30 – 09:30	3	4	0	1	0
20°C / ☼	10:30 – 11:30	3	7	2	0	1
19°C / ☼	12:30 – 13:30	10	12	4	0	2
18°C / ☼	15:00 – 16:00	1	20	6	3	6
18°C / ☼	17:30 – 18:30	11	7	2	3	1
Weather	**South (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
15°C / ☼	08:30 – 09:30	2	2	0	0	0
20°C / ☼	10:30 – 11:30	0	4	0	0	1
19°C / ☼	12:30 – 13:30	7	10	2	0	2
18°C / ☼	15:00 – 16:00	10	16	7	1	9
18°C / ☼	17:30 – 18:30	16	16	3	0	0

C2 station		Pedestrian Counts				Sunday (21.10.2007)
Weather	**East (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
15°C / ☼	08:30 – 09:30	1	0	0	2	0
20°C / ☼	10:30 – 11:30	1	2	0	0	0
19°C / ☼	12:30 – 13:30	0	2	0	0	0
18°C / ☼	15:00 – 16:00	6	6	5	1	3
18°C / ☼	17:30 – 18:30	4	3	16	0	1
Weather	**West (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
15°C / ☼	08:30 – 09:30	0	2	1	0	0
20°C / ☼	10:30 – 11:30	2	4	0	1	4
19°C / ☼	12:30 – 13:30	4	2	0	0	1
18°C / ☼	15:00 – 16:00	2	5	8	0	2
18°C / ☼	17:30 – 18:30	6	1	5	2	0

D1 station		Pedestrian Counts				Sunday (21.10.2007)
Weather	**North (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
15°C / ☼	08:30 – 09:30	3	4	0	2	0
20°C / ☼	10:30 – 11:30	7	5	2	0	1
19°C / ☼	12:30 – 13:30	22	18	7	0	6
18°C / ☼	15:00 – 16:00	18	18	9	1	4
18°C / ☼	17:30 – 18:30	21	27	1	2	0
Weather	**South (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
15°C / ☼	08:30 – 09:30	2	5	0	0	0
20°C / ☼	10:30 – 11:30	0	5	1	0	0
19°C / ☼	12:30 – 13:30	10	8	7	0	0
18°C / ☼	15:00 – 16:00	24	16	11	0	6
18°C / ☼	17:30 – 18:30	15	5	2	2	0

D2 station		Pedestrian Counts				Sunday (21.10.2007)
Weather	East (3 minutes)	Women	Men	Teenager	Elderly	Children
15°C / ☼	08:30 – 09:30	1	2	4	0	0
20°C / ☼	10:30 – 11:30	0	3	0	0	0
19°C / ☼	12:30 – 13:30	3	7	2	1	0
18°C / ☼	15:00 – 16:00	5	3	5	0	1
18°C / ☼	17:30 – 18:30	6	9	2	0	2
Weather	West (3 minutes)	Women	Men	Teenager	Elderly	Children
15°C / ☼	08:30 – 09:30	0	4	0	0	0
20°C / ☼	10:30 – 11:30	0	3	0	1	1
19°C / ☼	12:30 – 13:30	7	14	6	0	1
18°C / ☼	15:00 – 16:00	7	11	2	1	1
18°C / ☼	17:30 – 18:30	2	3	2	0	0

E1 station		Pedestrian Counts				Sunday (21.10.2007)
Weather	North (3 minutes)	Women	Men	Teenager	Elderly	Children
15°C / ☼	08:30 – 09:30	0	2	1	0	0
20°C / ☼	10:30 – 11:30	2	3	1	0	0
19°C / ☼	12:30 – 13:30	3	3	3	0	2
18°C / ☼	15:00 – 16:00	8	5	3	2	2
18°C / ☼	17:30 – 18:30	10	19	0	0	3
Weather	South (3 minutes)	Women	Men	Teenager	Elderly	Children
15°C / ☼	08:30 – 09:30	2	2	0	1	1
20°C / ☼	10:30 – 11:30	4	5	0	0	0
19°C / ☼	12:30 – 13:30	10	9	2	1	3
18°C / ☼	15:00 – 16:00	11	19	9	0	2
18°C / ☼	17:30 – 18:30	19	19	3	1	3

E2 station		Pedestrian Counts				Sunday (21.10.2007)
Weather	East (3 minutes)	Women	Men	Teenager	Elderly	Children
15°C / ☼	08:30 – 09:30	0	2	0	1	0
20°C / ☼	10:30 – 11:30	1	2	1	0	1
19°C / ☼	12:30 – 13:30	1	1	0	0	0
18°C / ☼	15:00 – 16:00	5	8	9	0	0
18°C / ☼	17:30 – 18:30	9	5	11	0	3
Weather	West (3 minutes)	Women	Men	Teenager	Elderly	Children
15°C / ☼	08:30 – 09:30	2	1	0	0	0
20°C / ☼	10:30 – 11:30	2	1	0	0	1
19°C / ☼	12:30 – 13:30	10	9	4	0	1
18°C / ☼	15:00 – 16:00	7	11	11	0	0
18°C / ☼	17:30 – 18:30	8	7	14	0	0

F1 station		Pedestrian Counts				Sunday (21.10.2007)
Weather	North (3 minutes)	Women	Men	Teenager	Elderly	Children
15°C / ☼	08:30 – 09:30	2	4	2	0	0
20°C / ☼	10:30 – 11:30	0	1	0	1	0
19°C / ☼	12:30 – 13:30	3	5	8	0	1
18°C / ☼	15:00 – 16:00	8	4	9	0	3
18°C / ☼	17:30 – 18:30	6	10	0	0	0
Weather	South (3 minutes)	Women	Men	Teenager	Elderly	Children
15°C / ☼	08:30 – 09:30	2	2	0	0	0
20°C / ☼	10:30 – 11:30	1	4	0	0	0
19°C / ☼	12:30 – 13:30	9	7	14	2	2
18°C / ☼	15:00 – 16:00	8	10	14	0	0
18°C / ☼	17:30 – 18:30	6	4	1	0	0

F2 station		Pedestrian Counts				Sunday (21.10.2007)
Weather	East (3 minutes)	Women	Men	Teenager	Elderly	Children
15°C / ☼	08:30 – 09:30	0	3	2	1	1
20°C / ☼	10:30 – 11:30	0	2	3	1	0
19°C / ☼	12:30 – 13:30	12	15	2	0	3
18°C / ☼	15:00 – 16:00	9	21	4	0	1
18°C / ☼	17:30 – 18:30	9	10	0	0	0
Weather	West (3 minutes)	Women	Men	Teenager	Elderly	Children
15°C / ☼	08:30 – 09:30	1	2	1	0	0
20°C / ☼	10:30 – 11:30	0	2	0	0	0
19°C / ☼	12:30 – 13:30	3	3	9	1	0
18°C / ☼	15:00 – 16:00	8	14	6	0	1
18°C / ☼	17:30 – 18:30	10	8	0	0	1

G1 station		Pedestrian Counts				Sunday (21.10.2007)
Weather	North (3 minutes)	Women	Men	Teenager	Elderly	Children
15°C / ☼	08:30 – 09:30	2	4	0	1	0
20°C / ☼	10:30 – 11:30	3	0	0	0	0
19°C / ☼	12:30 – 13:30	4	2	0	1	1
18°C / ☼	15:00 – 16:00	17	10	5	0	3
18°C / ☼	17:30 – 18:30	7	5	0	2	0
Weather	South (3 minutes)	Women	Men	Teenager	Elderly	Children
15°C / ☼	08:30 – 09:30	1	3	0	0	0
20°C / ☼	10:30 – 11:30	4	2	5	1	0
19°C / ☼	12:30 – 13:30	10	9	4	1	0
18°C / ☼	15:00 – 16:00	14	14	0	0	1
18°C / ☼	17:30 – 18:30	7	5	2	1	4

G2 station		Pedestrian Counts				Sunday (21.10.2007)
Weather	**East (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
15°C / ☼	08:30 – 09:30	0	1	0	0	0
20°C / ☼	10:30 – 11:30	0	1	6	0	0
19°C / ☼	12:30 – 13:30	2	2	1	0	0
18°C / ☼	15:00 – 16:00	10	6	5	1	1
18°C / ☼	17:30 – 18:30	1	3	0	0	4
Weather	**West (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
15°C / ☼	08:30 – 09:30	2	2	0	0	0
20°C / ☼	10:30 – 11:30	6	4	0	0	0
19°C / ☼	12:30 – 13:30	1	3	1	0	0
18°C / ☼	15:00 – 16:00	4	2	0	0	0
18°C / ☼	17:30 – 18:30	1	6	2	0	0

H station		Pedestrian Counts				Sunday (21.10.2007)
Weather	**North (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
15°C / ☼	08:30 – 09:30	1	1	0	1	0
20°C / ☼	10:30 – 11:30	2	3	0	0	0
19°C / ☼	12:30 – 13:30	4	5	0	1	0
18°C / ☼	15:00 – 16:00	3	8	0	0	0
18°C / ☼	17:30 – 18:30	6	10	0	0	1
Weather	**South (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
15°C / ☼	08:30 – 09:30	0	2	0	0	0
20°C / ☼	10:30 – 11:30	5	6	0	0	2
19°C / ☼	12:30 – 13:30	4	7	3	0	1
18°C / ☼	15:00 – 16:00	6	6	0	0	0
18°C / ☼	17:30 – 18:30	5	3	0	0	0

I station		Pedestrian Counts				Sunday (21.10.2007)
Weather	**North (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
15°C / ☼	08:30 – 09:30	2	2	0	0	0
20°C / ☼	10:30 – 11:30	2	5	0	1	0
19°C / ☼	12:30 – 13:30	9	8	4	0	2
18°C / ☼	15:00 – 16:00	17	12	2	3	2
18°C / ☼	17:30 – 18:30	8	11	0	1	0
Weather	**South (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
15°C / ☼	08:30 – 09:30	3	5	1	0	0
20°C / ☼	10:30 – 11:30	1	6	0	0	0
19°C / ☼	12:30 – 13:30	10	8	3	1	1
18°C / ☼	15:00 – 16:00	7	3	1	3	1
18°C / ☼	17:30 – 18:30	5	11	0	0	0

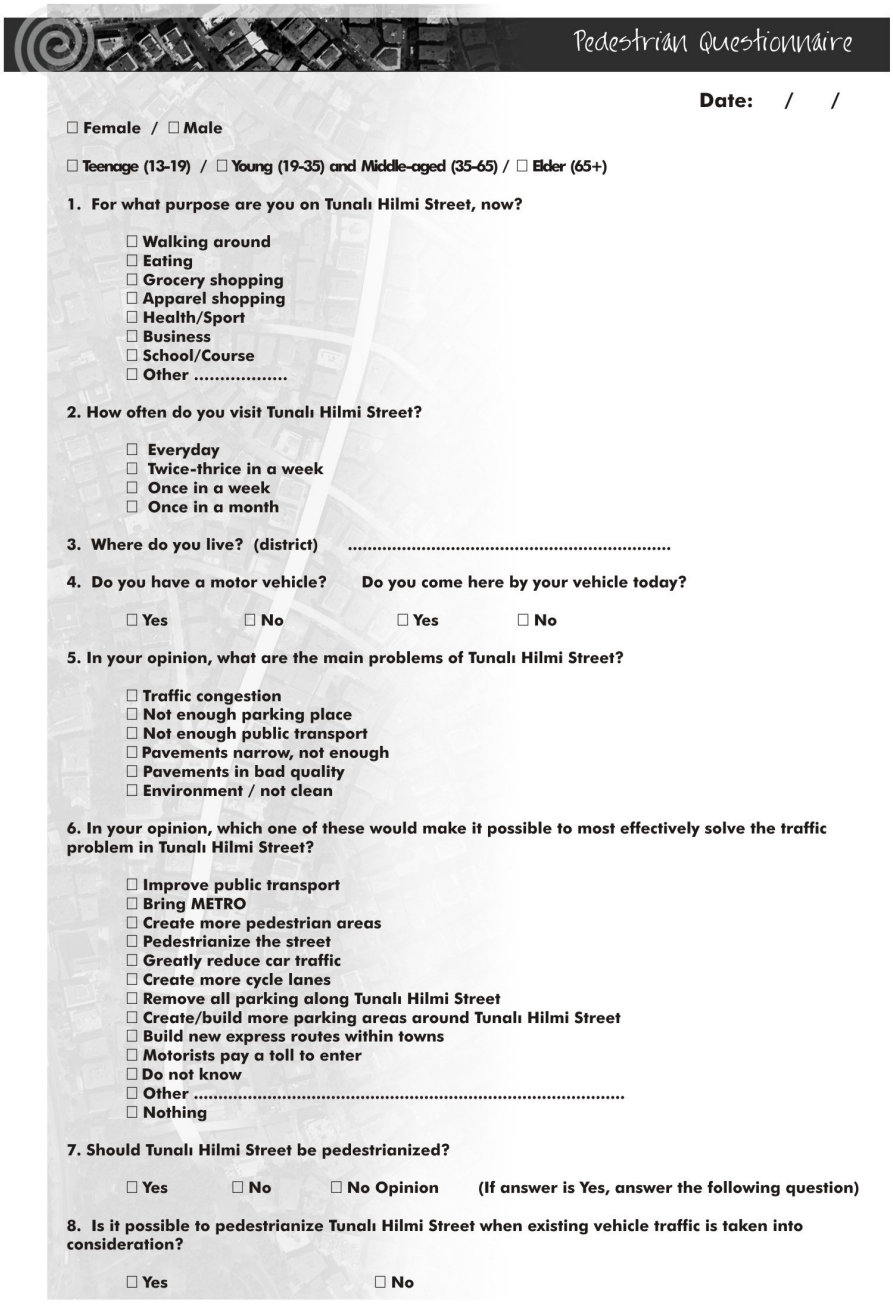
J station		Pedestrian Counts				Sunday (21.10.2007)
Weather	**North (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
15°C / ☼	08:30 – 09:30	2	3	0	0	1
20°C / ☼	10:30 – 11:30	1	3	1	3	0
19°C / ☼	12:30 – 13:30	5	5	2	0	1
18°C / ☼	15:00 – 16:00	8	5	4	0	3
18°C / ☼	17:30 – 18:30	3	6	0	1	0
Weather	**South (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
15°C / ☼	08:30 – 09:30	1	0	0	0	0
20°C / ☼	10:30 – 11:30	3	4	1	1	0
19°C / ☼	12:30 – 13:30	2	4	2	1	1
18°C / ☼	15:00 – 16:00	3	2	0	0	1
18°C / ☼	17:30 – 18:30	6	4	1	0	0

K station		Pedestrian Counts				Sunday (21.10.2007)
Weather	**North (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
15°C / ☼	08:30 – 09:30	2	4	0	0	0
20°C / ☼	10:30 – 11:30	4	8	3	2	0
19°C / ☼	12:30 – 13:30	1	3	3	1	0
18°C / ☼	15:00 – 16:00	19	16	3	3	0
18°C / ☼	17:30 – 18:30	8	5	0	0	0
Weather	**South (3 minutes)**	**Women**	**Men**	**Teenager**	**Elderly**	**Children**
15°C / ☼	08:30 – 09:30	4	8	4	0	0
20°C / ☼	10:30 – 11:30	8	12	4	1	2
19°C / ☼	12:30 – 13:30	9	4	3	1	3
18°C / ☼	15:00 – 16:00	3	6	5	2	0
18°C / ☼	17:30 – 18:30	5	5	0	2	0

APPENDIX B

QUESTIONNAIRE SHEETS

B.1. Pedestrian Questionnaire



Pedestrian Questionnaire

Date: / /

☐ Female / ☐ Male

☐ Teenage (13-19) / ☐ Young (19-35) and Middle-aged (35-65) / ☐ Elder (65+)

1. For what purpose are you on Tunalı Hilmi Street, now?

☐ Walking around
☐ Eating
☐ Grocery shopping
☐ Apparel shopping
☐ Health/Sport
☐ Business
☐ School/Course
☐ Other .....

2. How often do you visit Tunalı Hilmi Street?

☐ Everyday
☐ Twice-thrice in a week
☐ Once in a week
☐ Once in a month

3. Where do you live? (district) .....

4. Do you have a motor vehicle? Do you come here by your vehicle today?

☐ Yes ☐ No ☐ Yes ☐ No

5. In your opinion, what are the main problems of Tunalı Hilmi Street?

☐ Traffic congestion
☐ Not enough parking place
☐ Not enough public transport
☐ Pavements narrow, not enough
☐ Pavements in bad quality
☐ Environment / not clean

6. In your opinion, which one of these would make it possible to most effectively solve the traffic problem in Tunalı Hilmi Street?

☐ Improve public transport
☐ Bring METRO
☐ Create more pedestrian areas
☐ Pedestrianize the street
☐ Greatly reduce car traffic
☐ Create more cycle lanes
☐ Remove all parking along Tunalı Hilmi Street
☐ Create/build more parking areas around Tunalı Hilmi Street
☐ Build new express routes within towns
☐ Motorists pay a toll to enter
☐ Do not know
☐ Other .....
☐ Nothing

7. Should Tunalı Hilmi Street be pedestrianized?

☐ Yes ☐ No ☐ No Opinion (If answer is Yes, answer the following question)

8. Is it possible to pedestrianize Tunalı Hilmi Street when existing vehicle traffic is taken into consideration?

☐ Yes ☐ No

B.2. Shop-Owner/Manager Questionnaire

Date: / /

☐ Owner / ☐ Tenant

Shop type

- ☐ Café
- ☐ Restaurant
- ☐ Apparel store
- ☐ Grocery/Market
- ☐ Sports
- ☐ Health
- ☐ Jewellery
- ☐ Other .....

1. Do you come to your shop by motor vehicle?

☐ Yes ☐ No (if not how?).....

2. How long have you had a shop on Tunalı Hilmi Street? (Year)

.....

3. Are you a member of an any neighbourhood organization?

☐ Yes ..... ☐ No

4. In your opinion, what are the main problems of Tunalı Hilmi Street?

- ☐ Traffic congestion
- ☐ Not enough parking place
- ☐ Not enough public transport
- ☐ Pavements narrow, not enough
- ☐ Pavements in bad quality
- ☐ Environment / not clean

5. In your opinion, which one of these would make it possible to most effectively solve the traffic problem in Tunalı Hilmi Street?

- ☐ Improve public transport
- ☐ Bring METRO
- ☐ Create more pedestrian areas
- ☐ Pedestrianize the street
- ☐ Greatly reduce car traffic
- ☐ Create more cycle lanes
- ☐ Remove all parking along Tunalı Hilmi Street
- ☐ Create/build more parking areas around Tunalı Hilmi Street
- ☐ Build new express routes within towns
- ☐ Motorists pay a toll to enter
- ☐ Do not know
- ☐ Other .....
- ☐ Nothing

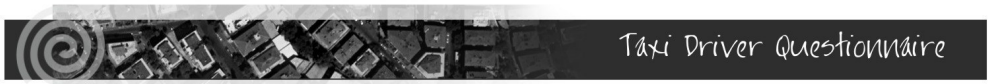
6. Should Tunalı Hilmi Street be pedestrianized?

☐ Yes ☐ No ☐ No Opinion (If answer is Yes, answer the following question)

7. Is it possible to pedestrianize Tunalı Hilmi Street when existing vehicle traffic is taken into consideration?

☐ Yes ☐ No

B.3. Taxi-Driver Questionnaire



Date: / /

Taxi stand name and location: .....

1. In your opinion, what are the main problems of Tunalı Hilmi Street?

- ☐ Traffic congestion
- ☐ Not enough parking place
- ☐ Not enough public transport
- ☐ Pavements narrow, not enough
- ☐ Pavements in bad quality
- ☐ Environment / not clean

2. In your opinion, which one of these would make it possible to most effectively solve the traffic problem in Tunalı Hilmi Street?

- ☐ Improve public transport
- ☐ Bring METRO
- ☐ Create more pedestrian areas
- ☐ Pedestrianize the street
- ☐ Greatly reduce car traffic
- ☐ Create more cycle lanes
- ☐ Remove all parking along Tunalı Hilmi Street
- ☐ Create/build more parking areas around Tunalı Hilmi Street
- ☐ Build new express routes within towns
- ☐ Motorists pay a toll to enter
- ☐ Do not know
- ☐ Other .....
- ☐ Nothing

3. Should Tunalı Hilmi Street be pedestrianized?

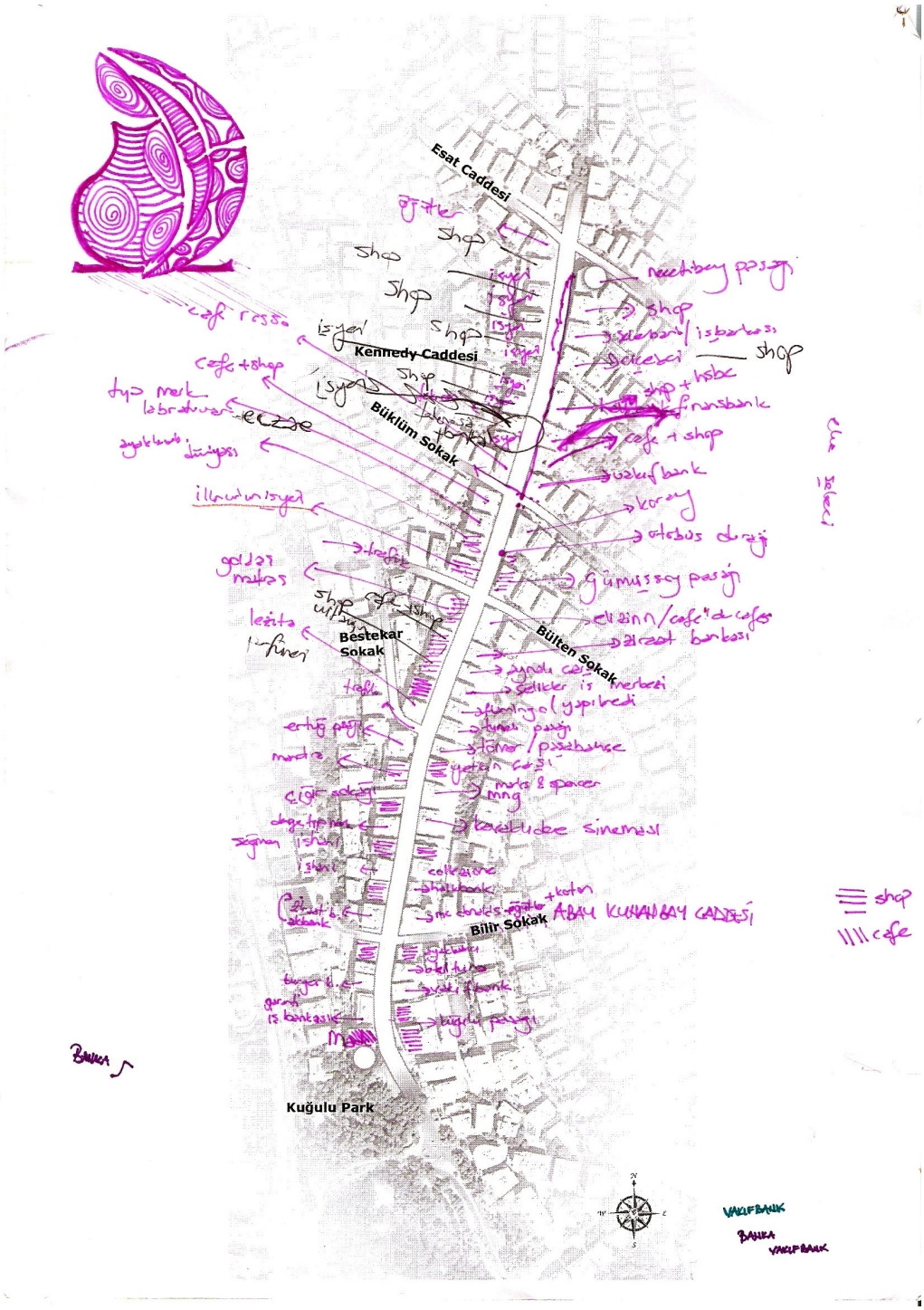
☐ Yes ☐ No ☐ No Opinion (If answer is Yes, answer the following question)

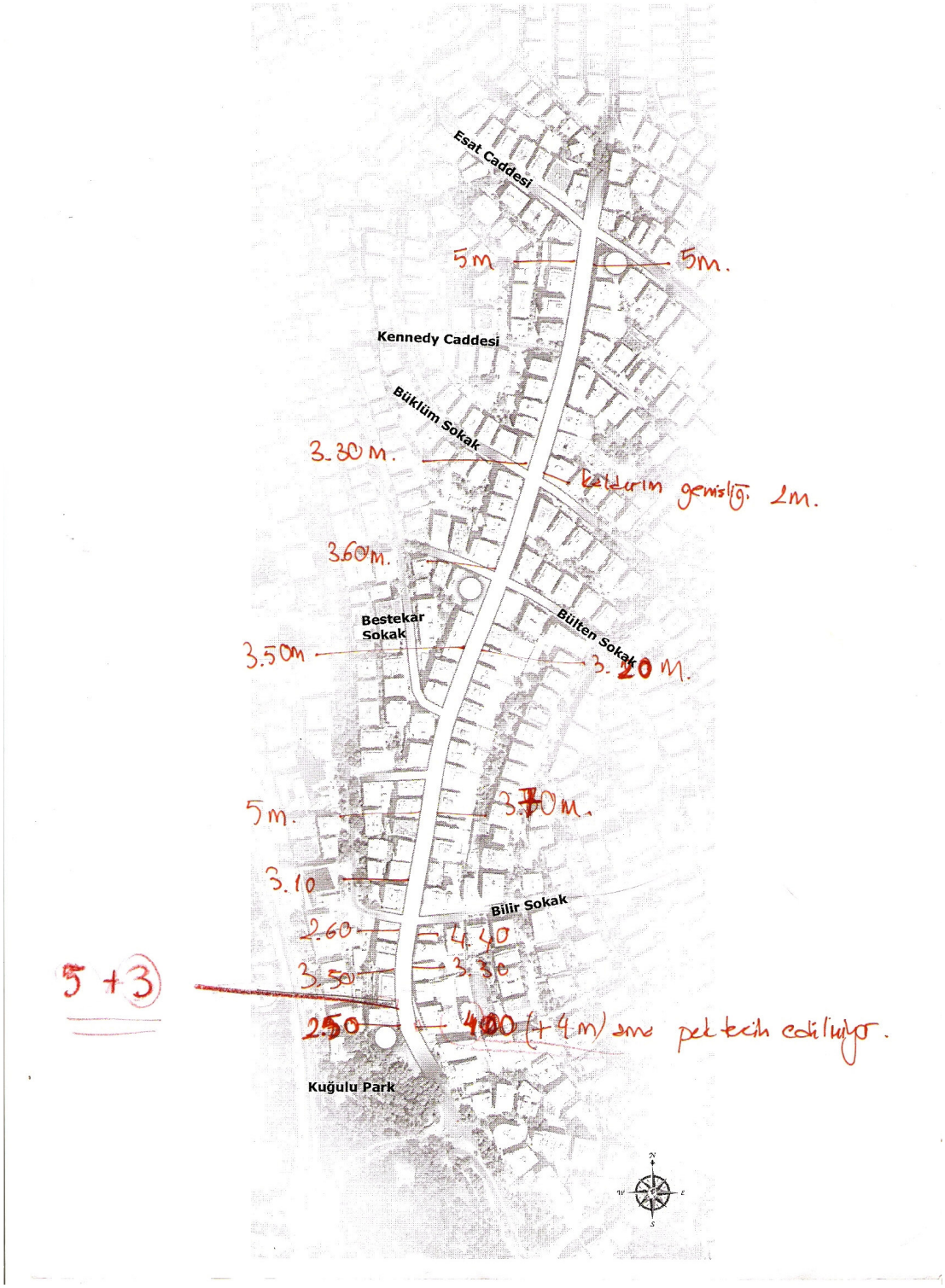
4. Is it possible to pedestrianize Tunalı Hilmi Street when existing vehicle traffic is taken into consideration?

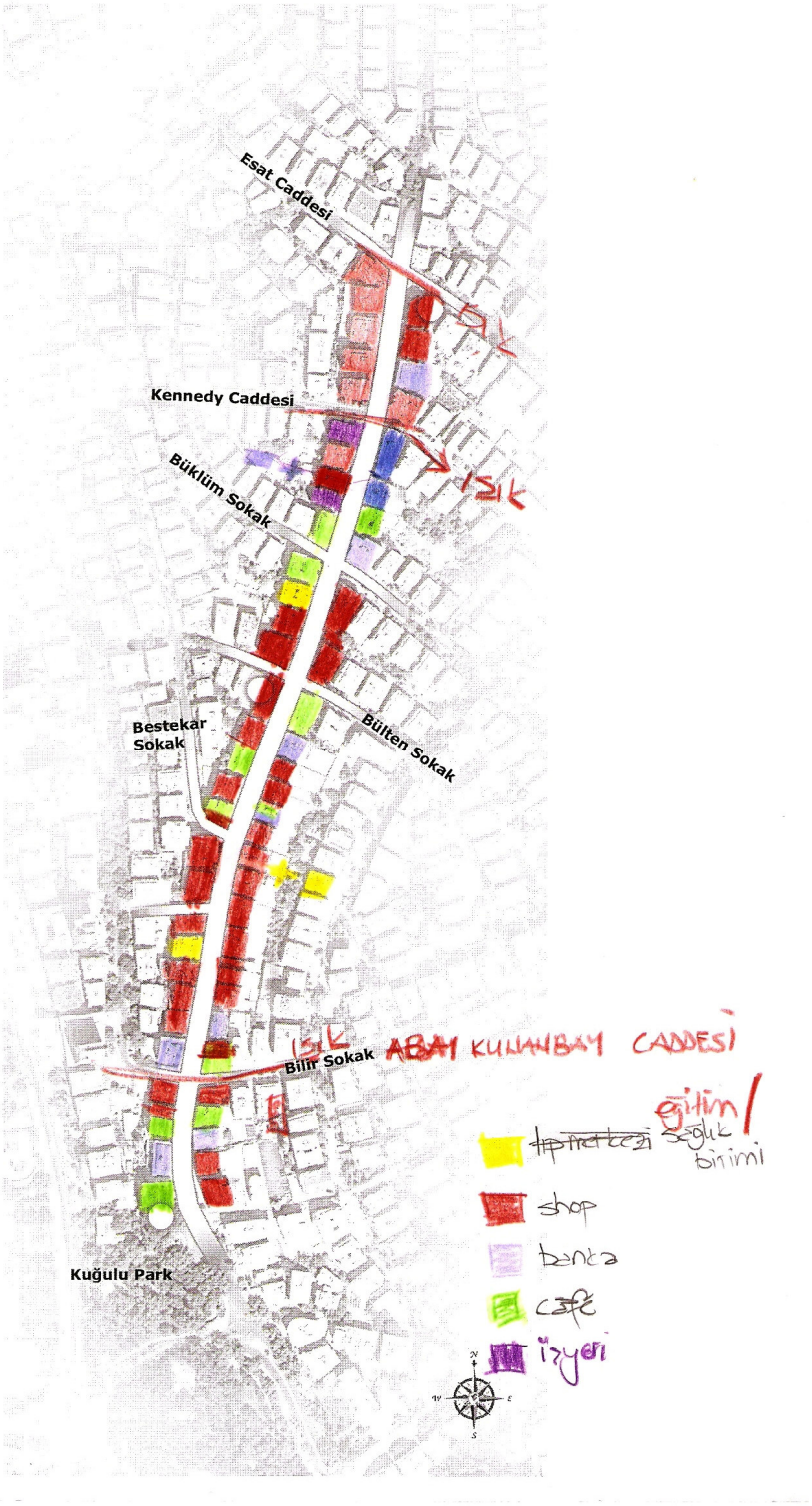
☐ Yes ☐ No

APPENDIX C

OFF THE RECORD




Esat Caddesi
5m
5m.
Kennedy Caddesi
Büklüm Sokak
3.30 m.
Kaldırım genişliği 2m.
3.60m.
Bestekar Sokak
Bülten Sokak
3.50m
3.20 m.
5m.
3.10
Bilir Sokak
2.60
4.40
3.50
3.30
5 +3
2.50
4.00 (+4m) ana yol tercih ediliyor.
Kuğulu Park


Esat Caddesi
Kennedy Caddesi
Büklüm Sokak
Bestekar Sokak
Bülten Sokak
Bilir Sokak
Kuğulu Park
ABAY KUNUNBAY CADDESİ
eğitim / sağlık birimi
shop
banka
cafe
işyeri


Esat Caddesi
Kennedy Caddesi
Büklüm Sokak
Bestekar Sokak
Bülten Sokak
Bilir Sokak
Kuğulu Park