Evaluating Non-Motorized Transportation through Selected Walkability Factors: The Case of Famagusta, Cyprus

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ABSTRACT

Walkability is one of the techniques to design more sustainable and livable cities. In contemporary architecture and urban design, the topic has gained significance due to many benefits it offers in relation to people's health and sustainable mobility. After the Second World War, there were tendencies to design more humanized cities as a reaction to modern urbanism, which gave rise to rapidly developing cities with increasing car ownership. The character of the modern city deprived the citizen from the most basic right, the act of walking. Constructed on this diagnosis, the thesis investigates the transformation of the city from car-dominated approach of modern urbanism to a more humanized, walkable approach of new urbanism. In this respect, the thesis draws attention to the history of urbanism with an emphasis on walkability and its techniques. After a thorough look into the theory of walkability introduced by new urbanism, specific factors have been selected to analyze the case study of Famagusta. Finally, the study presents a comparison between the walkable city factors and the selected case study in order to propose more walkable paths in between these nodes by the help of a map of walkability.

Keywords: Non-Motorized Transportation (NMT), Sustainable Mobility, Walkability, New Urbanism, Famagusta, North Cyprus.

ÖZ

Sürdürülebilir ve yaşanabilir yerler elde etmek ancak yürünebilir kentlerin tasarlanması ile mümkün olacaktır. Bu konunun çağdaş mimarlık ve kentsel tasarım alanlarında önem kazanması insan sağlığına ve sürdürülebilir akışkanlığa sağladığı katkılar ile yakından ilişkilidir. İkinci Dünya Savaşı'nın ardından daha insani kentler tasarlama arzusu modern kentleşmeye bir tepki olarak ortaya çıkmış ve araç mülkiyetinin artarak çoğaldığı hızla büyüyen kentler ile bizi tanıştırmıştır. Modern kentin karakteri kentliyi en temel hakları olan yürüyebilme faaliyetinden de mahrum etmiştir. Bu bulgu üzerine kurgulanan tez, araç merkezli modern kentin daha insan odaklı bir kente dönüşmesini literatürdeki kent tarihi üzerinden okumaktadır. Bu bağlamda yürünebilir kentlerin tasarlanmasına katkı sağlayan ve yeni kent ile ilişkilendirilen kavramsal yaklaşımlar incelenmektedir. İlgili kaynak taraması sonucunda Mağusa, Kıbrıs'ta seçilen alan çalışması belirlenen kriterler çerçevesinden analiz edilerek daha yürünebilir bir ağın oluşturulması ile ilgili öneriler sunulmaktadır.

Anahtar Kelimeler: Yürünebilir kentler, yeni kent hareketi, Sürdürülebilir Akışkanlık, Mağusa , Kuzey Kıbrıs.

DEDICATION

This work is dedicated to God Almighty, to my parents Mr. Mohammad Mohseni, Mrs. Robab Mohseni and my sister Fatimah Mohseni.

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Chapter 1

INTRODUCTION

"People go where the people are there "Jan Gehl 2010

Walking is the most basic means of Non-Motorized Transportation offered in many societies. Therefore, regardless of people being rich or poor walking is the main mode of transportation. Indeed, everybody needs to walk to access other types of transportations. The quality of walking and quantity of pedestrians are variable in different societies. For example, recent studies show that "between 25 and 50 percent of trips in the major Indian cities, 1 and around 50 percent of all trips in major African cities, are entirely on foot, and that trips undertaken primarily by public transport also involve significant walking distances. In medium and smaller cities, the share of all-walking trips increases to 60 to 70 percent clearly, walking dominates for shorter trips, but even in terms of distances traveled, walking accounts for over 50 percent of all trips in Morogoro, Tanzania" (Sachdeva 1998).

In many cases, city authorities are unable to offer walkability as a means of transportation. However, in many developed countries, this type of transportation is accepted and shoppers welcome pedestrians although it is still difficult to give priority to pedestrians. Many fast growing countries in Asia has accepted walking as a main means of transportation in short distances as part of their urban planning goals but unfortunately, the first priority is with motorized transportation. These attempts resulted in segregation of pedestrians in pedestrian-only ways, which are

usually not designed well. Many of these attempts resulted in the location of the pedestrian roads, along the main traffic routes, which may not always reflect the desire of people. However, walking is a transportation that should not be segregated from other types of transportation (De Langen and Tembele 2000, Sachdeva 1998).

The study of the walkable city directly or indirectly defines itself based on a priority of non-motorized transportation system. However, the layers of the design in each district of city are shaped on urban planning policies of that specific area or country but some values like permeability or safety are universal standards for benign urban design. The idea of the walkable city as mentioned has many benefits, and it needs to be considered as a vital factor in urban design. This is especially valid for those cities with substantial growth based on modernist ideas that led to fragmented parts. These parts should be integrated to each other with a mixed use based on more sustained dynamism where human priority needs in transportation are considered (Ellin, 1999).

Moreover, the walkable city idea should be seen in the larger frame of sustainability which needs to pursue the relevant theory or strategies of NMT (Speck 2014). New Urbanism or Smart Growth is one those strategies that has recently been used with these considerations that prevent gated walkable communities (ibid).

These general concerns are also applicable for the case of Famagusta where pressure has been put on the surrounding Salamis road due to the rapidly growing population of the University. The thesis concentrates on the connecting route between the University and the old town to evaluate the level of walkability within the context of

predetermined factors. Based on the criteria collected through the literature survey in chapter two, a qualitative assessment is carried out to arrive to some concrete solutions for the selected case.

1.1 Problem Statement

Rapidly growing cities usually share similar problems of which the most common one is the rising number of private cars, and therefore the negligence of pedestrian friendly routes and activities impacting negatively on the act of walking. Sharing a common difficulty due to the rapidly growing number of, Eastern Mediterranean University, the Salamis road has turned into a route for cars only where pedestrian paths are mainly used as car park areas. Starting from the node in front of University and leading to the node welcoming the old town, where many new developments have taken place during the last twenty years, there is a need for deeper research to understand why it is mainly dominated by cars and how often pedestrians use that route to access to their destinations. It is also observed that University is a separate fragment or modern development within the city, where people have a different image of whereas the old town has a completely different image due to being not quickly reachable. The distance between these two nodes is not too much but many use private cars, and this motorized transportation do not help collect any memories of the old town making it almost unrecognizable to many people temporarily or permanently living in the city. The character of the university and the old town create two separate boundaries with two physical edges. Moreover there are other issue of concern along this route such as the existence of unsuitable sidewalks which provide contrivances of comfort for pedestrians. Therefore, there is a need for defining a set of values which comes from Non-Motorized system, for creating a comfortable walking route along the specified pathway. Then, how can we find these basic

elements of sustainable mobility based on new ideas in urbanism and adapt it to today's situation in the example of case study? Alternatively, in simple words what are the priorities of a walkable city to encourage people for Active Transportation (NMT) along the Salamis road?

1.2 Aim of Research and Limitations

The thesis aims to create a practical guide for researcher, practitioner who wish to design or study walkable city under the non-motorized transportation priorities. In the light of this target, the strategies of non-motorized transportation are investigated from various sources in order to pinpoint the most common factors involved. These factors like safety, connectivity and comfort which help create a walkable city are utilised in the assessment of the selected case study. In summary, the aim of the research is to

- Look into various sources for drawing a theoretical background for walkability factors
- Underline the most crucial walkability factors
- Apply these walkability factors to the selected case study

The study on walkability drag the discourse into various fields like sociology and philosophy but due to the limited time of study, walkability within the frame of urban design will only be discussed here.

1.3 Methodology of the Research

Related literature from primary sources like books and scientific articles, and secondary sources such as internet sources are investigated where related maps and photographs are tracked for the completion of the case study analysis.

Schematic drawings provided for the case study are based on observations made for better understanding of the aims of the research.

The methods adopted for this thesis are:

1. Qualitative research method.
2. An onsite observation of selected street and
3. Questionnaires with a number of locals and focused interviews have been has been carried out.

1.4 Structure of the Thesis

The chart below shows the breakdown (structure) of the entire thesis. In Figure 1.1, main chapters, and related sub-chapters are given in a systematic way.

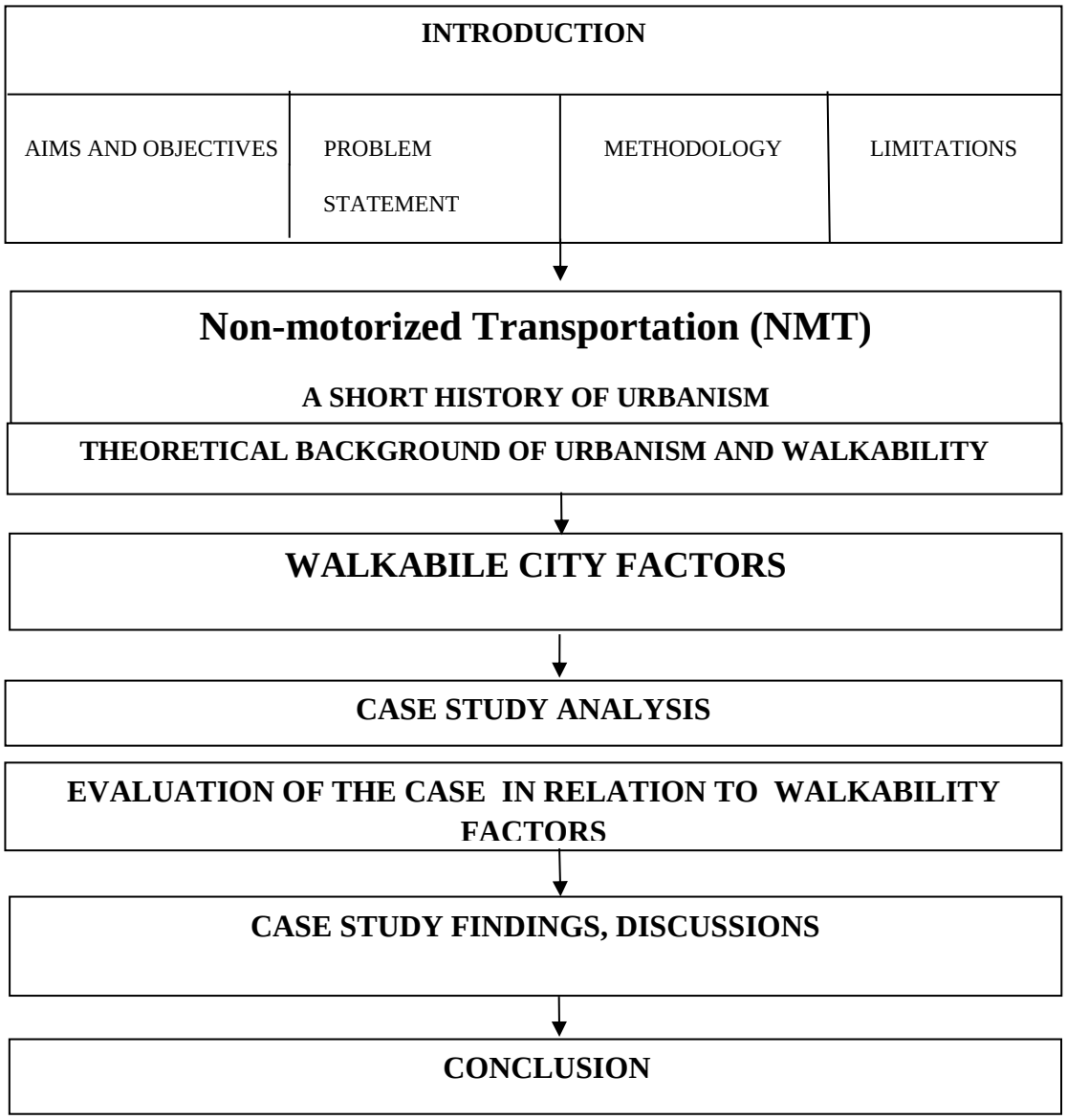

Figure 1.1: Research Structure

Chapter 2

Non-motorized Transportation

”*Le Corbusier wanted a modern architecture that seeks freedom of movement in a perfectly coordinated form. To expunge* historical *time from the city, Corbusier's "Voisin Plan" the street should be for 'trucks and taxis' and excluding people* ”

(Sennet,1991).

2.1 Walkability in history of urbanism

Non-motorized transport (NMT) has benign environmental effects. The users of this type of transportation are a wide range of people from different levels of income. Therefore, it is very important to trace its attitudes in the history of urbanism. Despite these obvious facts, policy makers have ignored NMT in many aspects. The purpose of this chapter is to understand the NMT definition, and in light of its characteristics and benefits, to suggest a framework for walkability. Rather an explanation of strategies for NMT, it is necessary to shed a light on historic backgrounds of Active Transport or Non-Motorized Transportation. The two major modes of NMT are walking and various forms of cycling. Though, the background of walkability relates to history of humanity and urbanism but bicycle is a new invention from last centuries. Moreover, in case of explaining the history of walkability there is a need to look into the history of urbanism.

There are two different categories in defining the city in the literature. Those books, which try to conceive the human settlement, are labeled as *realizer*, the other one labeled as*commentators* holds imaginative attitudes that nourished by municipal regulations, construction manuals even utopias. In this case, there are genuine and false utopias that produced these texts in the urbanism and a bigger picture, in the human built environment (Choay, 1997).

Figure 2.1: The Piazza del Populo (Kostof, 1995)

For the first group, we can name Alberti as an author. His objectives are conceptual methods or the generative rules that enable creation. Those rules come from the houses to the cities or in simple words from building to architecture. In particular, for the next group of textbooks in architecture, we can name many not even architects and designers (ibid).

In Figure 2.1 which is a perespective of the Piazza del Populo in Italy, the pedestrians charged experience come from how perspective creates movement in the city, turning the person into its web of streets outside the sufficiency of his or her perception, searching for where to go next (Sennet, 1990).

The perspective quickly turned to be a rule in the art of architecture; mainly the view was the first presence of humanism in architecture in a systematic way, for western architecture and urbanism after Renaissance and it was a contrivance for urban designers to make walkable streets (ibid). Before that the human perspective to perceive the design was the primary aim of Abet Suger in Gothic architecture is characterized by a height that impacts the user to understand the house of God, and recognize it as a separate building from other parts of the city (Panofsky, 1951**).** That was resumed in the art of creation in Renaissance mainly by considering the proportions in architecture.

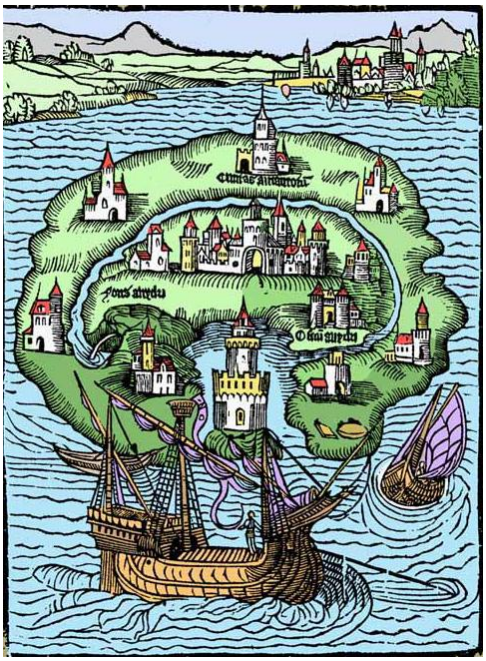

Figure 2.2: The island of Utopia described by T. More in 1516-source: Thomas More, 1478-1535

The technology has a share with the body of society consciousness from ancient times, which leads to a harmony that is reachable and understandable for an individual in the14thcentury. Therefore, the location appears based on the collaboration of technology and inquiry of people's needs. In this point of view, the

application to design a city was a cultural understanding, local environment, economic conditions and local geographical situation of cities. FollowingAlberti's idea of reaching the durability", "utility and "Beauty". Albertidid not need to define a new particular structure because the base or the identical units were already defined. He maps a new structure for proportions for the architecture of buildings in city, so mainly there is a model for urbanism completely adapted to people needs like 'walking distances' although those identical units carry the rights of the user as criteria.There is no need for Alberti to preserve the principles in a utopia. he doesn't need to create a utopia , up to the island of Utopia as described by "T. More" in 1516 (Figure 2.2) (Thomas More, 1478-1535).This is why many commentators' like T. More texts are not able to cover the gap between books to reality.

In the eastern part of the world especially in middle east, growth of cities was following such complete organic way based on the needs of people(like walking which is the main part of NMT) within but, unfortunately, there are not unique texts as the "realizers" books in western countries. Nevertheless, those developments were based some organic growth from inner parts of cities, especially in Sassanid period and later in Islamic world (Pirnia, 1997).

The Roman order for city planning was to reduce the chaos to manageable proportions. The Romans used Greeks' idea of grid city and improved it to a gridiron form the buildings inside which were connected with each other in a certain order.The most significant part of Roman city was the street system, which was in a cross shape and connected different zones of city that celebrated pedestrian

movements through a series of complexes like forum, aguraetc. Those two creates more walkable city Mainly (Mumford, 1961)

The emphasis in urbanism of Enlightenment is on a unity between landscape and city due to humanism inherited from Renaissance. In this way, we can name John Wood's 1727 Queen Square (Figure 2.3) where is the human eye as therefore reference for designer and the perspective changes to give the pedestrian a visual measurement of space and time. On the other side, the cities of America followed another principle that we can name "instant cities" through a grid discipline. The network based on scholar's ideas has its roots from Romans military camps in newly

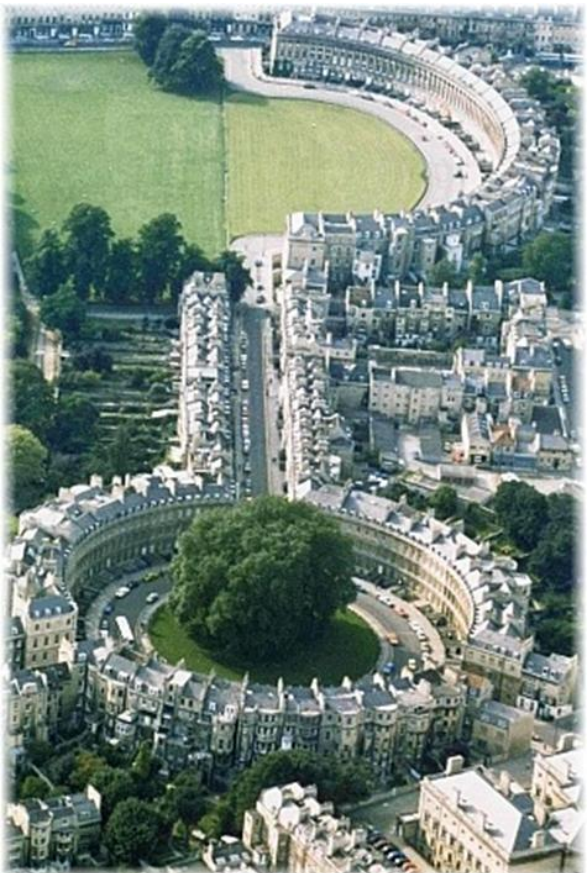

Figure 2.3: John Wood 1727, Queen Square, England
Source: *Images of England*. Retrieved by google earth -2015

dominated countries (Sennet, 1990).

Modern city planning in the early 20 century arose quickly; Walter Gropius, Le Corbusier, and Tony Garnier were the eldest of the modernist city planners. In modernism approach, the base for culture and tradition of a place is ignored. “Modern planners and urban designers believed that the land must be free of any use to create vertical shape. Skyscrapers are one of the most emblematic modernist architecture and city planning simulacra (Dirlik, 2002). Modernists believe that the city should be divided into sections and also there is a repetition of similar form in each one that is not related to the context of the local user but to the city fabric (ibid). That makes the city a place for cars because those distances between sectioned places needed to be connect by a motorized system of transportation, walking is meaningless, and pedestrians are limited in their gated communities.

Table 2.1: Urbanism situation in periods, from middle ages until modernism

Period	**The role of walkability in Urbanism**
Middle Ages	growth of cities was following such complete organic way based on the needs of people within the cities
Renaissance	presence of humanism in architecture in a systematic way
Enlightenment	unity between landscape and city due to humanism
Modernism	city divided into sections and also there is a repetition of similar form in each one that is not related to the context of the local user but to the city fabric

2.2 Walkability in urban planning

Urbanism of 19th and 20th century has had many changes and attitudes that it cannot be summarized briefly but here most important ones are presented. One of the most significant ideas was the idea of garden city by Ebenezer Howardthat followed by frank Lloyd Right later in United States of America. In Europe Tony Garnier and le Corbusier improved the idea of industrial modern city, which follows principle of partitioning the city functions that is criticized by Lewis Mumford in the United States. Mumford believed that that idea is the cause of automobile dependency of United States, which is against the mixed use, and the idea of walkable city.

In late 1960s and early 1970s quantitative and qualitative methods in urbanism flourished alongside each other but the qualitative approach was primarily historical and as mentioned before finding a "base form" as a kind of survival and distribution of historic buildings (Cataldi, 2003). however, on the other hand, urban geographical morphology developed in the United States of America and the concept of this approach was socio-economic perspective in urban design and typological basis it refers to was a land-use pattern (Katz, 1993) yet a shifting paradigm happened in the verge of new century which will be discussed later in New Urbanism. In1990s, there was an interest among professionals and academics in urban landscape disciplines but somewhere earlier M. P. Conzen expressed an idea about studying the structure of cities which is known as "English approach of typo-morphological studies". Conzenian approach in morphological studies follows a pattern of streets, plots, and buildings. This method separates the morphological regions as "townscape" and the general plan type of these morphological regions is categorized in four ranks of hierarchy; the first fold is called morphotypes and contains the essential historical core of the city. The second layer is the first developments and old areas, the third

one is a combination of old ones and new developments then there is a fourth level that contains the new developments of city (URL 2).

The new level of urbanism is a mixture of Italian approach with the English one and the help of French version which contains real experiences to feed the historical part of this new movement in Landscape design and Urban Planning. Different aspects of Walkable city needed to define and also name some significant elements of NMT (Non-Motorized Transportation) that have had impact on the urbanism of contemporary years. For evaluation of those attitudes in NMT there is a need of an explanation about the nowadays situation that trend us to this type of transportation:

2.3 The Rise of Ecological Approach to the City

In the last quarter of 20thcentury, architects like Venturi and his counterparts decided to challenge the norms and the facts of functionalism relating to modernism. These architects primary discipline was based on being sensitive to the context of the knowledge in general, however they also believed that interpretation of context comes with different experience so the idea takes another step and shows that knowledge is ungraspable without correct consideration of context. As mentioned before the origins of this new movement comes from the United states around 1960s-1970s when the science was overwhelmed in chaos of determining the structure of the world and many scientific ideas failed to describe our surrounding world (nature) for example in physics. By rapid increase of population, in political world many countries gained their independence in those years that began with the cold war after the World War II. Moreover, because of transformation of information, new voices in multi-cultural societies started to interprets their ideas of knowledge based

oncontext, the United States of America, the winner of world war was a good place for flourishing those specifics (David, 2009).

The crisis of population growth caused two major issues. One was the birth of new countries besides ancient nations and the second was the importance of communication between these communities and most prevailing culture of each region of the world. This request appeared in those communities for defining their communities with the architecture of symbols and symbolic urbanism. So each of them used their way of reading the context based on their technological abilities.

Unnatural global warming of earth based on latest research of scientists is real and caused by humanity. The impact of global warming within architecture is the central theme of new urbanism and new approach to urbanism for more sustainability (United Nations projections). In urbanism, the city is dominated by cars, which consume fossil energy and release pollution based on modernist ideas of the separated city. As mentioned before cars also deprive citizens from many of natural human rights. Therefore, the non-motorized transportation is considered as a solution for the situation mentioned. In the light of this perspective, we need to define the meaning of non-motorized system or active transport firstly and then evaluate its benefits.

2.4 Definition of Non-Motorized Transportation

"Active transport"(also called *non-motorized transport*, *NMT* and *human powered transport*) refers to walking, cycling, and variants such as wheelchair, scooter and handcart use. It includes both utilitarian and recreational travel activity, plus stationary uses of pedestrian environments such as standing on sidewalks and sitting at bus stops. *Pedestrian*, *walker*, *cyclist*, and *non-driver* refer to active mode users,

whereas *motorist* and *driver* refer to automobile users, although most people fall into multiple categories." (Litman1997-2015)

These active modes are the main part of NMT and here some of most important aspects have explained based on Litman researches:

1. 10-20% of local trips are entirely by active modes, and most common one is walking from home to drive our car outside.

2. By improving active mode in transportation there will be less traffic congestion and less pollution and it let the city grow smartly.

3. Walking and cycling are affordable for every one as a basic transport so socially, economically and physically they are helping for more social equity and economic opportunities.
4. Active transport is a practical way of preserving the fitness and health in public.

5. Sidewalks, paths and hallways are a major portion of the public realm for Pedestrians. Socializing, waiting, shopping and eating overtake in these environments.

6. Walking and cycling provides enjoyment and health benefits for people and supports related industries like, recreation and tourism.

Although, it is understandable that planning decisions affect walking and cycling conditions. This chapter describes methods for a sober evaluation of these impacts.

Active travel is diverse; some attitudes mentioned in this thesis are related to local condition of each society, modes or trips. Some of existing analyses refers to the priority of walking, some prefers cycling and some of them prefer an access to public transportation in certain condition. The point is user must determine the appreciation of analyses.

2.5 Evaluating Non-Motorized Transportation Benefits

Here some NMT values have named and some will be explained with their related evaluation methods in following (Appendix 1) (Litman, 1997-2015; Carley olsen, et al 2005; Rapoport, 2005):

1. User Benefits
2. Option Value
3. Equity Benefits
4. Physical Fitness and Health
5. Vehicle Savings
6. Reduced Chauffeuring Burdens
7. Congestion Reduction
8. Barrier Effect
9. Traffic Safety Impacts
10. Energy Conservation
11. Pollution Reduction
12. Land Use Impacts
13. Vehicle Traffic Impacts

The first four factors will be looked at in detail in the thesis as they are closely related to walkability issues in urban planning. Issues relating to designing for

bicycles or controlling the cars in the traffic are not within the limits of this study. (Appendix 1)

In Appendix 1 NMT benefits and strategies are given detail and Table 2.2 gives a summary of these strategies. Some of these suggestions can only affect part of a worksite. As mentioned before a combination of these strategies can result in a significant improvement of active transit within cities and that is why New Urbanism or Smart Growth strategies will be looked closely in this study.

Table 2.2 A summary of NMT strategies for more active transportation.

NMT Strategy	**Result**
Facility improvements for walking and cycling	universal design for all people including foreign users
Educate people who are using active transport	Safety for pedestrians and cyclists
An easy rent Bikes system	Encourage more people for NMT
Redesign, traffic calming, road diets and traffic speed controls	more enforcement for motorized traffic
Improved road and path connectivity	shortcuts and more encouragements for people who want to walk and cycle

Improvements of Public transport	Improvements of the sidewalks, packings and many other related facilities for pedestrians and cyclists
The models of transportation as a program	Better managements for prices and affordable for users
Increasing the price of driving	Reinforce the active transit
New Urbanism or Smart growth	improve walking and cycling conditions and encourage use of active modes

2.7 Walkability

2.7.1 Definitions of Walkability Concept

The walking is the most familiar part of (NMT) and other form of NMT include bicycles/tricycles are new human made tools and we can add up handcarts/wheelbarrows, animal drawn carts and other human powered vehicles. In fact, the definition of Non-motorized system is any type of human powered vehicles but not combustion motor**.**

"More than Three-quarters of adults in the US are not engaged in enough physical activity, and one-quarter of this population is inactive in their free time. (Southworth, 2005)." Nearly two-thirds (64.5 percent) of adults in the US are overweight as a result, almost one-third of this population are obese according to a recent survey by National Health and Nutrition Examination Survey (Ewing, et al. 2003). In contrast,

European countries with the highest rates of walking and bicycling have less obesity, diabetes, and hypertension than the U.S. (Pucher& Dykstra 2003; Southworth, 2005).

Of course, we cannot deny the positive impacts of the high speed of automobiles but we must notice the harms. Obnoxious impacts on environments, destruction of historical heritages and negative influences on citizen health, are a short list of such harmful advantages. By considering all of the negative and positive points the use of public transportations gets more important than personal ones. Moreover slow movement with lower pace has its qualities that should not be neglected which is a central attitude of ancient cities through history; for example the kind of relation pedestrians make with their natural and human-made environment is entirely different from crowds within cars that find that environment is like temporary pictures passing by fast, like a movie. The people's life in big cities is affected by rapid movements and it is not possible to deprive citizen of those quick movements quickly but what we need is a new equation between movement's methods within cities and natural environment and their local cultural heritages (Gehl, 1987; Appendix, Charter of The New Urbanism, (www.cnu.org).

Walking is a natural potential of every human being that should be preserved as a human right. Because we do not need any tool for that, it is almost the cheapest way of transportation that is accessible for all layers of society. Though based on that right of walking nowadays there is a request for that right in urban areas as the "right of walking". This is a kind of transportation for distances less than one kilometer through city corridors used for shopping, sport and more. People who walk in city use walking for a combination of work and enjoyment, so the web of connections in

the city needs a quality of accessibility for pedestrians that a citizen could use these qualities in the best case (ibid).

2.7.2Standards of design for walking

Based on California regulations (Portland Pedestrian Master Plan, ph-4 1998), a pedestrian is someone who can move forward on foot or another tool but not bicycle. Therefore, the people who use a wheelchair or other devices are counted as pedestrians.

Activities of pedestrians are managed in two groups:

1. Dynamic activities; walking, strolling

2. Static activities; sitting, standing, eating, playing, sleeping

Designing for these activities are different in different environments and cultures is related to everyday routines of people. A pedestrian need an average of (1.4 m^2) and this standard is not fixed for all situations, but it should be preserved as a minimum that is needed to prevent clashing of pedestrians. Categorizing of "pedestrians areas" in walkable city is not easy because in each culture and city it could be different based on climate and cultural factors but we can generate five main items;

1-pedestrian roads

2-sidewalks

3-passage-way

4-special streets for pedestrian

5-square: where all other pedestrian roads cross

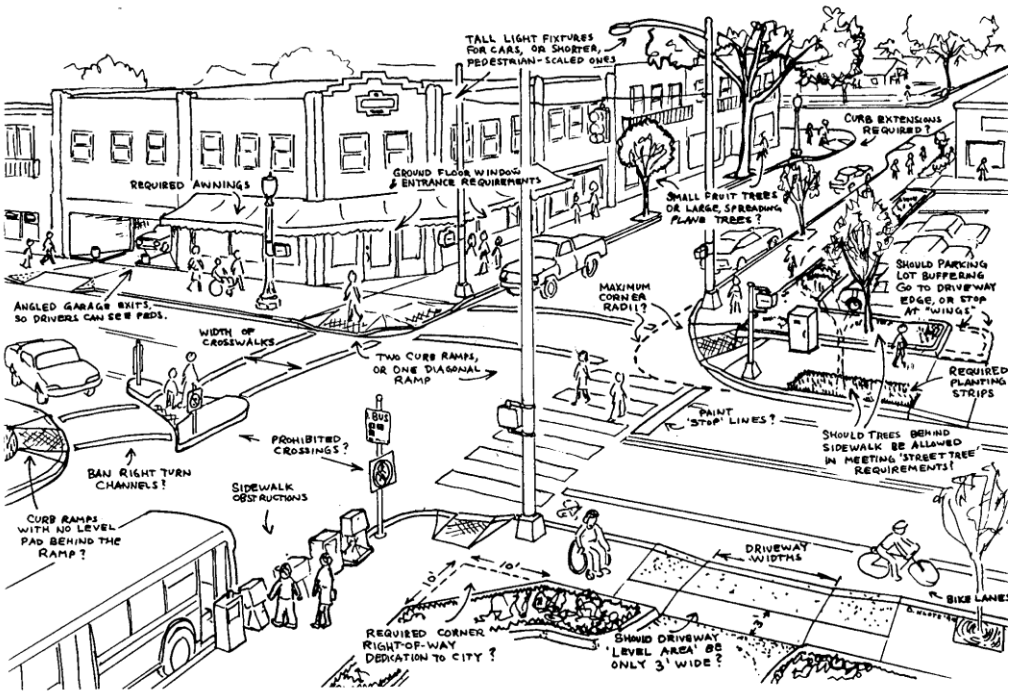

Figure 2.4:Illustration in guidelines of Portland pedestrian Master Plan.
Source: Portland pedestrian master plan (1998)

One good example of adaptation to local needs based on the factors conducted by a volunteer on the citizens working group, illustrates many of the issues and questions about pedestrian design raised during the process of developing the guidelines of Portland pedestrian Master Plan (figure 2.4).

A typical pedestrian can walk 5 kilometers per hour and areas more than 1.4 m^2 needs additional distance to pass on the other pedestrians who are walking slowly and this extra distance manages the pace of footsteps in pedestrian area congestion. Though based on other distances we can categorize the quality of pedestrian areas in six ways (Portland pedestrian master plan, phase 4, 1998);

Table 2.3: The area of usage for pedestrian movements schedule.
Source: Portland pedestrian master plan, phase 4, 1998.

The area of usage	**Free distance without pedestrian(m^2)**	**The result**
A	More than 3.25	Enough distance for overtaking and passing, optional speed of walking, prevent intersecting clashes
B	2.3-3.25	There is enough distance for one way crossing and pedestrian can walk with optional speed that reduce the other people speed of walking in front.
C	1.4-2.3	Limited speed of walking, intersecting clashes
D	.93-1.4	Many of pedestrians should reduce their speed to prevent clashes and overtake
E	.64-.93	One way group pass and overtake and pass is possible
F	Less than .64	One way pass without intersecting pass in width

One primary factor of the pedestrian area quality is about the pace of walking. By increasing this speed, the ability of overtakes and passes decrease in a fixed area of usage. This table will be used as a reference for next chapter analyses.

Moreover , we need a particular strategy in this thesis to emphasize NMT in line with New Urbanism or Smart Growth. The reason behind this is that the 'New Urbanism' as a set of values will help us to put walkability priorities in a larger scale not separated from fragmented walkable communities. The following sections discuss New Urbanism as a related strategy of NMT**:**

2.8 New Urbanism

"New Urbanism" is being promoted as a set of ideas to mitigate sprawl, to encourage sustainable growth, and to facilitate infill development. New Urbanist ideas are conceived as a response to contemporary circumstances of urban development characterized by deteriorating environmental quality, declining public realm, and the rise of non-place edge-city phenomena collectively seen as sprawl (Garde 2004).

We consider "New Urbanism" as this middle ground to promote creativity and respect those positive historical experiences of context. "New Urbanism" as the latest paradigm of urban design must correspond to local criteria limitations. The first step for new urbanism is to focus on sustainable transportation. Walkability is not a new form of transportation, but it can be a useful tool for significant sustainable programs in cities. Moreover "compact land use and mixed land use" are two different critical factors for designing walkable areas due to more dynamic place (Leinberger& Alfonzo1, 2012). (Figure 2.5)

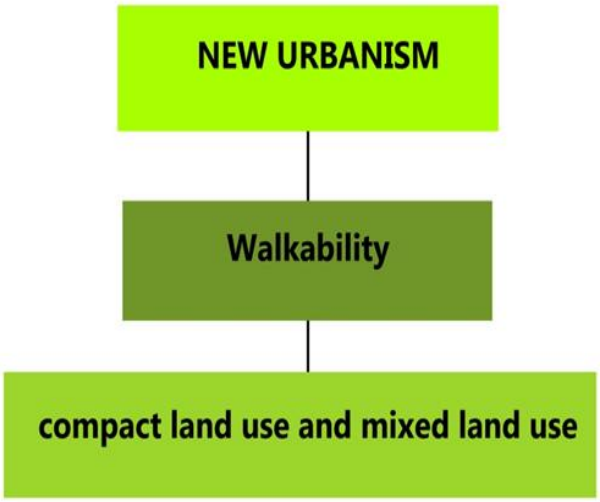

Figure 2.5: Compact land use and mixed land use, are two different key factors for designing walkable areas due to more dynamic place.

New Urbanism in simple words is about the qualities of pieces within cities and also new developments of cities. These conditions are categorized in to four groups: pedestrian scale, an identified center and edge, a diversity of use and population and defined public spaces (Katz, 1993). The difference of the meaning of diversity in "New Urbanism" is that urbanist diversity should not be segregate by cars.

Therefore, the new urbanism advises principles for new development that is "mixed use", walkable street, active public spaces, integrated civic and commercial centers, transit orientation, accessible open spaces (ibid). In this way, new urbanism method to evaluate qualities of the urban spaces is to judge it by unique qualities of space even for suburban sites. The idea is same and it is advisable to have mixed uses for the sake of creating neighborhood quarter or towns. For example for smaller parcels within the city the task is to complete this mixture as mentioned before based on those unique qualities of space that are those principles mentioned before. Spite of pedestrian scale which will be discussed more; another important task is identified as the edge of regions. This permanent side is established for the area and is stabilized

with green belts. One reason is to stop fast growth regions expanding into each other and also the priority is with older parts of city; this is like giving an opportunity to older areas to absorb the growth and organize city from its core. But "New Urbanism" also has a holistic view about the balance of fresh growth and infill; like an actual urban metropolitan form or the hierarchy of boundaries in general (public and private) (Southworth, 2005).

The goal in "New Urbanism" is to apply the best qualities in region and neighborhoods; this happens when we think about the community that shapes the region, "New Urbanism" is about;

1-diversity

2-human scale

3- Public spaces.

(Katz, 1993)

But in practical manner main factors of "new urbanism" are a lot and many of its attitudes are about controlling the population of cities and also the price of land in order to give more opportunities to local people to extend their neighborhood. CNU (charter of the new urbanism) proposed the essential aims of the new urbanism based on Charter of The New Urbanism, (www.cnu.org)(Duany,A&etl, 2010*)*;

1. *The region: Metropolis, city, and town*
2. *The neighborhood, the district, and the corridor*
3. *The block, the street, and the building*

That follows by priorities of New Urbanism (Appendix.2).

2.9 Walkable City

According to Speck (2014), creating a situation for walking in cities need to be considered keeping a great range of criteria in mind. Therefore, there are many different approaches to walkable developments. As mentioned before, the New Urbanism is a strategy and one branch of Landscape Architecture and Environmental Planning. By using this strategy, Michael Southworth, Jeff Speck, Amos Rapoport and many more authors have proposed many ideas of how a walkable city should be. 'Walkable city idea mainly is a health argument' and it is about the quality of life. That is valued by many and it is not just because it reduces the congestion of cars traffic or has lower negative impacts on our environment but is based on new researchers it can improve the mental and physical standards also it has social values.

Also this is not the whole story; the role of walking in our daily life is more than the phenomenological understanding of our social behavior dependent on the way we conceive our environment. The understanding of a walkable city can be followed through different interpretations. In order to develop a better understanding of walkability factors, the theorists' idea from 2000 till 2015 will be explained here in detail. These three urban designers (Michael Southworth,2005, Jeff Speck,2014, Amos Rapoport, 2000) have shaped their own factors based on their regional situations in the time that they have carried out their researches.

2.9.1 Walkability factors (Jeff speck)

Speck (2014) in his recent book "Walkable City", proposed criteria for walkability and we may consider his perspective as an American approach, which follows by mitigating the sprawl and other priorities of United States urban design (Speck, 2014).

A. The useful walk

Useful walk means accessibility for necessary goods and other supplies for pedestrians around a certain neighborhood and is followed by:

1. Putting cars in their place
2. Mixing the uses
3. Getting the parking right
4. Letting transit work

B. Safe walk

Safe walk means safety criteria for non-motorized users and is followed by:

5. Protecting the pedestrian
6. Welcoming bikes

C. Comfortable walk

Comfortable walk means that building and land scape shape a space like a “outdoor living room” and that is different from wide open spaces which cannot attract pedestrians.

7. Shaping the spaces
8. Planting trees

D. The interesting walk

The interesting walk means that the surrounded area like facade of buildings around sidewalks contains signs of humanity abound, and is followed by:

9. Making friendly and unique faces
10. Picking your winners

2.9.2 Walkability factors (Michael Southworth)

Based on Southworth's suggestion a successful walkable city is shaped by these factors (Southworth, 2005);

1. Connectivity
2. Linkage with other nodes
3. Beautiful grained land use patterns
4. Safety
5. Quality of path
6. Path context

2.9.3 Walkability factors (Amos Rapoport)

Based on Rapoport, movements of pedestrians are affected by two broad parameters, physical and socio-cultural parameters. Countless parameters are summarized in five groups (Rapoport 2000);

1. Continuity of the pedestrian road which means all webs should be connected from the start point to the destination.
2. High quality shortcuts; because pedestrians are highly sensitive in selecting short roads.

3. Benignant design and safety; in quiet neighborhoods they find themselves in danger and defenseless so they need to be seen or see other people also on a road with better quality of design they will walk with better filling and enjoy their trip.

4. Physical factors like width of the roads, congestion of roads and intersecting of vehicles, enough light for surveillance, the quality of flooring, the open brooklets beside the road that make the road disconnect and hard to pass.

5. Comfort: slope of the road, slippery of floor, the sudden change in height of the roads like stairs, preserving from sunlight, rainfall, and snowfall.

In this thesis we will use a combination of priorities to evaluate the case study on walkability. However, before entering to the analyses chapter, let's see some recent experiences in non-motorized transportation as reference for next chapter.

2.10Selected Walkability Factors

After summarizing the ideas of the three theorists mentioned above, below walkability are selected due to their importance.

A. Connectivity

1. Linkage with other nodes
2. Accessibility
3. High quality shortcuts
4. The variety of uses (Beautiful grained land use patterns)

B. **Safe walk**

1. Safety
2. Welcoming bikes

C. The interesting walk

1. Shaping of the spaces
2. Plantation of trees

D. **Comfortable walk**

1. Physical factors

Moreover, to prevent complexity in the analyses some of related factors will be combined and anlyzed under three groups:

1.Connectivity (Linkage with other nodes, Accessibility, High quality shortcuts, the variety of uses (Beautiful grained land use patterns)

2. Comfortable walk (Physical factors, Safe walk)

3.The interesting walk **(**Shaping the spaces, Plantation of trees)

2.10.1 Connectivity

- **Accessibility and Linkage with other Nodes**

Connectivity is a local measure of how many nodes are connected to each other (e.g. how many intersections a given street has) (Osmond, 2005). Itmust be mentioned, based on Kevin Lynch and his central idea of "image of the city", connectivity and the linkage with other nodes propose an immediate image of the city for a user. People judge the web of connections in the place that they live based on their backgroundssuch as the historical context and a need for the "everyday routines" of their lives. So far, in 21st century landscape design and urbanism, the role of these everyday routines of people is crucial and the webs that connect the nodes of a city shouldbe able to obtain the needs of people (Lynch, 1960). Therefore, the large separated district of the city is a kind of different character, which defines an edge or boundary with a web of connections within the district.

- **High quality shortcuts**

How is connectivity related with walkability? Southworth (2005) says walkability "is the extent to which the built environment supports and encourages walking by providing for pedestrian comfort and safety, connecting people with varied destinations within a reasonable amount of time and effort, and offering visual interest in journeys throughout the network" (Southworth2005). A reasonable quantity of time and effort is directly related to connectivity. Another value is permeability level of district zone, a high permeability level is maintained by a

suitable access pattern and that accessibility pattern must separate and define limitations of each catchment within each district and smaller parts like neighborhoods by high quality shortcuts. The main road comes first then it breaks down into avenues by various commercial and shopping tasks then the residential premises with a reasonable distance from the main road. However, these residential parts do not continue endlessly; they have their core to preserve the mixing functions as a value of new urbanism and landscape design. Inner permeability of each site must not turn to a gated community or communities, and this part is more related to the authority of the city to break down those gated communities by shortcuts. According to Richard Sennet, the authority of the city should be the people, as normally city “doesn’t belong to anyone”. In such a city people always, try to find a way to make their own marks for figuring out their way (Sennet, 1990). In simple words, the people make their shortcuts and those shortcuts do not follow the walkability premises.

Therefore, sustaining the inner permeability with the authority of people, which is legible for the viewer as mixed functions like shops, houses, parks and other services, is a good accessibility pattern. But this district with all of those functions as a node must be connected with other districts and nodes of the city in a reasonable way as Southworth said and was mentioned before. A good example of this is that in a walkable city, a pedestrian can find his/her way through outer district easily towards mainstream and decide to walk to his/her next destination.

One key factor in “New Urbanism” is to connect the neighborhoods with more connections and Less width in case of decreasing the speed of cars and also better control of traffic congestion with more connections instead of primary wide streets as shown in figure 2.6, which is a part of Copenhagen that old boundries are connected to the new developments by bridges as shortcuts for active transportation users(see Fig. 2.6). These narrow corridors help inner permeability of district and there are too many options for pedestrians to link their ways to other nodes. “Neighborhood is like a tree that should not grow more than its needs and people who live in it should be able to feel the distinct identity of it and also they should be able to walk to the

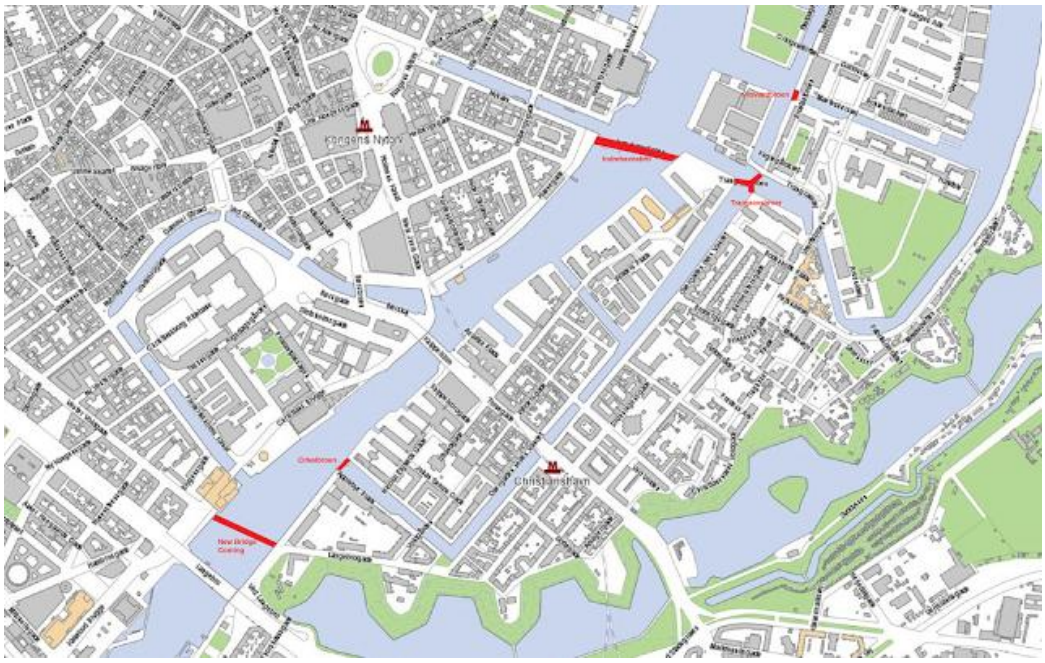

Figure 2.6: The new pedestrian and bicycle linkage between old fortresses of Copenhagen with new developments (red lines) Source: http://www.copenhagenize.com (URL 3)

nearest food supply, health and entertainment around 10 minutes.”(Farr, 2012).

- **The Variety of Uses (Beautiful grained land use patterns)**

In almost every American model for using the land in case of "New Urbanism", it is important to find a place behind the house not in front of it for car parking. However, in contemporary subdivisions, these patterns for neighborhoods in American citiesare categorized in six ways and each of them contains meaningful relations with its context (Figure 2.7). Sidewalks are one of the most significant parts in new urbanism, and there is an emphasis on expressing the facade of the building related to the sidewalks instead of cars thatare aligned in front of building's facade. New urbanism gives more value to pedestrians on sidewalks and separates those from the street edges with a green line of 1.5 to 3 meters, but this could be dangerous for pedestrians.In some cases, detaching the sidewalks from the street makes more

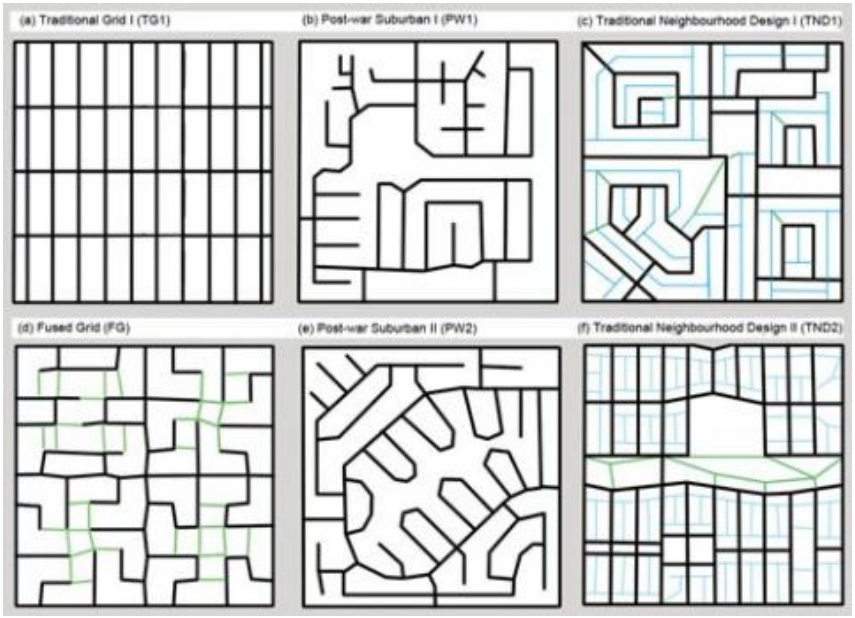

Figure 2.7 In contemporary subdivisions, the patterns for neighborhoods in American cities are categorized in six ways. Source: Xiongbing Jin And Fanis Grammenos- (URL 4)

problems for pedestrians crossing the streets. The mentioned pattern could be useful in case of large main streets with much congestion (Farr, 2012).

Another important issue in the land use pattern is the congestion. Using more congestion in the city center as the contrivance of decreasing the price of transportation and outbreak of the non-motorized transportation ,is one of the plans for new urbanism that comes from historical roots. Old cities were made with high congestion of buildings at the center to be more controllable and the price of fixing and preservation of a broad city with a non-centralized congestion was very high (Katz, 1993).Though in new urbanism land use pattern and typology of buildings in the city could be extracted from the morphology of the city not as a unique form but as a plan to control the city fabric due to more sustainable city (Litman, 2008). Around 27 to 31 occupants in one hectare cause a realiable connection and it should not be less than 15 inhabitants in one hectare though the accumulation of people in new urbanism is a definite point due to sustainable transportations (Newman et al., 1999).

2.10.2 Comfortable walk

Here the comfortable factors are mixed with safety factors because they are deeply related to each other. First, there is a need of explanation about comfortable walk in contemporary history of urbanism. The first separations of pedestrian priority and "vehicle-only traffic streets", starts from 1960, but the problem was that the city in these cases does not follow a general discipline of safety. For example, the driving zones were not safe for pedestrians and the pedestrian-only roads reduce the level of everyday services by automobiles. Then the concept of "shared streets" appeared and these shared streets were called "complete street" which contained bicycle roads and

suitable sidewalks with a percentage of motor vehicle transportations. Nowadays those experiences are known to shape a safe pedestrian city; we need them for people of the cities, not a design for the city (Gehl, 1987). These interpretations about the comfort of walking move the idea of walkability to new horizons. Moreover, these physical factors are more important in designing a pedestrian road. In following we will analyze these physical factors in a case study in eight points. First, there is a need of defining a function for a physical change due to walkability.

- **Physical Factors and safety**

Jan Gehl in his outstanding book *Life Between Buildings* writes about a different perspective on the city and categorizes the impacts of path Quality on pedestrian activities. He believes that the pedestrian activities could be sorted in three categories; essential, optional, and social (Gehl, 1987).

1. Essential activities are those activities that are necessary for people, like going to school, working, or shopping and there is a light impact from the environment on these activities.

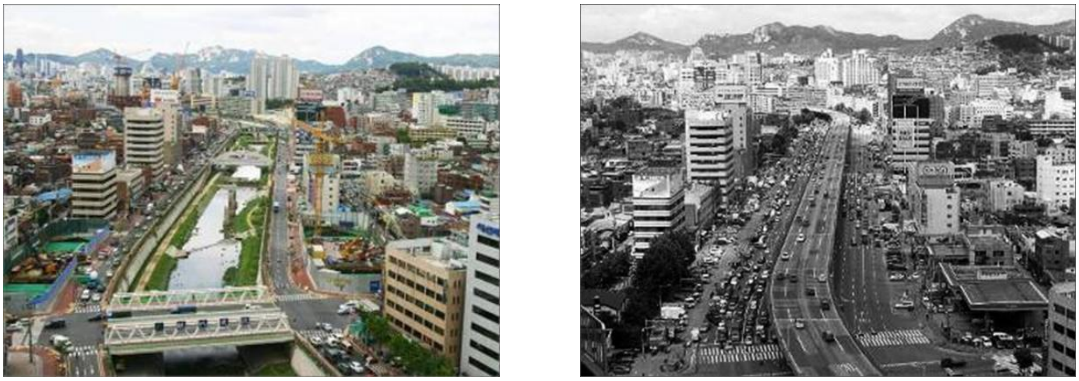

Figure 2.8:Cheonggyecheon River in Seoul, South Korea.Source: URL 5

2. Optional activities are those activities that depend on environmental situation and if it would be suitable, the people in essential activities decide to do them, like walking for pleasure.

3. Social activities happen automatically in public spaces. In case of a better situation of public spaces, these kinds of pedestrian activities increase (ibid).

Therefore, physical factors and safety depend on the mentioned activities. The changes for a more walkable area must first define a walkable function for new developments.

Here, Seoul is brought as an instance as Korea is a pioneer developing country and it is easier to observe the new active transportation factors in contrast to the background of such countries. Therefore, Seoul in South Korea offers a suitable example in which authorities changed a highway on Cheonggyecheon River to the pedestrian road, and it caused activities that are more social for pedestrians (Figure 2.8).

2.10.3 Interesting Walk

Different approaches to using the street are the primary cause of shaping the character of streets. The way every culture uses the streets and public spaces is different, and many of them grant walking instead of motorized transportation. Activities happen in a particular area are a function of expressing culture priorities even these rules shapes the physical approaches. That kind of cultural approaches defines the credit of an activity. Though designing an activity without considering the cultural bases is useless and after a while will not be used by people or they may use it in a different way and design its scope with the cultural heritage of its context. Also to provide a situation for a particular design various cultural factors should be changed (ibid).The use of pedestrians of public spaces especially streets is related to some extends to physical efforts and social attitudes like Introvert society. In case that society does not accept, the social interactions then society consider those public spaces as not suitable places and other way around. A good example of that issue is India's streets. Streets are full of different activities, and some part of street becomes

Figure 2.9:An example of the street-side activities in India. Photo Credit: Claude Renault (URL 6)

privacy zone of people (Figure 2.9). Streets in India used by persons for praying, sleeping, sitting, eating, working etc. In contrast, in “Beverly Hills” of California a foreign pedestrian will not be welcomed easily (Rapoport, 2000). This culture shapes our behaviors in streets. In addition, this is our culture that shapes our physical factors and behaviors of pedestrians; meanwhile these cultural factors could be improved by a good design or weakens those activities.

2.11 Conclusion

The main aims of this chapter were to explain the history of non-motorized system in urbanism and then, look at the role of sustainable transportation, non-motorized transportation or Active Transit as a solution for existing situation of urban mobility. Based on the dissections, the explanation of NMT is followed by priorities of this approach and some strategies for preserving the aims of NMT. Those strategies of NMT should include the following (Sachdeva 1998; De Langen and Tembele 2000; De Langen and Tembele 2000; Litman 2009):

1. A clear law for pedestrians and cyclists in traffic managements.
2. National plans for NMT framework in local areas.
3. Provision of safe movements for pedestrians and cyclist.
4. The focus in movements must be on Active transit more than vehicles.
5. The laws for NMT framework must preserve by police like vehicle traffics.
6. Developing small models beside NMT as an affordable plan for everyone due to social equity.

Moreover, the standards of walking in design like walkability factors are discussed such as the pace of walking and standards that are more physically addressed.

Recently, urban theorists have suggested New Urbanism as a strategy of NMT, which was briefly presented in this chapter. In the following chapter the priorities of walkability which are extracted from urbanism theorists' ideas will be examined in the example of the selected case study.

Table 2.4: Walkability factors and its related priorities

Walkability factors	**Related priorities of factor**
Connectivity	Linkage with other nodes, Accessibility, High quality shortcuts, the variety of uses, Beautiful grained land use patterns
Comfortable walk	Physical factors, Safe walk
The interesting walk	Shaping the spaces, Plantation of trees

Chapter 3

The case of Famagusta

"The priority in designing of any space is people who use those spaces not buildings" Jan Gehl

At the Westside of Famagusta, there are ruins of a town named Salamis Ruins. There are some suggestions in the history about how this city collapsed, yet the Salamis road is a connection to that place. It seems that this road has been a connection road between that Roman town and a village that after centuries turned to a city that nowadays is the old town of Famagusta (Enlart, 1899; Konnari and Schabel, 2005). In the 13th century, Famagusta in Cyprus became a paramount trading port in the Levant (East Mediterranean). French, Italian, Greek, Syrian and Armenian merchants lived together in a multi-cultural environment when it was not unusual in this part of the world. Because of long wars between the East and the West of the world, the island gained a strategic status for European and Eastern kings (ibid). It should be stated here that this period represents the peak in relation to the island's wealth. During this period the architecture of the city represents a mixture of different tastes.the transportation in this period within the city is a non-motorized system indeed. After the domination of Ottomans in 1571 until the last century, the city grew out of the old city in east banks of the seashore and south of the old town (ibid). The old town communicated with eastern part of the city in the last century by cars and after the political conflict in Cyprus, some parts were detached from the city in east and in the contemporary years, another node was inserted in the west (Figure

3.1-3.3), which is the international university and other residential developments in the west. In the continuation of this chapter, the development of Salamis road will be given and discussed in line with the walkability factors. However, in this analysis some limitations have been introduced relating to the length of Salamis road.

Figure 3.1: Famagusta's Arial Image (retrieved from google earth)

Accordingly, the continuation of this boulevard named Ismet Inonu Bulvarı has not been added to the case study. (see Fig. 3.3)

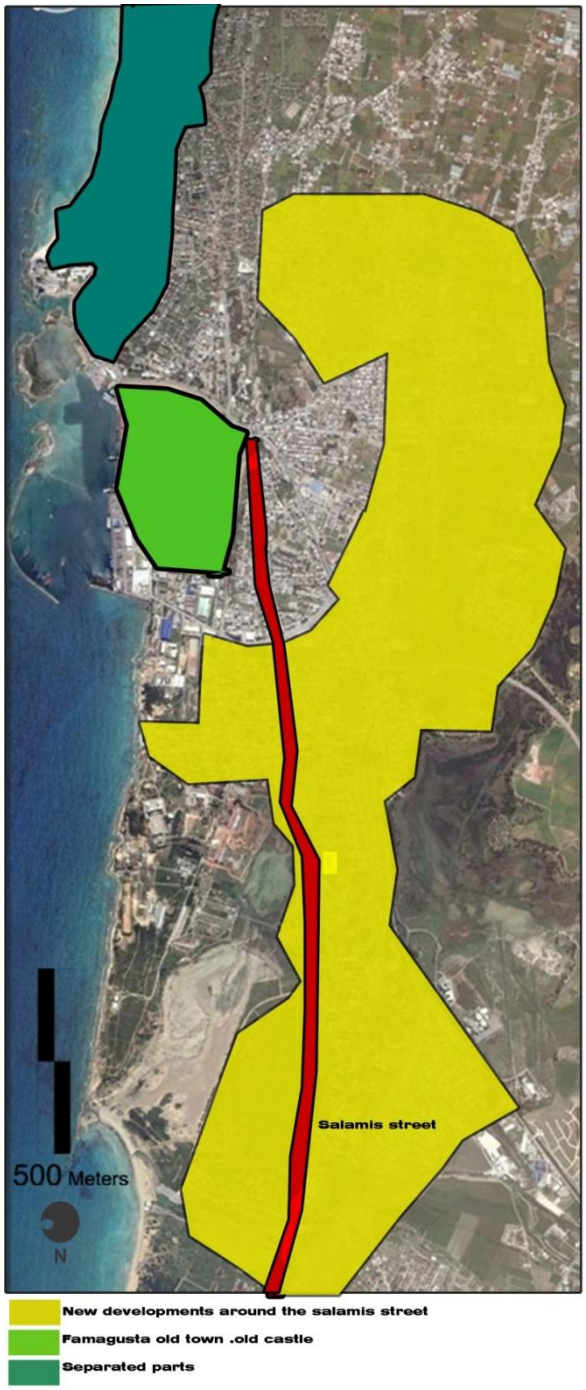

Figure 3.2: The Salamis road (red), the old town (green), the abandoned part of the town (azure), and the new developments (yellow)

New developments in the west have a central axis that is the Salamis road. There are neighborhoods connected with this road and communicate to this principal axis (figure 3.2). Based on an observation that was conducted by the author which will be explained through a story (Appendix .3), the salamis road was sectioned into three parts based on the web of connections; first developments and also oldest one then the development around new node (Eastern Mediterranean University) and there is a middle ground between these two that has potentials to connect these two central nodes.

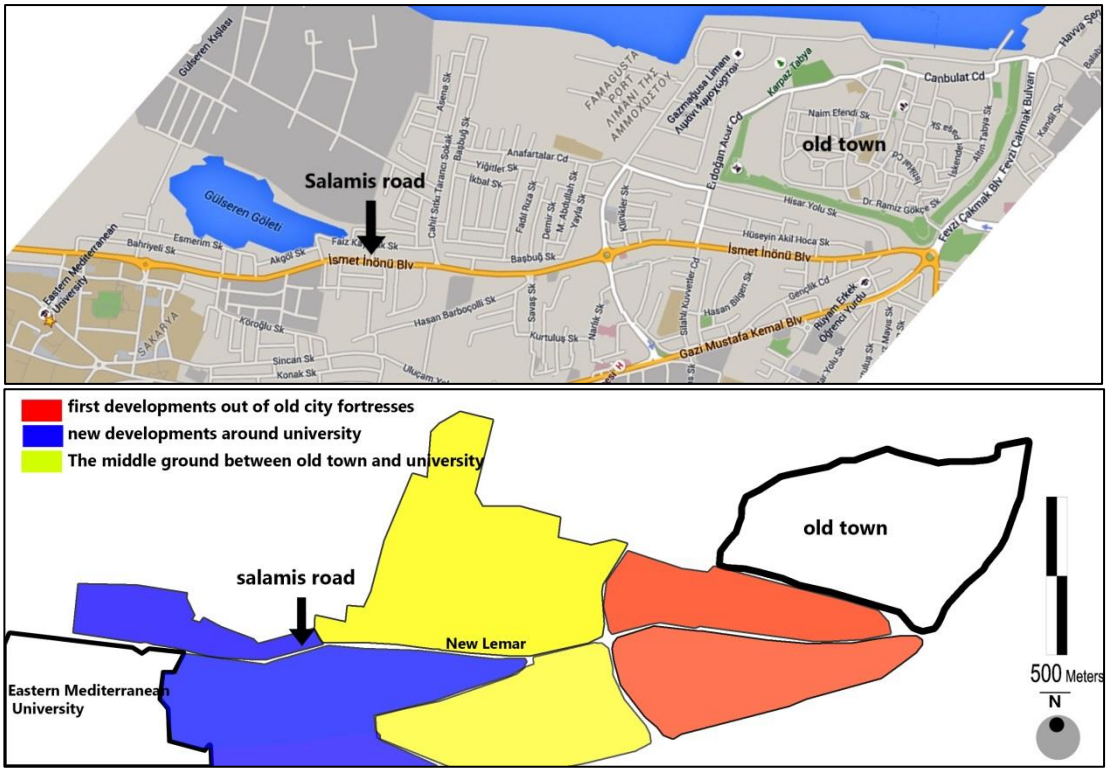

Figure 3.3:Different phases of the new developments along the Salamis road.

This middle ground between those two nodes contains broad vacant lands, but lately a large shopping mall is constructed (New Lemar) beside other facilities for public uses. There is a chance for this area to become suitable public space that connects old parts with new developments in the western section (Figure 3.3).

For a systematic analysis and because of the tolerance of walkability -which is one kilometer- that is discussed previously, in this study, the eight selected points shall be observed (fig. 3.4). Moreover, these points are selected based on the observations of author in the case study. In the following section, Salamis Street changes will be expounded in those eight points from 2000 until 2015:

Point 1: This point is in front of the old town gate and placed in oldest ring of the new developments around the castle . Although, there are not many changes around the street there are some restorations of pavements and other facilities for pedestrians.

Point 2: This point is surrounded by residential buildings. In the last 15 years, some high-rise buildings are added along the street. These buildings around the road were just added in the place of older buildings but based on the observations of the author, the related facilities and considerations for pedestrians have remained the same in these 15 years.

Point 3: This point, which is in front the central mosque, is a roundabout and drastic changes happened in these recent years that could be summarized in three lines:

1. Big malls are constructed as new shopping centers.

2. Buildings more than two floors are added.

3. The width of the street and sidewalks are same but because of the new buildings and malls, the traffic congestion they lost their functional use.

Point 4 and 5: This point is one the most important parts of the city. In these 15 years some green areas are inserted and big malls are added. New buildings are appearedalong the road and older ones functions' have changed. Some parking lots are added along the road and the width of street and the width of sidewalks got wider .In the reaction to these changes parallel avenues appeared in north and south side of this point. The price of the lands also the traffic congestiongot higher. Because of these changes, this point becomes the destination of many pedestrians in recent years.

Point 6: In this point,buildings got higher and several high-rise buildings are added with residential premises. These new buildings are dormitories or renting for temporary residence. The parallel street in north injecting people in to the street though, in recent years,various shops and bars are shaped along the street. A vacant landis left for parking lot also the width of the street and sidewalks are same.

Point 7: this point is in front of a military base which is a gated community belongs to United Nations. In these 15 years because of this gated community, the street pushed the population to the north side and a parallel avenue has shaped. This parallel avenue function is to transport the pedestrians from this place to the neighborhoods in front of the international university. Most of new developments are happening in this parallel street. Sidewalks are narrow and the situation of the street is same in these 15 years. The mentioned parallel road crosses by a lake in the north side, which is the destination of many pedestrians.

Point 8: this place is in front of the international university gate and there is a roundabout at the junction. Based on the observations of author, from the date that

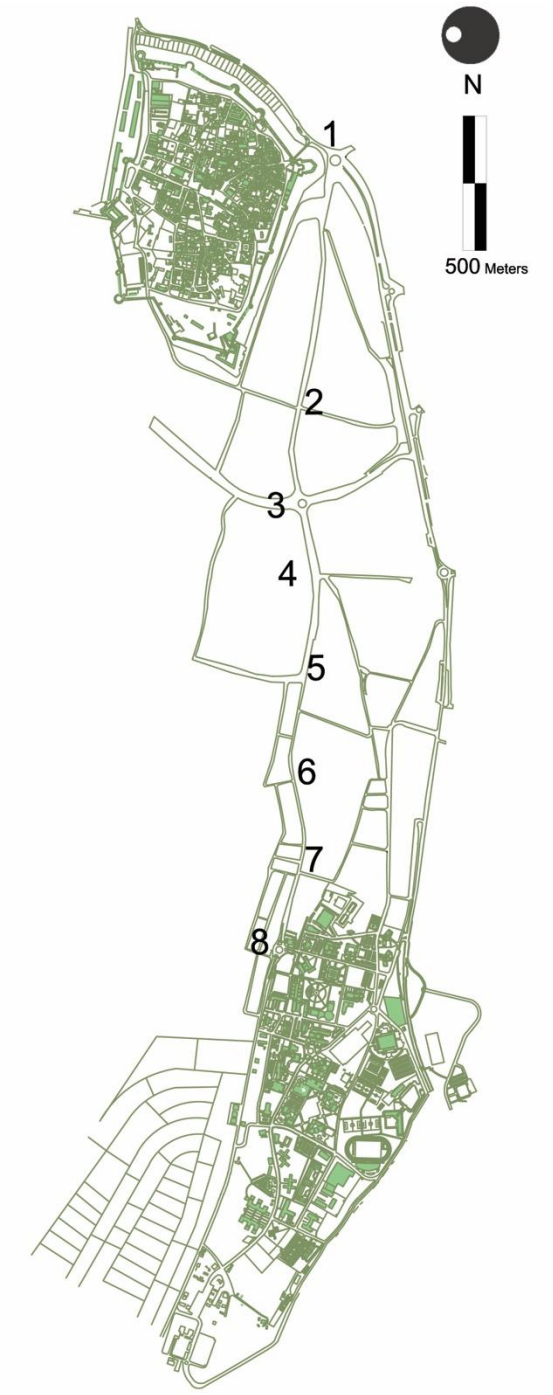

Figure 3.4:the eight selected points along salamis road for observation

the university established (more than 30 years ago) a colony of buildings are shaped in front of the university gate like a circular ring in the north side and most of the population are the students. Thereis no drastic change in the situation of buildings around but several high-rise buildings in these 15 years. The street got wider also the sidewalks. Because of the importance of this point, many shops are extended to the sidewalks area by temporary structures within these years.

After this brief introduction of the case study, now the priorities of walkability will be analyze in following:

3.2 Walkability Factors

By summarizing the ideas of those three theoristsabout walkability factors that were mentioned in the last chapter, these following factors are more important and in this chapter, we will analyze the case study by these in eight places around Salamis Street:

1. Connectivity(Linkage with other nodes, Accessibility, High quality shortcuts, the variety of uses, Beautiful grained land use patterns)
2. Comfortable walk (Physical factors, Safe walk)
3. The interesting walk **(**Shaping the spaces, Plantation of trees)

3.3Connectivity

3.3.1Accessibility and Linkage with other Nodes

Connectivity, as mentioned, is a major factor that relates to accessibility level and linkage with other nodes. For analysis of the accessibility, we need to separate the city into boundaries and ask local people about their needs relating to the accessibility (questionnaire 1, Appendix). The aim here is to study the walkability

level, and for this purpose, we merge the nodes into two main nodes within the city. The first is the Eastern Mediterranean University and the second is the old town as the core of all new developments (Figure 3.5).

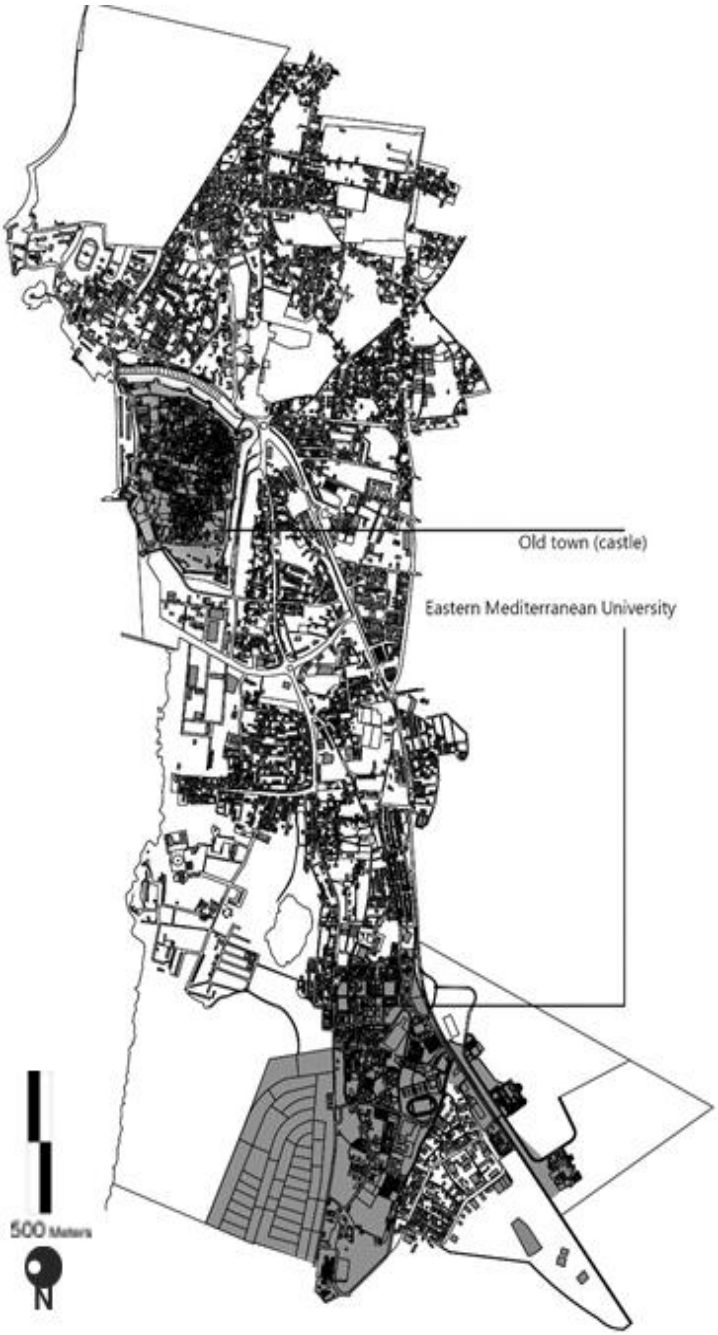

Figure 3.5:The two principal nodes of Famagusta

3.3.2 High quality shortcuts

As mentioned previously in the pace of walking, a pedestrian could walk each hour around 5 kilometers (table 2.3). Therefore, by a simple calculation, it can be concluded that a pedestrian can walk more than 800 meters in 10 minutes. This is important based on this distance and some local abilities pertinent to the case study. Accordingly, the Salamis road can be sectioned into four parts (see figure 3.6). Based on figure 3.5 and 3.7 there are two main accessibility paths between the main nodes in Famagusta. In order to design a high-quality shortcut, the new proposals should be stemming from these two main roads. Based on the nodes and potentials of the Salamis road and the pace of walking, we can divide the distance between these two nodes into four sections each with the distance of 1.13 kilometers (Figure 3.6). By a deeper look to the movements of pedestrians around the Salamis road, which is mapped in figure 3.7 and 3.8, pedestrians (pedestrians followed for a week around Salamis Rd.) always chose the shortest way to reach their destinations. However, this is not a concrete rule of walkability, because walking is a human action and it contains aspects that are more psychological. For example, the pedestrian that is shown in figure 3.8, in green color, she always chooses the longest way to go the New Lemar, which is the one of the most attracted points along the Salamis road. The reason behind not choosing the main street as a walkable pathway could also be psychological.

Moreover, there are two main shortcuts based on author's observations, (which people use to walk) one shortcut is from the Eastern Mediterranean University (EMU) to New Lemar and from that place to the gate of the old town (see figure 3.9). These two shortcuts are around 1 kilometer for people to walk and it takes around 10

minutes to go through them. Moreover, these shortcuts could be qualified based on walkability factors (see figure 3.10 and 3.10 the situation of these two shortcuts are demonstrated through photography).

Figure 3.6:The optimum distances for the introduction of shortcuts in the road

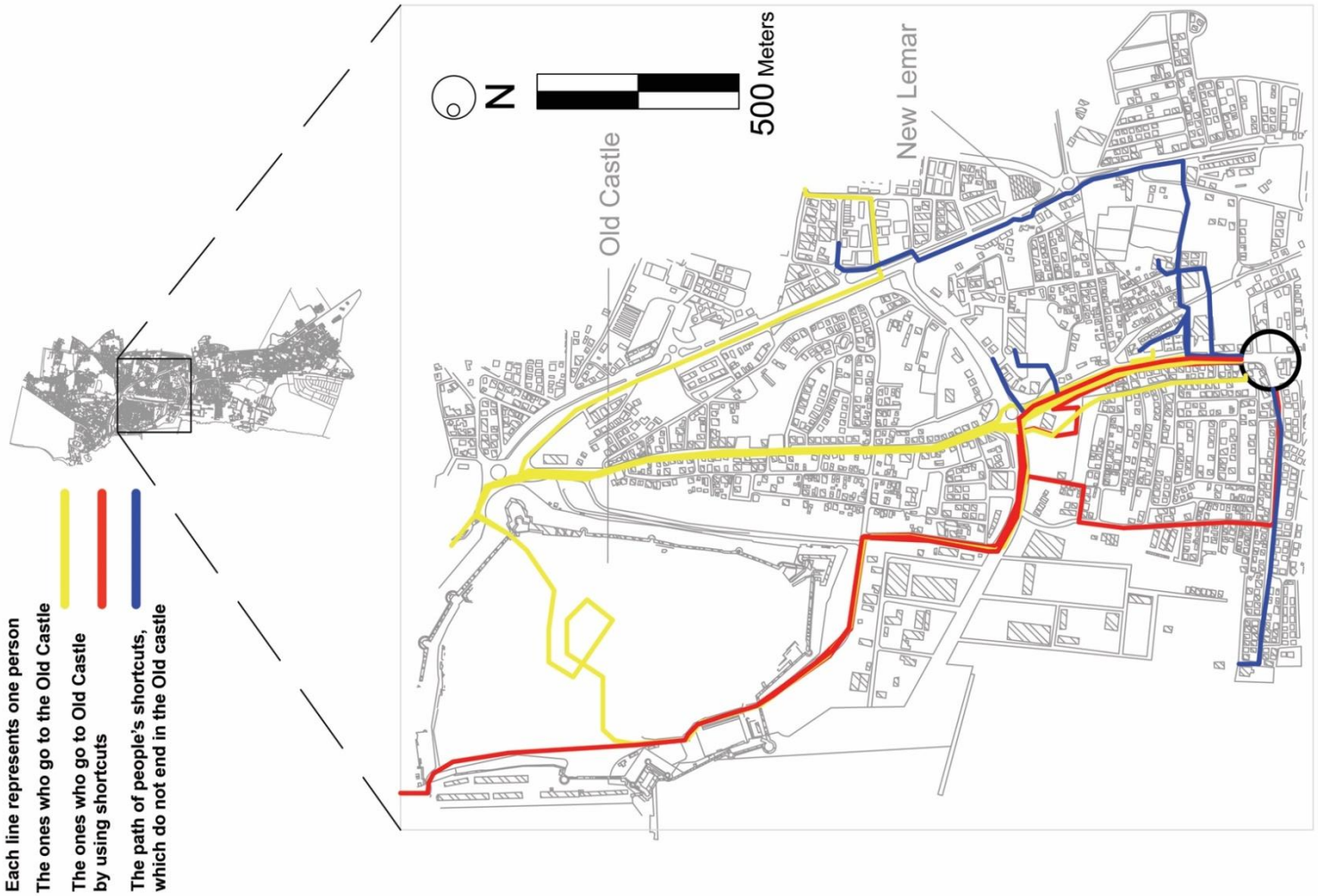

Figure 3.7:Paths of the movements of people in search of shortcuts from New Lemar to the old town.

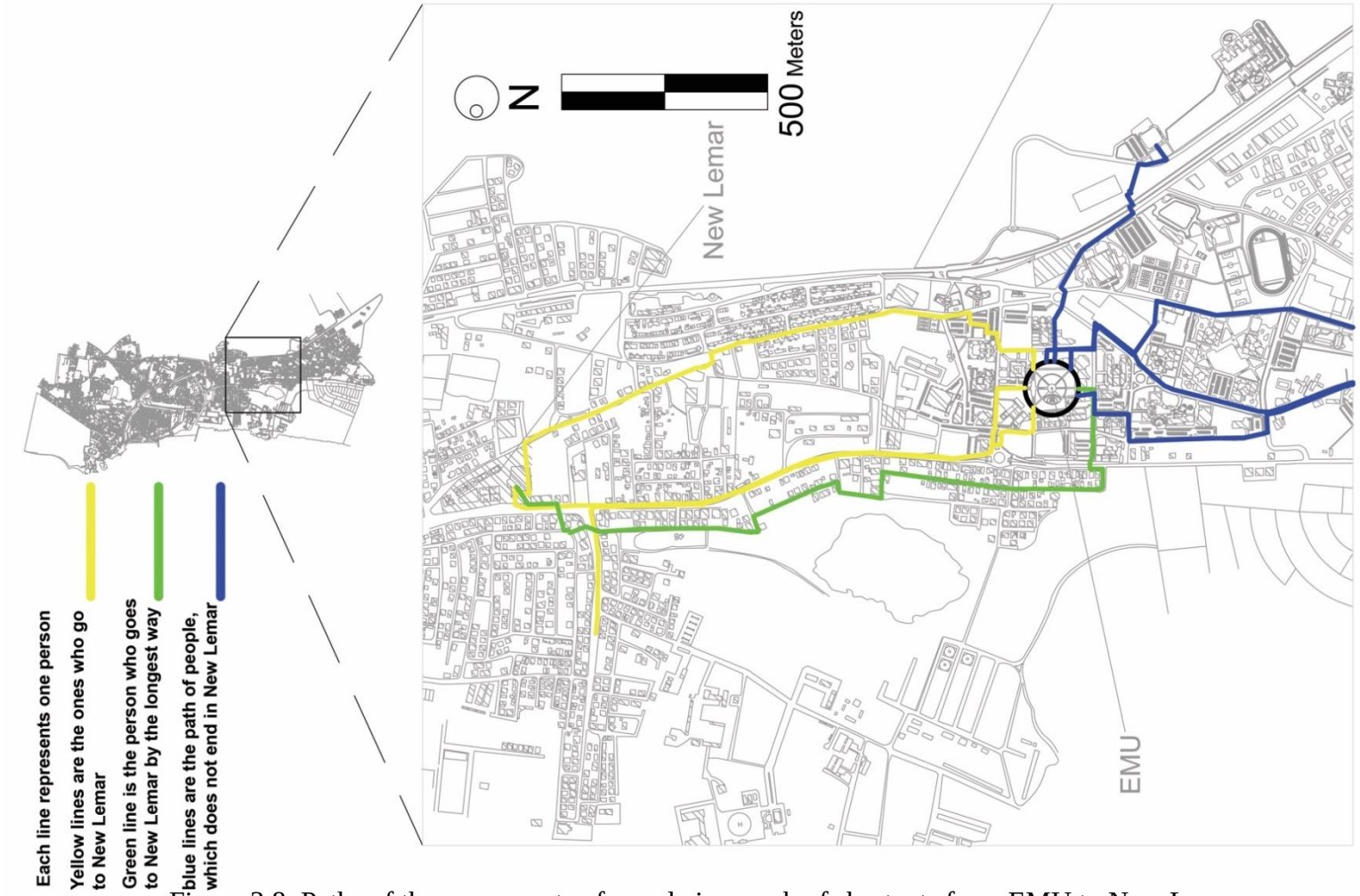

Figure 3.8: Paths of the movements of people in search of shortcuts from EMU to New Lemar.

Figure 3.9: The yielded shortcuts of the observations. .Blue line: Salamis road, red line: Shortcuts

3.3.4 The Variety of Uses (Beautiful grained land use patterns)

In the case of Famagusta, the essential activities around the Salamis street will be analyzed to find out about the fabric of land use on this street along the road following the six functions in each of the eight points (figure 3.10).

Based on the observations of the author, it can be stated shops have a priority to residential blocks in terms of proximity to the pedestrian access. It is also possible to find public places for pedestrians to sit or do other walking-based activities in some rare places. All of these factors can be gathered together in figure 3.11 on one figure to represent the level of connectivity along the road based on walkability factors.

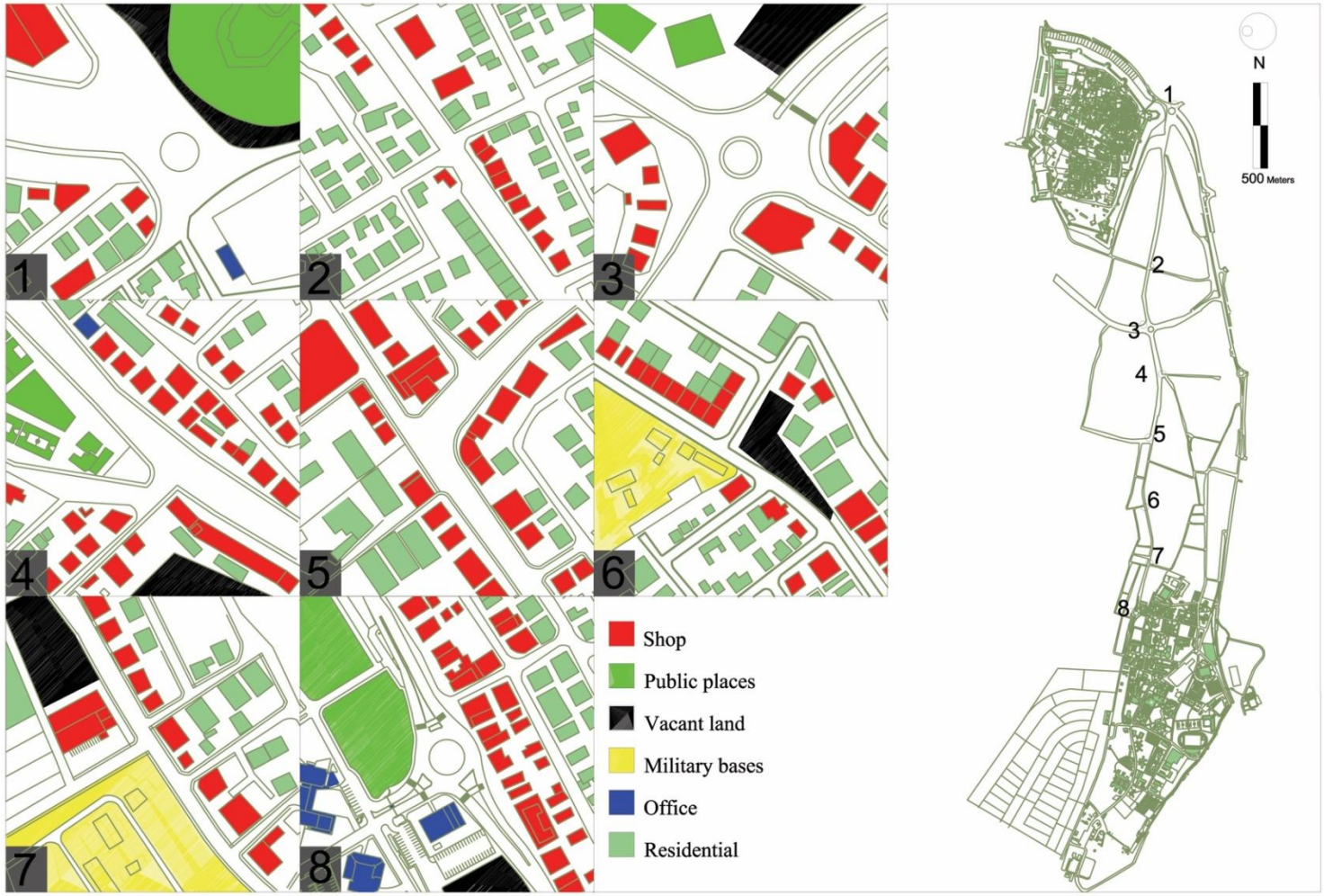

Figure 3.10: The land use map along the selected case on the Salamis Street

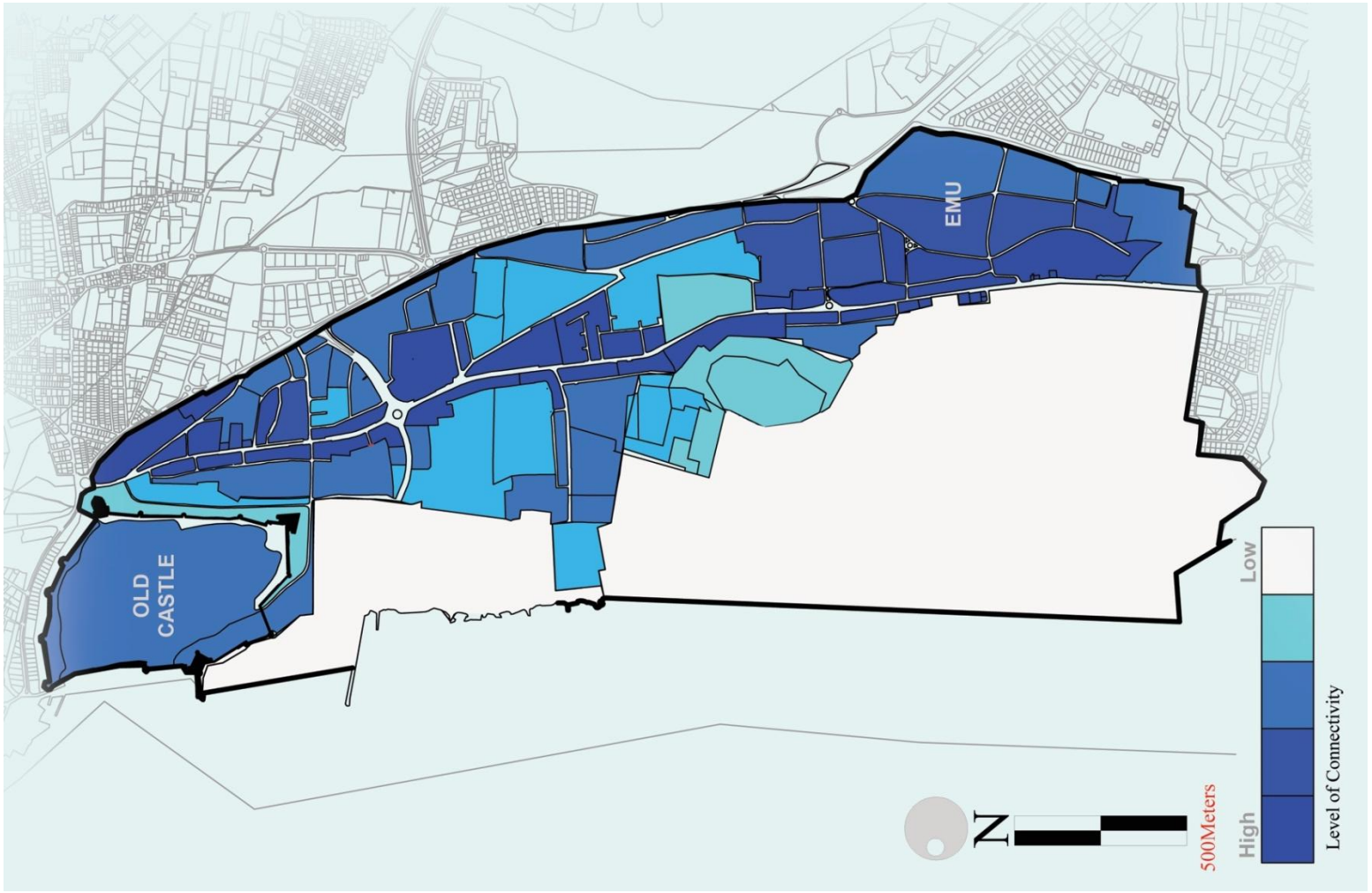

Figure 3.11:The level of connectivity along the Salamis street -the darkset blue shows high connectivity based on three factor of connectivity.

3.4 Comfortable walk

A comfortable walk depends on too many factors that include other aspects of walkability like connectivity but here only physical factors will be emphasized like situation of sidewalks and safety of walking along the roads.

3.4.1 Safe walk and physical factors

Safety is a very important factor and it contains many more related issues. Here, some safety factors will be examined through the analysis of the case study. As mentioned earlier, the safety is a very large concept, so pictures can express this quality better than words (see figure 3.18-25), where the places for photographic analysis are marked. For a better understanding of functions around these eight nodes, refer to Appendix (Mohammad and Aristotle trip)

1. Figure 3.13 (which is point 1 in figure 3.12): This place is in front of the old castle gate and there are some facilities for pedestrians. At nighttime after 10 or 11 p.m, it is extremely hard to find a person around this place which makes this place not crime safe.

2. Figure 3.14 (which is point 2 in figure 3.12): This place is the first junction in Salamis Street, after the old castle. At the nighttime there are some dogs around and it is hard to find someone around this place also there is not enough light for pedestrians. The sidewalks are cut and parking lots interrupt the pedestrian roads. Mixed uses are not preserved and the shops close altogether at the same time.

3. Figure 3.15 (which is point 3 in figure 3.12): The Square in front of the central mosque is hard to cross at daytime. It is safe because it is near to a police station.

There is no tree around the site and it is also surrounded by vacant lands no shade for pedestrians. Sidewalks are narrow and there is no chance of overtaking and crossing for pedestrians. There is not enough light at nighttime but it needs benign design at the pedestrian-level height lighting.

4. Figure 3.16 (which is point 4 in figure 3.12): This place is near New Lemar mall. There is enough light at nighttime. The sidewalks are safe and it is easy to cross over the street. There is enough shade for pedestrians because of trees and there are bus stations nearby. Some convenient stores (24-hour shops) are open until morning therefore it is safe against crimes.

5. Figure 3.17 (which is point 5 in figure 3.12): This place is surrounded by shops and it is safe even at nighttime. It is not safe against vehicles because there is no alternative parking so cars interrupt the sidewalks. Sidewalks are wide and there is possibility of crossing and overtaking. There is enough light in this place for a comfortable walk.

6. Figure 3.18 (which is point 6 in figure 3.12): This place is always crowded and sidewalks get narrow. Cars interrupt sidewalks; there are some physical obstacles against walking such as trash cans. There is enough lighting along the road.

7. Figure 3.19 (which is point 7 in figure 3.12): This place is in front of the United Nations military base. This military base is a gated community and it is safe to walk there. There is enough lighting and shade because of trees. Yet, it is not easy to cross over the street.

8. Figure 3.20 (which is point 8 in figure 3.12): This place is in front of the University gate. It is always safe to walk here and there is enough light for a safe walk at nighttime and permanent shade for pedestrians. Sidewalks are interrupted with cars but it is not hard to cross over the street.

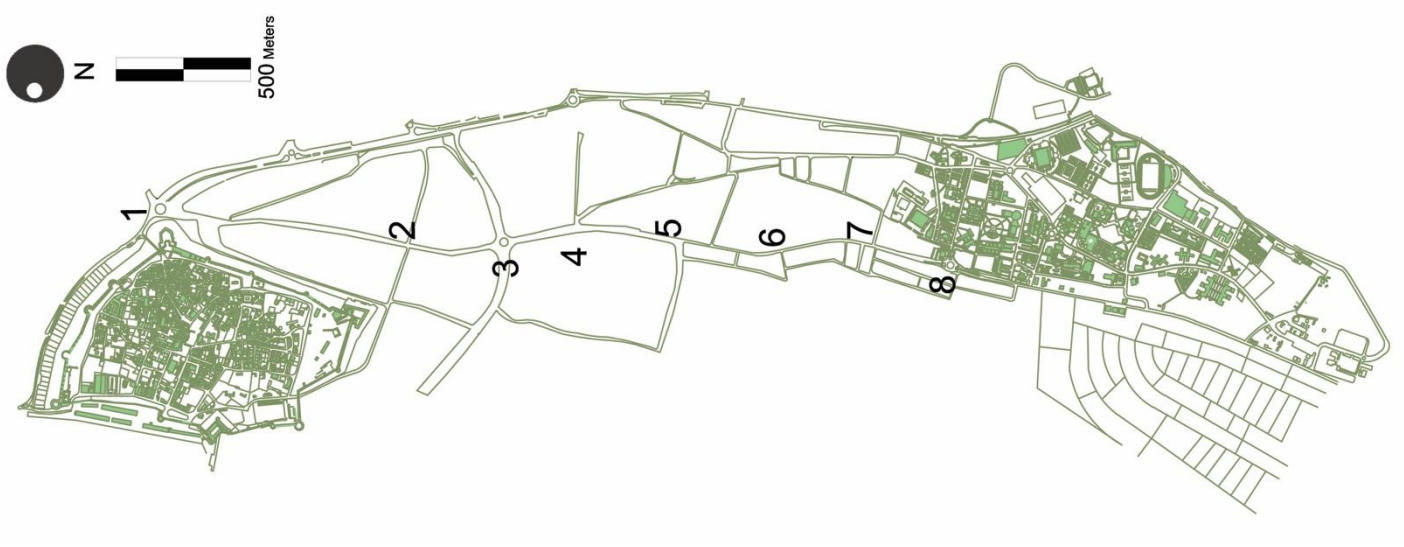

Figure 3.12: Points for the safety analysis in Salamis Street

Figure 3.13: Point 1 in figure 3.12 in front of old castle gate

Figure 3.14: Point 2 in figure 3.12, first junction in Salamis Street, after the old castle

Figure 3.15: Point 3 in figure 3.12 the square in front of central mosque

Figure 3.16: Point 4 in figure 3.12, near the New Lemar

Figure 3.17: Point 5 in figure 3.12

Figure 3.18: Point 6 in figure 3.12

Figure 3.19: Point 7 in figure 3.12

Figure 3.20: Point 8 in figure 3.12

From figure 3.13 to figure 3.20, the Salamis street has been observed by photographs. Moreover, a questionnaire was distributed randomly and people were asked about the level of safety, and some other pertinent questions (see appendix for questionnaire). The level of safety of these eight places (see figure 3.21) are summarized in a chart based on the questionnaire (appendix 4), table 3.1 and observations of author to evaluate the five main safety factors (Rapoport, 2000; Southworth, 2005; Speck, 2014; Todd Litman, 2013b), (figure 3.21).

A. Safety against Crime
B. Safetyagainst physical obstacles of walking (slope, sleeper, trashcans, etc.)
C. Enough Lighting
D. Safety against vehicles
E. Benign design of sidewalks (flooring, handrail, ramps, zebra lines, etc.)

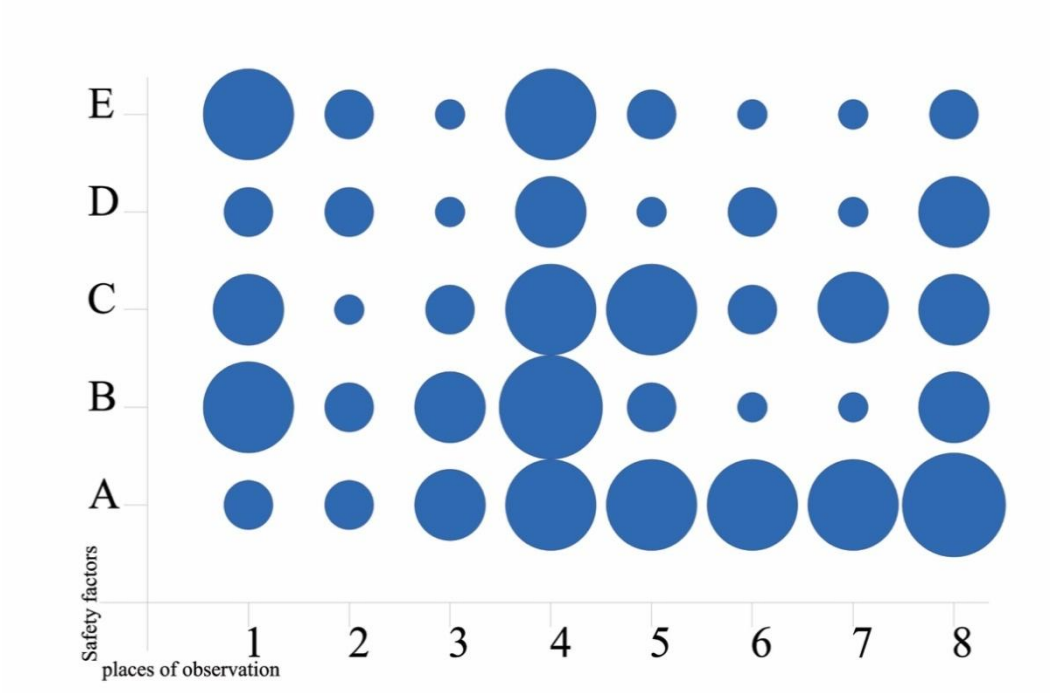

Figure 3.21: Chart showing observations from the site for the five main safety factors as mentioned in figure 3.12

Referring to the observations and conducted questionnaire, we can see that the highest level of safety belongs to point 4 (figure 3.12), which is in front of New Lemar in Salamis Street. Therefore, because of the safety of that place, it would be the best place for a comfortable walk (appendix 3, the Mohammad and Aristotle trip).

3.5 Interesting Walk

The case has been looked from the perspective of functional use, if there was any particular cultural activities that help shape the space along the road. Based on the observations relating to (appendix 3. Muhammad and Aristotle trip in Famagusta) people's everyday routine along this road, it can be stated that common activities involve watching soccer and other related activities of fans, which is one of the cultural activities that shape the space and functions around points 4-5 in figure 3.12 (those activities can be seen in figure 3.22).

Moreover, there are some additional helpful ideas like planting of trees or using local symbols based on Jeff Speck's walkability concept. To sum up, the point 4 and 5 in figure 3.12 have this potential of being used in people's everyday routines and that is a potential for an interesting walk.

Figure 3.22: Activities along the Salamis street around points 4-5 in figure 3.12.

3.6 Findings and Discussions

Based on the observations and people's responses to the questionnaire (see the appendix 3-the Aristotle and Mohammad trip) the following conclusions can be made in relation to connectivity, comfortable and interesting walk.

Table 3.1 The level of each factor in eight selected points

Factors / points	Connectivity	Comfortable walk	Interesting Walk
p.1	Low	High	High
p.2	Low	Strongly low	Strongly low
p.3	Normal	Low	Low
p.4	High	High	High
p.5	Low	Low	Normal
p.6	low	Strongly low	Low
p.7	Strongly low	Strongly low	Low
p.8	High	Normal	Normal

Chapter 4

Conclusion

In the past, the priority of city traffic was for motorizing transportations in exchange for neglecting the needs of the pedestrians. The increase in the automobile use and therefore the problem introduced with speed attenuated the quality and safety of pedestrian areas. The high price of building and land caused decline in the central areas of cities. With the increasing of population and therefore congestion of construction, finding a place for pedestrians get harder and harder therefore, designing car-free areas become more important for the sake of stronger cultural interactions in the city center.

In recent years, people like to carry on their routine life without the fast rhythm of cars, in a place with less stress in interaction with other members of society. These interactions give them a better "image of city" so car free-areas to the city center make the city a better place for people especially elderlies and children who are often neglected. A good example of this is the European and North American cities, which have invested an enormous effort on making these areas attractive for non-motorized transportation (active transportation) users (like cinemas, restaurants and street theaters in a variety of uses along with the residential buildings. A critical factor for designing these areas is that they must have a high quality design for all day and night hours for creating a walkable city. Therefore, a correct structure for people

within the city is of high importance for developing safe, walkable areas in the urban spaces.

In this thesis, a street and its connected areas were probed through observations and questioners for evaluating walkability along the main mode of Salamis street which acts as a connection between the old town -where new developments could be harmful- and the University node. Based on a pattern and local standards that were mentioned in the previous chapters the standards that are, more or less, local should be preserved by the urban designer for preserving the heritage of this city.
In the study, eight points are observed and evaluated with walkability factors, these points can further be analyzed based on the local standards.

In the last chapter, those elements of a walkable city were examined by photographs, maps and a simple story of two pedestrians along Salamis road (Appendix 3) in a particular time to evaluate the level of walkability of Famagusta for a foreigner that does not have any image of city before. However there is no way to bring out all of the factors of walkability because the walkability as a need of a city should be asked first and the city should be organized based on local abilities as a self-organized city not as a list of standards. As Jane Jacob says in her book 'Death and Life of Great American Cities', the cities can give people all of their needs only when people themselves design the city. A summary of the last chapter findings can be summarized as:

Connectivity: Starting from 2008, drastic changes have been observed in the urban layout of the area, which is briefly mentioned in the last chapter. The New Lemar building as a pedestrian benchmark in Salamis street is one of those but this must be

considered based on the ideas of prominent urban designers as malls and pertinent stripe around urban areas lead cities to be dominated by a motorized system. After all, the large shopping mall, Lemar has been considered as a pedestrian benchmark that helps to give a new character to the street and is not a useful organ of the self-organized city. Moreover, based on observations in the last chapter, this part of the city can play a strong role for more connectivity along the salamis road.

Comfortable walk: In the questionnaire distributed, 96 persons responded towards the eight points selected (Appendix.4). Based on the figure 3.7 the distance from New Lemar to the main gate of the old town is not more than 1.5 kilometers, but this range for people is more than its physical reality, which proves there is an issue between these two nodes of the city (Appendix 4).This issue can be due to lack of safety or physical obstacles against walking. The witness of such suggestion is the appearance of more people in point 4, 5 and 8 in Fig.3.17 in contrast with other points.

Interesting walk: Based on observations, the share of local symbols and activities along the Salamis Street is not much and there are only some unorganized activities that are managed by people themselves. In points 4, 7 and 8 there are some positive points in regards to shaping of the space for pedestrians like trees and other facilities.

In addition, by a deeper look at figure 4.1, which shows the map of walkability level along the Salamis road, there are three main walkable nodes in the case study, which are Eastern Mediterranean University (EMU), New Lemar and the gate of Old castle. However, there are some areas around the nodes that are not walkable. The

observations reveal that the main reason of such issue is that those places are gated communities (military bases, see figure 3.14) or are under the influences of gated communities.

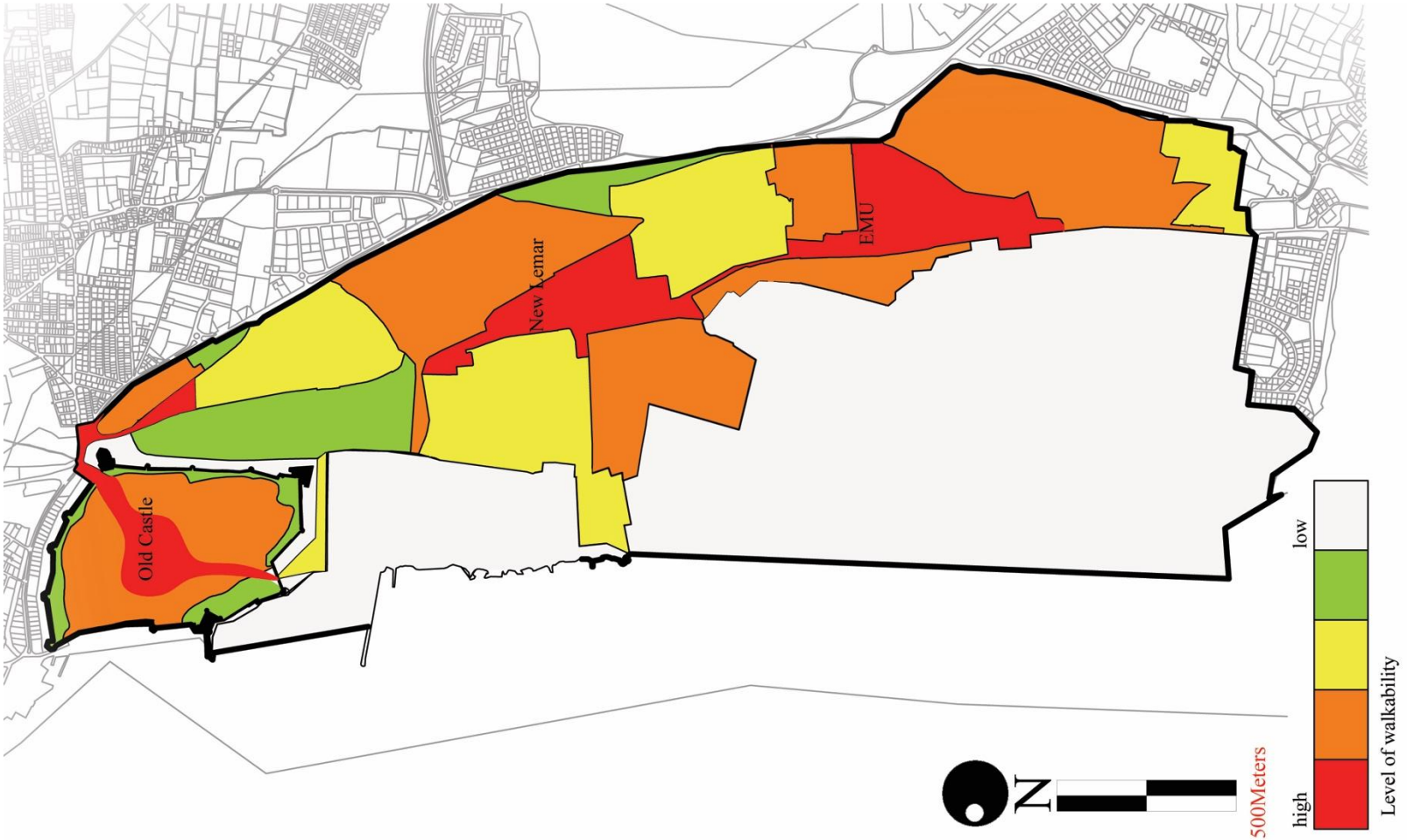

Figure 4.1:The map of walkability level along the Salamis street according to the three main walkable nodes.

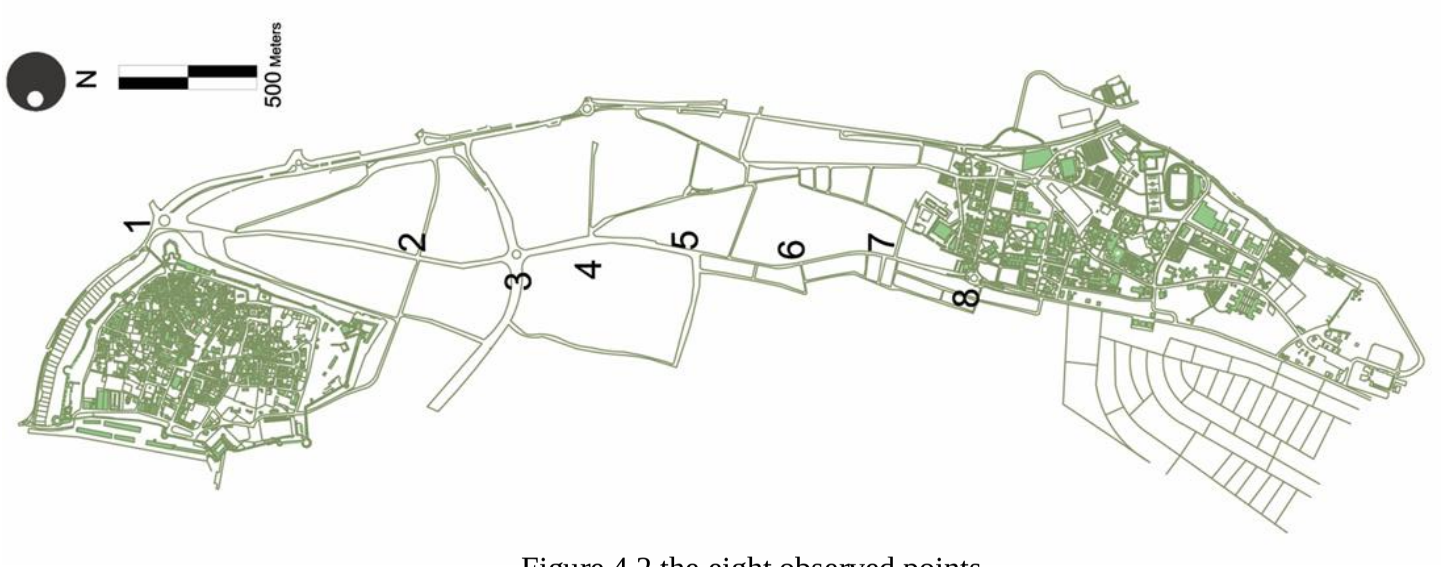

Figure 4.2 the eight observed points

Then, it is possible to express a table of walkability level in those eight points mentioned in the last chapter (see Fig. 4.2). In table 4.1 all the aspects of walkability around the specific points (500 meters around) are considered.

Table 4.1 The evaluation of walkability level in eight points

points	Strongly high	High	Normal	Low	Strongly low
p.1					
p.2					
p.3					
p.4					
p.5					
p.6					
p.7					
p.8					

4.1 Recommendations for Future Research

Due to the genuineness of this thesis and its significance, it is advisable that further research is conducted on the influential nuances based on walking patterns of daily routines defined as “narration of the city”. Moreover, research can be done for studying people’s consciousness of the city by focusing on their daily life in a specific case study. Beside these major left areas, there are some minor aspects, which can be probed in order to shed more light on the necessary areas of this subject.

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APPENDIX

Appendix.1 NMT (non-motorized transportation) Benefits and Strategies

User Benefits

By improving active mode attitudes (like sidewalks, crosswalks, paths, bike parking, traffic speed reductions, etc.) directly it will improve the condition for people who walk and cycle the in the city and it will encourage other people as new users to walk or cycle in the city. It is like a situation for motorist, when we make a safer or better pathway for them they will drive more and better so the better condition for pedestrians like better sidewalks results in more pedestrians and cyclists. The reasons behind those benefits are (Speck 2014; Litman2009):

1. NMT is one part of transportation system. As mentioned before it is the second most popular traveling system. Though by increasing the walking and cycling and other modes in Active Transportation it will result in diversity and more efficiency for all part of transportation system.

2. The NMT modes are basic mobility for everyone. In a normal community, 20-60 percent of people cannot drive because of disability or poverty. As a result, they are vulnerable part of society whoare forced to rely on motorized system of transportation. Though the NMT attitudes let them to provide themselves for goods or other necessary fundamental needs in their independence.

3. Walkable areas lead to public spaces, which naturally interact for people to meet others in these public spaces .Sidewalks, paths are the place of standing,

waiting, socializing, playing, eating, working, and these are very important part of urbanism. As the result,are provided which providing better walkable areas make these activities a better place and then increase the level of happiness and livability.

4. Although NMT used is only for 5-15 percent of all trips , the time that people are in walking or other modes of Active Transport is significantly higher than motorized system .Therefore the NMT make our experience of travel and this experience affect many other attitudes of our daily routines.

5. NMT result in exercise: Walking and cycling are part of a recreation in all societies, and that many people would like to walk or cycle (ABW 2010).

Therefore, there are too many benefits for users but there are methods to evaluate the level of those benefits.

User Benefits Evaluation methods

There are different methods to evaluate the walking and cycling user benefits that some of them are mentioned in following (Bartholomew and Ewing, 2011; Cortright, 2009; Krizek et al, 2006; LGC, 2001):

1. *Avoided costs method:* active modes of transportation like cycling and walking reduce consumer costs on automobiles and other motorized transportation; also exercise equipment or gym memberships. In some cases if a family would neglect using a car it can result in thousands of dollars of saving.

2. *Contingent valuation (user surveys) method*: in this method a survey is conducted by to determine the willingness of people to pay for accessing to trail or paths which shows a good evaluation for NMT preferences (Olsen, et al 2005).

3. *Hedonic pricing method*: many different studies shows that the walkability and other trends in active transportation leads to higher prices in a certain neighborhood property price values.

Option Value

"*The Option value refers to the value people may place on having an option available that they do not currently use, such as the value ship passengers place on having lifeboats available for emergency use***"** (Litman, 2009). Potential option value of those people who use to walk, cycle or other modes of active transportation are high, Because of recreation affects and affordable aspects of NMT.

Option Value Evaluation methods

The Option value can be quantified using surveys in contingent valuation mode. In this survey, people are asked 'how much they would be willing to pay for walking and cycling facilities and services that they do not currently use?'In thisresearch, the transportation diversity estimates that improvements in NMT modes can be valued at 7 per passenger-mile(DfT, 2003); also, this value is a midrate consideration for that suggestion although the specific can be higher (Litman, 2009).

Equity Benefits

Before estimating the role of transportation equity, there is a need of defining the 'social equity', which:

(Also called fairness*)* refers to the equitable distribution of impacts (benefits, disadvantages and costs). An important planning goal and a requirement for

sustainable development, which balances economic, social and environmental objectives. Conventional transportation planning tends to focus on economic goals (congestion reduction and increased travel speeds, travel cost savings, and traffic safety), and in recent decades, has added environmental objectives (resource conservation, emission reductions, and habitat protection). Various performance indicators have been established to help evaluate economic and environmental impacts. Social equity objectives receive less systematic analysis; they may be considered during political negotiations and through public involvement processes, but there are no standard methodologies for evaluating social equity impacts (Litman& Burwell 2006), (Rapoport 2000).

"In practice, transportation social equity issues are often addressed using an 'environmental justice'lens, which tends to focus on illegal and measurable harms to certain vulnerable minority groups"(ibid).

Major categories of transportation equity include (Litman 2012):

1. *Horizontal equity:* the people with similar abilities must be judged similarly and more over they must bear similar costs and similar share of resources.

2. *Social equity with regard to income (Vertical equity):* estimates that the policies should protect the lower income people as a priority.

3. *Equity in transportation ability and needs (vertical equity)* –the transportation policies should estimate in protecting the people with disabilities such people on wheelchair.

4. *Affordability:* the ability of people to access to their needs. Walking and cycling help people to decrease the price of their transportation so it would be affordable.

5. *People dignity*. The motorized system tends to mark people with their different vehicle for their social status but, the Active Transportation follows more social equity for the people's dignity.

By considering active transportation, all layers in society can achieve a similar share of resources and the vulnerable layers will be protect by considering their disabilities and needs. As mentioned previously in a normal community, 20-60% of the population cannot or should not drive because of their disabilities, age or income.(DfT 2003) Therefore, the active transport may help this group of people to improve the quality of their basic mobility, in addition encourage the drivers to walk more for example.

For this purpose, some effective specifics will be estimatedin order to have more equity in transportation (Litman 2009), (Ewing and Hamidi 2014), (Speck 2015):

1. Universal design: Estimate a design for all of the people specially considers people with disabilities and people with special needs.

2. *Basic mobility*: it is about services and activities, such as healthcare, employment, education, basic shopping, and social activities.

3. *Economic opportunity*: This opportunity is the vulnerable people opportunity of using their basic mobility like walking or cycling to achieve their share of resources like education or recreation.

Equity Evaluation methods

Various objectives and impacts can be considered in transport equity analysis(Forkenbrock and Weisbrod 2001; Forkenbrock and Sheeley 2004; Litman 2004):

1. Everybody receives equal shares: this suggestion asserts that the active transport must receive an equal share of resources for developing its attitudes.In this meaning, if NMT transport's share were about 12 percent, the resource budget would be equal to this portion.

2. Each user group should pay their share of costs: this suggests that public taxes for public facilities must be equal to the use of them for everybody.

3. Everybody should compensate the harms they impose on others:To a certain degree that motorized system harm the Active Transportation, there must be a horizontal equity that motorists pay for facilities of Active Transportation.

4.Policies should favor disadvantaged people: this evaluation method considers the range of efforts for physically, economically and socially disadvantaged people. Traffic calming and speed control, and funding cycling facilities with motor vehicle user fees are some of those efforts.

There are many different ways to determine the social equity. There must be a willing to consider disadvantaged people as a part of community and improve the

facilities for Active Transportation to a degree of equity between drivers and non-drivers.

Physical Fitness and Health

As mentioned before there is a scientific relation between diseases and indicated physical activities. Active travel provides fitness and health benefits (Pucher, et al 2010). Even small increases in physical activity can improve public health (Sallis, et al 2004). Experts recommend that adults spend at least 150 minutes per week (22 minutes per day) in moderate physical activity, with additional health benefits if the exercise is more rigorous and longer duration (CDC 2010).

Strategies to improve Active mode of Transportation

There are many possible ways to improve Active mode of Transportation. But here emphasize is on segregated activities despite of large benefits of overall advantages of Active Transport for each society. The plans experts suggest include four elements for such improvements: engineering, encouragement, education and enforcement (Alta Planning 2005; FHWA 2004; VTPI 2010).

Here some examples of active mode improvement mentioned:

1. Facility improvements for walking and cycling*:* This involves improvements for crossroads, sidewalks, bicycle parks and other facilities. Another aspect of that is a universal design, including wheelchair and handcart users, also using signs for people who do not know local languages.

2. Educate people who are using active transport:there is a need to encourage people to walk and an education for their safety in all layers of society.

3. An easy rent bikes system and distribution all around a community.

4. Redesign, traffic calming, road diets and traffic speed controls: the advantage of such activity result in reducing the traffic speeds and the number of traffic lanes especially in urban areas also this redesign can include the fixed speed limits and more enforcement for motorized traffic speed.

5. Improved road and path connectivity: Connectivity is a major solution for more active transportation within cities because people always choose shortcuts. These shortcuts are very important to encourage people for walking and cycling a pathway.

6. Improvements of Public transport*:* Public transport is a very useful alternative for active transport: Public transit can reduce vehicle traffic and sprawl though it would improve the sidewalks, packings and many other related facilities for pedestrians and cyclists.

7. The models of transportation as a program: This suggest different models of transportation for different various activities like transportation model for going to school or work. These often can encourage people by giving those regards or extra credits for their efforts of using such programs.

8. Increasing the price of driving by motorized vehicle like instant payment for insurance, packings and fuel for improvement of roads based on active transportation attitudes.

9. New Urbanism or Smart growth (also called location-efficient development) land use policies):More compact, mixed, connected land use, and reduced parking supply tends to improve walking and cycling conditions and encourage use of active modes by reducing the distances people must travel to reach common destinations such as shops, schools, parks, public transit, and friends (Ewing and Hamidi2014). The next parts are about explanation of this method in designing priorities of a walkable city.

Appendix.2Charter of New Urbanism

1. Metropolitan regions are finite places with geographic boundaries derived from topography, watersheds, coastlines, farmlands, regional parks, and river basins. The metropolis, made up of multiple centers that are cities, towns, and villages, each with its identifiable center and edges.

1. The metropolitan region is a fundamental economic unit of the contemporary world. Governmental cooperation, public policy, physical planning, and economic strategies must reflect this new reality.

2. The metropolis has a necessary and fragile relationship to its agrarian hinterland and natural landscapes. The relationship is environmental, economic, and cultural. The farmlands and nature are as important to the metropolis as the garden is to the house.

3. Development patterns should not blur or eradicate the edges of the metropolis. Infill development within existing urban areas conserves environmental resources, economic investment, and social fabric while reclaiming marginal and abandoned areas. Metropolitan regions should develop strategies to encourage such infill development over peripheral expansion.

4. Where appropriate, new development continuous to urban boundaries should be organized as neighborhoods and districts, and integrated with the existing urban pattern. Noncontiguous development should be organized as towns and villages with their urban edges, and planned for a jobs/housing balance, not as bedroom suburbs.

5. The development and redevelopment of towns and cities should respect historical patterns, precedents, and boundaries.

6. Cities and towns should bring into proximity a broad spectrum of public and private uses to support a regional economy that benefits people of all incomes. Affordable housing should be distributedat all parts of the region to match job opportunities and to avoid concentrations of poverty.

7. The physical organization of the region should supportthe framework of transportation alternatives. Transit, pedestrian, and bicycle systems should maximize access and mobility throughout the area while reducing dependence on the automobile.

8. Revenues and resources can be shared more cooperatively among the municipalities and centers within regions to avoid destructive competition for tax base and to promote rational coordination of transportation, recreation, public services, housing, and community institutions.

9. The neighborhood, the district, and the corridor are the essential elements of development and redevelopment in the metropolis. They form identifiable areas that encourage citizens to take responsibility for their maintenance and evolution.

10. Neighborhoods should be compact, pedestrian friendly, and mixed-use. Districts emphasize an exclusive single use, and should follow the principles of community design when possible. Corridors are regional connectors of neighborhoods and districts; they range from boulevards and rail lines to rivers and parkways

11. Many activities of daily living should occur within walking distance, allowing independence to those who do not drive, especially the elderly and the young. Interconnected networks of streets should be designed to encourage walking, reduce the number and length of automobile trips, and conserve energy.

12. Within neighborhoods, a broad range of housing types and price levels can bring people of diverse ages, races, and incomes into daily interaction, strengthening the personal and civic bonds essential to an authentic community.

13. Transit corridors, when properly planned and coordinated, can help organize themetropolitan structure and revitalize urban centers. In contrast, highway corridors should not displace investment from existing centers.

14. Appropriate building densities and land uses should be within walking distance of transit stops, permitting public transit to becoming a viable alternative to the automobile.

15. Concentrations of civic, institutional, and commercial activity should be embedded in neighborhoods and districts, not isolated in remote, single-use complexes. Schools should be sized and located to enable children to walk or bicycle to them

16. The economic health and harmonious evolution of neighborhoods, districts, and corridors improved through graphic urban design codes that serve as predictable guides for change.

17. A range of parks, from tot-lots and village greens to ballfields and community gardens, should be distributed within neighborhoods. Conservation areas and open lands should be used to define and connect different neighbor- hoods and districts

18. A primary task of all urban architecture and landscape design is the physical definition of streets and public spaces as places of shared use.

19. Individual architectural projects should seamlessly linked to their surroundings. This issue transcends style.

20. The revitalization of urban places depends on safety and security. The design of streets and buildings should reinforce safe environments, but not at the expense of accessibility and openness.

21. In the contemporary metropolis, development must adequately accommodate automobiles. It should do so in ways that respect the pedestrian and the form of public space.

22. Streets and squares should be safe, comfort- able, and interesting to the pedestrian. Properly configured, they encourage walking and enable neighbors to know each other and protect their communities.

23. Architecture and landscape design should grow from local climate, topography, history, and building practice.

24. Civic buildings and public gathering places require important sites to reinforce community identity and the culture of democracy. They deserve distinctive form because their role is different from that of other buildings and places that constitute the fabric of the city.

25. All buildings should provide their inhabitants with a clear sense of location, weather and time. Natural methods of heating and cooling can be more resource-efficient than mechanical systems.

26. Preservation and renewal of historic buildings, districts, and landscapes affirm the continuity and evolution of urban society.

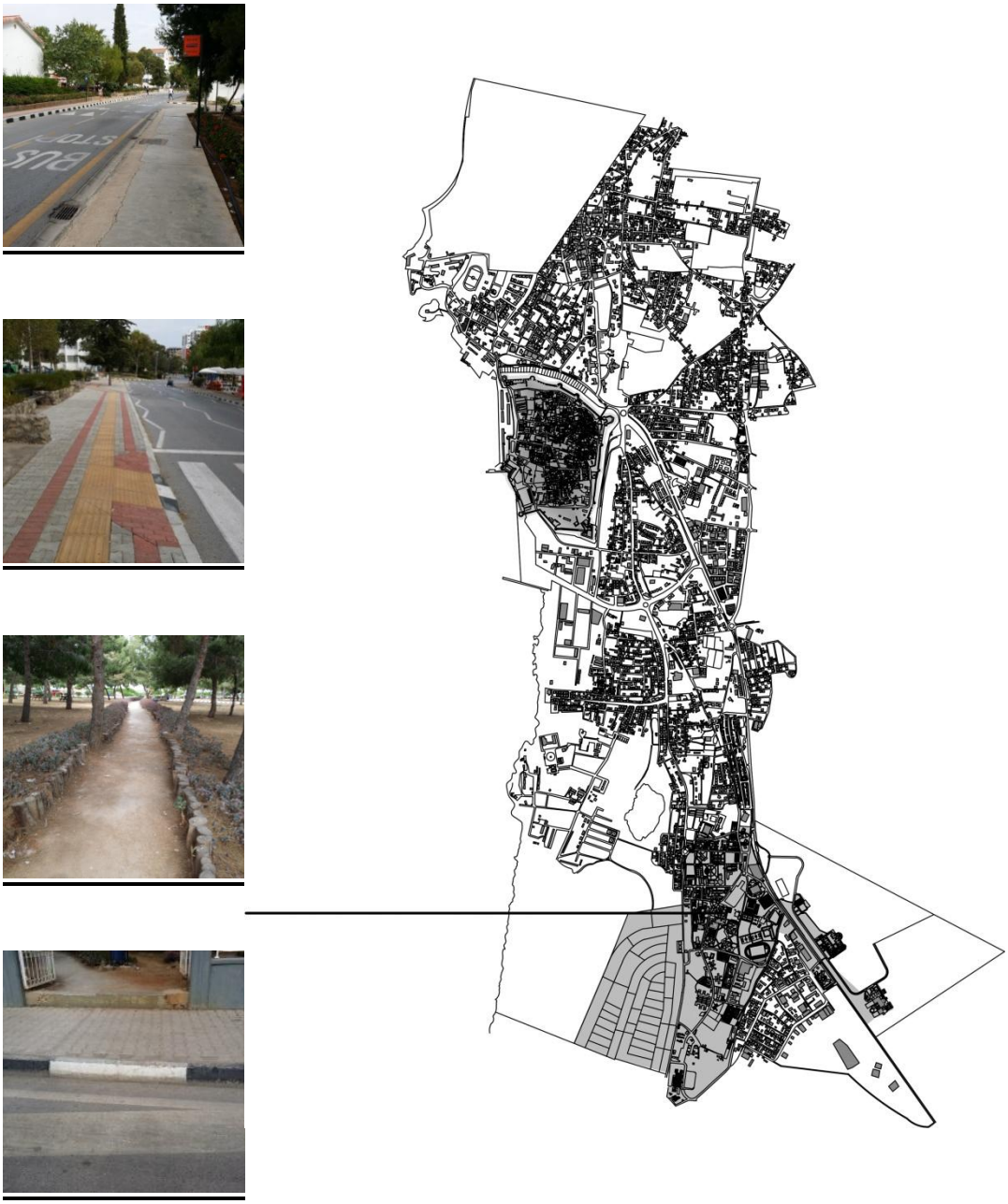
(URL 1)

Appendix .3 Muhammad and Aristotle trip in Famagusta

In this part based on questionnaire and the research photography of writer car dominance that happened in Famagusta mainstream, “Salamis Road” is observed. The primary aim of this part is to analyze those factors that were mentioned in chapter three as necessary factors of walkable city with a story of two pedestrians from EMU (eastern Mediterranean University) to old town in Famagusta. The reason for using such a means of observation is to highlight the context of its user who is undetectable from the city (figure 4.3). Considering that this view could be different from other people in city, any way it could be more beneficent for Famagusta to be observed as a foreigner in case of finding solutions about walkable city based on with these factors; (1) Connectivity (2) Linkage with other nodes (3) Fine grained land use patterns (4) Safety (5) Quality of path (6) Path context. Walkability as social justice environment creativity focuses on connectivity and uses patterns that are emphasized in this study.Salamis road with 15 meters width and 3.25 kilometers length is the advantage of the growth of a city. Split of political issues lead to separation of Cyprus in two parts from years ago. The growth could be an introduction to many choices for a little town like Famagusta, but the design should follow democratic decisions based on social equity as mentioned before in chapter two.

Appendix 2.figure1: Pedestrians whom are undetectable from city.Source: author

Muhammad and Aristotle are our pedestrians from another country that study in EMU. It is 4 o'clock, and there is a ceremony in old town for new students. They want to walk down to the old town and to see the city, but they do not know the exact address and the street names. They start walking from a dormitory in University (EMU) established more than 30 years ago. EMU formation of buildings are different from the city fabric typology also the standards of walkability are right for example as you can see in figure 4-4, the sidewalks are wide enough and "there is enough distance for one way crossing and pedestrian can walk with optional speed that reduce the other people's speed of walking in front" based on schedule that was mentioned in chapter three. University web of connections in some parts is close to the standards of "complete street" like bike lines and facilities for disable pedestrians (Figure 4.4). University is a group of separated faculties with a web of connection for cars that are alerted nowadays to be more walkable.



Appendix2. Figure 2: The figure shows the pedestrian roads and sidewalks within the university source: author

Appendix2. Figure 3: The figure shows connected roads from university lead to old town and distances that sectioned into four parts. Source: author

Muhammad and Aristotle walk out of the university campus gates and based on figure 4.5 that are a summary of the complete map of city, it could be seen that they must walk around 3.25 km to reach the castle or old town, along Salamis road. Walkability area limitation is around one kilometer though if we section the path to three equal parts to have independent walkable areas.

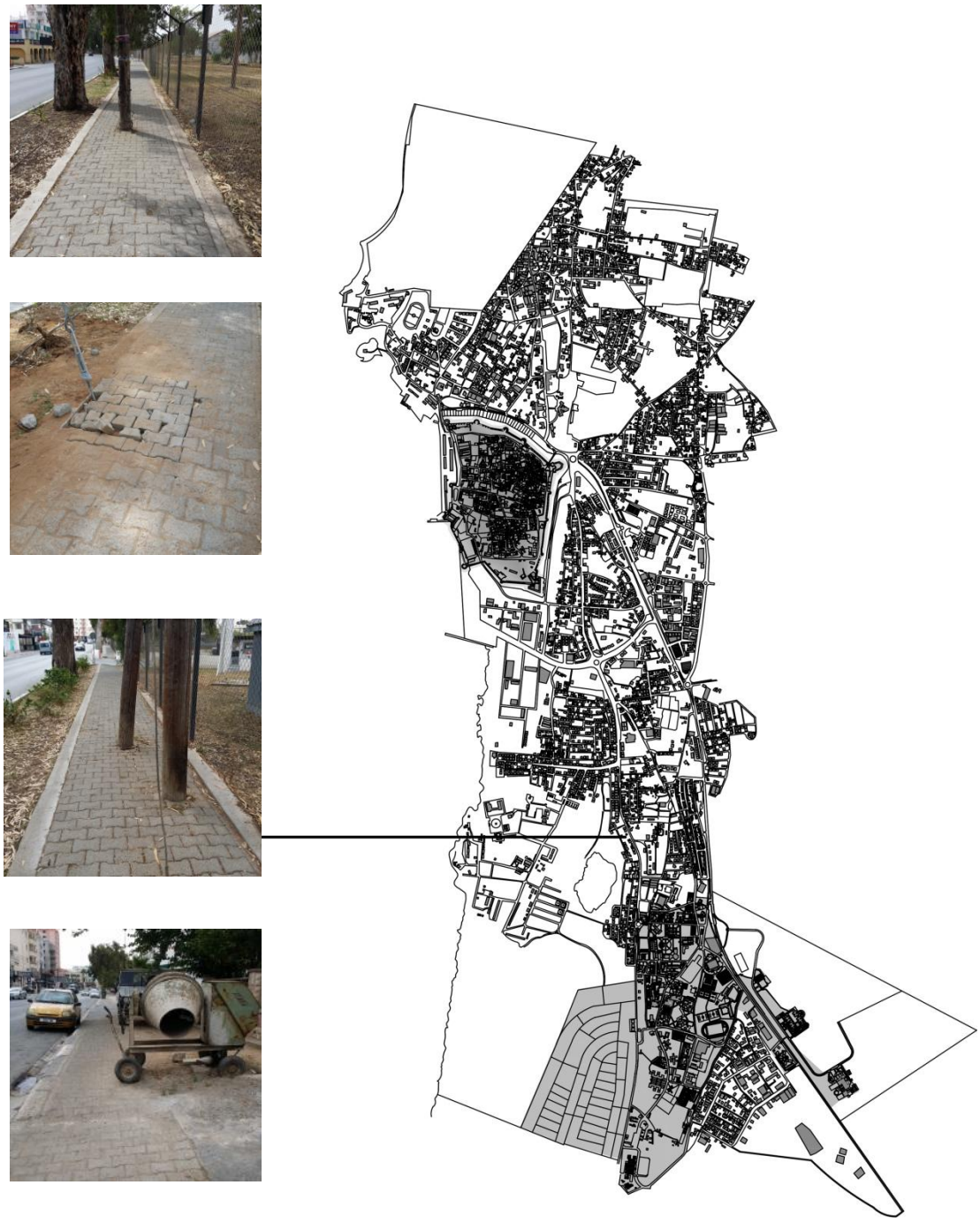
Muhammad asks his friend “they are you sure that where is that place?”

Aristotle “don’t worry we can find it I have checked it on maps it’s not too far away.”

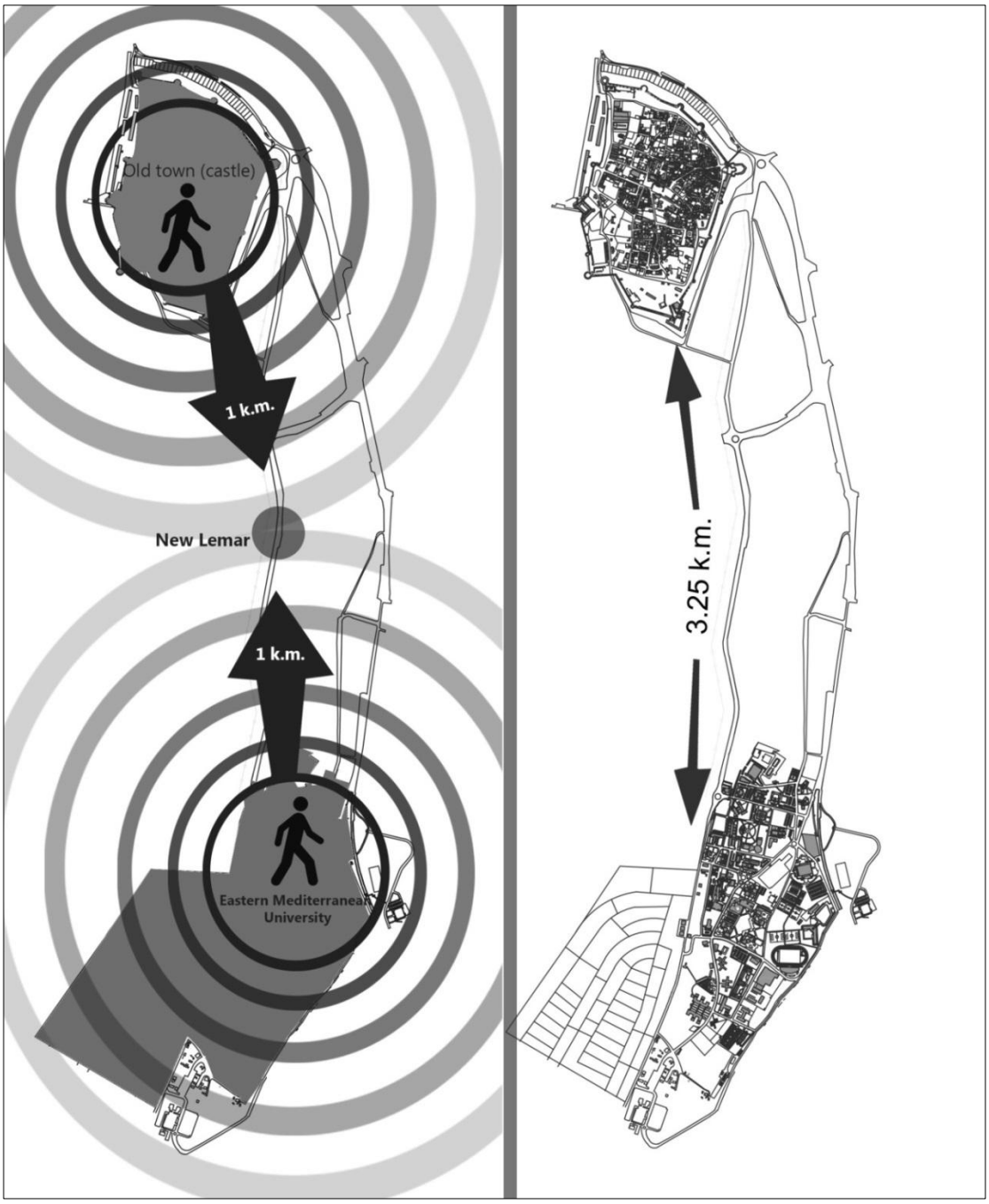
There is no direction on the street to lead them to the old city, so they ask someone and walk along Salamis road.

Appendix2.figure4: Perspectives that Muhammad and Aristotle see in street level from sidewalks under the shadows of giant eucalyptus trees which are so tall that are not block the pedestrians surveillance. Source: author

Along the road, there are junctions that connect the road with sacks of residential neighborhoods and these patterns are repeated all along the road. The figures 4.6 and 4.7 are perspectives that Muhammad and Aristotle see in street level from sidewalks under the shadows of giant eucalyptus trees that are so tall that they are not seen to block the view of pedestrians. The quality of pavements and sidewalks change, for example, the sidewalks get narrow to 1.2 meters that “Many of pedestrians should reduce their speed to prevent clashes and overtake”. Here it must be said that Famagusta has two cores of attraction for pedestrians, one is the old castle as the heart of all developments and new developments like university campus.



Appendix2.figure5: The quality of pavements and sidewalks changed, for example the sidewalks get narrow to 1.2 meters that “Many of pedestrians should to reduce their speed to prevent clashes and overtake” -source: author



Appendix2.figure6: the figure shows one of the mainstreams from university to old town which are 3.25 kilometers away from each other and the figure in left shows the New Lemar that stand in the middle of these two nodes.-sources: author

Appendix 2.figure 7: The figure shows extended restaurant in to sidewalks and the people routines that Sometime blocks the street for applauding their favorite soccer teams. Source: author

The main thoroughfare connects these two by two main streams that are against the goals of "New Urbanism" (Figure 4.8). This mainstream could be changed in more accessibility connections with less width. Let us see where are our pedestrians, Muhammad, and Aristotle; after passing narrow sidewalks in the shadow of tall trees they pass through extended restaurants to street sidewalks, which are the place for soccer fans as a part of people's routine life in Famagusta especially at night, for watching football and eating with companies. Sometimes the street blocks by these fans for applauding their favorite football teams. (Figure 4-9) Now our pedestrians are in the middle of the way from university to old town. They have walked more than one kilometer, so they need to sit and rest.

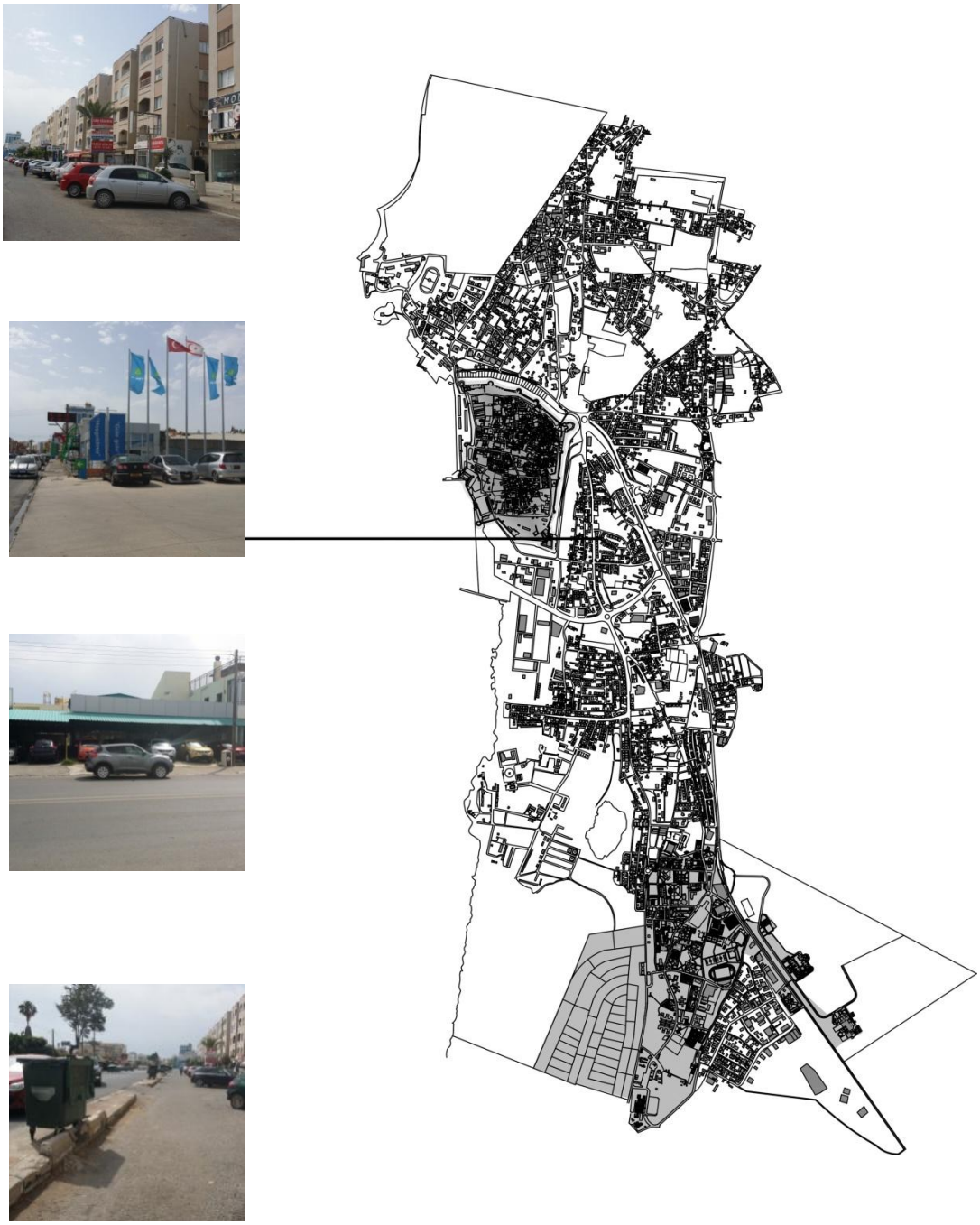
Aristotle "let's find a place and rest for a while! See, there is a green area near that big mall. "

Muhammad" yeah, Lemar! I can see trees over there, there must be a place to sit" (figure 4.10)

Appendix.2 figure 8: The figures show the New Lemar and facilities for public use around it. Source: author

Appendix2.figure9: The figures show a mosque and related places as elements in the road which creates an image of salamis road in the pedestrian mind. Source: author

Lemar is a big mall constructed in 2008 surrounded by neighborhoods with parallel avenues with Salamis Street. These areas are the place of low-rise local people's residential buildings and separated with salamis road that is around 20 meters width that makes hard for pedestrians to cross over. This area has a high potential to turn the Famagusta to a walkable city because it is a benchmark between old and new developments also it contains a mixed use ability for people like shopping and more optional walking challenges based on the discussion of chapter three about categorization of walking purposes. Though, despite the problematic eastern separated areas, this area as a new suitable growth of old city could be a big positive spot for Famagusta walkability. The next stop for our two pedestrians is a big mosque the minarets of which are now seen at the end of the street's corner and Muhammad asked his friend to remember this mosque as a benchmark to find their way back to university dormitory (Figure 4.11). Here for a no good reason shops are turned into vacant lands and street gets wider and also there is a junction that connects a large roundabout in front of the mosque to another main thoroughfare of the city.

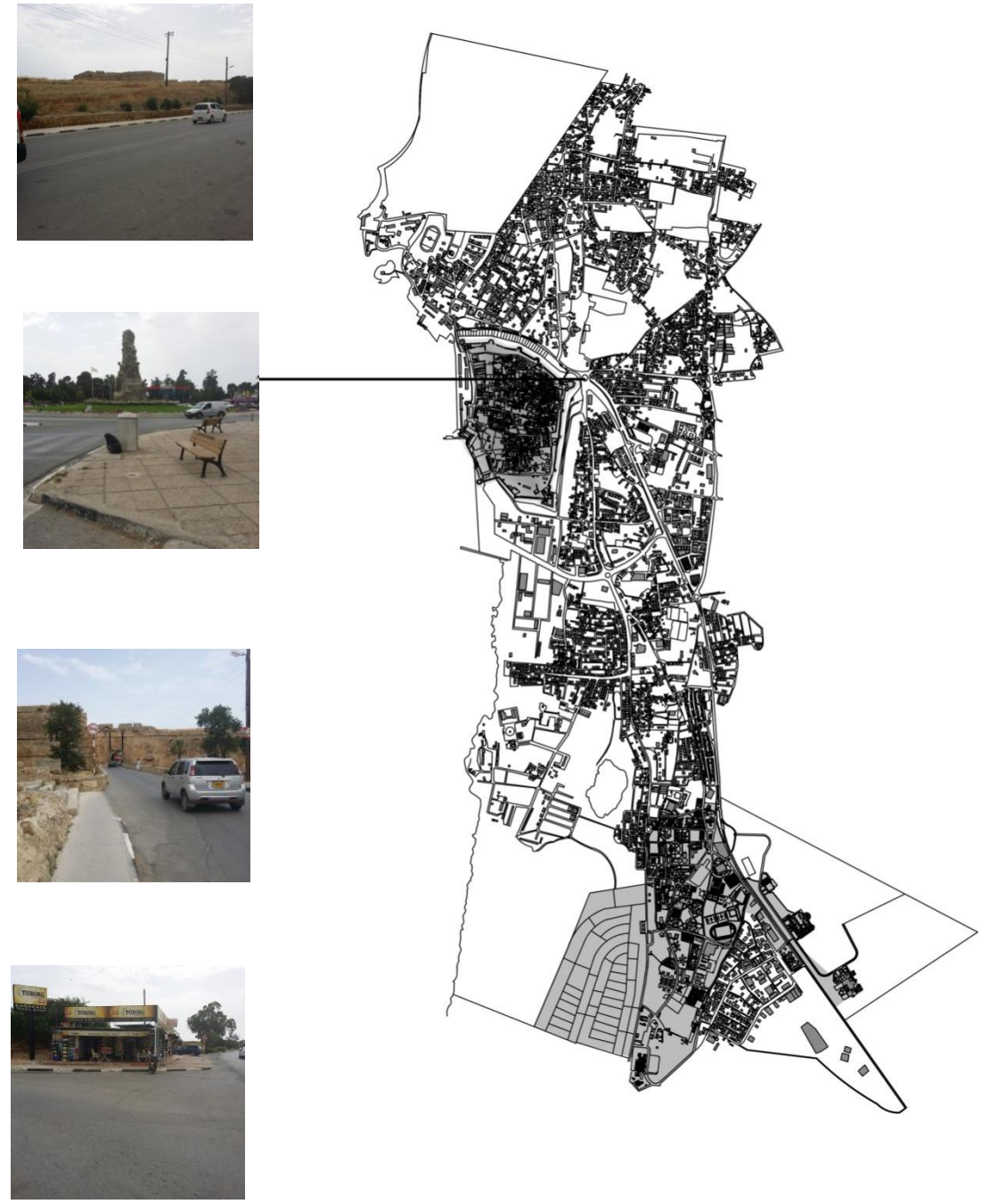


Appendix2.figure10: After five minutes walking from the last roundabout the sidewalks manipulated by cars and the road lost its character for pedestrians. Source: author

Muhammad and Aristotle cross the street then walk straight along Salamis road but after 5 minutes of walking they feel they've got lost, and it is an endless road to nowhere for them. All the buildings are similar to each other (Figure 4.12) because the street is surrounded by garages and standard petrol stations and they have passed 1 more kilometers from Lemar, but there is no benchmark here for them to build their "image of city" well. It is hot, so Aristotle decides to take a taxi and get back to the university, he takes a taxi and the driver asks him "u Lefkegidiyorsun?" In Turkish, and Aristotle simply replies "ok..!"

Taxi leaves while he is waving his hand for Muhammad.

But Muhammad decides to continue walking, and then after minutes of walking he finds the signs of stone buildings and fortresses of the old town (Figure 4.13).The roundabout in front of the main gate of old town appears with no real introduction for pedestrians but the quality of road like sidewalks get wider and floorings are better also Muhammad can see a very comprehensive good perspective around and a little cafe at the end of the road that he can buy a cold drink there then go through the gate of the old town (Figure 4.13).



Appendix2. Figure 11: Figures shows the perspectives around the old castle fortresses like roundabout in front of the gate. Source: author

Appendix .4 Questionnaire

In following,there is the two pagequestionnair that was conducted with 96 person in eight points along the salamis streetby the author in october of 2015.The answers of the questions are used within the chapter three:

Survey on walkability factors in Salamis Street

Dear Respondent
As part of my M.S. research/thesis at the Eastern Mediterranean University, faculty of Architecture Engineering in North Cyprus, I am conducting a survey to explore the users' evaluation of walkability factors in eight points(appendix 3.map), which positively improve the livability and sustainability in city. Your kind participation is highly appreciated. Any information obtained in connection with this study will remain confidential. No need to reveal your name. If you have any query, please contact me.
Thank you very much for your kind cooperation.
Mohsen Mohseni

PART A
For each of the statements below, please indicate the extent of your evaluation degree by placing a tick in the appropriate box.

The response scale is as follows:

1. Strongly high
2. high
3. Undecided or Neutral
4. low
5. Strongly low

Questions	1	2	3	4	5
1. How much do you like walking?					
2. How much do you like to walk to the places you like instead of driving?					
4. How much does it comfortable to walk in salamis street?					
5. Is the lighting in this place is convenience for a walk?					
6. How much the cultural signs of people in Famagusta are shaped the functions of building around this place?					
7. How much the quality of sidewalks is suitable for walking?					
8. How much this place is ready for cultural activities like ceremonies?					
9. Is it easy to reach New Lemar by walking for you?					
10. How much do you know about shortcuts to reach to the old castle?					

11. How much do you know about shortcuts to reach to the New Lemar?					
12. How much do you know about shortcuts to reach to the Eastern Mediterranean University?					
13. How much it is easy to walk to old castle by walking from Eastern Mediterranean University?					
14. How much it is easy to walk to old castle by walking from New Lemar?					
15.How much it is easy to walk to New Lemar by walking from Eastern Mediterranean university?					

safety	high	miderate	low
1. How much does it safe to walk in this areas?			

PART B

Age

18-27 ()
28-37 ()
38-47 ()
48-57 ()
58-67 ()

Educational Level

Primary school ()
Middle school()
High school ()
Junior technical college ()
University ()

Gender

Male ()
Female ()

Marital Status

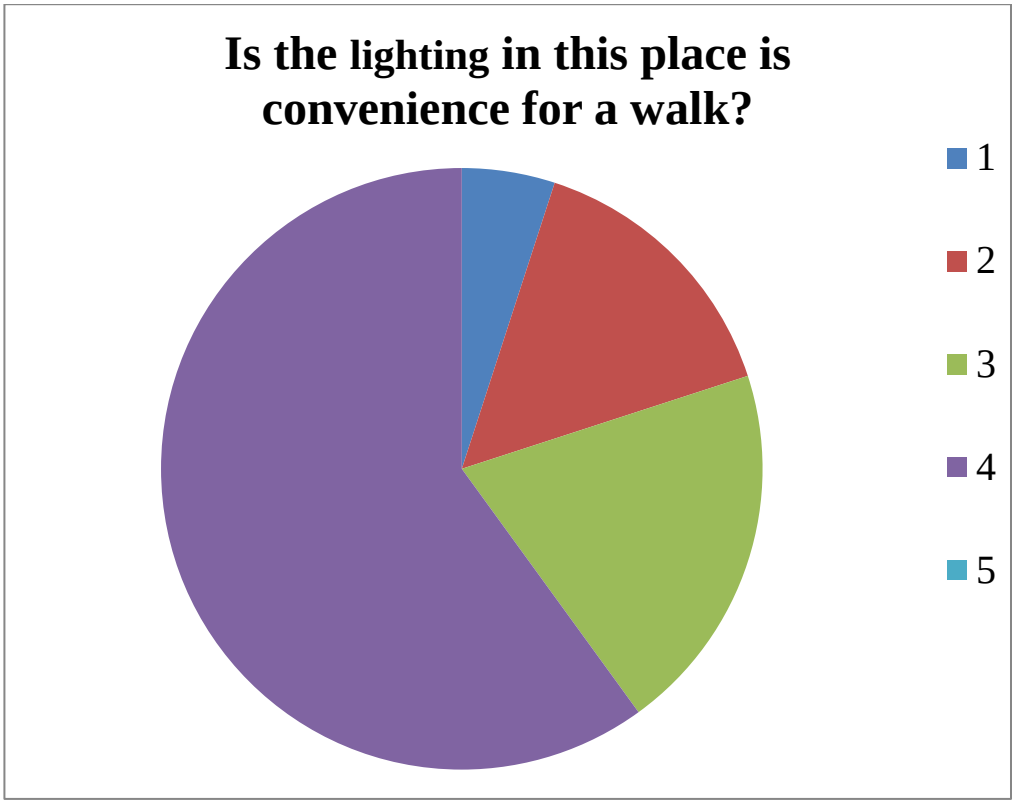
Single ()
Married ()
Divorced or Widowed ()

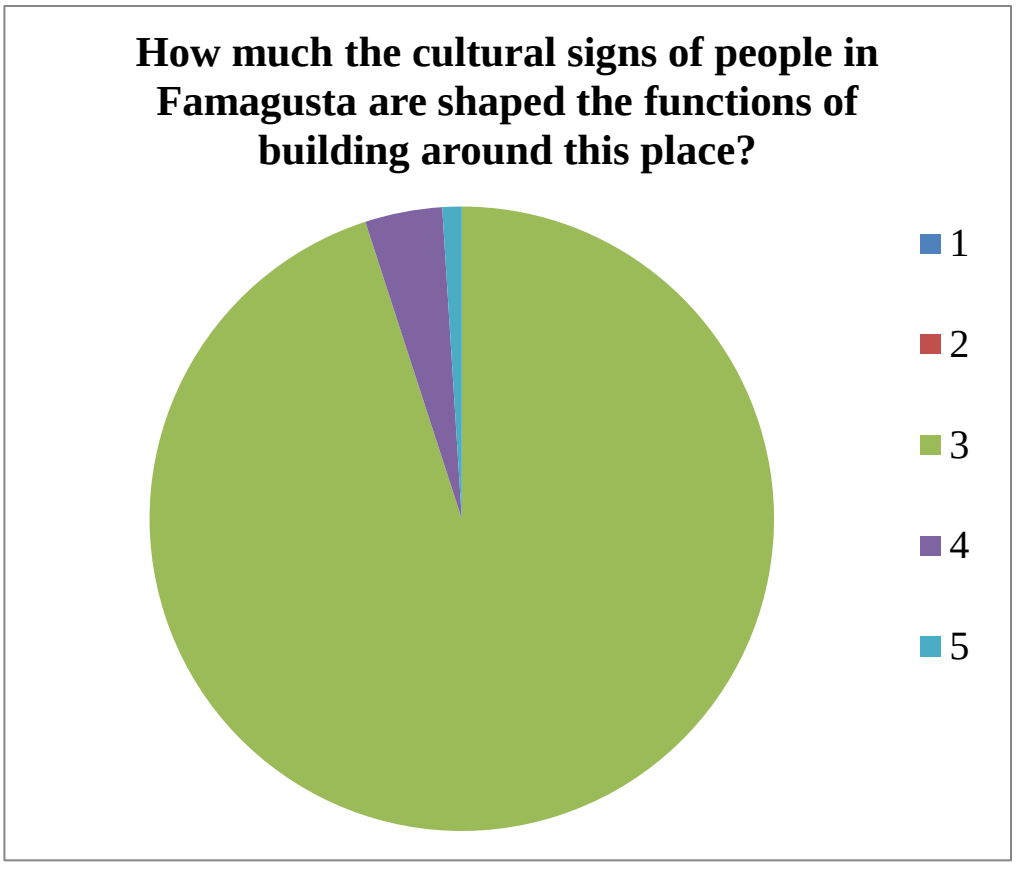
Are you **Driver ( )**
Tourist ( )
Pedestrian ( )
Public transfer user ( )

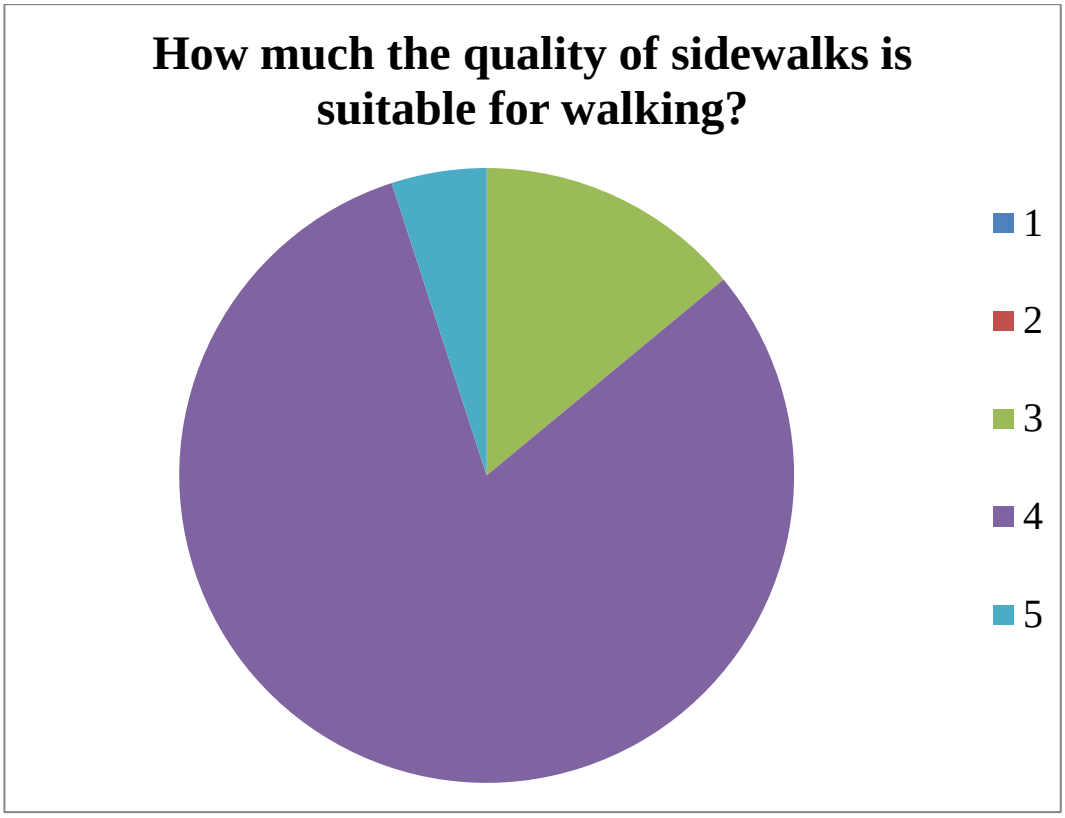
Thanks for your Valuable Cooperation

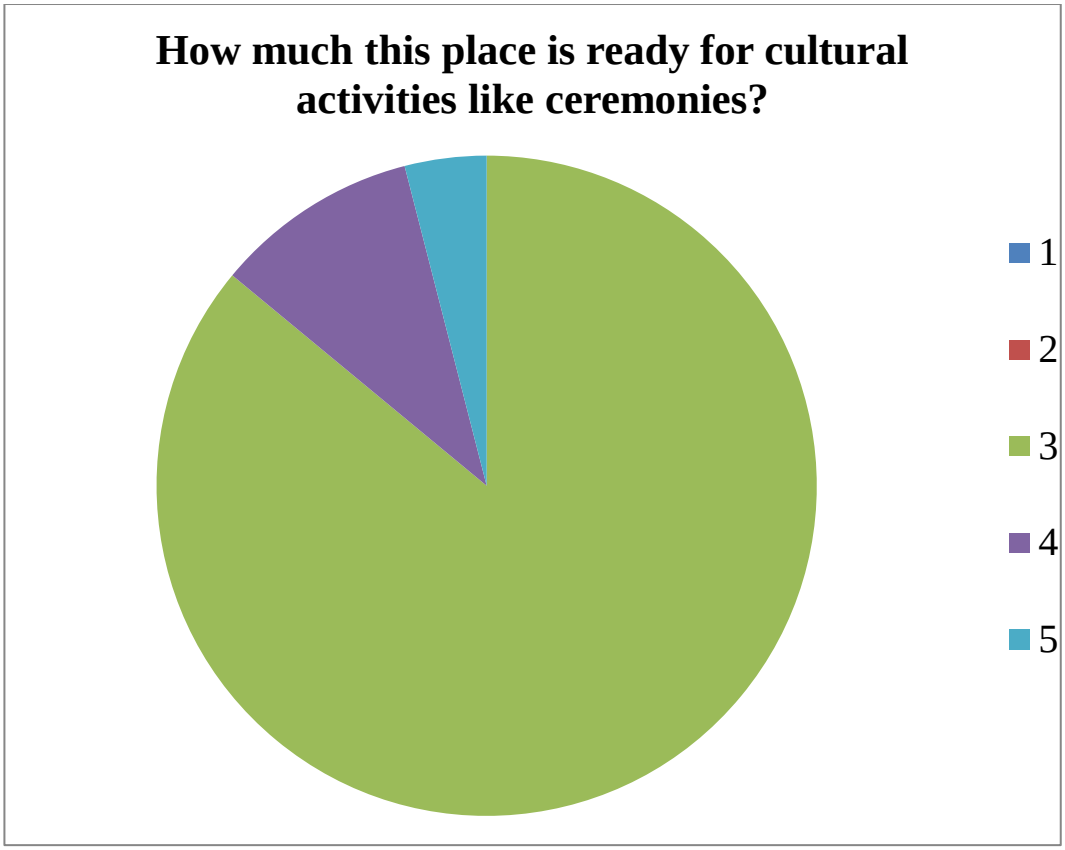

How much do you like walking?
1
2
3
4
5

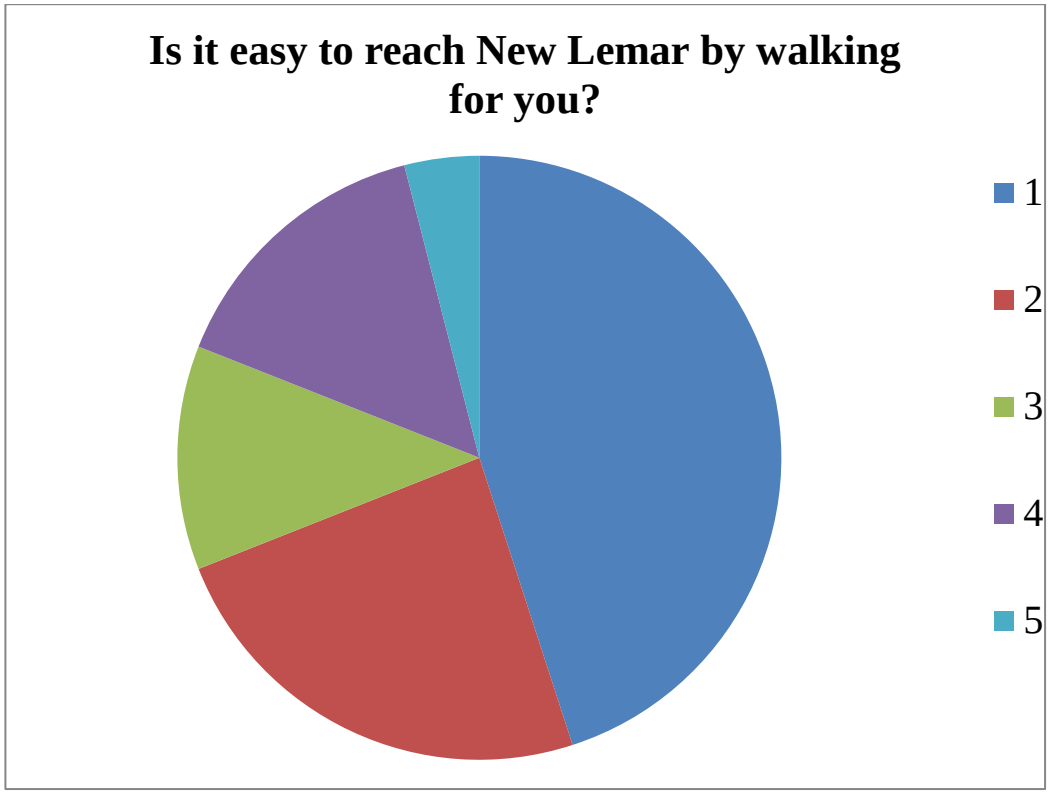

How much does it comfortable to walk in salamis street?
1
2
3
4
5

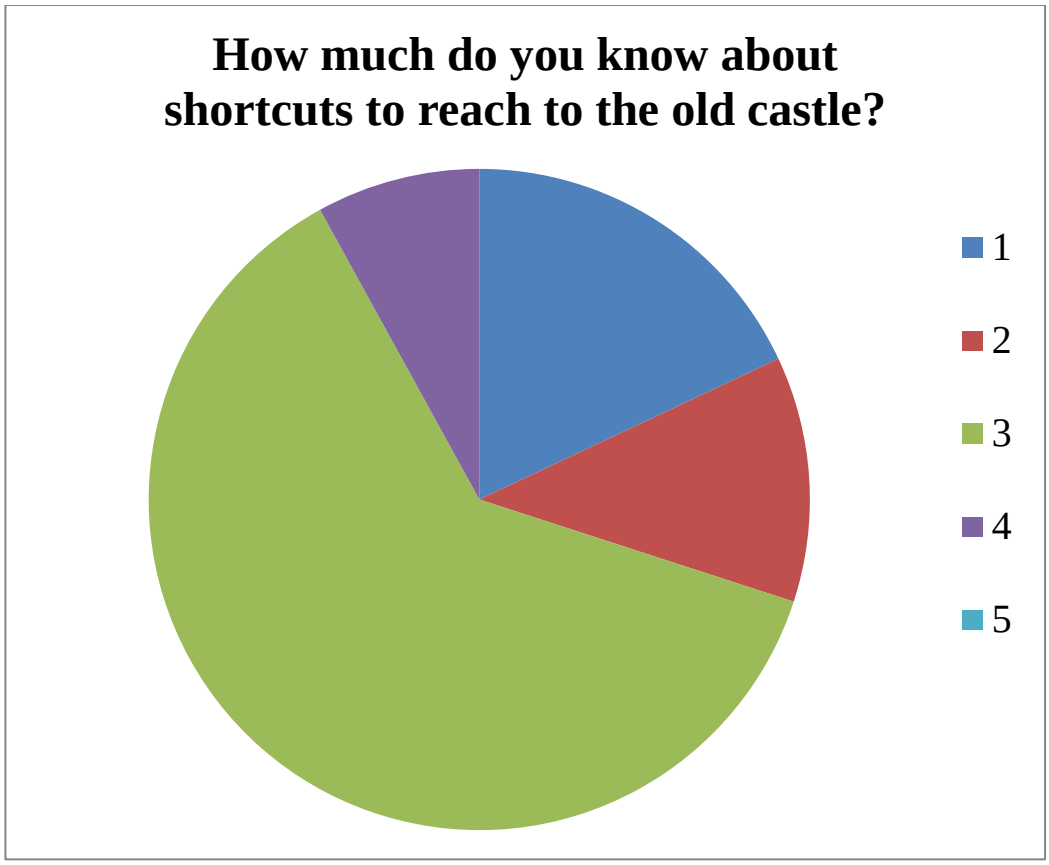

Is the lighting in this place is convenience for a walk?
1
2
3
4
5

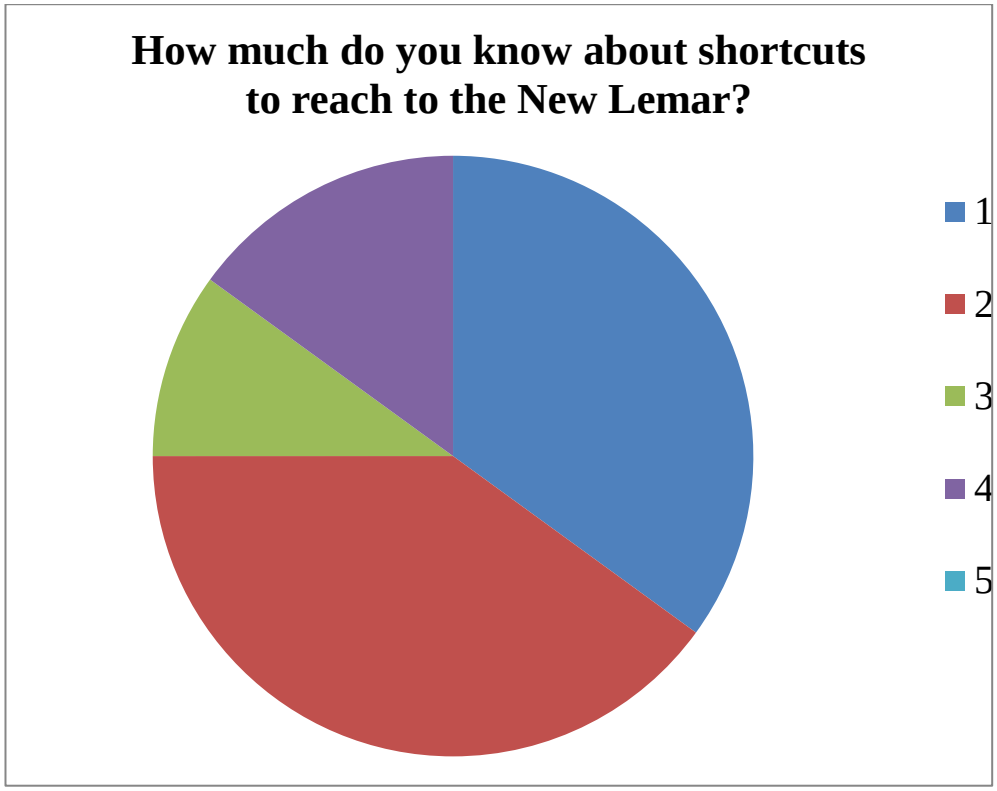

How much the cultural signs of people in Famagusta are shaped the functions of building around this place?
1
2
3
4
5

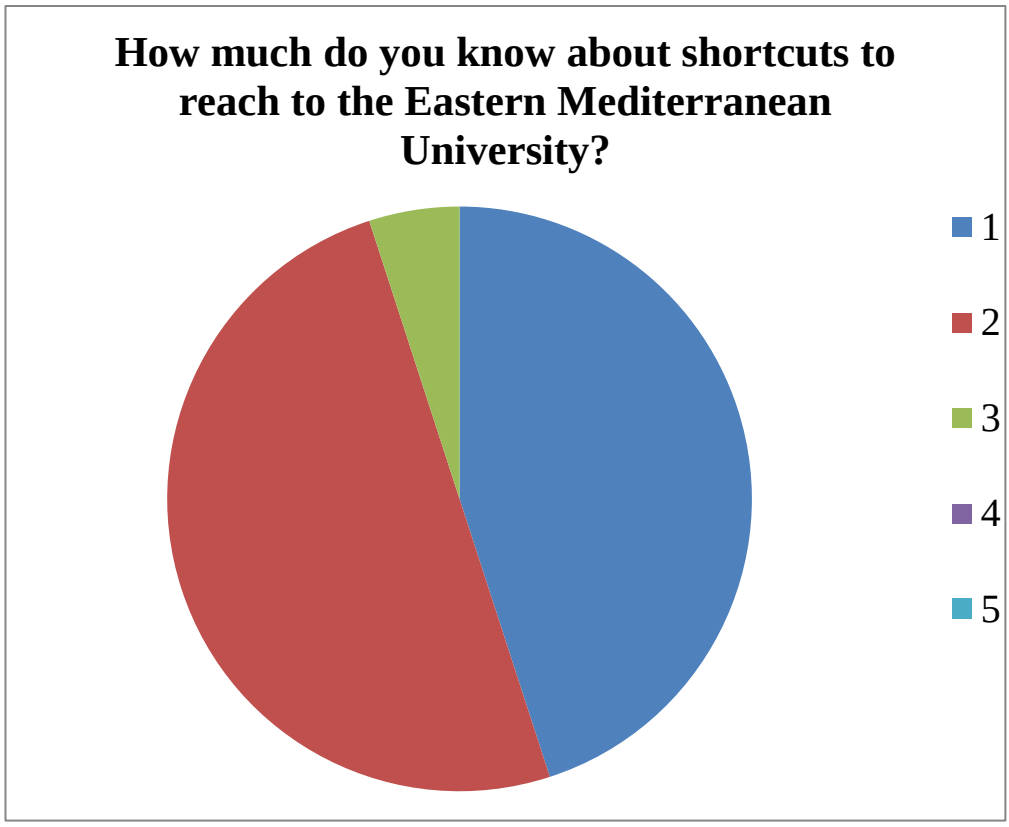

How much the quality of sidewalks is suitable for walking?
1
2
3
4
5

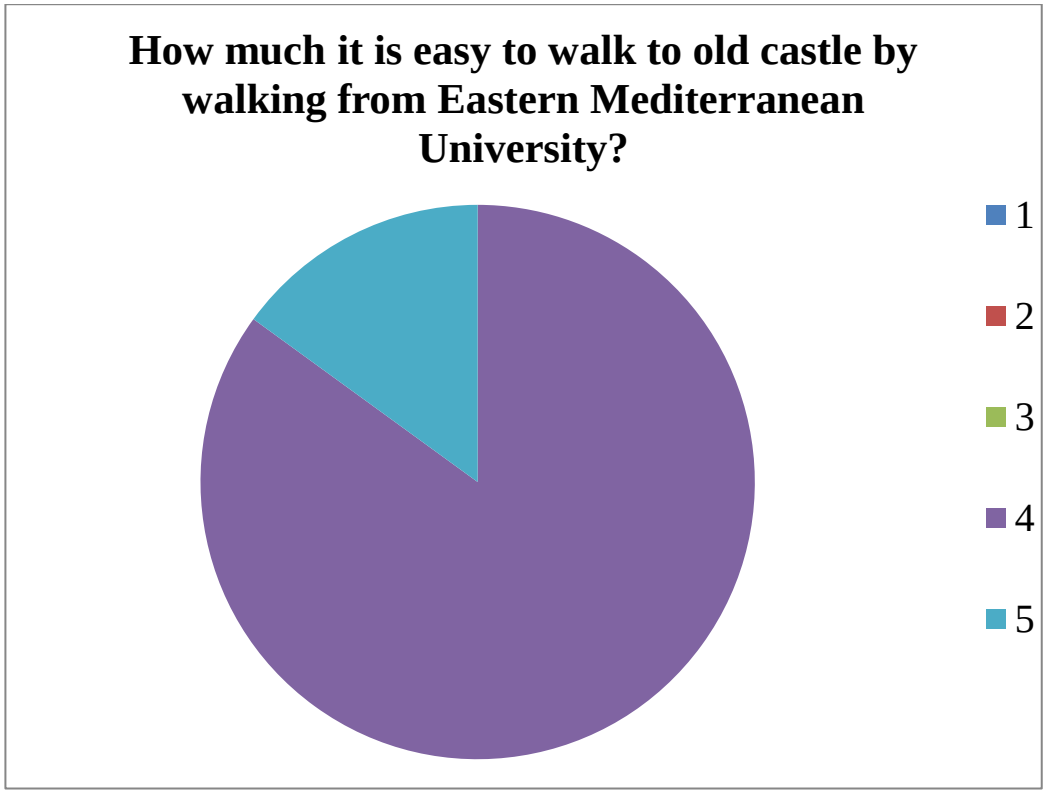

How much this place is ready for cultural activities like ceremonies?
1
2
3
4
5

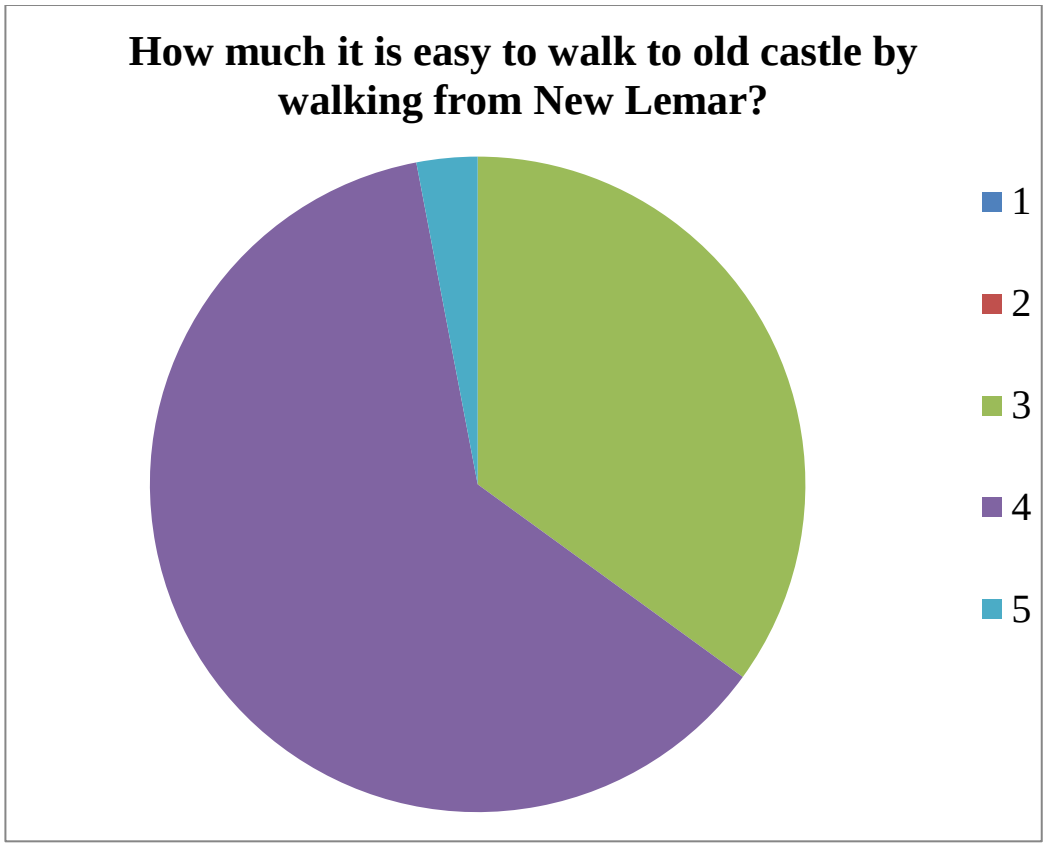

Is it easy to reach New Lemar by walking for you?
1
2
3
4
5

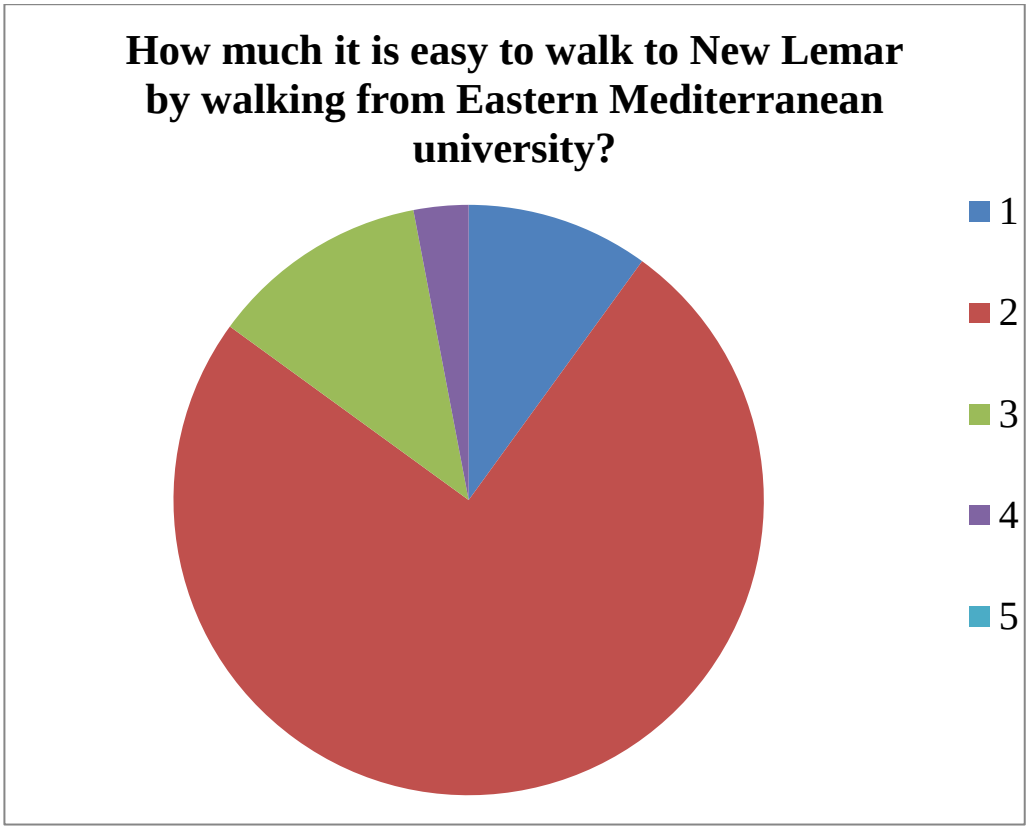

How much do you know about shortcuts to reach to the old castle?
1
2
3
4
5


How much do you know about shortcuts to reach to the New Lemar?
1
2
3
4
5

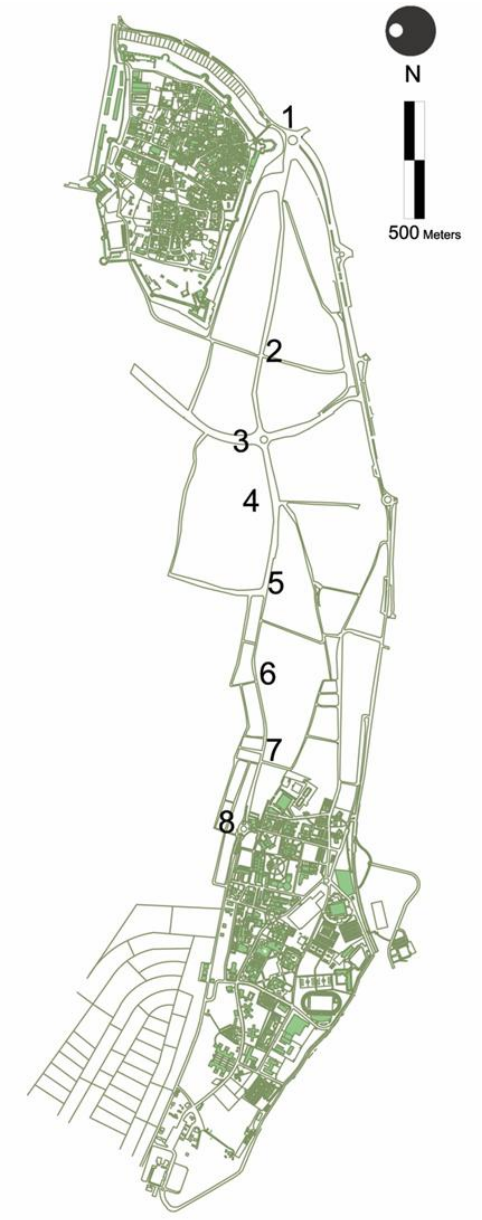

How much do you know about shortcuts to reach to the Eastern Mediterranean University?
1
2
3
4
5


How much it is easy to walk to old castle by walking from Eastern Mediterranean University?
1
2
3
4
5

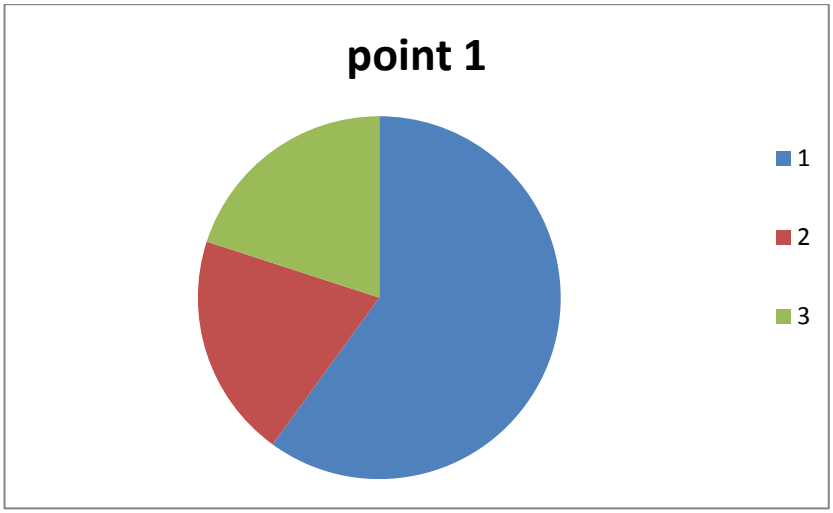

How much it is easy to walk to old castle by walking from New Lemar?
1
2
3
4
5

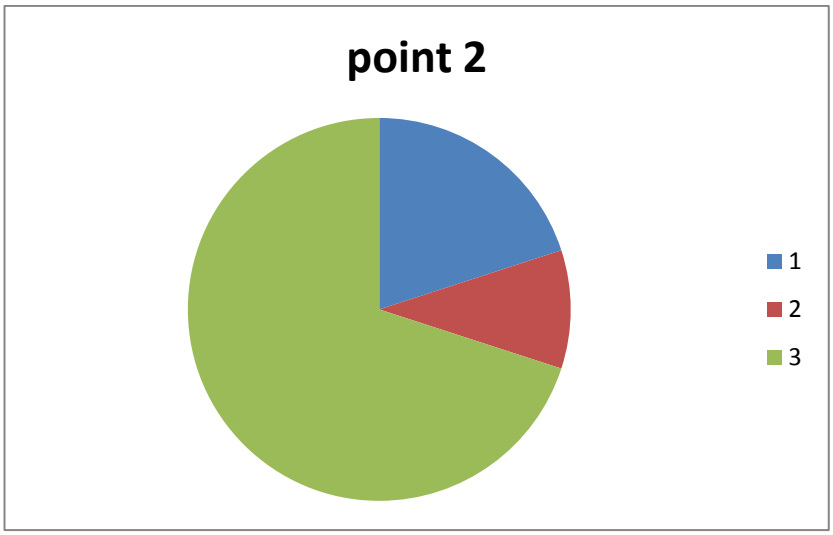


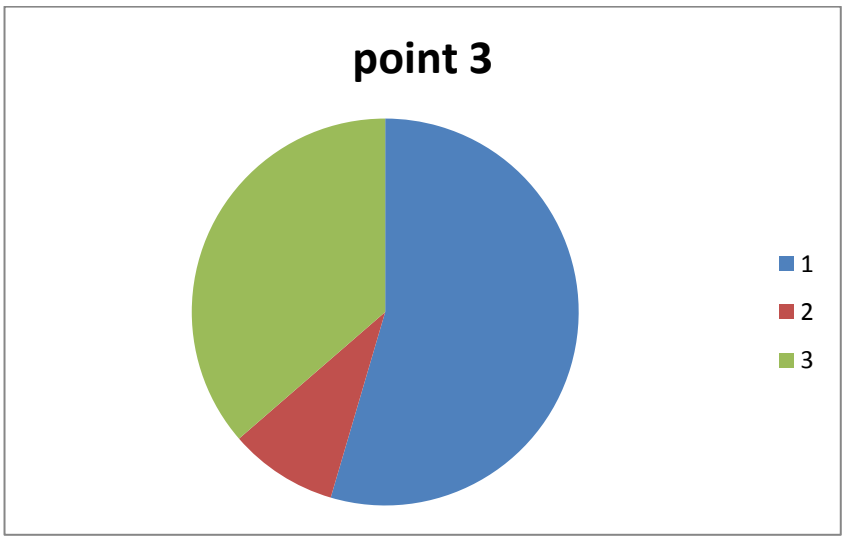
Safety results

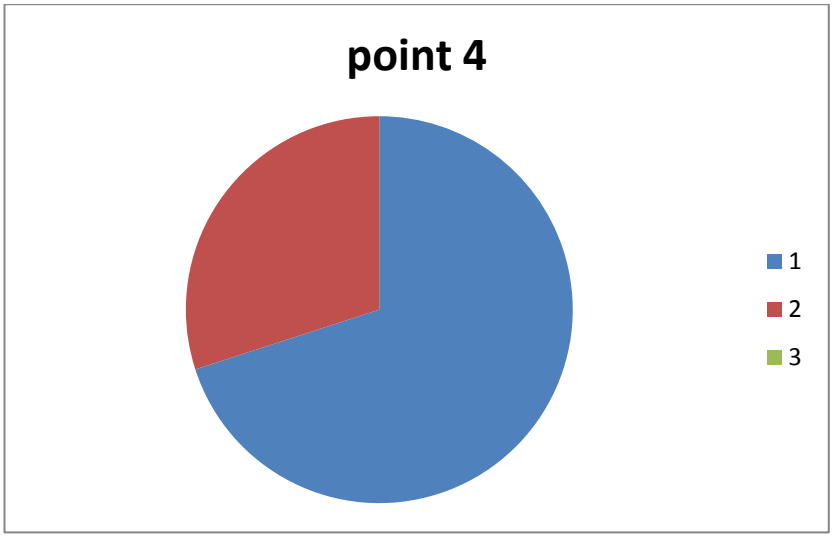


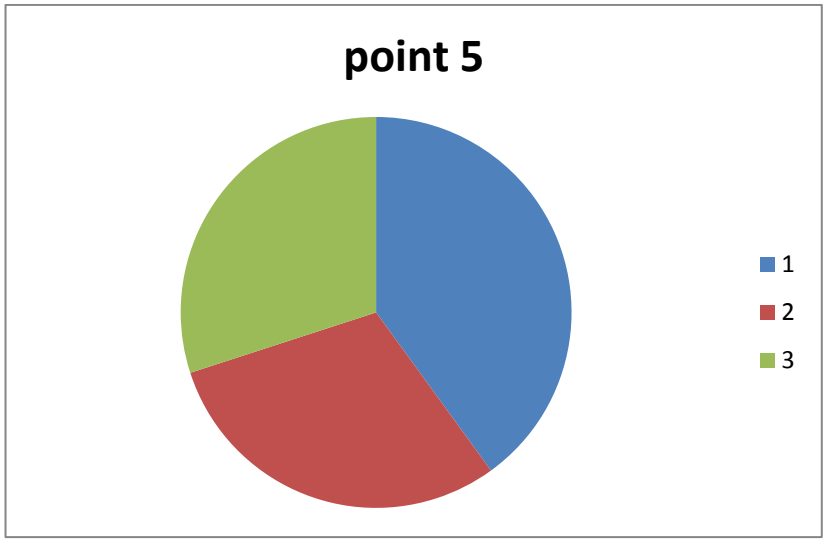
Appendix figure .figure shows those eight points
that questionnaires are distributed

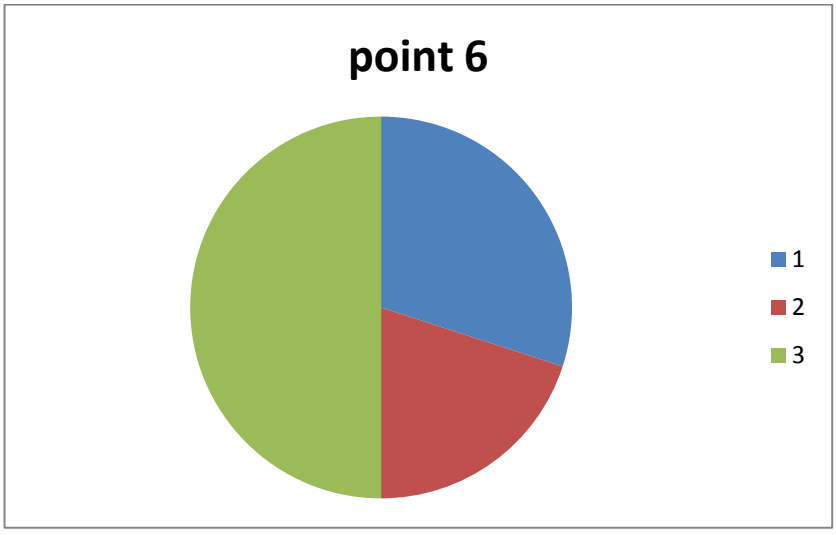

point 1
1
2
3

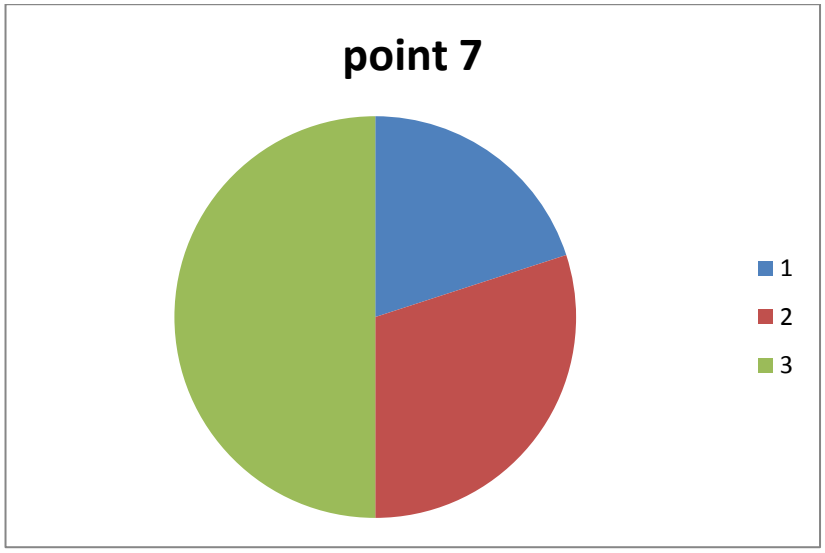

point 2
1
2
3

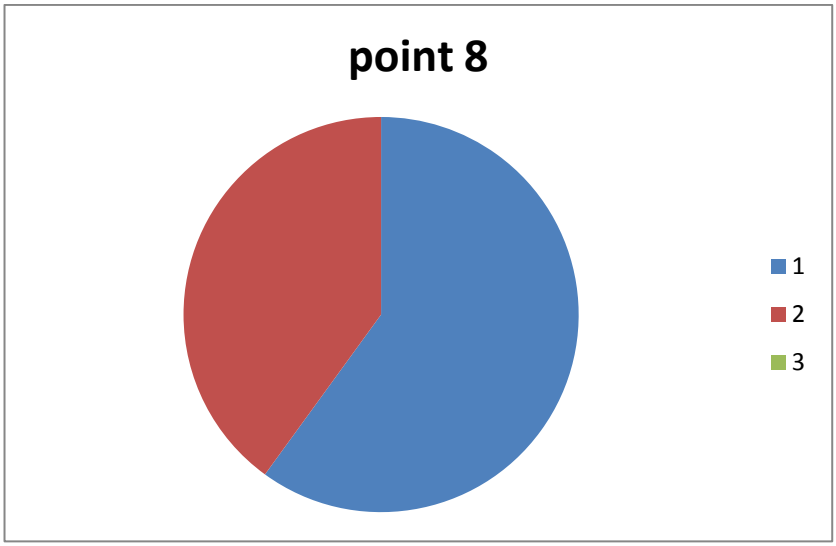

point 3
1
2
3


point 4
1
2
3


point 5
1
2
3


point 6
1
2
3


point 7
1
2
3


point 8
1
2
3

Appendix figure 2.Famagusta map
Google maps