BUILDING A LEGIBLE CITY: HOW FAR PLANNING IS SUCCESSFUL IN ANKARA

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ZEYNEP ERAYDIN

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Prof. Dr. Canan ÖZGEN
Director

I certify that this thesis satisfies all the requirements as a thesis for the degree of Master of Science

Prof. Dr. Melih ERSOY
Head of Department

This is to certify that we have read this thesis and that in our opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Science

Assist. Prof. Dr. Adnan BARLAS
Supervisor

Examining Committee Members

Assoc. Prof. Dr. Baykan GÜNAY (METU,CP) _____

Assist. Prof. Dr. Adnan BARLAS (METU,CP) _____

Inst. Can KUBİN (METU,CP) _____

Prof. Dr. Murat GÜVENÇ (Bilgi Univ., CP) _____

Assist. Prof. Dr. Nil UZUN (METU,CP) _____

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Zeynep Eraydın

ABSTRACT

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Eraydın, Zeynep

M.S. in Urban Design, Department of City and Regional Planning

Supervisor: Assist. Prof. Dr. Adnan Barlas

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Human environment perceptual relationships have significant effects on human psychology in urban spaces. The concepts of urban legibility and imageability concentrate on these relationships and define components to create livable places by organizing the physical structure. However, determining legibility components is not sufficient in order to define whether a place legible or not.

This thesis explores Gestalt laws of perception can be used to re-define the relationships among legibility components by setting some guidelines. The main aim of this thesis is to find out how far planning is successful in creating legible environments which is evaluated by legibility guidelines set. The thesis also aims to explore issues that make an environment more readable than others. To this end, Çayyolu district containing several sub-districts which are recently developed by plans are examined in a comparable way.

The result of the analyses show that the concepts of legibility and imageability are underestimated in planning practices in Çayyolu which is based on two-dimensional subdivisions of lands and three dimensional determination of bulks of structures. In other words, the Çayyolu district does not provide a legible environment and a whole structure for observers that their psychological needs should be met.

Key Words: Urban Image, Legibility, Imageability, Human Psychology, Gestalt laws of Perception

ÖZ

OKUNABİLİR BİR KENT YARATMAK : PLANLAMA ANKARA'DA OKUNABİLİR KENT PARÇALARI YARATMADA NE ÖLÇÜDE BAŞARILI?

Eraydın, Zeynep
Yüksek Lisans, Şehir ve Bölge Planlama-Kentsel Tasarım
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Kent mekanlarnda insanın çevre ile olan algısal ilişkileri insan psikolojisi üzerinde önemlidir. Kentsel okunabilirlik ve imgeselleştirilebilirlik bu ilişkiler üzerine kurulur ve fiziksel yapının örgütleyerek yaşanabilir kentlerin bileşenlerini tanımlar. Ancak, bir mekanının okunabilir olup olmamasında okunabilirlik bileşenlerinin tanımlanması yeterli değildir.

Bu tez, mekansal okunanabilirlik bileşenleri arasındaki ilişkilerin Gestalt kanunlarının yeniden yorumlanması ile yeniden tanımlanabileceğini ve bazı göstergelerin oluşturulabileceğini öne sürmektedir. Tezin amacı, planlamanın ne ölçüde okunabilir mekanlar yarattığını mekansal okunabilirlik göstergeleri kullanılarak irdelemektir. Tez, bunun yanı sıra hangi konuların bir mekan parçasının diğerlerinden daha kolay okunabilir olmasına neden olduğunu da araştırmaktadır. Bu amaçla, çeşitli alt bölgelerin yer aldığı son yıllarda yapılan

planlarla gelişimiş Çayyolu bölgesinde karşılaştımalı bir araştırma gerçekleştirilmiştir.

Tüm bu araştırmaların sonucu iki boyutlu mülkiyet bölünmeleri ve üç boyutlu imar haklarına bağlı olarak oluşturulan Çayyolu' nda okunabilirlilik göz ardı edilmiştir. Başka bir değişle, kullanıcıların psikolojik ihtiyaçlarının karşılanması için önemli olan fiziksel mekan Çayyolu bölgesinde bütüncül bir yapı sağlamamaktadır.

Anahtar Kelimeler: Kentsel İmge, Okunabilirlik, İmgeleştirebilme, İnsan Psikolojisi, Algılamanın Gestalt kuralları

To my grandmother and grandfather……

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INTRODUCTION

1.1. Aim of the Study

The way that urban physical components are arranged plays an essential role in perceptual interaction between human and environment. How city is experienced depends upon how it is formed, and the form defines how it is experienced. There is a mutual relation between humans and the environment.[1] Physical arrangements and perception are cyclical and inseparable and the perceptual structure of urban space affects the overall dynamics of urban vitality. Urbanism is concerned with the elements and qualities that are to be found in successful urban places e.g. legibility, connectedness, strong identity, intensity, diversity and quality in the public domain (Chathartha and Uirbeach, 2000).

The legibility of an urban environment refers to the ease with which its inhabitants can develop a cognitive map over a period of time and so orientate themselves within it and navigate through it (Lynch, 1960). Work on legibility has been concerned with the way in which people are able to 'read' an environment and hence perform way-finding tasks. In his book *The Image of the City* Kevin Lynch (1960: 2) defines the legibility of a city as: "…the ease with which its parts may be recognized and can be organized into a coherent pattern…" Here, Lynch is referring to the formation of a *cognitive map* within a person's mind, a structure which is an internal representation of an environment which its inhabitants use as a reference when navigating in a setting.

[1] Kevin Lynch defined in the book *Image of the City* that human and environment has a reversable interaction that effects the whole image and perceptual quality.

Actually, we can distinguish two acceptances of legibility (Ramadier and Moser, 1998). The first criterion for the acceptance of legibility is about the spatial representation of the surroundings. Legibility is essentially considered to be a physical and spatial quality of the surroundings. This perspective hypothesizes that surroundings directly influence spatial cognition. The second definition is related to human behavior. According to Evans *et al.*1980, legibility, as a measure of spatial quality, has a consequence on behavior, particularly on traveling. Similarly Weisman (1981) also focused on behavior indicating that legibility is the degree of facility with which finding one's way is possible in a given built environment.

Research into this topic since the 1960s has argued that, planners can significantly influence the legibility of the built environment by carefully designing its key features. For a long time urban planning has been the realm of people from various disciplines. Recently, however, as Scheer (1992: 3) has defined "there has been a pronounced move back to what clearly is the origin of the impulse to plan: the appearance and "legibility" of the physical form of the community". In many parts of the world, people are dissatisfied with their physical environment and they are beginning to ask for a less chaotic, and more appealing public environment. One of the important issues of their dissatisfaction is the lack of legibility or the ability to understand the order of a place and to find a way in and around it. In fact, after the modern sense of design an alienation of people from others and environment occurred on account of unreadable urban environments (Barlas, 2006). Furthermore, the lost of human dimension adversely affected socio-psychological issues.

The concept of legibility has long been a concern for town planners, despite the fact that the concept is far form concreteness. Yet, as Lynch (1960) stated, it is possible to identify some general rules and define urban components affecting legibility of urban spaces. According to him, the complexity of the urban structure, the level of differentiation of its elements and its visual aspect are the main variables influencing legibility in terms of spatial representation.

Not just Lynch, but also some other scholars have tried to set some guidelines to carry the subject from an abstract to a more concrete level. This is because of the aspiration to build urban spaces that provide pleasure and satisfaction to their users. These premises suggest that there is need to formulate the physical environment due to the feelings created in human psyche. So much so that, to reach this end the basic laws of perception Gestalt psychology[2] were figured out, which became the bases of several theories, although none of the theories have referred to Gestalt laws of good composition. Lynch (1960) for example talked about some characteristics of form quality as continuity, simplicity etc. Cullen (1961) also mentioned similarity and closure to define sensible places.

The review of extensive literature on legibility and its qualifications provides us a clear list that includes landmarks, districts, paths, nodes and edges. However, in order to define whether a place is legible or not, the legibility components are not enough, there is a need to define the relationships between the so-called legibility components. These relations can be used as evaluation criteria.

Screening existing evaluation criteria for urban legibility provides us several clues. First, legibility, which is a combination of three senses –orientation, way-finding and formal aesthetic-, is based on human psychological needs in terms of visual quality. Orientation is "the sense of clear relation of the observer with the city and its parts" (Lynch, 1991: 135). Barlas emphasized that humans need to orient themselves to sensually attach to the physical setting. Moreover, "a space (or setting) only turns into a place it its users feel attached to it" (Barlas, 2006: 154). Way-finding on the other hand is a crucial issue for a legible city which prevents observer from the sense of lost. Thirdly, as Lynch (1960) stated, one of the values of a good city is the formal aesthetic which is based on aesthetic needs, correlated with imageability and recognizable environment. It is obvious that a clear image enables individual and social opportunities. Moreover, it provides a free moving opportunity and in connection, a possibility to choose, emotional security and satisfaction (Lynch, 1960). Not only individual growth but also in

[2] Max Wertheimer, Kurt Koffka and Wolfgang Köhler, by Gestalt psychology defined the laws of good composition in organization of form.

social context it also provides a collective memory of group communication. Therefore, it is a significant indicator, which must be taken into consideration in the production of urban form.

In the production of urban form in Turkey there are three main stages. First one is the subdivision of two-dimensional land. The second is to determine the three dimensional structures (solids) and the last one is the architectural design of the three dimensional forms. In this process, it is not certain that creating legible environments are taking into consideration. Thus the aim of thesis is to discuss the differences in the use of legibility principles in selected urban districts by seeking answers for such questions.

- How far planning is successful in terms of legibility?"
- What are the tools or principles that make the neighborhoods more legible?"
- What makes the district more readable than the others?
- What should be done to improve their performance of legibility?"

In order to provide answers to these questions three different recently planned and developed sub-districts in Çayyolu are selected as case study areas in Ankara, Turkey. The findings from these case studies will be used not only to define the legibility of these areas but also to define the major components and criteria that make these residential places more legible than the others.

1.2. Method of the Study

The method for the study is based on legibility analysis of different urban districts. In this study, the analysis is formulated by dividing the complex structure of urban space into two; psychological space (group of observer who perceive the environment) and the physical space (perceived urban setting by observers).

Thus, the first part of the thesis discusses how humans perceive the environmental elements, images and forms. In this sense the evolution of perception history and different point of views play an important role. Thus the thesis starts with human perception systems. The aim of this section is to construct the bases of the concept of legibility. This section is also important to justify the survey method of the study. Although it is believed that background knowledge and social status is very important for reading the city, there are common senses as Lynch emphasized. The issue of perception is "an awareness of something whether one's own thoughts and feelings, one's social surroundings, a business opportunity, the way to solve a math problem, or the current spatial layout" (International Encyclopedia of Social and Behavioral Sciences, 2001: 11202). By this definition, one can understand that legibility is not dependent on social differences. As Gibson stated, "the end product of perception is not an internal representation of the environment; it is the direct pick-up of the invariants in the environment." (Zhang, 2006) In this sense, Gestalt psychology and laws of form perception summarizes human perception/cognition under three subsequent phases. Sensation, association and attention are the steps of this process where the first image is perceived in the sensation process. Attention, which can be identified with cognition, on the other hand, provides us the ability to make judgments. Cognition is basically to process perceived information. This two sided conceptual development influenced both how observer/user sees the surrounding and organizes, stores and recalls the environmental information or signs. The man-environment perceptual relations, image building process and its components de of legibility, besides the Gestalt laws are briefly presented in Chapter 2.

In Chapter 3, a comprehensive literature review on urban legibility and urban elements is reviewed and the psychological and physical components of legibility are introduced. This part of the study revises how designers work on urban image, describe the city and the relationships between urban environment and observers. Although the term legibility is remembered with Lynch's name, it has a longer history starting from 1850s. Lynch conceptualized the urban structure with five urban elements that increase the ease of physical setting.

The main point of the thesis is that the legibility theory does not just conceptualize about the visibility of physical parts of the city, but also defines the importance of the influence organizations of components on human behavior. To make a city more legible there should be order and visual organization between city components. They should be readable and perceivable within a whole composition. “These elements are simply the raw material of the environmental image at the city scale” (Lynch, 1960: 83). They are all arranged and related in city settings. The composition of the whole that Lynch coded in the Image of the city can be referred to as the Gestalt law of “good composition”. Gestalt laws of perception aimed to figure out that “human visual system is powerful at finding patterns” (Günay, 2005). According to Gestalt psychologists there are three concepts that describes “integrative quality”; *quantity*, *order* and *meaning*. The order in Gestalt can be grasped as a whole which Lynch’s description of legibility refers to. Barlas stated that a perceivable and recognizable relationship of urban elements bring an order that can be grasped as a whole. “That is, the order and its elements should be legible in Lynch’s terms, so that one can easily orient himself/herself within the urban space” (Barlas, 2006: 157).

Cullen (1961) identified city by segments. Observer absorbs (perception and cognition) the physical pattern along a pedestrian movement. Thus, the movement paths (segments) should have an understandable visuality. Alexander, on the other hand, stated that the city is a combination of differentiated patterns. These patterns should be perceptible within themselves and recognizable as a whole. Lozano’s (1990) high level and low level orders also based on the same imageable. All of these theories have a common aspect: No matter how the city is described – elements, segments, pattern, orders- its elements should be legible and recognizable.

In this thesis the general point of view for legibility will be based on the wholeness, good composition and order of urban components. By such a method it will be possible to integrate the principles of urban image with “legibility”. The

components and parameters are those which were categorized by Lynch, Cullen, Alexander and Lozano. The principles that they stated will be included in survey questions.

Chapter 4 introduces the five qualities of legibility namely, low level order and structural complexity, high level order and diversity, continuity in sequential elements and rhythm of salient elements, path way configuration, and wholeness and unity.

Chapter 5 presents the findings of the study that aimed to evaluate the level of legibility of the newly planned areas in Ankara based upon six sub-cases from Çayyolu District. As it is mentioned before, the qualities of legibility defined in this thesis provide a framework of evaluation of the sub-districts and the whole residential districts recently planned and developed. With the help of the findings it is possible to bring a discussion on the planning experience in Turkey. In fact, the main discussion point of the Conclusion Chapter is how far the plans are able to generate legible urban environments. In this last section of the thesis the problems of creating legible urban areas are addressed and brief evaluation of the Turkish planning system is presented using the findings of the case studies.

CHAPTER 2

ASPECTS OF HUMAN - ENVIRONMENT RELATIONSHIP

Man-environment relationships form the essence of planning. They have been a theme of curiosity for many years. Several ways of conceptualizing these relations have been proposed not only to figure out the psychological patterns of human understanding and behavior, but also the physicality of environment that effect psychological attributes. Recently, the studies on human-environment relationships have focused on interactions between people and cities, since a city is defined as an object that can bring changes on human psychology.

This part of the thesis focuses on three main questions that are related to man-environment relationships; specifically on legibility and visuality.

- How do people understand or perceive physical environment?
- What are the stages of psychological process?
- At what stage a designer or a planner is able to increase legibility of a city?

2.1. The Nature of the Environment

The broad literature on environmental psychology studies that define man-environment relationships can be grouped into three.

1. Environmental determinism: physical environment determines the human behavior. Gibson (1979) claims that physical environment provide cues which can affect perceiver's behavioral choices and perception.
2. Possibilism: environment offer possibilities that human can choose.

3. Probabilism[3]: environment provides choices of which are more probable to be chosen (Rapoport, 1977).

To some planning discipline follows the first way of understanding in man-environment relationships. “Changes in the form of cities and buildings can lead to major change on behavior, increase happiness, increase social interaction and so on” (Rapoport, 1977: 2). Since the physical environment affects interaction, it is useful to determine the “environment”.

A brief review of the literature shows that the environment can be defined in different ways and with use of different sub-categories. Ittelson (cited in Rapoport, 1977: 8) defines the categories of environment as follows; *perceptual environment, expressive environment, the domain of aesthetic values, adaptive environment, integrative environment, instrumental environment, ecological interrelationship of all these.* This kind of categorization seems to be complicated to understand the man-environmental relationship. A different but simpler configuration that is proposed by Lawton (cited in Rapoport, 1977) includes five components; *individual, physical, personal, suprapersonal and social environment*. In another study, *phenomenal and personal environments* are differentiated (Kirk 1963 cited in Barlas, 2006). Gibson (1979) on the other hand identified three environments; *geographical, animate and cultural*. The terrestrial (geographic) environment possesses some qualities sustaining life that they do not have cultural and social aspects (Lang, 1987). The animate environment contains human beings with other living species. For human beings, the life exists in a cultural environment. The categorization - *behavioral and geographical environments* - proposed by Koffka (1963) is another approach. According to him, “the geographical environment refers to those things which are really around us and therefore corresponds to an objective setting. The behavioral environment, on the other hand, is taken to be a cognitive image of the former, and as such is accepted to be the basis of behavior” (Barlas, 2006: 17). The common point of

[3] One of the well-known theorists, Egon Brunswik in 1950s summarized the probabilistic approach as the variety of signals that the environment offers among which the “perceiver must make sense of the most important ones to function effectively in a setting” (Gifford, 1997: 24).

these approaches is the differentiation between the environment with an organization of physical elements and the environment depending on sensory and behavioral issue.

Built environment, for Lang (1987) is a component of both geographical and cultural environment. It contains then, not just physical elements but also human interaction with these physical components. Thus, any change in physical environment can lead to change the affordances[4] that are provided. Similarly, Rapoport (1977) stated that the *built environment* contains series of relationships among physical elements and people. The organization of these physical components, thus, is a result of a set of rules and laws that effect human perceptual relation in a positive or negative way. The positive way, which means a clearly perceivable and recognizable setting, refers to the concept of legibility in Lynch's terms.

2.2. Fundamentals of Understanding and Perceiving Physical Environment

There is a common view that a good image satisfies human sensual needs. Therefore, physical organization should be based on the environmental quality, ideal image[5] and good environment satisfying higher quality of life.

The construction of image and perceiving environment is a psychological process. Rapoport (1977) claims that according to the current view in psychology it is difficult to separate cognitive and perceptual process. Environmental perception of a city is important for Rapoport because the physical setting has a meaning for observers and affects the human sense of quality and quality of living. Humans first obtain and gather environmental information, then organize them in mind, lastly evaluate the information and react according to preferences. Therefore, in Rapoport's environmental interaction process there are three steps; perception,

[4] Affordances of the environment are first coded by James J. Gibson (1977). A built environment provides variety of affordances for human activities and behaviors.

[5] Good image, in other words a legible image, is simply the ease of perceiving the physical components separately and recognizing as a unified whole. The concept of legibility and its components will be broadly analyzed in the following chapter.

cognition and evaluation (preferring). “Perception is relatively stable, consistent, enduring -it works, and there is relative constancy across cultures” (Rapoport, 1977: 33). However, in cognition process cultural differences or preferences effect the organization of perceived elements in mind. Urban image plays an important role in perception cognition process. Amos Rapoport also emphasized in *Human Aspects of Urban Form* the importance of organization of physical elements to create an urban image.

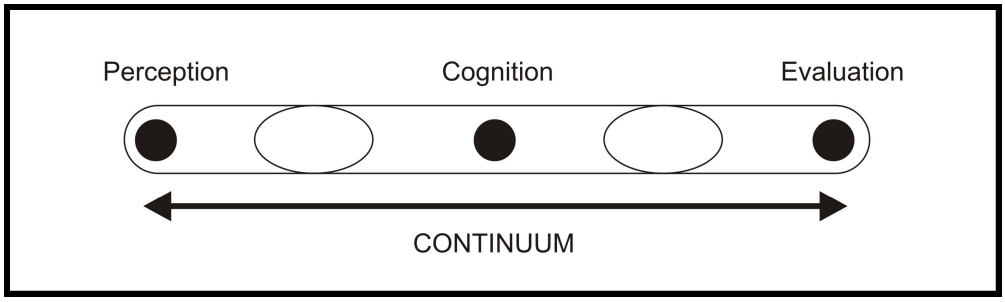


Figure 1: Rapoport’s process of human environmental assessment
Source: Rapoport, A. (1977), “**Human Aspects of Urban Form**”, Pergamon Press Ltd., Oxford, England, pp. 37

Gestalt psychologists defined different three stages of psychological process; sensation, association and attention (Koffka, 1922). The physical elements, once aroused in the form of images, are experienced by senses. “Given a certain stimulus and a normal sense-organ, we know what sensation the subject must have, or rather, we know its intensity and quality, while its clearness or its degree of consciousness is dependent upon still another factor, namely, *attention”* (Green, 2006: 2). Association is based on memorial workings. It is basically the gathering of information observed by sensation. Attention “is a recognized fact, that, clear and simple as association and sensation appear to be, there is a good deal of obscurity about concept of attention” (Koffka, 1922: 4) .

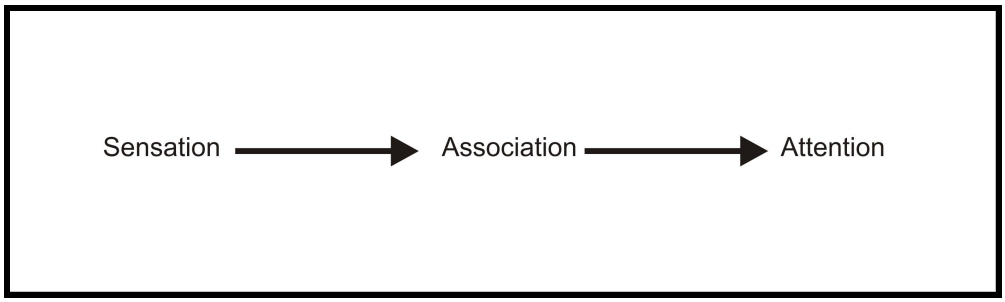


Figure 2: Human process of observation by Gestalt psychology
Source: Adopted from Kurt Koffka (1922)

The filter model (Warr and Knapper, 1968 cited in Rapoport, 1977) determined differently the relationship between perceived and real world to explain the process of psychological process. The real world presents the physical setting and the perceived world represents the symbolized stimuli after an evaluation with respect to filters.

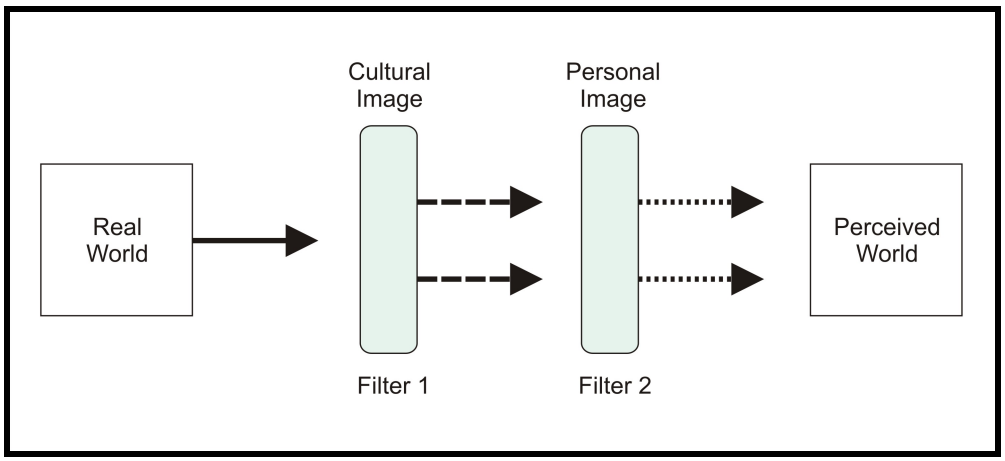


Figure 3: Filter Model of perceiving process
Source: Redraw from Rapoport, A. (1977), "**Human Aspects of Urban Form**", Pergamon Press Ltd., Oxford, England, pp. 38

The filters that occur in the stages of perception cognition and evaluation proposed by Rapoport depend on the cultural, biological and other differentiation among people. The filter (1) is named as the cultural image. It is an evaluation process and is also called "information filter" (Rapoport, 1977: 38) or knowledge. On the other hand, the second filter represents the evaluation of the real world according to personal goals.

According to Rapoport (1977) who has defined the perceptual relationship between man and environment by differentiating the symbolic spaces, there are also behavioral, perceptual and operational environments in addition to spatial environment. The behavioral space is the inner part that can be varied among different groups of people (age, sex etc). Within the perceptual environment, symbolic meanings are given to physical settings. The operational space on the other hand, contains the actions and reactions (Rapoport, 1977).

Gibson's view on the process of human behavior is based on the affordances that physical environment provide. Affordances are the cues that physical setting provides. The planes, lines (abstract geometry) are the elements that are visualized. Abstract geometries can not be perceived, while physical (ecological) geometries such as surfaces and edges can be perceived by observers. These physical elements in environment afford people. These affordances have some properties;

> • Affordances provided by the environment are what it offers, what it provides, what it furnishes, and what it invites. The environment includes the medium, the substances, the surfaces and their layouts, the objects, places and hiding places, other persons and animals, and so on.
> • The "values" and "meanings" of things in the environment can be directly perceived. "Values" and "meanings" are external to the perceiver.
> • Affordances are relative to animals. They can only be measured in ecology, but not in physics.
> • An affordance is an invariant.
> • Affordances are holistic. What we perceive when we look at objects are their affordances, not their dimensions and properties.
> • An affordance implies complementarities of the perceiver and the environment. It is neither an objective property nor a subjective property, and at the same time it is both. It cuts across the dichotomy of subjective-objective. Affordances only make sense from a system point of view. (Zhang, 2006)

Gibson's model suggested a linked process of perception, cognition and spatial behavior. According to Gibson, perception is not a simple process of gathering the information from environment and it is not a composition of elemental building

such as form, shape and pattern. Instead, it is composed of substances and surfaces that provide affordances, although not all affordances are perceived in the same way by different observers. What a perceiver pays attention changes according to the meaning of that place. Therefore, the environment in which architects and designers see forms and shapes is not similar to perceivers who attribute environment a different functional or emotional meaning. Cognition, on the other hand, guides emotional responses.

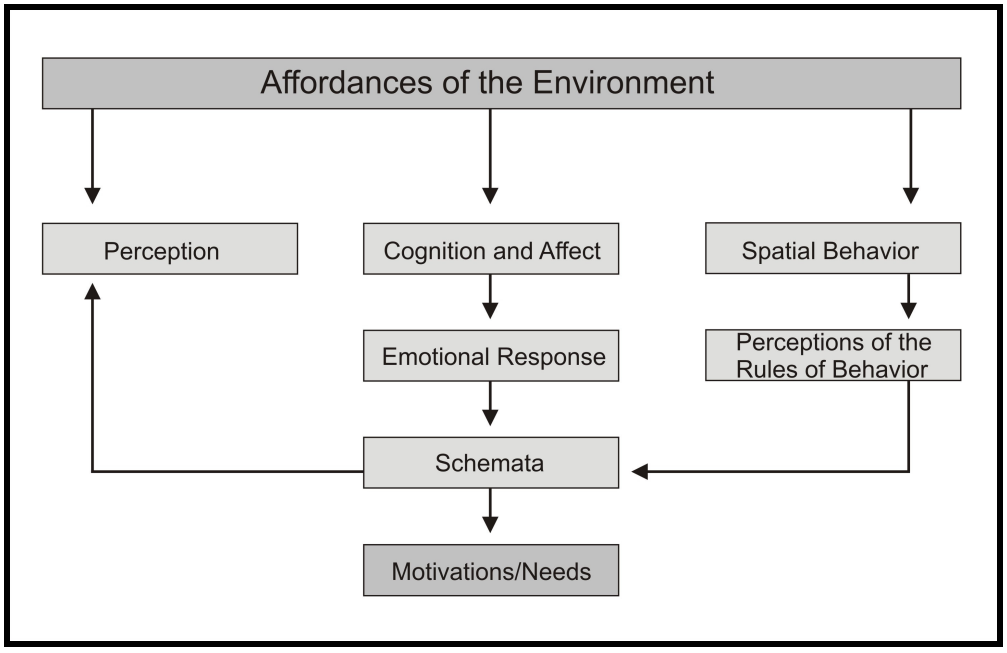


Figure 4: "Fundamental components and processes of Human Behavior"
Source: Lang, J., (1987) "**Creating Architectural Theory**", Van Nostrand Reinhold, New York.

2.3. City is an object to perceive

There are different perspectives that define how humans perceive the city. The most well known contribution is by Kevin Lynch who is a city planner with a background in architecture, and who was fascinated and intrigued both by the physical structure of space arrangement and also by urban experience. According to him, the city is not just a physical space that designers arrange, but also a social environment that should be taken in to consideration. Within this framework, he intends to create a new way of looking at environment and urban form.

Furthermore, he was searching for “a taxonomy to describe the physical city” (Lynch, 1991: 5).

Lynch (1991) states that the cities we live in provide unprecedented opportunities. Nevertheless, cities also have physical and visual problems. There are four main reasons for this controversial situation: the burden of perceptual stress, the lack of visible identity, illegibility and the lack of openness. They cause not only an uncomfortable and limited environment, but also a visually disordered space organization. According to him, an active relationship between humans and environment, understanding and experiencing the city are the key answers to those problems.

Another topic that Lynch is curious about is the human perception of environment. In his works, he questions how humans or public understand/perceive their everyday environment and how they shape and organize it. These questions enable him to concentrate on two main issues: urban quality and good city form.

Different than Lynch, Bacon’s way of perceiving the city is based on continuity. “Key to the whole concept is the way in which one perceives the continuity of space within which the inner and outer spaces operate” (Bacon, 1975: 41). He draws four main types of environmental perception. In the first one, the space is boundless and one perceives the *unity* of space. In the second, the *duality* is perceived by the observer who divides the space into two by drawing a line (physically or mentally) and chooses one of the sides. The third type of perception is based on the level of *dominance*. “The designer establishes the dominance of one element and the subdominances of the other” (Bacon, 1975: 41). The last type of perception is the endotopic view (inner space) and exotopic blindness (outer space).

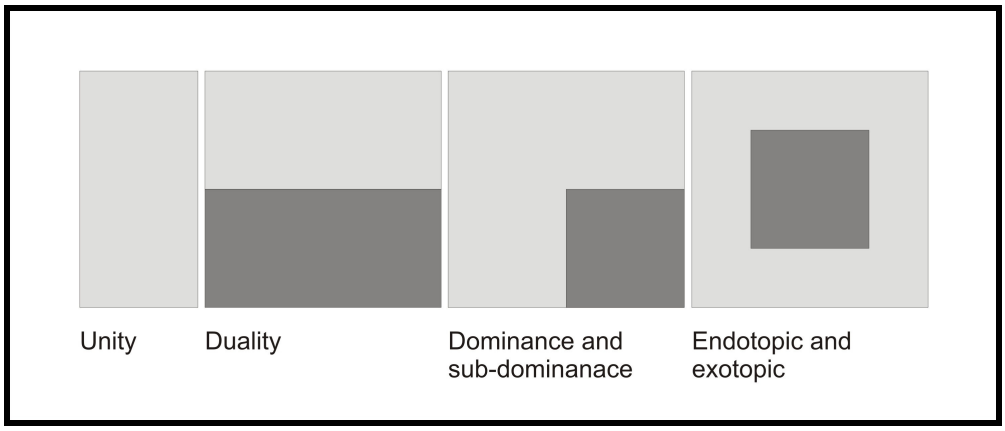


Figure 5: Bacon's way of perceiving space
Source: Bacon, E., (1975) "**Design of Cities**", Thames and Hudson Ltd, London, pp. 41.

The third important contribution to the literature on perception of cities is by Cullen (1961). According to Gordon Cullen, people perceive the city while walking through it. In this perceptual process, they create a feeling of possession of the places that mostly suit them. Cullen mainly reacted to modernist approaches that decrease the vitality of urban space and street life. Thus, he claimed that there exist some human feelings, which makes it possible to create livable and orderly places. The townscape in his mind is an art of building organized, well-perceived and sensible buildings, streets and spaces. According to him, spaces must have distinct characteristics differentiated from others. "The practical result of so articulating the town into identifiable parts is that no sooner do we create a *here* than we have to admit a *there*, and it is precisely in the manipulation of these two spatial concepts that a large part of urban drama arises" (Cullen, 1961: 182).

Broadbent (1990) summarized Cullen's view of environmental perception as follows:

> He draws an analogy with a party, which starts with the meeting of strangers, all observing the proprieties, making polite in rather general terms so that one reveals a personality. It is, he says, an exhibition of manners, of how one ought to behave, which also boring. But as the evening wears on, people relax and get to know each other. One is a good-natured wit; another is simply exuberant; each one acts as a foil for others. People enjoy themselves hugely because they have agreed to differ, within

> certain recognized bounds. Cullen's view, of course, is that planning should be more like the latter stages of his party rather than earlier, stiff and formal stranger (Broadbent, 1990: 219).

In this thesis, the image building process is defined with the help of the theories summarized above. Accordingly, the process of environmental perception starts with the sensation which is basically unaware of already collected information. This stage is excluded in some theories; however, it is clear that the human environment interaction starts with the use of five senses of human beings. The second stage is perception, the sensory experiences and conscious information gathering. The sensation and perception can be thought as an ensemble because they are both based on the sensory collection. The first image that appears after these two stages is called the perceived image. The next stage is cognition, where some filters detect and determine individual images.

The perceived image is the mental representation of the physical organization (Figure 6). Cognition and evaluation, on the other hand depend on the background information. It is for sure that the physical arrangements influence the image. Thus, it is important for designer and planner to understand the processes of sensation and perception, cognition and spatial behavior. The discussion, therefore, will proceed with these three concepts.

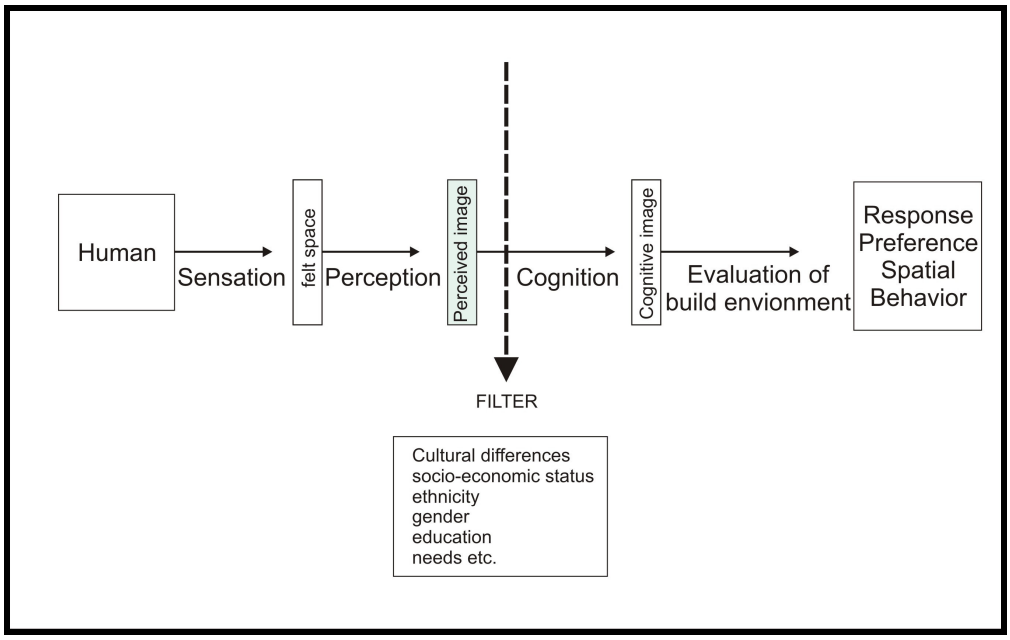


Figure 6: Human psychological process of building image
Source: Personal rendering

2.3.1. Sensation and Perception: The first stage of image building

Perception history in philosophy started with scientific experiments of how man perceives and remembers. This question brought the identification of the difference between perception and thinking. Plato, who emphasized on "knowing from experience" (Arnheim, 1969: 6), pointed to *the intellectual perception* as the key of knowledge. According to him perception is independent of senses and he thought that "the sensory perception is illusionary and the true knowledge arises from intellectual perception" (International Encyclopedia of Social and Behavioral Sciences, 2001: 11203). Aristotle, on the contrary, denoted *sensory perception* as follows: "the soul is principle of life and vitality, including reproduction and growth sensory perception and purposeful activity and intellectual theorizing" (International Encyclopedia of Social and Behavioral Sciences, 2001: 11203). He also added that man perceives and receives the quality by sensory soul independent from the matter of the object. According to Aristotle perception is faculty and man always perceives universe and systematize these sensory experiences (Arnheim, 1969). "Aristotle was probably the first to suggest the rudiments of what we now believe, namely that vision resulted when

something emanated from an object and was transmitted to and then absorbed by the eye" (Uttal, 1983: 24). It should be noted that Aristotle's idea of transmission was never considered as a theory of visual perception, but it constituted the basis of the modern concept of perception. It was Euclid in that time that linked the notions of vision and geometry. By his work with light and mathematical inputs, he not only founded the geometrical optic theory but also extended the form perception. The *geometrical rule*, *size consistency* make things much more alike is the root of some modern psychological theories.

The significant query in about 1000 A.D. stimulated the thought of mind-body relations that led to two different approaches. According to *monism*, mind cannot be evaluated without brain and it is just an aspect of body. On the other hand, *dualism* observed that mind and brain are different substances, which can be assessed as separated parts. Rudolf Arnheim (1969) is concerned with this ancient debate and defined perception as "what we received by the senses at the time when we are stimulated by outer environment" (Arnheim, 1969: 16). However, perception can differ from person to person - *person perception* **-** and therefore perception is a sensitive attitude or action depended on personal qualifications (habits, possessions et.) and intelligence (Arnheim, 1969).

In modern ages perception-thinking argument gained a new dimension. The main subject of discussion became if the vision is acquired or innate. Due to Berkeley's hypothesis there are two different dimensions of perception: mediate (indirect) and immediate (direct). In the mediate stimuli (perception of depth) visual experience has to be linked with some learning. On the contrary, those who are innate can perceive the immediate stimuli.

Empiricism (Titchner 1910, Helmholtz 1925, Carr 1935) suggests that the sense data put together in the brain by association (Lang, 1987). Helmhotz (1925) emphasized on the *spatial perception***,** while nearly all other theorists accepted that the perception is based on non-spatial, punctiform sensations varying only in quality and intensity (International Encyclopedia of Social and Behavioral

Sciences, 2001). The idea that perception is built up from punctiform sensations, was challenged by Gestalt Psychologists in the twentieth century. They insisted on three-dimensional meaningful world rather than two-dimensional perspective images. The other approach *Rationalism* says that the mind is inherently rational; our cognitive and perceptual abilities do not result from experiences, but help to organize our experiences. *Transactionalism*, on the other hand, focused on the importance of the experiences. Debates concerning the differences between sensation and perception claim that some of the acquired visual skills are innate.

2.3.1.1. Form Perception

An important concept concerning form perception was introduced by Thomas Reid, Christian von Ehrenfels, Ernst March and Gestalt psychologists. All of them emphasized the global organization of patterns that was on the opposite side of *Elementalist* approach. During the late 1800's Gestaltists concentrated on form and perception. "Gestalt theory argues that the basis for the integration is the spontaneous organization of sensory inputs to the brain, whereas *information-processing* theories suggest that there are computer-like processes in the brain" (Lang, 1987: 86). Stephan and Rachel Kaplan's (1987) theory of information processing is based on the interactions between human and landscape by information processing. Their premise is that "perceptual process involves extracting information from one's environment." (Kaplan cited in thesis.library.adelaide.edu.au/uploads/approved/adt-SUA20060615. 142413/public/02 chapters1-6.pdf). According to Kaplan's theory there are four variables that formulate environment. The first two indicators -coherence and legibility- facilitate to understand environmental setting. The other two indicators are complexity and mystery that support environmental investigation:

> . Coherence is the ease of cognitively organizing or comprehending a scene
> . Legibility is being able to predict and to maintain orientation as one moves more deeply into a scene, the promise of being able to make sense of it in the future
> . Complexity is being involved immediately a scene's capacity to keep an individual busy

. Mystery is the promise that more information could be gained by moving deeper into a setting (thesis.library.adelaide.edu.au/uploads/approved/adt-SUA20060615.142413/public 02chapters1-6.pdf).

Underlying view in Kaplan's approach is an evolutionary view that believes human preferences derive from the adaptive value offered by particular settings (Kaplan, 1987).

Another theory, *ecological approach* of James J. Gibson (1975), suggests that perception is based on information. Different from the conventional theories of perception, the starting point of Gibson's theory is not the retinal image but the "structure in the light extended over space and time" (Zhang, 2006). The perception process is related with the observer's memory not the information process in himself. The end product of perception is not an internal representation of the environment; it is the direct pickup of the invariants in the environment" (Zhang, 2006).

In Gibson's theory there are two fundamental spaces that effect perceptual relations. External space is the physical structure and the information of environment. Internal space, on the other hand, is the organisms inside the structure of biological, perceptual and cognitive abilities. The combinations of these two spaces construct the affordance space. The original theory is based on the relations of these spaces.

External space (environment) contains physical configurations, chemical patterns, spatio-temporal and symbolic structures. They are consistent with the internal space's elements, which are biological system of the body, the physique of the organism, perceptual and cognitive systems (Zhang, 2006).

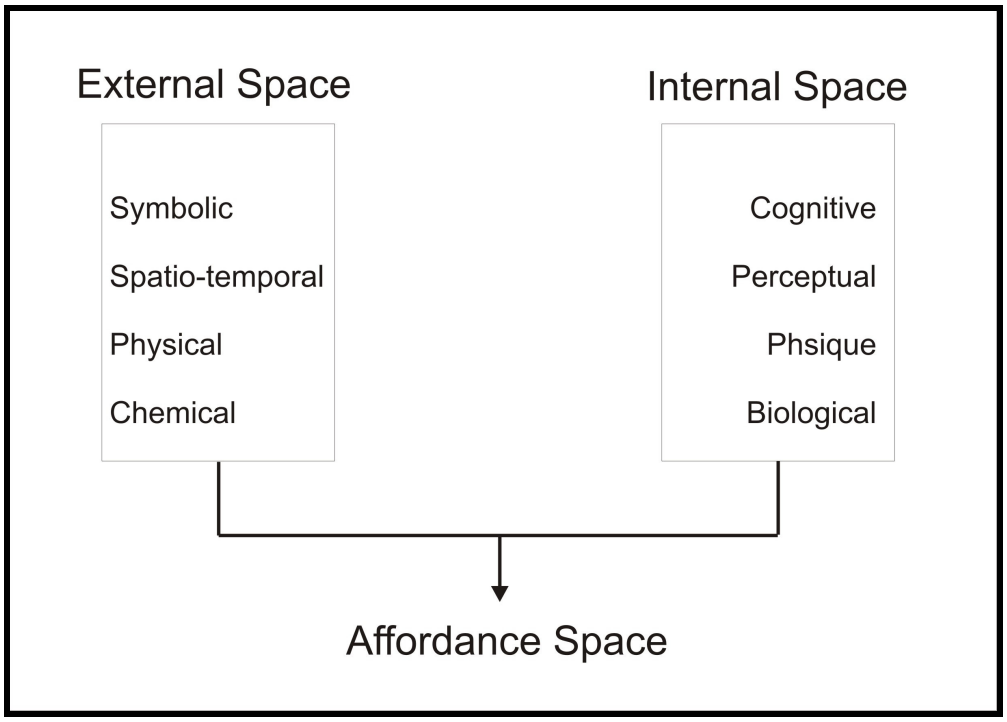


Figure 7: Gibson's relationship of affordance space and internal-external spaces
Source: Adopted from Zhang (2006)

Types of affordances:

1. Biological affordance (affordance of food)
2. Physical affordance: this is the most underlined affordance that refers to physical models in the environment. Shelter, object, water, or fire can be given as example for physical features.
3. Perceptual affordance: the pictorial signs can be given as an example. This affordance is related to Gibson's perception of invariants in environment. The invariants that are directly and unconsciously perceived.
4. Cognitive affordance: this type of affordances is mainly connected with the cultural or some kind historical conventions. The symbolic representations and forms can provide affordances. The traffic light and its meanings are the example of cognitive affordances (Zhang, 2006).

Brunswik's theory of *probabilistic functionalism* (1952) is based on an approach that takes up the environment and the perceiver into a system. In theory, observer assigns the weights as a conscious process. The conscious process of weighting

the cues does not always support accuracy, because nature sends full of cues to perceiver. Among them, not every cue is reliable or vice-versa. Therefore, there is a probability that the cues are sometimes inaccurate. Gifford (1997) explains Brunswik's probabilism with a clear example. When you see a bridge while driving on the road, one can be quite confident that he will afford safe passage to other side. However, in San Francisco, a few people had found to use the bridge after the earthquake in 1989. "The probabilistic model is the basis for research on organism-environment relationships, in which greater emphasis than is usual is placed on situation sampling rather than subject sampling so that the environment's influence on behavior might be better understood" (thesis.library.adelaide.edu.au/uploads/approved/adt-SUA20060615.142413/public/02chapters1-6.pdf).

Unlike Gibson and Brunswick, Daniel Berlyne (1967) did not concentrate on either human or environment separately but focused on their relationships. According to Berlyne (1967 cited in Kelly and Kelly, 2003), there are four types of *collative properties* (characteristic of the stimulation) in the environment that force the perceiver be more attentive. These are novelty (newness to observer), incongruity (things out of perceived space), complexity (variety of elements in setting) and surprisingness (unpredicted elements). All these characteristics influence observer's aesthetic judgment of environment. Its assertion is that images that own moderate properties look more beautiful than any others that own more or less of those properties. It is showed in Berlyne's theory that humans feel happy in intermediate environments. So, a setting with an intermediate level of complexity, novelty, surprisingness and incongruity would be judged as beautiful.

The Gestalt Theory; however seems to be the most influential approach affecting the environmental designers. Thus, it should be helpful to re-read this theory in talking about environmental design and perception.

2.3.1.2. Gestalt theory of Perception

Gestalt psychology began in Germany in 1910, while Max Wertheimer was traveling by train on his vacation. According to history, Max Wertheimer was seized by an idea when he saw flashing lights at a railroad. With a motion picture toy "zeotope" he discovered that a succession of stationary pictures appeared to be a single moving picture. "Wertheimer made his own picture strips, consisting not of identifiable objects, but of simple abstract lines, ranging from vertical to horizontal. By varying these elements, he was able to investigate the conditions that contribute to the illusion of motion picture" (Behrens, 1998).

Years later Max Wertheimer met with other Gestalt psychologists: Kurt Koffka and Wolfgang Köhler. None of Gestalt psychologists were artists or designers; there were signs of a mutual interest between the two disciplines. For example, another Gestalt psychologist Rudolf Arnheim studied on the clarity and honesty of his building design. Another Gestaltist, Marcel Breuer used the principles in his furniture designs. Additionally Paul Klee supported Gestalt psychology in his paintings.

The three founding Gestalt psychologists, Max Wertheimer, Kurt Koffka and Wolfgang Köhler argued "if a melody and the notes that comprise it are so independent, then a whole is not simply the sum of its parts, but a synergistic whole effect" (Heider, 1973 cited in Kelly and Kelly, 2003). Wertheimer thought that parts did not express a complete meaning when they behave individually; they gain meaning in a nature of the whole. Simultaneous contrast anticipated holism, in the sense that gestaltists are likely to say that all such appearance of a color are legitimate, because "we always experience perceptual wholes, not isolated parts. We never see figures alone but dynamic "figure-ground" relationships" (Behrens, 1998).

What may be Gestalt psychology's most enduring influence on art and design came from Max Wertheimer in the *theory of form*. He said that "such tendencies

are inborn, not learned, is suggested by the cross-cultural effectiveness of sleigh-of-hand magic and camouflage, both of which work by subverting laws" (Wertheimer, 1943: 24). Surely, one of the reasons artists chose Gestalt theory since it has provided "in their minds, scientific validation of age-old principles of composition and page layout" (Behrens, 1998).

Later, French psychology adopted gestalt principles and emphasized the significance of "flat abstract patterns, structural economy and implicitness" (Behrens, 1998). Therefore, Gestalt theory became associated with the modernist tendency toward aestheticism. Then Dow found a persuasive resemblance between Gestalt principles and Japanese inspired aesthetics. Behrens (1998) supported this resemblance of the whole-part relation between Gestalt theory and Japanese theory. For example, figure-ground theory can be observed in yin-yang symbol, as well. "Even, the research of embedded figures by gestaltist Kurt Gottschaldt has an astonishing parallel in Dow's use of compositional grids, which were adapted from Oriental lattice patterns and applied by Frank Lloyd Wright in architecture" (Behrens, 1998).

What is Gestalt? What is its context?

Gestalt psychology is based on the observation that we often experience things that are not a part of our simple sensations. According to Gestalt psychologists we are built to experience the structural whole as well as the individual sensations. Additionally, we even add structure to events, which do not have gestalt structural qualities. In perception, there are many organizing principles called gestalt laws, which declare that "we are innately driven to experience things in as good a gestalt as possible" (Boeree, 2000). In this statement "good" relates with regularity, order, simplicity, symmetry and so on.

According to Paré (2006), Gestalt psychologists tried to find out the goodness of form, which is "every stimulus pattern is seen in such a way that the resulting structure is as possible; the simplest and the most stable interpretations are

favored" (Paré, 2006). Humans always tend to perceive the environment according to rules that are learned, but in general, perception is not a conscious process. Paré (2006) summarizes the human perception process as:

> "Perceiving a visual scene involves:
> 1. the detection of its feature
> 2. the parsing of the scene so that figures can be identified from the background
> 3. the grouping of the figures' parts into single objects
> 4. the recognition of the pattern, i.e., answering the question: what is it?
>
> The perception of form begins with the detection of **(1) Primitive Features** (color, orientation, curvature, end of lines), the building block of visual perception. Once we identified which features are present, the next step is to organize the overall visual scene, a process called **(2) Perceptual Segregation.** A crucial step in visual segregation is the separation of the object from its settings, so that the object is seen as a coherent whole, separate from its background (Figure-ground relation). The **(3) Perceptual Organization** of the elements within a visual scene is guided by some factors that were described by Gestalt psychology and regarded as principles. Once the features of visual scene are detected, that the figures have been segregated from each others and from the scene background, that the parts of figures has been grouped into single objects, the next step consists of **(4) Recognizing the Pattern,** i.e., answering the question: what is the object?" (Paré, 2006).

Gestalt theory's one of the starting point is that environment can be divided into two; geographical and behavioral (Koffka, 1963: 681). The geographical environment is the unanimated part of the world. The other part, behavioral, is the animated part where the behavior is the rule adapted not only to this part, but also to the geographical environment.

According to Koffka, the concept of organization is included the perceptual organization. In the perceptual organization, we perceive things and space within a whole. "For the Gestalt psychologists a whole was more than the sum of its parts and that the whole determined the form of any object that we see, rather than its parts" (Günay, 2005). The facts in the environment have been presented in a theoretical setting in the perceptual organization and these facts have influence on behavior. The Gestalt psychology implies an organization in this context.

Therefore, a gestalt is a product of organization and this organization is the process that leads to a gestalt (Koffka, 1963: 682).

The second point that Gestalt Theory focused on is the concept of perception. In psychology the term perception is used in a specific sense, opposite to sensation, as a more complex process. According to Koffka this idea constructs the fundamentals of traditional psychology. Thus he introduced three concepts; sensation, association and attention. With the help of these three concepts Koffka enlarged and formulated the concept of perception. Firstly, "the elements, one aroused in the form of sensations, may also be experienced in the form of images" (Koffka, 1922: 5). Secondly, association is the primary factor governing the coming and the going of our ideas and it is based on sensation-image relation. Lastly, attention is a recognized fact that enables us to make judgments. If a sensation does not properly correspond to the stimulus applied, the attention must have been inadequate; therefore we make a false judgment.

These viewpoints to environment and perception are the fundamental elements of Gestalt Theory. The differences from traditional psychology enabled Gestalt psychologists to look to the world, environment and things from another perspective.

Why Gestalt?

"This world is limited, but, up to a point, manageable knowledge is direct and quite unscientific, in many cases perfectly true, but in many others hopelessly wrong" (Koffka, 1963: 7). Therefore, man learned to analyze the real world and developed a new activity called thinking. "The process of thinking had destroyed the unity of the primitive world." (Koffka, 1963: 7) By thinking man obtained a number of advantages namely, science. By scientific knowledge he started to find out false and truth. However, truth gave no guidance to some instances. Therefore, a great dualism arose between science and religion.

Science, in building rational system of knowledge, had to select some cases for constructing a system (**systematization**), thus has to dismiss some other cases. "As long as science misunderstands its task it will always be in danger of losing its position of independence and integrity." (Koffka, 1963: 8) However, in time science gained its characteristic of recreating original unity. "A science, therefore, gains in value and significance not by the number of individual facts it collects but by generality and power of its theories." (Koffka, 1963: 9) Moreover, the acquisition of true knowledge by science should help us to reintegrate our world. This statement is true for all sciences, even for psychology that deals with the behavior of living beings.

As science, psychology countered distinctive problems as life, matter and mind relation. Materialism says "The whole problem is illusionary. There are no three kind of substances or modes of existence, matter, life and mind; there is only one, and that is matter, composed of blindly whirling atoms" (Koffka, 1963: 11). Due to this approach, thinking and feeling are just the movements of these atoms. According to Koffka, materialism is rather weak in discrimination of these scientific dignities.

Gestaltian psychologists offer a solution by rejecting those two approaches. In this psychology, mind-body and life-nature problems are not ignored, but, it is accepted as they are separate from each other by "impassible chasms" (Koffka, 1963: 13). Therefore, the "integrative quality" (Koffka, 1963: 11) becomes the keyword combined with three concepts; quantity, order and meaning.

Quantity

Modern scientific psychology (which started with quantification) is two sided: qualitative and quantitative. On the one side, everything (sensations, emotions, intelligence etc.) is measurable and on the other side, psychological problems are amenable to quantitative treatment. According to Koffka, there is a mistake in consideration of these concepts. In this context, Gestalt psychology "may be

perfectly quantitative without losing its character as a qualitative science" (Koffka, 1963: 15).

Order

In order to understand Gestaltian "order" concept, it will be explanatory to go back to positivism-vitalism controversy. In positivist approach, "Order is not an objective category" (Koffka, 1963: 15). According to mechanical laws, everything could be everywhere. On the contrary, vitalism claims that in inorganic nature you find mechanical laws, but when you go to life you will find order. Due to Koffka, both reactions would be justified if our attitude were truly eclectic. Therefore, Gestalt theory proposes that life and nature should be brought together. "By this kind of integration Gestalt theory contributes to knowledge on things animate and inanimate" (Koffka, 1963: 17). As materialism says that the inanimate nature consists of order in itself, Gestalt theory additionally claims that "We feel directly and unreflectively for life will spread over to inanimate nature also" (Koffka, 1963: 17).

Meaning

"There is such a thing as intellectual climate" (Koffka, 1963: 17) which varies from country to country. As the physical climate changes some physical elements in different locations, the growth of idea depends upon intellectual climate. Gestalt psychologists emphasize the meaning or significance –the deepest root of Gestalt theory- of these changeable ideas.

For a long period psychology faced with this contradiction; differently developed ideas in different cultural climates. The belief of "there is just one true" failed when the cultural aspects are considered. Consequently, the dilemma of psychology arose. "On the one hand it was in possession of explanatory principles in the scientific sense" (Koffka, 1963: 20) where some important problems of psychology did sot solve. "On the other hand it dealt with these problems, but without scientifically explanatory principles; to understand took place of to explain" (Koffka, 1963: 20).

Gestalt theory tried to solve this dilemma with the help of "principles of science and of meaning" (Koffka, 1963: 20). According to Wertheimer to explain and to understand are similar forms of dealing with knowledge. That means, "A causal connection is not a mere factual sequence to be memorized" (Koffka, 1963: 20). We must use concepts like meaning and value for a full understanding of mind and environment "which is at the same time a full explanation" (Koffka, 1963: 21).

To conclude, in each category the same principle holds: to integrate quantity and quality, mechanism and vitalism, explanation and understanding. It has also introduced two new concepts: order and meaning. With these concepts, Gestalt theory defines which parts belong as parts to functional wholes, their positions in the wholes.

Gestalt Principles of Form

"The pattern of stimuli mentioned by Köhler occurs due to grouping of elements (edge parts, blobs etc.) in the sensory field" (MacEachren, 1995). These elements constitute a pattern in the representation. Wertheimer compiled a list of factors that influence the perception of form. Seven of them are much more important in environmental design because "they all us much about how units in the environment are perceived" (Lang, 1987: 86). These are proximity, similarity, closure, good continuance, closedness, area and symmetry.

Law of Proximity

Proximity defines which items are in relationship to each other. The distance between elements show different attributes as, "objects close together form groups" (MacEachren, 1995). According to Gestalt psychologists, objects that are close to each other are perceived as a whole. In fact, proximity is a relative term. "One and the same distance which in one pattern may be an intramembral distance may in another be an intermembral one" (Koffka, 1963). Proximity is

also defined with use of the term “equality”. It is claimed that equal parts which are in greater proximity can be organized into a higher unit (Koffka, 1963).

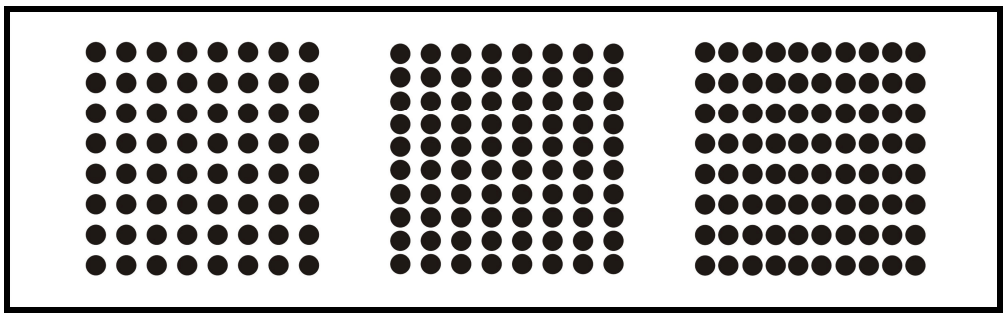


Figure 8: Law of proximity
Source: Personal rendering

Law of Similarity

Objects look like are seen as a group. In this principle, not spatial but physical similarities (color, shape, value etc.) are more important factors. However, it should be mentioned that there is a degree of similarity; Wertheimer pointed out the degree by the term “more or less dissimilar”, which means that “similarity is not absolute” (MacEachren, 1995).

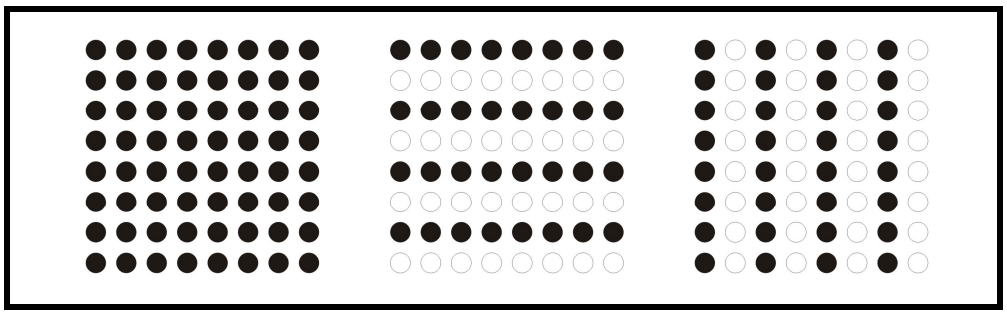


Figure 9: Law of similarity
Source: Personal rendering

Law of Closure

“Closed objects form wholes” (MacEachren, 1995) and in visual perception there is a tendency to see the elements with boundaries because the mind supplies the missing places in a composition.

Figure 10: Law of closure
Source: Personal rendering

Law of Good Continuance

This principle is based on the movement of the eye in the direction of the element, or elements that move together. The eye follows a particular direction and continues to look until something significant has occurred.

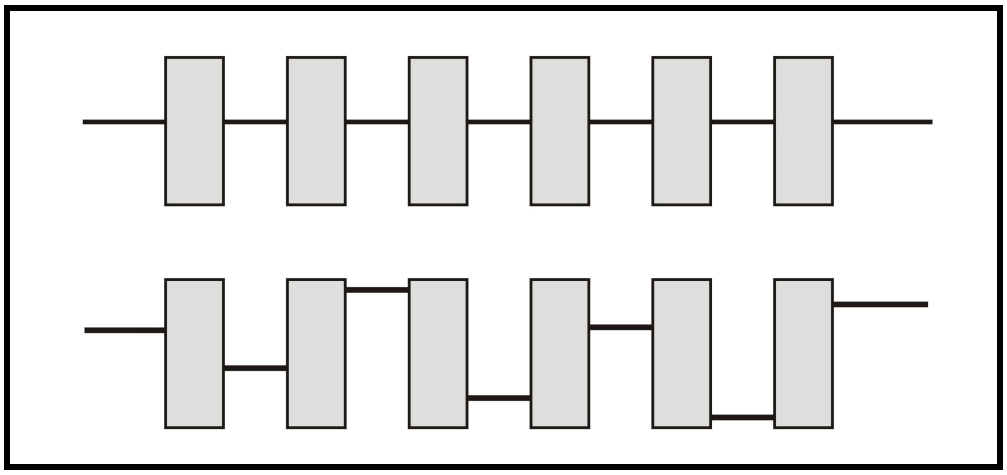


Figure 11: Law of good continuance
Source: Personal rendering

Law of Closedness and Law of area

A closed line determines an area and a boundary. In urban environment, a district should have a defined boundary to be perceived as a whole unit.

Law of Symmetry

The principle of symmetry describes the instance where the whole of a figure is perceived rather than the individual parts, which make up the figure.

In the literature, the Gestalt laws of perception are considered as rules of form perception or visual organization. Looking at the design principles, one should see some of the principles such as; harmony, contrast, balance, orders to describe the rules of composition. Similarly, a number of designers generally try to adapt these Gestalt laws into their designs or visual products. “Pinker contends that Gestalt principles have a role in the process of translating the initial visual scene to a visual description of a graph” (MacEachren, 1995). Bertin (1967, cited in MacEachren, 1995) emphasized on the visualization of maps with Gestalt principles and said that it is possible to show many variables in one graphic with these laws. Additionally many architects and basic designers use Gestalt principles in their products.

The whole-part relation is the key point of Gestalt psychology. “To distinguish among recognizable and elements that belong to one another in any medium build up the gestalt quality of any whole and its parts” (Günay, 2005). Köhler emphasized the importance of wholes as “it is precisely the original segregation of circumscribed wholes which makes it possible for the sensory world to appear so utterly imbued with meaning…” (Köhler, 1947: 139). The laws of similarity (likeness of elements), proximity (nearness of elements), closure (enclosure of elements) and continuity (good continuance of elements) are the laws of wholeness. The other principles –closed forms, similarity, simplicity, common fate, connectedness, alignment, symmetry- are added to Gestalt principles of perception when the Gestalt became more popular (Günay, 2005). These whole principles were also regarded as attributes that effect urban space. Edmund Bacon emphasized on his volume of spaces, structural devices of the urban space and their interrelations. According to him, perception is “progressing from the earth and earth materials into less tangible elements of the universe” (Bacon, 1975: 15). The concepts continuity, variation and enrichment increase this perceptual relation. Therefore, space and mass interrelations and physical properties such as material, texture and also the form of their togetherness are significant constituents in human perception of urban environment.

Gestalt rules represent the human psychological organization in processing the form. “Psychological organization will always be as good as the prevailing conditions allow; where the term good is undefined but embrace such properties as regularity, symmetry, simplicity and others” (Koffka, 1963: 110). Although the good composition or organization of design is still a topic of discussion, as Lynch has stressed applying the rules of Gestalt should help to constitute a common sense in urban place.

2.3.2. Cognition

By the development in information technology and artificial intelligence (computer) the perception gained another dimension. It utilized computer models and simulations to gain insight into how a brain works. Furthermore, the technology focused on seeing and processing, therefore the *cognitive psychology* has become the focal point. Additionally, by this century the concept of perception started to be used by various disciplines. Ehrenzweig said that “the demand for clear visualization is not confined to the visual arts; it vitiates also teaching of music and in a somewhat different form the teaching of science” (Kepes, 1965: 65). Like Ehrenzweig, Arnheim (1977) also stressed the importance of visual education. He thought that visual thinking is a thinking operation in itself. “Arnheim investigated the relationship between perception and thought, observing that our preoccupation with intellectual concepts, with words and numbers, has led to the disparagement of sense perception” (Kepes, 1965: 84). Arnheim (1977) also stressed visuality related with form and space. Therefore, “the graphic representation” and the perception gained importance in other disciplines such as; architecture and planning.

Cognition basically refers to organizing, storing and identifying the collective information. Thinking, learning and remembering are the issues in cognitive psychology (Barlas, 2006). Piaget and Inhelder (1967 cited in Golledge and Stimson, 1997) defined the stages of cognition as;

- Vague awareness
- Spatial characteristics (categorization of spatial characteristics)
- Recognizing
- Identification (attachments of meanings to objects)

Cognitive mapping then is the process of structuring the information that is collected. Lynch (1960) used this method in his well known broad work to find the elements that affect most human perception of environment. Cognitive map is a useful tool to gather information about the physical setting. Since spatial behavior is dependent to the images, cognitive mapping is still a valid method in finding the way the spatial organization affects human psychology.

The image is the sum of sensory information evaluated through the observers' values system (Pocock and Hudson, 1978). Lack of image cause confusions and induce the feeling of comfort and safety. As it can be observed from the Figure 6 human psychological needs have influence on cognition. Maslow (1943, cited in Lang, 1987) identified six major needs which can be contributed to environmental design process. According to him, physiological, safety, belonging, esteem, actualization and cognitive/aesthetic appear in a hierarchical order (Lang, 1987). Physiological needs are the basic needs such as shelter, safety needs refers to the protection and orientation, belonging needs are related with accessibility to communal settings and services (Lang, 1987). Esteem needs contains personalization and control, actualization is related with opportunities and choices and lastly aesthetic needs are "the desire to become knowledgeable and desire for beauty" (Barlas, 2006: 21). For an image based study the safety, belonging and aesthetic needs are meeting in a legible and imageable environment.

2.3.3. Emotional Response

In image building process, since the physical environment and observer has a two sided relationships, the built environment provides impressions on human. Based on the needs and physical organization human feelings guide the behaviors. Sense

of place, sense of interest, sense of comfort and sense of safety can be listed senses related with image. Besides physicality, some other variable affect these senses such as usage and activity, sociability or accessibility.

Lynch defined the psychological satisfactions that a good urban form provides.

- Warmth and Attachment

The sense of place which increases the feeling of security and happiness, pleasure gives satisfaction to user. Here, adaptation of physical elements to human scale, warmth in details some undifferentiating forms are significant characteristics.

- Stimulus and Relaxation

"Structures and spaces must also be proportionate to their use and designed to insure the necessary concentration" (Lynch, 1991: 142). For Lang (1987), a feeling of relaxation can be obtained by structuring the urban environment due to some guidelines. Soft flowing forms, lines and spaces combining with little contrasts and surprising elements create a pleasant smell (Lang, 1987: 191).

- Sensual delight

In a pattern order, variety, rhythm, contrast relation etc., give a certain sensual delight to user. To the observer, a city is basically a pattern of spaces. Their qualities are determined by the shape and proportion of the volume (Lynch, 1991: 144).

- Interest

A pleasure in a city is to figure out elements in complexity and also discover the hidden details in variety of physical components.

- Movement and urban pleasure

Urban observer finds pleasure not only in stable position but also he find emotional satisfactions in movement and in social activities like shopping and entertainment. In this context it should be said that human experiences the city in two ways; by moving, seeing the "serial visions" and by standing.

2.3.4. Spatial Behavior

The spatial behavior of individuals is determined by the level of perception and meaning attached to the places. Since the cognition filtered by individual differences, it is observed differences in spatial behaviors. In most of the researches, there are differences based on personality, cultural and social systems. However, culture provides a shared systems of believes and values which means environmental designers can be able to build a common image. Thus, in understanding human behavior for environmental design, there have to be general agreements on basic process of perception. Here, the laws of Gestalt seem to be clear enough to explain the finding is cognitive maps.

2.3.5. Conclusive remarks

The main aim of this thesis is to define out some applicable and tangible rules in forming urban space. That is why the summary of the different perspectives on human-environment relationships are essential to understand, evaluate and design the urban space. As the brief review of the literature shows there is wide concern how the real world is perceived. Many scholars defined firstly how an object is perceived and the importance of several aspects of urban form in perception.

It can be concluded that there are four main parts in the process of building image; perception, cognition, emotional response, spatial behavior. The environmental designer in this process has great influence. Spatial organization to provide a legible and imageable environment, which is the main focus of Chapter 3, increases psychological satisfaction while strengthening perceptual relationships between man and environment. The indicators and laws defined in this Chapter are quite important in the urban design process, which are also defined clearly by the Gestalt psychology. They state the rules that lead to a legible and imageable environment.

CHAPTER 3

LEGIBLE AND IMAGEABLE CITY: Aspects of Urban Image

Towards the end of the 1850s, city beautification movement was initiated by the leadership of Ebenezer Howard[6], Frederick Law Olmsted[7] and Daniel Burnham[8], as a remedy to tremendous adverse changes in American cities. At that time cities had become unpleasant and inhospitable places. These architects thought that an aesthetic transformation was needed to create more pleasant environments in these cities. The main theory behind this movement was that orderly environments were essential for good society. A good and beautiful city can promote moral and social environment. In 1890s Camillo Sitte (1965), emphasized the strong influence of physical environments on human soul. For him, the city should be providing secure and happy places for citizens. Therefore, not just activities that are needed but also **artistic pattern** became crucial for city planning profession. By 1950s and 1960s the idea changed considerably. Against the theory of physical determinism, some theoreticians argued about the significance of social affects in relation with physical environment. They stated that designers should understand how social forces influence physical environment.

In 1960s the concept of **urban image** was introduced to react to the modern manipulation of space, the destructive impacts of modernism and the loss of human dimension in cities. Kevin Lynch, who focused on architectural review and urban experience, defended the *townscape movement*. "The

[6] Ebenezer Howard (1889) is the father of the utopia of Garden City which was used as a model of suburban development.
[7] Frederick Law Olmsted, an American landscape architect, was famous with designing urban parks.
[8] Daniel Burnham is an American architect and urban planner. His famous work, Plan of Chicago, is the first comprehensive plan (www.wikipedia.com).

phenomenological view of the city was espoused ultimately by Lynch and Jacobs. It identified a whole new vocabulary of urban form –one that depends on sights, sounds, feels, materials, textures, facades" (Jacobs & Appleyard quoted in Akit, 2004: 3). In the light of these ideas Lynch tried to describe the city components and their general characteristics. Similarly, in 1961 Gordon Cullen emphasized the importance of space perception for citizens. He, with D. Brown stated that designing the urban form should be considered as an **art of relationships** to promote for the citizens to have a serial vision. In 1965, Christopher Alexander started working on building cities which can provide better perceptual experiences. In 1970s and 1980s Amos Rapoport who was also dealing with man-environment relations stated that the **organization of space** should be analyzed in association with behaviors and relations. According to him, human perception and the cognition of environment should be the subject of space organization, not just architecture. Similarly, Eduardo Lozano (1990) stressed on the effects of physical settings on human behavior.

Following this brief summary on the leading debates, this chapter focuses on the concepts of urban image, legibility and imageability. First, definitions based on the relationships between legibility - imageability and good environment are presented. Second, the components of legibility and imageability are analyzed in psychological context. Finally, the physical elements of urban environment and their qualifications are evaluated in terms of building legible places.

3.1. Urban Image

Urban images, which are formed by the integration of many separated elements, play an important role in human-environment relationships. According to many theoreticians images are the mental representations of physical parts. Lynch (1960) listed five urban elements in constructing urban images. These well-known five elements[9] have to be organized in such a way to create a legible and imageable environment. Lynch (1960) stated three main components for an

[9] These five elements – path, edge, node, landmark and district – will be analyzed in detail in previous parts.

environmental image; identity, structure and meaning. Identity is the special characteristics of the environment that separate it from others. A legible environment should have distinctive and recognized features. The structure of an environmental setting is based upon the relationships of physical elements and recognized as separated parts and wholes. Lastly a legible environment should have "emotional or practical" meanings for its users (Lynch, 1960: 8).

In his image study, Kevin Lynch (1960 and 1981) defined that a good urban form has to build an image evoking the senses. Sense is mainly the ease of perceiving the physical elements and their organized wholes. It depends on spatial form and quality and perception. In the dimension of sense, just because "perception" varies from one observer to another, one can think that it is changeable. However, there are some significant unchanged, common things; common experiences and common cultural norms. The elements of sense according to Lynch (1981) are:

- identity[10]: familiarity, form recognition
- structure: how the parts of city form fit together

"Local structure makes it easier for us to identify a place by perceiving how its parts fit together" (Lynch, 1981: 134).

- congruence: the match of environmental structure and non-spatial structure
- transparency/immediacy: the degree of which one can directly perceive the operation of the various technical functions, activities and social and natural processes
- legibility: the degree to which the inhabitants of a settlement are able to communicate accurately to each other via its symbolic physical features (Lynch, 1981: 139). Congruence, transparency and legibility are components of sense, which describe explicit connections of settlement form to non-spatial concepts and values.
- significance: symbolic meaning of city

[10] Kevin Lynch describe used the term identity by referring sense of place and imageability. According to him therefore, the identitiy of a place evokes the recognition of that place and senses on human psychology.

"A good place is one which, in some way appropriate to the person and her culture, makes her aware of her community" (Lynch, 1981: 142). Sense, therefore, is a significant element of a good city. It is possible to increase the sensibility by improving human ability to perceive or by increasing perceptibility of environment. In both cases, the designer should think of environment and man, values (harmony, variety, beauty, order) and priorities (user preferences) together.

Gordon Cullen mentioned "serial vision" to point out the significance of the image constituting while moving. He stated in his book, *The Concise Townscape*, a whole image for a city or urban setting is created by series of related spaces (Cullen, 1961). According to Cullen, walking from one point to another in the city affords "serial drawings" (Cullen, 1961: 17). The buildings themselves are the unique elements in the city setting. They can be analyzed or appreciated as architectural units. However, they constitute volume and they are perceived as "solids" when they form groups. The city form, therefore, can be seen as solids and voids (blacks and whites). The vision according to Cullen "is not only useful but it evokes our memories and experiences, those responsive emotions inside us which have the powers to disturb the mind when roused. It is this unlooked-for surplus" (Cullen, 1961 cited in Broadbent, 1990: 218).

Movements in urban environment are the main focal points for Cullen because according to him a city and its elements are perceived from the street level. Similarly, Jane Jacobs looked into the cities from the streets. Different from Cullen and Lynch, she focused on the vitality and security issues in urban streets besides the imaginary side of cities. Jacobs summarizes the image of the city as the streets of city. She means that the image of the street shows the image of that city (Jacobs, 1961).

Jan Gehl's[11] starting point for urban spaces and image resembles Lynch's and Cullen's theories. However, his focal point is the life or lifelessness of urban

[11] Jan Gehl, an architect, concentrated on the activity patterns that occur in open spaces between buildings. Gehl (1987), different than the other theorists, indicated the significance of different

spaces, like Jane Jacobs. The livability of places depends on how much satisfaction observers get from the space and opportunities provided to observers such as walking, sitting and so on (Gehl, 1987).

Francis Tibbalds (1992) believed that urban design should produce good urban areas, which are legible and simply readable. Urban environment is perceived differently by its users, though it is a must to create readable and understandable places for all. Observers, pedestrian or driver, should orient themselves in the city (where am I?) and find their paths, ways, directions without too many signs. For him, a legible city can guide users with its definite nodes and continuous paths. Shortly, "the more legible urban form the less signs are needed" (Kelly and Kelly, 2003: 17).

Montgomery (1998) has defined image as the combination of identity of place and user perceptions. "The image of a place is therefore their set of feelings and impressions about the place" (Montgomery, 1998: 6). Montgomery pointed Lynch's legibility elements (path, node, edge, district and landmark), but differentiating their importance for different types of users. For example, for new comers the landmarks have more significant values than other elements. He concluded that individual's perceptual filters result again in an image of the city. Therefore, creating an image for a city is a cognitive process for Montgomery. Similarly Harrison and Sarre (cited in Rapoport, 1977: 40) defined the image as the individual mental representation of physical elements filtered through personal experiences. As discussed in Chapter 2, for Gibson on the contrary, perception is a process that environmental physical cues or elements are represented in mind and an informational process (background information, cultural differentiations etc.) is excluded from perception.

types of activities. Necessary activities are compulsory for the user. Optional activities offer users a choice.

3.1.1. Legibility

The term legibility is defined as “the ease with which its parts can be recognized and can be organized into a coherent pattern” (Lynch, 1960: 2). This term was introduced by Kevin Lynch and is concerned with the relationships of physical elements or urban components and their imageability. According to Lynch, the space is said to be legible, if “the parts and the whole are understood in relation to one another” (http://www.hitl.washington.edu/publications/r-99-13/chap_1.htm).

Legibility is the key for understanding the city wealth. It is definite that legibility can help rethinking on how cities are represented and also how people interact with them. A legible layout though will be best at the point where there is a free moving opportunity and when there is an ease in connecting people. “Legibility initiatives aim to link urban users to their destinations in a complete movement and information system, thereby making cities accessible, welcoming and easily understood” (Kelly and Kelly, 2003: 15). Even though each person has a unique and particular ways of perceiving the city, it is possible to detect similar patterns of both spatial and psychological behavior. “In urban studies the concept of “public image” is used to make reference to these similarities originated from the widely shared features of individual mental representations of environment” (Faria and Krafta, 2003: 2).

Lynch (1991) listed some characteristics as criteria of legibility for cities. The first one is that inhabitants should be able to fit together with the urban components. The structure must be legible not just in metropolitan scale but also in detail. The other criterion is that the image must be adoptable for new development and changes in physical structure. The last is “metropolitan image should be congruent, having a form which can easily be associated with the form of the existing social and functional organization” (Lynch, 1991: 67).

It is obvious that any city should have an image to be easily identified. For such a legible urban form basic perception parameters and forms (elements, segments,

and patterns) are not enough to evaluate the degree of legibility. Moreover it is impossible to create a legible environment for every individual who have their own character and behavior traits. At this point it can be said that "common sense" that Lynch and others coded, refer to this perceptual forms in the city.

3.1.2. Imageability

Lynch (1960) defined imageability, different than legibility, to mention and emphasize a mental image. According to him imageability is "the quality in a physical object, which gives it a high probability of evoking a strong image in any given observer" (Lynch, 1981: 9). It is the physical qualities that make the object or place different from others and recognizable. Imageability is a quality that heightens the sense.

A highly imageable city thus has to be remarkable and create a sense for its citizens. Here the terms legibility and imageability can be quite different. Legibility can be summarized as the clarity of urban elements and perceptible as a whole. A legible environment in this sense helps its citizens to orient themselves. Imageability on the other hand is the distinctiveness of that urban place which creates a sense of place.

Kevin Lynch in his book The Image of the City stated that there are some other properties of a beautiful environment such as; "meaning or expressiveness, sensuous delight, rhythm, stimulus and choice" (Lynch, 1960: 10). Imageability, one of these properties, has a concentration on perceptual relationships between humans and environment.

3.2. Legibility and Imageability as components of good urban form

Form is basically the physical setting that provides vital and sensitive environments. Since human beings relate to physical environments, the organization of physical environment is essential for urban quality. Lynch's

dimensions of performance are key to good urban form. While identifying these dimensions of performance Lynch (1981: 112-113) listed a number of characteristics. According to him, these dimensions of performance should be:

- unchanged
- general as possible
- connectable with goals and values
- cover all features of settlements
- usable where values differ
- same level of generality
- identifiable and measurable
- independent one to another
- usable when time changed

Kevin Lynch tried to find out a set of criteria that describes a "good city". He uses some of the past experiences while constructing them. But he does not use them directly because they are not suitable in every situation. Therefore, he uses some general ideas and views. According to Lynch "the good city is one in which the continuity of this complex ecology is maintained while progressive change is permitted" (Lynch, 1981: 116). So the sense of continuity, both in cultural and historical terms, makes the settlement "good" for its citizens. Continuity, of course, is not the only characteristic but openness, development and connection are also important.

Lynch's dimensions of performance for evaluating cities have two main characteristics. Persons or groups may value differently these dimensions however; "relative goodness" of a place can be obtained. "All dimensions can be defined, identified and applied to some degree and this application can be improved" (Lynch, 1981: 119). He listed the dimensions as **vitality, sense, fit, access** and **control** in order to identify a good city. Due to him, a good urban form should be vital (sustenant, safe and consonant), sensible (identifiable, structured, congruent, transparent, unfolding and significant), well fitted (a close match of form and behavior which is stable, manipulate and resilient), accessible (diverse,

equitable and locally manageable) and well controlled (congruent, certain, responsible and intermittently loose). These dimensions are "certain identifiable characteristics of the performance of cities, which are due to their spatial qualities and measurable scales" (Lynch, 1981: 111). For him, a good urban space should meet all the senses, and urban image is the key factor to produce the common sense for citizens.

Rapoport (1977) differentiated two indicators in determining good environment. One of them is called "material and biochemical aspects of the physical elements", which included air and environmental pollution, crowd etc. Lynch (1981) also mentioned the importance of biological health in the provision of lively and good environments. The other one is about human-environment relationships, which give satisfaction to observer or cause dissatisfaction. In these relationships, the environment needs to meet all senses, including the sense of place, orientation and the sense of interest. That means that good urban places should provide vitality not just physically, but also psychologically.

Montgomery (1998), who was influenced by Lynch, proposed three components for good urban environments; **activity, form and image**. Montgomery (1998) combined the physicality that was emphasized by Cullen (1961) and the psychological aspects of place that were stressed by Lynch and Alexander.

For activity, Montgomery, same as Rapoport, stated that a good urban place should provide vitality. Similarly, he pointed that good environment should be legible and has a clear form to be perceived. Montgomery (1998) mentioned "vitality" in *Making a City: Urbanity, vitality and urban design as the components of activity*. According to him, an activity pattern constitutes two main concepts: vitality and diversity. "Vitality is what distinguishes successful urban areas from others"(Montgomery, 1998: 4). Lively places have their rhythm, which means that these places have their own active lives. Barlas (2006) claimed that rhythm is an essential issue for urban perception. He explained that "rhythm involves sorts of measures and beats as well as different or similar segments,

brought together in this or that way" (Barlas, 2006: 159) The beats or in Cullen's words the sudden jerks or landmarks are the components of the rhythms involved in a city.

"Vitality is a conservative, as well as a very general, rule –a passive, supportive feature. It emphasizes continuity, yet provides the opportunity for individual development" (Lynch, 1981: 123). In this context, the future and present stability of ecology and suitability between humans and environment is important during the course of the development of a city. A lively place –"supports health and biological well functioning" (Lynch, 1981: 121), is a good habitat for its users. Lynch (1981) stated that while describing "health" one should consider three main principles:

- sustenance: a vital place should support sufficient supply of food, energy air and a sustainable life
- safety: a good and vital place should provide the sense of security for its citizens by controlling or encountering natural and man made fear factors
- consonance: a good spatial environment should support natural rhythms in order to provide the fitness between environment and human

Edmund Bacon (1975) pointed out the vitality in a time-space perspective. According to him, a city is the space of art where people share their experiences. In this context a designer's mission is to create livable places with continuous vitality. A designer "conceives forms as pulsating expressions of organic vitality flowing through the structure of the city, and he brings to the mind of the community the significance and meaning of the evolving forms in the flow of the total development" (Bacon, 1975: 23). Movement through space creates a segment within the whole structure of urban form. Bacon called this segment as "continuity of experiences" which creates harmonious environment (Bacon, 1975: 34).

3.3. Legibility and Imageability in Creating Psychological Satisfaction

Cullen claimed that human psychological satisfaction can be obtained with possession. According to him "occupied territory, advantage, enclosure, focal point, indoor landscape and so on, are all forms of possession" (Cullen, 1961: 21). The city is a combination of various physical elements with some characteristics. From landmarks to paths or landscape, all items influence the performance of quality of space. "Ornamentation and featuring, the way buildings open out into spaces, gateways, vistas, landmarks and the like" (Montgomery, 1998: 95) is the physicality that Cullen emphasizes.

Cullen (1961) also stated that people feel comfortable when the place suits them. There are two kinds of **possession** that an observer can feel. One them is the static possession. In the static possession, observer needs to feel the visibility and readability. "….the success with which he (observer) discovers and gives interpretation to the most significant lines of force will largely determine whether the form achieves an intelligence and characteristic for" (Cullen, 1961: 111).

Different from Cullen, Kevin Lynch emphasized the importance of psychological space for the sense. Lynch (1981: 131) described the sense of a settlement as:

> ….. the clarity with which it can be perceived and identified and the ease with which its elements can be linked with other events and places in a coherent mental representation of time and space and that representation can be connected with non-spatial concepts and values. This is the join between the form of the environment and human processes of perception and cognition

Place and observer have to have a relationship in which observer is the active element in this place. Not all observers have an identical degree of perception on the same place; yet there are fundamental constancies in the experience of the same place.

City form is usually described as a spatial pattern with combined physical elements. These objects are said to be attached to usage and activities. Due to Lynch, urban form "is the spatial arrangements of persons doing things, the resulting spatial flows of persons, goods and information, and the physical features which modify space in some way significant to those actions, including enclosures, surfaces, channels, ambiances, and objects" (Lynch, 1981: 48). The city is a combination of physical, social and some kind biological features. The environmental quality that Lynch focused upon is the social part of the city. In Chapter 2, Lynch's psychological satisfactions were stated as;

- Warmth and Attachment
- Stimulus and Relaxation
- Sensual delight
- Interest
- Movement and urban pleasure

Similarly, Alexander stressed the psychological space but by emphasizing patterns. In the universe there are some patterns of urban space. Due to Alexander, cities with specific features in urban and architectural scale are more harmonious and attractive.

The origins of patterns are Carl Jung's patterns of psychology. The consciousness, personal and collective unconsciousness are the parts of the whole human psychological system. The whole-part relationship that Gestalt emphasized was also based on patterns. Even, the German term gestalt means "pattern" out of which the main concern is relationships. Alexander's pattern theory is simply based on structural thinking by which designers try to obtain readable forms, patterns and serial pattern.

> Each pattern can exist in the world, only to the extent that is supported by other patterns: the larger patterns in which it is embedded, the patterns of the same size that surround it, and the smaller patterns which are embedded in it. This is a fundamental view of the world. It says that when you build a thing you cannot merely build that thing in isolation, but must repair the world around it, and within it, so that the larger

> world at that one place becomes more coherent, and more whole; and the thing which you make takes its place in the web of nature, as you make it (Alexander, cited in http://www.gardenvisit.com/landscape/architecture/3.6-psychologicalpatterns.htm).

Amos Rapoport (1977) stated that there are "**series of relationships**" between physical elements of environment and people and they constitute pattern. "These relationships in the physical worlds are primarily spatial - basically objects and people are related through separation in and by space" (Rapoport, 1977: 9). In this physical world the space which is perceived in the third dimension has an organization within itself in both spatial and social sense.

According to Rapoport space has a meaning in different contexts. There are distinctions between human and non-human space, designed and non-designed spaces. Designed space is mainly ordered due to rules of spatial organization and "reflecting some ideal environment" (Rapoport, 1977: 12). There are also physical and symbolic spaces; behavioral, perceptual environments. It is obvious that groups of people build up perceived environments that provide a sense of place, due to the physical element in the environment.

Rapoport identified two main types of environmental quality. First is the "material and biochemical aspects of physical environment" such as air or environmental pollution. The second is "the more complex interpretation and is related to the less easily definable and more variable qualities of the natural and man-made environment which gives satisfaction to people, its sensory quality in all modalities; the positive and negative effects on human feelings, behavior or performance and its meaning" (Rapoport, 1977: 61).

The first theorist that highlighted the importance of "activity" for urban quality is Jane Jacobs in Death and Life of Great American Cities (1961). Different from Lynch and Cullen, she used the term urban quality referring to activity patterns. The success of an urban environment is the sensory experiences and perceptual process in terms of the variety of activities used by the community. "She identifies four essential determinants which govern or set the conditions for activity: a

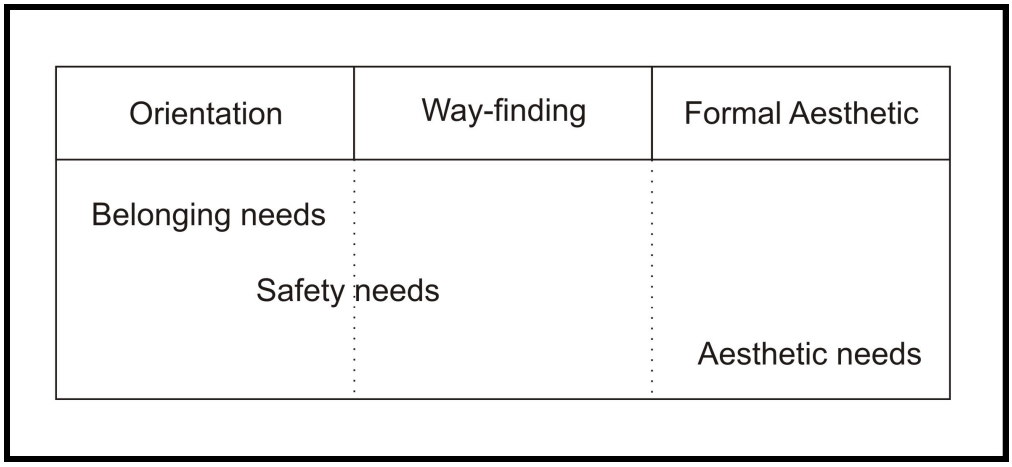
mixture of primary use, intensity, permeability of the urban form and a mixture of building types, ages, sizes and conditions" (Montgomery, 1998: 3).

On the other hand, Montgomery (1998) emphasized urbanity by combining different theoretical issues in literature. According to him, urbanity can be obtained with the combination of psychological pattern, physical setting and desired activities in urban space. For achieving urbanity, the urban space should provide a variety of activities (pedestrian flows, openness and so on), an image (legible, perceivable, understandable, and memorable) that is perceived by the citizens and a physical form (combined and well organized a whole including parts).

3.4. Psychological aspects: a legible and imageable city meets human psychological needs

Many people feel strongly about their visual world, even if they find difficulty in articulating it. Emotions are associated with spatial characteristics, in particular, and with the apparent coherence (or lack of it) in the whole scene. One can state, with much confidence, that a legible and imageable environment can meet belonging needs, safety needs, aesthetic needs and cognitive needs which are parts of Maslow's hierarchy. Based on these needs and the concepts of legibility and imageability, there are three components that are worth mentioning: orientation, way-finding and formal aesthetic.

Table 1: Psychological components of legible and imageable environment and relationships between human psychological needs



3.4.1. Orientation

Since mental maps consist of places, physical elements and their overall relational system, orientation became a subject to analyze. Sense of orientation not only provides a free moving opportunity, but also a sense of security. Lynch (1990) and Hall (1996) stated that "it is linked to survival and sanity" (Rapoport, 1977: 142).

Perceiving a city as a whole helps observer orient him or herself easier. According to Lynch there are many ways to perceive the city as a whole. The repetitions and harmony in physical setting, panoramic views, clear lines and elements are key components for a whole that observer can grasp a city easily.

Orientation is "the sense of clear relation of the observer with the city and its parts" (Lynch, 1991: 135). Amos Rapoport also strictly focused on orientation not only for its importance for survival and sanity but also its influences on cultural variety. "Orientation concerns three main questions; where one is, how to get where one is going and how one knows that one has arrived" (Rapoport, 1977: 142). For this process, one has to know the relative measurements not just

physically but also mentally. Lynch listed the significant elements of orientation as:

- directed lines (strongly organized lines),
- sequences (linear but not necessarily directed)
- landmarks (isolated objects of peculiar form, key locations)
- spaces (locations with key functions)
- grid systems (compass directions)
- diffuse (compass orientation)
- topographic (orientation form, the slope)
- symbolic (use of maps)

Rapoport, on the other hand, classified orientation into three main headings: "topologically by recognizing continuity, through pattern (identifying elements and placing them in a frame of reference) and through positioning (using directional clarity and spacing)" (Rapoport, 1977: 174). For these types of orientation models, he developed four methods of increasing orientation. These are:

- signs and verbal aides
- pattern recognition
- using behavioral pattern
- landmarks

To clarify the concept of orientation, a labyrinth example will be helpful. When thinking of a labyrinth, one can imagine a series of very similar places, which is so different to catch the small differences. In such places with no dissimilar elements, one can easily loose orientation. This condition arise the sense of being lost, which combines with fear and discomfort.

3.4.2. Sense of direction -Way finding

Way-finding is the primary issue for the physical design process and the significant component of easily perceivable environments. In its absence, it is hard to find special points as starters and there would be a loss of effect and order. Lynch described way-finding as “a consistent use and organization of definite sensory cues from the external environment. In the process of way-finding, the strategic link is the environmental image, the generalized mental picture of the exterior physical world that is held by an individual. The image is the product both of immediate sensation and of the memory of past experience, and it is used to interpret information and to guide action" (Lynch, 1960: 3).

Gluck (1990) stated that “way-finding is the process used to orient and navigate. The overall goal of way finding is to accurately relocate from one place to another in a large-scale space" (Gluck cited in http://www.hitl.washington.edu/ publications/r-99-13/chap_1.htm).
It is obvious that an individual must perceive his environment to orient himself, to get satisfaction from his/her outer setting and to find locations. “The individual must perceive his environment as an ordered pattern, and is constantly trying to inject order into his surrounding so that all the relevant perceptions are jointed one to the other” (Lynch, 1991: 199).

3.4.3. Formal Aesthetics

The production of good space has been a theme of discussion among urban designers and psychologists for years. Lang (1987) stated that formal aesthetics include the spatial qualities of the physical environment. Its main concern is to afford aesthetic needs and provide pleasure in urban space. The identification of the determinants of aesthetics and their relationships are subjects pertaining to formal aesthetics. Gestalt theory of perception can be considered as the theoretical justification of that issue (Lang, 1987, Barlas, 2006).

Formal aesthetics was listed as one of the components of psychological components of a legible and imageable city, since "aesthetic values of an object can evoke feelings of interest and pleasure" (Barlas, 2006: 94). Lynch (1981) emphasized sensual delight which gives psychological satisfaction to observer to highlight the importance of aesthetic formations. Therefore, it can be said that urban space is an object that carries aesthetic values evoking such feelings. Undoubtedly, positive effects of an imageable environment influence recognition of that place.

Montgomery (1998) stated that a legible and good urban form increases human satisfaction. According to him, the sense of belonging to a place can be obtained by the successful representation of that place in mind and feelings gathered from that place. "To individuals, the image of a place is therefore their set of feelings and impressions about the place" (Spencer and Dixon, 1993 cited in Montgomery, 1998: 6). So, an easily perceivable city which means a legible and imageable urban form is essential in sensual delight.

3.5. Physical Aspects: Physical arrangements provide legible environments

There are different theories about the form of urban space. According to disciplines these theories can be categorized as; architecture, urban geography and urban design. Architecture is mainly interested in the three dimensional physical organization, moreover the aesthetic and functional dimensions (Madanipour, 1996: 32). Urban geography, on the other hand, deals with urban morphology. Gordon (1984: 3 cited in Madanipour, 1996: 53) stated that urban morphology cope with "plots, building, use, streets, plans and townscapes." It means that it is concerned with urban form, shape and function. Urban design, however, besides the form and function, deals also with the psychological aspects. It means that in the process of producing urban form there are different indicators in different stages.

According to Trancik (1986) urban space can be supposed to be a combination of three levels of physical and imaginary components. The first level is the two

dimensional pattern which contains the basic subdivision of land (Günay, 2005). This layer is called the "figure-ground" layer in the theories of urban spatial design (Trancik, 1986: 96).

In the figure-ground theory, space is an object combined with blacks and whites. Its starting point is the relationship between urban mass building structure (solids) and open spaces (voids). This approach has "powerful tools for identifying the texture and patterns of the urban fabric as well as problems in its spatial order, but can lead to a static and two dimensional conception of space" (Trancik, 1986: 98).

In art and basic design studies, the figure-ground theory has significance in terms of understanding the whole pattern. In Gestalt psychology it was identified that humans tend to perceive the figure as a separated item in a visual scene of background. The figure ground composition can be differentiated due to their orders. In the urban context it provides ability to categorize urban form. According to Trancik (1986), figure-ground studies enable us to find out the distinctive attributes of urban districts. "Beyond revealing the character and aggregate urban form, figure-ground drawings help articulate the differences between urban solids and voids and provide us with a tool for classifying them by type" (Trancik, 1986: 101).

The second layer in urban spatial composition is the organization of lines that connect solids and voids. "In this approach dynamics of circulation become the generators of urban form. The emphasis on connection and movement is a significant contribution, but need for a spatial definition is sometimes undervalued" (Trancik, 1986: 98). This level of urban layout consists of directional and organizational axis that connects urban parts. The paths that Lynch defined and segments in Cullen's term are included in this part. Sense of direction and way-finding should be the psychological indicators in creating paths and continuous elements. The next layer, on the other hand, reflects the three dimensional physical space. It is where the imageability of urban form can be analyzed.

Lozano (1990) referred to low level order and high level order to conceptualize the urban space. The low level order, in this sense can be thought as the first two layers that Trancik (1986) described. Similarly the high level order can be referred to the place theory. According to Lozano urban forms has to provide patterns to create the sense of order for its citizens (Lozano, 1990: 265). That is because human brains tend to perceive the information patterns and try to organize them within an order. Gestalt psychology also mentioned that "order" facilitates the process of perception.

The built environment is full and variety of information. These information units or cues in Gibson's terms are found in combinations of components and wholes. In such a flow of visual inputs human brain selects the symbolic wholes due to the background knowledge in the cognitive process. Lozano (1990) suggested that low level order messages (cues, information) are more rapidly perceived by observers. Then it is not false to talk about a priority in perceivable elements. In perception literature it is supported with the experimental evidence that simple regular forms organized with repetitious elements in an order are easy in seeing and perceiving (Lang, 1987). Therefore, the success of physical organization is strictly related with the wholes containing order.

3.5.1. Elements of a legible and imageable city

One of the main concerns of this thesis is the identification of the legibility elements. According to Lynch there are five basic elements, or it should be said five categories of elements, analyzed in cognitive maps: paths, nodes, edges, landmarks and districts. He found out in his study that despite the meanings vary people identified similar elements to orient themselves not just physically but also socially.

Another theorist Norberg-Schulz (1971, cited in Lang, 1987) differentiated the elements as places, paths and domains. Places are the nodes or landmarks with

special characteristics. They are locations where important events take place. Paths are as they are in Lynch's theory. They are continuous elements constituting linkages within the whole structure. Domains, on the other hand, are the areas "that contain similar elements which are defined by closure" (Lang, 1987: 140). In this composition, places and paths are figure and domains are the ground. David Stea (1969 cited in Lang, 1987) identifies another set of features in a cognitive map; points, barriers, boundaries and paths. Here, the paths are similar to Lynch's and Norberg-Schulz's paths. Barriers resemble to edges and points resembles to nodes.

Gestalt laws of visual organization are quite explicit in building legibility components. Paths and edges can be considered as "elements of continuity" (Lang, 1987: 139). In Gestalt psychology it is stated that people tend to perceive continuous elements as a whole. Districts at the same time can be described with respect to the laws of proximity and similarity.[12] Landmarks are the dissimilar elements in the unity. As it was previously mentioned, people tend to perceive similar units and dissimilar elements to avoid monotony.

[12] According to Gestalt psychology similar and proximal elements tend to be perceived as a whole.

Table 2: Elements of a legible and imageable city

Kevin Lynch	Norberg-Schulz	David Stea	Gestalt Psychology
Path	Path	Path	Elements of continuity
Edge	—	Boundary	Elements of continuity
Node	Place	Point	—
Landmark	Place	—	Dissimilar elements
District	Domain	—	Good contour proximity and similarity of elements
		Barrier	

3.5.1.1. Paths

Paths like streets, roads, rivers or walkways are channels of movement. Paths provide potential lines of relationships between two places. They are significant components for both orientation and the sense of order. The canals in Venice, for example, have a dominant character in human minds.

Spatial qualities can strengthen the imageability of paths. According to Lynch (1960) for example, “streets that suggest extremes of width or narrowness, attracted attention” (Lynch, 1960: 50). Since the proximal elements perceived as a whole due to Gestalt laws of perception, it will be not false to say streets with a certain volume increase the sense of place. Gordon Cullen (1961) stated that medieval well-defined streets have attractiveness for people.

Some physical components also characterize paths. The façades are important for the identity of streets. In İstanbul, Soğuk Çeşme Street has a unique characteristic

in terms of façades and buildings that differentiate from nearby streets. The façade line has a significant effect on identity of streets and human psychology. Unity and similarity in façades make it perceived as a whole composition as stated in Gestalt psychology. However, as Lozano (1990) mentioned, there should be an optimum similarity and diversity to prevent monotony and chaos.

The proximity to special places in the city or the activities on the street also influences the image and the ease of its recognition. It is important to remember that the activities can make a place vital but not legible and imageable. A good composition of physical elements should be considered in terms of creating psychological satisfaction. Where paths lacked identity, or cannot be visually grasped, the image is in difficulty.

3.5.1.2. Edges

Edges are linear and continuous (in Gestalt psychology) elements that isolate one place to another. Edges can be a façade or a line of trees or even a path. In mental maps and visual representations they generally refer to a continuous line and symbolize a boundary. “Edges are boundaries that break or contain or run parallel to the form; they are not used by the observer as paths but they may well be so used by others” (Lang, 1987: 137). Edges have strong and crucial visibility in built environment. They may be sometimes a boundary but also a seam or ridge in spatial behavior.

Edges, like paths, have some qualities. They have a sort of directional qualities like paths. Different from paths they have separator effects. The difference effects that edges posit are the most considerable characteristic. In Gestalt psychology edges are the elements of continuity. Undoubtedly, they are not isolated elements, but a part of the unity as stated in Gestalt.

3.5.1.3. Districts

Gestalt describes a district with the help of the laws of proximity and similarity. Due to the law of area, closed forms tend to be perceived as a whole. According to Lynch, districts are the relatively small parts of the whole urban form. Districts should have a recognizable identity. In other words they should be legible, among other components. To make it easy to understand, it could be said that a city is a big district constituting small part (districts). Since the city should be legible, its components should have an order and should construct a composition. This is the same for smaller districts. This is called nested hierarchy, which is stated in the definition of legibility. A district, therefore, must be well defined with external references and moreover it must have a legible pattern inside.

Within districts there are a number of elements and components: buildings, paths, pavement, façades, textures etc. Sometimes the width of the paths and sometimes the special façades make the district identifiable. Lynch (1960) stated that the district Little Tokyo has recognizable characteristics with the help of Japanese lettering and signs. Although Little Tokyo is said to be recognizable, it is impossible to determine its legibility according to distinctive lettering. As it is mentioned in the previous part, a place must provide the sense of orientation and sense of place in order to be considered as legible and imageable.

3.5.1.4. Nodes

Nodes can be described as strategic places in cities. “They are distinctive behavior settings located at places” (Lang, 1987: 137). The main characteristic of nodes is that they contain an intensive activity. The junctions of pathways are significant nodes for city whole. This is because the observer has to make a decision and this increases the attention for the physical components of the environment. Lynch (1960) mentioned that there is a tendency to perceive the surrounding elements in detail. Thus the physical composition has to have certain clarity.

Nodes are in general accompanied by another legibility element: landmark (Lang, 1987). This combination turns nodes to attention points for that location. Porteous (1977 cited in Land, 1987) refers to this as *cores*, and takes the nodes as the focus of their surroundings. Thus, a strong physical stress with a landmark increases the level of recognition of that place among people. Additionally, the functional importance can give the same result. The main feature for nodes however, is the psychological affects created by physical organization. A node should give variety of information to help physical and psychological orientation. Moreover, these varieties of physical elements should contain an order to increase the sense of place.

3.1.5.5. Landmarks

Since the urban form takes shape with the combination of patterns and changes in patterns as Lozano (1990) stated, landmarks are the dissimilar elements in this unity. As it is stated in Gestalt psychology, the order needs to contain similarities and dissimilarities. In this sense, landmarks are the distinctive elements that identify the place by their uniqueness. In figure-ground theory, landmarks are the contrasts in the background. According to Lynch (1960) "a sequential series of landmarks" provide a series of cues for the observers in movement. This is same with Cullen's serial vision while traveling along a line. Here line is a number of segments joined with each other by nodes or landmarks. According to Cullen (1961: 26) these are the vertical focal points "which crystallizes the situation". In other words, segments are the "ground" and landmarks may be considered as "figures."

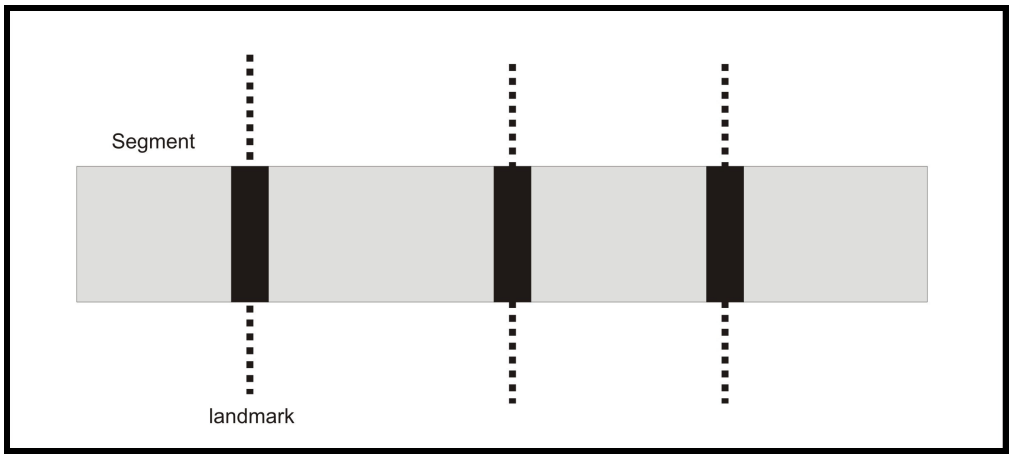


Figure 12: Graphic representation of landmarks (dissimilar elements) and segments
Source: Personal rendering

Landmarks are generally the reference points for observers in the way-finding process. Lynch's cognitive map analysis showed that people tend to describe addresses with respect to the landmarks. This is not just a landmark as an external reference, but also a visually distinguished element in the built environment. It should be noted that landmarks do not always have to be in the form of single physical elements. A district or path may be considered as landmarks for their vicinities.

The discussion of urban legibility elements so far concentrated on one single element of the urban image. In the urban environment these elements do not exist separately. On the contrary they all are in reciprocal relationships.

> A marketplace, for instance, is not merely noted as an area formally and functionally distinct from the urban matrix, but it is seen as a node, the meeting place of paths, defined by edges and identified by characteristic landmarks (Porteous, 1977 cited in Lang, 1987: 137).

In the cognitive maps, the combinations and relationships of these elements can be easily observed. This is again the whole-part relationship emphasized in Gestalt psychology. It is actually essential in building a good composition with all elements together. Such togetherness can also enhance each others' perceptual strengths. Similarly one physical object can contain two of these qualities so that they enable it to have a stronger visuality. The Great Wall of China in this sense is

an example of the combination of edge and path. When the extreme labyrinth example is recalled, one can detect that there are clearly defined paths and edges, in addition to a district. However, the absence of landmarks and nodes or dissimilar elements arouses negative feelings on human. This is unwilling situation in orientation and way-finding.

3.6. Conclusive Remarks

The concept of urban image emerged as a reaction to the loss of human dimension in urban environment. Legibility and imageability, the simplicity to perceive physical components of the environment and recognize it as a whole, are two components of urban image. In this thesis, the subject of legibility and imageability is approached from two aspects: psychological and physical. Psychological aspects of a legible and imageable environment are based on such needs as safety, belonging and aesthetic. Due to these premises, orientation, way-finding and formal aesthetics are found to be the three components of a legible and imageable environment. These three components are fundamentals for survival, sanity and pleasure in urban space.

The physical aspects of a legible and imageable city are the elements that Lynch put forth (1960). These elements -paths, nodes, edges, districts and landmarks– can be redefined in Gestalt terms. This Chapter intended to re-read urban image and its components. In building legible and imageable urban spaces, there are some qualities which will be explained in the following Chapter.

CHAPTER 4

HOW TO BUILD A LEGIBLE CITY: Guidelines

The previous chapter covered the discussions on physical components – paths, edges, district, nodes and landmarks- for a legible city. In this part, however, the qualities, needed for a legible and imageable place, which are based on the psychological components previously mentioned, will be introduced. The main purpose here is to figure out some general and objective guidelines that enable us to evaluate whether a certain place is legible or not. The discussions and studies about the qualities of a legible city will help define the main hypothesis that will be tested via the case study.

Accordingly, this chapter is organized as follows: First, the qualities of a legible city are scrutinized with the help of the vast literature. Second, a diagram is produced, which is used as the framework of the case study and third, the main hypotheses are given based on this new framework. Following this theoretical framework, criteria used to test hypothesis of the dissertation in selected case study areas.

4.1. Theoretical framework: The qualities of a legible city

According to Lozano (1990) there are two qualities of place; diversity and orientation. Diversity is basically the variety of components that increases the sense of place. Orientation is the sensual attachment of humans to settings. It is obvious that "a space (or setting) only turns into a place if its users feel attached to it" (Barlas, 2006: 154). Orientation needs to be clear and easy in order to experience a physical setting so that a cognitive image can be formed which can

then contribute to the sense of identity. The spatial organization of physical elements in urban space should not only be perceived as separated objects but also recognized as a whole pattern. In this whole, the observer should orient him/herself and find the travel path with its destination point. Thus, the continuance of the sequential elements and differentiated elements on this line must have significant qualities.

Similarly, for physical orientation, or in other words way-finding, the continuity of sequential elements and the appearance of salient elements are important. According to Rapoport (1977), the main points in the way-finding process are existing location, estimating or guessing the next location and the way between these two. Thus, in addition to the spatial configuration of the pathway and other elements, the clues that they give for helping predictability in the setting are also important. For an easy way-finding action, the environment therefore has to have a continuance in salient and sequential elements.

The hierarchy has also great influence in way-finding. Lozano (1990) emphasized the hierarchical organizations as a key factor in organizing information. Lynch on the other hand, stated that "the form must have general unity or clarity" (Lynch, 1991: 148). A lack may cause insensibility. "As space or linked chain is sensed by movement so is the spatial pattern of the city as whole, which should have some rhythmical quality" (Lynch, 1991: 145). Lynch listed four main issues of psychological satisfaction:

1. The problem of **order** and **variety**: "There must be an organized whole holding within it a rich complexity" (Lynch, 1991: 152).
2. **Contrast** and **relaxation**: the delight of two unlike things.
3. Intensity: the concept of optimum, maximum, minimum or **proportion**.
4. **rhythm**: the periodic fluctuation of intensities or qualities

Cullen (1961) provided additional elements for legible city. He stressed on the **well defined**, "**intelligible and characteristic**" form in providing the sense of

place. For both pedestrian and vehicles, a city is a composition of serial vision. The segments should provide an **order** and **unity**.

Table 3: Three components of legible and imageable environment. These components are based on human psychological needs; belonging, safety and aesthetic needs as it is mentioned in Maslow's (1943) hierarchy of needs.

Orientation	Way-finding	Formal aesthetic
Low level order and clarity Directed and continuous lines Dissimilar elements in unity Definite boundary of district (area)	Start and end points of paths Salient elements into a sequence Paths and landmarks within a frame of reference Physical differentiation in edges Plan configuration Hierarchy in paths and focal points	High level order with diversity Rhythm in focal points / sudden jerks Harmony of contrast relations

Figure 1 shows the qualities of a legible and imageable environment. Based on these theories, qualifications of a legible and imageable city are determined in this dissertation as follows:

1. Low-level order (Structural complexity) – plan configuration
2. Diversity in high level order– physical differentiation of edges
3. Continuity of sequential elements and rhythm in salient elements and rhythm in salient elements (continuity of dissimilar elements)
4. Hierarchy of pathway configuration and focal points
5. Wholeness (spatial definition) - Frame of reference and Unity - Harmony with contrast relations

4.1.1. Order and Level of Complexity (Monotony and Chaos)

While each component or object carries a meaning of its own, the order in which the objects are gathered within a whole provides different meanings to users. Moreover, the order itself is very important in perceiving the parts and the wholes. As Gestalt psychologists stated, humans have a tendency to perceive objects within an order. Barlas (2006) noted that there is need to refer to Gestalt laws of perception while talking about order. The order that Gestalt pointed should be legible (in Lynch's terms), readable and easily perceivable in the frame of reference. "Order aids orientation, but variety is also necessary, to allow the distinguished parts" (Lynch, 1991: 138). In Gestalt psychology there are some laws that focus on the perception of whole. Gestalt psychologists claimed that there are wholes and parts, and humans tend to perceive organized patterns rather than separated ones. Lynch (1991: 358) stated the importance of perceiving the whole as:

> Every physical whole is affected not only by the quality of its parts, but also by their total organization and arrangement. Therefore, the first criterion for form analysis is that it identifies form qualities which are significant at the city or metropolitan scale, that is, which can be controlled at that scale and which also have different effects when arranged in different patterns that are describable at that scale"

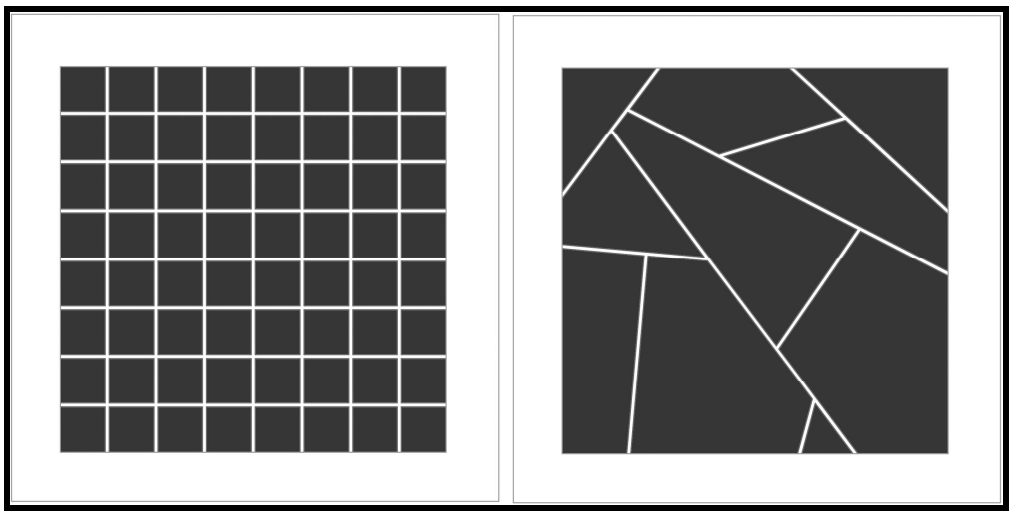


Figure 13: Order: Simplicity of forms
Source: Personal rendering

Since the observer needs order to survive and orient himself, designers should provide order in urban environment. In perception literature, it is proved that human beings perceive and understand the forms with an order easier. “Based on Gestalt thought, an ordered environment is one in which the parts from the whole in such a way that redundancy, self-contradiction, and conflict are avoided” (Lang, 1987: 189). According to Arnheim (1966), order can be explained by a kind of lawfulness. The simplest form of order can be obtained by applying the same series of principles in the whole pattern. Order “is dependent on two elements: pattern and changes in pattern” (Lozano, 1990: 265).

The experiments showed that **simplicity** is a factor facilitating perception and mental organization. As stated in Gestalt psychology, law of similarity explains how elements are organized into a whole according to regularity. Lynch (1960) stated that people tend to convert complex structures to simple forms to make them understandable. Thus, “**clarity** and **simplicity** of visible form in the geometric sense” (Lynch, 1960: 105) should be obtained in built environment. Here, the term simplicity is used interchangeably with the term order.

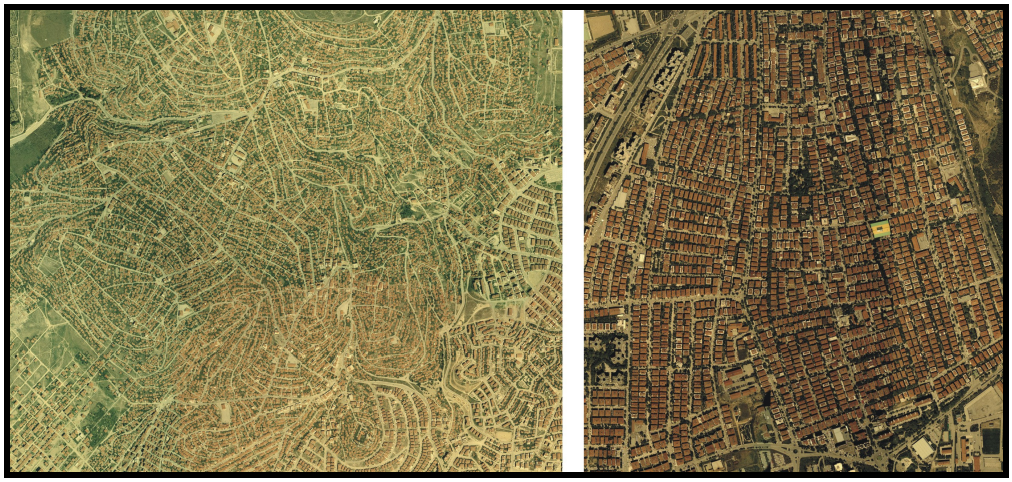


Figure 14: Low-level order simplicity. These two urban districts in Ankara show the simplicity and complexity of low-level order. When the level of simplicity is lost there will be chaos.
Source: Personal archive

In urban environments irregularly developed patterns are less legible in terms of understanding the whole. Simplicity and regularity of pattern organization is more

legible from the point of complexity. Planned environments with regular geometry, therefore, evoke the senses of orientation and way-finding more successfully. However, they are not unique indicators of a legible and imageable environment. It should be noted that a certain level of diversity is needed in spatial organization to help observer attach himself/herself to that place by more information. Thus, a spatial organization should be evaluated with the combination of the form qualities listed above.

As it is stated in the Gestalt theory, order can contain any degree of complexity (Lang, 1987). A complex structure is then, a composition of various components existing with certain principles. Remember that while human brain collects the variety of information, it also seeks for differentiations in between to avoid monotony. Patterns, though, should be composed of repetitive and distinctive elements. Thus, the pattern is a combination of variety of components and their relationships among each other. Lozano called diversity the changes in pattern. We can refer to Gestalt psychology when talking about good composition. The use of similar elements having clear and recognizable relationship, bring about an order that can be grasped as a whole. Thus, it can be claimed that **similarity** and **dissimilarity** (diversity) are other components of order. Kevin Lynch listed the components of a legible environment; path, edge, district, node and landmark, as the elements that help observer understand the whole organization of the city. The landmarks and nodes are the dissimilar objects in the group of similar objects.

4.1.2. Diversity and High-level order

Lozano also defined that complexity which is a kind of **diversity,** as a component of place quality. The diversity in shapes, sizes or elements is such an important issue that may cause adverse effects on human psychology. Barlas summarized this situation emphasizing two concepts; chaos and monotony. Chaos can be referred to a stimulus with variety of different environmental component or characteristics that distracts observers. On the contrary, monotony can be also a disrupter when then the degree of similarity increases. Therefore, there is a thin

line among similarity, complexity and chaos. There should be an optimum sense of complexity in creating legible environments.

Cooper (1965, cited in Rapoport, 1977: 238) introduced 13 ways of variety in residential districts which are significant in perception;

- Varying the number of units per row
- Staggering facades of buildings
- Using different materials and combinations of material
- Varying colors of adjacent buildings and roofs
- Varying the sizes of units and combinations of sizes
- Varying the height of building
- Varying the position of front doors
- Varying window spacing
- Varying the design of front porches
- Varying the design of some stairs
- Varying roof vents with some enclosed and some not
- Altering roof pitch, ranging from flat to steep
- Varying the distance on units from the sidewalk and varying the orientation of units vis-à-vis traffic streets

Figure 15: Variety in high level order. The edge in Grand Canal in Venice has variety of buildings. These building vary in color, shape and size, however, similarity and continuity in building heights are observed.
Source: Venice Grand-canal (2005), personal archive

All these varieties, according to Rapoport (1977) are issues that observers pay attention when considering diversity. "Of the 40% who noticed differences the principal was color, followed by variations in building height and size of units" (Rapoport, 1977: 238).

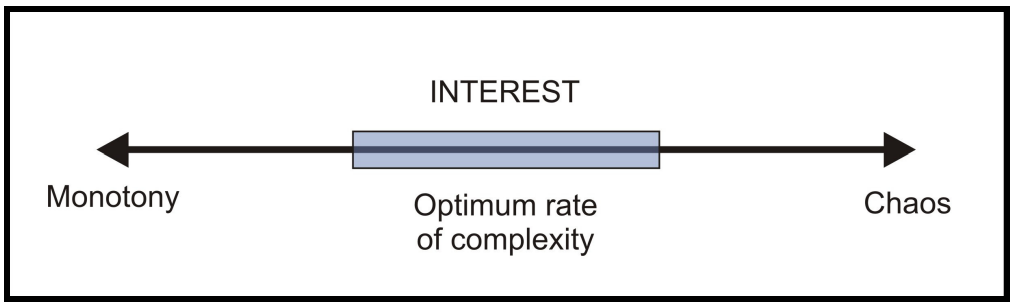


Figure 16: The level of Complexity
Source: Adapted from Rapoport, 1977

These concepts diversity, complexity and readability are observed not just in physical environments but these are also important concepts in cartography. In the book How Maps Work, McEachren (1995) worked on creating readable maps and emphasized on its importance of transferring the information that these maps contain. This reference can be a good illustration to understand the complexity level.

4.1.3. Continuity in sequential elements and Rhythm of salient elements

Paths and edges, among other Gestalt elements of continuity, are the main elements that afford the sense of physical and psychological orientation and way-finding. A good continuance is the main qualification of paths and edges. Continuity in edges and paths "facilitates the perception of a complex physical reality as one or as interrelated" parts (Lynch, 1960: 106). It is obvious that segments are composed of different physical elements. Lynch stated that special façade compositions play an important role in identifying paths. Not only façades but also landscape elements, urban furniture, different levels and types of paving are also determinative. This helps in structuring closure[13] and proximity to obtain felt volume. In geometric sense, these can be identified as separated objects of a composition. Thus the continuous elements must have a well-defined beginning and end with a well defined character (Cullen, 1961).

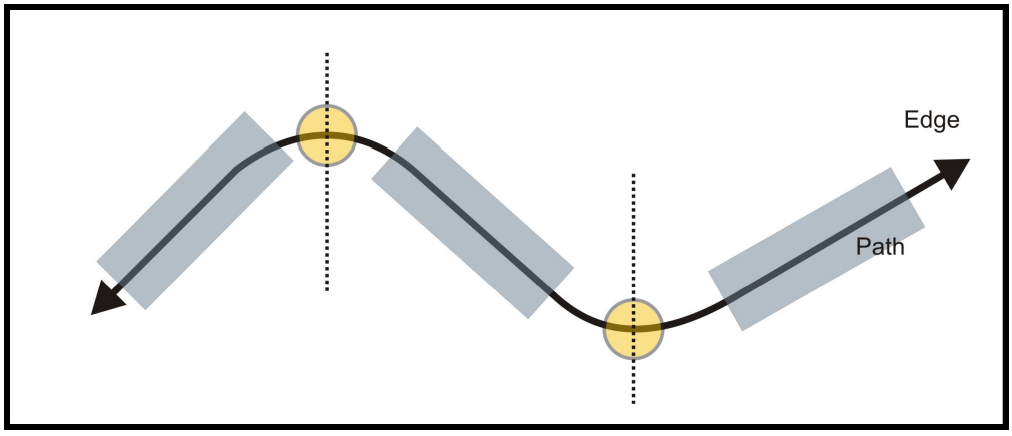


Figure 17: Continuity of sequential elements. Continuity of pathways offers opportunities in way-finding and orientation. Moreover, well-defined paths with edges increase legibility and imageability
Source: Personal rendering

Same as Lynch, Cullen who analyzed the urban environment by segments emphasized serial movement. A motion awareness make observer sensible for both visual and kinesthetic senses (Lynch, 1960: 107). Each segment with a continuous pathway has significant characteristics differentiating it from others.

[13] Law of closure in Gestalt stated that grouped items tend to complete a pattern.

Certain markers, namely sudden jerk (dissimilar elements), define the segments and create a transition between two segments. These definite markers create a feeling that the observer is on a way in a setting. They are, in Lynch's terms, landmarks helping and guiding observer in way-finding process. "The dominance of one elements" (Lynch, 1960: 126) can make it identifiable in the whole pattern. In way-finding process, "directional differentiation" (Lynch, 1960) is also an important quality. This quality is very useful in structuring large scale plans.

"Way-finding is the original function of the environment image, and the basis on which its emotional associations may have been founded" (Lynch, 1960: 125). Therefore, to be a definite whole is one of the most significant qualifications for a segment. Each segment has a unique character in terms of physical, psychological and activity pattern. The variety of activities combined with differentiated physical elements can provide variety of senses. Cullen (1961) stated that an optimum level of similarities and differences increase the perception and pleasure.

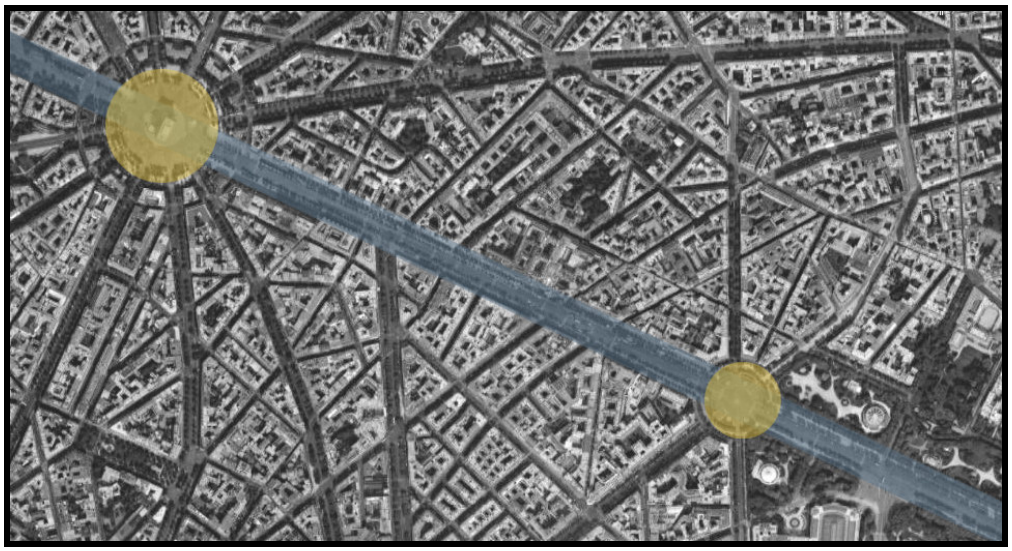


Figure 18: Continuity of pathways in Champs-Elysée, Paris. The Champs-Elysée Boulevard has strong imageability with strictly continuous paths and edges, and well-defined focal points (nodes, landmarks) along the pathway.
Source: Google Earth

Rhythm has a history that dates back to ancient times. In Renaissance, the rhythmic articulation used in the façades of building were said to gain aesthetic

quality. Palladio was the one that used rhythm in his buildings (Barlas, 2006). Rhythm has positive affects on human sensual delight and moreover it eases pursue of the composition.

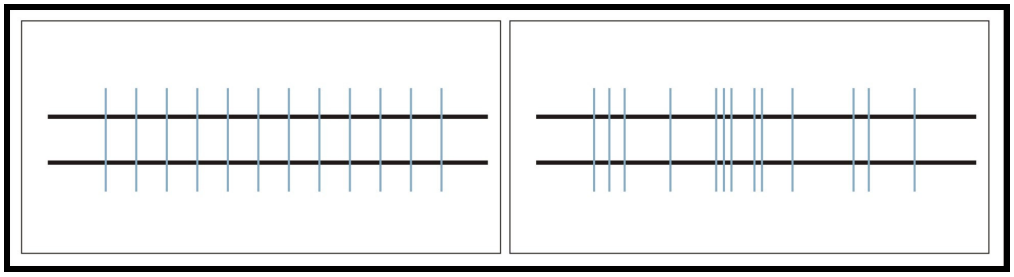


Figure 19: Regular and irregular rhythm.
Source: Adapted and redrawn from Rapoport, 1977: 244.

Lynch (1960) stressed the importance of repetition and rhythmic compositions for a legible environment. Parallel to this, he defined that dissimilar elements encountered on a route should have a rhythmic sequence for quality in form. Cullen (1961) also mentioned the rhythmic beats (landmarks, dissimilar elements) along a group of segments. These beats awake the sense and attract attention when the movement becomes monotonous. In traditional settlements these kinds of beats are usually seen in the form of landmarks or squares which provides imageable spaces.

4.1.4. Hierarchy of pathways and focal points

The term hierarchy has usually a meaning of rigid organization. However, "it could allow for a highly democratic and flexible organization by introducing order to complexity" (Lozano, 1990: 87). Hierarchy is the basic quality and regulator of a complex system. Complex urban patterns provide a variety of information to an observer who satisfies his/her personal attachment. But unless an urban pattern has a hierarchical order, the observer can lose his/her control and may have some problems in orientation. Arnheim defined hierarchy as "an order of some complexity, in which elements are distributed along a gradient of importance" (Arnheim, 1965: 132). Lancelot Law Whyte (cited in Lozano, 1990: 85) stated that "hierarchical structure is the basic feature common to matter and mind".

Hierarchies provide conceptual framework, because they organize all the subsystems within a whole. Thus a highly defined hierarchical pattern controls all parts of this pattern. Hierarchies generally contain groups of elements which are related to the main pattern. This enables us to "prioritize subsystems without missing totality" (Lozano, 1990: 85). According to Lynch (1960) there would be examined a problem of complexity of various components in metropolitan scale. Static hierarchy is one of the techniques that organize urban form by considering sub-districts.

In an urban environment, hierarchy helps users to categorize and easily organize urban elements. Lozano (1990) defined different urban layers distinguished by hierarchy as the identifiable parts of the whole. Thus, this provides an opportunity to open-mindedness for an observer.

The nested hierarchy is the key factor in a legible city. From the definition of legibility, it could be stated that the legibility elements (path, node, edge, district, and landmark) have to determine the whole city and they have to have continuity in the smaller parts. Since these legibility elements are differentiated in different scales, the urban form containing these elements should provide legibility not just in macro scales but also in micro scales.

In cognitive map analysis, it is proved that the pathway configuration constitute the bases of the analysis. In general, humans tend to draw the map starting with paths and then other elements with reference to paths (Lang, 1987). Therefore, it can be stated that paths are the major elements; and a pattern with a hierarchical definition of the movement system is simpler in perception. Path configuration with similar dominance is unsuccessful in way-finding and orientation. The network-like and tree like hierarchical pathway arrangements are successful examples for a legible environment. Besides paths, the hierarchy of focal points is also significant indicators in way-finding and orientation processes. While moving, observer tends to catch a differentiated point that enables him/her to guess the next segment in movement line. That means the hierarchical organization of landmarks and nodes give clues about the previous point.

4.1.5. Wholeness (spatial definition) and Unity

For districts a perceivable boundary should be maintained through the use of the Gestalt laws of **closedness** and **area**. Similarly, Lynch (1960) mentioned that the sharpness of boundaries is a significant quality for identifiable patterns. Undoubtedly, when various sizes of any district is of concern well-defined boundaries are not sufficient for legibility. One or two guidelines stated above do not make the environment readable. Instead a total approach for legibility elements and guidelines should be taken into consideration. "A certain amount of repetition, redundancy and reinforcement seems to be necessary" (Lynch, 1960: 108).

Wholeness and a recognized pattern are essential for not just physical and psychological orientations, but also imageability. In cognitive map analysis, it is observed that there are different types of drawing a district or city. In the path based drawing, focal points are the landmarks and edges that defined paths. However, in this kind of drawing it is hard to talk about wholeness. Drawings started with the frame of reference, on the other hand, offer a patterned figure which is a crucial point for imageability and legibility.

Unity represents harmony among physical components or characteristics within a whole. In architecture the characteristics such as form, material or color should be in harmony to emphasize aesthetic aspects. In the urban environment, unity of a setting enables it to be distinguished from its surroundings; thereby helping people draw its visual boundaries. Moreover, the uniformity in physical elements in terms of scale, material, color and harmony among objects strengthen the environment's identity. Since harmony enable successful integration of variable components, it is possible to relate the term to the uniformity of environment.

Harmony, like all other principles, gives pleasure to an observer. The need for aesthetic experiences and stimulation is provided by "good" environments. It is

certain that the term good varies among people. However, it is again certain that some spatial organizations satisfy the psychological needs better than others.

4.2. Features and method of the model

Based on this theoretical framework, there are some guidelines in building legible and imageable environments. Since planning and urban design disciplines intend to create imageable and legible environment for human beings, psychological needs of observers or users should be considered. In this thesis it is advocated that a legible and imageable city has certain qualities based on the psychological components of orientation, way-finding and need for aesthetic. It is the hypothesis of this thesis that a legible and imageable urban space should have a low-level order with a certain level of complexity, a high-level order which is diversified, continuity in sequential elements and hierarchy, wholeness with well-defined frame, rhythm, repetition and harmony in focal points and lastly proximity and human scale in built environment.

In the following Chapter selected urban district is studied in terms of the guidelines that are defined in this section of this study and the hypothesis. The main statement is therefore, to build legible and imageable urban spaces, some tangible guidelines are necessary. The research as an empirical model proposal and this theoretical framework has some features;

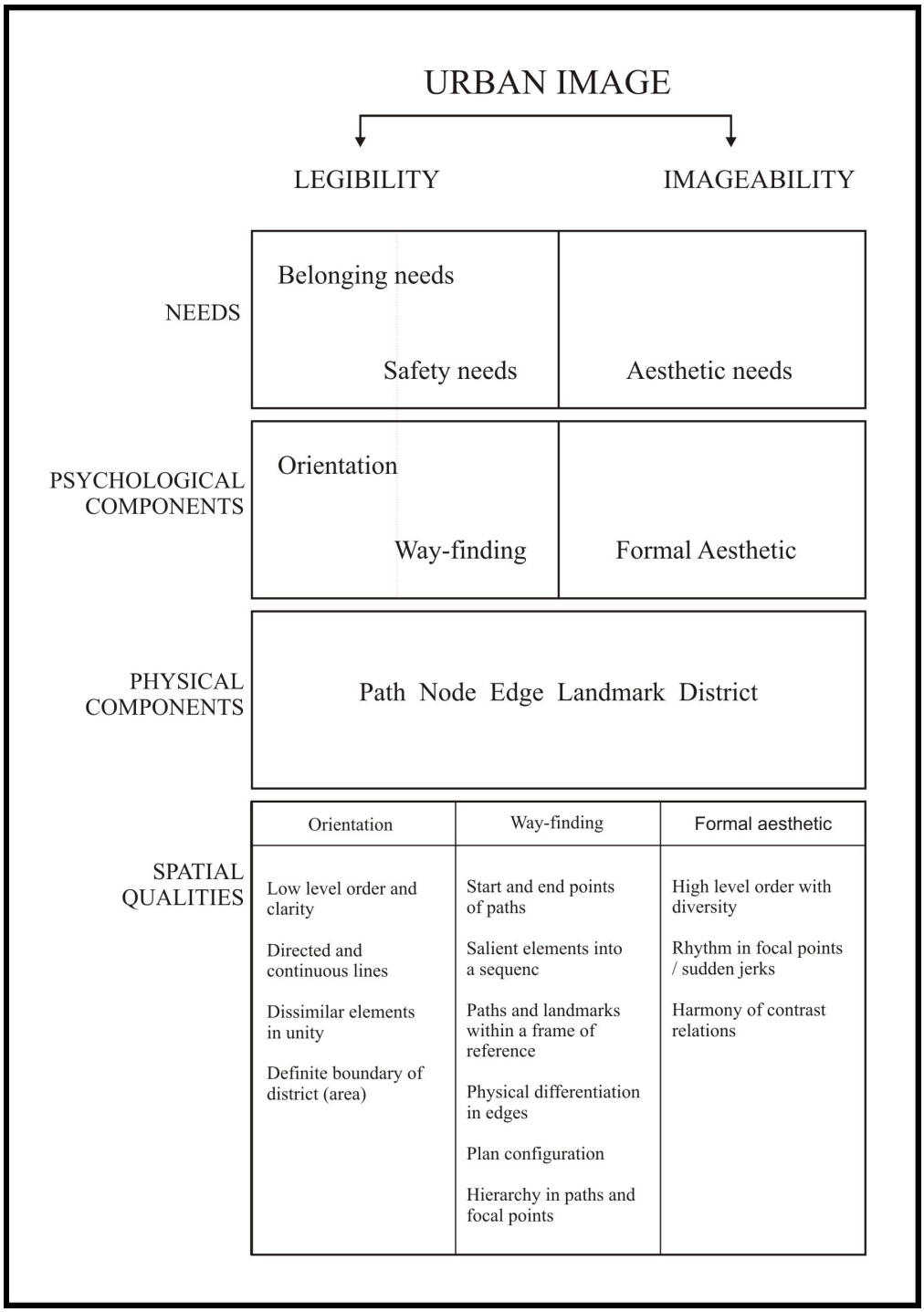
1. The scope of the study is limited with the physical organization and human way of perceiving it. The psychological needs are guiding concepts of legibility and imageability. Human phenomenal environment including cycle of life and activity are disregarded.

2. The main point is focused on the spatial organization of the environment. The emotional and behavioral responses of human beings are considered to help set the guidelines. “What makes the environment legible and imageable?” is the main question to be answered.

3. The applicable scale of model is limited due to the legibility elements stated in Chapter 3. The qualities and elements are considered as representations of various spatial environmental components in different scales.

4. Basic relations of man and environment are considered in three psychological components of legibility and imageability. Orientation, way-finding and formal aesthetics. The related reflections of psychological needs constitute the basis.

Table 4: Diagrammatical representation of the summary of building a legible and imageable city



In the following chapter an empirical analysis will be offered. The legibility and imageability of Çayyolu in Ankara will be analyzed based on the qualities determined above. The study area is selected, as it is mentioned before Çayyolu, in Ankara. The selection of study areas has following reasons;

1. Since one of the aims of the thesis is to find out how far planning profession is successful in creating legible and imageable environment, the selected areas should be recently developed by plans.
2. The area is situated in the fringe of Ankara where there was an attempt of decentralization and compact districts.
3. The area contains sub-districts which give opportunity to compare.

The method of the study is developed through two main phases. First, spatial values and legibility elements (path, node, edge, landmark and district) which are stated in the previous chapter are defined. Their existence and distribution in the study area will identify the areas with legibility elements. In the second phase, the qualities of a legible environment will be examined in selected areas in an observational view. Thus this thesis will try to achieve the legibility and imageability of Çayyolu district based on five main components: *Structural complexity, diversity, continuity and rhythm, hierarchy, wholeness and unity*. This observation based analysis will be done in two different dimensions. Since legibility and imageability are two components detected both in two dimensional figure-ground relation and three dimensional solids and voids, the analysis should encompass these two milieus. Thus while talking about some features, both the two dimensional plans and the three dimensional places are going to be examined. One of the aims of this research is to guide environmental designer and show significant aspects and issues while building or creating legible and imageable urban spaces. Therefore, a brief history review on legibility of Ankara in the following chapter will help to evaluate the whole city and analysis of Çayyolu will provide concrete solutions.

CHAPTER 5

CASE STUDY: How far planning is successful?

Since the beginning of the Republican period, there had been several attempts to prepare plans for Ankara. These plans are prepared under different conditions and pressures. The analysis below shows that the interest on building an image was taken granted in the first years of planning, but in later years under the pressure of high population increase, growth became the major issue and unfortunately the image building and creation of legible living areas were undermined. The purpose of this chapter is to analyze the legibility of existing situation of Ankara in the case of Çayyolu district.

5.1. Urban Development

The attempts of planning in Ankara goes back to the beginning of the Republic, since creating a modern capital was one of the major achievements of the new Turkish Republic. After Ankara is declared as the capital city of the new Republic, it has faced a rapid increase of population. In 1927, a competition with limited invitation was announced and in 1928 with the Law 1351 Directorate of urban Development of Ankara (Ankara İmar Müdürlüğü) was established. The main concern of this department was to organize a competition that had to deliver a plan that suits the identity of the Republic with the main aim was to produce “a new physical environment and related life-style” (Tankut, 1993: 45) for new and young capital city. Moreover, it aimed to have a long-range, comprehensive development plan to control the urban development. In Jansen Plan neighborhood unit forms the basis of the plan, where these units were designed to have an organic internal pattern. The plan also emphasized the pedestrian routes and aimed at

minimizing the motorized traffic routes. The most remarkable decision in this plan, however, was to define two main axes. The first one was the north-south axis (today Atatürk Boulevard) that connected the new governmental quarter to the old city. The other one was the east-west axis parallel to which had same direction with the railroad. In this context two main focal points (old city- citadel and the Government district) were linked with a continuous path (Atatürk Boulevard). Along the "path", different segments were emerged with the emphasis of various landmarks (elements and areas). The boulevard was defined with buildings (edges) in both sides.

Yücel-Uybadin Plan (1957) that had been acquired by an international competition also emphasized the two axes similar to the previous plan. According to Günay (1988a: 38) the city plan of Yücel and Uybadin "remained as a two dimensional blue-print". It stayed far away from the real social needs and demands. As Günay stated, the two dimensional plans which intended to create livable garden cities with low population became "a high density, dull and monotonous." (Günay, 1988a: 38) The plan remained insufficient in bringing solutions to the problems of the city and as its predecessor failed in providing a form and structure of the city to guide further development (Ceylan, 2003).

The third plan was prepared by Ankara Metropolitan Planning Office, which was founded in 1969 as a branch of the Ministry of Development and Construction. This plan was different from the first two plans, which were prepared as classical master plans. However 1990 Ankara plan introduced "a new planning understanding and process which should be considered as a structure plan." (Bademli cited in Günay, 1988a: 39, Bademli, 1987: 109). According to Günay (1988a: 39) "Actually it was a structure plan because it tried to give the town a new shape and for the first time formulated many of the problems the previous plan neglected." This plan was different from previous plans as new development areas started to develop out of the surroundings of inner city (Ulus and Kızılay). It was seen new cooperative Mesa and Oran development in the southern part of the city on Eskişehir road. This was first that offered big residential districts in the west of Ankara two major corridors towards east in the plan, the northern one İstanbul Road, and the southern

one Eskişehir road. Batıkent and Eryaman developed on the north axis (İstanbul road) and Çayyolu on the south axis (Eskişehir road), which is the major study area of this thesis.

5.2. Residential Development in urban fringe of Ankara

In Western countries the development of new residential districts are used a solution to prevent unhealthy development in cities. The concept of suburbs has appeared which means beyond the city, in the light of this solution. Suburbs are compact settlements which try to form an urban life integrating residential and social activities inside (Trancik, 1986).

The idea of New Towns was first exposed by Ebenezer Howard in 1898 as Garden Cities. The Garden City movement has influenced many suburban developments in many countries. CIAM principles of town planning also mentioned the idea of new towns in 1950s. The concepts of sun, space and greenery of CIAM's principles intended to built environment with physically improved. Later in the 1950s and 1960s the new town ideas are criticized for the lacking of character and being placeness.

The residential areas developed in the fringe of Ankara have a history that dates back to 1970s. The scarcity of land in the core of the city is one of the most important factors for this attempt. Cooperatives, local administrations and private organizations are the improvement actors of large suburban areas. Before 1970s there are also other interferences in building new towns such as; Bahçelievler in 1934. However, big scale housing projects are on the agenda since 1970s. Batıkent, Eryaman and Çayyolu are three of these large scale new residential areas.

5.3. South-Western residential district along Eskişehir Road: Çayyolu

The district locate in the south western side of Ankara has developed in 1980s while new housing projects are adapted to the initial one. The Çayyolu district has two parts which are under the authorization of two municipalities; Çankaya and Yenimahalle. Due to implementation period, the area consists of differentiated mass housing projects such as Konutkent, Koru Sitesi and Çayyolu.

Konutkent project was realized in two stages in 1990s. In the plan there are low-rise building units and apartment block, covering approximately 2800 dwellings. Koru Sitesi project which is another that developed along the Eskişehir Highway, similarly consists of different types of building units covering 1160 dwellings. Çayyolu Project, on the other hand, was initiated in 1985 in accordance to master plan decisions. It is planned in two stages, which both contains low-rise and high-rise building blocks. The first part of the project is nearly accomplished, however; in the second part the construction activities still go on. At the end of the project, it is intended to provide 4735 low-rise housing units and 9096 apartment blocks.

As it is stated above, Çayyolu district covers a large area. Since the building and construction activities are not finalized yet, in this thesis, empirical study we have concentrated upon a sector delimited the Çayyolu district with İncek-Çayyolu road. This pathway is one of the main arteries that connect separated districts in Çayyolu. Moreover, it constitutes an edge between southern and northern part of the district. The boundaries of the area defined by legibility elements are shown in previous section.

5.4. Legibility and Imageability Analysis of Çayyolu District

Legibility and imageability analysis covers the legibility elements identified in Chapter 3. Firstly, the five legibility elements; path, node, edge, district and landmark will be figured out for Çayyolu district and secondly the perceptual

elements and their relationships, namely form qualities, are defined within the study.

5.4.1. Legibility Elements

5.4.1.1. District

The district can be defined according to spatial, geographical and visual features of the area. In the area, geographical features can be observed as the most significant separators. Furthermore, the edges and nodes also create these separations as a reference. In the study area, since the whole development has partial configuration, the districts can be determined due to these factors. Based on these arguments, six main districts are identified in Çayyolu.

- District 1: Konutkent 1 and 2, due to their similarities in form and surrounding housing developments due to their proximity to Konutkent can be grouped in district 1. This part is also separated from the rest by its geographical features.
- District 2: This part in the whole has not a definite or well- defined boundary however, the main road in Çayyolu district (8^{th} street) is a great determinant for this sub district. The district consists of housing blocks along and around the pathway. Geographical and physical features as edges shape the form of the district.
- District 3: Similar to district 1, the proximity of elements is perceived as they constitute a whole. Koru Sitesi, Beyazgül Sitesi and Doğa Sitesi constitute the district 2. On the north, the Eskişehir road, on west and east geographical features and on the south an inner pathway defines the district boundary.
- District 4: This part is quite big while comparing with others. The residential areas situated around Ümitköy are considered within this district. Again the geographical features are important in identifying this district.

- District 5: The sub-district namely Beysukent, which consists of a number of cooperatives, is the fifth part in the whole.
- District 6: Angora Evleri can be differentiated from other districts by its whole structure and location. This district and district 5 are surrounded by geographical edges that make them separated in whole.

5.4.1.2. Edge

Edges are the continuous elements which define boundary between two areas. Eskişehir Road is the strongest edge which separates the area from the north part. The edge is quite legible that everyone remembers the linearity of this edge. The road is also generally known for its special role as main distributor road. Çayyolu district is connected to the city center this continuous element thus the sense of its existence is quite clear.

Continuity and visibility are crucial for strong edges. They do not always separate areas but also join them. The 8th street in this sense is a connector between the northern and the southern parts of the districts. The path with its strong continuity and distinctive elements on the path is a separator and at the same time a connector. The pathway newly built between Angora Evleri and Konutkent 2 is an edge that separate the residential district located along two sides of the road. Although the road has not aesthetic or special qualities, it is very visible. That is because it is a high-speed artery and do not allow pedestrian cross.

Edges are often paths in the study area, but geographical features can also be considered as edges. The hill between Beysukent and Ümitköy sub-districts is a geographical boundary between these two parts. Again there is a small hill in the northern part of Ümitköy where the Nato Radar Station is situated. This area draws a boundary for surrounding residential areas.

5.4.1.3. Paths

According to Lynch (1960) paths are the channels where the movement takes place. As it is mentioned in the previous chapter, paths are the most significant and dominant elements for mental maps. The paths in the study area are marked in the map below. However, it is possible to categorize paths according to their importance in the network. In this context, it is for sure that the first degree path in the area is Eskişehir road that provides services for the whole area. Inside the district Çayyolu, 8th street which connects the sub-districts with each other from Konutkent to Ümitköy is the secondary pathway. The pathway, which connects the districts Beysukent, Angora Evleri and Çayyolu 1 is another secondary path for study area. Paths that create entrance and provide services from the main Eskişehir road are also important for the area. The third and lower degrees of paths are located inside the sub districts.

5.4.1.4. Nodes

Lynch (1960) defines nodes as spot points in an urban environment. They might be either junctions of transportation modes or places where the movement breaks. In this sense, squares or parks along the movement line, junctions are called nodes. Due to this definition, in the study area there are several spot points with different characteristics.

The entrance points of sub-districts – Konutkent, Koru Sitesi and Ümitköy - from Eskişehir road can be called as important nodes for observers. That is why the perceptual importance of these locations arouses observer's attention and the sense of arrival to a residential district. In other way, these points are transitions from a highway to streets.

Dr. Ali Sezen Park, Atapark, Cumhuriyet Park are some nodes along the 8th street where the movement breaks. Although there is no squares the area in front of Arcadium and Tansaş Shopping Centers draw a visual square that it is a focal

point for whole district. Similarly, the places around Galleria Shopping Mall and surrounding commercial activities build nodes for observers.

Another important node for the district is actually a part in the whole; Çayyolu Village. The sub-district is a junction point not just for its location on the main 8th road, but also its distinctive physical features and commercial activities. Çayyolu Village is an old settlement that it still preserves its location inside residential developments in Çayyolu district. Before the recently developed commercial activities in Ümitköy and Çayyolu such as Arcadium Shopping Center, the small shops in Çayyolu Village have attracted users. However, it is still a focal point for observers in Çayyolu district.

5.4.1.5. Landmark

Landmarks are the reference points for observer in movement, dissimilar elements in unity and attraction points in an imageable environment. In the study area, the landmarks are limited by building with special activities. Landmarks in the area are differentiated by their distinctive physical forms. In this sense, in Çayyolu, Arcadium and Tansaş Shopping Centers and Galleria and surrounding small shops are landmarks and focal areas. These buildings have identifiable character from outside.

Figure 20: Schematic representation of legibility elements in Çayyolu district
Source: Personal rendering

The nodes and landmarks in the study area are situated along the continuous pathways. In Figure 20 it is clearly observed that in Çayyolu the nodes and landmarks are not limited by just a unique building, but there is a tendency to create common places or streets. The 8th street, which is the main distributor road in district, has a characteristic of social space with its commercial centers, small restaurants and parks on them. However it is hard to talk about a rhythm in salient elements that attracts observer's attention.

It can be concluded that there are observed legibility elements in the district of Çayyolu. However to call a place legible, the place should support form qualities. The next part focuses on the analysis based on guidelines mentioned in the previous chapter.

5.4.2. Form Qualities

5.4.2.1. Low level order – Structural Complexity and Clarity

In building legible environment simplicity or complexity of low level order plays a significant role. As it is mentioned in previous Chapter, while the complexity level increases the level of legibility decreases in terms of way-finding and orientation. The figure-ground map shows that Çayyolu district consists of varieties of forms which make the pattern complex (Figure 21). For the whole district it is hard to say that an order is provided and a legible environment is obtained.

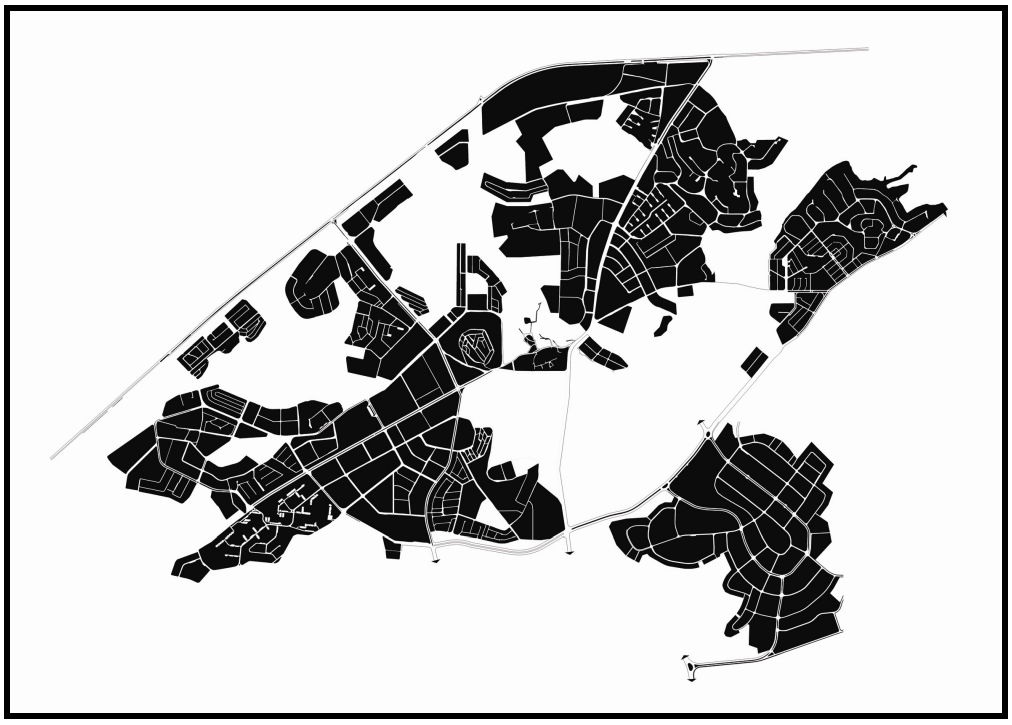


Figure 21: Figure – ground representation of Çayyolu district
Source: Personal rendering

The pattern organization consists of both organic and regular structures. Çayyolu Village has organic and complex structure. Other parts which are developed by plans have a certain level of regularity and geometric relations. However, orders do not always have to be in the form of regularity. Here the Gestalt laws of form

perception should be remembered while talking about order. Laws of similarity and proximity are two of them which provide perceivable and recognizable relationships. Based on these issues, for general structure of Çayyolu it can be concluded that varying forms in pattern make the structure complex and illegible. However, there are differentiations in structural simplicity of sub-districts in Çayyolu. There are simple structures with regular plans or predominant systems, and complex patterns which is not legible for orientation and way-finding.

In this sense Angora Evleri has a distinctive pattern which is simple and predominant. The order is simple that observer can easily perceive and there is a geometrical organization based on curves (Figure 22). The similarity in building lots (blacks) and paths (whites) depict easily perceivable imaginary geometry. The pattern consists of loops. According to structural organization the pattern is legible and the plan configuration is easy to understand and perceive.

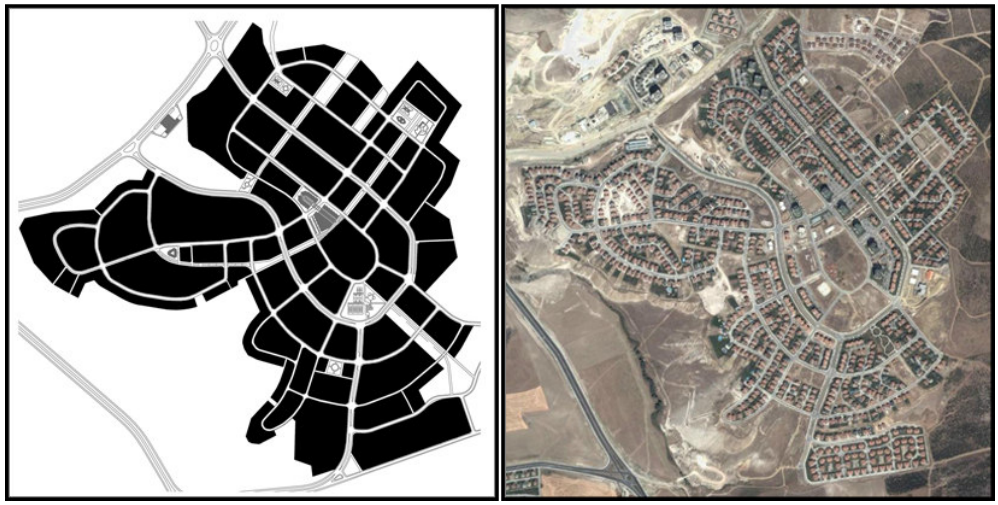


Figure 22: Figure – ground representation Angora Evleri and aerial photograph
Source: Personal rendering, Aerial photograph Google Earth, 2007

Konutkent 2 has a distinctive character with its order provided by similar units. The structure of the pattern has perpendicularities in geometric sense different from Angora Evleri. The similarities in high level order units and their proximity strengthen the frame of reference of the area and it is separated from its surroundings (Figure 23). The other parts of Konutkent district have regularities.

However, based on Gestalt laws there are varieties of two and three dimensional elements which decreases the legibility of the environment.

Figure 23: Figure – ground representation Konutkent 2 and aerial photograph
Source: Personal rendering, Aerial photograph Google Earth, 2007

According to pattern organization Koru Sitesi has geometrical and regular pattern with the dominance of perpendicularity. The high level order draws structural organization, which is legible with similar units.

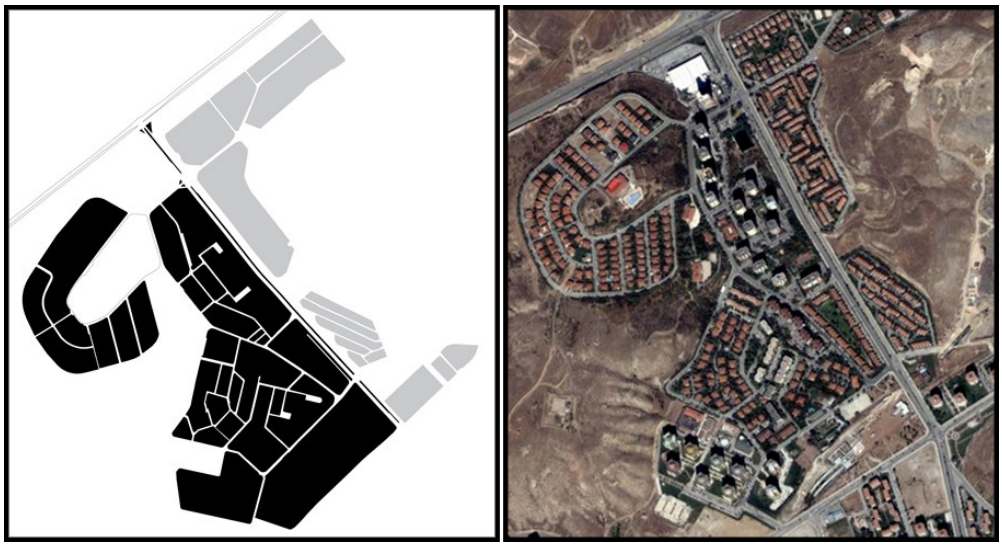


Figure 24: Figure – ground representation Koru Sitesi and aerial photograph
Source: Personal rendering, Aerial photograph Google Earth, 2007

Due to figure-ground and solid-void maps, Beysukent has two different organizations according to structural pattern. One is more regular which has geometrical organizations and perpendicularities. In the other side, on the other hand, the pattern is consisted of loops and cul-de-sac. It is hard to mention

perpendicularities, however, the pattern still simple. In the Figure 25 it is shown two different patterns in Beysukent. Based on structural simplicity the plan configuration of Beysukent can be evaluated as legible.

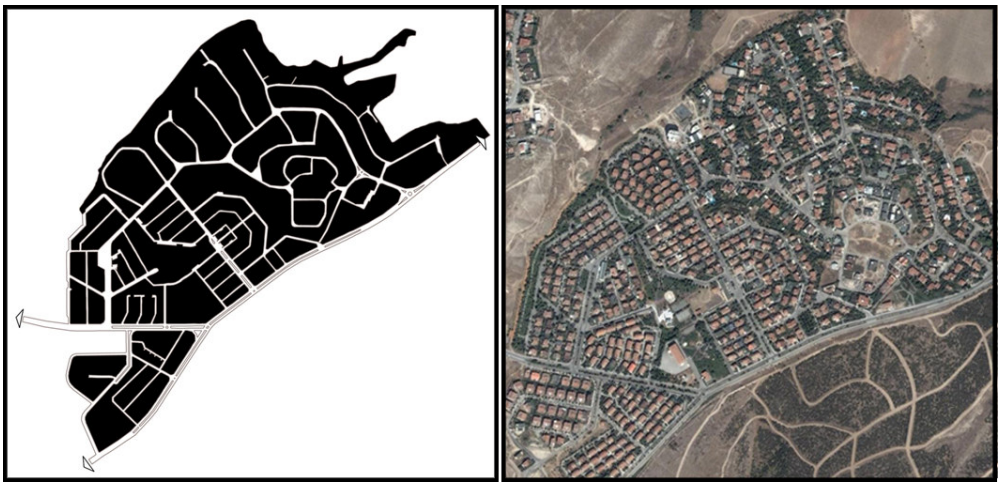


Figure 25: Figure – ground representation Beysukent and aerial photograph
Source: Personal rendering, Aerial photograph Google Earth, 2007

In Ümitköy and Çayyolu 1 the picture is getting more complex. Although both these two areas have been developed according to the plans, it is hard to talk about wholeness in two dimensional spatial organizations. The solid- void maps show that the structure developed is based on similar building blocks on a so-called grid iron plan (Figure 26 and 27). However, it is perceived that units (consisting of similar building blocks) are attached one to another. As it is mentioned above the area do not display a whole structure because of the lack of definite boundaries and the unity of elements. Although the pattern does not contain undirected paths the irregularity of structure makes the district less legible than others. Moreover, the high level order has varieties, which do not configure an order. Nevertheless, it is important to remember that the structural complexity and simplicity is not the unique indicator for a legible and imageable environment. So that, other determinants should be considered.

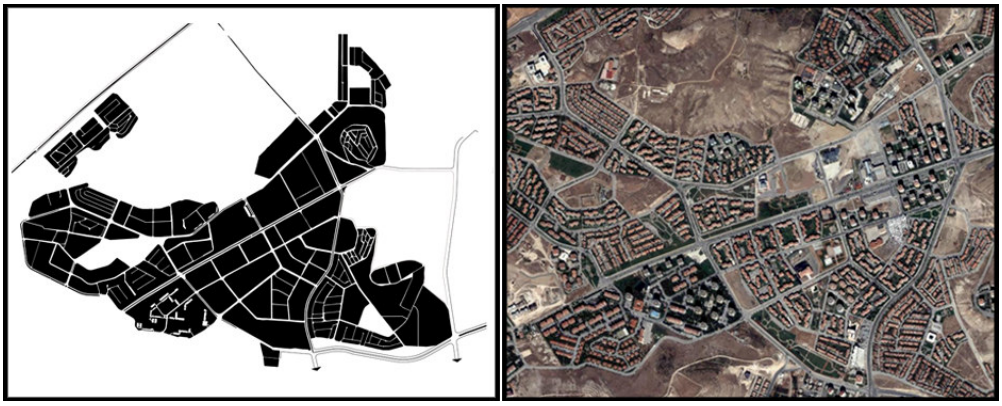


Figure 26: Figure – ground representation Çayyolu 1 and aerial photograph
Source: Personal rendering, Aerial photograph Google Earth, 2007

Figure 27: Figure – ground representation Ümitköy and aerial photograph
Source: Personal rendering, Aerial photograph Google Earth, 2007

5.4.2.2. Diversity in High Level Order

The diversity in built environment provides more information, which increases personal attachment to a place. Moreover, diversity in sequential elements (edges) plays an important role in way-finding and orientation. However, again the level of diversity has diverse effects on human psychology. Monotony and chaos are two diverse effects of different level of diversity. In such perspective, in Çayyolu, the diversity in high level order causes quite chaotic environment for users. Since the diversity has limited within building sites, it is hard to talk about

spatial unity in the third dimension. Figures and photos below from the main road in Çayyolu district show the changes in third dimension.

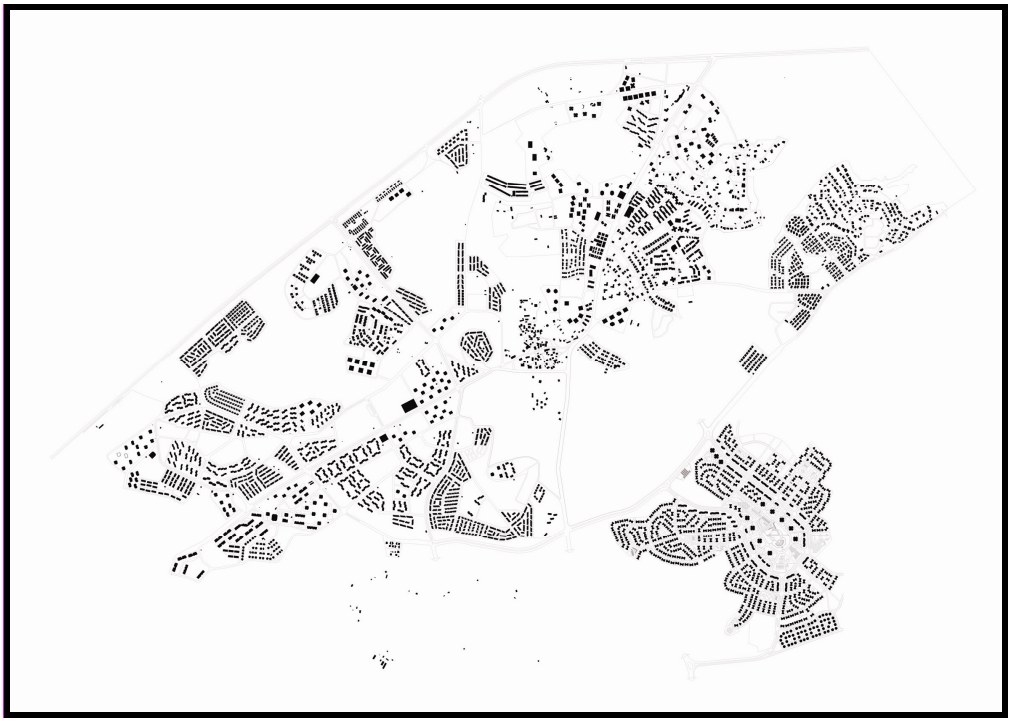


Figure 28: Solid-void representation of Çayyolu district
Source: Personal rendering

Figure 29: Solid-void representation of Çayyolu district
Source: Personal archive

When the sub-districts are considered, there are again observed differences. Since the diversity level is an intangible parameter, a comparative analysis is more reliable while talking about three-dimensional diversity. In this context, parts that are developed as a whole structure have diversity in themselves. The three-dimensional variety provides different experiences for observers as well as this structural organization offers different places. The diversity in high level order is crucial for self orientation and way-finding. The observer needs to catch dissimilarities in urban environment to draw the general structure refereeing these dissimilarities in unity. The figures below show diversity in Konutkent 2, Koru Sitesi and Angora Evleri. All these three districts have diversity in building heights, forms besides similarities which prevent observer to fall into chaos. Thus it is important to recall that while analyzing these three districts, it is important to remember that diversity should be evaluated within the frame of unity.

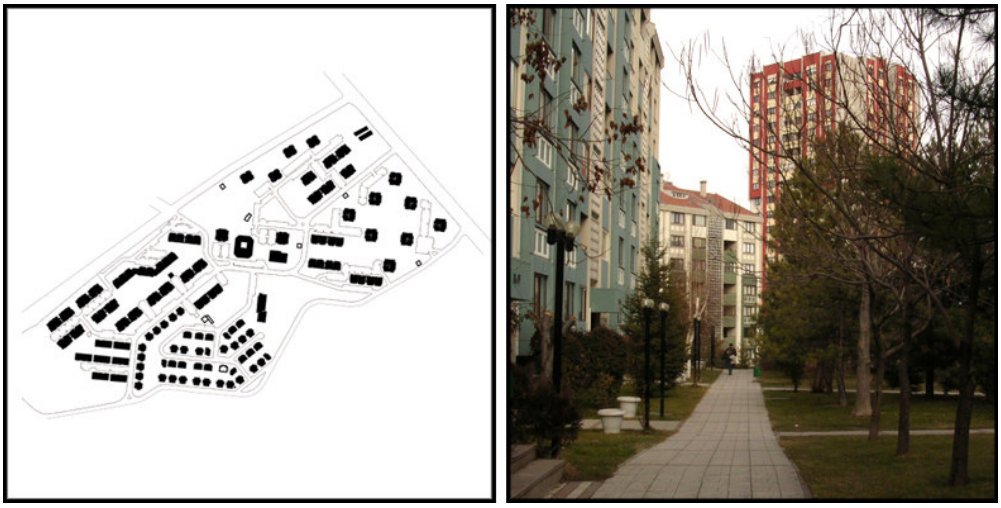


Figure 30: Solid-void representation of Konutkent 2
Source: Personal archive

Figure 31: Solid-void representation of Koru Sitesi
Source: Personal archive

Figure 32: Solid-void representation of Angora Evleri
Source: Personal archive

Beysukent, another district, contains of a number of cooperatives and individually developed areas. The area with its clear boundaries shows the character of a whole. However, dissimilar elements are limited indicating the low diversity. There are small differences that make orientation difficult.

Figure 33: Solid-void representation of Beysukent
Source: Personal archive

In Çayyolu 1 and Ümitköy, the diversity of three-dimensional objects is limited by differences between the forms of building blocks in different lots. That means, in the whole structure, although it is possible to observe the variety of differences the uniformity of building lots is dominant. This situation makes the district illegible in terms of diversity. That is because the unity can not be obtained by differentiating high level order in lots. While moving in the area, an observer can not achieve to locate forms mentally. Moreover, the observer can not orient himself by a reference point. The 8th street and landmark on this pathway are the only reference points for observers. The district around the pathway, however, has not distinctive characteristics for creating imageability.

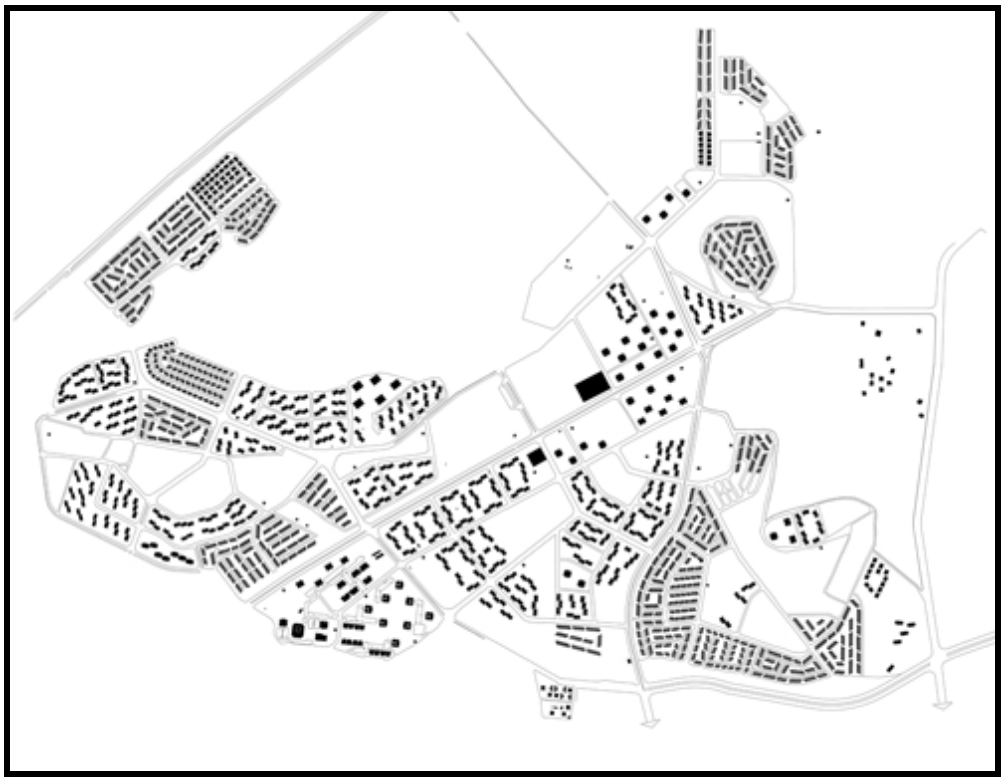


Figure 34: Solid-void representation of Çayyolu 1
Source: Personal rendering

Figure 35: Photographs from Çayyolu 1
Source: Personal archive

For Ümitköy the situation resembles to Çayyolu. Although there are parts with special characteristics that observer can perceive, the whole is not legible in terms of diversity. In the district, the diversity is too high that there exists chaos (Figure 36 and 37). There observed variety in form, color and building height.

The pathway with variety of focal points is quite legible for observer in way-finding and orientation, but districts around the pathway are not legible. Inside the districts, there observed repetition in junctions of paths and lack of spatial differentiations which are significant for way-finding and orientation. Landmarks and focal points are also absent. Since legible districts should be imageable and a nested hierarchy is needed, designing wholes becomes significant. The photos and figures below show the existing situations in these districts.

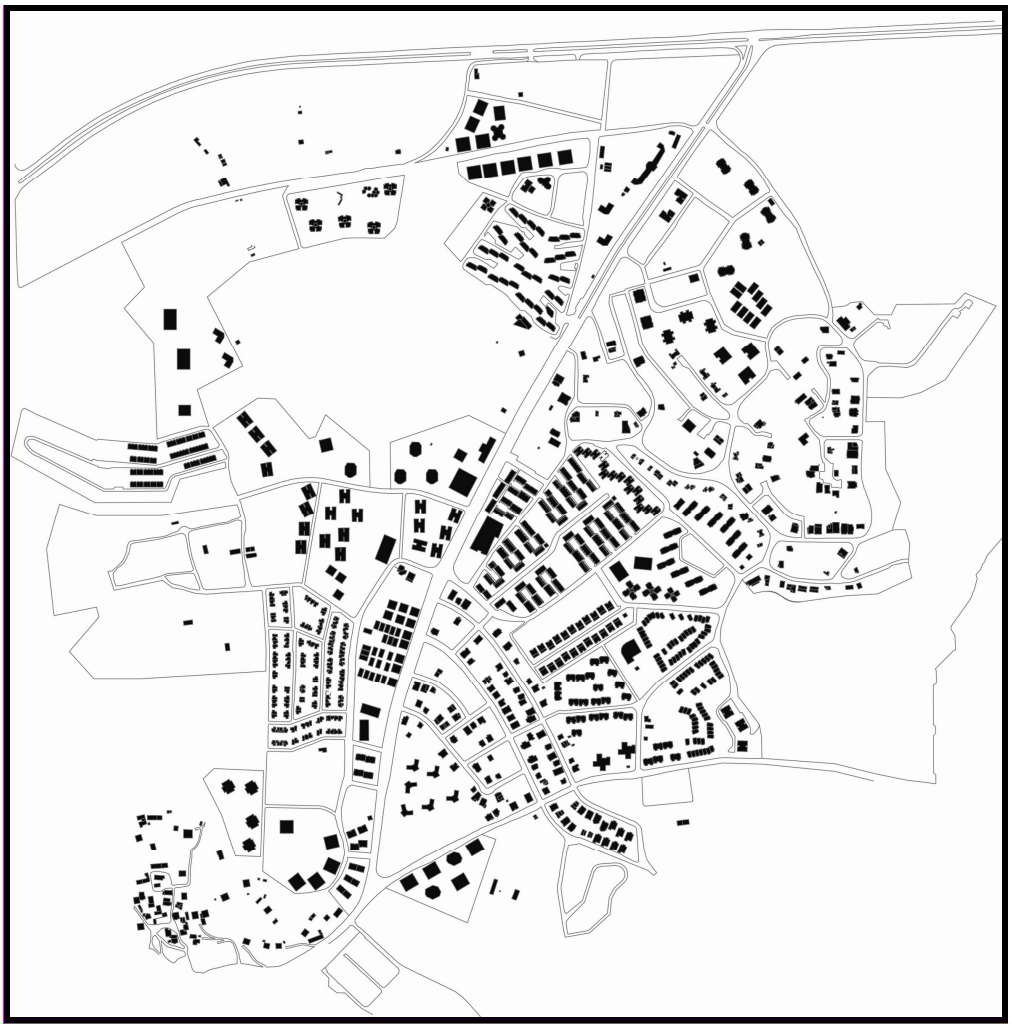


Figure 36: Solid-void representation of Ümitköy
Source: Personal rendering

Figure 37: Photographs from Ümitköy
Source: Personal archive

5.4.2.3. Continuity of sequential elements and rhythm in salient elements

Continuity in pathways that provides enables people to perceive the whole structure and relate the spatial elements. For clear way-finding and orientation without falling into confusion should be essential in design process. In urban environments paths and edges are continuous elements. These continuous elements should be defined with salient elements. In way-finding and orientation

these salient elements arouse the attention of an observer when the movement gets monotonous. This is what Cullen's defined by segments and sudden jerks.

In the area, there are clearly defined pathways with landmarks and nodes. These physical features along the main pathways make legible environment for observers. However, these conditions are not valid in secondary and lower pathways. This situation resembles the legibility of Atatürk Bulvarı, one of the main distributor roads in Ankara, and illegibility or the lack of imageability of districts along the pathway. Çayyolu district has main road of 8th street starting from the Ümitköy entrance from Eskişehir Road and continuing up to Konutkent, which guides observers by nodes and focal points. Here, it can be observed segments defined by landmarks and focal points along the pathway (Figure 38).

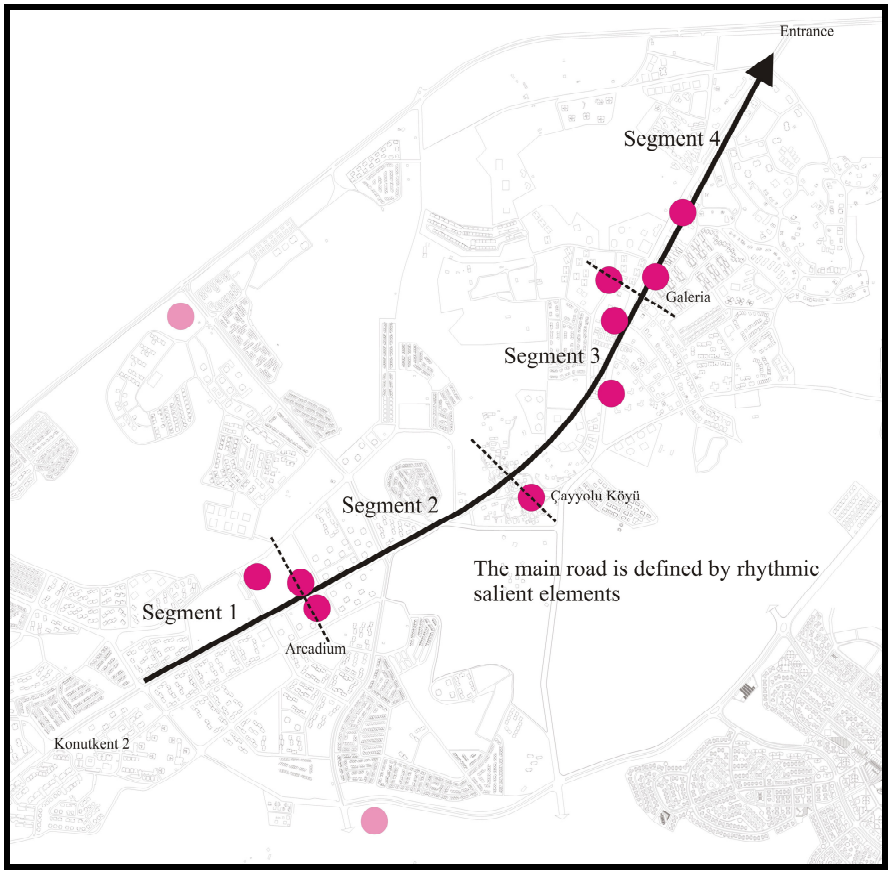


Figure 38: Segments in pathways, Çayyolu
Source: Personal rendering

Figure 39: Continuity of pathway, 8th street in Çayyolu
Source: Personal archive

For whole area it can be noted that there exists continuity in pathways but the continuity should be taken up with differentiated edges and rhythmic focal points. The main distributor, as it is shown in Figure 40, is continuous and defined by nodes and landmarks. However, the situation changes inside the sub-districts. In Ümitköy, the pathway organization is complex but paths are continuous, although the definition of paths as segments with nodes and landmarks is not sufficient enough. The nodes are limited with repeated (similar) path junctions which do not provide clues for observers. It should be remembered that focal points not always have to have commercial or attractive activities. With hierarchical organizations which are define in the previous section, paths and edges should orient observers. The figures that show focal points and pathways in Çayyolu 1 and Ümitköy demonstrate continuity of salient and sequential elements.

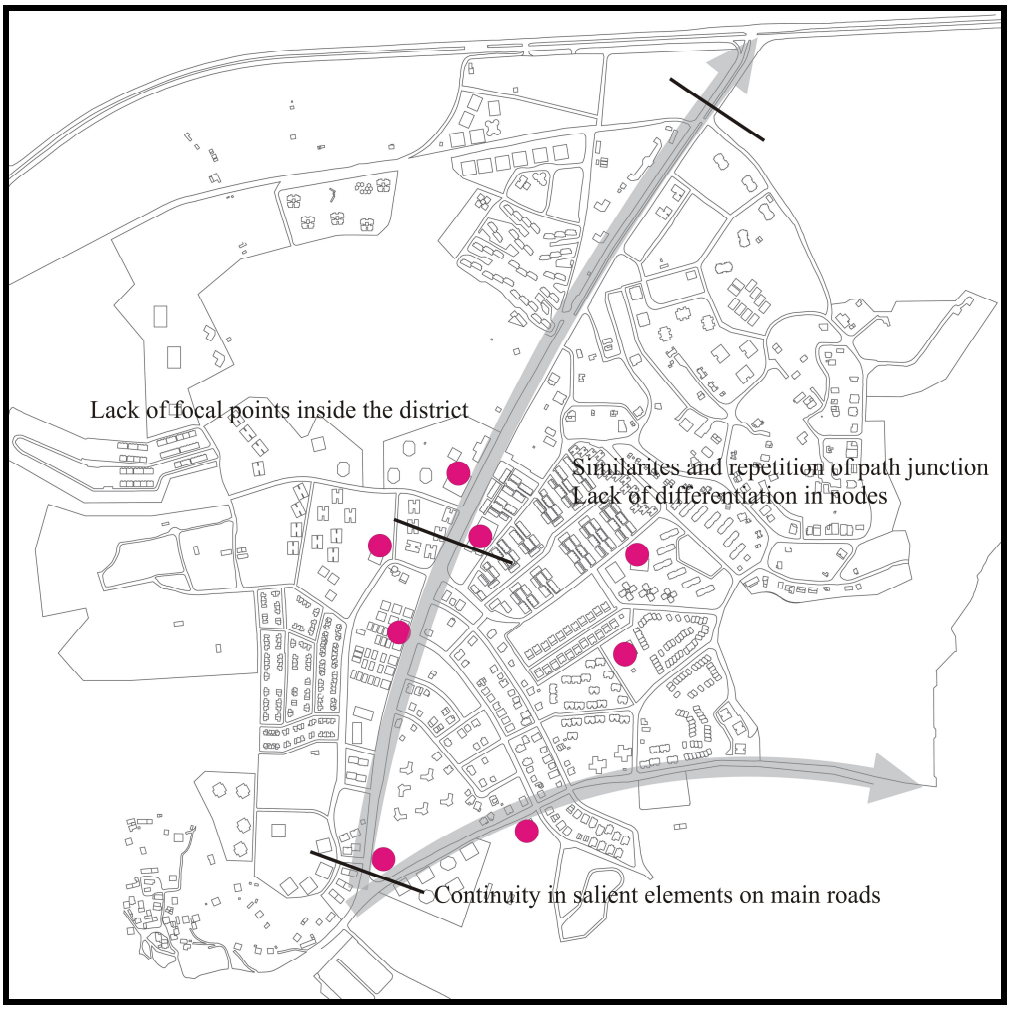


Figure 40: Segments in pathways, Ümitköy
Source: Personal rendering

In Beysukent, the continuity in the main roads is observed but, endless paths with similar degrees of access roads (cul-de sac) create adverse effects for observers. The paths are defined by similar edges and diversity is limited, which decreases legibility decreases of the sub-district. There is a lack in differentiated focal points defining paths. In the area repetition in nodes (path junctions) causes an illegible

In Konutkent 2, Koru Sitesi and Angora Evleri the nodes clearly define pathways and places. Moreover, diversity in edges help observer to perceive differences and spatial characteristics. Although Konutkent 2 and Koru Sitesi are small districts, the areas are rich in terms of focal points. Moreover, the visibility of spatial elements through the urban layout is quite clear.

The sequential elements should be continuous, but they should also have to enable clear way-finding between starting and end points. In the existing situation the main road, 8th street, has a starting point which is defined by the node of Ümitköy entrance. However, it is hard to describe an end point for the path. These cause confusions for observers, since an observer needs to perceive the environment easily.

5.4.2.4. Hierarchy of paths and nodes

Hierarchical definition of movement system has a special influence on way-finding. The monotony in the degrees of pathways decreases the legibility of the environment that an observer can not feel the differentiations. In Çayyolu case study, the hierarchical degrees of pathways are not enough for clear orientation. In the area, the main pathway is the first degree road which connects whole structure. As it is mentioned in the previous qualities the 8th street with main activities and landmarks is the most significant pathway. Beside 8th street, there is another path which has a first degree due to its width. This is a newly developed road which connects the district Çayyolu and İncek. In the case study area this path is an edge that defines the boundary.

The secondary pathways can be defined as the connectors of sub-districts to Eskişehir road. These paths start from the entrance of the district from Eskişehir road and are connected to the main road; 8th street. In the figure below secondary pathways are shown. Up to that point it is possible to observe a hierarchical structure. However, from that point on the hierarchical degree of pathways decreases and the repetition of access roads causes the unsuccessful way of achieving legible environment.

In the case of Beysukent the pattern organization, which is a modified grid, reflects the same type of street connections in each direction and with similar width in paths. Similarly in Ümitköy, there is an absence in the regularity of pathway organization and the hierarch among the paths. The absence of

hierarchical definition in these districts has adverse effects on legibility of the environment. Moreover, the lack of diversity in these repeated paths and distinctive elements along the paths affect negatively the attractivity of these places. It is important to note that all these qualities should be considered in relation to each other; not just one quality can determine the legibility and imageability of an environment. Thus, while talking about hierarchy, the importance of three-dimensional physical elements needs to be considered for creating the sense of orientation.

Figure 41: Hierarchical definition of paths in Beysukent
Source: Personal archive

Figure 42: Hierarchical definition of paths in Ümitköy
Source: Personal rendering

In Çayyolu 1 a hierarchical organization can be observed, although it is not rationally designed. In this sub-district the similarity in street connections decreases the legibility of environment. On the other hand, in Konutkent 2, Koru Sitesi and Angora Evleri rationally designed hierarchical patterns exist. For all these three sub-districts, in terms of hierarchical definition the urban patterns that have been created are legible. The figures below show the difference in hierarchical definition of sub-districts.

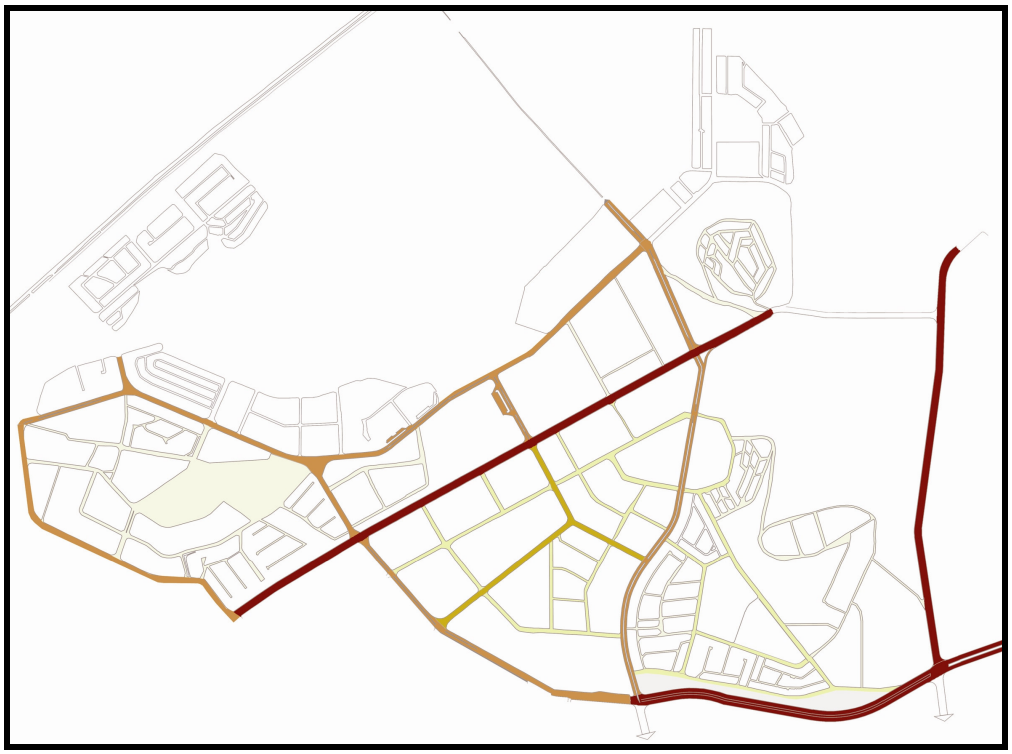


Figure 43: Hierarchical definition of paths in Çayyolu 1
Source: Personal rendering

5.4.2.5. Wholeness – Frame of Reference and Unity – Harmony

Since definite boundaries enable people to draw the mental map of one district and orient themselves within the whole, a legible environment should have a recognizable and perceivable area. According to Gestalt psychology, the law of area and closedness as well as the proximity of physical elements provide the perception of the structure as a unified whole.

The name Çayyolu is actually the name used for the projects developed in 1985s. However, today for the citizens of Ankara Çayyolu district is such a big district situated on the south west side of the city. Thus the project boundaries are not important primarily in the discussions on the legibility and imageability of the district, but there are some geographical and physical features that define the boundaries of this district. For example Eskişehir road is a significant edge and also boundary for the district, although beside this path it is hard to find some

other clear cut boundaries. Furthermore, the pathway organization does not enable to perceive the district as a whole. Since understanding the whole is crucial for orientation and way-finding it can be stated that the whole district is not legible in terms of wholeness. One of the main reasons of this situation is development of this area with partial plans, which are not well connected to each other. It is known that the south-west district has developed as small districts that are based upon different types of organizations that ranges from private housing developers, housing cooperatives and Mass Housing Development Administration and Emlak Bank.

In the area it is clearly observed that there are units which are developed as a whole. Konutkent, Koru Sitesi, Angora Evleri are three parts differentiated by their wholeness and boundaries. These districts draw the frame of reference by pathway configuration inside the district, the similarity and proximity of three dimensional objects (based on Gestalt laws of perception) and additionally some geographical features draws the boundaries. Beysukent different from these three districts has developed by variety of cooperatives but it is perceived as a whole structure by its clear and well-defined boundaries and proximity of building blocks.

In Çayyolu 1 the situation is quite different. On the north side, the path that connects Konutkent to Beysukent draws a boundary (edge) for the area, but the other sides are open that an observer cannot perceive the wholeness. Therefore it can be said that the area has not a definite boundary and it is illegible for observers. Ümitköy seems to have similar qualities with Çayyolu that developments are base on building lots. In such a development the proximity and similarity of buildings which provide perception as a whole, can be obtained just in building lots but not in general. Moreover, the residential developments go further till the end, up to empty areas.

Figure 44: Similarity and dissimilarity in high level order, Çayyolu district
Source: Personal archive

Unity represents physical harmony among similar and dissimilar elements within a whole. An imageable environment should support unity to increase the sense of pleasure and meet aesthetic needs of observers. As it is stated in the previous chapter, the unity of form, color and materials strengthens compatibility in third dimension. Moreover, uniformity in terms of scale, space and building form and technique can be defined as the indicators of compatibility of districts.

The sub-districts inside the whole are differentiated in terms of unity and wholeness. In this sense, Angora Evleri has a definite boundary visually and physically with its location and unity and harmony of physical elements. In the area there are two main types of building units used for residential purposes dissimilar elements for commercial activities. For unity there should be more than one issue that provides compatibility in whole structure. In Angora Evleri, variety in three-dimensional forms provides unity with similarities in texture, color and construction techniques.

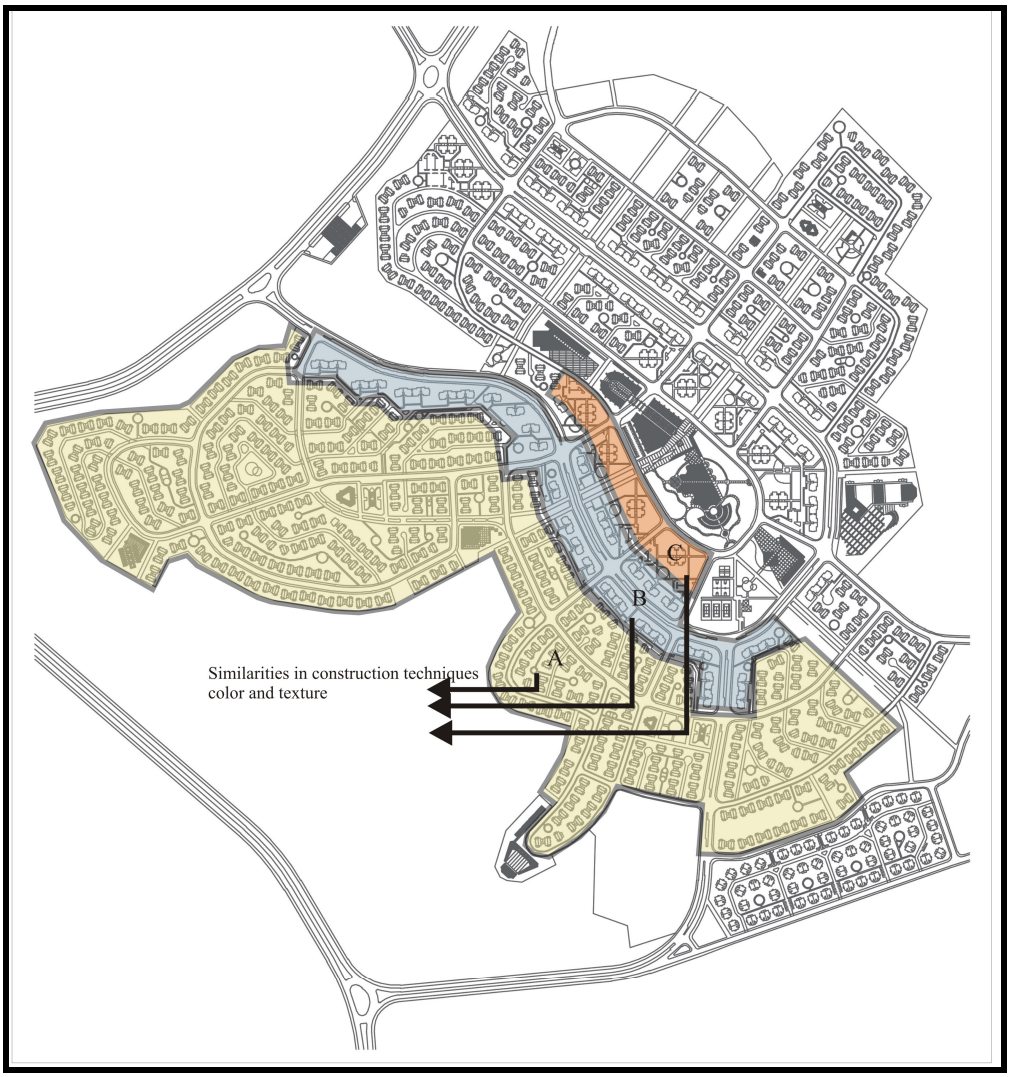


Figure 45: Unity in Angora Evleri
Source: Personal rendering

Similarly Beysukent shows unity in structural pattern. In Beysukent, there are different cooperatives with different types of housing blocks. However, for Beysukent it can be said that it is an imageable place with similarities and harmony among groups of houses. The figure below is the representation of similar groups and dissimilar elements in Beysukent. Since the similar elements are perceived as a whole according to Gestalt laws of perception it can be said that there are similarities in three dimensional physical objects. The groups are not totally separated from others, but similarities in building heights provide unity.

Thus there exist a distinctive characteristic while thinking the whole district. In this sense Beysukent is imageable in terms of unity and wholeness.

Figure 46: Unity in Beysukent district
Source: Personal rendering

These two examples namely Angora Evleri and Beysukent can be differentiated since they have separated by geographical features. But it is certain that there exist harmony for these two districts. Konutkent 2 in sub-district of Konutkent is another example that draws a visual frame for observers. The area has unity and harmony in three dimensional elements. Mesa Koru Sitesi is another example of unity. These two examples consist of variety of forms within a whole structure.

In other districts on the other hand, it is hard to talk about a general unity. Both in Çayyolu 1 and Ümitköy there exists uniformity in building lots, but harmony and compatibility are not supported. In the case of Ümitköy, there are parts which provide unity in terms of similar three dimensional units. However, there are also several areas developed as building plots. Therefore it is hard to talk about a general unity for district of Ümitköy. The figure below shows the unity and uniformity of structural pattern of Ümitköy. Since harmony represents successful integration of different physical elements, it is impossible to mention about harmony in such places where only uniformity exist. In Figure 47, 48 and 49, the uniformity in building lots in Çayyolu 1 is presented.

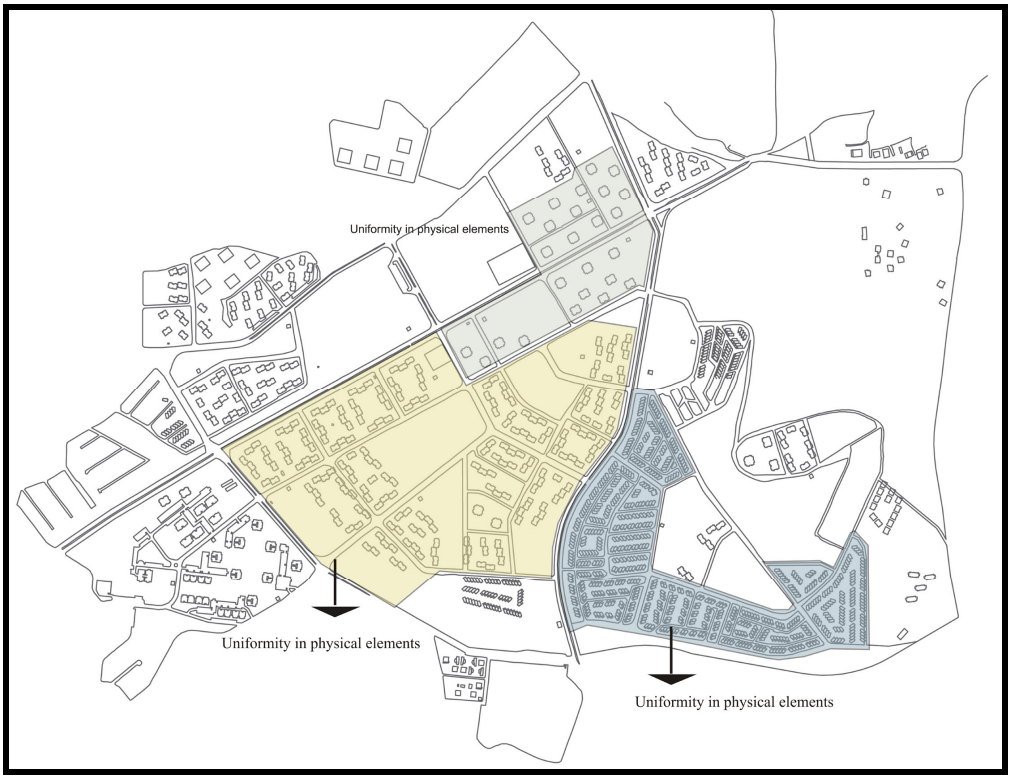


Figure 47: Uniformity in Çayyolu 1
Source: Personal rendering

Figure 48: Uniformity in building lots, lack of unity: Çayyolu
Source: Personal archive

Figure 49: Too much diversity decrease the unity: Ümitköy
Source: Personal archive

5.5. Conclusive Remarks

Çayyolu is a newly developing district that is located on the south-west part of the city of Ankara. Although the district has developed in different stages, the area in total is called the district of Çayyolu. In the district the legibility analysis shows that there exits all five legibility elements. The whole district contains of six main sub-districts depending on the legibility elements; Konutkent, Çayyolu 1, Koru Sitesi, Ümitköy, Beysukent and Angora Evleri. In this thesis, we have limited are study with the İncek pathway, since the construction process is still continuing in

the south part of the district. Thus, the analysis based on form qualities listed in Chapter 4 is completed for whole district and six sub-districts.

The analysis covered five main legibility and imageability components:

1. low level order – structural complexity
2. diversity in high level order
3. continuity in sequential elements and rhythm in salient elements
4. hierarchy in pathway configuration
5. wholeness, unity and harmony

The findings of the study show that Çayyolu does not have all legibility qualities. The general pattern of district has a complex structure with varieties in two and three dimensional elements. Moreover, the pattern has regular and irregular parts which decrease the legibility of the district. Inside the district on the other side, there are differentiated structures. According to the findings Ümitköy is the most illegible part with its complex structure and Angora Evleri and Konutkent 2 have simple orders which are easily perceived by observers. A3ccording to diversity, the parts in the whole structure are again differentiated according to the level of diversity in three dimensional environments. Angora Evleri, Konutkent and Kou Sitesi are legible parts in terms of variety in building heights, forms and structures but similarities in textures and colors. Therefore these three sub-districts form wholes which are very important for legibility and imageability. The other sub-districts on the other hand constitute uniformity in building lots and absolute difference among the lots. It is for sure that wholeness and unity is crucial for legibility and it should not be mixed with uniformity.

The pathway configuration of Çayyolu is quite complex that the orientation and way-finding are difficult. The continuity and determinants on paths, however, are legible in primary roads. The distribution of salient elements creates a rhythmic organization which provokes observer attraction. On the contrary, the nested hierarchies in these nodes do not carry on in all sub-districts. This situation again causes an illegible environment for observers. The hierarchy in path configuration

is again definite in primary streets, but there is an absence in sub-districts. Moreover, the repetition in path junctions' causes monotony and the sense of lost for observers.

Table 5: Form qualities in Çayyolu district

Low level order Structural complexity	Pattern organization : regular and organic The structure has varieties of forms The structure: COMPLEX ---- ILLEGIBLE
Diversity in high level order	High level order: monotony / diversity / chaos The pattern has variety of three dimensional objects whish are formed by repetition of building blocks Too much diversity: CHAOS ---- ILLEGIBLE
Continuity and Rhythm	Continuity in pathways Spatial definitions in primary paths Lack of noticeable differences in secondary and lower paths Lack of saptial features: UNDEFINED ---- ILLEGIBLE
Hierarchy	Hierarchical definition higher degree paths: LEGIBLE Lack of hierarchical definition inside sub-districts: ILLEGIBLE
Wholeness and Unity	Uniformity in building lots Lack of unity and harmony in whole structure Too much variety and lack of relationships among them Lack of characteristic distinctiveness NOT LEGIBLE and IMAGEABLE

In conclusion the analytical studies show;

1. Çayyolu district has a complex structural pattern in whole that decreases legibility of environment, however, there are parts that has simple pattern which makes them easy to perceive
2. The diversity in high level order is differentiated in the whole structure but it can be said as a conclusion that too much diversity is observed in the

district and this decreases imageability and legibility of the district. Thus chaos is observed in the third dimension.

3. The continuity in pathway is provided, but the segments defined by differentiated nodes and focal points are limited on the main roads. There is a lack of noticeable differentiation in the junctions of paths which cause sense of lost on human psychology.
4. Landmarks and focal points are located on the main roads that the secondary paths do not provide reference points for observer in way-finding process.
5. Hierarchy of movement system differs in whole district. However it can be generalized that hierarchy is not enough especially in sub-district areas
6. It is not possible to talk about wholeness and unity which is the most negative effect for legible and imageable environment. There observed uniformities in building lots, but too much variety is observed in whole structure.
7. In the whole structure, there are differentiated parts that support some of the qualities.

CHAPTER 6

CONCLUSIONS

Human environment sensational relationship affects planning profession since the sense of vision means to perceive and recognize the physical structure. Designers thus, have influences on human psychology in urban space by organizing physical components of the city. Legibility and imageability, which are the terms appeared in 1960s, are the reflections of psychological issues on urban environment.

Since the beginning of 1960's new approaches began to challenge the modernist idea of planning and design, there appeared several new arguments that focused on the unpleasant and inhospitable places. Kevin Lynch (1960), Jacobs and Appleyard (1987) in their studies emphasized the loss of human dimension and put forward the problems for modern urban design as poor living environments, gigantism and loss of control, large-scale privatization and the loss of public life, centrifugal fragmentation, destruction of valued places, placelessness, injustice and rootless professionalism. They propose that the goals for urban life should include; livability, identity, legibility, imageability and control, access to opportunity, imagination and joy, authenticity and meaning, community and public life, urban self-reliance and an environment for all, which means the need for taking into consideration the urban design principles.

This study exposes guidelines of a legible and imageable environment based on human psychological needs. It is intended to answer three main questions (what is legibility, what are the components and what qualifications make an environment legible and imageable) to reach the end of obtaining evaluation criteria. Thus, a

main question that it is intended to answer can be stated as how far planning is successful in Ankara.

The concepts of legibility and imageability have been discussed since the loss of human dimension in cities became crucial. It is for sure that human beings contact with the physical environment with senses. Seeing, since it means perceiving and understanding, is the fundamental tool that shapes the interaction between man and environment. If the relation between observer and environment is critical for human psychology, these concepts should be included in the environmental design process.

Legibility and imageability are directly related with man and environment relationships based on perception and evaluation. Legibility itself is the simplicity of perceiving the spatial organization as a whole and recognizing the separated parts in this composition. Imageability, on the other hand can be summarized with the concept of identity, which means that the "image" of one place that is created in human minds. Thus, these two concepts with the term image depend upon psychological process of building image.

The detailed findings of the study show that although some of the sub-districts have favorable conditions in terms of some legibility elements and qualities, the other sub-districts have important drawbacks in legibility qualities. Moreover, it is not possible to say that Çayyolu as whole is not a district that meets the criteria of legibility. This situation shows that the guidelines did not contribute to design procedure. There are two main reasons of these situations in urban environment. The **first reason** of this situation is that the components and guidelines of legibility are not taken into consideration in planning process.

Perceiving physical environment and building image have four stages depended on personal and cultural varieties. This thesis draws a frame based on visuality by generalization of the qualifications of perceivable environment. Gestalt laws of perception, which conceptualize form perception in 1930s, are tools to overcome

cultural and personal differences in perception. It is for sure that in planning and urban design procedure, a common sense should be obtained for optimum level of social satisfaction. Moreover, environmental designers should consider human needs in the design process. The understanding of people's preferences and perceptions and attitudes and satisfactions toward different environments will provide better matches between designers' decisions and human psychological needs, through contributing guidelines to planning.

Safety, aesthetic and belonging in Maslow's hierarchy of needs constitute the basis of emotional responses in the process of building image. Clarity of physical structure meets these psychological needs where human beings try to find security, sanity and personal attachment. From this aspect, basic environmental behavior, which is defined with the process of perception, cognition emotional response and spatial behavior, determines the physical qualifications of environment. With respect to these behavioral attitudes and psychological needs, a physical phenomenal environment should be; legible, has to have clarity in perception, ease in orientation and way-finding, imageable, providing variety of information for personal attachment and rising the sense of pleasure with formal aesthetic.

Under the orientation, way-finding and formal aesthetic, in more detailed manner, we have defined a set of rules that makes the environment legible and imageable. These can be accepted as guidelines, which can contribute the planning procedure.

Orientation:

1. The physical environment should satisfy clarity and simplicity in low-level order, since complex structures cause chaos.
2. In the pattern, continuous elements provide movement paths for observers moreover make easy to define general structure.
3. Dissimilar elements in unity are determinants since observer can orient him/her with referring to them.

4. Clear frame of reference should be satisfied because a boundary is essential for identifiable pattern.

Way-finding:

1. Way-finding can be purposeful or not, however, in both case the pattern should provide starting and end points to decrease the sense of loss.
2. Salient elements are guiding through a movement along paths, since they act as reference points for observer.
3. Same with orientation, a frame of reference is crucial to understanding whole structure and determining the movement direction.
4. Edges play significant role in way-finding since they represent the sub-district.
5. The plan configuration should be simple to avoid confusion and sense of loss.
6. Continuous elements should be clearly defined in terms of hierarchical degrees to provide for observer opportunity of differentiating the parts in whole structure.

Formal Aesthetic:

1. Urban environment should provide diversity since the diversity in high-level order provide variety of information which strengthen personal attachment of observer
2. In the physical environment, rhythm in focal points (sudden jerks) arouses sense of interest, which decreases by similarities.
3. Harmony among similar and dissimilar elements in physical structure increases attractiveness and enable perceiving the pattern as a whole, which is significant for legibility and imageability.

Based on these issues, I concluded that there are eight main rules in creating legible and imageable environment. If these rules can be adapted to

environmental design projects, it is possible to create legible and imageable environments. These guidelines can be stated as follows;

1. Low level order and Level of Complexity
2. Diversity and High level order
3. Continuity in sequential elements and Rhythm in sequential elements
4. Hierarchy of pathways and focal points
5. Wholeness (spatial definition) and unity

The second reason of illegible urban environment in Ankara is rapid urban development. In fact, in Turkey every year large amounts of newly built areas are added to the existing city and important numbers of housing units are constructed every year. The metropolitan cities such as Ankara is growing quite rapidly but the growth based on quantity do not enable to create high quality urban spaces, which have legibility qualities. There are small spot like districts/residential areas that are legible, but when these small spots are evaluated within the larger entity, their contribution to the legibility of the districts stay minimal.

The rapid growth of population after the 1950s, unfortunately defined "planning for growth" at the first priority. The earlier attempts to create an imageable urban system, as can be observed in Jansen plan, faded due to the very strong pressure brought by population increase, mainly due to migration, after the 1950s. However, the plans and the measures to control rapid development were not enough even to satisfy the growing demand of especially low- income families for land housing.

The illegally developed areas became an important problem, which legitimized the illegally developed settlement areas and many more times after, which defined the form of the city. The other component that has shaped the urban form is the Local Plans (Mevzii Plan) prepared for residential and non-residential areas beyond the boundaries of the metropolitan Areas. These areas, some of which also took place in the adjacent areas, brought a chaotic pattern and brought the

pressure to bring services to remote places, which are far from each other and the already settled areas. This situation negatively affected planning in larger sections of the city and the increasing parts of the city had been developed on piecemeal basis, without any consistency and harmony. During second half of the 70's, some mass housing projects contributed to the patchwork type of development on the major development axes of the major metropolitan areas.

Today planning system is even more chaotic and has very important problems. First, the multiplications of plans to be prepared by the greater city municipalities such as regional, structural, metropolitan are plans as well as regeneration plans that are under control of different institutions bring a chaotic planning framework. Moreover, in terms of physical planning, the strategy functions are divided between the metropolitan municipality and the lower level municipalities – the former focusing on the broader master plan while the lower level produces implementation plans that conform to the master plan. This highlights the urgent need to ensure a clear hierarchy among all these plans; too many plans kill the planning.

As a conclusion, this fragmented nature of planning, obviously, is a problem to create legible and imageable urban environments. Moreover, while the problems of planning; its chaotic nature should be reconsidered, the lack of urban design principles at different scales is quite important to create more imageable urban environments. In fact, in order to create the livable and legible urban areas one of the major things is to contribute urban design guidelines based on human psychology into the planning system. Additionally, it should be rethought the separated two-dimensional and three-dimensional plan decisions to make them a whole process of production of urban form considering human dimensions.

The findings of the case studies showed that these principles are not taken into consideration in building a huge new district namely Çayyolu in Ankara. As discussed earlier the planning system has very important problems and as Alexander (1977) has defined that, the growth by piecemeal character does not contribute to a growing wholeness. He says that (1977: 3) piecemeal growth

produces unrelated acts, which leads to chaos. I believe that as the planners one of our responsibilities to provide wholeness of the urban districts and secondly to follow the urban design principles in order to provide the residents more legible living and working spaces.

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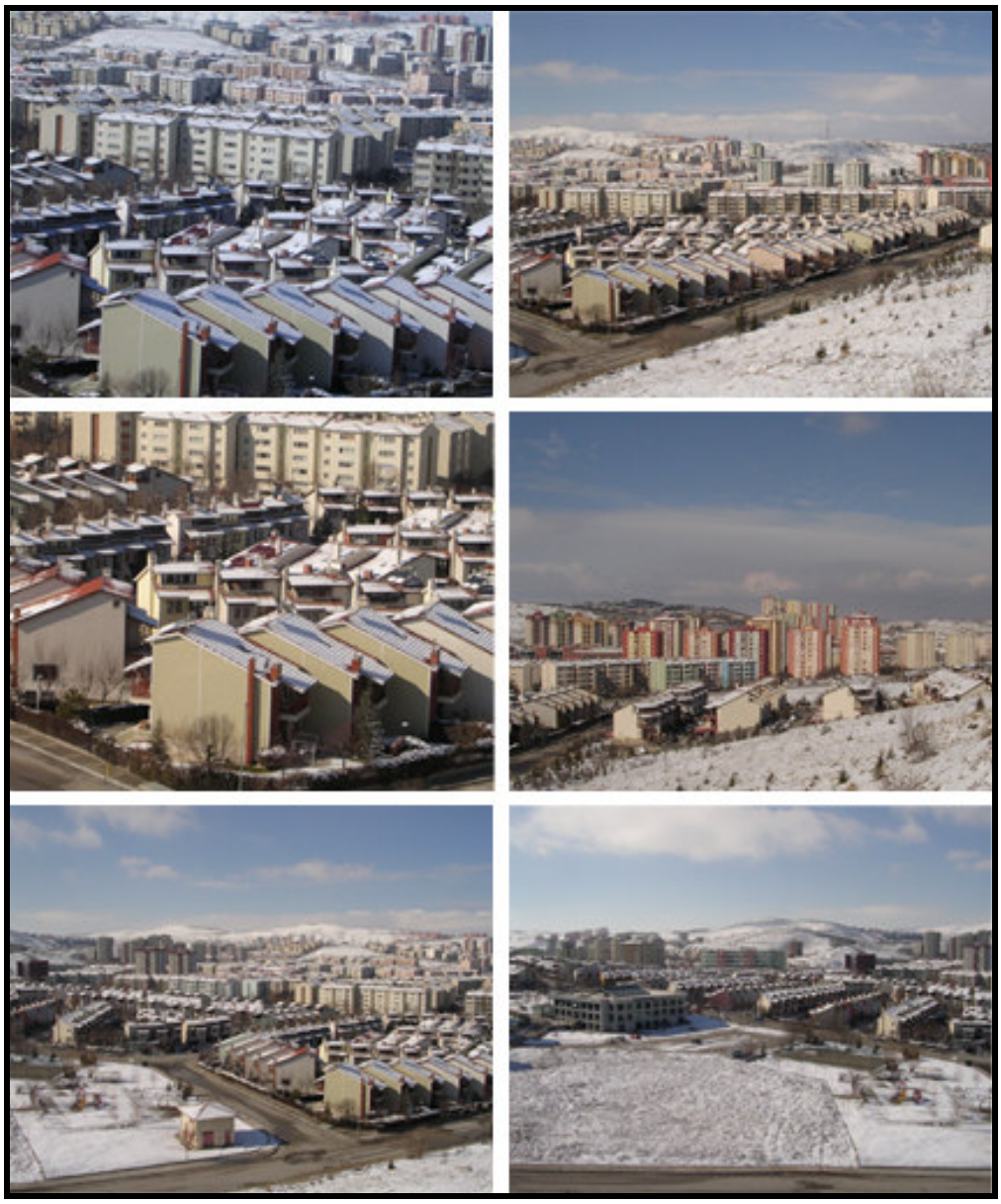
APPENDIX

View from Çayyolu District

Source: Personal archive



View from Çayyolu District

Source: Personal archive

View from Angora Evleri

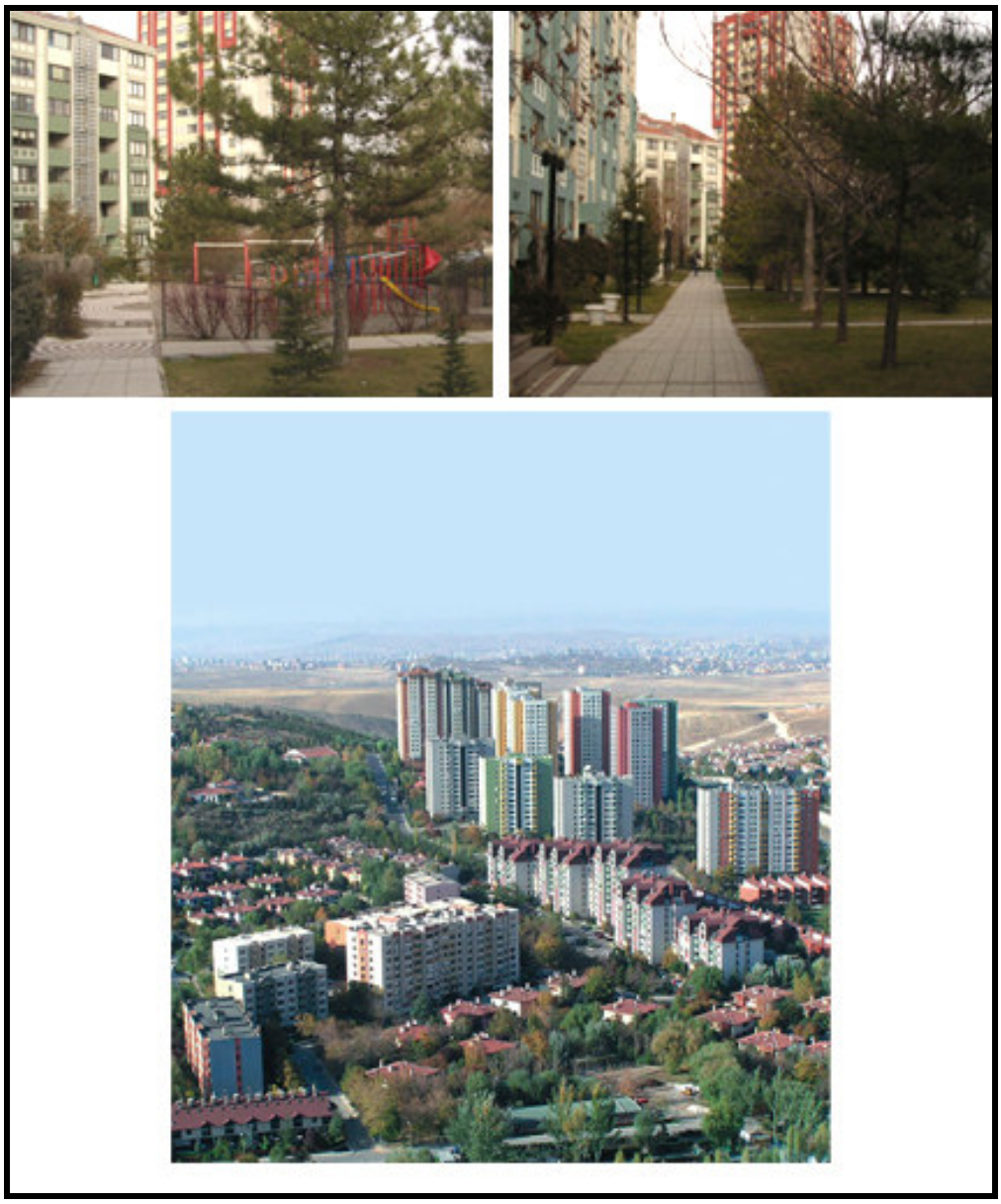
Source: Personal archive

View from Beysukent

Source: Personal archive

View from Ümitköy

Source: Personal archive



View from Konutkent2 and Koru Sitesi

Source: Photograph, personal archive

Ariel photograph, http://www.tmb.org.tr/firma.php?ID=66