

**SOCIAL AFFORDANCES OF RESIDENTIAL OPEN SPACES:
CASE STUDY OF DIKMEN VALLEY, ANKARA**



THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF ENGINEERING AND SCIENCE
OF BILKENT UNIVERSITY
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR
THE DEGREE OF
MASTER OF SCIENCE
IN
ARCHITECTURE

By
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Dec 2020

To my beloved ones



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As the examining committee, we certify that we have read this thesis, and that in our opinion it is fully satisfactory, in terms of its scope and its quality, as a thesis for the degree of Master of Science.

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ABSTRACT

SOCIAL AFFORDANCES OF RESIDENTIAL OPEN SPACES: CASE STUDY OF OF DIKMEN VALLEY, ANKARA

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This study describes a methodology to assess the *social affordances* of residential open spaces. To this end, referring to Gibson's concept of *affordances*, the study investigates the relationship between the social affordances of residential open spaces and the main environmental attributes of 1) topological depth, 2) spatial demarcations, 3) constitutedness, 4) visibility, 5) inter-visibility, 6) the number of block stories, 7) existence, location, and orientation of landscape elements. The methodology is used to analyze the case of Dikmen Valley in Ankara, which was reorganized with a comprehensive regeneration project. The first step of the study is the analysis of the open space typologies of the residential compounds. Afterwards, each type is scrutinized through an in-depth analysis with methods of spatial analysis, visibility graph analysis, and on-field observations. It is revealed that similar environmental attributes have similar social affordances and in conclusion, this study indicates which residential open space typology of the case study has the optimum social affordances.

Keywords: Environmental Attributes, Social Affordance, Residential Open Spaces, Dikmen Valley.

ÖZET

KONUT AÇIK ALANLARINDA SOSYAL SAĞLAYICILIK: ANKARA DİKMEN VADİSİ ÖRNEĞİ

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Aralık 2020

Bu çalışma, konut alanlarındaki açık mekanların *sosyal sağlayıcılığı*ni değerlendiren genel bir metodoloji oluşturmaya çalışmaktadır. Bu amaçla, çalışma Gibson'ın *sağlayıcılık* kavramına atıfta bulunarak, konut açık alanların sosyal sağlayıcılığı 1) topolojik derinlik, 2) mekansal sınırlar, 3) bir bütünün parçası olmak, 4) görünürlük, 5) Karşılıklı görünürlük, 6) blok kat sayısı, 7) peyzaj elemanlarının varlığı, konumu ve oryantasyonu başlıklar altında tanımlanan temel çevresel nitelikler arasındaki ilişkiyi araştırmaktadır. Metodoloji, Ankara'da kapsamlı bir kentsel dönüşüm projesi ile geliştirilmiş bulunan Dikmen Vadisi örneğine uygulanmıştır. İncelemenin ilk aşamasında alandaki konut gruplarının (siteler) açık alanları tipolojik bir analize tabi tutulmuştur. Sonraki aşamalarda mekansal analiz yöntemleri, görünürlük grafiği analizi, ve saha içi gözlemler aracılığı ile vakaların derinlemesine analiz edilmiştir. Analiz sonucunda benzer çevresel özelliklerin benzer sosyal sağlayıcılığa sahip olduğu ortaya çıkmıştır ve sonuç olarak bu çalışma, dikmen vadisi örneğinde hangi konut açık alan tipolojisinin optimum sosyal sağlayıcılığa sahip olduğunu göstermektedir.

Anahtar Kelimeler: Çevresel Nitelikler, Sosyal sağlayıcılık, Konut Açık Alanları, Dikmen Vadisi.

ACKNOWLEDGEMENT

First and foremost, I would thank my advisor Assoc. Prof. Bülent Batuman for his continuous support and motivation throughout my thesis process. He guided and encouraged me all the time and helped me develop my thesis further. There is no way words can express my appreciation and respect for him.

I would also like to thank my beloved family for their unconditional and endless love and support throughout my academic life.

I would lastly express my thanks to dear Dr. Deniz Altay Baykan, who provided me primary references on Dikmen Valley Project which helped me a lot in grasping different aspects and approaches of governments towards the project.

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1. Introduction

Physical built environment and social behaviors are not independent and separate entities. Hence any comprehensive study should integrate these two fields to achieve the criteria which should be addressed in planning and social research (Frick, Hoefert, Legewie, Mackensen, & Silbereisen, 1986). Therefore, a broad scope of studies has been conducted to demonstrate the effects of the nearby physical environment on several dimensions of people's daily life trying to investigate how physical environments affect human behavior, usage of the space by people, and social interaction (Fischer et al., 1977; Stokols & Schumaker, 1981). In this study, the selected physical built environment settings would be the residential open space. Therefore, further studies that had the aim to highlight the importance and role of residential open spaces in residents' social interaction have been reviewed and examined.

In this regard, I will mainly refer to the ecological approach towards environmental perception which means the detection of nearby environmental invariances and their *affordances* by the organisms. This approach is commonly discussed by many authors. I will refer to the pioneer scholar of this approach, James J. Gibson, and refer to his concept of *affordances* (Gibson, 1979). According to this approach and concept, any human behavior would be attributed to certain environmental *affordances*. Helft (2010) argues that *affordances* provide or offer opportunities for actions. While some environments attract certain actions, others can repel them. Also, certain environments can afford different actions for different individuals according to their age, gender, background, and etc. Finally, this environment-individual behavior approach leads us to a socio-spatial approach that could relate social interactions in residential open space to its physical context.

In this regard, in-depth analysis of the two residential compounds of Dikmen Valley Urban Transformation Project phases I, II, and III will be conducted through a step by step process. First of all spatial layouts of the cases will be analyzed based on the seven

environmental attributes of topological depth, spatial demarcations, constitutedness, visibility, inter-visibility, the number of block stories, existence, location, and orientation of landscape elements. This analysis will be supplemented by visibility graph analysis in DepthMapX and on-field observations. Since the project encompasses five implementation zones with different approaches due to administration changes and varied existing social contexts, different and comparative results are expected from each of the zones.

1.1. Research questions

The main questions aimed to be answered in this study are then as such:

- Is the physical built environment a determinist factor in human behaviors?
- How important is the role of residential open space on residents' behaviors including social behaviors?
- What environmental attributes afford social interaction in residential open space?
- By which changes in the physical layout of a residential open space it is possible to enhance it in order to improve the social interaction in it?

1.2. Methodology

The study will be based on an extensive literature review on various relevant fields including environmental psychology, human behavior, urban design, quality of residential space, residential satisfaction, and social interaction in residential open spaces.

In order for this study to be as valid as it can, theoretical considerations will be supplemented by empirical evidence. First of all, a comprehensive list of environmental attributes that affect social interaction will be prepared. Then all the spatial zones of residential open spaces would be categorized and studied. Next, the spatial analysis of

these zones will be conducted according to the environmental attributes listed in the previous step.

This spatial analysis will later be supplemented by observation. By means of observation, my aim is to track residents' behaviors including their social interaction. Referring to the "behavior setting" theory of Roger Barker, behavior mapping will be my tool to associate certain individuals' behaviors, especially social interactions, to certain environmental features (Barker, 1968). This method is an objective observational method to track patterns of certain behaviors and usage of the space by individuals. It is a valid method since it is a direct field observation in the study field and both behavior variables and environment variables are observed and coded simultaneously and precisely (Moore & Cosco, 2010). In other words, I will look at 'where the action is' (Heft, 2010) to relate certain behaviors to certain environment variables. Therefore, I will be able to recognize what environmental features of residential open spaces are important to whom and to track the correlation between these features and social behaviors afforded for different individuals by the environment. By mapping the behavior patterns and social interactions in certain spots of the residential open spaces I will try to understand what opportunities of actions do different environments of residential open spaces afford for different individuals (Moore & Cosco, 2010).

Moreover, since the concept of *affordances* is also concerned with visual perception and visibility is one the main factors initiating activities and socializing, to track the relationship between visibility and social interaction in the selected case study, visibility graph analysis(VGA) will be conducted in computer via depthmapX software to combine it with behavior mapping in order to assess the level of social interaction in the most visible spaces within the residential open spaces. I deploy VGA since I attach importance to the visibility of every spot in the selected area from every other spot.

Overall, since this method is a normative methodological approach aimed to enhance the environment-individual relationship I will be able to answer questions such as “Which settings and physical components in the context of residential open space are most heavily used than the others?”, or “Which settings and physical components in the context of residential open spaces support physical activity, social interaction, or interaction between and among different groups?” (Moore & Cosco, 2010).

1.3. Rationale of selecting the case study

The selected case study in this research is the first three phases of Dikmen Valley Urban Transformation Project. The project area is located in the southern part of Ankara, between the prestigious district of Çankaya on its east, lower-middle-class district of Dikmen on its west, and the city center on its north.

In the previous studies on Dikmen Valley, the focus within the scope of the urban transformation has been whether on the comparison of the ex-squatter inhabitants currently living in the project area and the newcomers, or the sustainability of the project. However, in this study, the focus is on the spatial layouts of residential open spaces and their social *affordances*.

In this regard, my rationale for selecting this case study is dependent on two main reasons which support this study. First, Dikmen Valley Urban Transformation Project is the oldest one of its kind in Turkey which also provided housing for the ex-squatter housing inhabitants (right holders) and after years there are ex-squatter housing inhabitants still living in their new living area. This means not all of them could not adapt to the new lifestyle and not all of them left the area. This issue is an important criterion in selecting this project as the study area because the time residents spent in the new living area is in relation to and influences residents' level of integration. (Levine, 1973; Kartal, 1978; Senyapılı, 1979; Türksoy, 1983; and Erman, 1998 in Kahraman, 2008). Second, this project which has spanned decades involves transformation of

squatter houses with different the transformation models due to different governments' approaches. This allows us to comparatively assess the different residential open spaces' qualities and *affordances*.



2- Social interaction in residential open space

Residential schemes either apartments or houses differ in the level of outdoor open space they provide for the residents. While some have front and back gardens, or shared courtyards as communal space for a few building blocks, others use their balconies as their outdoor open space. Any layout of residential open space affects residents' daily life, outdoor activities, and socializing in a different way.

Residential open spaces have *public* qualities. They afford residents the opportunity to sit and relax from the daily stress, to communicate and socialize, to play, and to engage in activities. On the other hand, they also have *private* qualities and strangers' entrance to them are controlled. Since we can associate residential open space with either of these qualities, we can consider them as residential in-between spaces. The term "in-between space" is defined by Nooraddin (2002) as the relation between indoor space and outdoor space. Since these two spaces overlap most of the time, using the term "in-between space" is sometimes preferred over semi-private space and semi-public space terms.

Therefore, the "in-between space" acts as a negotiating space or an intermediate space controlling the contacts between private and public space. Simultaneously, it controls inclusion/ exclusion, hierarchical territory, and protects the privacy of the private space through its different spatial layout. In this regard, privacy determines who can access and interact with private space. Likewise, territory zone which has an asymmetrical hierarchy based on inclusion, only lets people to move from private to public and not vice versa (entrance of the strangers to the indoors space) (Can, 2012: 46-48). In this regard, major in-between spaces in residential areas can be the communal spaces providing a ground for life between buildings. As such are the walking tracks, playgrounds, gathering spots, courtyards, and gardens making possible various unplanned daily activities such as pedestrian traffic, play, short stays, and social activities as the residents desire (Gehl, 1987: 59).

Moving on to the main discussion of the study, it has been recognized that housing has been largely studied as a dimension of social structure. Its socio-spatial nature and significance for the social life are highlighted in the studies which focused on the relationship between the location of dwelling and the social integration of people. Location of the dwelling determines different everyday life relationships of individuals by affecting the contact they have with neighbors and their extra-local relationships (Kemeny, 2003).

Secondly, the type of residential open space is also a determining factor in controlling the level of social interaction in the area. While single apartments with front gardens aligned alongside a street have higher chances of unplanned social contacts between residents and their neighbors from a few blocks away or even with strangers, in the case of gated communities due to the barriers and controlled entrances the chance of unplanned contacts with nonresidents of the community decreases. Gated communities are extreme examples where all non-residents are considered as threats of crime (Biddulph, 2007). However, the socializing level can be satisfying inside the gated communities in which socializing is very dependent on the environmental qualities and provided facilities to afford socializing.

Despite all the evidence on the relationship between the physical environment of residential open space and social interaction in it, there is a general continuous decline in socializing level between neighbors, and an increase in extra-local social relationships in the recent decades (Guest & Wierzbicki, 1999). It is whether due to fewer constraints on being confined to a limited neighborhood and having the opportunity to commute to any other neighborhoods (Fried, 1986; Talen, 1999) or due to technology and the inclination of the new generation towards virtual instead of proximate social contacts. Even when at home, people would interact via social media with people who are miles away from them. Therefore, local social life and interaction have continuously shrunk in scale and significance in recent decades (Forrest, 2012).

However, we still socialize with my neighbors. There are still people with very local neighboring, friendships, and social networks (Spencer & Pahl, 2006). Wherever people live, whether in the village or in the city, they interact, engage in socializing, and build social networks within their local environments. Although their “locally-based identities intersect with other sources of meaning and social recognition, in a highly diversified pattern that allows for alternative interpretations” (Savage, Bagnall, & Longhurst, 2005: 60).

Therefore, in what we live and where we live defines connects, and affects our social life in numerous ways. It influences our social interaction, friendships, and neighboring since it determines how we commute to work, how, and with whom we spend our leisure time on a daily basis. In other words, whether on our own choice or through constraint, we spend a considerable amount of time around our dwelling. Therefore, our sense of identity and belonging is also affected by our living environment (Forrest, 2012).

In this study, I will use residential sociability similar to what Skjaeveland et.al. (1996), regard as “manifest neighboring”, which is defined as “observable social interaction and exchange of help and goods”, which takes place when neighbors have face to face contacts and indulge in socializing, and offer and receive help from each other (Warren, 1986). Hence any kind of observable social contact between neighbors in residential open space would be tracked to measure the social interaction level of the area. Since all of these social contacts take place in the environment, the role of the environment, and what it affords comprise the main topic of my study. However, before I dive into the topic of social interaction in residential open spaces I would like to discuss different kinds of outdoor contacts, their explanation, how they take place, and initiate further contacts leading to social interaction.

According to Kim and Kaplan (2004), urban social interaction between people falls into three categories: “interaction” between neighbors of a residential area, “casual social

encounters” between neighbors who are not acquainted with each other, and “informal social contact” between people who are not neighbors and are not acquaintances.

Therefore, the social interaction among the neighbors can whether be “interaction” or “casual social encounters” which can be divided into passive and active contacts. All the unintentional and unplanned encounters providing opportunities for co-presence and co-awareness are passive contacts. If repeated, these passive contacts may lead to active contacts.

An initial active contact would be the superficial/ unpretentious contact which means chance meetings followed by short greetings or exchanges of few words. Nodding to an acquaintance, exchange of pleasantries in the morning while leaving for work, or a help to take a parcel are called “unpretentious everyday contacts” (Henning & Lieberg, 1996: 6). Kuper (1953) discusses the importance superficial contacts by claiming that although it is rare that people not knowing each other would initiate conversations and introduce themselves in the first encounter, it happens by recurring of the encounters among same persons through time and the formation of friendships may be a possibility of this process. Easily formed friendships between kids or adults because of their frequent contacts with the ones living nearby is a good example (Gehl, 1987: 21).

The importance of superficial contacts and weak ties is also highlighted in various studies. In a study, these contacts were considered to promote the well being of the residents since these contacts meant “practical as well as social support”, “feeling of home”, and “security” (Henning & Lieberg, 1996). These feelings and especially decrease the trust problems, heterogeneity, and fear of crime all of which are believed to limit social interaction in residential areas Mesch, G. and Manor, O.(2001) cited in (Forrest, 2012). Moreover, superficial contacts are enough for the creation of a sense of social cohesion and a sense of community (de Vries, 2010). However, despite the fact that they may help to have more strong ties (Henning & Lieberg, 1996), the sense of community and belonging does not always result in neighboring (Skjaeveland, Gärling, & Maeland, 1996).

Active contacts can also be long chats depending on the environmental conditions as well as residents' desires. Most of the time these chats happen at the meeting points such as the front doors, gardens, and spaces next to hedges if the environmental conditions are suitable. The more environmental conditions are preferable, the more probable that the duration of these conversations elongate. Participants at ease, engaged in the same activity such as standing or sitting next to each other will most probably linger in the space and elongate their conversations (Gehl, 1987).

According to Gehl's categorization, there are three kinds of outdoor conversations in residential areas: conversation with the ones you accompany, conversation with acquaintances you meet, and possible conversations with strangers you may encounter (Gehl, 1987). In this regard, Goffmann (1963) claims that while unacquainted individuals require a reason to engage with each other, acquainted individuals require a reason not to do so. However, conversations of any category demand different kinds of environmental features to take place. The physical design and attributes of the environment, its availability, location, and spatial arrangement, furniture, possibilities it affords for standing and sitting directly affects the opportunities for conversation (Edward, 1966; Gehl, 1987) and the initiation of social interaction.

Before I investigate the influences of residential open space, the physical design, functional and social partitioning of spaces, and so on, on opportunities of developing social relationships (Abu-Ghazze, 1999; Gans, 1961; Whyte, 1980; Yancey, 1971), I should discuss three general variables which affect social interaction in residential areas: "the opportunity to contact", "proximity to others", and "an appropriate space to interact" (Fleming, Baum, & Singer, 1985).

2.1. Opportunity to contact

Similarity (social similarity, similarities in interests, similarities in ethnicity and nationality, similarities in life-course stage) and *time* are two preconditions that provide

opportunities for contacts, social interactions, and social relations in residential areas. These two are referred to as intervening variables (Kuper, 1953). Similarities between neighbors would increase perceived homogeneity, which promotes the sense of community and helps to develop friendships (Michelson, 1976). Likewise, time matters in the provision of opportunity for social contact. A good example would be the residents who recently moved into housing units, which upon their initial needs of information for the sake of convenience, temporarily would not be searching for social similarities. In this case time supersedes the existence of social similarities due to the needs of the newly arrived residents and the need to establish a new life. However, as time goes on residents turn to be more selective on their social contacts and relations. On the other hand, the opposite can be the case as well. As time passes, long-standing residents get to be familiar with higher numbers of neighbors and to socialize more with their desired ones. In other words, the longer a resident lives in an area the more number of local friends he or she would have (Forrest, 2012; Gans, 1967; Keller, 1968; Sampson, 1988).

Forrest (2012) highlights the extent to which we care about the social similarity between neighbors and neighborhood's social norms by mentioning that we would probably not want "difficult neighbors" or would not want to live in an environment where people's social norms are at odds with ours. In this regard, Gehl (1987) highlights the importance of the existence of common interests between neighbors in different spheres such as politics, economy, or ideologies in order that a certain level of social interactions takes place. Therefore, the importance of interaction with neighbors can differ for groups of different economic status. High-income people do not consider interaction with neighbors as essential as the low and middle-income people do (Fried, 1986). This is due to constraints of the low and middle-class people and the wealth of the high-income people which lets them escape the limitations of 'residential propinquity' (Talen, 1999) and have extra-local social contacts

Likewise, social interaction level in residential areas can also be affected by ethnicity and nationality. Usually, social interaction among the neighbors of the same ethnicity and

nationality is more intense and sometimes defensive (Forrest, 2012). However, although rare, there happens to be some kind of social interaction between people from different ethnic groups or nationalities due to the passive contacts afforded by the environment.

Moreover, stages of people's life-course affect their social life and their level of social interaction. Old people, housewives, and the young usually tend to spend more time in their local area around their dwelling since they don't work and have more leisure time. That's the reason why people mostly have social interaction with the ones of the same age as theirs. This happens because people share a certain environment together at the same time and it is easier to find topics of common interests. Grandfathers would love to discuss their grandchildren with each other. Housewives, which in my study manifested higher levels of social interaction, would discuss what meal they are preparing for today and children would discuss new games to play (Campbell & Lee, 1992; Forrest, 2012).

2.2. Proximity or closeness: physical and functional distance

If there are opportunities for contact and there are common interests and social similarities, it is highly possible that proximity would influence social interaction. However, it is not enough for the initiation of social interactions and relationships and it cannot overcome social dissimilarity. In other words, individuals would always prefer contact with compatible and like-minded people no matter how far they are.

A wide range of studies has discussed proximity as the main attribute of the physical environment which affects social interaction (Appleyard, 1980; Festinger, Schachter, & Back, 1950; Gur & Enon, 1990; Kuper, 1953; Lang, 1987; Lindzey & Byrne, 1968; Nahemow & Lawton, 1975; Whyte, 1980). One obvious example showing the effect of proximity on social interaction is the example of children who prefer playing with neighbor's children who are within a small distance (of a radius of approximately 50 meters) from their front doors, to playing with children who live farther.

Proximity or closeness as the main characteristic of the environment which affects social interaction is influenced by both physical distance and functional distance. In a residential area, physical distance is simply the measure of distance from point A (one dwelling unit) to B (another dwelling unit), while the functional distance is the positioned relationships between them that makes the residents come into contact. In other words, functional distance relates to the space syntax (spatial organization or layout) of the environment and it is concerned with the orientation of dwellings, orientation of their openings in regard to each other, the mutually used paths that make residents meet frequently for the aim of daily activities, the location of services nearby such as garbage cans or sport facilities and so on (Cochran, 1994; C. Fischer et al., 1977; Gehl, 1987; Hillier & Hanson, 1984)

Therefore, functional distance matters since the position and orientation of units influence the patterns of individuals' way of using the space and determines who meets whom. On the other hand, the less the physical distance between units, the greater the number of individuals who share the space (Gehl, 1987). The importance of physical and functional distance in social relations is also highlighted by referring to the principle of passive contacts. As these distances decrease, the chance that passive contacts take place increases which also enhances the possibility of manifested neighboring including superficial and active contacts.

2.3. Appropriate space to interact

Although the social cognitive theory has emphasized the correlative relationship between environment and individuals, the importance of the study of the environment have been developed since the last decade with the emergence of the socio-ecological models (Giles-Corti, Timperio, Bull, & Pikora, 2005; J. F. Sallis, 2009; J. Sallis & Owen, 1997; Story et al., 2009).

Since what we do every day and all our social activities are integrated with space, we must be aware of the role of space and environment as driving factors in defining our behavior in it including our interaction with space and social contacts with people (Gottdiener & Budd, 2005).

Being aware of all the factors affecting social interaction in residential areas, the main body of this study will dive into the second and third factors (proximity and appropriate space to interact) which are about the environment and its ability to affect social interaction. Believing that the residential open space is a social context, my approach is based on the reciprocal/ transactional relationship of individuals and the environment which means that people and environment are constantly affecting each other in a dynamic interactive way (Canter, 1985; Myers & Ward Thompson, 2003; Thompson et al., 2010).

In a broad spectrum of studies concerned with the correlation between environment and individual's behavior, it's a common belief that the physical environment affects how people behave in it and there is always a desire to verify the validity of measuring the level of influence built environment has on human behavior (Bechtel, 1997; Bechtel & Churchman, 2002; Cassidy, 1997; Frank, Engelke, & Schmid, 2003; Gifford, 1987; Mehrabian & Russell, 1974; Proshansky, Ittelson, & Rivlin, 1972; Zeisel, 2006). Among the pioneer design practitioners who utilized the environment-behavior approach was Kevin Lynch who believed the city is a human artifact designed to serve their needs. His approach to environment-behavior study is exhibited in his concept of "fit"(Lynch, 1981).

Any environment could offer possibilities for showing or not showing specific behaviors. Peoples' interaction with the environment, initiated activities, or engagements in the ongoing ones is highly influenced by the environment and its qualities. More generally, it is a common belief among scholars that quality of daily experiences and quality of life is hugely affected by the quality of the environment we live in (Thompson

et al., 2010). Moreover, the environment has a direct connection with my health which encompasses physical, mental, and social well-being (World Health Organization, 1948).

According to Whyte (1980) who has deliberately demonstrated the relationship between qualities of urban features and the level of activities in them, small physical changes in the environment could rearrange and improve the use of the space considerably and improve social interaction. He then explains some spatial qualities that encourage this process. Some of these qualities are the layout of the space, availability of common access, spatial dimensions and scale, landscape elements and furniture, viewpoints, defined movement patterns, buildings' location and surroundings (layout, form, height, facade, etc.)

Adding to this, Gehl (1987: 55-56) suggests some features of the environment that make possibilities for social interactions by providing certain activity patterns. Accessibility, well planned physical environment, socially partitioned spatial arrangements, and the proper existence of environmental elements and furniture, good places for walking, standing, sitting, seeing, hearing, and talking are among these qualities. If a space fails to attract people to use it or if it is used only by the undesirables it is an indication that its design, or management, or both have not been thought of properly (Jacobs, 1961; Whyte, 2000).

Gehl also classifies outdoor activities and highlights the importance of the quality of the physical environment and its role in affecting people's behavior in daily life and social interaction. He classifies outdoor activities into three categories including necessary activities, optional activities, and social activities. Necessary activities usually occur no matter how qualified an environment is. An example of such an activity is going to work and coming back home. Optional activities depend on the availability of environmental conditions and quality. Walking for leisure or lingering in a space are examples of such

activities. However, social activities result from high levels of optional activities (Gehl, 1987). One characteristic that all optional and social activities have in common is that they only happen when good external conditions are provided; when there are the highest advantages and lowest disadvantages provided physically and socially, to make it pleasant to stop/stay and move about in the environment (Whyte, 1980).

Reviewing all the above-mentioned studies, I would like to base my approach to built environment-individual behavior relationship on Gibson's theory of *affordances* since the core of this theory is based on the transactional correlation of the individual and the environment. Gibson had an ecological approach to perception and he introduced the term *affordances* by explaining that "the *affordances* of the environment are what it offers, what it provides or furnishes, either for good or ill" (Gibson, 1979:127). According to him, *affordances* provide opportunities for specific behaviors in the physical environment.

Later on, he expanded this definition claiming that affordance "is equally a fact of the environment and a fact of behavior. It is both physical and psychical, yet neither. An affordance points both ways, to the environment and to the observer." (Gibson, 1979: 129). In other words, both environment's features and the agent's ability, background, memories, physical, mental and social status are necessary for an environment-user interaction to happen.

Since ancient times, in any environment, people have sought food, water, shelter, etc. and they tried to detect landscapes that could afford them what they needed. The ecological approach frames this process: people inherently look for certain characteristics in the environment that can afford them what they need, desire, or expect (Gibson, 1979; Norman, 1999). When the desires and expectations are afforded by the environment and its qualities, it is called satisfaction. Quality of the environment affects

the quality of experiences and that affects the satisfaction level (Schomaker & Knopf, 1982).

In my case, regardless of the type, any residential open space with its setting of the dwellings, structure, layout, configuration, form, shape, plan, and all functional factors has different environmental qualities providing different *affordances* and affecting the quality of daily experiences and life (Gehl, 1987; Trancik, 1986). Therefore, the environment's qualities and residents' satisfaction level are important for the success of the residential open space since they correlate with residents' use of open space, their engagement in different types of activities, and socializing. The higher the level of satisfaction, the more there is "intensity of people". This means a long duration of usage and a higher number of persons engaged (Gedikli & Özbilen, 2004).

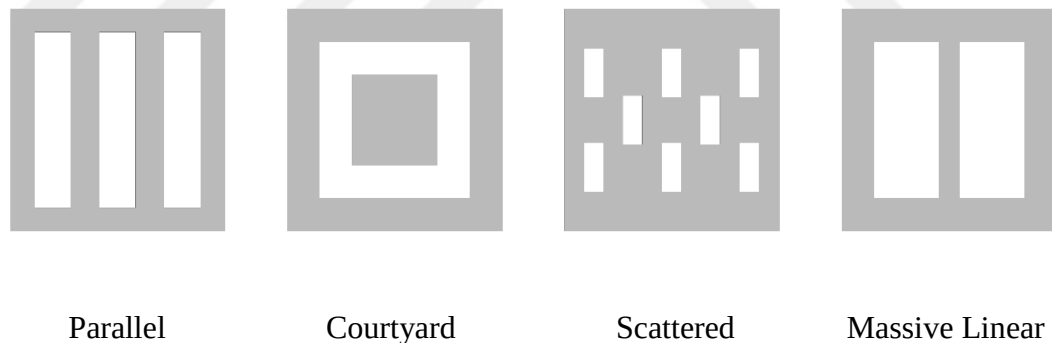


Figure 1- Housing layouts with different arrangement typologies (source: author).

Consequently, there is a need to identify and categorize the environmental qualities of residential open spaces. Generally, an environment's quality depends on 5 factors (Saiedlue, Hosseini, Yazdanfar, & Maleki, 2015):

- Functional factors: proximity, provision of services, feasibility, accessibility, safety, and view
- Form factors: Building geometry, height, material

- Semantic factors: identity, restrict, legibility, vitality, comfort, and relaxation
- Environmental factors: provision of natural elements such as greenery and water
- Social factors: cultural proximity, social safety, social life

A good quality residential environment that evokes a sense of satisfaction in residents should include functional, physical, cognitive, and social characteristics. These characteristics in a way correlate with the hierarchy of human needs. Physical characteristics of the environment address the human need for the provision of space, feasibility to access and use it, and its safety. Cognitive characteristics address the need for comfort and pleasure in space and social characteristics concerns with the human need for crowding, privacy, and social connection/ relationships/ social affiliation (R. W. Marans & Couper, 2000; Shabak, Norouzi, & Khan, 2012; Whyte, 2000)

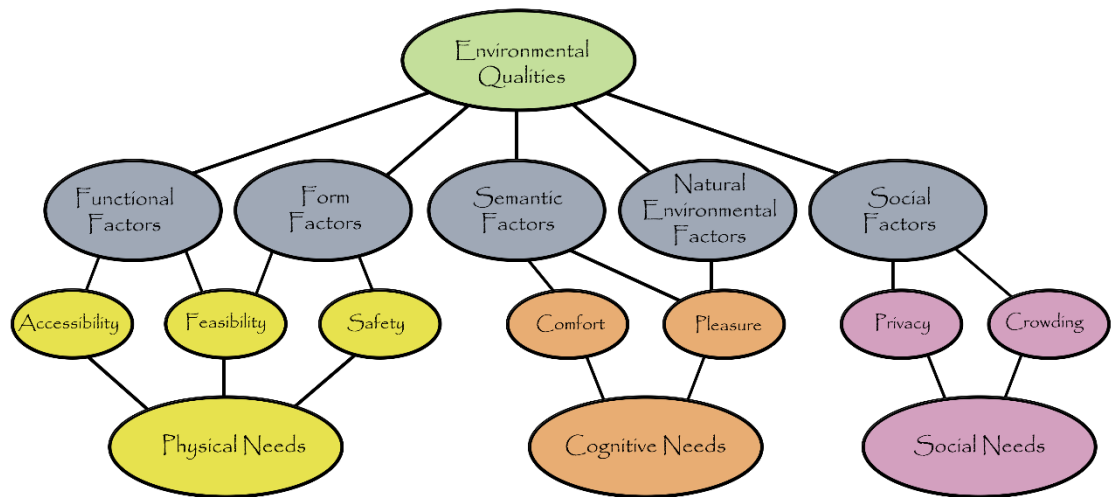


Diagram 1- Relationship between environmental qualities and the hierarchy of human needs (Source: author)

Therefore, these characteristics are not separate entities. Physical characteristics (*feasibility, accessibility, and safety*) can promote residents' interest in using the space.

If the physical qualities of the environment meet their cognitive needs (*comfort and pleasureability*) they will linger in these spaces. Later on, the presence of people would bring more people (*crowding*). Finally, the co-presence of people is an important initiator of *social interaction* if they desire to engage (*privacy*).

Overall, there are a number of features that residents expect residential open space to have and these features are usually affecting user activities and social interaction in the area. In summary, these features can be accessibility and walkable distance in daily activities, pavement quality, footpath foliage and vegetation, provided seats alongside the routes, vehicular traffic, and its properness according to the pedestrian paths, plants and trees in the area, seats in the area, views and things to watch, maintenance, water features, properly designed car parking and so on. Consequently, a successful residential open space should meet these qualities and afford as much as it can.

However, as Rapoport (1977, 1983) discusses, environments do not determine or elicit certain behaviors. Instead, they can be neutral, inhibiting, and can even sometimes be “catalysts”, or supportive of certain behaviors and activities. He claims that sometimes environments can also be “catalysts” of previously inhibited behaviors.

Similarly, Heft (2010) emphasizes this issue and explains Gibson’s concept of *affordances* as an environmental perception approach which connects environmental properties to the functional importance of them for the individuals. He claims that *affordances* are of importance in understanding the dynamic experience of users in environments through their actions and activities. In other words, *affordances* are the action related properties of the environment which can be considered in promoting active living. Different environments can support and promote or hinder various actions to a different degree. Heft also explains that *affordances* should not be thought of as a determinist factor causing an action. In fact, they suggest possibilities for and constraints on particular actions.

Moreover, although an environment's affordance offers various possibilities for actions, activities, and experiences, the concept is relational, which means while a place says 'Come on down' for one individual, it may say 'Do not enter' to another one (Heft, 1989; Little, 2010). The relational essence of the concept of *affordances* is also highlighted by Simon Bell (2014) who classifies environmental *affordances* in two categories. He relates some environmental *affordances* to the concept of supportive features, which provide a set of possible actions such as a rock providing a possibility to sit on. He calls some other environmental *affordances* as negative *affordances* that can prevent people from doing something such as a bench too low for old people to sit on. He then emphasizes that these two categories are relational. While a low bench prevents old people to sit on it, it can invite children or younger people to do so.

If an environment succeeds to afford mostly for the good the result would be the engagement and co-presence of various people from different age groups to see, hear, walk, sit, stand, act and interact in the environment. This co-presence is the initiator for other activities such as talk, play, sports and therefore the engagement of further people. New activities get initiated close to the ones already in progress. In other words, the initial small activities may be a base for and trigger other big and complex ones and shape social relationships. People seek the presence of other people and gather around the things that are happening (Gans, 1961, 1962; Gehl, 1987, 2010; Kim & Kaplan, 2004; Whyte, 1980; Yancey, 1971).

Whyte (1980) exemplifies this process by introducing the concept of triangulation. He gives the example of the co-presence of two individuals (A and B) at the same space at one moment, spectating an outdoor performance by a street entertainer(C). A and B start exchanging smiles and initiating conversation while enjoying the C's performance. While the environment afforded an appropriate space for the performer to perform and attract audience, a gathered audience at a later time make this space more active and live affording more activities. This is the two-way relationship between the environment and individuals that I mentioned previously.

To sum up, since the physical environment is a material setting people engage in, it is both a “condition” and “consequence” of behaviors and social interactions in it. It is a condition since it can provide possibilities for certain behaviors and social interactions or makes them difficult or even impossible. On the other hand, it is a consequence since it is shaped by patterns of these behaviors and social interactions, their content, frequency, and intensity. In other words, “the physical environment reflects its usage by people - their activities, their wellbeing or their ill-feelings. And the changes it undergoes are to a certain extent reflection of this use.” (Frick et al., 1986)



3. Environmental attributes and spatial zones of residential open space

3.1. Environmental attributes affording social interaction

Although environmental *affordances* and physical characteristics of the residential area can influence superficial contacts and weak ties more than they can influence the strong social ties and intense relations between neighbors (de Vries, 2010), in this research I prepared a comprehensive list of environmental features and qualities providing proper conditions for more possible contacts (passive and active), initial engagements in conversations, and further complex activities, all of which would increase the level of social interaction in the area. These features include the correlation of buildings and streets, configuration or spatial layout, the way building openings (doors and windows) are connected to the street (the *constitutedness* of the streets) or to the residential open spaces (*constitutedness* of residential open spaces), the visibility of the residential open spaces, the inter-visibility of the building openings, the topological depth of the public space from the most private one (van Nes, 2014: 247), the spatial demarcation between different zones, and the availability, adequacy and the quality of the environmental elements and furniture. Investigating the effects of each of these characteristics would help us to better understand the effect of environmental *affordances* of residential open spaces on social interaction levels in them.

3.1.1. Topological depth

The topological depth of a public space from a private one or vice versa is the number of semi-private or semi-public spaces between them (van Nes, 2014: 248). The topological depth of a space determines its permeability and its hierarchical territory. Studying the topological depth one could understand a space's selective inclusion or exclusion and to what degree a space is accessible.

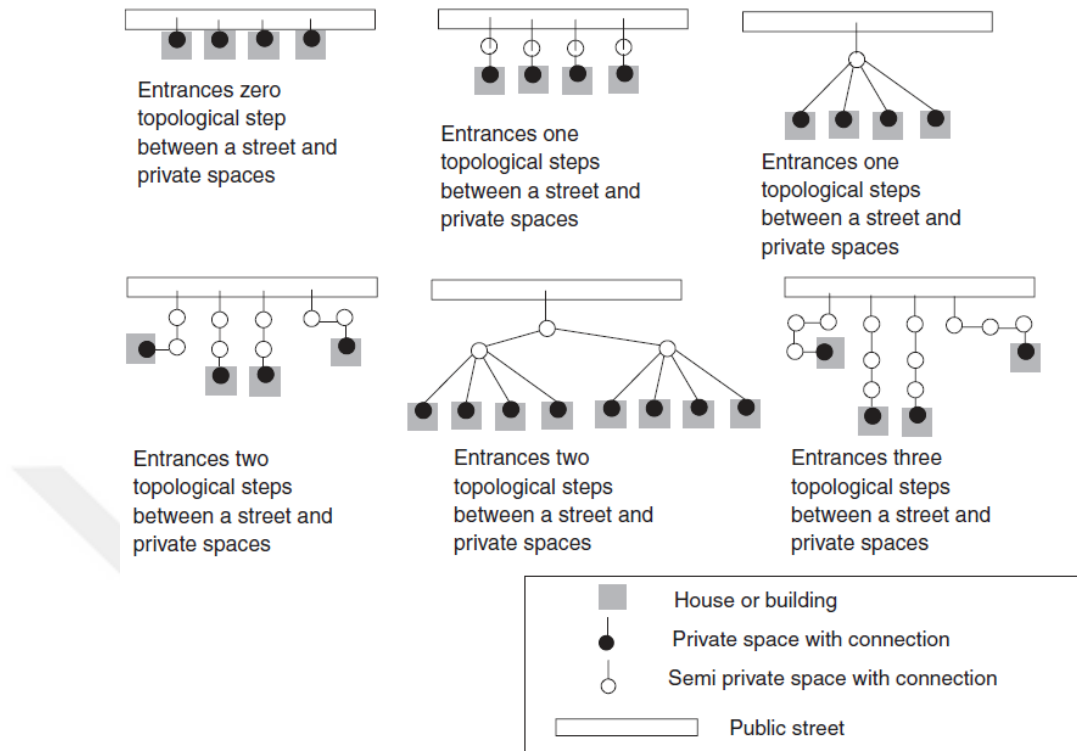


Figure 2- Topological depth between private and public spaces (van Nes, 2014: 252).

3.1.2. Spatial demarcations

The transition between the neighborhood street and the building block needs to be demarcated and defined. In the in-between space elements like fences and shrubs can demark these transition zones in a sharp or soft manner reflecting the degree to which the private space is accessible (Can, 2012: 43). However, environments with high liveliness are the ones with no firm demarcations to hinder contacts (physical or visual) between different zones through the public-private transition. This means a flowing and gradual transition is one of the characteristics of a good quality environment. This is because the ability to see and hear strongly affects outdoor social activities by assisting people to either take part or keep on the sensory experience of surrounding events. In other words, although an environment's ability to promote social interaction enhances its quality, on the other hand, it should also give the individual the choice of optimum level of social interaction. In other words, individuals should also have the choice of privacy

which means having well-demarcated and well defined (physically, socially, and psychologically) territory or microclimate if they desire to (Smith, Nelischer, & Perkins, 1997).

Moreover, demarcations should not be implemented by applying level difference. Activities must happen on closely same level for the viewer to notice them and maybe engage in. That's why the possibility of experiencing the activities happening on a slightly higher level is greatly lower compared to the possibility of experiencing the ones on a lower level. This is due to having an overview on the space from the above. However, even in this case the contacts are limited to visual and verbal contacts without a chance to participate and interact physically (Gehl, 1987). Whyte (1980) argues that when people don't see a space, they don't use it.

3.1.3. Constitutedness

By recording the changes in the number and diversity of street-level activities, Ford (1984) have found that where ever there are less number of doors opening to the street, there are also less number and diversity of street-level activities (Ford, 1984). This characteristic of the street is similar to what Bill Hillier defines *constitutedness* (Hillier & Hanson, 1984: 92). According to him, the building's degree of adjacency and permeability to the public space determines the street's level of *constitutedness*. When a building constitutes the street it means there is direct access to the street. However, when buildings are adjacent to the street but there is no direct access, the street is un-constituted. This can be the case when there are high fences or large front gardens hiding the entrances of the buildings or when the entrances are from the sides of the buildings. In other words, the degree of *constitutedness* is related to the topological depth from the entrance to the street. The more space you pass through, or the more turns you take along your way the more topological depth the entrance has from the street. As the depth increases, the constitutedness of the street decreases (Hillier & Hanson, 1984; Akkelies van Nes, 2008).

In addition to the entrances, constitutedness is also related to other kinds of building openings such as windows and balconies. In residential compounds, the level of usages and social interaction in the open area hugely depends on the constitutedness of the open space by building openings (Farahat, 2019). The overlooking openings to the open space where the activities are taking place will trigger motion and social interaction. This would also enhance the sense of safety and control over space (Jacobs, 1961). In other words, any kind of residential open space whether a balcony, a garden, or a shared common open space, can provide a chance of surveillance on the surrounding for the residents and also provides visual interest for the visitors and strangers passing by (Biddulph, 2007). Usually, being able to see what is going on around you, who are engaged in what activities and so on offers possibilities for social contact. Moreover, although a higher level of street constitutedness is desirable, having backdoors opening to the backstreets and valleys may make possibilities for these spaces to host various activities as well. However, if overcrowded by people these spaces might face problems. For instance, informal and friendly social interactions between neighbors may be disrupted (Hess, 2008).

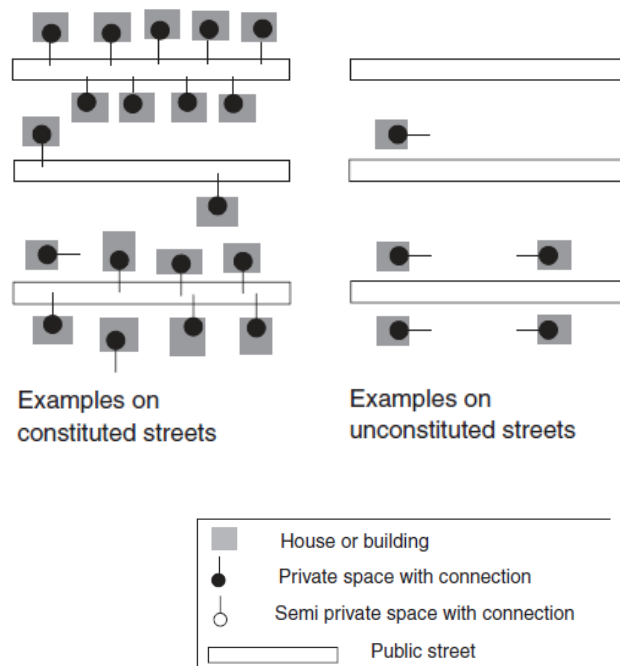


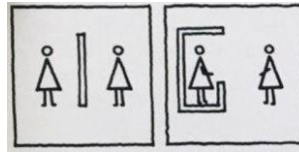
Figure 3- *Constitutedness* of streets (van Nes, 2014: 253)

3.1.4. Visibility

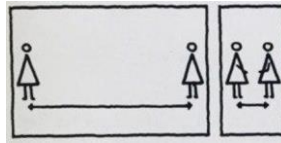
Referring back to the concept of *affordances*, Heft's discussions have led to an understanding of the concept through the interpretation of the ecological approach to visual perception. Since two-third of the nerves are in the eyes, the way we perceive and experience a space depends on who and what we see. This is called the immediate visual impression of the space (Lawson, 2001: 42). In this regard, not dismissing the other senses, our visual senses are the very most important senses of all which links the landscape to our perception making it easier to decide whether or not we act in a certain way or we participate in any activity. However, this perception gets stronger through the act of movement which integrates other senses with the visual one. This is called the "aesthetic of engagement"(Berleant, 1992).

Hence, this is important to study the visibility issue in any environment to understand the effects of visual *affordances* on visual perception. Among the pioneer scholars which studied outdoor visibility is Benedikt who introduced the term "isovist" which was then recalled as vista or viewshed in the fields of landscape and geography. However, in the field of architecture and urban studies, the term is still used as "isovist" mostly by space syntax scholars (Benedikt, 1979; Dalton & Bafna, 2003).

What can be seen in the isovist or visual field while you are static changes when you move in the environment. However, any of these isovists affects your immediate visual impression. Likewise, any spatial configuration and arrangement or any physical element can affect visual contact between individuals in a space. Gehl (1987) specifies five correlations between the configuration of physical elements and visual or auditory contacts. Arrangements that inhibit the contacts and the ones that promote contacts are schematically depicted on the left and right drawings respectively by him.



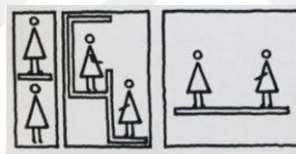
Walls



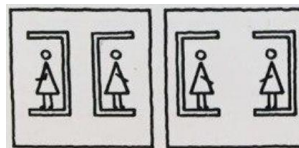
Physical distance



Speed



Level difference



Orientation

Figure 4- Arrangements inhibiting the contacts and the ones promoting them (Gehl, 1987).

The link between visibility and social interaction is then investigated in various studies. Skjaeveland and Garling (1997) highlight the importance of the appearance of a place (which is related to Gibson's discussion about visual affordance), and its visibility in developing social interaction in the space. Likewise, regarding the relationship between

visibility and social interaction Gehl (1987, 2010) introduces the term “social field of vision” which he claims is a specific distance of 100 meters in open spaces. This distance is the threshold when humans seen as figures start to be recognizable. According to him, seeing humans within a distance of 100 meters can trigger the other senses. People start to read, interpret and interact. This is why he calls it the “social field of vision”. However, people even within the 100 meters distance may still not be within one’s “social field of vision” due to the obstacles inhibiting contacts between individuals. Therefore, well-planned location and orientation of an environment’s physical features are required for social interaction in the space (Skjaeveland & Garling, 1997: 17).

Moreover, the provision of proper lighting is also essential for the visibility of the residential open spaces’ different zones especially the vehicular and pedestrian paths. In addition to the social outcomes, proper lighting ensures safety after dark especially by minimizing the risk of accidents on the shared paths by vehicular and pedestrians. Likewise, lighting enhances security by reducing opportunities for crime. Otherwise, the spots in shadow could make them vulnerable to the wondering strangers (Planning Service & Roads Service (DOE), 2000).

Based on Jane Jacobs (1961) and Oscar Newman (1972) concepts of “eyes on the street” and “defensible space” the visibility issue is very important. When the common space of residential areas is visible from the windows to a higher degree, natural surveillance happens and the space is defensible. Both scholars discuss the constant unpaid security check through the window-viewing of the residents or in other words the “eyes on the street”. Although it seems a weak and remote way of experiencing outdoor spaces, a wide range of studies have highlighted the benefits of window-viewing (seeing through the window) (Mandel, Baron, & Fisher, 1980; R. Marans & Spreckelmeyer, 1982; Ulrich, 1993; Verderber, 1982). Likewise, when the entrances to the buildings and the common areas are overlooked by the neighbors all the commutes of both residents and strangers are seen by neighbors and a friendly and safe atmosphere is achieved.

Moreover, the entrances would be less inviting for the intruders if they would be seen by people passing by on the street (Jacobs, 1961; Newman, 1972).

Moreover, visibility of the common area through windows, balconies, and building entrances helps people to see and hear others outdoor, follow what they do, and maybe get a driving or motivating force to engage in at least verbal communication unless they don't get motivated to approach and join them physically. As Gehl (1987) claims to see what's happening outside the dwelling is an invitation to go and explore, engage, and interact. Several studies proved the relationship between having the chance to see the events and activities, and the desire to take part and participate in them (Appleyard, 1980; C. S. Fischer, 1982). Hence, the location of the building in relation to the open space, the location of the dwelling unit in terms of floor, and their orientation towards the open space are determining factors in the visibility of open space where the main activities take place and this enhances the level of social interaction.

3.1.5. Inter-visibility

The highest level of residential open space visibility happens when it is inter-visible which means several buildings' openings are located facing each other, with having more people observing these spaces. Inter-visibility can also apply to a street where all the houses along it have their opening towards the street (van Nes, 2014: 252). This feature has so many benefits for the success of the inter-visible space. It is an attribute of a functionally well-designed environment which provides the possibility for having more eyes on the street and more consistent unpaid security checkouts and the inter-visible space whether the open area or the adjacent street would be a defensible space with a high level of social interaction in it (Jacobs, 1961; Newman, 1972).

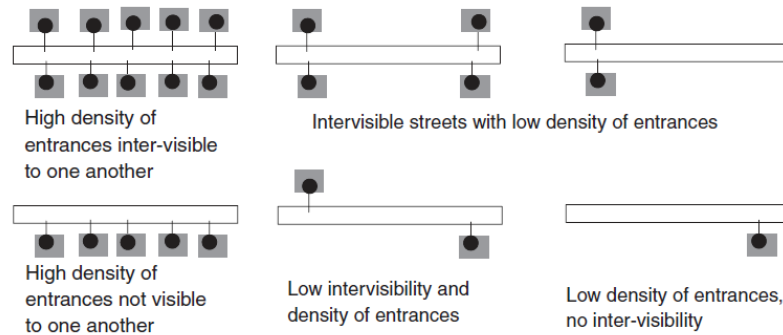


Figure 5- Inter-visibility degree of the building openings (van Nes, 2014: 253).

3.1.6. Number of block stories

The number of block stories affects the quality of open space and the level of social interaction from different aspects. First of all, the ease of commute between indoor and outdoor space is a feature that significantly affects outdoor activities and social life in residential open spaces. Therefore, the number of stories that should be passed across matters. In low rise housing buildings, residents can visit outdoors only bypassing a few steps. They easily pop out to check on what's going on. Any kind of these outdoor visits provide possibilities for stays and different kinds of events to develop. For example, women may bring other daily activities such as peeling potatoes, drinking tea, or coffee on the doorsteps. However, in multistory buildings passage between private and public domain requires either taking the elevator or passing more number of stairs to reach outdoor activities. Although they do so on a daily basis regardless of which floor they live on, it would be only comings and goings or in other words only the necessary activities. Since coming down and going up would be bothersome there would be few stationary activities either for leisure or for socializing. Consequently, although there are higher numbers of residents in a multistory building, the level of outdoor activities and socializing is considerably low compared to low rise buildings (Abu-Ghazze, 1999; Gehl, 1986; Gehl, 1987; Morville, 1969; Whyte, 1980). However, the existence of an elevator helps to reduce this disadvantage of the multistory building to a certain level.

On the other hand, since social interaction can also take place across vertical distance (between a balcony and the ground floor open space) the number of stories is again of

importance. Regarding the multistory buildings, according to Gehl (1987, 2010), meaningful contacts with the events on the ground floor are only possible from the first few floors. He defines some thresholds to show the decreased level of contact with ground level by being on higher floors. He specifies that social interaction across vertical distance is only limited to 13.5 meters. However, the higher the floors the more social interaction would be short and limited to visual and verbal communication which would be in an uncomfortable position of the neck and body. Distances more than 13.5 meters totally inhibit social interaction and the relationship to the ground level gets lost. For example, compared to the children living on higher levels, the ones living on the first floors would have a considerably higher chance of visual contact with the ground floor activities and plays.

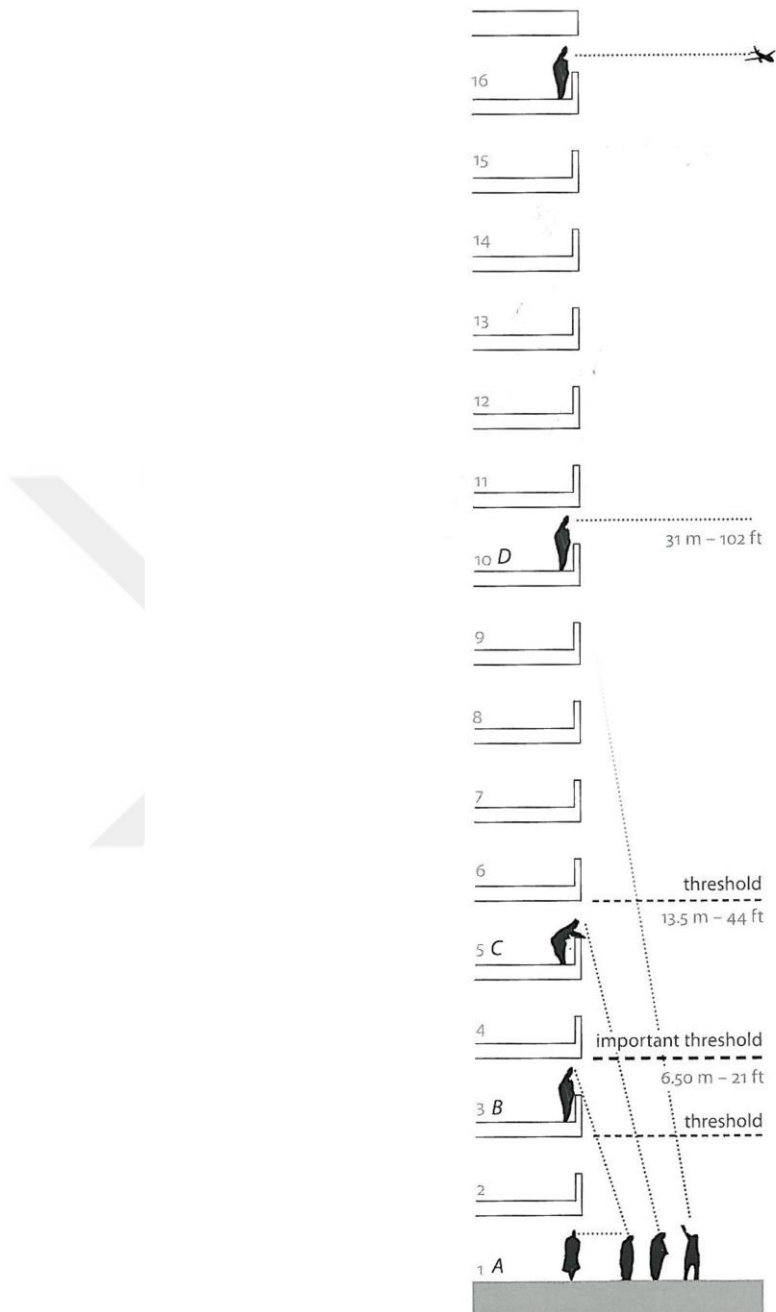


Figure 6- Social interaction on the vertical distance (Gehl, 1987: 100)

3.1.7. Landscape elements: existence, location, and orientation

Moreover, the existence of the landscape elements and furniture are affective factors of environmental quality that influence social interaction. These elements initially stimulate people's interaction with the environment by being attraction points for them to stop,

stand, sit, rest, and spend some time there having their own privacy. Environments with no elements such as columns, trees, plants, benches, and so forth are not rich enough to provide people places to stop. It means stays of any duration exist only when there are opportunities to stop, otherwise, people will only walk on by. On the other hand, brief stays in the space mean that there would be a lack of attractive activities out there, and a lack of social interaction in the area (Gehl, 1987).

So which places are the most preferable for standing, lingering, or sitting and where should designers put environmental elements? It is commonsense that a good view with no obstacles to hinder lines of vision is preferred and the longest lines of vision are the ones starting from the building edges going throughout the open space. Therefore, mostly used places to stand and sit are along the building facades. Derk de Jonge calls it the edge effect and argues that the preferred urban zones for stays of any duration are the ones close to the borders or the edges of a space (facades of a building, borders of a group of trees and etc.). This is because of the opportunity these zones give to individuals to observe the surrounding (De Jonge, 1967). The importance of the edge effect and the edge zone is also emphasized by Christopher Alexander who claims that "If the edge fails, then the space never becomes lively" (Christopher, Ishikawa, & Silverstein, 1977). Moreover, according to Edward T. Hall, since one's back is protected by the edges of the space, it also provides a chance to have a personal territory, to keep a distance from others, or to be less exposed compared to being in the middle of a space, and to see while not being seen too much (Edward, 1966). Gehl (1987) argues that the efficiency of the edges can be increased by the provision of niches, recessed zones, porches, and colonnades, with sunshades or awnings alongside the building edges. However, using shade trees on the edges would block the visual contact between the interior and exterior of the block and decrease the resident's urge to pop out and engage in activities.

After the building edges, the second preferred spots to stop are under the trees which provide shade from the sun. Therefore, the importance of green space, trees, plants,

flowers, and so on, has also been studied by various scholars. The green space is able to reduce stress or even help restore attention since it affords for good. It affords quietness, the soothing sound of the birds, and clean air, all of which help meditation and contemplation. On the other hand, it lacks *affordances* for the ill. It lacks traffic, noise, air pollution and so on. In other words, the absence of negative *affordances* is as important as the presence of positive *affordances* (Bell, 2014; Hartig, Book, Garvill, Olsson, & Garling, 1996).

Moreover, the closeness of green space may hugely contribute to the level of social contacts and social cohesion among neighbors (Coley, Sullivan, & Kuo, 1997; Kuo, Sullivan, Coley, & Brunson, 1998; Kweon, Sullivan, & Wiley, 1998). While a green space affords a quiet and refreshing place to reduce stress in the early times of the day, it may afford social contacts in the other hours of the day. People may prefer to drink a coffee or have small picnics with their neighbors in the nearby green space in the evenings (de Vries, 2010). It is also a fact that if supplemented by proper sitting furniture, the duration of stays in the green space becomes prolonged. Green space and sitting furniture are supplementary to each other in affording stays of longer duration. People would prefer to sit on comfortable furniture which is sheltered from the sun and linger there if there is green space and a good view to watch. Generally, comfortable furniture to sit on are the ones with back and armrests and usually are the wooden instead of metal ones (Biddulph, 2007).

In addition, the location of the seating furniture is as much important as its quality and comfort. since people choose sitting locations according to the favorable external conditions, the location and orientation of elements providing places to sit are of more importance compared to the location and orientation of elements affording casual transitory stops. Therefore, placement of the elements providing sitting places must be based on a thorough spatial and functional analysis. They should be located where there is a defined, intimate, well protected, and secure place near a corner or a niche, having a good microclimate. Moreover, the provision of a good view with no obstacles to hinder

lines of vision in order to recognize what's going on in the surrounding is of importance for the choice of a place to stay for any duration (Gehl, 1987). On the other hand, the aesthetics of the afforded view provided by the seating furniture is also important. An attractive view would be the one offering visual stimuli including properties of coherence and legibility while simultaneously offering properties of moderate complexity and mystery plus a richness of natural elements such as greenery and water (Hartig et al., 1996; Kaplan & Kaplan, 1989). Such views also help relieve stress (Frumkin, 2001).

The orientation of the sittings furniture should also give a choice of behavior. On one hand, seating should be able to act as a conversation landscape if there is a mutual desire in individuals to start a conversation. On the other hand, if the conversation is not desired by the individuals, they should be able to easily free themselves from the conversations. If conversations take place, these conversation landscapes can facilitate functions other than merely sitting. Moreover, an additional provision of sitting opportunities can be provided in forms other than benches. These secondary sitting opportunities could be on the steps, stairways, pedestals, low walls, boxes, and etcetera. Among these steps are the most preferable serving as good lookout spots (Gehl, 1987).

3.2. Spatial zones in residential open spaces

Any zone of residential open space is within the five spatial categories that Gehl (1987) identifies: “circulation space”, “seating space”, scenic space”, “activity space” and the ones not categorized as one of these fall to the “vague space” category. Architectural characteristics or properties that any of these spaces should be paid attention to while designing or assessing are location, dimension, proportion scale, form, surrounding buildings, landscape, material, lights, furniture, and movement patterns.

Circulation spaces are all the vehicular paths, pedestrian paths, and sidewalks. Seating spaces could be anywhere in which there is a sitting activity afforded. Likewise, scenic

spaces could also be anywhere over the open space where there something pleasurable to watch. It can be a view of nature or a check on other individuals' activities. The spaces where individual activities take place, e.g. kids playing, are called activity spaces. These are not merely the spaces that were initially designed to accommodate activities. However, vehicular paths can sometimes afford cycling activity for the kids and act as an activity space alongside acting as a circulation space. On the other hand, vague spaces are undefined, not often visited or not used properly spaces e.g. spaces affording vandalism.

3.2.1. Circulation paths

Usually, high presence of vehicular traffic or widespread parking area next to the pedestrian zone is not preferred since it reduces the feeling of safety and discourages people's physical activity. It also diminishes the sense of friendliness and helpfulness in the area (Mullan, 2003). Therefore, some practitioners tried to separate vehicular paths from the pedestrian zones and paths. However, arguments for separating vehicular traffic routes from pedestrian traffic routes lose their validity if cars move at low speed alongside pedestrians or among the stay and play areas. Separate routes for vehicular and pedestrian traffic are no more than boring paths. In other words, it is better to integrate different activities with vehicular traffic (Gehl, 1987). Consequently, it is proper to integrate different paths but to keep the pedestrian's dominance over vehicles. However, the quality of all the paths and spaces allocated for vehicles and pedestrians which afford different activities should be thought about.

Among the initial attributes of both vehicular and pedestrian paths that should be paid attention to is the pavement. First of all, it is proper to differentiate the site's identity from the neighborhood street by using a pavement different from asphalt. Likewise, having a mixture of pavements for different zones, key locations, and paths inside the residential open space is a proper way of demarking different zones. These patterns of

pavement inside the residential site can emphasize focal points for different activities within it (Biddulph, 2007).

3.2.1.1. Vehicular paths

Inappropriate design of vehicular paths decreases the level of social interaction. As I discussed before, speed is one of the factors which decreases visual and auditory contacts which happen mostly in the stationary status of people. On the other hand, it is believed that strong ties and intense social contacts are generally stimulated by stationary activities rather than dynamic ones. In conclusion, the higher the speed, the lower the possibility for social contact (de Vries, 2010). Hence speed limitations are of huge importance while targetting higher levels of social interaction in residential areas. Therefore, there should be a speed limit while driving in the residential area. Cars should slow down where ever there are people or children playing. The presence of cars should be thought of in a way not to risk the safety of pedestrians.

However, driving right up to the building and parking there reduces the outdoor activities in the area. Cars should be parked at a distance from the building providing a chance for the driver to walk along to the building while checking on what's going on in the surrounding. He or she may engage in verbal communication on the way or further join the activities. If vehicular paths are navigated right next to the building, at least there should be a speed limit and a good level of natural surveillance over them from the block openings. In other words, these paths should be constituted so that no stranger can intrude the residential open area and space would be defensible. Un-constituted paths would be devoid of any activity if also separated from pedestrian paths (Gehl, 1987).

In addition to these issues, regarding the design and demarcation of vehicular paths, Biddulph argues that instead of dropping the kerbs to the vehicle road level, it is more appropriate to keep the vehicular road at the same level as pedestrian sidewalks' level to provide a convenient movement for the pedestrians. Features such as trees, bollards, and

planters can be used to demark the different spaces. However, these features should not cause partial sight for the drivers. If level differences are inevitable, they should be kept to the minimum and ramped with a soft incline (Biddulph, 2007).

3.2.1.2. Pedestrian path

Pedestrian routes are of huge importance in residential open spaces since they are the most visited spaces residents share on a daily basis meeting each other. Lots of passive and active contacts happen in these spaces facilitating the development of more complex activities and social interaction. Therefore, their quality and functional characteristics such as availability, adequacy, origin and destination, dimension, and scale, so on and so forth should be designed properly. These routes are determinant factors in which residents have higher possibilities of daily encounter (Abu-Ghazze, 1999).

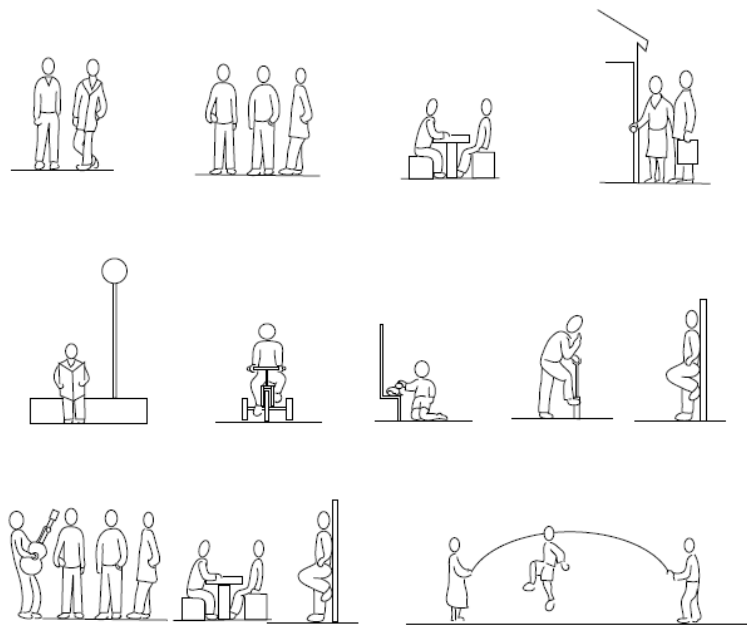


Figure 7- Pedestrian routes especially when connected to the open spaces should be able to afford for various activities (Planning Service & Roads Service (DOE), 2000: 71).

Among the attributes of the pedestrian routes which matter a lot are the pavement and connection of them since they affect the quality of the walking experience. It is important to provide an easy walking experience in any weather condition. The level difference in connection points of pedestrian routes should be avoided if possible. However, in some of the cases, this is inevitable due to site topography. Hence, they should be connected in a proper way. Generally, relatively flat or slight steep ramps are preferred to stairs since it does not affect the walking rhythm seriously. Moreover, ramps allow carrying baby strollers or wheelchairs easily. (Gehl, 1987).

3.2.2. Vehicular parking

Parking areas matter not only because they provide a space for the vehicles but also because the layout and location of these areas affect the surrounding open space to a significant degree. Most importantly, the parking area should not spoil the visual character of the site by its dominance over pedestrians. In other words, seeing cars all over the residential open space is not attractive (Planning Service & Roads Service (DOE), 2000). Therefore, not all the parking provision should be on the ground level and if inevitable, the allocated area for the parking on the ground level and its layout should be located properly. Even, well-located parking areas can contribute to the quality of the space since people will commute to and from their vehicles, and passive and active contacts will happen on their way. When cars are not parked these areas can also act as play areas for children (Biddulph, 2007). However, parking areas should not dominate and spoil the visual character of the site. To soften and break up the negative visual effects of parking areas and cars on the ground level, trees and shrubs can be planted surrounding the parking. This can also be applied in the case of in-curtilage parking areas alongside the building lines between the building edges and the parking area. In the case of huge parking areas, another way is to insert low walls or to have a mixture of paving for the parking areas to break the visual effect of its size (Planning Service & Roads Service (DOE), 2000). On the other hand, although parking areas should not dominate and spoil the visual character of the site, they should also be located in

indiscriminate, safe, and convenient spots where there is natural surveillance from the building blocks to reduce the vandalism in these areas.

3.2.3. Entrance zones

The entrance zones control the accessibility of the indoor space (Can, 2012: 43) and play an important role in the level of social interaction. For instance, shared stairways and paths accessing the residences would provide the chance of passive contacts and enhance the probability of forming friendships (O Skjaeveland & Garling, 1997). Therefore, it is important to have a well-defined entrance zone affording for good e.g. sitting, resting, socializing and etc. High-quality residential buildings generally have sitting possibilities at the entrance zone, on the entrance stairways, resting spaces right in front of the building, or on the transition zone (in-between space) which in its best version could be a front yard. These features are of more importance in the case of multistory buildings (Gehl, 1987).

Moreover, referring to the concept of “eyes on the street” or the “natural surveillance” introduced by Jane Jacobs, residential areas with extensions of the interior space to the exterior as an in-between space, (e.g. existence of the front gardens, or open spaces right in front of the entrance) and a gradual spatial hierarchy of access, would result in higher levels of surveillance which would increase the sense of co-presence and co-awareness. Moreover, one other gained advantage would be the residents’ collective responsibility to protect their residential open space and the public space close by against crime. As a result, these spaces become safer and liveliness and quality of them increase (Gehl, 1987; Hillier, 2002; Jacobs, 1961; Newman, 1972; Akkelies Van Nes & López, 2007; Van Nes & Rueb, 2009). Moreover, Macdonald (2005) mentions the importance of the entrances to the indoors and suggests the necessity of having them at a few steps higher than the sidewalk level. By this means, while respecting the privacy of the interior space and expressing the spatial hierarchy from outside to the inside space, it also provides the front terraces a better viewpoint to the exterior.

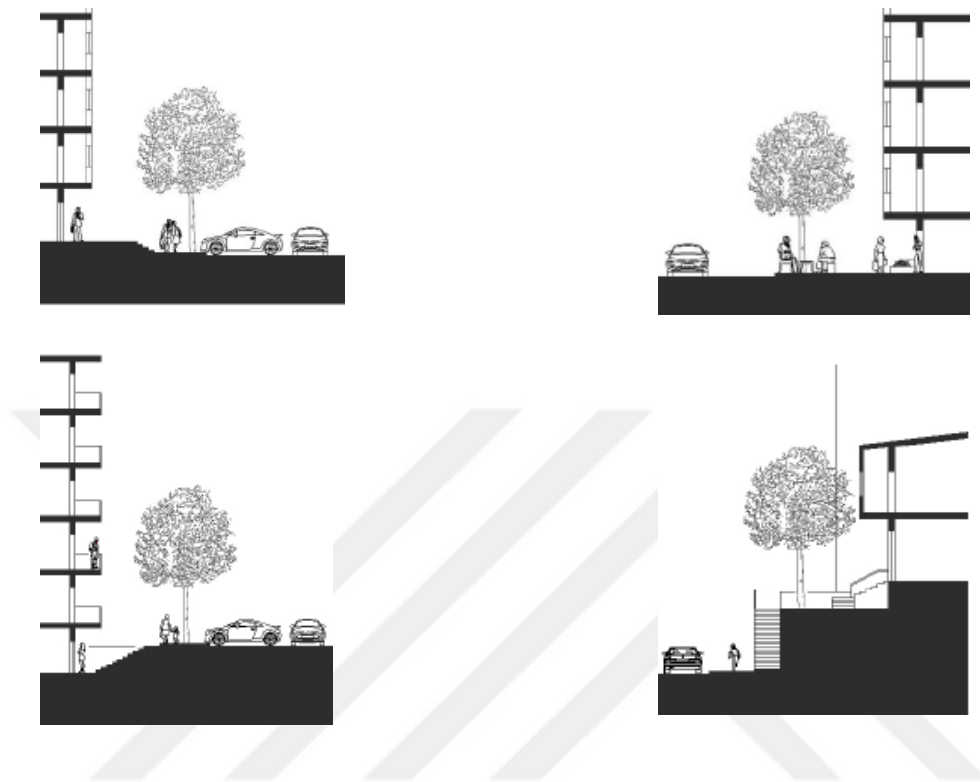


Figure 8- Different typologies of entrance zones (source: author)

3.2.4. Gardens

Gardens can either be the in-between spaces between building interior and street (front gardens) or between the building interior and residential communal space in residential compounds (kind of back gardens). In both cases, the quality of the gardens and what they afford matter. These spaces should have properly paved and grassed areas to afford sitting, children's play, hanging washed clothes to dry out, planting and gardening, and extension of some household chores (Planning Service & Roads Service (DOE), 2000). In this regard, Skjaeveland & Garling (1997) emphasizes the importance of front gardens as private- open spaces which act as in-between spaces, extending the interior space to the exterior and are required for social interaction (Skjaeveland & Garling, 1997). In fact, in-between space in its best version can be considered as a front garden. This is emphasized by Macdonald that transition spaces between private and public

should have gardens (Macdonald, 2005). Front gardens afford most of the long-duration activities, contributing to the liveliness of streets and neighborhoods (Gehl, 1986) by offering various sensual experiences (Edward, 1966). These in-between spaces can provide the possibility to bring daily domestic activities to the outdoor. People could do things like potato peeling, studying, sewing, planting, in the front garden while enjoying the accompany of the neighbors sitting near them (Gehl, 1987). In addition, more meaningful combinations of useful and pleasurable activities could be developed in front gardens if the garden is within the view of passersby. People and activities happening in the front garden would be of visual interest for the passersby which as a result, the liveliness and quality of the space start to grow and further recreational and social activities develop (Gehl, 1987; Lawrence & Low, 1990; Macdonald, 2005). Therefore, front gardens act s transition zones between building and street should be properly in scale in order to simultaneously provide privacy for the residents and allow contact with the street. While on the other hand, back gardens can act as in-between space between the building interior and the communal space of a few building blocks. However, in the case of single buildings, despite their role in the social interaction of building residents, they should also afford a level of privacy from the strangers on the street (Planning Service & Roads Service (DOE), 2000).

3.2.5. Playspace for children

Compared to adults, space is experienced differently by children since it is established in a different structure for them (Forrest, 2012). Rasmussen (2004) explains this structure by explaining the “institutional triangle” which is composed of mainly home at the first corner, then school, and finally recreational setting at the third corner. He also calls the path from the recreational setting to the home the “last leg”.

Cooper Marcus and Sarkissian (1986) classifies children into three groups of preschool children, children aged 5-12, and teenagers. They emphasize that it is important to think about young people while designing housing schemes and try to provide opportunities

for them to meet their needs. While preschool children need to play safely near their home and under the direct gaze of their parents, teenagers may “hang out” in spaces out of the adults’ gaze. Preschool children tend to play with equipment to jump, run, swing, climb, balance and slide, and enjoy manipulating and experimenting environmental features such as water and soil. Children aged 5-12 tend to develop more types of activities such as skipping, skateboarding, and cycling. Rule-based skill games such as football and basketball are interesting for these children. They also tend to engage in fantasy and role-playing as well as building up a structure. On the other hand, teenagers engage in sports and music-related activities (Marcus & Sarkissian, 1986). As a result, children socialize in the playground or any other interesting space which can act as a recreational setting for them. It is seen in many cases that children would use spaces other than the playground as their playing setting. As such is the children cycling on the ground floor parking areas or on the circulation paths. Others may share spaces under gazebos and pergolas as playing areas with friends.

Vehicular paths in residential areas are the most preferred spaces by children to play due to four reasons. Firstly, because their hard surfaces afford activities engaged with wheeled toys such as skateboarding and cycling. Secondly, since these spaces are within proximity they are accessible every day despite the time restrictions imposed by children’s parents. Thirdly, children prefer to play in a wider area than gardens where expansive play activities are restricted. Fourthly, since children’s journeys are on foot these spaces give them more freedom and the possibility of play between destinations. However, the value of vehicular paths as play areas is undermined due to the risk of a kid being hit by a car. This risk can be reduced by implementing road humps or chicanes and imposing speed limits for the drivers while inside the area. Drivers should be aware of and even anticipate the presence of children since they are the source of hazard for children and they should be more responsible (Biddulph, 2007).

In addition, the quality of play areas is an important factor affecting the level to which these spaces are used by children. They should be interesting and attractive offering as

many possibilities as possible for the kids to engage with it. Generally, high-quality playgrounds are the ones with components which are manipulable or loose and easy to move. Furthermore, the location and visibility of playgrounds also matter a lot. For example, for a kid who can see whether there are other children and which children are out there playing in the playground or children are cycling on the paths would promote possibilities for social interaction. Seeing and noticing what's going on would be a motivation to go and play, and socialize with other children (Gehl, 1987: 63-65). In contrast, children who have not the chance of seeing the other children's play do not usually have the motivation for social interaction. This is the case of children whose home is in a farther distance, whose windows are not overlooking the playground, or the ones who live on upper floors of a multistory building. Moreover, play settings are not only a huge opportunity for kids to play together and form friendships but also a setting to open up a chance for the parents to accompany each other watching their kids, get acquainted with each other and perhaps socialize in ways which they may not do so in other settings (Vincent, Neal, & Iqbal, 2018; Wilson, 2013).

4. Case study: Dikmen Valley, Ankara

4.1. History of squatter housing in Turkey and the government's approach to them: models of urban transformation

Rural-to-urban migration in Turkey started in the period following WWII and began with the development of the agricultural cultivation technology and the newly developed highway network, both of which were initiated by the Marshall Aid from the USA. Major results of this remarkable migration to the cities were rapid population growth and rapid urbanization in metropolitan areas which gave rise to the make-shift housing built by the incomers. Therefore, the 1950s was the beginning of squatter housing (Gecekondu) in Turkey (Dündar, 2001: 391). In the beginning, these rural migrants started to settle in the low-standard gecekondu which they individually built on public land. Later on, some of these gecekondu owners have constructed more than one gecekondu and most of the public land was eroded, not much left for the newcomers to build a gecekondu on it. Therefore, during the 1960s, the newcomers became the tenants of the previous gecekondu owners which helped gecekondu owners to gain rental income. More newcomers had no chance but to settle on private land. Alongside these developments, there was also 'unauthorized shared ownership' which resulted in a new kind of gecekondu development. The developers, bought lands on peripheral areas and informally subdivided them, and sold them to different individuals through a public notary. However, these informal land subdivisions and the constructions on them were illegal and therefore title deeds could not be issued (TSSA, 1998; Şenyapılı, 1996; Türker-Devecigil, 2005).

Governments' approach to the squatter housing areas varied. Until the mid-1960s, these areas and their populations were seen as "the source of social ill in the urban system" and renewal projects planned to demolish and clear these areas from squatters. Later on, the Gecekondu Law (No. 775) was passed in 1966 aiming the improvement of the existing gecekondu by first clearing the uninhabitable ones and relocating their inhabitants to other housing areas, and then putting an end to the construction of new gecekondu settlements by developing low-cost housing. The Gecekondu law's objective

was then upgrading the existing gecekondu employing the existing development pattern (Türker-Devecigil, 2005: 215).

This was followed by rehabilitation and upgrading in the 1970s. Although the state promoted the building of social housing after the demolition of the gecekondu areas, the ratio of squatters to the urban population in major metropolitan cities was so high that providing enough housing was impossible. Hence, until the 1980s, a series of amnesty laws were introduced which legalized the existing gecekondu and forbade the building of the new ones. Nevertheless, incomers kept building new ones since they were protected by the populist politicians in exchange for their votes (Dündar, 2001: 391, 392).

During the 1980s a structural change in the urban planning system and metropolitan management occurred. In addition, a new approach to the gecekondu problem was introduced. It was a new amnesty law (Law No. 2981) which led to a new urban transformation plan in the existing gecekondu stock. This law in addition to legalizing the illegally developed housing areas provided the owners or the users of land the development rights through development plans. In this context, local governments gained more authority and a “two-tier metropolitan system” was formed including the Greater City Municipality and district municipalities (Leitmann & Baharoğlu, 1999).

Since the 1980s, the responsibility of district municipalities included planning, approval, and implementation of up to 1/5000 scale urban plans as well as improvement plans, issuing occupancy, and construction permits. On the other hand, the responsibility of the Greater City Municipality was to prepare the urban plans on a large-scale and to assure the compatibility of all the plans on different scales. Later on, due to the economic crisis during the 2000s, and the increasing disputes between Local and Greater Municipalities on sharing the rents, gecekondu development was no more a pure attempt of providing housing needs for the urban poor (Türker-Devecigil, 2005: 214).

To sum up, there have been five major transformation models until now that were implemented aiming gecekondu clearance in Turkey: 1) The resettlement model, 2) The improvement plan model, 3) The urban transformation project model, 4) Ad-hoc urban transformation, 5) Strategic management approach.

	1940s		Rural to urban migration
	1950s		Beginning of squatter housing
State-led Industrialization	1950-1965		Squatters as a source of social ill Approach: demolition and clearance
	1966	Resettlement model	Approach: upgrading existing gecekondu with the existing development patterns Clearing uninhabitable ones and relocating inhabitants Improving the inhabitable ones
	1970s		Approach: rehabilitation and upgrading Demolition of gecekondu areas and building social housing on them
	Until 1980		Approach: legalizing existing gecekondu and forbidding the building of the new ones
	1980s	Redevelopment model	Approach: Legalizing the illegally developed housing areas Providing development rights Two-tier system of Local and Greater Municipalities
Locally Administered Neoliberalization	1989-1990s	Urban Transformation project model	Approach: Private- Public partnership Public participatory Three-tier system of Local Municipalities, Greater Municipalities, and İmar Metropol
	1990s onwards	Ad-hoc Urban Transformation model	Rise of Islamism Changed development rights Economic crisis Disputes between Great Municipalities and Local Municipalities on sharing the rents
	1994-2002		Islamist ruled the cities
	2002 onwards		Dominance of neoliberalism accumulation strategies over Islamist ideological inclinations
State-led Redevelopment Plans	2005		Greater Municipality in power Redeveloping areas deemed necessary
TOKİ concerned with squatter housing	2007 onwards	Strategic Management	TOKİ in power regarding the squatter housing areas Approach: comprehensive solutions Long-term applicable redevelopment considerations

Table1- Timetable of governments' approach to squatter housing in Turkey; derived from (Batuman & Baykan, 2014; Ö Dündar, 1997; Leitmann & Baharoğlu, 1999; Şenyapılı, 1996; Türker-Devecigil, 2005).

4.2. Dikmen Valley Urban Transformation Project

Dikmen Valley is located between Çankaya and Dikmen, two densely populated housing quarters located in the south of Ankara and gecekondu development started in this valley after the 1960s and the number of gecekondu units reached 1,916 with approximately 10,000 inhabitants within 20 years (Egercioglu, 2006; Metropol, 1991). The Dikmen Valley Urban Transformation Project was first discussed as a resettlement project. However, the resettlement plan of the project could not be completely implemented due

to oppositions of the gecekondu inhabitants of the valley taking the project to the court, and high expropriation costs (Türker-Devecigil, 2006) and then the project was affected by the redevelopment law in 1984 and provided Gecekondu owners the right-holder status. Therefore, the Greater Municipality of Ankara introduced the Dikmen Valley Green Area Project in 1984 which included five implementation zones and aimed to transform the valley into an urban park and relocate the gecekondu owners to another part of the city. The project which is a significant element of Ankara metropolitan area culture and recreation system included a valley of 158 hectares, 2300 gecekondu, and 9809 residents in 1989. Gecekondus were demolished and 14.5% of the area (23 hectares) was appropriated for housing and 18,000 people were settled in 404 housing units (Dündar, 2001: 395).

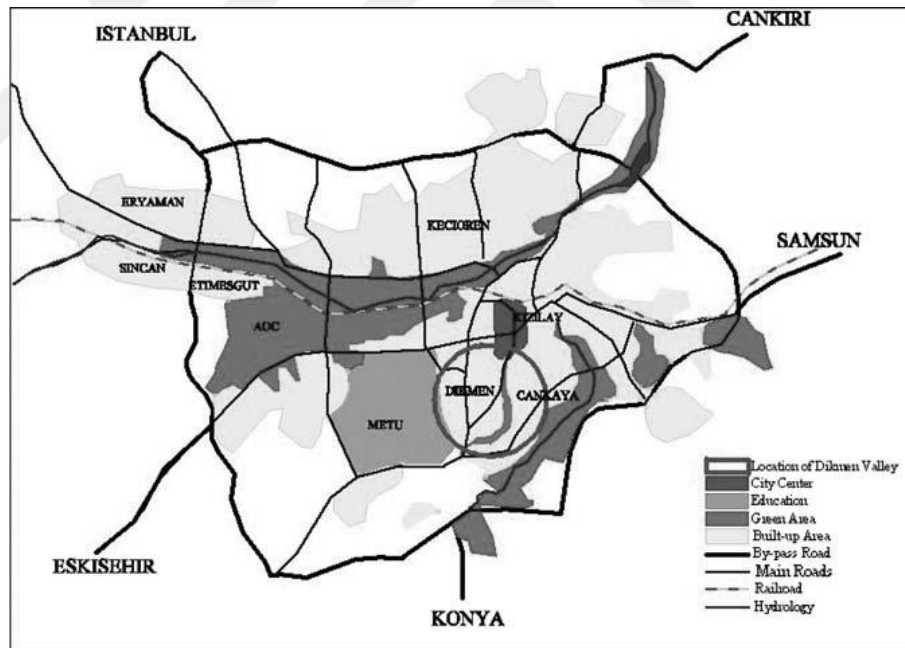


Figure 9- The Location of the Valley in the Ankara (Türker-Devecigil, 2005: 212).



Figure 10- Dikmen Valley in 1989: gecekondu houses surrounded by authorized housing pattern developed by the Build–Sell Model. Source: personal archive of Kenan Ozdemir (Türker-Devecigil, 2005: 217).

Later on, after the 1989 municipal elections, the project was revised and adopted a new model of transformation by the Greater Ankara Municipality (GAM) and the Çankaya District Municipality (ÇDM), known as the urban transformation plan (UTP) model. They renamed the project the Dikmen Valley Housing and Environmental Development Project (Ciftci and Karakayaci, 2002 cited in Uzun, 2005: 187-188). At the time this project was introduced as the biggest gecekondu transformation project of Turkey by the local administration. The GAM, the ÇDM and Metropol İmar (a public project management company, whose capital holders were GAM, and the district municipalities) were the project holders (Kuntasal, 1993).

This time, new financial innovations, private-public partnerships, and public participatory mechanisms were implemented. This helped financing firms and increased the feasibility of construction in the area by sharing the rent. The importance of participation was enhanced and a participatory decision-making process was created. This was intended to decrease public resistance to transformation and maybe to gain public support. In this regard, public meetings were organized in the municipality. The committee of the main decision-making mechanism included the GAM and the ÇDM mayors, directors of Metropol İmar, Ankara Water and Sewer Directorate, Urban Utilities and Urban Development Directorates of GAM, and the cooperatives. Also, four housing cooperatives were formed as representatives of the four neighborhoods during the decision-making process. They included gecekondü owners in the decision-making process and tried to promote solidarity patterns and social communication. They attempted to better represent their members and keep their members informed of the project development and at the same time to pass information from their members to project developers. However, at last, the process was criticized as ending up at information-giving and not being able to be an active participation system in the democratic planning environment of Turkey (Dündar, 2001; Metropol, 1991).

From the 1990s onwards, on one hand, landowners and gecekondü residents started to expect the same development rights. On the other hand, increased expropriation values determined by courts stopped the economical feasibility of the project. Moreover, the economic crisis and changing administrations also affected the feasibility of the project. In addition, there were increasing disputes between GAM and ÇDM which accelerated the problems of the project (Metropol, 1994). After the municipal elections in 1994 and the administration change afterward, the participatory character of the project was also lost. Sharing the rents and values generated by the project turned out to be the only important issue. Consequently, even the gates of the valley (Ayrancı and Dikmen, via Culture Bridge; and Çetin Emeç) were transformed into residential areas to decrease the costs and increase the profits. Moreover, the legislative framework of urban transformation projects was not clear anymore. Therefore, during the first 13 years

(1984-1997), only two of the five stages of the project were completed because of all these issues. Later on, since the constructions were not completed in the expected time period, the financial efficiency of the project was not achieved as planned. In order to achieve financial sustainability, as the project continued to the third, fourth, and fifth implementation zones, huge modifications were implemented in the design principles. The results were high constructions with a dense population and a decrease in public services (Türker-Devecigil, 2005: 219).



Figure 11: Stages of Dikmen Valley Urban Transformation Project. The area marked with the ellipse is the Portakal Çiçeği Valley which was also studied alongside the Dikmen Valley investigation in (Batuman & Baykan, 2014).

Overall, one of the main aims of the project was to sustain the social integration of the area. In addition to the housing provision, municipal service areas were allocated at the intersection points of the new transportation roads including office spaces alongside the commercial and service facilities. These facilities were meant to accommodate also the new population and increase the social infrastructure quality of the region. However, the municipal service area in Dikmen Valley attracted additional facilities that were not planned beforehand and resulted in an increase in the rent of the area and hence resulted in more pressures on the valley. Consequently, the municipal service areas were left to

luxury housing after the project's completion. As a result of the construction of more luxurious residential buildings, real estate values in the area increased considerably. This led to the displacement of the gecekondu dwellers and social heterogeneity in the area. In 2002, the titleholder gecekondu dwellers constituted only 38% of the apartment residents in the Dikmen Valley Project area as most of them sold or rented their house, and moved to other neighborhoods where land prices were lower and low-income groups lived (Uzun, 2005: 189, 190).



Figure 12- The apartment houses constructed for the former gecekondu dwellers and higher income groups in the first three phases of Dikmen Valley Urban Transformation Project (source: author).

4.3. In-depth case analysis

There are two groups of residential areas with different socio-cultural textures on both sides of the valley. Therefore, taking the social heterogeneity of the area as an invariable factor and being aware of its impacts on the level of social interaction in residential open spaces of the project, the aim is to pinpoint the ability of these residential open spaces to enhance social interaction between neighbors by what they can afford. Access to residential common spaces and the social affordances of the space stand out as factors that should be examined in the selected residential compounds of the project. For this purpose, this study tries to understand and grasp the ongoing daily social activities by behavior mapping to observe, track, and code different practices in different spatial layouts.

In a similar study place preferences of residents to spend time, how often they used their open space, level of communication with their neighbors, their place preferences to spend time with neighbors, and the communication opportunity between the street and the open space has been studied through questionnaires (Burcu, 2019). According to the results of this study, compared to the Çankaya side, residents on the Dikmen side of the valley attach more importance to neighborhood relations, prefer to spend time in their residential open space, and more often use these spaces. Moreover, they communicate with their neighbors more often and they prefer to do so in the residential open space (Burcu, 2019).

However, in this study, I observe different results which cannot be generalized to two. Instead, I observe different social affordances of residential open spaces throughout the first three phases of the DVUTP. These three phases comprise thirty-seven residential compounds with different spatial layouts and hence different social affordances.

Therefore, I categorize these residential compounds according to the typology of their spatial layouts. In this categorization I attach importance to the level differences in their

section drawings. As a result of this categorization there are six groups of residential compounds with different typologies.

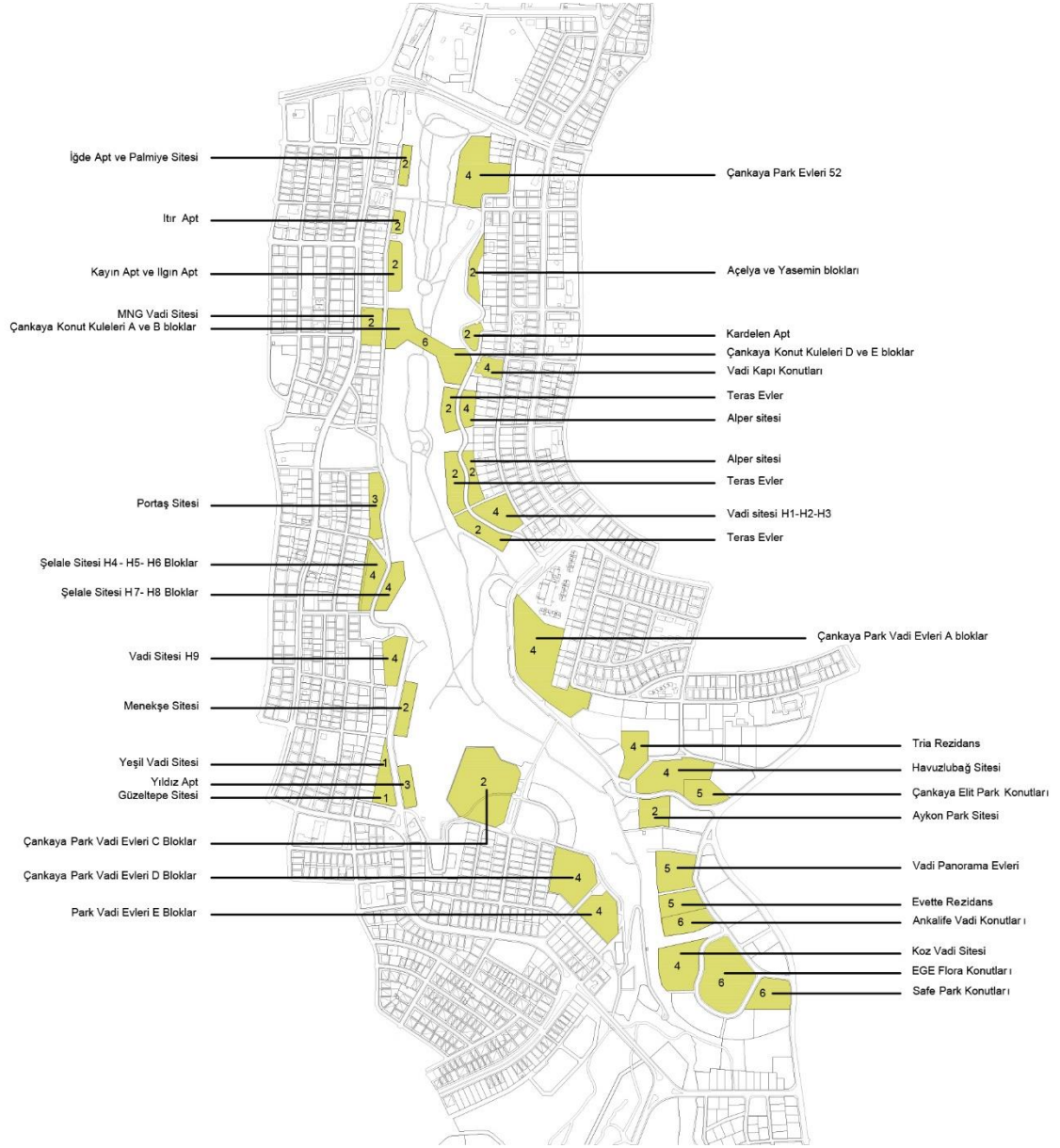


Figure 13- Thirty-seven residential compounds of Dikmen Valley Project's first three phases and their categorization into six typologies (source: author).

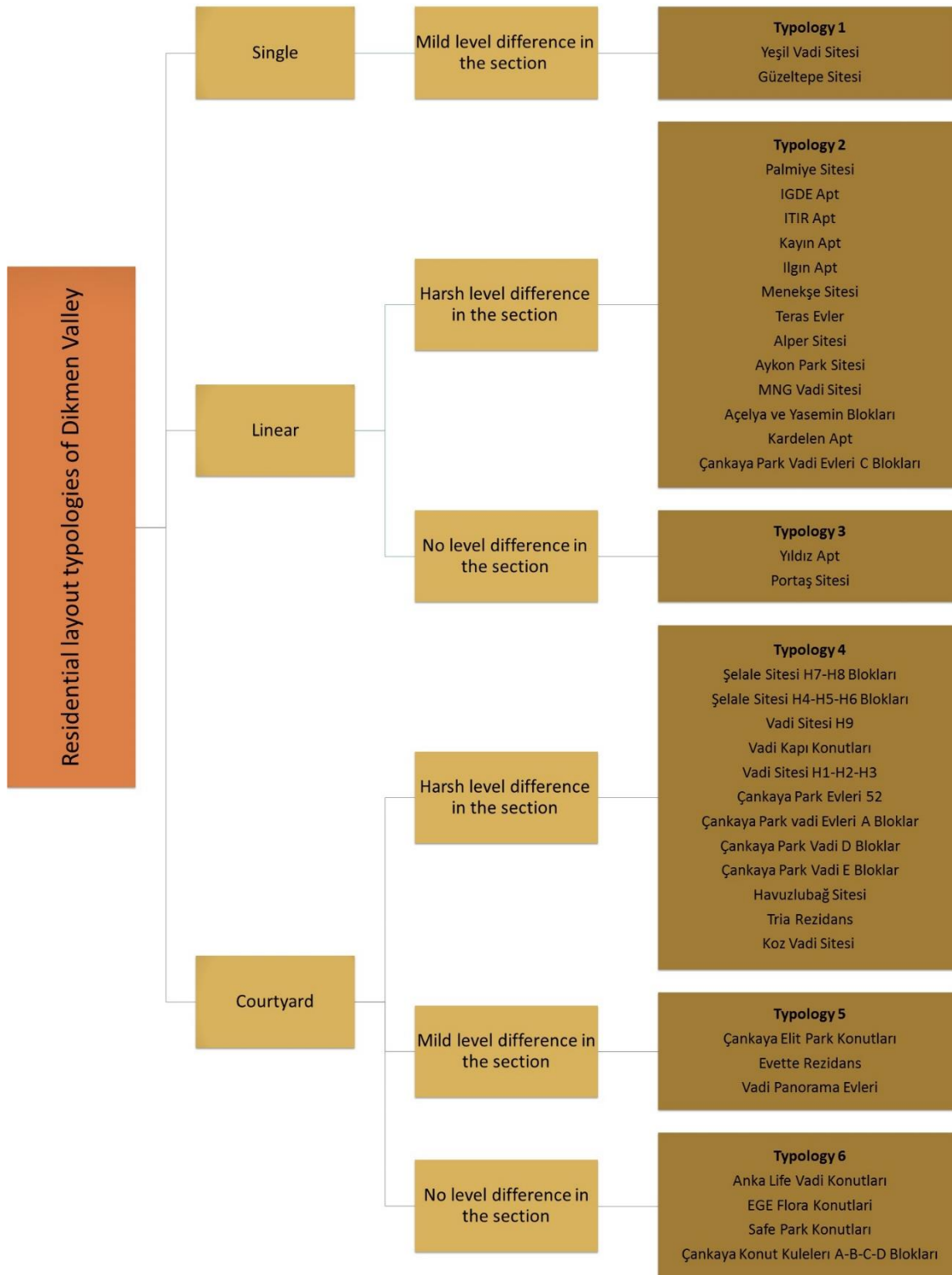


Diagram 2- Diagram of residential layout typologies of Dikmen Valley project's first three phases (source: author).

In this regard, an in-depth analysis of the six typologies is prepared investigating their topological depth, spatial demarcations, constitutedness, visibility, inter-visibility, number of block stories, and landscape elements. In this regard, section drawings, site plans, and graphs are used. Moreover, both human and vehicle densities are tracked in field observations throughout the study.

4.3.1. Typology 1

Residential compounds of typology 1 (Yeşil Vadi Sitesi, Güzeltepe Sitesi) are single blocks with mild level differences in their sections. These compounds are provided with one access into the residential open space, through which residents access the block. This access is used both by vehicles and pedestrians. Moreover, spatial demarcations that define the residential compounds in this typology are through slight level differences due to the topography of the area. Therefore, as illustrated in the section drawing of one of the examples of this residential typology, since the semi-private residential open space adds one topological depth to the indoor-outdoor access, and since this space is separated from the public street; permeability of the indoor space decreases and contacts are limited to the ones among the residents inside the residential open space. In other words, this one extra topological depth excludes strangers from engaging with the residents. This leaves the streets devoid of any activity, and socializing happens only within the residential compound.

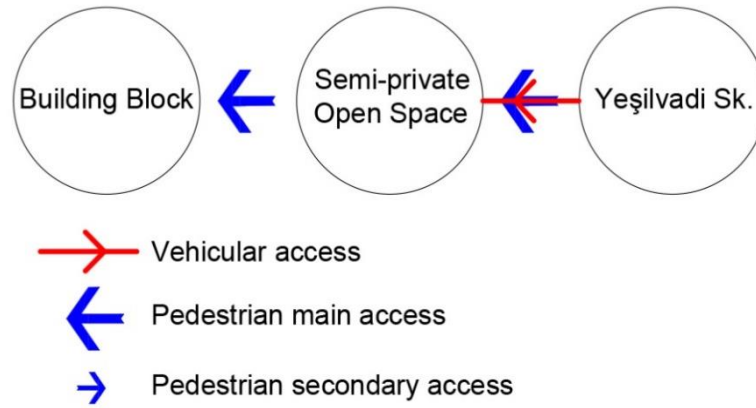


Figure 14- Typology 1, Güzeltepe Sitesi topological depth (source: author).

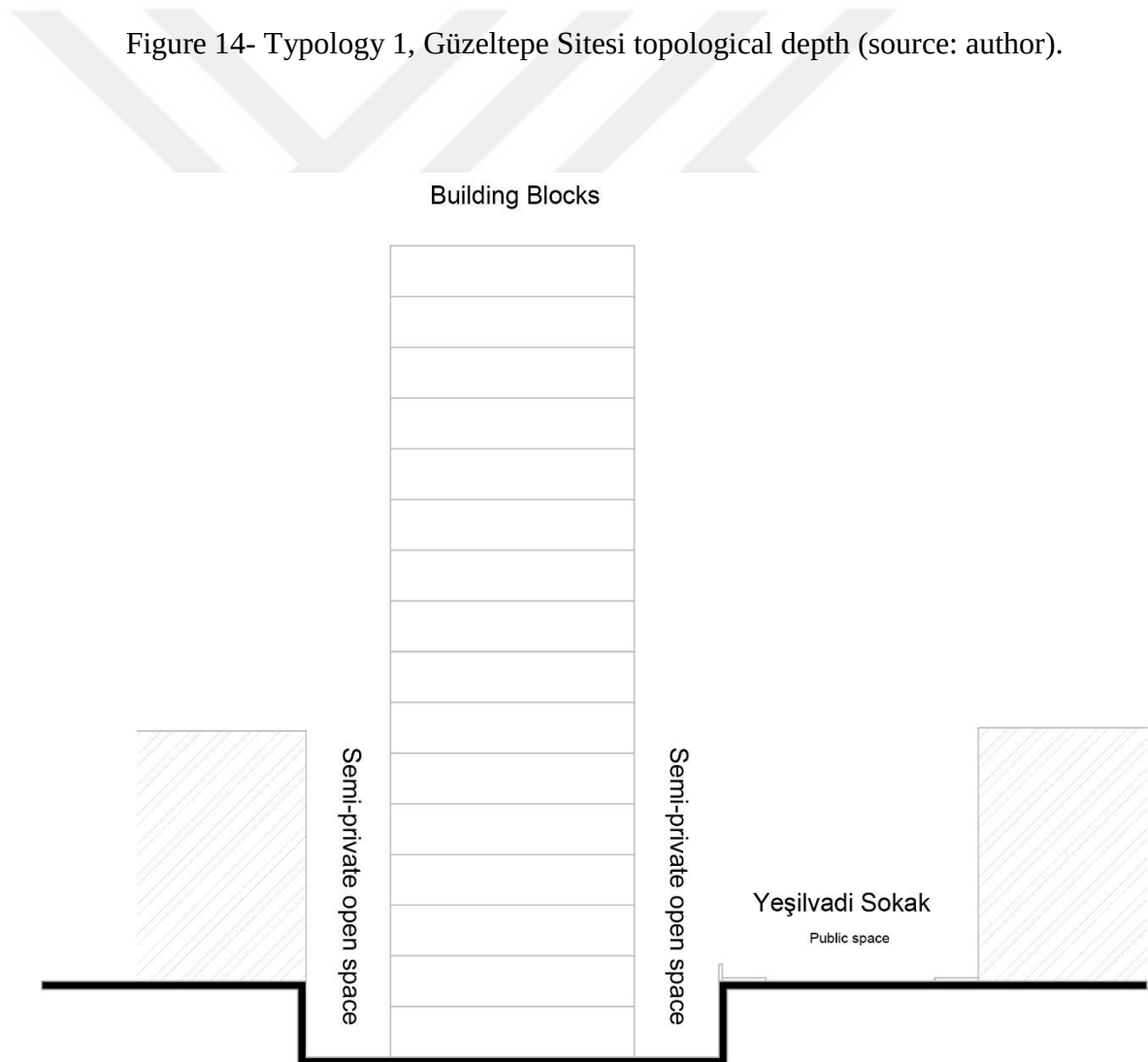


Figure 15- Typology 1, Güzeltepe Sitesi section drawing (source: author).



Figure 16- Güzeltepe Sitesi site plan analysis (source: author).

In addition, streets are un-constituted since there are walls around the residential compounds and one shared entrance is allocated for their residents. In other words, there are very few openings directly joining the streets. This also decreases the liveliness of the streets. On the other hand, constitutedness of the residential open space differs in each zone. The most constituted zones are the ones in front of the entrances at two sides of the block where most of the interactions (chance or scheduled meetings) take place among residents.

Moreover, the visibility of the streets is high. However, it is only through the windows which are overlooking the streets. On the other hand, the visibility of the residential open space differs in each zone. The most visible zones are the spaces allocated for the parking area. On the other hand, seating and activity spaces are located in less visible zones (playground on zones 4 and seating space on zone 5). However, higher levels of interaction are taking place in zones one, two, four, and five respectively compared to less visible zone three. Moreover, since there is only one block in this typology, there is no inter-visible zone within the residential open space.

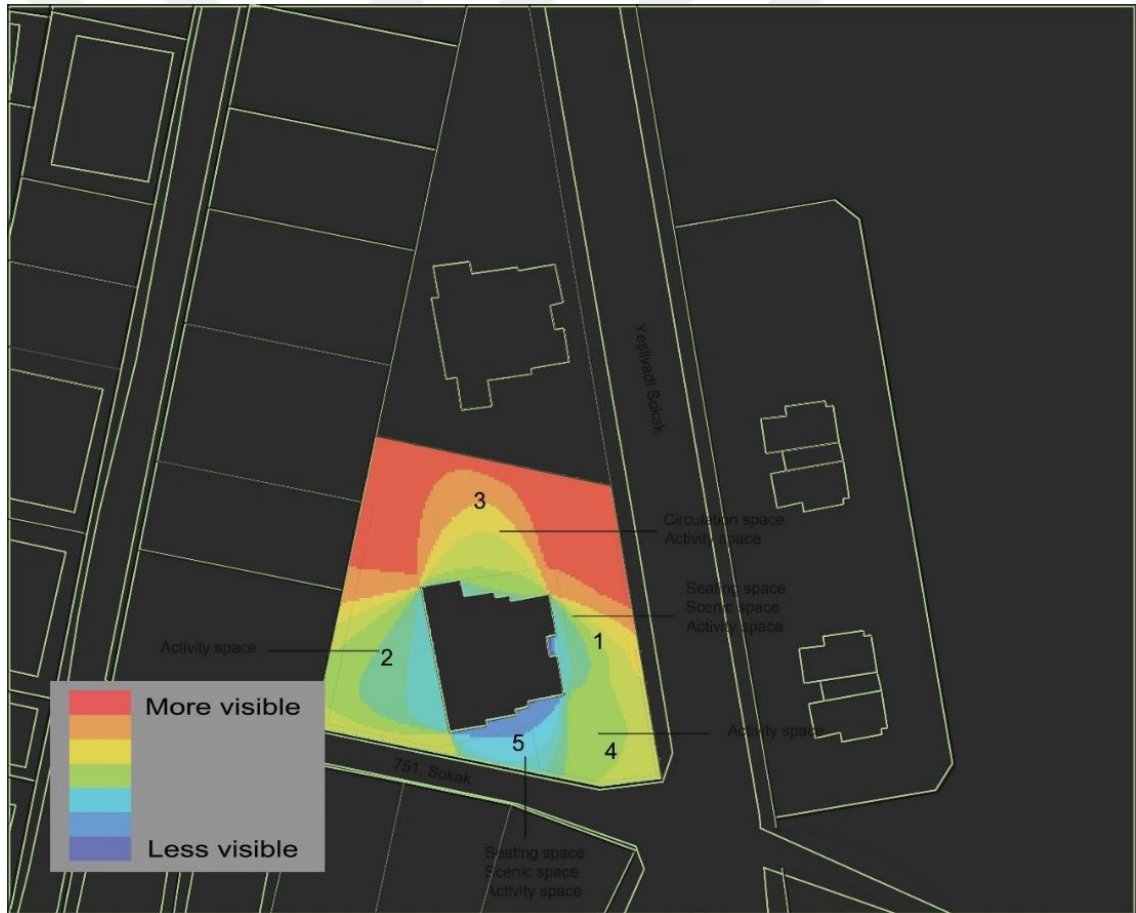


Figure 17- Visibility graph analysis of Güzeltepe Sitesi (source: author).



Figure 18- View of 751. and Yeşilvadi Streets, un-constituted with high visibility through the windows (source: author).



Figure 19- View of Güzeltepe Sitesi constituted zones with less visibility level (zones one and two) (source: author).

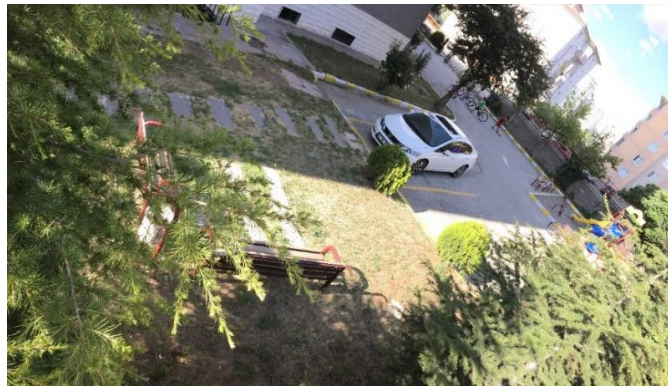


Figure 20- View of Güzeltepe Sitesi less visible zones with more interaction in them (playground in zone 4 and seating space in zone 5) (source: author).

Furthermore, residential compounds of this typology have multi-story blocks which leave a huge portion of the compound for open space. However, a high number of stories limits contacts on the vertical plane to the ones among ground floor open space and the first few floors of the block. In addition, Landscape elements of the residential open space are weakly organized and hence not used regularly. Trees and green stripes are used on the edges or as spatial demarcations, and in some cases to define or improve the function of furniture in the seating spaces. Although in some zones (zone one) they improve the user experience and enhance the probability of meetings, in most of the zones they could be way better than how they currently are.

4.3.2. Typology 2

Residential compounds of this typology are linear blocks with harsh level differences in their sections. These compounds are whether typology 2-1, provided with one access into the building (Palmiye Sitesi, IGDE Apt, ITIR Apt, Kayın Apt, Ilgın Apt, Menekşe Sitesi, Teras Evler, Alper Sitesi), or typology 2-2, provided with one access into the residential open space (Aykon Park Sitesi) or typology 2-3, provided with one access into the building and one into the residential open space (MNG Vadi Sitesi, Açelya ve Yasemin Blokları, Kardelen Apt), or typology 2-4, provided with two accesses into the residential open space (Çankaya Park Vadi Evleri C Blokları).

The topological depth of this typology depends on the kind of access it has. The ones with access into the open space (typologies 2-2, 2-3, and 2-4) have one more topological depth than the ones with access into the building (typology 2-1). In this typology, spatial demarcations between the public streets and residential compounds are through harsh level differences due to the topography of the area. As illustrated in the section drawing of some of the examples of this residential typology (appendix2), in typologies 2-2, 2-3, and 2-4 the semi-private residential open space adds one topological depth to the indoor-outdoor access, and residential open space is separated from the public street. Hence permeability of the blocks from the streets decreases and contacts get limited to the ones

among the residents inside the residential open space. On the other hand, in typology 2-1, the topological depth of the block from the street is zero since there is direct access to the block from the street and there is no negotiation space in-between.

Within four sub-typologies, typology 2-3 is of more interest due to its layout since it is worth to investigate the usage of two entrances to the residential blocks. In Karlıkayın Apartments case, one access is from Karlıkayın Street and the other from Şair Nazim Street which both are connected to Reşat Nuri Street (the main neighborhood road).

While access from Karlıkayın Street provides direct entrance to the blocks and is located on the same level as the street, the entrance from Şair Nazim Street provides access into the residential open space which is higher than the street level. Pedestrians initially enter the open space from a shared entrance and then get distributed to their own blocks.

Therefore, the topological depth of the blocks from the streets differs while accessing from two different entrances. While there is zero topological depth from Karlıkayın street, there is one topological depth from Şair Nazim Street. This one topological depth makes the blocks less permeable from Şair Nazim Street.

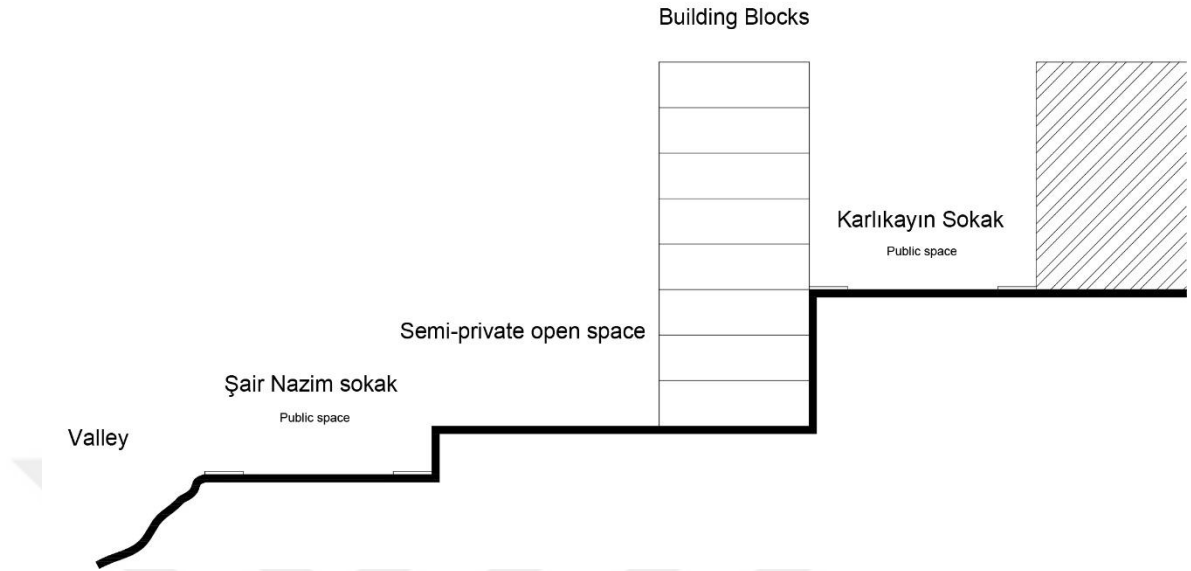


Figure 21- Typology 2-3, Kardelen Apartment section drawing (source: author).

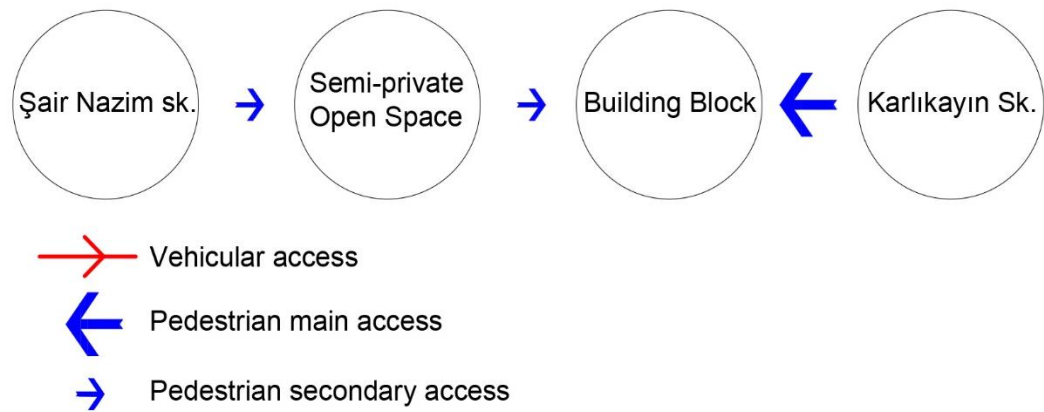


Figure 22- Typology 2-3, Kardelen Apartment topological depth (source: author).

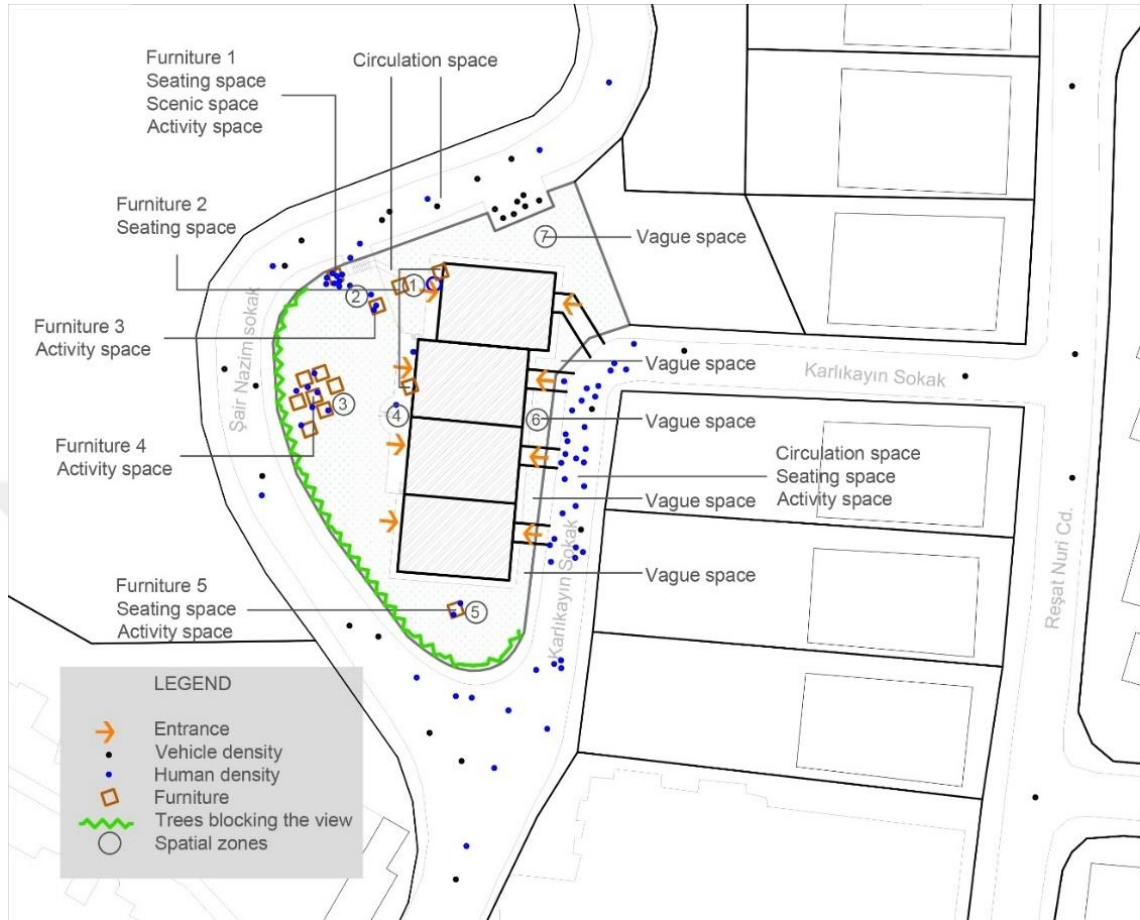


Figure 23- Kardelen Apartments Site plan analysis (source: author).

Moreover, since demarcations between the street and residential open space are implemented by level difference due to the topography of the area, commuting from this entrance is less preferred since it demands more effort. Moreover, although this level difference affords a sense of privacy by adding spatial hierarchy to the spatial organization and provides a territory and cozy atmosphere for the residents to use the residential open space, on the other hand, it minimizes and limits the social contacts to the ones among the residents and no interaction takes place between individuals in the open space and the ones on the street. However, spatial demarcation inside the open space is implemented by slighter level differences. While ensuring the possibility of visual and auditory contacts between them, these slight level differences afford a choice of privacy in small territories and microclimates.

Due to the topological depth and level difference on the Şair Nazim Street side, this street is un-constituted and less visible from the building openings or from the open space. This makes the street and the entrance from it less preferred to be used since people don't feel safe enough. This means fewer chance meetings, contacts, and activities take place on Şair Nazim Street. On the other hand, Karlıkayın Street is constituted by the blocks' entrances and therefore is more crowded with both pedestrians and vehicles.



Figure 24- Kardelen Apartments' entrances, un-constituted Şair Nazim Street on the left and constituted Karlıkayın Street on the right (source: author).

Likewise, constitutedness of the residential open space differs in its different zones. The most constituted zone is the one in front of the blocks' entrances from residential open space where there is a terrace in-between them. This zone which elongates alongside the blocks has a bench and a table that affords sitting and drinking coffee for the ground floor residents mostly in the evenings. Moreover, these residents also use this terrace as their private yard and hang their clothes to dry under sunlight. In addition, since this zone is elevated more than the open space, it affords a good view of the valley. However, there are trees blocking the interior exterior visual contact, and residents of the ground floor cannot have a view of the valley.

In addition to the un-constitutedness of Şair Nazim Street, this street's visibility is also low due to the level difference. Un-constitutedness and low visibility devoids this street

of any activity. On the other hand, Karlıkayın Street is constituted and visible from the blocks and therefore is preferred to be used as parking area for the drivers, playing area for the children, sitting and talking space for teenage girls, and space for riding bike for the teenage boy. This is because they can see their friends on the street from their windows. Moreover, parents permit their kids to play on Karlıkayın Street since it is more visible from windows and they can observe their kids playing there. However, there is the disadvantage of the presence of vehicles and drivers should be aware of the possible presence of kids playing on the street.

Likewise, the visibility of the residential open space differs in each zone. The most visible ones are zones one, two, and three which are the seating, scenic, and activity spaces provided with furniture. Furthermore, the linear layout of the blocks enhances the visibility of a huge part of the open space from the units which are overlooking it and there is always natural surveillance on the space, people, and the activities taking place in it. Parents can watch their kids playing in the open space from their windows. Children can see their friends playing and tend to join them. This attribute also enhances the safety and the usage of the open space. Overall, the most visible zones within this residential open space were the most visited and used ones by residents (both adults and kids). Visibility is one of the reasons why some zones and some of the furniture are used more than others. On the other hand, the open space is not intervisible since the blocks' layout is linear and no block entrances are facing each other.

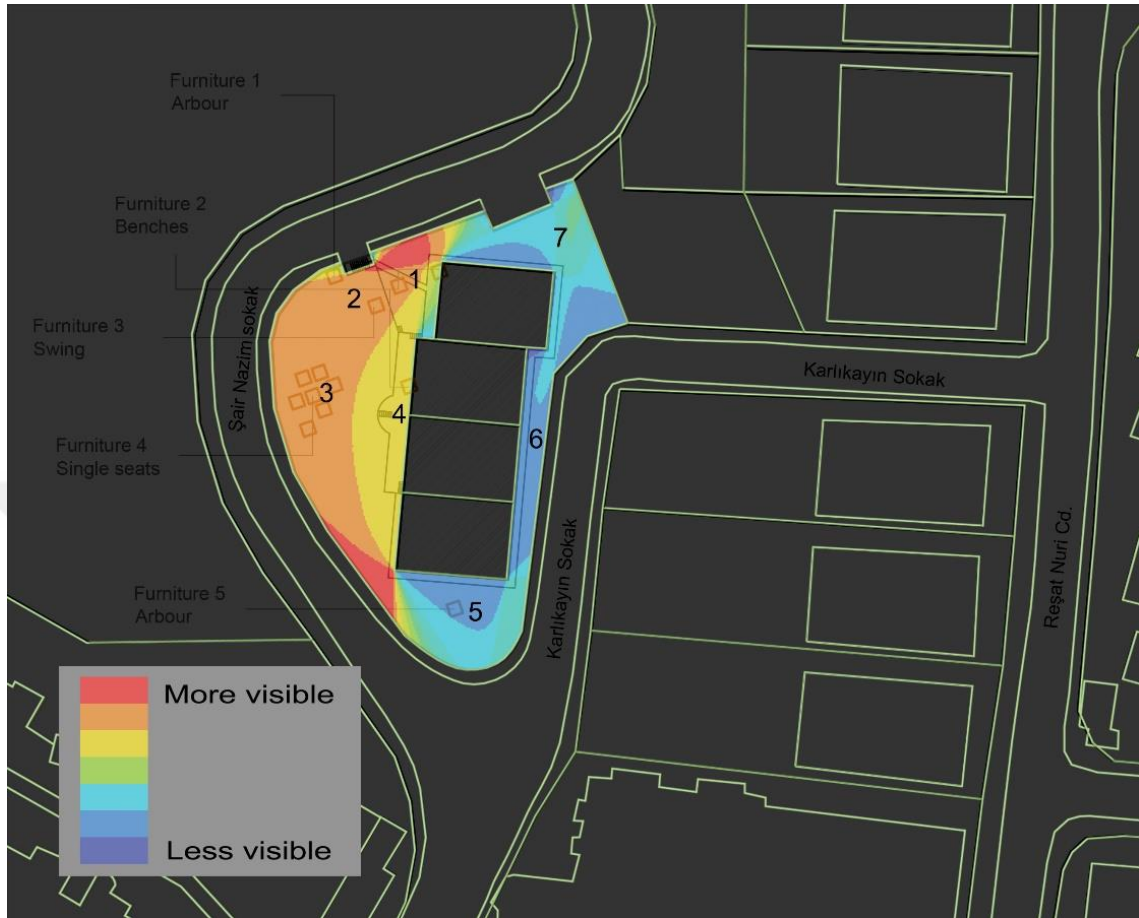


Figure 25- Kardelen Apartments visibility graph analysis (source: author).

Furthermore, since the blocks are eight floors and they are not equipped with elevators, the entrance from Karlıkayın Street which enters the third floor requires less effort for residents to access their units. However, the entrance from the open space enters the ground floor and requires more effort for the residents who live on the eighth floor. Hence the number of stories directly affects the number of visits to the residential open space, contacts, and social interaction in it.

Moreover, landscape elements in this residential compound play a huge role. Furniture is distributed in a way not to stay abandoned. Some benches are placed on the way from the Şair Nazım entrance to the blocks to afford resting for the residents of the first few floors. Some manipulable furniture is affording various plays for children. These are the

single cubic seats and small tables which are all made by the residents themselves. Children (of both genders) run around these furniture, jump over them or sit and play together. One swing is also made by the residents for younger kids close to the Şair Nazim entrance and the harbour. Two gathering spaces are afforded for the adults by harbours, one close to the Şair Nazim entrance and the other one in the less visible cozy corner of the open space where children prefer to play away from the gaze of their parents. Moreover, trees are located and oriented on the edges of the open space which afford a sense of privacy and provide territory and cozy atmosphere for the residents inside the open space. However, on the other hand, it helps minimize the social contacts to the ones among the residents by blocking visual and auditory contact between the open space and the street.

Overall, zone two which has an harbour and a swing is the most visited zone by the residents. Located at the edge of the open space, the harbour in this zone is highly visible and affords a good view of the valley and to Şair Nazim Street. While in the mornings adults (mainly female) gather to have breakfast together in the harbour, teenagers (mainly male) gather to drink and chat in the evenings. Likewise, some teenagers (of both genders) study during different hours of the day. The swing is usually used by the kids of the adults who sit in the harbour and closely watch their kids. However, usage of this space is confined to the residents of the first floors since the buildings are not equipped with elevators.



Figure 26- Kardelen Apartments landscape elements (source: author).



Figure 27- Trees aligned at the edges blocking contacts between public street and residential open space (source: author).

4.3.3. Typology 3

Residential compounds of this typology are linear blocks with no level difference in their sections. These compounds are provided with separate direct accesses into each residential block with an open space at the back with no level differences in typology 3-1 (Yıldız Apt) or with level differences in typology 3-2 (Portaş Sitesi). In both typologies, the direct accesses into the blocks are only for the pedestrians. Whereas vehicles are parked in front of the blocks on the street (topology 3-1) or on the sidewalk (topology 3-2). Therefore, as illustrated in the section drawings, topological depth of the block interior from the public street is zero. However, the topological depth of the residential open spaces at the back from the street is one. This means the permeability of the residential open space decreases and this space is more private.

In both cases, pedestrian sidewalks and border plants may help define the borders of the residential compounds. In typology 3-1, since spatial demarcations between the public street and the residential compound are marked with metal fences and there is no level difference between street and open space at the back, visual and audial contacts between these spaces are possible. However, in typology 3-2 spatial demarcations between the the public street and the residential open space at the back are marked with level differences and visual and audial contacts between them are weak.

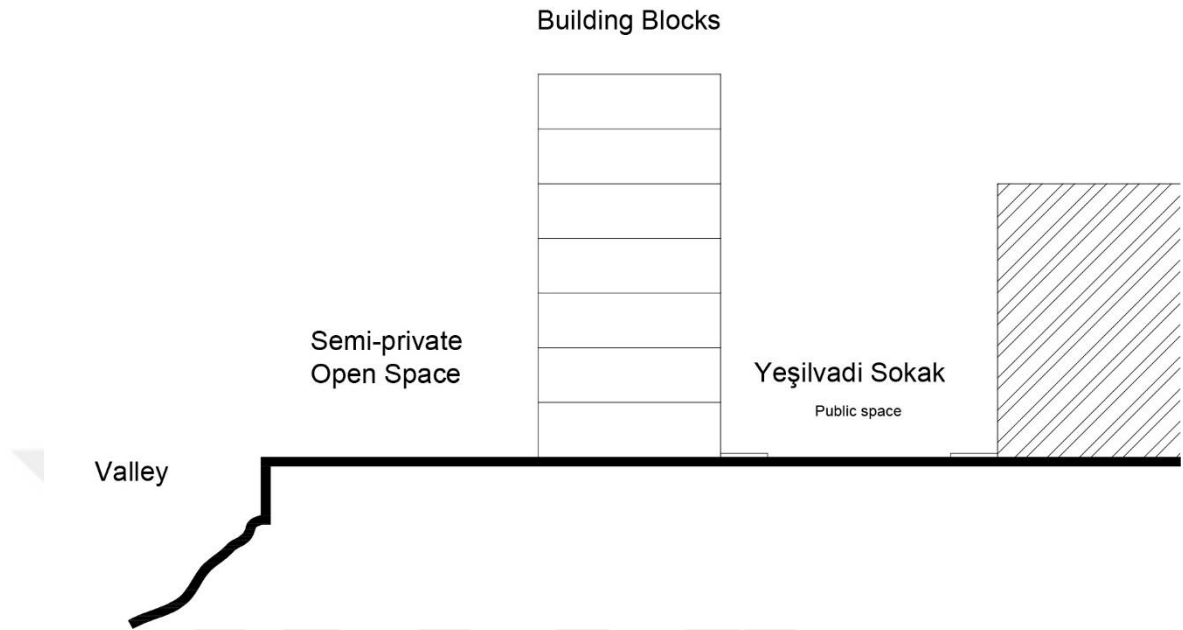


Figure 28- Typology 3-1, Yıldız Apartments section drawing (source: author).

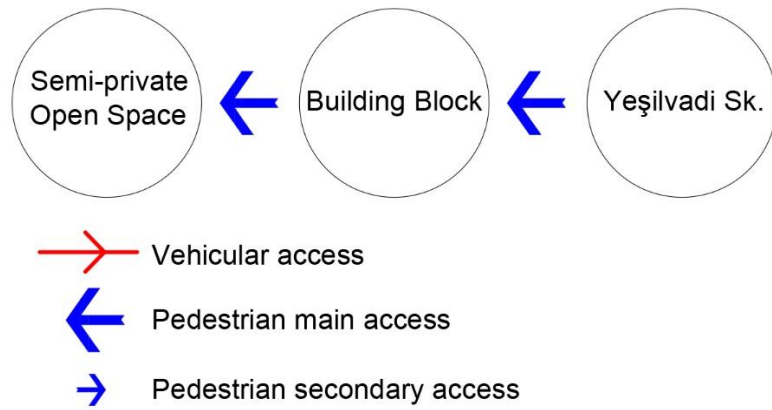


Figure 29- Typology 3-1, Yıldız Apartments topological depth (source: author).

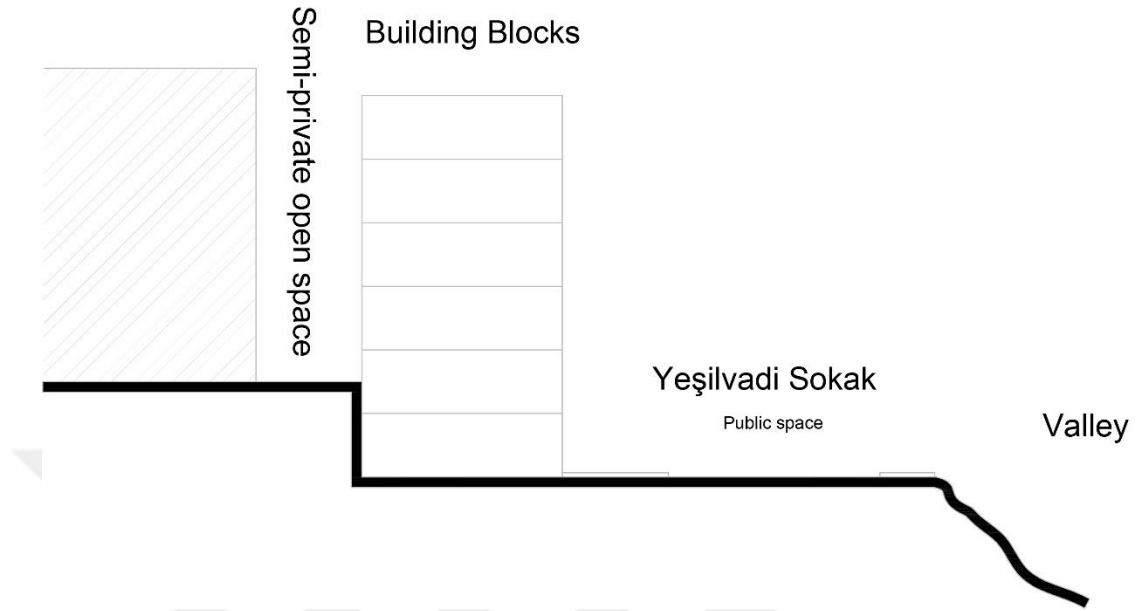


Figure 30- Typology 3-2, -Portaş Sitesi section drawing (source: author).

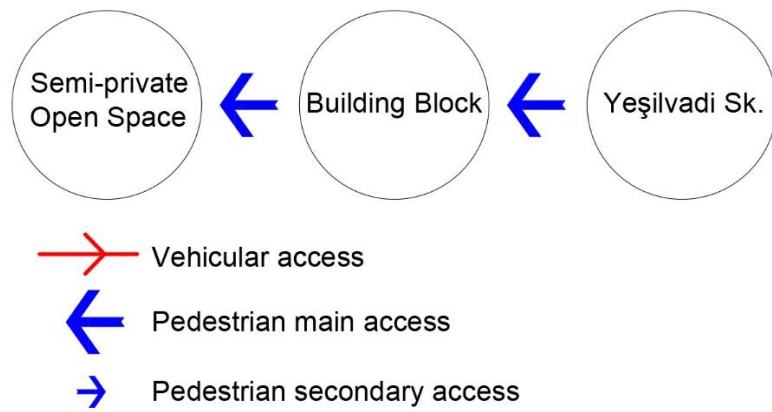


Figure 31- Typology 3-2, Portaş Sitesi topological depth (source: author).



Figure 32- Typology 3-1, Yıldız Apartments site plan (source: author).

In addition, in both cases streets are constituted since all entrances to the residential compounds are directly joining the blocks to the public street. This increases the liveliness of the streets and various activities are taking place on the streets and pedestrian sidewalks. On the other hand, residential open spaces are also constituted partly through the backdoors. This means the zones right in front of the back doors are encompassing more chance meetings and interactions compared to the un-constituted zones.



Figure 33- Typology 3-2, Portaş Sitesi site plan (source: author).

Moreover, the visibility of the streets is high. There are both doors and windows overlooking the streets in both cases. On the other hand, the visibility of the residential open spaces differs in each zone. The most visible zones in both typology 3-1 and 3-2 are the spaces lacking any landscape elements and any kind of activity in them. On the other hand, seating and activity spaces are located on less visible zones (zones three) in which most of the interactions take place. These zones are always intervisible in typology 3-2, however, in typology 3-1 the one in the center of the two blocks is more visited than the other one.

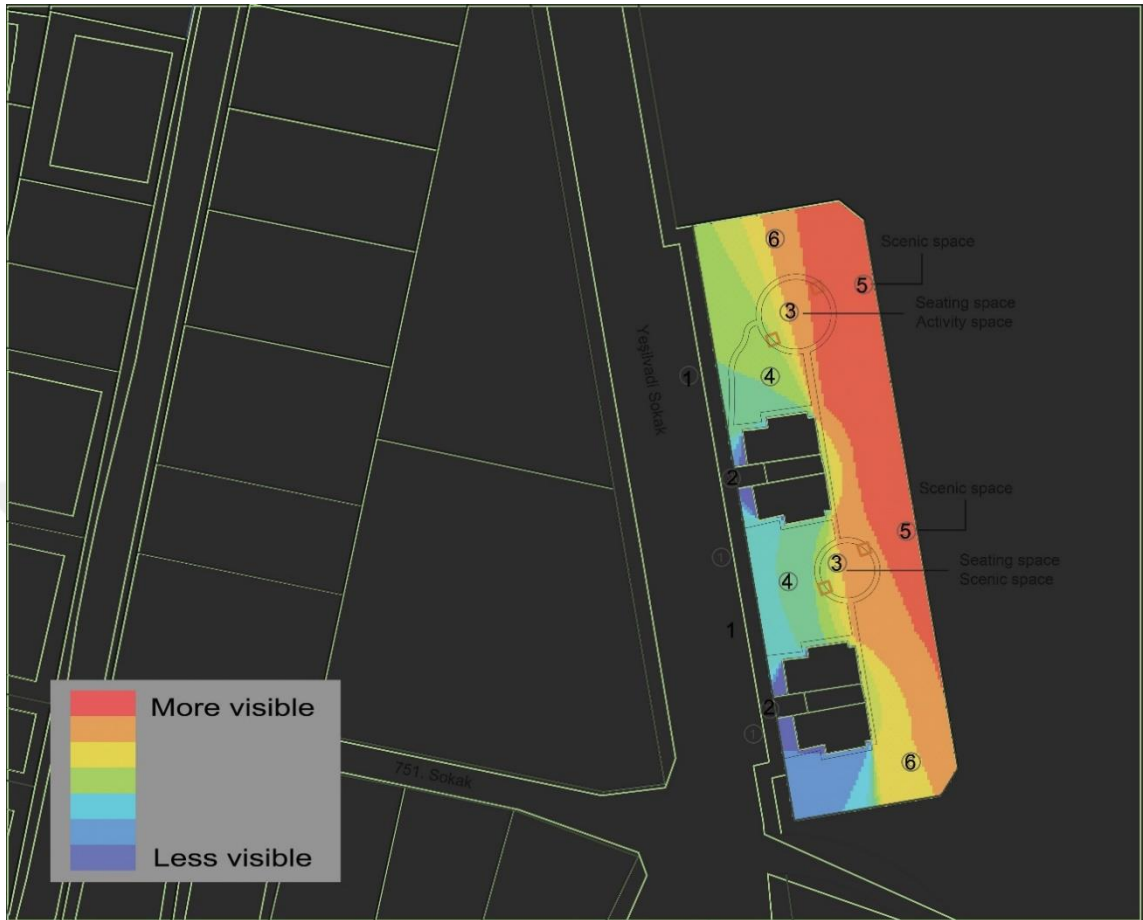


Figure 34- Typology 3-1, Yıldız Apartments visibility graph analysis (source: author).

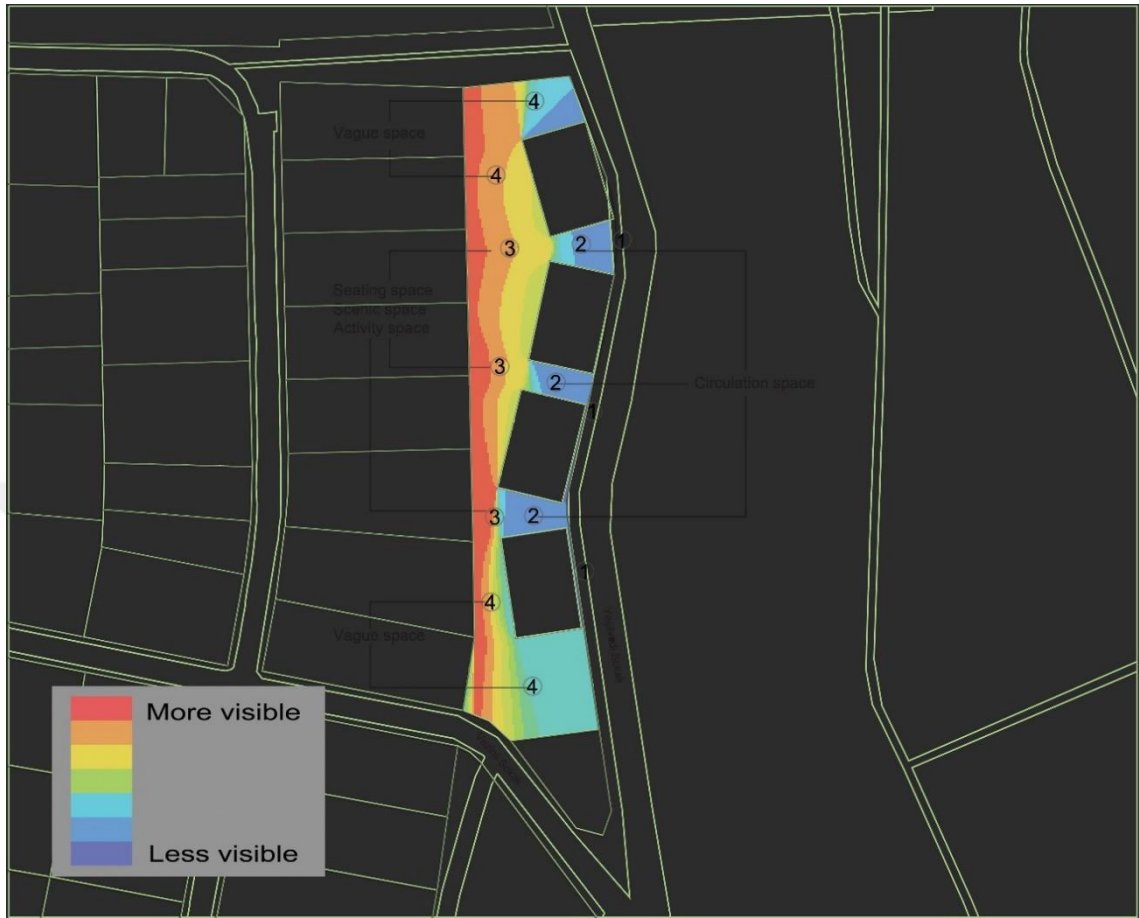


Figure 35- Typology 3-2, Portaş Sitesi visibility graph analysis (source: author).



Figure 36- View of Yeşilvadi Street, constituted with high visibility both in Yıldız Apts (on the above) and Portaş Sitesi (on the below) cases (source: author).

Moreover, residential compounds of this typology are eight-story blocks which leaves a huge portion of the compound for open space. Therefore, contacts between the street and windows of any story are possible. Parents call for their kids from the windows or children communicate through vertical plane inviting their friends to join them while riding a bike. In addition, landscape elements of the residential open space are too few and not enough to be used regularly. Residents sometimes carry portable furniture to sit on. On the other hand, trees are rich in existence but are located arbitrarily. Hence, they are acting as spatial demarcations between residential open spaces and the street in both cases. Therefore, they are decreasing contacts between these two spaces.



Figure 37- Activity and Seating spaces in less visible zones (Zone three) of Yıldız Apts (on the above) and Portaş Sitesi (on the below) cases (source: author).

4.3.4. Typology 4

Residential compounds of this typology are a group of blocks scattered in an open space or with a courtyard in the center. These residential compounds are whether typology 4-1, provided with one entrance for pedestrians and vehicles (Çankaya Parkvadi A bloklar, Koz Vadi Sitesi), or typology 4-2, with two entrances for pedestrians and vehicles (Vadi Sitesi H1-H2-H3 bloklar, Şelale Sitesi H4-H5-H6 blokları, Çankaya Park Vadi D bloklar, Çankaya Park Vadi E bloklar), or typology 4-3, with two entrances, one for pedestrians and one for vehicles (Şelale Sitesi H7-H8 blokları, Vadi Sitesi H9, Çankaya Park Evleri 52, Havuzlubag Sitesi, Tria Rezidans), or typology 4-4, with two entrances, both for pedestrians (Vadi Kapı Konutları). However, common to all of them is that the entrances are to the residential open space and there is a harsh level difference in their section.

Since the entrance is to the residential open space and residents are distributed to the blocks through this space, the topological depth of typology 4 is one in all the residential compounds. Moreover, spatial demarcations between the public street and residential compounds are through harsh level differences due to the topography of the area. As illustrated in the section drawings of some of the examples of this residential typology (appendix2), since the residential open space adds one topological depth to the indoor-outdoor access and since there is a harsh level difference between residential open space and the public street, the residential compounds become more isolated and more private compared to the other typologies. Therefore, the permeability of the blocks from the streets is minimized and contacts are limited to the ones among the residents inside the residential open space.

Within four sub-typologies, typology 4-2 is of more interest to compare the usage of two entrances and the courtyard and the investigation of the different zones due to the level differences within the residential compound. In the case of Çankaya Park Vadi D bloklar one access is from 27 Street and the other is from 750 Street which both are considered as main entrances. Since both these entrances are to the residential open space which is the in-between space between the public street and private interior of the units, the topological depth from both sides is one.

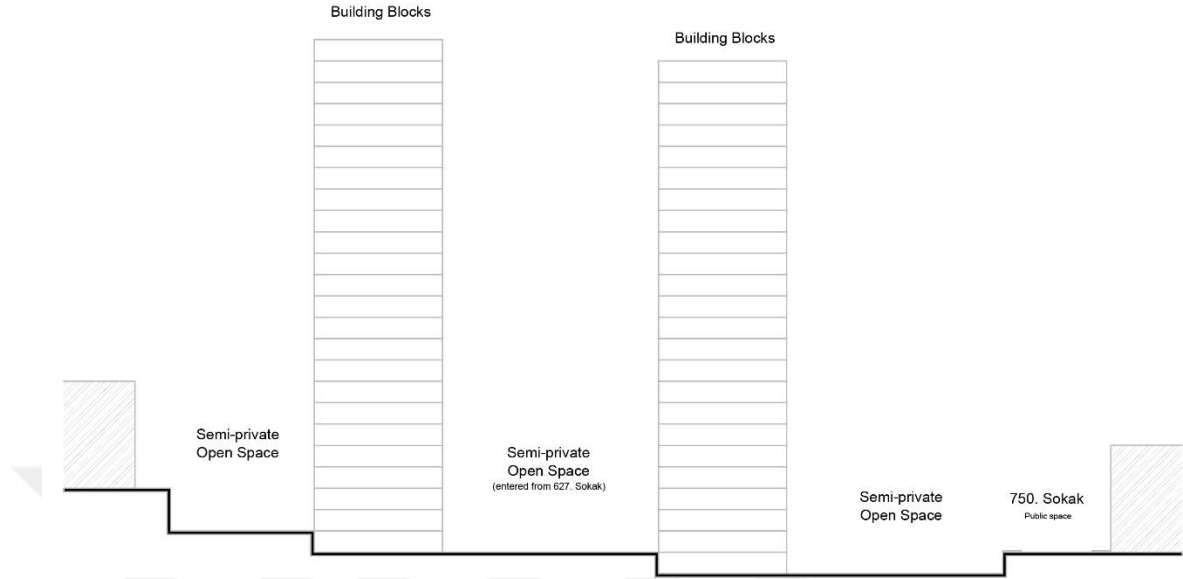


Figure 38- Çankaya Parkvadi Evleri D blocks section drawing (source: author).

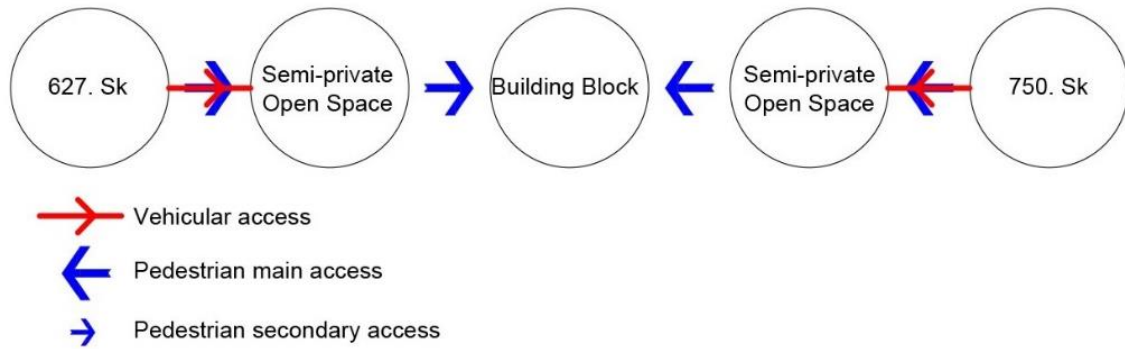


Figure 39- Çankaya Parkvadi Evleri D blocks topological depth graph (source: author).



Figure 40- Çankaya Parkvadi Evleri D blocks site plan (source: author).

Moreover, the spatial demarcation between streets and the residential open space is through a harsh level differences on 750 Street side and through walls on 627 Street side. These spatial demarcations make the residential compound less permeable and exclude strangers from engaging with the residents. In other words, the residential compound is isolated from its closeby housings and social interaction mostly takes place among the residents of the same residential compound. However, the urban umbrella and seating furniture which affords activities make 627 Street more live than 750 Street. There are also level differences inside the residential open space. While entering into the central circulation area from both entrances, vehicles get distributed whether at the edges of the central circulation space or on the circulation street wrapped around two of the blocks on a higher level. Therefore, in this typology, level differences inside the

residential open spaces are the main spatial demarcations which help the creation of various zones affording different activities. This means, while zone four is a resting spot where most chance meetings happen, zone five is where the scheduled evening gatherings take place. Similarly, scheduled meetings for the dog-owners take place in zone seven which is a bit cozier and more silent, proper for them to walk their dogs together. This zone affords a seating, scenic and activity space that is somehow isolated from the crowd. While walking their dogs, or watching them play, people enjoy chit-chatting with each other. Hence, the level difference, and the walls around the zone which make the space semi-isolated, and the absence of the vehicles are the reasons why some residents prefer to linger in this zone.

However, zone two is only used by the car-owners since this space is allocated for the parking area on a higher level with is no furniture, nothing to do, and nothing to watch except cars and there are no visual or auditory contacts happening between this zone with other zones. Hence, this is not a space residents prefer to visit except for parking their cars and walking to their home through this space. However, in some other zones (one, three, four, and five), while ensuring and affording a choice of privacy in small territories and microclimates, visual and auditory contacts with other zones are possible. Therefore, the effect of level difference on the usage of the space and interactions in it is well understood in this typology.

These spatial demarcations (harsh level difference and walls as barriers) and the lack of any block entrance directly opening into the streets make both 627 and 750 streets unconstituted. This makes the streets less preferred spaces to socialize since people don't feel safe and comfortable enough especially in the late hours of the day. This means in addition to the residents who commute between home and work through these streets, there are only a few individuals engaging in interactions and few activities take place on the streets.



Figure 41- Çankaya Parkvadi Evleri D blocks entrances from un-constituted Streets of 627 (on the above) and 750 (on the below) and spatial demarcations between these streets and the residential compound (source: author).

In this residential compound, since there are different zones, the location and orientation of the residential units affects the visibility of the zones from the unit interiors through the windows. Therefore, this issue affects the affordance of different zones. While some facets of the blocks are having a view of the parking area (a road at the back of the two blocks) others have a view of the central circulation space or the backyard and the playground. Hence, residents and especially kids with a view on the central circulation space get motivated when they see what's going on in this activity space.

Zone four which is among the most visible zones and is provided with furniture is the most visited zone among all since in addition to the resting it affords, before entering the blocks, it also affords a good view on most of the zones and watching what's going on around the residential open space. On the other hand, since the playground (zone six) is located at a lower level at the corner it is among the least visible zones. This location selection may be due to the desire to provide a safe place for kids where there are no vehicles around. However, since this zone is not visible from and constituted by all the blocks, not all the children can see their friends playing there, and hence the playground is not inviting enough. Only one of the blocks has eyes on it and it is mostly used by their kids. On the other hand, zone eight which is the least visible and the most hidden seating and scening space affords a cozy isolated space for children to play without being visually controlled by their parents. Some teenagers also use this space for having a coffee while enjoying the view. However, the low maintenance of the furniture is the disadvantage of this zone.

Therefore, it is observed that both the most visible and the least visible zones were visited by different individuals for different purposes. Moreover, the highest visibility level is in zone five where building openings are facing each other making the space in-between them intervisible. The affordance of this zone is also enhanced by the landscape elements such as trees, grass, and spatial demarcation elements. Therefore, a high level of passive contacts and chance meetings take place in this zone. Gathering for an evening chat or cycling for kids are afforded. Kids cycling is then extended to the circulation space (zone one) due to its centrality, proximity to all blocks, and more importantly, its visibility from all blocks.

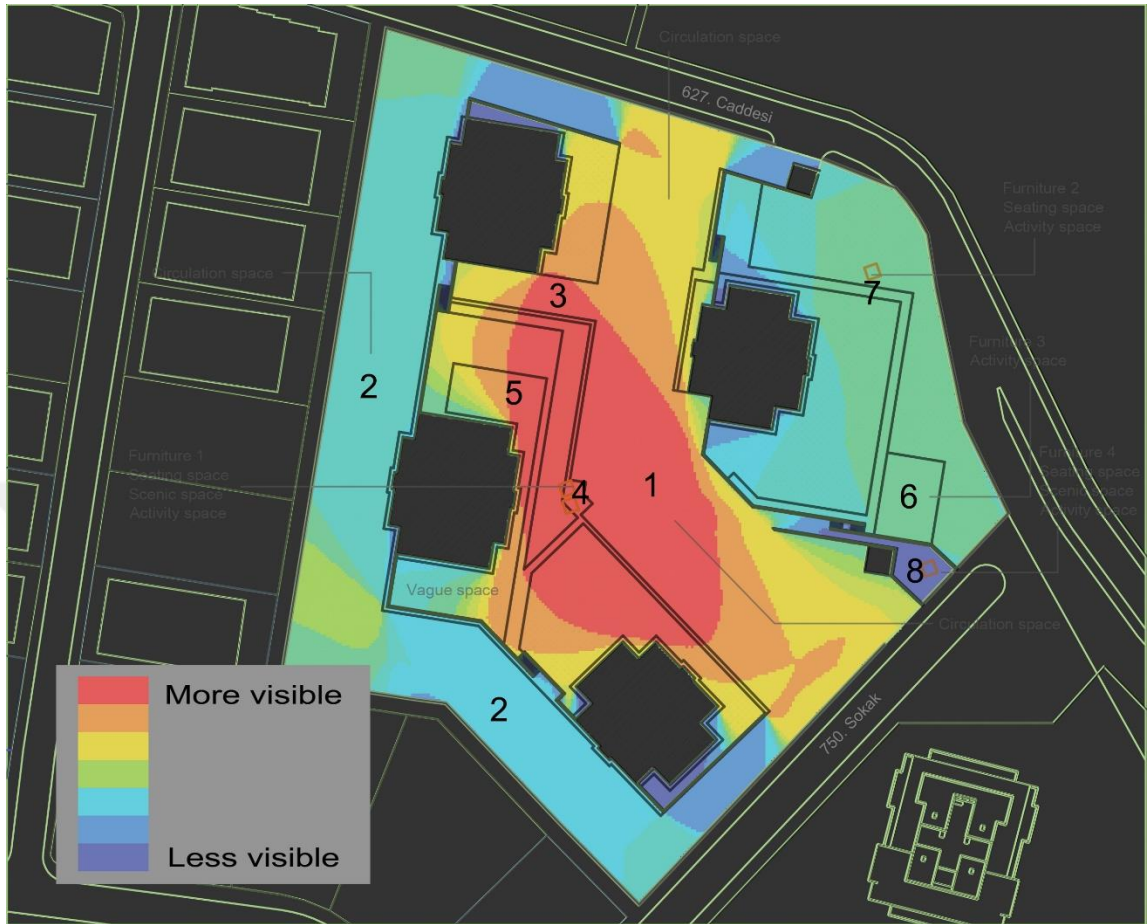


Figure 42- Çankaya Parkvadi Evleri D blocks visibility graph analysis (source: author).



Figure 43- Çankaya Parkvadi Evleri D blocks residential open space zones (source: author).

In this residential compound, a huge part of the area is allocated to the open space since the blocks are multi-story. This increases the percentage of possible contacts on the horizontal plane. However, at the same time, it decreases possible contacts on the vertical plane. In other words, since the visual and auditory contacts get weak, the social contacts on the vertical plane are limited to the ones among the first floors of the blocks and the ground floor residential open space.

The importance of furniture is well-highlighted by the urban umbrella provided on 627 Street right in front of the entrance of the residential compound. Moreover, the orientation of the furniture in this seating space affords a relaxing view of the valley. Therefore, this space extends the residential social interaction to the outside of the residential compound. Hence, this street becomes more live and more interactions take place compared to 750 Street. Furthermore, landscape elements such as trees and grass have a huge role in separating different spatial zones within the residential open space. For instance, there is a green strip acting as a transition zone between the central circulation space (zone one) and the blocks. This is while one of the blocks does not have these elements in front of it and there is only a sidewalk separating the interior from the exterior. Obviously, this affects the level of social contact around the blocks. The ones with green stripes, plants, and trees invite more people and afford more to engage in social contacts than the other one does. Moreover, although zone four's visibility influences the level of interaction in it, more importantly, the provision of seating furniture under the shadow of trees, the location of the trees at the edge of the circulation space at zone four affords people a safe and cozy space to sit.

4.3.5. Typology 5

Residential compounds of typology 5 (Çankaya Elit Park Konutları, Evette Rezidans, Vadi Panorama Evleri) are twin blocks located inside an open space on a land with mild level differences. These residential compounds are provided with one entrance for both pedestrians and vehicles into the residential open space. Therefore, residents are

distributed to the blocks through this space and the topological depth of block interiors from the public street is one in this typology. Moreover, spatial demarcations between the public street and residential compounds are through mild level differences and physical barriers such as walls and fences to define the borders of the residential compound. Therefore, single entrance to the residential open space makes the streets unconstituted and the interaction level on the streets decreases. Interactions are confined to commuting between home and work through these streets and there are no other individuals interacting and engaging in activities on the streets.

These attributes make the residential compounds become semi-isolated with low permeability of the blocks from the streets. Therefore, contacts are limited to the ones among the residents inside the residential open space. Furthermore, in the case of residential open space, zones are separated by mild level differences. However, they are very small spaces and not enough for the residents of the multi-story buildings. Moreover, the majority of the zones inside the residential open space are used as circulation space and parking areas for the vehicles. In other words, there is no more than a circulation area and vehicles to see. The dominance of vehicles on pedestrians makes zones afford only one activity except driving, which is cycling for the kids.

Hence, the constitutedness, visibility, intervisibility, and the number of block stories are not so much of importance in this typology since the residential open spaces are open spaces just because they are open. In other words, even if they have activity spaces such as playgrounds, human densities are considerably low due to the lack of landscape elements. Since the environment has nothing to afford, residents prefer to spend time at home or outside of the residential compound boundaries.

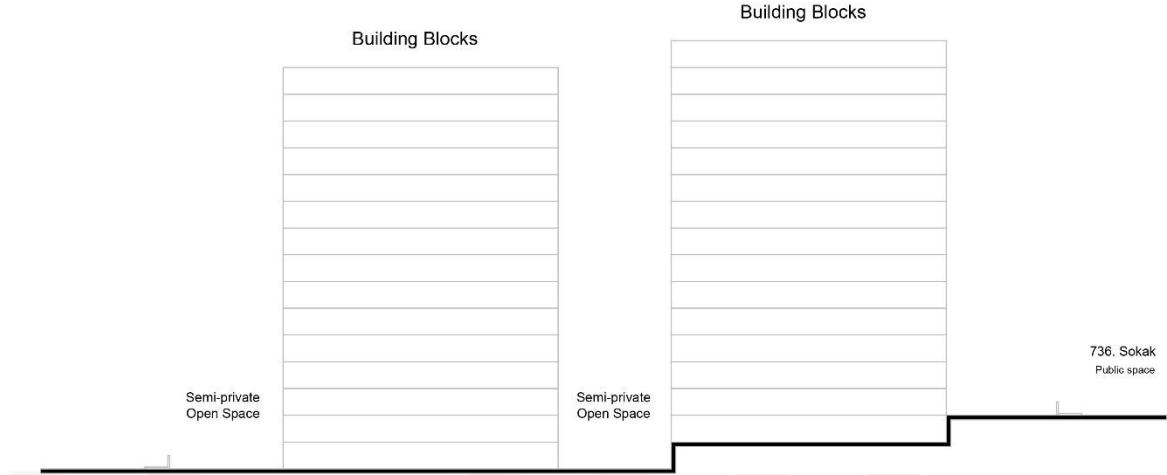


Figure 44- Typology 5, Çankaya Elit Park Konutları section drawing (source: author).

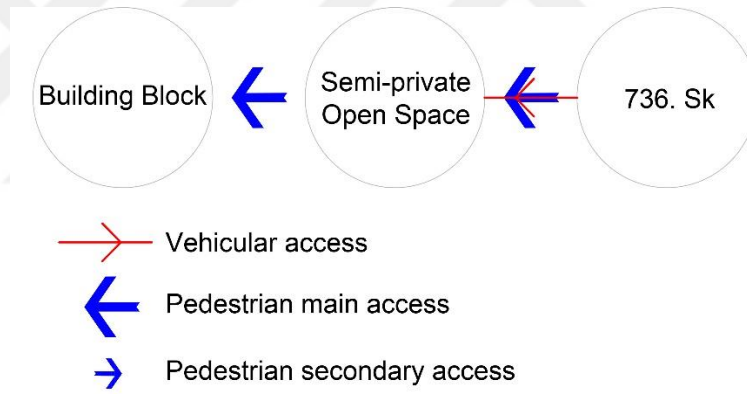


Figure 45- Typology 5, Çankaya Elit Park Konutları topological depth (source: author).

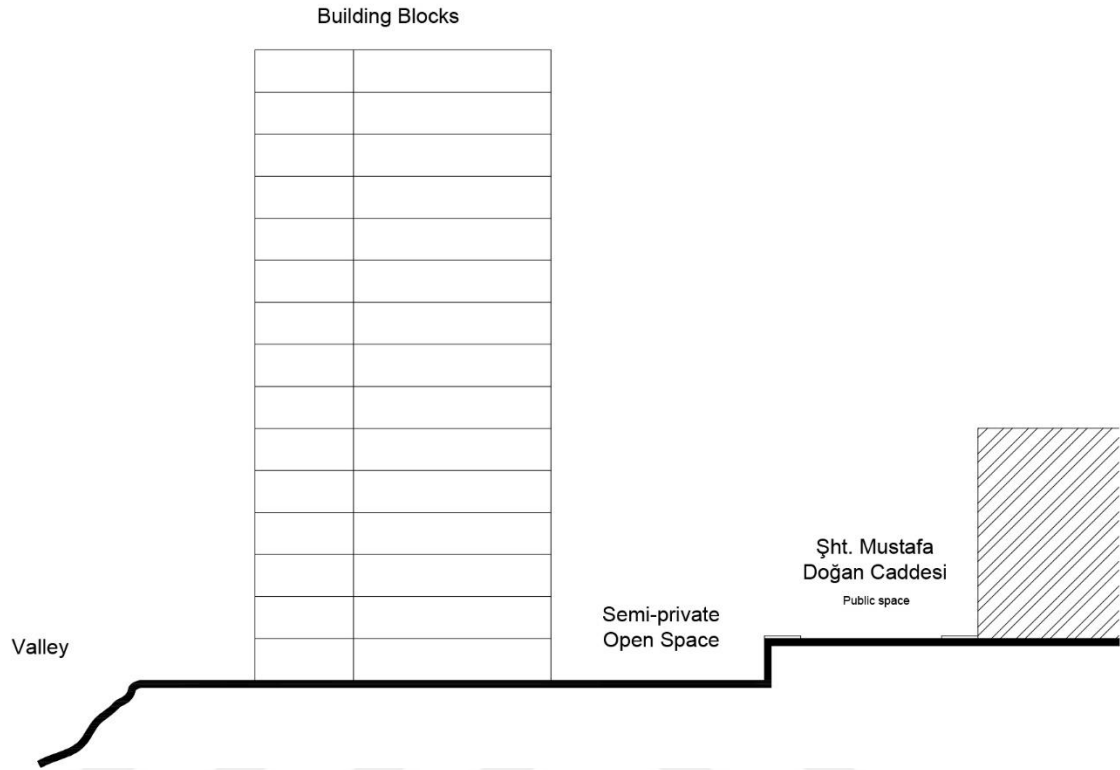


Figure 46- Typology 5, Vadi Panorama Evleri section drawing (source: author).

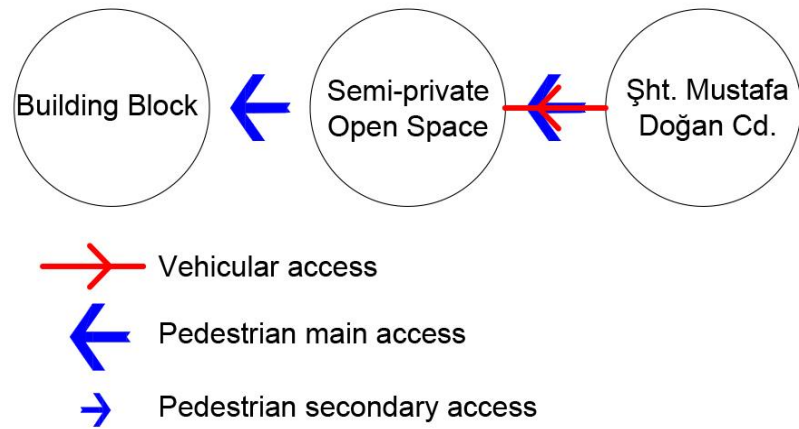


Figure 47- Typology 5, Vadi Panorama Evleri topological depth (source: author).



Figure 48- Çankaya Elit Park Konutları, Evette Rezidans, and Vadi Panorama Evleri respectively from above to below (source: author).

4.3.6. Typology 6

Residential compounds of typology 6 are blocks located inside an open space on a land with no level difference. These residential compounds are whether provided with one or two entrances for both pedestrians and vehicles into the residential open space. In both cases, residents are distributed to the blocks through the residential open space. This means the topological depth of block interiors from the public street is one.

In this typology, there are two kinds of spatial demarcation between the public street and the residential compounds. While in some cases there are fences making visual and auditory contacts possible, in some cases there are more harsh demarcations such as walls and trees at the boundaries of the compounds blocking any kinds of contacts between inside and outside. Moreover, in all cases, one topological depth makes the streets un-constituted and the interaction levels decrease. Therefore, contacts are mainly among the residents inside the residential open space. As a result, there are few individuals interacting and engaging in activities on the streets. These attributes make the residential compounds become semi-isolated with low permeability of the blocks from the streets.

In this typology, in cases of Anka Life Vadi Konutları, and Çankaya Konut Kuleleri A-B-C-D Blockları, which have small open spaces allocated for multi-story blocks there are poor landscape elements which do not afford much except parking vehicles or riding bike in the open space that is mainly a circulation space. Therefore, in these cases, the importance of the other environmental attributes is faded under the shadow of this one. No matter which zones are properly defined with spatial demarcations, how well zones are constituted, visible, or inter-visible, lack of landscape elements and not defined open space affords nothing for the residents. Even if contacts happen they do not develop into interactions if there are not proper landscape elements. However, other cases of this typology with proper landscape elements have significantly higher levels of interaction in them.

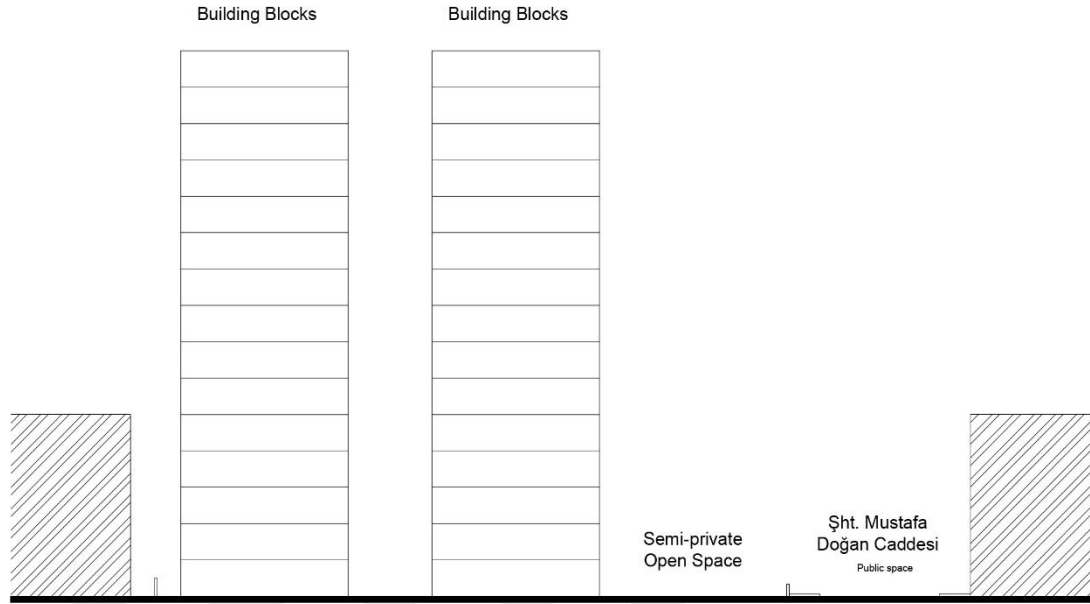


Figure 49- Typology 6, Safe Park Konutları section drawing (source: author).

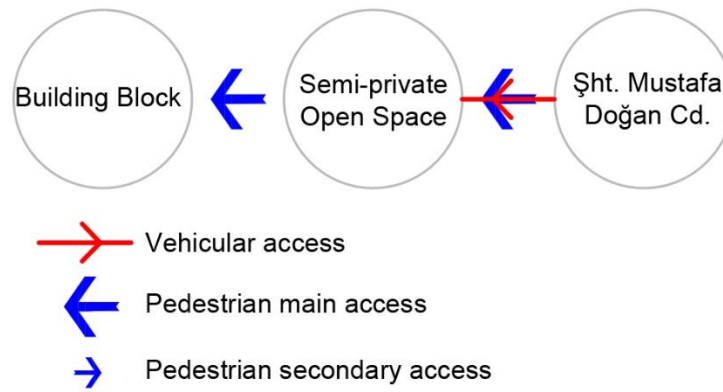


Figure 50- Typology, Safe Park Konutları section drawing (source: author).

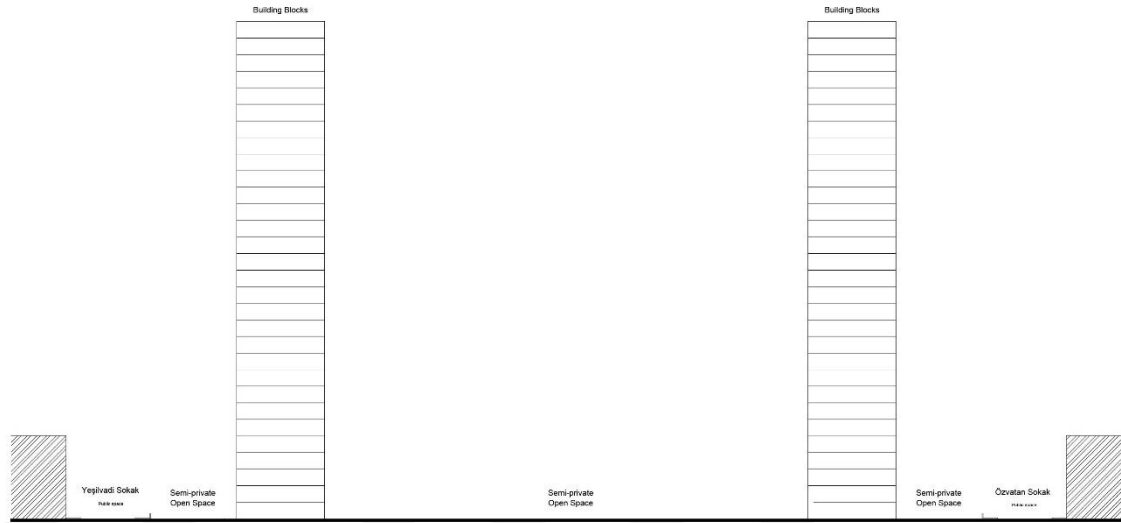


Figure 51- Typology 6, Çankaya Konut Kuleleri A/B/C/D Blocks section drawing
(source: author).

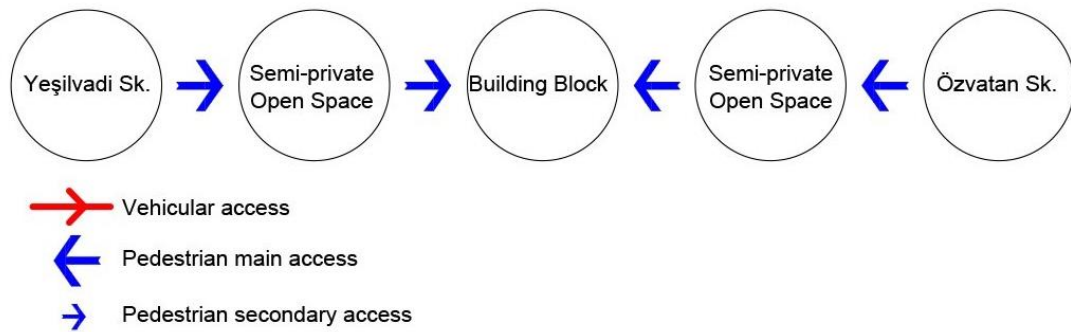


Figure 52- Typology 6, Çankaya Konut Kuleleri A/B/C/D Blocks topological depth
(source: author).



Figure 53- Anka Life Vadi Konutları, EGE Flora Konutları, Safe Park Konutları, and Çankaya Konut Kuleleri A-B-C-D Blokları respectively from above to below (source: author).

5- Conclusion

As it has been widely studied till now, there is a strong bond between the physical built environment, its attributes, qualities, affordances, and human behavior. However, the environment is not a determinant factor defining specific behaviors and does not afford the same for individuals from different genders and ages. In other words, the environment does not initiate but suggest different actions and activities to different user groups through its layout and attributes which in the context of residential open spaces are topological depth, spatial demarcations, constitutedness, visibility, inter-visibility, number of block stories, and the existence, location, and orientation of its landscape elements.

This study was then an examination of the environmental layouts and attributes of residential open spaces affording different possibilities including social interaction. In this regard, I categorized residential compounds in Dikmen Valley into six typologies according to their layouts. Next, I have analyzed spatial attributes of different typologies of residential compounds in Dikmen Valley with the help of section drawings, site plan analysis, and graphs. Next, In order to conduct a deep study, I conducted on-field observation in which behavior mappings were tracked down and later combined with my layout analysis of the typologies.

While the majority of the studies on Dikmen Valley have focused on the effects of the urban transformation project on the social life of the valley, and they have been comparing two sides of the valley and generalizing the social life of the valley into two groups; however, in this study, I do not categorize this area into two. Although there is a difference in the social context of the different sides of the valley, I conclude that there can be similar outcomes due to similar design layouts. It means similar typologies of residential layouts can show similar affordances and can affect social interaction similarly.

Therefore, my first conclusion is that the seven environmental attributes of any residential open space which are: 1) topological depth, 2) spatial demarcations, 3) constitutedness, 4) visibility, 5) inter-visibility, 6) the number of block stories, 7) existence, location, and orientation of landscape elements can have different levels of influence on social affordances of residential open space. Hence, they can not be weighted the same. A matrix is prepared to illustrate the level of impact each environmental attribute has on social interaction in residential open space. However, this grading is subjective and by reference to Dikmen Valley residential compound typologies.

	Impact of environmental attributes on social interaction in residential open space						
	Topological depth	Spatial demarcations	Constitutedness	Visibility	Inter-visibility	Number of block stories	Existence, location, and orientation of landscape elements
Typology 1	**	***	*****	*	—	***	**
Typology 2	*****	****	***	**	—	****	*****
Typology 3	**	***	*****	*	*****	***	*****
Typology 4	*****	*****	*	***	*****	***	*****
Typology 5	**	***	**	*	***	*****	*****
Typology 6	*****	***	***	**	***	*****	*****
Average	3.33	3.5	3.16	1.16	4	3.66	4.33

Table 2- Impact of environmental attributes on social interaction in residential open spaces of each typology (source: author).

According to the matrix, the most influencing attribute of the environment in the case of residential open space is the existence, location, and orientation of landscape elements. Wherever there are proper elements provided, the possibilities of various activities and social interactions are high. On the other hand, even if other factors afford for the best but the landscape elements are lacking, there would be open spaces with no interaction in them. After that, inter-visibility is the second important factor. Regardless of the affordances of the environment by other factors, most of the interactions are taking place in the most inter-visible zones. Next, the third important factor is the number of block stories which should be determined according to the portion of the area allocated for the residential open space. However, if the residential open space affords different actions,

residents of higher levels also make the effort to come down and engage in social interaction. However, this gets more possible when the blocks are equipped with elevators. Then, the fourth important factor is the spatial demarcations which were intensified wherever there were harsh level differences or physical barriers blocking contacts. After that, the fifth important factor is the topological depth which adds to the effects of spatial demarcations. While some zones were mostly visited due to their least topological depth, sometimes zones with the most topological depth were visited by different user groups. Next, the sixth and seventh important factors are constitutedness and visibility respectively. Compared to other factors, constitutedness and visibility had less impact on social interaction level. Sometimes the least constituted and visible zones within the residential open space were preferred by individuals as gathering and socializing space because of the sense of coziness provided by these zones.

The second conclusion of this study is that if having enough portion of land allocated for the residential open space, some of the residential compounds of Dikmen valley have higher levels of interaction in them mainly due to their spatial layouts which make some zones more constituted, visible, and inter-visible through the spatial demarcations. In these cases, provided landscape elements' location also has a huge role in enhancing the interaction levels in these zones. Therefore, according to these issues, the residential compounds of higher social affordances and a higher level of interaction in them are Aykon Park Sitesi, and Çankaya Park Vadi Evleri C Blokları from typology 2, Şelale Sitesi H4-H5-H6 Blokları, Çankaya Park Evleri 52, Çankaya Park vadi Evleri A Bloklar, Çankaya Park Vadi D Bloklar, and Çankaya Park Vadi E Bloklar from typology 4, and EGE Flora Konutlari, and Safe Park Konutları from typology 6.

As a general conclusion, this study proposes an investigation method that can be applied to any residential compound by analyzing the environmental attributes which affect the level of social interaction in residential open space. Studies of this kind should never be neglected since the living environment bears heavy importance in people's lives. Well-designed residential compounds have to afford their best for good and enhance the

possibilities for social interaction among its residents and at its best, among residents of residential compounds close to each other as well. Therefore, the overall process of this study would be a general methodology to be applied to any case study. However, this study had its own limitations as well. First of all, this study was limited to the first three phases of Dikmen Valley case study. Secondly, this study was limited due to the Covid-19 pandemic throughout the last year of my thesis process. This pandemic limited my study since I could only conduct behavior mappings on low densities of people compared to normal days before Covid-19. I could only track the social behavior of a few individuals in my observation sessions since people were avoiding contact and were keeping their social and physical distances from each other. Therefore, I sometimes tried to picture possible affordances and conditions in mind. I hope in future studies these limitations will be overcome.

Appendix: Section drawings and topological depth diagrams of other residential compounds of Dikmen Valley

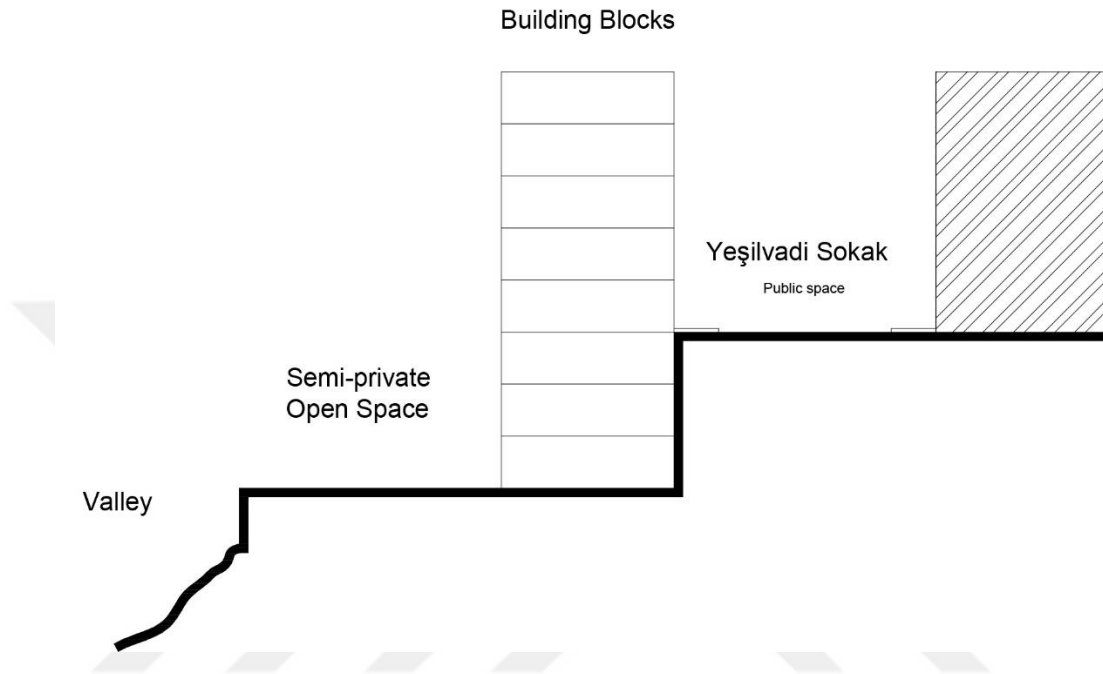


Figure 54- typology 2-1, Palmiye Sitesi section drawing (source: author).

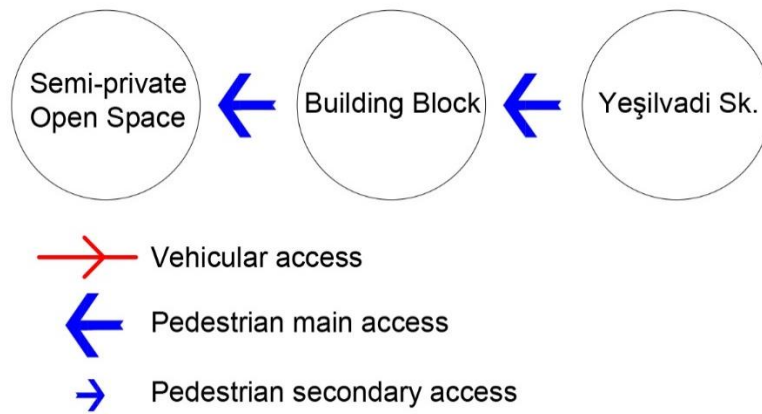


Figure 55- typology 2-1, Palmiye Sitesi topological depth (source: author).

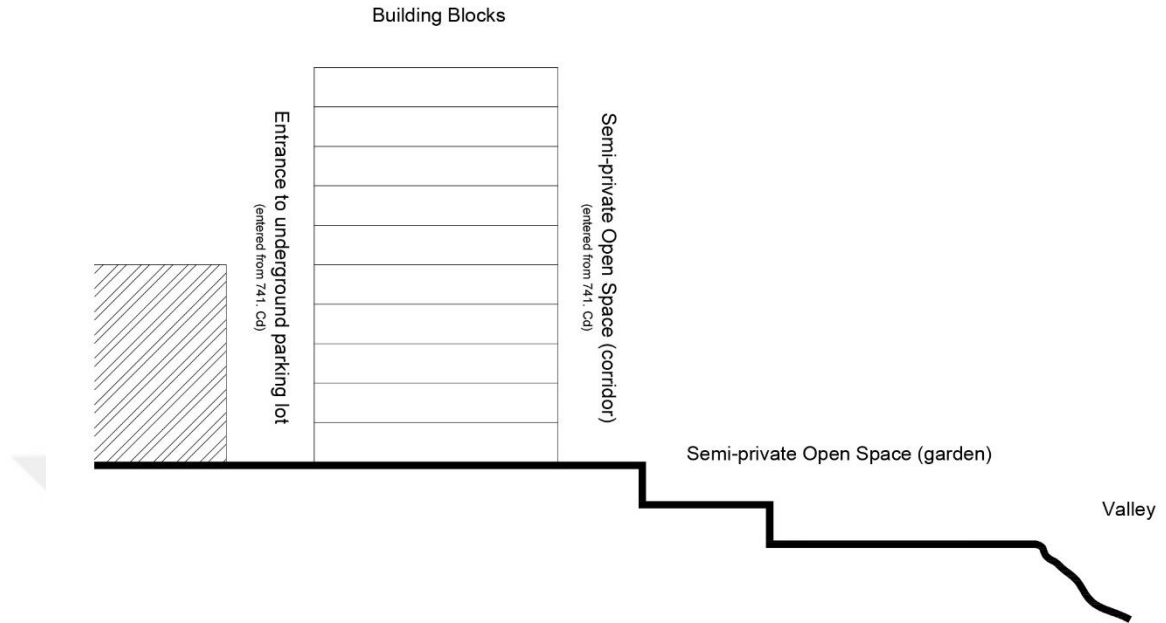


Figure 56- typology 2-2, Aykon Park Sitesi section drawing (source: author).

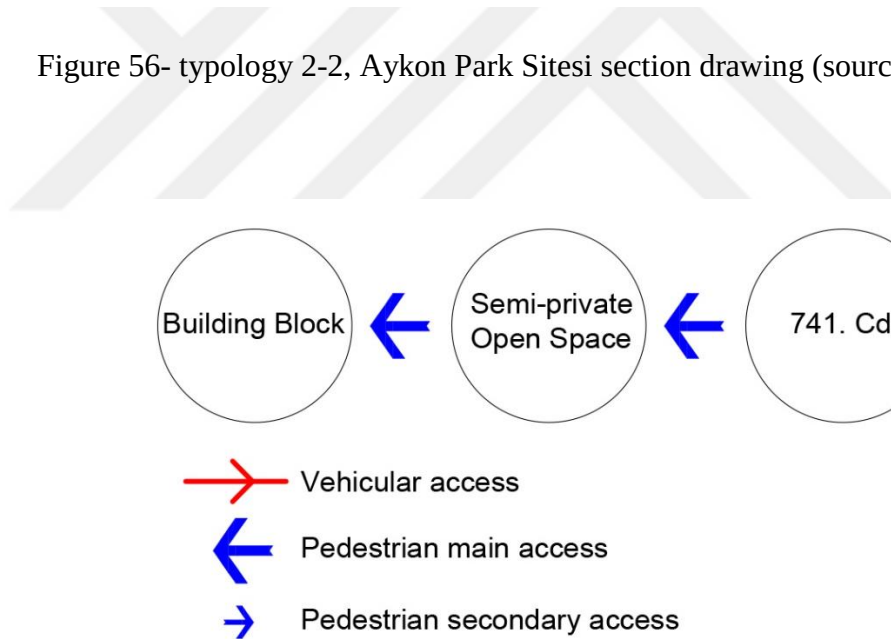


Figure 57- typology 2-2, Aykon Park Sitesi topological depth (source: author).

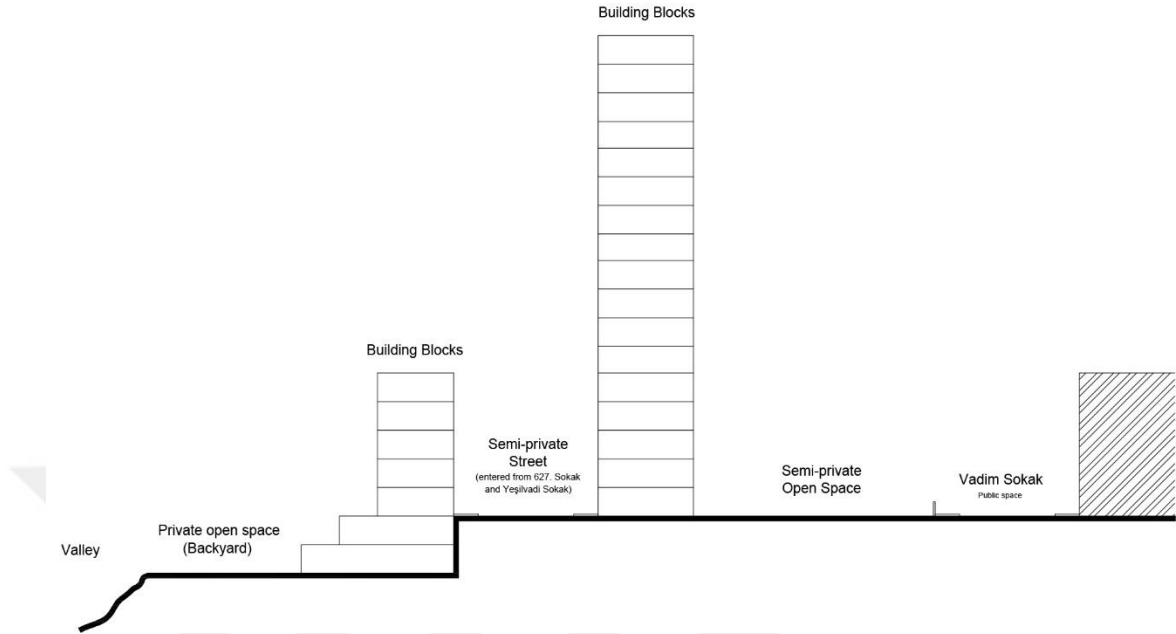


Figure 58- typology 2-4, Çankaya Parkvadi Evleri C Blocks section drawing (source: author).

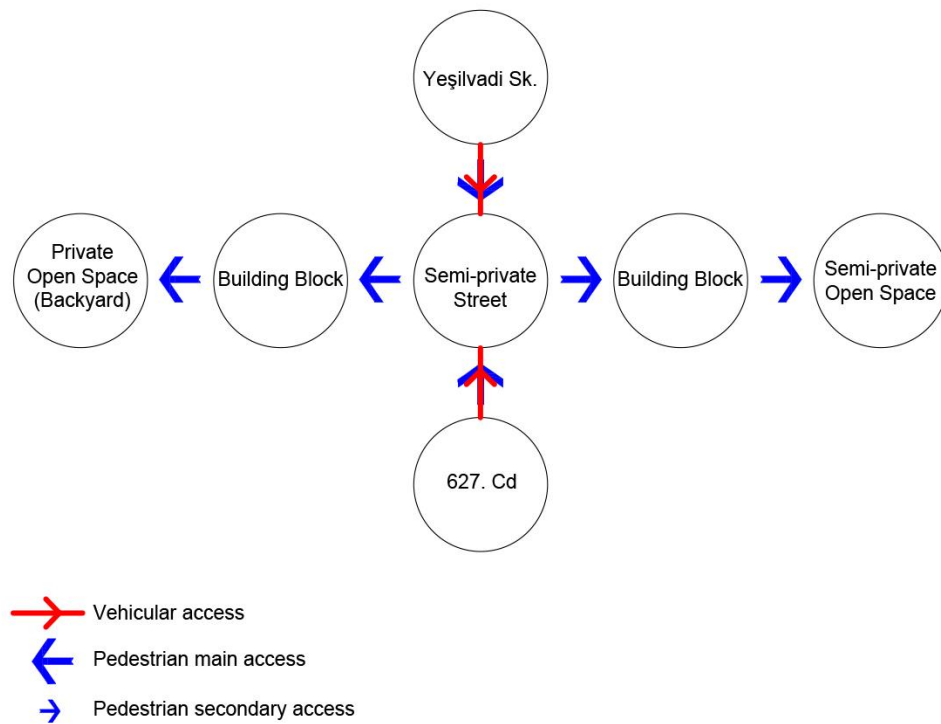


Figure 59- typology 2-4, Çankaya Parkvadi Evleri C Blocks topological depth (source: author).



Figure 60- Typology 4-1, Çankaya Parkvadi Evleri A Blocks section drawing (source: author).

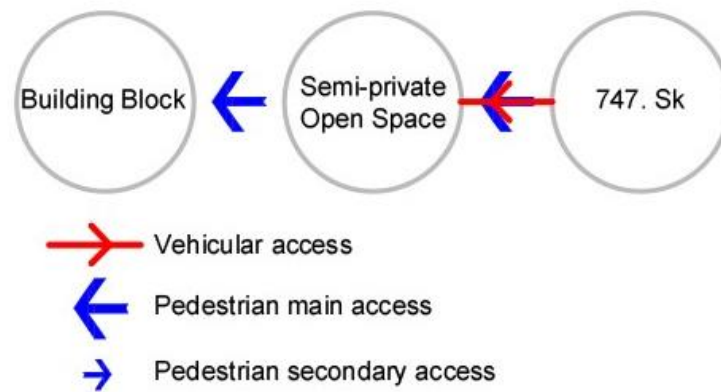


Figure 61- Typology 4-1, Çankaya Parkvadi Evleri A Blocks topological depth (source: author).

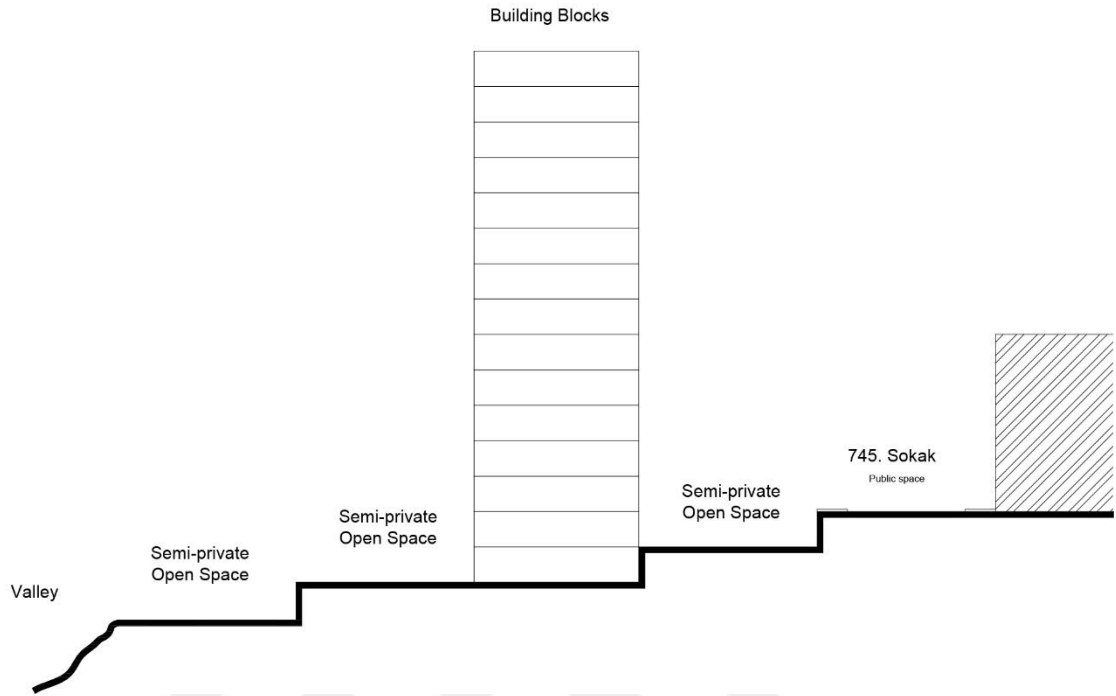


Figure 62- Typology 4-1, Koz Vadi Sitesi section drawing (source: author).

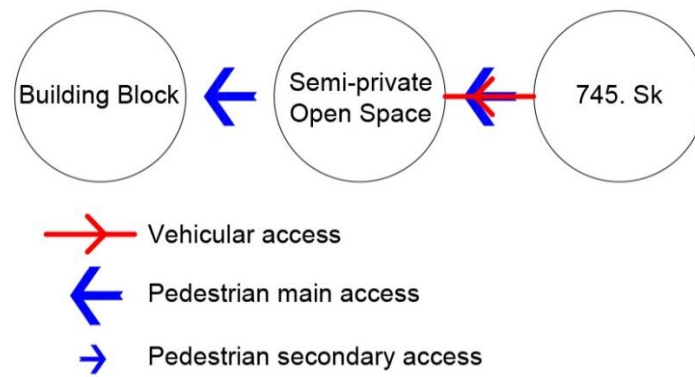


Figure 63- Typology 4-1, Koz Vadi Sitesi topological depth (source: author).

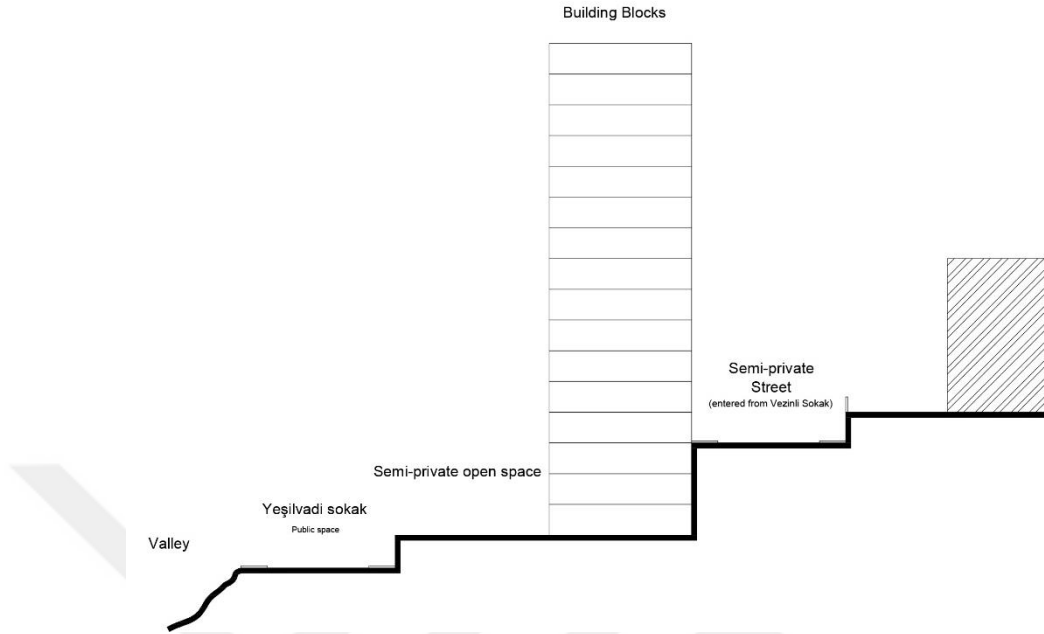


Figure 64- Typology 4-2, Şelale Sitesi H4- H5- H6 blocklar section drawing (source: author).

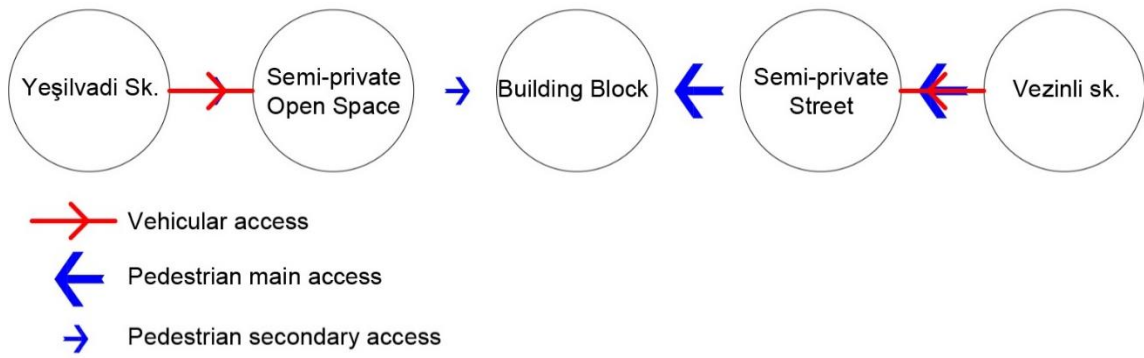


Figure 65- Typology 4-2, Şelale Sitesi H4- H5- H6 blocklar topological depth (source: author).

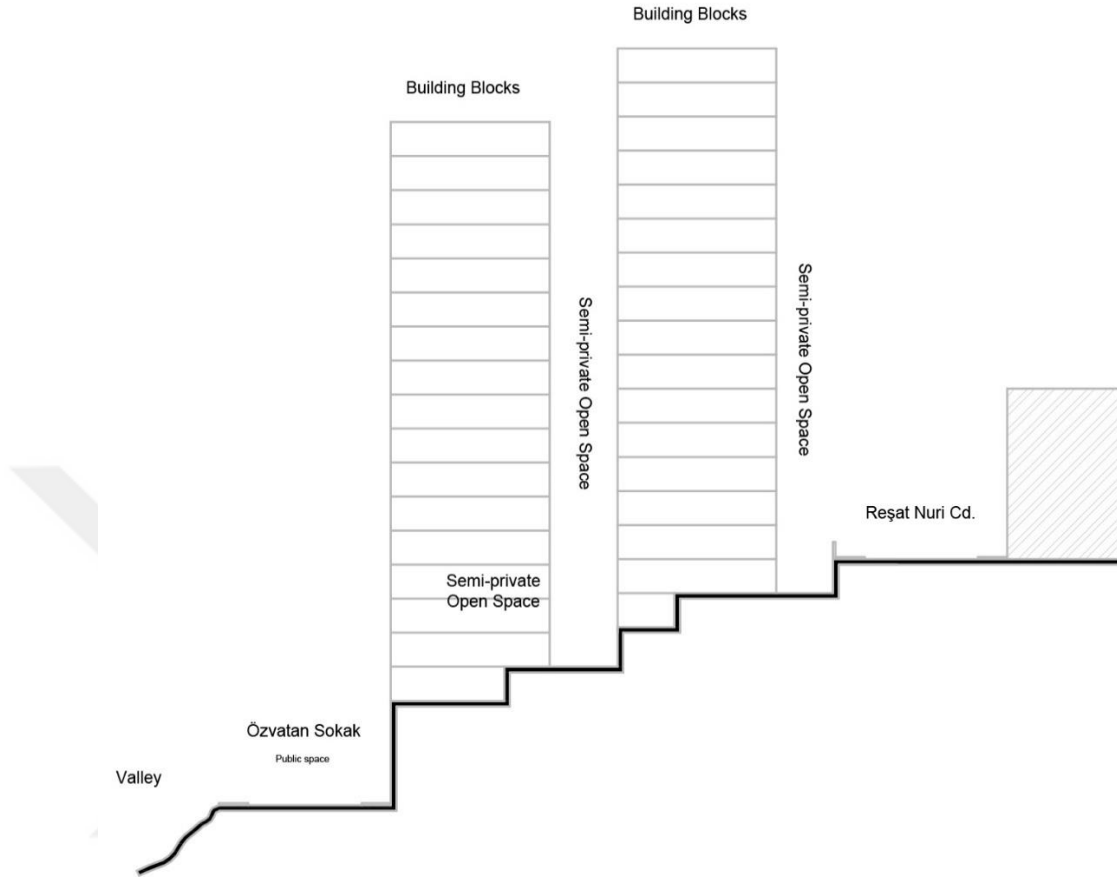


Figure 66- Typology 4-2, Vadi Sitesi H1-H2-H3 section drawing (source: author).

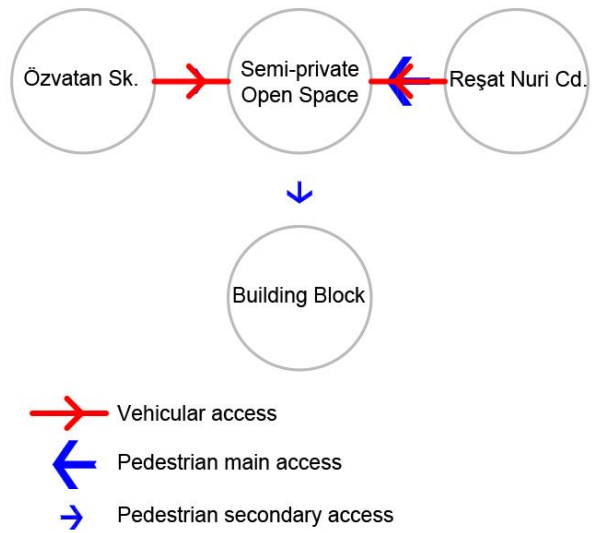


Figure 67- Typology 4-2, Vadi Sitesi H1-H2-H3 topological depth (source: author).

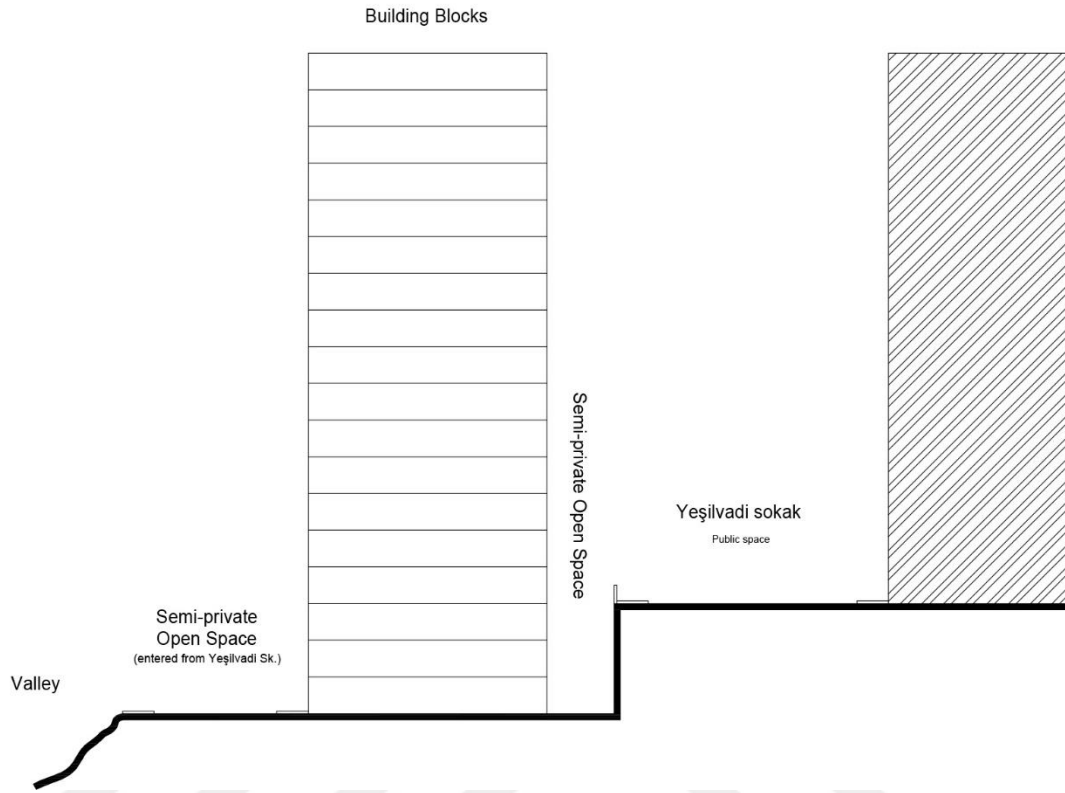


Figure 68- Typology 4-3, Şelale Sitesi H7-H8 section drawing (source: author).

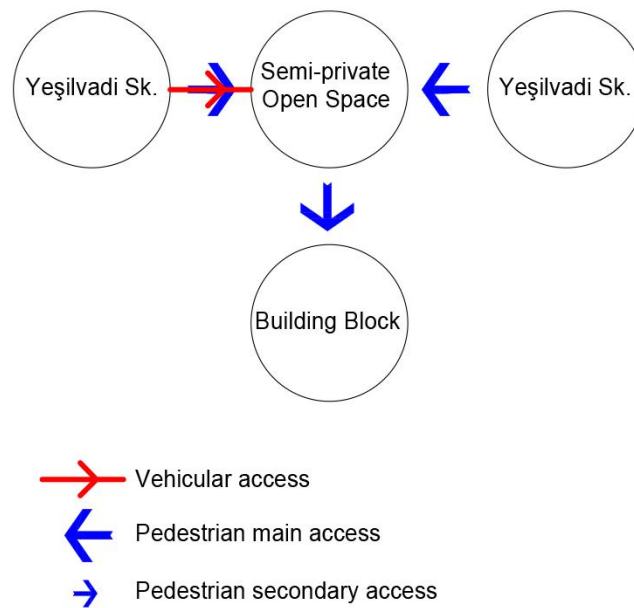


Figure 69- Typology 4-3, Şelale Sitesi H7-H8 topological depth (source: author).

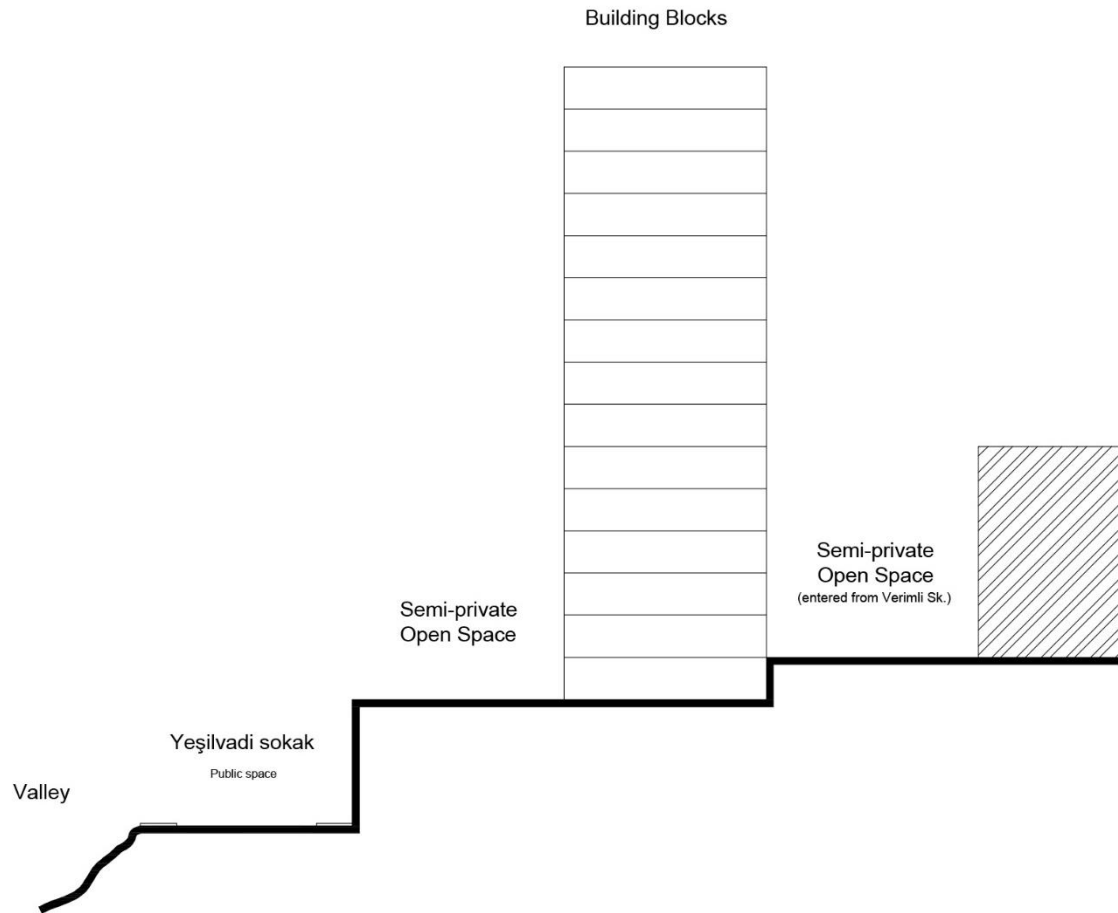


Figure 70- Typology 4-3, Vadi Sitesi H9 section drawing (source: author).

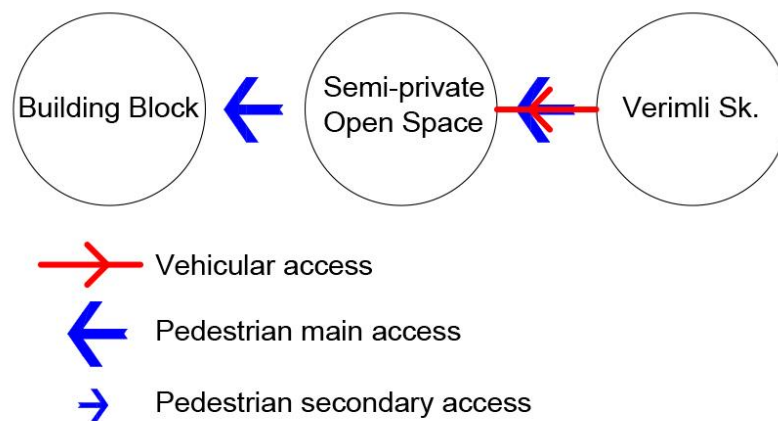


Figure 71- Typology 4-3, Vadi Sitesi H9 section drawing (source: author).

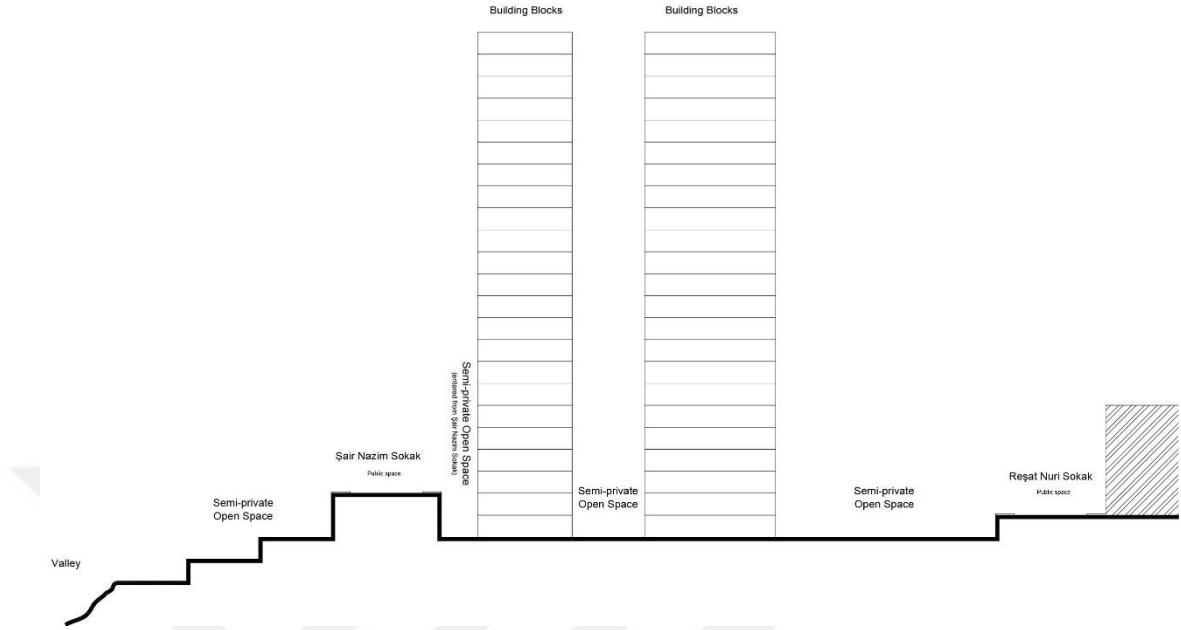


Figure 72- Typology 4-3, Çankaya Park Evleri 52 bloklar section drawing (source: author).

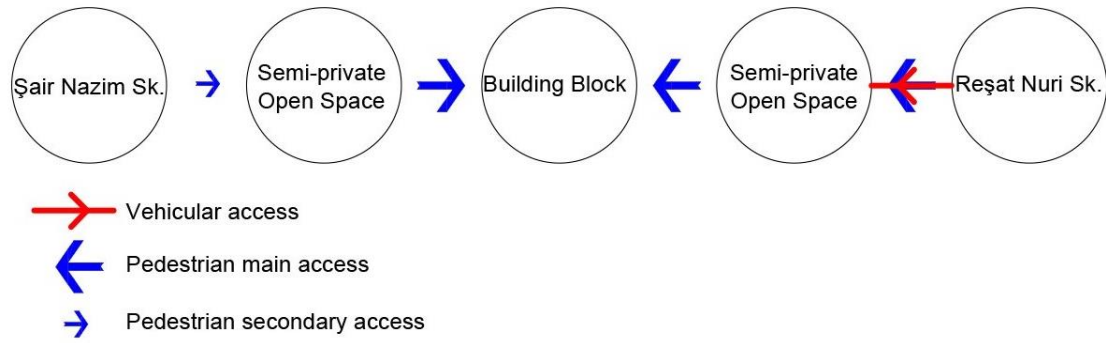


Figure 73- Typology 4-3, Çankaya Park Evleri 52 bloklar topological depth (source: author).

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