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RESEARCH ON THE PERCEPTION OF SAFETY IN URBAN GREEN SPACES; THE CASE ANKARA- DİKMEN VALLEY

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Abstract

Crime prevention through environmental design theories focus on the relationship between crime and the environment. In this study, it is aimed to investigate the relationship between the design of urban green spaces and the perception of safety and to develop design impact criteria and indicators. The research applied multiple research techniques under the name of social impact assessment to measure the effect of spatial features on the perception of safety in Ankara- Dikmen Valley. At the same time, spatial features and design criteria put forward by ecological crime theories and K. Lynch's space and perception criteria were evaluated and these criteria were differentiated and grouped under five dimensions. These are; social profile, comfort, harmony, legibility and transparency. These five dimensions and the sub-headings created under them are defined as the design impact indicator set. In line with the results of the research and the set of indicators that have been developed, the conclusion is that the Dikmen Valley 2nd stage is perceived to be safer.

Keywords: *Ecological crime theories, Desin ımpact assessment, Social impact assessment, Urban green areas, Perception of safety*

KENTSEL YEŞİL ALANLARDA GÜVENLİK ALGISI ÜZERİNE BİR ARAŞTIRMA; ANKARA- DİKMEN VADİSİ ÖRNEĞİ

Özet

Çevresel tasarım yoluyla suçun engellenmesi teorileri suç ve çevre arasındaki ilişkiye odaklanmaktadır. Bu çalışmada, kentsel yeşil alanların tasarımı ile güvenlik algısı arasındaki ilişkinin araştırılması ve tasarım etki kriterleri ve göstergelerinin geliştirilmesi amaçlanmıştır. Araştırmada, Ankara- Dikmen Vadisi'nde mekânsal özelliklerin güvenlik algısı üzerindeki etkisini ölçmek için sosyal etki değerlendirmesi adı altında çoklu araştırma teknikleri uygulanmıştır. Aynı zamanda ekolojik suç teorileri ve K. Lynch'in mekan ve algı kriterleri tarafından ortaya konan mekansal özellikler ve tasarım kriterleri değerlendirilmiş ve bu kriterler farklılaştırılarak beş boyut altında toplanmıştır. Bunlar; sosyal profil, konfor, uyum, okunabilirlik ve şeffaflıktır. Bu beş boyut ve bunların altında oluşturulan alt başlıklar tasarım etki gösterge seti olarak tanımlanmıştır. Araştırma sonuçları ve geliştirilen gösterge seti doğrultusunda, Dikmen Vadisi 2. etabının daha güvenli olarak algılandığı sonucuna varılmıştır.

Anahtar Kelimeler: *Suç ekolojisi teorileri, Tasarım etki değerlendirme, Sosyal etki değerlendirme, Kentsel yeşil alanlar, Güven algısı*

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1. INTRODUCTION

Urbanisation, migration, modernism, globalisation, inequalities in income distribution, poverty (ghettoisation), discrediting, social exclusion due to spatial segregation (Aksoy, 2011), unemployment, weakening of social control, deprivation, ethnic-class differences, deterioration in the urban environment and the formation of spaces that will provide opportunities for crime (Köklü, 2016). This situation leads to an increase in unused and non-preferred spaces in cities. Based on the interaction between people and the city, urban researchers associate crime with the characteristics of the space and the individuals using that space (Ataç, 2008).

In the early 20th century, the researches conducted at the University of Chicago drew attention to the social and physical environment affecting the behaviour of the individual while examining the behaviour of criminals. The Chicago School (1920), represented by Burgess and Park, influenced many of the contemporary theories explaining the behaviour of criminals (such as social disorganisation theory, rational location theory and crime pattern theory) in different ways. According to Shaw and McKay (1942), this approach, which is called 'theories of criminal ecology', examines the relationship between environment and crime and tries to explain crime as a function of social change (Shaw & McKay, 1942; Sampson & Groves, 1989). With these studies, the idea that criminal behaviour should be evaluated as a whole with the environment in which it occurs rather than a personal phenomenon has come to the fore (Serter, 2013). This has led to the theories of Crime Prevention Through Environmental Design (CPTED), which includes approaches to using design as a tool to reduce the opportunities that lead to the emergence of crime (Deniz, 2007).

Ray Jeffery was influenced by Jane Jacobs' theory of producing reassuring spaces and in 1971, he created the theory called Crime Prevention Through Environmental Design (CPTED). According to the CPTED theory; physical causes of crime should be evaluated along with social causes. According to Jeffery; built environment (building types, landscape design, land use and roads), physical architectural structure and social institutional structures are included in the scope of the environment and human is considered as a part of the environment (Cicerali & Cicerali, 2016). Designs that do not leave an effective impression on the user and are uncomfortable in terms of use increase the likelihood of crime and anti-social behaviour. Therefore, in areas with high crime rates, environmental design plays an important role in reducing crime and improving the perception of safety (Deniz, 2007). Designers such as landscape architects can intervene in the crime phenomenon through environmental design; the resulting fears and concerns are reduced and people perceive the environment safer.

Wekerle & Whitzman (1995) analysed all the theories of ecological crime and summarised them under 10 main points. These are; Lighting, Entrapment spots, Sightlines, Visibility by others, Activity generators, Signage or other informations, Movement predictors, Land use mix, Sense of ownership/territorality, Overall design.

At the same time, Kevin Lynch, who has an important place in urban studies, has made important contributions to the discipline of environmental design with his research on environmental perception-space perception and experience since the 1960s and has identified five principles. These are vitality, mood, harmony, access and control principles. In urban open green space design studies, meaning, identity, harmony, form, legibility and transparency, which are the sub-components of the mood principle, gain importance (Lynch, 1981).
Interventions and changes in the environment in which the individual lives are defined as social impact. These changes include the economic life, daily life, relationship with society, lifestyle, as well as rules, beliefs and values (Urban Strategy, 2015). The social impact of urban open green spaces is defined as the change that occurs in people through the activities carried out with other people in green spaces and the interaction that takes place as a result of these activities. This change can be positive or negative (Çelik & Aslantaş, 2018).

The study aims to; investigate the relationship between the perception of security as an important parameter in the creation of sustainable and livable urban spaces, investigate the relationship between the design of urban open green spaces and the perception of space and develop design impact criteria and indicators, develop a "Design Impact Assessment" (DIA) model for designing for the perception of security in open green spaces, - Explain the factors that establish the human-environment relationship and lead criminals to crime with environmental factors and spatial factors.

In the case of Ankara-Dikmen Valley, which was selected as the study area in line with the objectives of the research, multiple research techniques (observation, spatial sequence analysis and survey studies) were used under the name of Social Impact Assessment method (SIA) in Open Green Spaces. At the same time, the design criteria put forward by the theories of ecological crime and K. Lynch's criteria for space and perception were evaluated and these criteria were differentiated and grouped under five dimensions. These are; social profile, comfort, harmony, legibility and transparency. The effect of the spatial characteristics of the urban open green areas examined with these five dimensions on the perception of safety on the individual is defined as design impact; the five dimensions and the sub-headings created under them are defined as the design impact indicator set. Design impact assessment means the evaluation of the space-design-safety perception relationship with the idea that the human-environment relationship in landscape designs should be made by considering the spatial perception. All indicators were tested on the study area and compared with the results of social impact assessment, which is a research method.

It is thought that the study, which is unique in terms of its fiction and subject, will contribute positively to the ongoing and planned studies in Turkey and in the world by determining the landscape design criteria for security. In addition, the analyses carried out to determine the level and reasons of the effect of design features on the perception of safety in these areas will provide scientific data in terms of creating sustainable and livable cities by providing benefits for increasing the quality of urban life.

2. METHODS

2.1 Material

2.1.1 Study area

The main material of the research is Dikmen Valley (Figure 1), which is located in the city of Ankara, Turkey and consists of 3 phases. The fact that it is the first large-scale urban renewal area in Turkey is the primary reason for its selection as the study area.

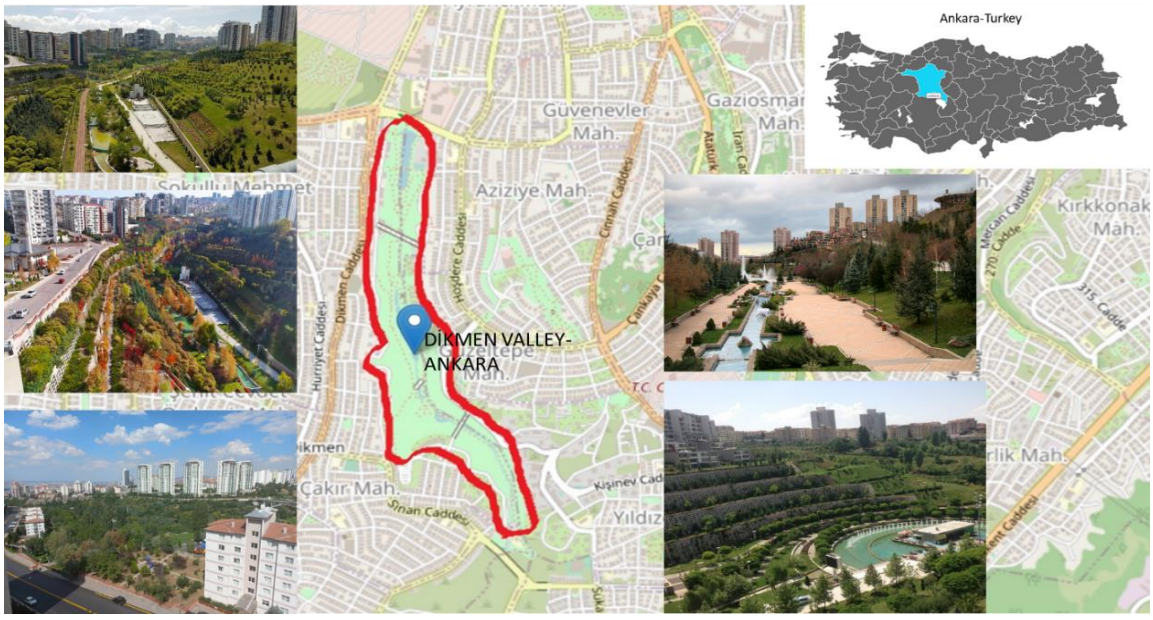


Figure 1. Ankara-Dikmen Valley

In addition, being close to the city centre (2.6 km) and being used intensively by the city dwellers for various activities are also important in site selection. Considering the housing changes, socioeconomic change, change in demographic structure and change in social structure in and around Dikmen Valley, which has been transformed by urban renewal (Figure 2), it is thought that the change in the perception of safety before and after the transformation can be measured.

Figure 2. Dikmen Valley before urban renewal & After urban renewal (Original 2022)

The material of the study consists of domestic and foreign sources (such as articles, papers, books and book chapters), project (.dwg), numerical and verbal data related to Dikmen Valley. The data were prepared using programmes such as AutoCAD, Google Earth, DepthmapX 0.80, Adobe illustrator, SPSS20.

2.2. Methods

Within the framework of the SIA approach, multiple research techniques that support each other were applied. Latene (1981) defines social impact as the influence of individuals' feelings, thoughts and behaviours by other individuals and the change that occurs as a result of this influence. The International Association for Impact Assessment defines the concept of social impact assessment (SIA) as the processes of analysing, managing and monitoring the positive or negative social consequences of planned interventions and social change processes initiated by these interventions (Çelik & Aslantaş, 2018). SIA, whose main objective is to create a just and more sustainable humanitarian environment, can use a combination of qualitative and quantitative techniques that complement each other. These techniques vary depending on factors such as the sector-subject-theme, region, time and target groups where the project will be implemented (Vanclay, 2003). While conducting social impact research, quantitative information collection methods with surveys, focus group studies, observation techniques and qualitative information collection methods can be used together (Çelik & Aslantaş, 2018). All methods and techniques used within the scope of the research are given below.

2.2.1 Investigation of area control with observation technique and crime prevention through environmental design (CPTED) criteria in dikmen valley

In the preparation of the checklist, the components of Wekerle and Whitzman's (1995) theories of environmental design and crime prevention were used. These are; lighting, entrapment spots, sightlines, visibility by others, activity generators, signage or other informations, movement predictors, land use mix, sense of ownership/territorality, overall design.

The CPTED checklist and questionnaire prepared for the observation research (such as the behaviour of the users of the area, their activity choices and in which areas there is intensity of use) within the scope of the research were prepared according to these items. With the prepared list, all three stages of Dikmen Valley were observed and evaluated according to these components. Within the scope of the research, Dikmen Valley was visited at different time periods (09:00-12:00; 15:00-19:00; 17:00-21:00) for a total of three months in different seasons and an average of 3.5 hours of observation was made.

2.2.2 Analyzing dikmen valley with space syntax analysis

Space syntax analysis is a method of reading space created by Bill Hillier and Jullienne Hanson (1984) at the Bartlett School, London. Space can be defined as a product influenced by society and social structure, as well as a factor affecting society and social structure. It is a set of techniques supported by theoretical approaches that are used to define the spatial models and spatial organization of built regions, dwellings and cities at different scales and to investigate the interaction of all these with the social (social) structure. The aim of this technique is to objectively examine the relationship between spatial organization and visibility and human mobility, and to reveal the potential of 'spaces' to direct and bring individuals together (Hillier and Hanson, 1984; Çil, 2006; Atak, 2009; Şıkoğlu and Arslan, 2015).

Using Auto-CAD and DepthMapX 0.80, axis and integration maps were created for all three stages of Dikmen Valley. Axis maps are mathematically derived maps of the texture and mobility potential created by land use. It is created by drawing and digitizing the longest and least number of lines in each accessible area (Köklü, 2016). In Dikmen Valley, the spatial alignment method, which was carried out to reveal the state of the viewpoint, the mobility of the area (socialization), and the number of connections of the roads, guided not only the physical analysis but also the formation of social relations. The greater the length of an axis (road) and the number of lines (roads) crossing that axis (road), the higher the user density of that axis, that is, the greater the socialization opportunity. By calculating the integration value on the axis map created by drawing the axis lines, the *Spatial Integration Map* is formed by sorting the six different values from largest to smallest and showing them in different colors (red, yellow, orange, blue, green, purple). The Spatial Integration Map shows the integration value of roads in measuring accessibility and mobility in the area (Şahin Körmeçli, 2019). Integration gives the number of lines that need to be crossed in order to access a desired axis in the axis maps (Köklü, 2016). In the integration map created by the DepthMapX 0.80 program, the areas with the lowest integration values are the areas with the least uses (in terms of area mobility), while the areas with high integration values are the areas with more intensive uses.

2.2.3 Analysis of user survey data specific to Dikmen Valley

Since user profile and social analyses provide important clues about the security of urban open green spaces, a survey was conducted with local administrators, residents living around Dikmen Valley and users of the area (96 people). Due to the pandemic lockdowns related to the Covid 19 virus that broke out in December 2019, the limitation created by the lack of social communication necessitated the digital preparation and distribution of the survey study. The questionnaires were shared with the neighbourhood residents living around Dikmen Valley and users of the area via the internet and social media through the mukhtars. The distributed digital questionnaire included questions such as demographic characteristics of individuals, neighbourhood relations, how often they use the valley and their purpose of use, what are the spatial elements affecting the perception of crime and insecurity. The survey was evaluated with the residents (96 people) of 3 neighbourhoods (İlkadım, Güzeltepe, Yıldızevler neighbourhoods) surrounding the valley in late 2020. The sample size was calculated based on the number of people (the sample size was calculated based on the number of people over the age of 18 living in the neighbourhoods bordering the Dikmen Valley in 2020, which is approximately 59,000. The sample size was calculated using the formula n= (Nt2pq) / (d2(N-1)+ t2pq). The expansion of the units in the formula is as follows (Özdamar, 2003).

N: Number of population units, n: Sample size

P: Observation rate of X in the universe, Q (1-P): The rate at which X is not observed

αZ : α= 1.96, 2.58 and 3.28 for 0.05, 0.01, 0.001

d= Sampling error

σ= Universe standard deviation

$\alpha\alpha \rightarrow \alpha$t ,sd= sd are critical values of t distribution with sd degrees of freedom (sd=n-1). t ,sd critical values can be taken equal to Z values when sd= n-1 5000.

When the sampling formula is applied, the population size is approximately 59,000 people in the neighborhood (over 18 years of age) and the margin of error is 0.1, and when the 't' value is taken as 1.96 at 95% confidence

level, it is calculated that 96 questionnaires are sufficient in the calculation made according to the formula. In addition, 'p' and 'q' values were taken equal to each other due to the possibility of the hypothesis to be or not to be.

3. RESULTS

3.1 Investigation of Area Control With Observation Technique And Crime Prevention Through Environmental Design (Cpted) Criteria In Dikmen Valley

Table 1. Observation results for all three stages of Dikmen Valley

CPTED CONTROL LIST	Dikmen Valley Stage 1		Dikmen Valley Stage 2		Dikmen Valley Stage 3	
	Yes	No	Yes	No	Yes	No
Is there enough lighting elements in the area?		X		X	X	
Are there movement predictors in the area?		X	X			X
Is there entry-exit control in the area for security purposes?	X		X		X	
Are the urban furniture in the area clean and well-maintained?	X		X		X	
Are there entrapment spots in the area?		X		X		X
Are there sufficient signage or other informations in the area?		X		X		X
Are there any points in the area that would obstruct Line of Sight/Tracking?	X		X		X	
Are there any points in the area that prevent the visibility of individuals?	X		X		X	
Are there any abandoned and deserted areas in the area?	X			X	X	
Is there a sense of ownership of the space?	X		X		X	
Is the overall design of the area sufficient for security?		X	X			X
Is the space used by people of different genders and ages?	X		X		X	
Is there activity generators in the area?	X		X		X	

Observations were made in Dikmen Valley with the checklist prepared with the crime ecology criteria of Wekerle and Whitzman. As a result of the observations, the 1st and 2nd stages were felt safer than the 3rd stage. During the observations made at night in Dikmen Valley, it was determined that the lighting was not sufficient in all three stages. It was determined that there are dark areas on the road route. It was observed that dense tree and shrub groups in the sloping-terraced areas were in darkness. Lighting has an impact on personal safety and can reduce the anxiety of being a victim. The user, who can easily see the environment he/she is in with sufficient lighting, feels safe in the familiar environment (Fennelly, 2004; Çelik, 2018). Dikmen valley images from all three stages can be seen in figure 3.

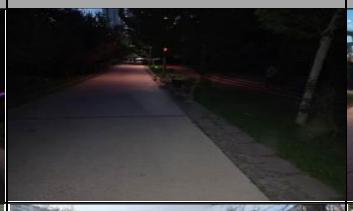
Criterias for CPTED	Dikmen Valley Stage 1	Dikmen Valley Stage2	Dikmen Valley Stage 3
Adequate Lighting			
Variety of Activities			
Mixed Use			
Urban Furniture			
Entrapment Spot or Abandoned Areas			

Figure 3. Photographs for observation of Dikmen Valley three stages (Original 2020-2022)

3.2 Analysing Dikmen Valley With Space Syntax Analysis.

According to the integration maps created for each stage of Dikmen Valley; while the integration value is high in Stage 1, Stage 2 has a high and moderate integration value, and Stage 3 has a very low and moderate integration value. The potential to come together is related to the ability of the users of the area to socialise, and this issue is directly proportional to the perception of safety. According to this result, the opportunity to socialise is higher in the 1st and 2nd stages, which have the highest potential to use the area (Figure 4-5-6).

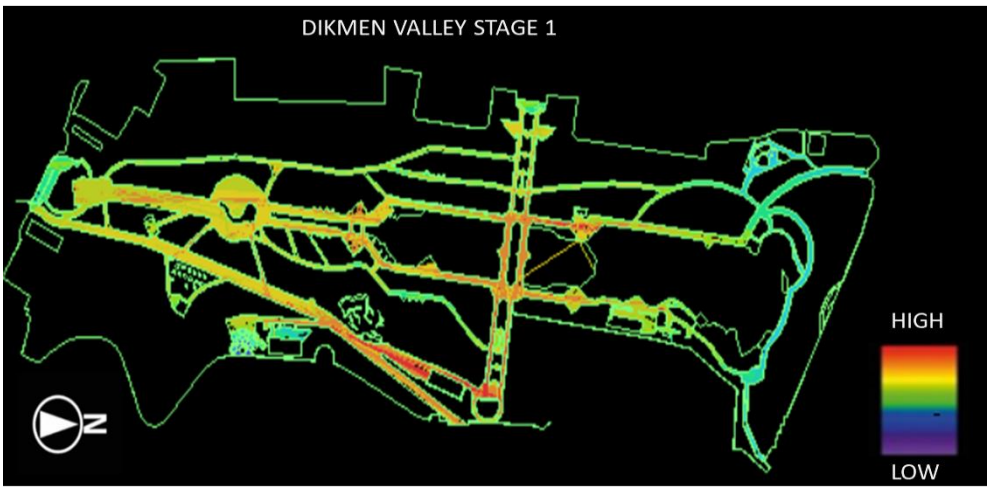


Figure 4. Dikmen Valley 1st Stage integration map

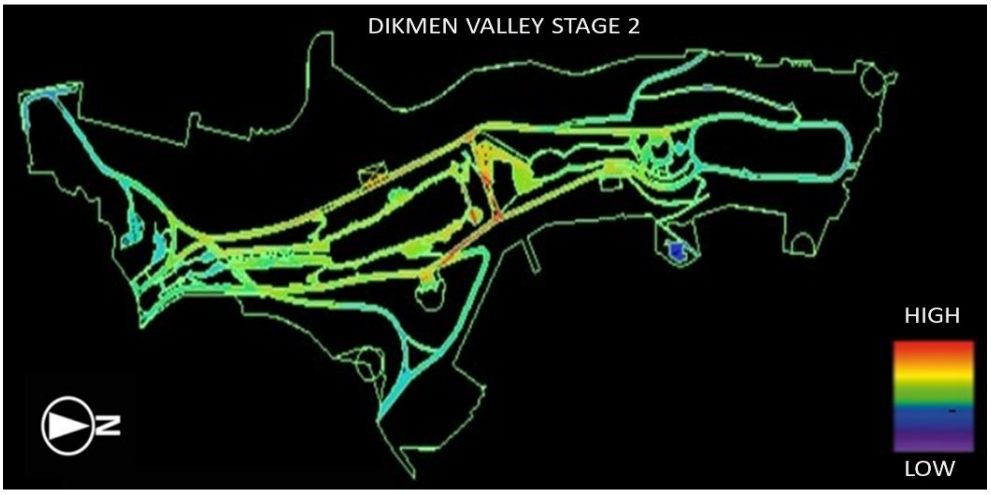


Figure 5. Dikmen Valley 2nd Stage integration map

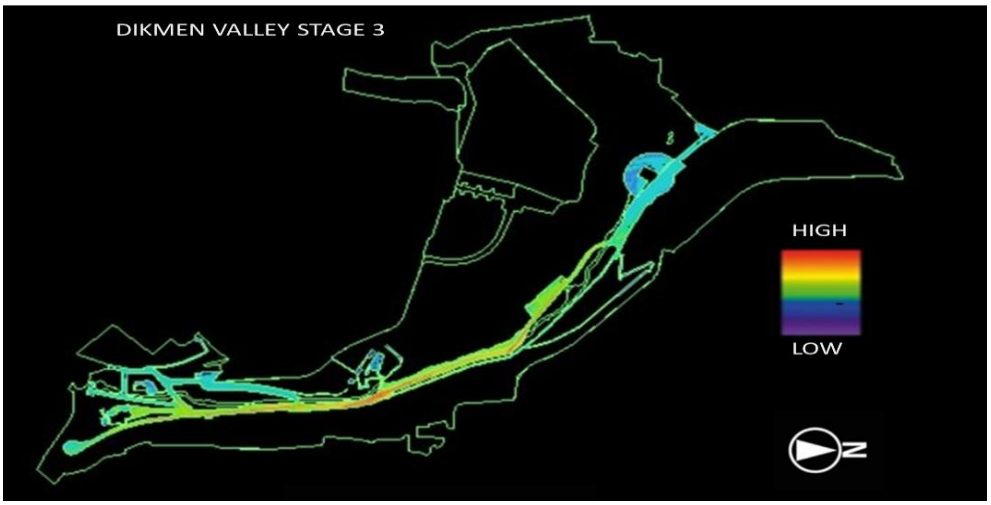


Figure 6. Dikmen Valley 3rd Stage integration map

3.3. Analysis and Analysis of User Survey Data Specific to Dikmen Valley

Of the 96 people who participated in the survey, 50 % were female and 50 % were male. The participants were asked questions according to their preferences for using the area in Dikmen Valley. According to the results; 66% of the participants stated that they use the open and green areas in Dikmen Valley mostly during the daytime to spend time in the fresh air, to do sports (walking, jogging, cycling, cycling, instrumental sports, etc.) and to relax, 34% of them stated that they use them to meet with friends, socialise and bring their children to playgrounds. The purposes of using the area such as picnicking and taking photographs remain at a lower rate (Figure 7).

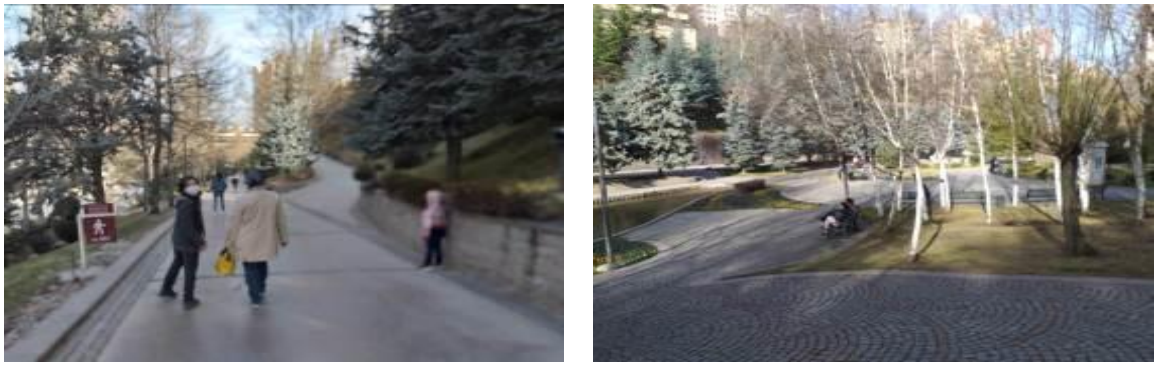


Figure 7. Use preferences in Dikmen Valley (Original 2021)

Figure 8. Dikmen Valley night use (Original 2022)

In the summer months, it was observed that there is an intensity of night use for walking, picnics and recreation in the more illuminated areas of Dikmen Valley (Figure 8). It was also observed that the mini soccer field is actively used by children and young people.

When survey participants were asked about the reasons for preferring Dikmen Valley, 66% of them answered that '*being close to where they live and having dense green areas*' were the most important reasons. At the same time, ease of transportation, meeting the need for fresh air and being a well-maintained area are also among the most preferred reasons. This situation shows that being accessible and accessible is important in the preference of area use. In addition, 38% of the participants preferred the option '*being a safe area for themselves and their loved ones'*. It is thought that feeling safe is important for space use preferences.

Figure 9. Stray dogs in Dikmen Valley (Original-night)

In the interviews, it was stated that the presence of stray dogs is frightening, frightening and prevents the use of the area. The same results were observed during the observations. It was observed that the most disturbing situations for the users of the area were stray dogs that suddenly appeared (Figure 9). Participants stated that the fact that Phase 1 has a flatter surface (except for the stairs at the entrances) and is a stair-free area is more convenient in terms of walkability (Figure 10)

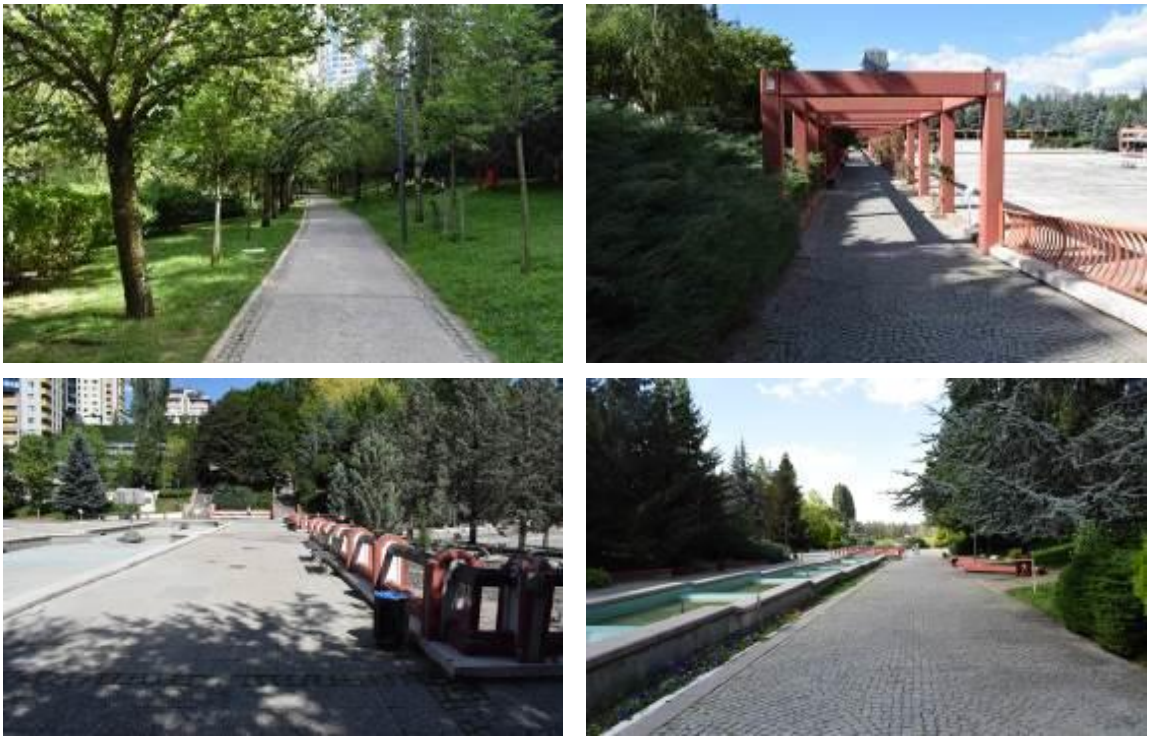


Figure 10. Dikmen Valley 1st Stage photographs (Original 2020)

They are also participants; it is stated that the presence of the Police House in the Etap is an important element for them to feel safe, Dikmen Valley 1st and 2nd Stages have a more crowded (mixed-use) user profile, which increases the feeling of safety, They stated that the presence of kiosks and cafeterias in the Stage creates safety.

The majority of the participants stated that Stage 3 gives a feeling of insecurity because it is more desolate and secluded. At the same time, the fact that the planned 4th and 5th stages, which are located in the continuation

of the 3rd Stage, have not yet started, and that the area is currently empty, neglected and ruined, although it is located in the 3rd Stage in Dikmen Valley, they stated that the area is secluded and feels insecure.

The survey participants were also asked about the elements that are thought to be effective in preventing crime in open green areas. The answers given in response to the question "*Which of the mentioned security elements do you think are effective in preventing crime and perception of insecurity?" are* given in Table 2 by evaluating them as "Most" and "Least".

Table 2. Effective security elements in preventing crime and fear of crime

Effective security element in preventing crime and perception of insecurity		**Number of people**
Most	Private security employees	**60**
	Panoptic devices, security cameras and metal detectors	**51**
	Armed soldiers/police	41
	Streets with controlled entrances and exits	43
Least	Metal and concrete barriers, safety strips and walls	13
	Barriers, bollards and lanes to restrict vehicle movements	20

In response to the question *"What are the spatial factors that lead people to commit crimes in open spaces?*", it is seen that the most selected factors are poor lighting and lack of official surveillance. According to the data obtained by the researcher in the light of the observations made by the researcher with the criteria of CPTED, there is no security (official surveillance) at every entrance in Dikmen Valley. Security guards supervise the area with a shift system in the valley. The answers given are given in Table 3 by evaluating them as '*Most'* and '*Least'*.

Table 3. Spatial factors that lead people to commit crimes in open spaces

Spatial factors that lead people to commit crimes in open spaces		**Number of people**
Most	Poor lighting	**74**
	Lack of access to assistance/Lack of official oversight	**61**
	Poor vision	**56**
	Hiding places	50
	Presence of unwanted persons	49
	Uncontrolled entry and exit	50
Least	Inadequate signage	5
	Poor maintenance of urban furniture	7

In response to the question *'What factors can make you feel unsafe in open spaces?'*, poor lighting and the presence of deserted areas are important. The answers given by the participants are given in Table 4 by evaluating them as *'Most'* and '*Least'*.

Table 4. Factors that make people feel unsafe in open spaces

Factors that make you feel unsafe in open spaces		**Number of people**
Most	Poor lighting	**64**
	Presence of uninhabited areas	57
	Presence of unwanted persons	52
	Lack of access to assistance/Lack of official oversight	51
	Poor vision	47

	Vandalism/destruction	45
	Hiding places	40
Least	Increasing activity options	4
	Inadequate signage	8
	Poor maintenance of urban furniture	9
	Crowded Use	12

Among the answers given, the majority of the issues such as poor lighting, poor visibility, the existence of uninhabited areas, lack of official surveillance support the criteria of the CPTED in terms of the perception of safety in the use of the area.

3.4 Design Impact Assessment Model Proposal

In the research, it was aimed to develop a set of indicators to be used both in the evaluation of urban open green space designs in the context of human-environment relationship and in the design process. In this context, the urban image criteria developed by Lynch and the criteria formed by the theories of CPTED were evaluated and combined under a single model as 'design impact indicator set'. The design impact indicator set was determined as social profile, comfort, harmony, transparency and legibility and divided into sub-indicators (Table 5). The created indicators, together with the sub-indicators, were evaluated in the Dikmen Valley, which was selected as the research area.

Table 5. Design impact indicators and sub-indicators for safety

Design Impact Indicators and Sub-Indicators for Perception of Safety

Indicators	**Confidence Sub-Indicators**	**Sub-Indicators That Make You Feel Insecure**
Social Profile	Mixed use/Diversity	Presence of unwanted persons
	Plenty of activity options	Alienation/Exclusion
	Sense of belonging	Inequality/Disrespect
Comfort	**Confidence Sub-Indicators**	**Sub-Indicators That Make You Feel Insecure**
	Presence of technological devices such as security cameras, metal detectors	Disorganization
	Presence of security forces	Lack of access to assistance/Lack of official oversight
	Well-maintained landscaping	Poor maintenance of urban reinforcement elements
	Privacy	Vandalism/Destruction
	Presence of input-output control	Distance to main axis
	Powerful illumination	Poor Lighting
Harmony	**Confidence Sub-Indicators**	**Sub-Indicators That Make You Feel Insecure**
	Integrity of design	Disengagement
	Rhythm/Continuity in design	Irregularity in Design
Transparency	**Confidence Sub-Indicators**	**Sub-Indicators That Make You Feel Insecure**
	Long line of sight	Narrow line of sight
	Presence of signs (signage etc.)	Presence of blind spots
	Density of trees and shrubs branching from the line of sight	Presence of hiding places

	Limited and enclosed space	Density of trees and shrubs branching from the root
Legibility	**Confidence Sub-Indicators**	**Sub-Indicators That Make You Feel Insecure**
	Visibility	Presence of uninhabited areas
	Accessibility	Physical and auditory isolation
	Presence of Escape Points	Lack of transparency of the space
	Presence of landmark elements (Landmark)	The area is not perceivable
	Presence of nodes (Focus)	Lack of signage in the area

A chart was prepared by asking the question '*Can the design features of open green spaces be evaluated in terms of safety perception using these indicators?* In this chart, it is desired to reach a conclusion with a scoring system (by the researcher).

Each indicator was given an equal score (positive (+) for confidence and negative (-) for insecure). Separate evaluations were made for each of the three phases in the study area. The presence of design impact indicators that give a sense of *safety* in the area was taken as positive (+5 points for each sub-indicator, +100 points in total), and the presence of design impact indicators that give a sense of insecurity in the area was taken as negative (-5 points for each sub-indicator, -100 points in total) and summed separately for each indicator. The results of all indicators were summed and the presence of the design effect that creates safety/insecurity was questioned for each stage. The results are given in Table 6.

This scoring system is realized by questioning the presence of indicators in open green spaces. The way of questioning each indicator and obtaining results differs. The indicators targeted to be used by designers for each urban renewal and open green space can be questioned using different methods and techniques, as in this research

Table 6. Scoring of design impact indicators

Indicators	**Assigned Score (out of 100)**	**Confidence Sub-Indicators**	**Dikmen Valley Stages**			**Assigned Score (out of 100)**	**Sub-Indicators That Make You Feel Insecure**	**Dikmen Valley Stages**			**Stages According to Research Results Score Received**		
			1.	**2.**	**3.**			**1.**	**2.**	**3.**	**1.**	**2.**	**3.**
Social Profile	5	Mixed use/Diversity	**X**	**X**	**X**	**-5**	Presence of unwanted persons	**X**	**X**	**X**	5	10	5
	5	Plenty of activity options	-	**X**	**X**	**-5**	Alienation/Exclusion	-	-	-			
	5	Sense of belonging	**X**	**X**	-	**-5**	Inequality/Disrespect	-	-	-			
Comfort	5	Presence of panoptic devices, security cameras and metal detectors	-	-	-	**-5**	Disorganization	-	-	-	15	10	0
	5	General maintenance of the landscape	**X**	**X**	**X**	**-5**	Lack of access to assistance/Lack of official oversight	-	-	**X**			
	5	Privacy	**X**	-	-	**-5**	Poor maintenance of urban reinforcement elements	-	-	-			

	5	Presence of input-output control	**X**	**X**	**X**	**-5**	Vandalism/Destruction	-	-	-	
	5	Powerful illumination	-	-	-	**-5**	Poor Lighting	**X**	**X**	**X**	
	5	Presence of security forces	**X**	**X**	**X**	**-5**	Distance to main axis	-	-	**X**	
Harmony	5	Integrity of design	**X**	-	-	**-5**	Disengagement	-	-	**X**	5 5 -5
	5	Rhythm/Continuity in design	**X**	**X**	-	**-5**	Irregularity in Design	**X**	-	-	
Transparency	5	Presence of signs	-	-	-	**-5**	Narrow line of sight	**X**	-	**X**	-15 0 5
	5	Density of trees and shrubs branching from the line of sight	-	**X**	**X**	**-5**	Presence of hiding places	**X**	**X**	**X**	
	5	Limited and enclosed space	**X**	**X**	**X**	**-5**	Presence of blind spots	**X**	**X**	-	
	5	Long line of sight	-	**X**	**X**	**-5**	Density of trees and shrubs branching from the root	**X**	**X**	-	

According to the results, it is concluded that the 2nd stage is the safest area among the Dikmen Valley stages evaluated with design impact indicators.

4. CONCLUSION

According to the results of the social impact assessment specific to Dikmen Valley;

- The diversity of activity options, mixed use, the high number of users in the area, the presence of businesses in the area, which provide socialisation opportunities to the users of the area in open green areas, enable the individual to communicate with the environment and each other, develop belongingness in the socialising individual and thus positively affect the perception of safety. In addition, the presence of security guards and tools (such as cameras, panoptic tools) in open green areas (the presence of official surveillance) has a positive effect on the individual's perception of safety. In this sense, it has been determined that the perception of safety of the users of the area is more intense in Dikmen Valley 1st and 2nd Stages.
- It has been determined that proximity to the main transport axis, entrance and exit points and ease of access, being able to see everywhere from the point where the user of the area is located (clear view angle) and being able to see himself/herself (visibility), general maintenance of open green areas, well-maintained equipment elements and plant density have a positive effect on the individual's perception of safety. It has been determined that dense plants not obstructing the line of sight and visibility, trees starting to branch above the eye level and shrub groups staying below the eye level have a positive effect on the perception of safety. Stage 2 is perceived as safer in terms of visibility and line of sight. Stage 1 was perceived to be safer due to the presence of trees, proximity to the main transport axis and the presence of a police house.
- The presence of locator and directional signs and signs in open green areas helps them to identify and read the area by saving them from the feeling of getting lost, which has a positive effect on the perception of safety of the users of the area. At the same time, the presence of nodal points and sign elements, which have the ability to perceive the location, give direction and have a more memorable feature, also positively affects the user's perception of safety. In this regard, it has been determined that the 1st and 2nd stages are perceived as safer areas.
- In the formation of safety perception; it is important to be ready for the dangers that may come from the environment. For this, it is necessary to perform the act of seeing in a healthy way and in this context, the environment should be bright. The effects of lighting on people should also be taken into consideration in lighting design. In this context, the designer should determine the effects he wants to create on people and use appropriate lighting techniques. Emotions such as happiness, seriousness,

peace, rest, rest, vitality, mobility, curiosity, mystery, enthusiasm and excitement can be created on people with lighting design. Luminaires should be placed in such a way that the light diameters they emit intersect each other. In this context, lighting in Dikmen Valley is insufficient for night use in all three stages.

- At the same time, the presence of deserted areas and blind spots in open green areas has a negative effect on the perception of safety in individuals. In this respect, the presence of blind spots and deserted areas in the 1st and 3rd stages makes users feel insecure.
- In the light of the analyses of all research methods and techniques, it is concluded that Dikmen Valley Phase 2 is perceived to be safer**.** The results of the assessment made with the design impact indicators and the results of the social impact assessment were compared and it was concluded that they are compatible with each other.

As a result, this study found support for the causal relationship between the perception of safety and landscape design features.

The design impact indicators obtained for the perception of safety will be developed and will contribute to the creation of a system of control, monitoring and change in different urban areas and to improve the perspective on landscape designs.

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