Available online www.jsaer.com

***Journal of Scientific and Engineering Research*, 2024, 11(6):78-87**

Research Article

ISSN: 2394-2630
CODEN(USA): JSERBR

Evaluation of Nodal Points of the City and Squares in Terms of Landscape Architecture, Mersin Province Example

Merve Torlak Güneri[1], Özgür Yerli[2]

[1]Department of Landscape Architecture, Düzce University, Türkiye
[2]Department of Landscape Architecture, Düzce University, Türkiye
[1]Corresponding author e-mail: mervetorlak@hotmail.com

Abstract In Landscape Design; The most important factor in the planning of city squares is people. Spatial arrangements made considering human needs and functions will enable these points to become the focal centers of cities. In this study; 5 squares in Mersin City Center were selected. There are many design criteria to consider for a successful square design. Considering the location of the city and the general conditions of the squares, 15 evaluation criteria and 3 sub-evaluation criteria were determined by the weighting (multiple criteria) method. For 15 evaluation criteria determined by conducting a survey with 54 experts in the field, multiplier criteria (multiplier criterion 3- multiplier criterion 2- multiplier criterion 1) were given according to the results of the survey and their degree of representation was determined. Evaluation criteria were applied to the squares and the total score obtained for each criterion was multiplied by the multiplier criterion to obtain the total scores. Squares can receive a minimum of 35 and a maximum of 183 points in total. An evaluation was made by determining the representative groups they entered according to the scores they received. According to this; Cumhuriyet Square 161 points (Very high score square), Mersin İdman Yurdu Square 130 points (High score square), Bjk 100.Yıl Square 113 points (High score square), Fenerbahçe Square 171 points (Very high score square), Galatasaray Square 174 (Very high scoring challenge).

Keywords Square, City, Landscape Design, Mersin, Criterion

1. Introduction

Cities are settlements where people live by meeting their social, cultural and economic needs [1]. According to the criterion of social science, cities are "settlements that are composed of socially dissimilar individuals, are relatively large, densely populated and have continuity in space." It is defined as [2]. A social communication is aimed by ensuring that these people from different centers come together in a common center, that is, "city squares", albeit for different purposes [3]. Open spaces that are effective in the formation of the city can be examined under two headings: streets and squares. Squares are places of urban communication and unity. Streets, on the other hand, develop with the formation of squares and the shaping of their surroundings [4].

Lynch (1960), who believes that there are always common values and a social consensus regarding the elements related to strengthening urban identity, firstly developed the concept according to the concept of "legibility" as mentioned in Figure 1.1. is focused. 'Identity elements are the main determinants of urban perception and city image. It groups identity elements into 5 different groups; Roads (Paths), which are the most dominant elements of the city image, Borders (Edges), which clarify the city skyline or the transition between regions, Industry, housing, commercial etc., which exhibit physical characteristics of the city. Districts are intense activity centers such as squares and intersections, and notable objects or spaces are focal points. According to Kevin Lynch, squares are intense activity centers created in urban spaces. Typically, squares are paved and surrounded by high density buildings and streets. It has features that will influence groups of people and facilitate meetings [5].

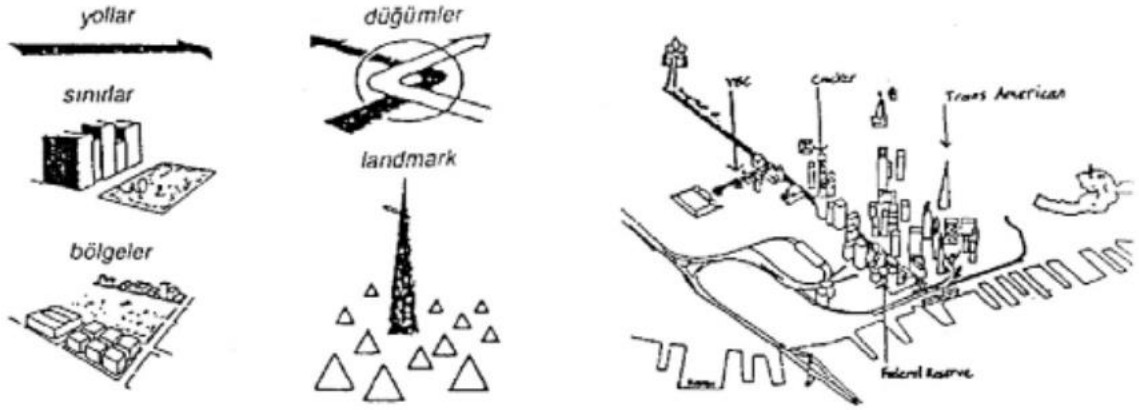

Figure 1: According to Kevin Lynch, the five main elements that image the city; borders, regions, routes, nodes and landmarks [6]

2. Material and Method

2.1. Material

In this research, five important squares from Mersin city center; From east to west, Cumhuriyet Square, Mersin İdman Yurdu Square, Beşiktaş Square, Fenerbahçe Square and Galatasaray Square were chosen. In selecting these areas; Factors such as ratio, scale, intensity of use, functional diversity, location and richness of historical texture played a role.

Republic Square; It is approximately 18,000 square meters in size and has a capacity to accommodate at least 500 people or more. Cumhuriyet Square, located in Akdeniz District, is a public space and ceremonial area that has a strong place in the identity of the city of Mersin and in the memory of its citizens. There is Silifke Street in the east of Cumhuriyet Square and İsmet İnönü Boulevard in the south. Since the official, social and cultural activities of the city are carried out in this area, it has an intense circulation.

Mersin İdman Yurdu Square is 550 square meters in size. It is a square in Mersin Metropolitan Municipality Culture Park, located on Adnan Menderes Boulevard in Yenişehir District, where the emblem of Mersin İdman Yurdu and red-dark blue colors are dominant.

Bjk 100th Anniversary Square; Beşiktaş Square is connected to Gazi District and Yenişehir District as District/Neighbourhood. It is located within the Mersin Metropolitan Municipality Culture Park on Adnan Menderes Boulevard. It was built for the 100th anniversary of Beşiktaş. It is located within an approximately 7 km long connected green area on the coastline of Mersin Province.

Fenerbahçe Square; While there is Adnan Menderes Boulevard in the north, there is the Mediterranean in the south and green areas in the east and west. Although Adnan Menderes Boulevard is the coastal road of the city center and has high vehicle and traffic density, it is a point with a high function of access by roadside private vehicle parking area and public transportation. Fenerbahçe Square is 3300 square meters. Square; It is located in connection with the Culture Park, which is approximately 7 km long on the coastline of Mersin Province.

Galatasaray Square; Square; It is located on the coastline of Mezitli District of Mersin Province. It is one of the squares of the three major football teams in Mersin. This square, surrounded by plenty of greenery, is located right next to the Mediterranean Sea. While there is Adnan Menderes Boulevard in the north, there is the Mediterranean in the south and green areas in the east and west. Although Adnan Menderes Boulevard is the coastal road of the city center and has high vehicle and traffic density, it is a point with a high function of access by roadside private vehicle parking area and public transportation. Galatasaray Square is 10,800 square meters. Since there is no other square on the Mezitli coast, its circulation is high. Among the squares I examined, Galatasaray Square has the most species in terms of trees, shrubs, shrub groups and grass areas.

In the survey study; İnceoğlu (2007) “In most cases, people do not perceive each factor as having the same importance. Some factors weigh more than others. It is therefore useful to assign weights to different factors. This method is referred to as the multiple criteria methods in the literature [9]. In line with the Weighted

(Multiple Criteria Method) we chose; A survey was conducted to prepare the observer form to be used during the functional evaluation of the squares. The scores to be given for the criteria will determine the degree of contribution of that square to the level of functionality based on the relevant criterion. Accordingly, the coefficients that the sub-criteria for each criterion will have will be determined. The survey form in question was prepared and a survey was administered to 54 technical personnel who are experts in their field. 36 Landscape Architects, 7 Architects, 6 Civil Engineers, 2 Survey Engineers, 1 Urban Planner, 1 Environmental Engineer, 1 Fisheries Engineer participated. They were asked to score the factors they thought would be found in a square on the basis of criteria.

2.2. Method

Squares define focal points in the urban fabric and contain the gathering function. For this reason, squares enable the population living permanently in the city and people visiting the city temporarily to establish relationships with each other and with the city they share. These areas, which offer equal usage opportunities to all city people, form a common platform for various activities [7] In order to determine the squares that are the node points of the city, Mersin squares, which are our study area, were determined first.

There are many evaluation criteria that can be taken into consideration when evaluating an area in terms of landscape. In this part of my study, I have chosen 15 criteria and 3 sub-criteria for each criterion, taking into account the location, characteristics and criteria that will be important in terms of the way they can be a square. In determining and evaluating the criteria, the "Weighted Criteria Method" approach, described by Gold (1980) and emphasized to be applied in the recreation planning of California (Santa Barbara) and some cities in the USA, was used.[8] Additionally, according to İnceoğlu (2007); A directly related method for measuring space quality has not yet been developed. However, Van der Voort, T.J.M. & Van Wegen, H.B.R. (2005, 157-166), whose methods may be related to architecture in the literature on this subject, Zeisel, (1981), Bechtel, et al. (1987), Baird, et al. (1996) and summarized it as follows:

• Quality of Use Measurement Indicators Method
• Weighting (Multiple Criteria Method)
• Valuation Method
• Integrated Methods [9].

When similar studies on the subject were evaluated, it was deemed appropriate to use Weighting (Multiple Criteria Method) for this thesis. The selected criteria are explained in the table below, as the features and scoring system used for the evaluation criteria and sub-criteria. According to the table; If the criterion meets all sub-criteria, it can receive a maximum of 6 points. If it does not meet the criteria, it will receive at least 1 point.

Table 1: Evaluation Criteria

	Evaluation Criteria	Features Used in Evaluation	Scoring
1	Transportation Criteria	Connected to more than one boulevard or street (0-100 metres away)	3
		Public transport passes in the vicinity with an intensity of 0-15 minutes	2

2	Size and Density criterion	Density of private car parking areas in the vicinity (200 metres and beyond)	1
		Size of the square (500 square metres and above)	3
		Capacity of the square (square with a capacity of 250 people and above)	2
		Density of the square - If the number of architectural elements around it is 2 or less (0-100 metres)	1
3	Plant Element Criterion	If there are trees and shrubs	3
		If there are groups of bushes and shrubs	2
		If it contains ground cover and grass area	1
4	Water Element Criterion	If there is a sea or river (0-100 metres)	3
		If there is a pool or ornamental pool	2
		If there is a fountain or any water item	1
5	Criteria for Connection with Green Areas	If in the Green Belt	3
		If within the Green Road	2
		In City Parks	1

6	Area Use Criteria	If near a Public and Cultural Area (0-500 metres)	3
		If near a Commercial Area (0-500 Metres)	2
		If Residential and Agricultural Area is nearby (0-500 metres)	1
7	Field of View Criterion It will be determined whether there are any architectural elements that fall into the main field of view of the squares. It was designed considering the presence of the Mediterranean in the south. (0-500 meters)	South facing open squares.	3
		Squares open in East-West direction.	2
		Squares open to the North.	1
8	Lighting Criterion	The square has been illuminated in general,	3
		Plants are illuminated in the square,	2
		Decorative lighting such as facade, wall etc. is preferred in the square.	1
9	Drainage Criterion	Systems resulting from the combination of open and closed systems (mixed drainage systems).	3
		Open systems (surface drainage systems)	2
		Closed systems (underground drainage systems)	1

10	Flooring Criteria	Separation of usage areas in the square, Separation of conflicting functions in the square, Durability, safety and load-bearing capacity in the function of the flooring.	3 2 1
11	Shadow Criterion	Providing shade with structural and vegetative elements in the square. Providing shade with vegetative elements in the square, Providing shade with structural elements in the square,	3 2 1
12	Rest Area Criteria	Fixed seating elements, Movable seating elements, Simplicity of form and details, Easy maintenance and long life. Resistance to external conditions and physical factors (impacts)	3 2 1
13	Criteria of Garbage Areas	Directly related to pedestrian circulation, Integrity with urban open and green areas,	3 2

		It can be felt as an element of the urban environment.	1
14	Barrier-Free Design Criteria	Both ramped and stepped solutions were used	3
		Ramped solutions are used.	2
		Cascading solutions are used.	1
15	Plastic Element / Sculpture Criteria	Creating a richness of visual sensation,,	3
		Unity, ratio, scale,	2
		Harmony, balance and symmetry.	1

In the analysis made to determine our representative groups according to our survey results and the table above;

- The evaluation criterion that received the highest score is the Barrier-Free Design Criterion; His total score is 246.
- The evaluation criterion that received the lowest score was the water element criterion; it received 176 points. The difference between them is 70 points (246-170=70).
- If we consider that we will divide it into three classes (70/3 = 23.3), one level will change every 23.3 points. As a result, in this case;

Low score between 176-199 (multiplier 1)
Mid score between 200-223 (multiplier 2)
Three different groups emerge as high scores between 224-247 (multiplier 3).
When evaluated on a criterion basis, four criteria will be included in the low score group, two criteria will be included in the medium score group, and nine criteria will be included in the high score group. Observation form in the table below; It emerged according to the results of our survey. The total scores received by each evaluation criterion determined the representation group (multiplier criterion) of those criteria.

Table 2: Scores of Evaluation Criteria and Representation Groups According to the Survey Results

Observation Form for Evaluation of Squares Based on Criteria			
Criteria Number	**Total Points**	**Points Group**	**Multiplier Criterion**
1. Transport Criteria	243	High Score	Multiplier 3
2. Size and Density Criteria	231	High Score	Multiplier 3
3. Plant Element Criterion	222	Medium Score	Multiplier 2
4. Water Element Criterion	176	Low Score	Multiplier 1
5. Connection with Green Areas Criterion	208	Medium Score	Multiplier 2
6. Criteria for Land Uses	197	Low Score	Multiplier 1

7. Field of View Criterion	190	Low Score	Multiplier 1
8. Lighting Criteria	227	High Score	Multiplier 3
9. Drainage Criteria	226	High Score	Multiplier 3
10. Flooring Criteria	230	High Score	Multiplier 3
11. Shadow Criterion	227	High Score	Multiplier 3
12. Rest Area Criteria	237	High Score	Multiplier 3
13. Landfill Sites Criteria	233	High Score	Multiplier 3
14. Barrier-Free Design Criteria	246	High Score	Multiplier 3
15. Plastic Element / Sculpture Criterion	199	Low Score	Multiplier 1

3. Findings and Discussion

In this section of my study, I will first evaluate the squares on the basis of criteria. Then, I will conclude my article by determining which of the square groups formed by the total points they received and the calculations I made. The following calculations were made in order to create the representation classes in which the squares fall. The score obtained from an evaluation criterion is determined and multiplied by the multiplier criterion to obtain the total score. When the scores obtained from all evaluation criteria are totalled, a square can receive a maximum score of 183 points and a minimum score of 35 points.

183-35=148.

Assuming it's divided into three classes;

148/3=49.33.

In this case, the representation class of the square will change every 49 points. In this case, a table will be formed as follows.

Table 3: Representation Classes of Squares

The highest score that the square can get by fulfilling the Criterion Score and Multiplier Criteria	**183**	**VERY HIGH RATED SQUARES (183-134)** **HIGH SCORING SQUARES (133-85)**
Lowest score that the square can get by fulfilling the Criterion Score and Multiplier Criteria	**35**	**LOW SCORING SQUARES (84-35)**

As a result, the total score and representation groups of all squares are shown in the table below. Cumhuriyet Square, Fenerbahçe Square and Galatasaray Square. They are among the squares with very high scores by fulfilling the evaluation criteria. Necessary arrangements should be made to ensure the sustainability of the functions in these squares. In order for Bjk 100.Yıl Square and Mersin idman Yurdu Square to be very high scoring squares, necessary planning should be made and applied to the squares.

Table 4: Total scores of the squares and the representation groups they belong to

SQUARE	SCORE RECEIVED	REPRESENTATION GROUP
Republic Square	161	**VERY HIGH RATED SQUARES**
Mersin Idman Yurdu Square	130	**HIGH SCORING SQUARES**
Bjk 100.Yıl Square	113	**HIGH SCORING SQUARES**
Fenerbahçe Square	171	**VERY HIGH RATED SQUARES**
Galatasaray Square	174	**VERY HIGH RATED SQUARES**

Erdoğan, Oktay and Selim (2021) in the research article titled Evaluation of Antalya Province historical environment renovation works in terms of landscape architecture; the main material of the study was determined as Muratpaşa Mosque and its garden located in Muratpaşa district of Antalya province [10]. The location of the study area, environmental connectivity analysis and photographs of the area were analysed. Among the criteria considered in this article, the location of the selected area, its connection with the streets, transportation criteria, distance to public transport and tram lines, public, residential, cultural areas around it, size of the area, environmental connectivity analysis, existing plant presence, current situation analysis within the scope of historical environment renovation works were carried out and evaluated from the perspective of landscape architecture for the sustainability and protection of the area. In the comparisons made with this article, I did not determine any criteria for the sustainability and protection of the historical environment elements and all the functions in the area in the squares I selected and applied them to the squares. In this article, it is an example that the functions of protection and sustainability, which is one of the basic principles of landscape architecture in terms of developability, can be applied to the squares I examined.

Bağbaşı (2010) in his thesis titled İrdelenmesi Istanbul City Squares in terms of Landscape Architecture Principles: Sultanahmet, Beyazıt, Taksim, Beşiktaş Ortaköy Square Example,[11] Socio-Psychological Elements; pedestrian mobility of squares, concerts, street artists, diversity of functions and activities. Physical elements include boundaries, buildings, sculptures, fountains, design, height, size, daylight direction, different depths. Spatial enclosure refers to the perimeter of squares and enclosed spaces. Proportion and scale; it deals with the relationship between human dimension and spatial dimension. Pedestrian circulation, aesthetic elements, pavements, level differences, vegetative elements, seating units, lighting elements, artistic objects, water elements and other elements (garbage bins, billboards, barriers, etc.) are considered as basic elements and squares are analysed.The criteria I have determined for the evaluation of Mersin squares are similar to this thesis which analyses the squares of Istanbul in terms of landscape architecture. However, the socio- psychological and historical evaluation of the squares is not among my evaluation criteria.

Müdük (2021) determined 40 criteria for determining the criteria of active green areas in the example of Evaluation of Active Green Areas of Mudanya District of Bursa Province in terms of Landscape Architecture.[12] These are the size of the area, slope, safety accessibility, maintenance, plant species, plant variety, functionality of plants, transportation network, drainage, water surfaces, seating units for individual use, equipment suitable for disabled people, publicity board, WC, fountain, lighting and garbage elements, children's playgrounds, sports fields. A questionnaire was conducted to score these criteria between 0-3 with the weighted criteria method and different groups were formed as proportionally calculated criteria, criteria that can be calculated with levelling and criteria that cannot be levelled. It was determined which group the criteria belonged to. As a result of the survey, the suitability degrees of the criteria were determined. The highest scores that active green area types can get were found.

Considering the 15 main criteria and 3 sub-criteria that I created with the weighted (multiple criteria) method in my thesis, I have been evaluated on the basis of a total of 45 criteria. Although my study proceeds in a similar logic with the survey and grading method used in Müdük (2021)'s thesis example, while the representation groups fall into 5 groups, 3 groups are formed in my thesis. In addition, on the basis of evaluation criteria, functions such as sports fields, children's playgrounds, publicity boards, toilets are not among the criteria I applied to the squares.

5. Conclusions and Recommendations

When the results of this research, which was conducted to evaluate the squares on Mersin City Adnan Menderes Boulevard and İsmet İnönü Boulevard in terms of landscape architecture, are generally evaluated; While Cumhuriyet Square, Fenerbahçe Square and Galatasaray Square received high scores, Mersin İdman Yurdu Square and Bjk 100.Yıl Square received lower scores. As a result of the lack of maintenance and repair work of a certain part of the existing urban equipment elements, aesthetic and functional deficiencies have been detected. In order not to repeat the remarkable mistakes in the use of squares in the area of responsibility of local governments in terms of criteria, the integrity of the areas in which they are used is taken into consideration, ensuring unity in open and closed space arrangements, making city-specific designs and carrying out

maintenance and repair works of urban equipment elements in the squares, urban health, visuality and should be taken into account in terms of functionality.

References

[1]. R. Yamaçlı, "The Concept of "Place" in the Context of Architectural Design and Visual Environment Interaction: The Case of Istanbul Edirnekapı-Fatih-Şehzadebaşı Axis," Istanbul,1997.
[2]. W. Louis, Urbanization as a Way of Life Within the City of the 20th Century, Ankara: İmge Kitapevi, 2002.
[3]. C. Moughtin, "Urban Design 'Street and Square'. Butterworth Architecture.," Oxford.,1992.
[4]. R. Krier, "Urban Space. Academy Editions," London, 1979.
[5]. A. Çetiner, Working Methods and Expression Techniques in City Planning, Istanbul: İ.T.Ü. Faculty of Architecture Publication, 1979.
[6]. K. Lynch, The Image of the City, the MIT Pres, Cambridge: 1960.
[7]. F. Semerci, "Beyazıt Square Example in terms of Urban Design Requirements. Master's Thesis, Yıldız Technical University Institute of Science and Technology," Istanbul, 2008.
[8]. Bartin Forestry Faculty Journal (BAROFD) Vol: 21, Volume: 3, Year: 2019.
[9]. M. Inceoglu, An Approach to the Evaluation of Urban Open Spaces in Terms of Quality: Investigation of Istanbul Squares, Yıldız Technical University Institute of Science and Technology, Istanbul, 2007.
[10]. R. Erdoğan, E. Oktay, C. Selim, Evaluation of Historical Environment Renovation Works in terms of Landscape Architecture: Muratpaşa Mosque Example. Journal of Architectural Sciences and Applications, 6 (1), 195-205. DOI: 10.30785/mbud.886207,2021.
[11]. G. Bağbaşı, Istanbul City Squares in terms of Landscape Architecture Principles: Sultanahmet, Beyazıt, Taksim, Beşiktaş, Ortaköy Square Example, Bartın University Graduate School of Natural and Applied Sciences, Department of Landscape Architecture, Bartın,2010
[12]. B. Müdük, Evaluation of Bursa Province Mudanya District Active Green Areas in terms of Landscape Architecture, Bursa Uludağ University Institute of Science and Technology, Master's Thesis, Department of Landscape Architecture, Bursa,2021.