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Research Article

ASSESSING PUBLIC SPACE COMPLEXITY: A COMPARATIVE STUDY OF WATERFRONT AREAS IN ISTANBUL'S BOSPHORUS DISTRICT

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Abstract Public space is an essential symbol of connection and integrity for both citizens and cities, serving as a platform for interaction and shared experiences. Among public spaces, coastal areas hold significant importance as they facilitate integration between citizens and water, offering opportunities for transportation and recreational activities. This paper aims evaluating complexity on public space in waterfront in comparison with the two side in Istanbul based on Carmona's classification. The study utilizes a comparative analysis based on land use data from the analysis by using Geographic Information System (GIS). Land use data, in essence, provides embedded information on accessibility. By analyzing these classifications, the paper seeks to shed light on the similarities and differences in the public space characteristics and public access between the coastal areas of the Bosphorus District. Preliminary findings indicate that the positive space characteristics in both sides are comparable. However, the ratio of ambiguous and private spaces varies due to historical factors, property ownership and land use patterns. These influence the nature and accessibility of public spaces, thereby contributing to the observed diversity along the waterfront. The study's findings have implications for urban planning and the development of inclusive public spaces in coastal areas.

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Introduction

Public space is one of the symbols of the connection and integration of citizens with the city. At the same time, it is described as a space that meets the needs of citizens by serving different age and socio-economic groups, strongly connects citizens to each other, urban space, and the world, and develops a sense of place (Carr et al., 1992). This multifaceted role of public space creates an interface between social, private, and public interests (Zukin, 1995). Furthermore, public spaces also serve as spaces designed for outdoor activities (Lynch, 1981). These open spaces are important as accessible spaces for public interactive activities (Madanipour, 2003).

However, the functions of public space are not limited to this. Four important social roles of public space have been identified such as functioning as a realm for social life, being a gathering place for diverse social groups, presenting symbols and images of society, and being part of the communication network among urban activities (Thomas, 1991).

In this context, public space plays a significant role in the sustainability of cities and the preservation of their social fabric (Mehta, 2004). Moreover, people's need for public space to engage in social and recreational activities such as shopping, transport, play, interaction with each other, and recreation emphasizes the importance of these spaces (Carmona, 2015).

The diversity of public spaces extends to the coastal areas. Scholars have acknowledged the notable importance of urban waterfronts as dynamic public spaces that facilitate the interaction between citizens and bodies of water. However, the relationship between a city and its waterfront has changed throughout history in terms of the function and land use of the waterfront for agriculture, transportation, military zone, commercial, industrial, and recreational (Timur, 2013; Saribiyik, 2022). While the primitive port cities in the pre-industrial revolution period had a strong spatial and functional relationship with the coastal areas in ancient and medieval times, the relationship between cities and coasts has weakened due to rapid commercial activities and industrialization since the 19th century. After industrial growth and the introduction of containers and ro-ro harbors, people began to depart from waterfronts to city centers in the mid-20th century. The industrial areas moved away from coastal areas because of changes in maritime technology in 1960–1980, defining it as retreating from the waterfront. Lastly, redevelopment of the waterfront planning projects began with large-scale modern port commercial areas (Hoyle, 1998).

Today, urban waterfront areas face numerous challenges that hinder their full potential as vibrant and inclusive public spaces. Despite their potential to enhance to the sense of place, belonging, and recreational needs of citizens, several issues pose significant obstacles to their effective utilization and development. These challenges include inadequate public access and connectivity, conflicting land uses and ownership, a lack of comprehensive planning, and the presence of ambiguous spaces, as observed in Istanbul's coastal areas.

Despite the acknowledged value of public spaces and urban waterfront areas as integral elements of cities, there is a necessity to gain a deeper comprehension of their intricacy and categorization within distinct contexts. The lack of understanding in this area is especially

apparent when considering the Bosphorus region of Istanbul, where the Anatolian and European sides display discernible traits and dynamics. Consequently, a dearth of comprehensive scholarly investigations exists regarding the categorization and analysis of public spaces situated on both banks of Istanbul's Bosphorus. This deficiency impedes the formulation of efficacious strategies for managing urban public spaces and making informed planning choices by local governing bodies. In order to bridge these existing knowledge gaps, the aim of this research is to conduct a spatial analysis and categorization of the public spaces situated on both the Anatolian and European sides of Istanbul's Bosphorus region. The study provides accessibility information from activity and land use characteristics in the coastal area, which is one of an important part of the city, improving the relationship and integration between the citizens and the city. This will be accomplished through the utilization of advanced Geographic Information System (GIS) techniques, coupled with the application of Carmona's well-established classification framework.

Literature Background for Public Spaces Classifications

Over the last forty years, literature on contemporary public space has included debates about the inclusivity and exclusivity of public spaces in terms of privatization of public space and publicness. One group of academicians (such as Sennet, 1992; Sorkin, 1992; Micthell, 1995) advocate for the “end of public space” due to the privatization and commercialization of the spaces. Another group (for example, Carmona and Wunderlich, 2012; Langstraat and Van Melik, 2013) depicts public spaces based on their production, management, control, and use, challenging the idea of the “end of public space” (Ercan & Memluk, 2015) (Table 1).

Public spaces appear as a complex and multidimensional concept when analyzed from various perspectives. This multidimensionality shapes the definition and meaning of public spaces. Kohn (2004) defines public space based on three basic aspects: ownership, accessibility, and intersubjectivity. While these dimensions help us understand the diversity of public spaces, it is emphasized that ownership and accessibility alone cannot fully describe public space without considering intersubjectivity, which represents the distinction between public spaces in terms of interaction and communication (Kohn, 2004).

However, Carmona (2010b) proposes a classification based on function, perception and ownership to further expand the description of public space. This classification increases the depth of public space by combining design, socio-cultural, and political-economic perspectives. Moreover, different models and dimensions have also been presented to further understand the specificity of public spaces. Varna and Tiesdell (2010) propose a Star Model for assessing the publicness of public space depend on five aspects: ownership, control, civility, physical configuration and revitalization. Langstraat & Van Melik, 2013, introduces the concept of pseudo-public space, describing four dimensions of "publicness": ownership, management, accessibility, and inclusiveness in their OMAI model. This approach focuses on the privatization of public space and its implications for access and inclusivity rather than focusing on the "end" or "loss" of public spaces.

The complex relationship between public and private areas is described as a continuum that combines elements of both public and private areas with varying levels of publicness (Akkar

2005a, 2005b; Mantey 2017). To better understand this relationship, Banerjee (2001) suggests focusing on the notion of public life instead of public spaces alone noting that small businesses such as cafes, bookshops and other third places contribute not only increasing public life but also supporting local economy. These spaces show that the concept of public life is not limited to public spaces. Privately owned public spaces increase limit over usage, behaviour, and access, although both publicly and privately owned spaces tend to promote public use (Nemeth & Schmidt, 2011). This reflects a balance in which public and private spaces interact.

Contemporary public spaces can be assessed in two phases: the planning process, which considers the extent of public and/or private ownership and accessibility, and the planning product, which focuses on the perceived value and publicness of the spaces (Leclercq et al., 2020). While people may prefer private-public spaces in terms of high levels of maintenance and control, safety and surveillance, there is a perception that privatised spaces do not tolerate or allow certain activities, behaviours and people (Leclercq & Pojani, 2023). Therefore, the complexity of public and private spaces and people's perceptions are important factors to consider in terms of urban planning, design, and management.

Public spaces are classified into various types based on various criteria, such as function, control, accessibility, and ownership, and these classifications help us understand various aspects of public spaces. Gehl & Gemzoe (2001) propose a classification system for "new" city spaces, which includes main city squares, recreational squares, promenades, traffic squares and monumental squares. Similarly, Carr et al. (1992) provide an extensive list of various types of public spaces as public parks, squares and plazas, memorials, markets, streets, children’s playgrounds, greenways and parkways, atrium and indoor marketplaces and waterfronts.

Further, Critiques of contemporary public spaces are organized in two categories: under-management spaces, such as neglected, invaded, exclusionary, segregates and domestic, third and virtual spaces, and over-management spaces such as privatized, consumption, invented and scary spaces (Carmona, 2010a).

Dines et al. (2006) list public areas as everyday places, places of meaning, social environments, places of retreat, and negative public spaces. Malone (2002) classifies public spaces and streets into two main categories based on spatial boundaries: strongly classified spaces with well-defined boundaries, such as churches, and shopping malls, and weakly classified spaces with open boundaries, such as sporting venues, carnival, and festival areas (adapted from Sibley, 1995).

Al-Hagla (2008) classifies open spaces as green spaces and grey spaces. Green spaces refer to vegetated land or structures, water, or geological characteristics, including parks, gardens, children's playgrounds, sports facility areas, green corridors, natural and semi-natural green areas. Grey spaces refer to urban areas such as squares, plazas, marketplaces, pedestrian streets, promenades, and seafronts (Al-Hagla, 2008). Moreover, Stanley et al. (2012) list seven types of open spaces, including food production areas, parks and gardens, recreational spaces, plazas, streets, transport facility areas and incidental spaces. Their typology is based on the form, function, and land cover of open spaces, creating a matrix that encompasses the

seven categories of open spaces and their scale (city, intermediate, residence) to represent green, grey, and green/grey spaces (Stanley et al., 2012).

Furthermore, public open spaces in private developments are assessed in five cluster types based on spatial justice performance that are described as edge zone, hide and seek, pseudo-public space, consumer's paradise and public plaza by Jian et. al (2020).

Open public spaces are classified based on morphology, form and function including streets, squares, parks, gardens and cemeteries, linear systems and green corridors, outdoor sports and recreation areas, campground and picnic areas and natural and semi natural green spaces. This classification is formed within a framework that includes interrelated layers such as land, the public realm, built form, program, trends, and fashions (Sandalack & Uribe, 2010).

Mantey and Kepkowicz (2018) enhance a typology of public spaces based on five criteria intended uses (all public with no restrictions, all public but in the role of consumers, selected groups and private users), time limits on access, prevalent forms of control (absence of control, civic observation, monitoring, security guards, private owner's control), intended function, and visual characteristics (type of location and equipment for the users). Dovey and Pafka (2020) have also purpose comprehensive typology for mapping the publicness of public spaces in terms of criteria of control and accessibility and ownership. The typology represented on a graph aligned along two axes as control and resulting in six overlapping categories of publicness: open-public space, ticketed space, inaccessible public space, invitation space, quasi-public space, and open-private space (Dovey & Pafka, 2020).

Table 1. Classifications of public space.

Authors	**Criteria**
Carr et. al, 1992	form and function
Sandalack& Ulrick, 2010	form and function
Malone, 2002	spatial boundaries
Dines et al., 2006	advantages and disadvantages for a sense of well-being
Carmona, 2010a	classification of critiques
Carmona, 2010b	function, perception, and ownership
Al-Halga, 2008	type of surface (natural and civic) for open spaces
Stanley et. Al, 2012	form, function, and land cover of open spaces
Mantey & Kepkowicz , 2018	function, uses, accessibility (time limit), control, form
Dovey & Pafka, 2020	level of publicness based on ownership, management, users' perception

Data and Methodology

This research employed a mixed-methods approach to classify and analyze the public spaces within Istanbul's Bosphorus region (Figure 1). First, Carmona's public space classification served as a framework for the spatial analysis. The land use data were analyzed and categorized into specific types of public spaces, positive spaces, ambiguous spaces, negative spaces and private spaces. Next, spatial analysis was conducted using GIS techniques to analyze the distribution and characteristics of public spaces within the study area. GIS software facilitated the visualization and mapping of the land-use data. The third stage involves the calculation and visualisation of the accessibility of the coastline derived from land use. The

final stage involved the evaluation and comparison of the public spaces between the Anatolian Side and the European Side of the Bosphorus. Descriptive statistics were used to quantify the distribution and proportion of different types of public spaces on each side. Statistical measures, such as percentages and ratios, were used to compare the findings and identify any notable differences or similarities between the two sides.

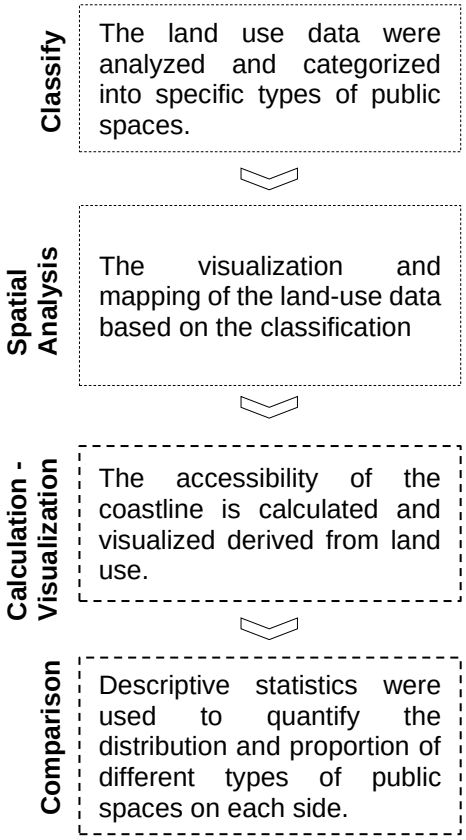

Figure 1. Methodology flowchart of the study.

Study area, sampling design and data collection

Istanbul, located on coast between Asia and Europe continents and split by the Bosphorus, has a coastal area that has been shaped by different settlement types and cultures throughout history. Istanbul is often referred to as “the city of waterfronts” because it stretches linearly along the coast until the 1960s (Yenen et. al, 1993). However, the city has lost its waterfront identity due to rapid urbanization (Yazgan, Sel, 2014). The waterfront areas of Istanbul have undergone radical changes due to cultural, political, technical, and morphological transformations (Kuban, 2020). In 2000s and beyond, the city expands towards the north and the sea leading to the construction of filling areas designed as green and recreational spaces along the coastline. Moreover, investment projects such as hotels, residential areas and marinas have been developed on the coastline of Istanbul in 21st century (Ozkan, 2017; Sarıbıyık, 2022). Kuban (2020) points out that water is an indispensable part of Istanbul's urban image, with landmarks such as the Golden Horn (Haliç), historical ports, and shipyards. The Bosphorus serves as an international transportation route with intense waterway traffic, while the Golden Horn strait has inner-city transportation paths (Turkoglu, Secmen, 2019).

Throughout history the waterfront areas of Istanbul have changed in terms of land-use characteristics due to urbanization. Today, the waterfront areas serve multiple functions, including commercial, residential, recreational, and transportation uses.

In context of Istanbul waterfront, the Istanbul Planning Agency reported in their spatial analysis for the Vision 2050 planning study that the forty-two percent of Istanbul urban waterfront area is classified as accessible public spaces, eighteen percent as semi-public spaces (educational areas and public administrative areas), and forty percent as private areas inaccessible to the public. These classifications were based on the spatial analysis of the Istanbul Environmental Revision Plan in 2016 and the World Cities Culture Forum studies in 2019 (IPA, 2020). Secmen and Turkoglu (2022) highlight that connectivity is an important parameter for the spatial evaluation of waterfronts in terms of quality of physical, functional and visual access of open spaces while continuity is another significant criterion for waterfront accessibility, referring to uninterrupted physical and visual connections. Istanbul's waterfront areas have weak connectivity and continuity due to insufficient public transportation nodes and pedestrian connections, although historical waterfront areas located at the intersection of the Golden Horn, the Marmara Sea, and the Bosphorus have better visual access than the rest (Seçmen, Turkoglu, 2022). Moreover, Sarıbıyık (2022) evaluated the spatial features of urban open spaces on the Marmara Coast of the Asian Side of Istanbul with five criteria: accessibility and continuity, image, activity diversity, socialization potential, and user density and security. The study found that the Marmara Coast of the Asian side of the city exhibited weak spatial characteristics due to weak connections with the water and the city, a lack of quality in the surrounding urban areas and transportation, and the distribution of public and private properties (Sarıbıyık, 2022). Another research conducted by Turkoglu and Secmen (2019) emphasized the importance of urban waterfront parks for the quality of life in Istanbul. According to data from the Istanbul Metropolitan Municipality in 2017, waterfront parks accounted for approximately thirty percent of green areas in the city, which is relatively low for a city surrounded by the sea (Turkoglu, Secmen, 2019). Furthermore, the satisfaction levels of urban green areas along the Marmara Coast in Istanbul were found to be higher than those along the Bosphorus waterfront, especially in parks located near residential areas, based on an analysis of the use and satisfaction levels of urban green areas (Koramaz, Turkoğlu, 2014). Consequently, the waterfront of Istanbul presents a complex variety of public space types due to its historical development and multi-layered urban pattern. Historical buildings, palaces, museums and *yalı (waterside mansions)* are well-known symbols of Bosphorus coastal area in Istanbul. On the other hand the public areas facing problems in terms of publicness are crucial parts of the waterfront and serve as important nodes for the city's residents. Therefore, the Bosphorus waterfront areas, with their multi-layered characteristics and complexity in terms of the publicness of public spaces, are being analyzed and classified as part of this study, encompassing both the Anatolian Side and the European Side.

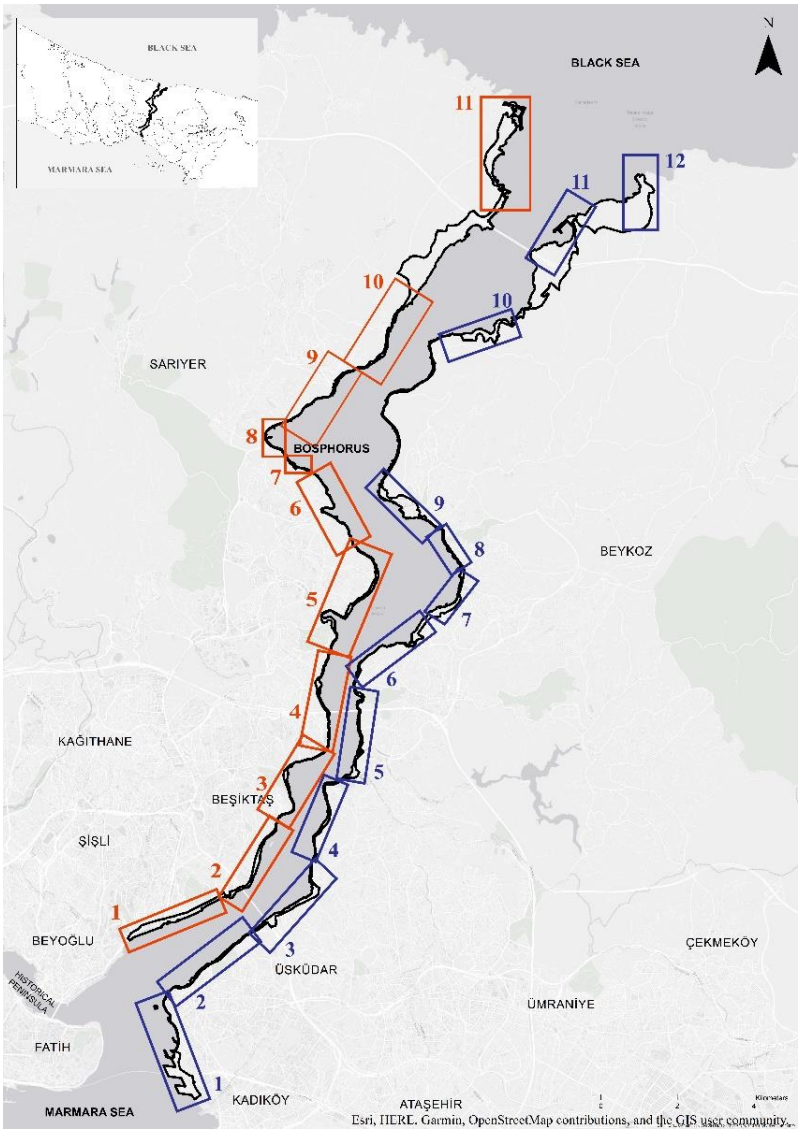

Figure 2. The case study border (The maps organized by the authors).

The complexity of Istanbul's waterfront pattern based on the uses of public spaces were evaluated based on land uses characteristics on spatial analysis by using GIS. The study area is bordered by the main road along the coast and the coastline itself, covering four districts: Beşiktaş, Sarıyer, Üsküdar, and Beykoz. Land-use mapping data is obtained from the Urban Planning Department of the Istanbul Metropolitan Municipality (IMM). Additionally, an open-source base map is used, provided by ArcGIS base maps. Finally, the waterfront areas of the Bosphorus districts are compared in terms of their public space characteristics and publicness.

Analysis

This stage involves spatial analysis based on the classification of public spaces using GIS. The land use data is classified according to Carmona's public space typology, which includes positive spaces, negative spaces, ambiguous spaces, and private spaces. In the classification of urban space types, "positive" spaces encompass natural or semi-natural urban spaces, civic spaces, and public open spaces. "Negative" spaces include movement spaces, service spaces, leftover spaces, and undefined spaces. "Ambiguous" spaces comprise interchange

spaces, public and private spaces, conspicuous spaces, internalized public spaces, retail spaces, third-place spaces, private-public spaces, visible private spaces, interface spaces, and user-selecting spaces. “Private” spaces are consists of private open spaces, external private spaces and internal private spaces (Carmona, 2010b).

It's worth noting that while some land use types, such as cultural facility areas, social facility areas, and public administration areas, may fall under the same class according to Carmona's classification, they are individually classified in this study. In other words, a cultural area can be classified as a positive space, while another may be characterized as a private space. For example, both Çırağan Palace in Beşiktaş and Beylerbeyi Palace in Üsküdar are identified as cultural facility areas. However, Çırağan Palace is classified as an ambiguous space due to its use as a hotel, whereas Beylerbeyi Palace is listed as a positive space because it provides free access to its garden.

In the context of spatial analysis, the land use analysis from the Istanbul Metropolitan Municipality (IMM) is evaluated based on Carmona's public space typology using GIS (Table 2). Positive spaces include park and green areas, squares, pedestrian ways, piers, fishing ports, cemeteries, forests, cultural facility areas, fair and festival areas, and beaches. Technical facilities, vacant areas, and car parking areas are categorized as negative spaces. Ambiguous spaces comprise health service areas, educational areas, religious facility areas, commercial areas, residential and commercial mixed-use areas, tourism facility areas, cultural facility areas, private beaches, social facility areas, fair and festival areas, ferryboat piers, and public administration areas. Residential areas, rural residential areas, public administrative areas, cultural facility areas, harbours, industrial areas, and agricultural areas are listed as private spaces. Military areas are excluded from the spatial analysis to ensure that they do not incorrectly impact the study results due to the land they cover. Besides, the road locating coast are excluded from the analysis, too, owing to that the scope of the analysis comprises between the middle of roads and the coast.

Table 2. Classification of land uses for the study area.

Classes	Land Uses
Positive spaces	parks and green areas, squares, cultural facility areas, fair and festival areas, pedestrian ways, marinas, piers fishing ports, forests, beaches, cemeteries
Ambiguous spaces	health service areas, educational areas, religious facility areas, commercial areas, residential and commercial (mixed used) areas, tourism facility areas, cultural facility areas, private beaches, social facility areas, fair and festival areas, ferryboat pier, public administration areas
Negative spaces	technical facilities, vacant areas, car parking areas
Privates’ spaces	residential areas, rural residential areas, public administrative areas, cultural facility areas, harbour, industrial areas and agricultural areas

Land use data, in essence, provides embedded information on accessibility. It is possible to reveal this information with Carmona's classification method. In this study, Carmona's technique is combined with geographical information systems to visualize access to the coastline (Figure 3). In this method, firstly, the starting and ending points where the land use types along the coastline intersect with the coastline are identified. Then, by calculating the length of the start and end points along the coastline in the GIS environment, the coastal length

of each land use type was calculated and visualized (Figure 7). Thus, the relationship between the parts of the coastline that are open to public access and the parts that are restricted or inaccessible was revealed (Figure 8). In other words, this GIS analysis shows the free public access along the coastline in Bosphorus based on the accessibility information obtained from land use characteristic.

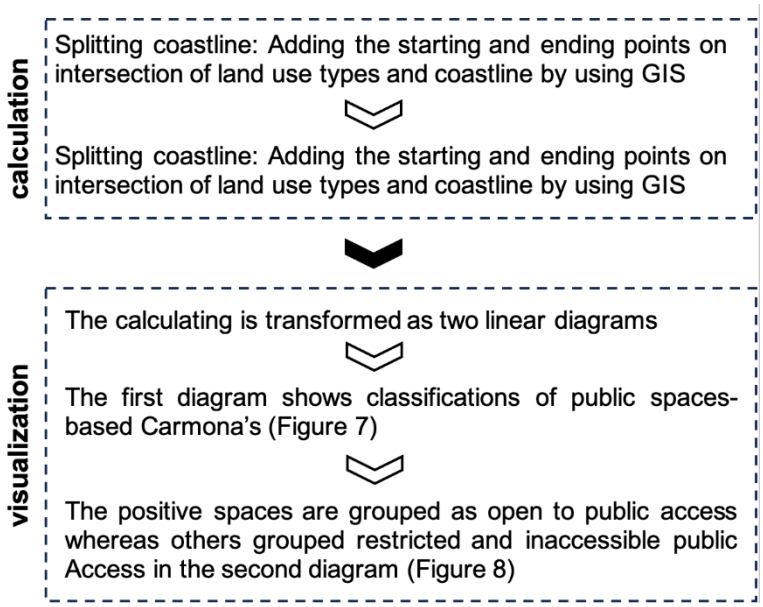

Figure 3. The diagram shows that how the accessibility information obtained from land use analysis by using GIS.

Findings and Discussion

To begin with, the numerical results reveal that positive spaces cover 51 percent of the waterfront on the European Side (687,131 sqm), while the Anatolian Side comprises 44 percent positive space (1,092,236 sqm). Additionally, ambiguous spaces account for approximately 300,000 sqm, representing 39 percent of the European Side coast, whereas they cover only 12 percent of the Anatolian Side coast. There is a significant difference in private areas, covering 218,439 sqm (16 percent) of the European Side coast, compared to 810,580 sqm (33 percent) on the Anatolian Side. Negative spaces constitute 5 percent of the European Side waterfront (63,168 sqm), whereas they cover 11 percent of the Anatolian Side coastal area (283,952 sqm) (Table 3).

Table 3. Ratio of classification on land uses (area and percentage distribution).

Class	**European Side**		**Anatolian Side**	
	Area (sqm)	Ratio (%)	Area (sqm)	Ratio (%)
Positive Spaces	687.13	51	1.092.236	44
Negative Spaces	63.168	5	283.952	11
Ambiguous Spaces	387.667	29	302.772	12
Private Spaces	218.439	16	810.580	33

The results demonstrate that positive spaces cover approximately half of the study area on both the European side and Anatolian side, thanks to the presence of forest, park and green areas. As mentioned earlier, the study area border is defined between the main road on coast and coastline resulting in a higher ratio of forest areas due to the gradual expansion of the

study area northward. Another important finding is that piers, fishing ports, pedestrian ways, and parks along the coast play a critical role in enhancing the publicness of the waterfront area. For example, the pedestrian ways between Kuruçesme and Baltalımanı, Emirgan and İstinye, Yeniköy and Kireçburnu, as well as Üsküdar Pier and Haydarpaşa serve to connect people to the sea and foster a sense of belonging in waterfront cities. From this perspective, the European Side is more favorable in terms of public access to coastal areas. Parks and green areas along the coast also contribute significantly to the promotion of the waterfront and the strengthening of the relationship between citizens and the coast. Both Bosphorus sides feature various parks and green areas, such as Paşa Liman Park in Üsküdar and Kireçburnu Haydar Aliyev Park in Sarıyer. Notably, Beşiktaş has more green spaces compared to Üsküdar, mainly due to parks like Kurucesme Park, Bebek Park, and Painting Museum Parks along the coastal areas. However, both sides of the Bosphorus exhibit a similar ratio of parks and green spaces.

The complexity of public spaces becomes apparent with a high proportion of ambiguous spaces, particularly on the European Side, especially in Besiktas's coastal area. Besiktas, being one of the central districts of Istanbul, features multi-functional land uses such as commercial areas, educational areas, cultural facility areas, and tourism areas, leading to a higher prevalence of ambiguous spaces. These spaces can be described as physically private but visually public or publicly owned but functionally private and user-determined, which adds complexity to the waterfront public spaces. Service areas like hotels, cafes, and restaurants contribute to the increased ambiguity in public space usage, where private management restricts full public access despite their formal public ownership.

Figure 4. The mapping for classification of public spaces on the Bosporus coastal line (The maps organized by the authors).

On the other hand, the Anatolian Side exhibits a higher ratio of private spaces compared to the European Side, primarily due to the presence of residential areas such as "yalı" (historical waterfront mansions), Haydarpasa Harbour, and old industrial facilities along the Beykoz coastal area. Residential areas are privately owned, making land property a significant obstacle to the publicness of the Bosphorus waterfront, reflecting the city's historical

background. Furthermore, negative spaces occupy a larger area on the Anatolian Side than on the European Side, mainly due to construction areas and technical facilities on that side. Hence, the classifications are developed in terms of public accessibility to waterfront areas as the area having public access completely and the area preventing the connectivity and continuity between public spaces for freely access to the public spaces (Figure 4). The analysis results are shown in detail and understandable in Figure 5 and Figure 6 based on areas from Figure 2.

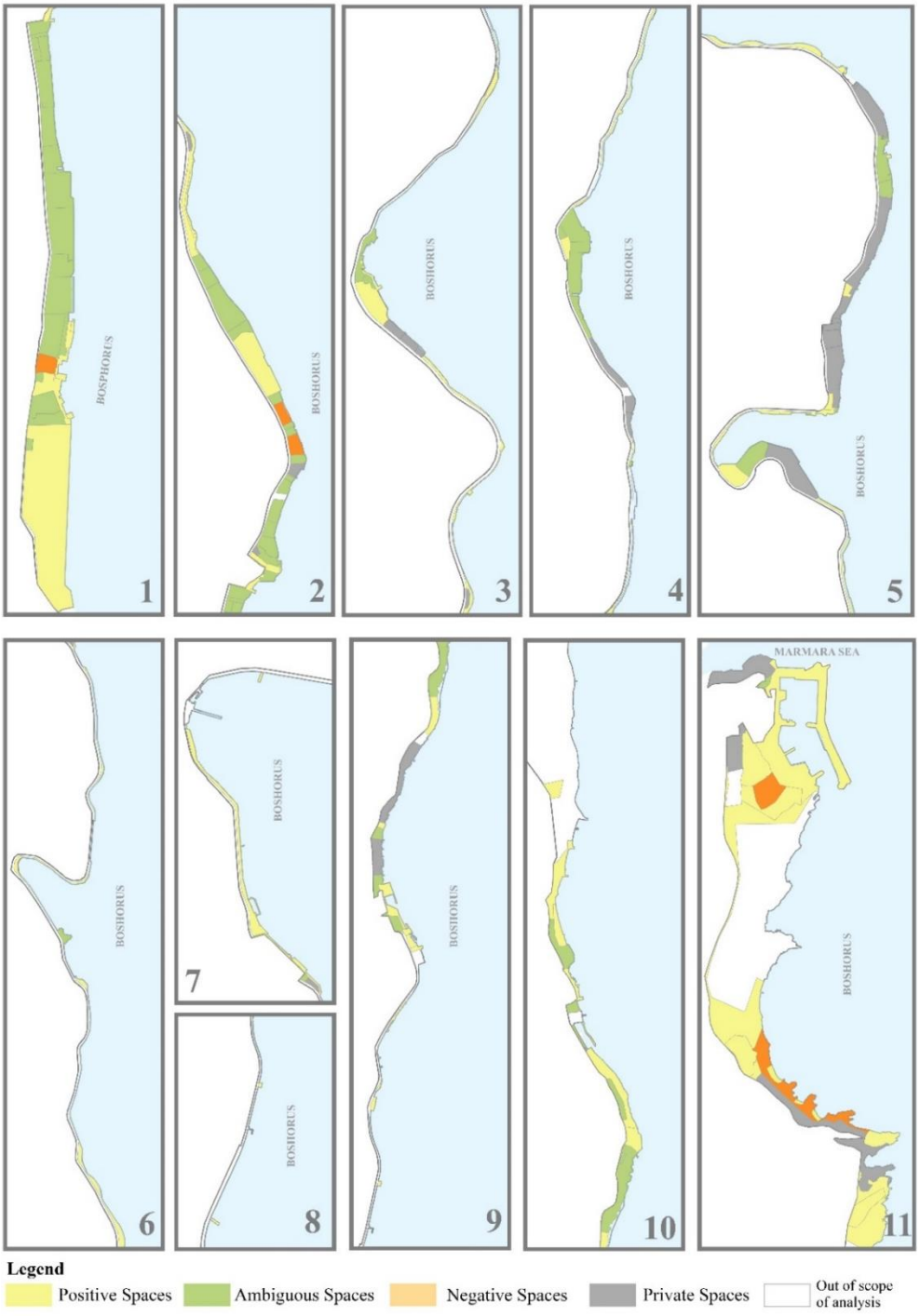

Figure 5. The mapping for classification of public spaces on European Side the Bosporus coastal line (The maps organized by the authors).

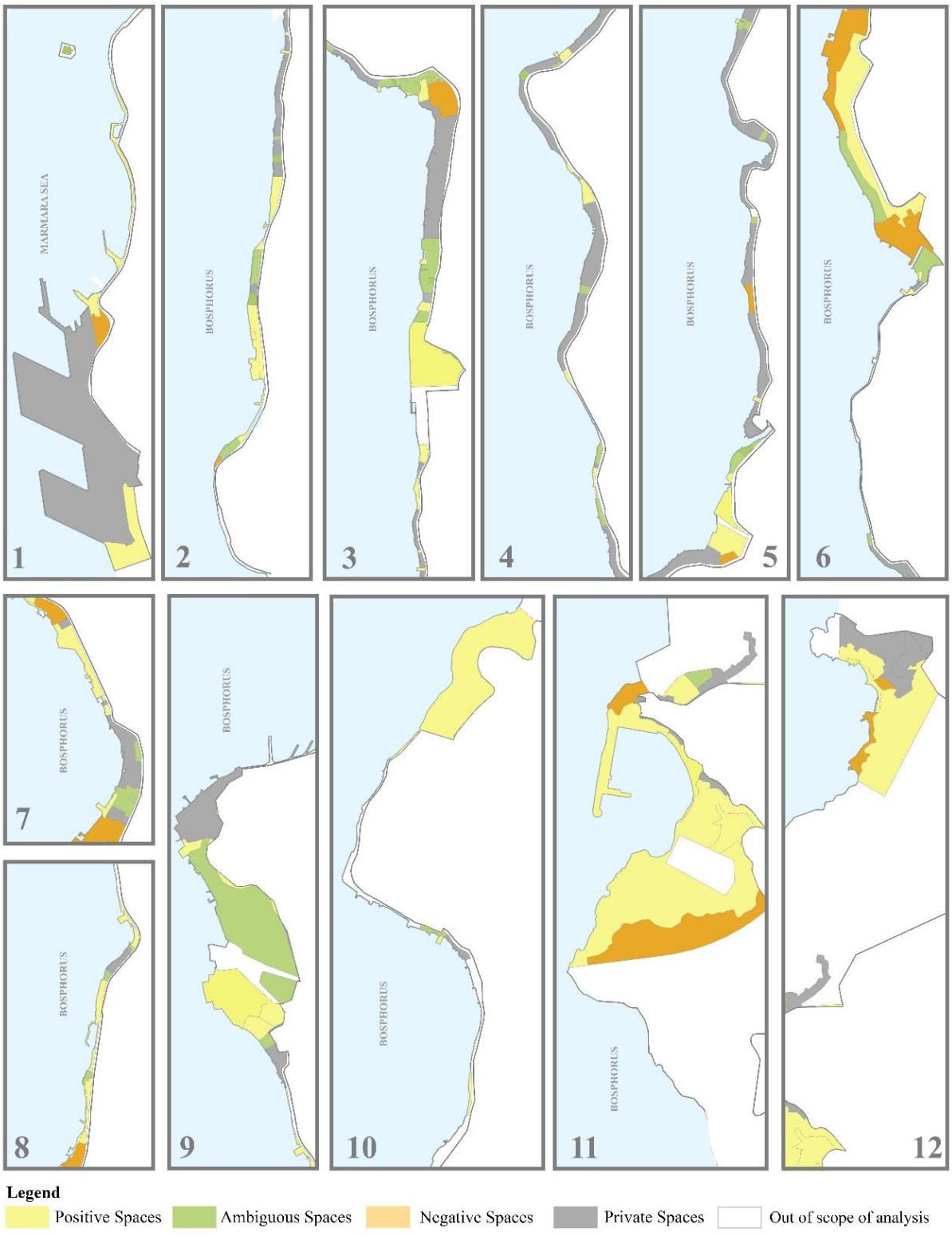

Figure 6. The mapping for classification of public spaces on Anatolian Side the Bosporus coastal line (The maps organized by the authors).

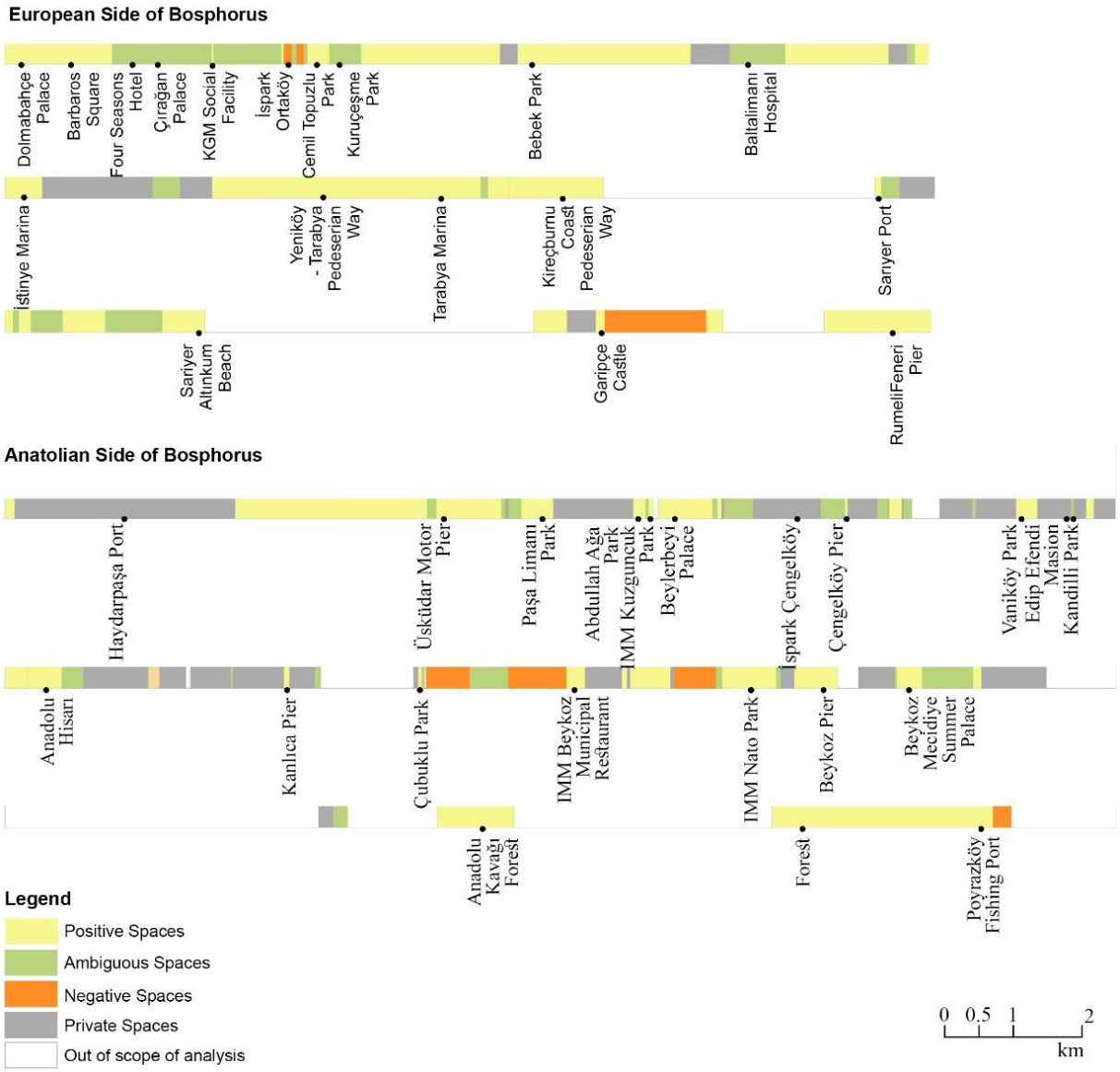

Figure 7. The diagram for results of the analysis (The maps organized by the authors).

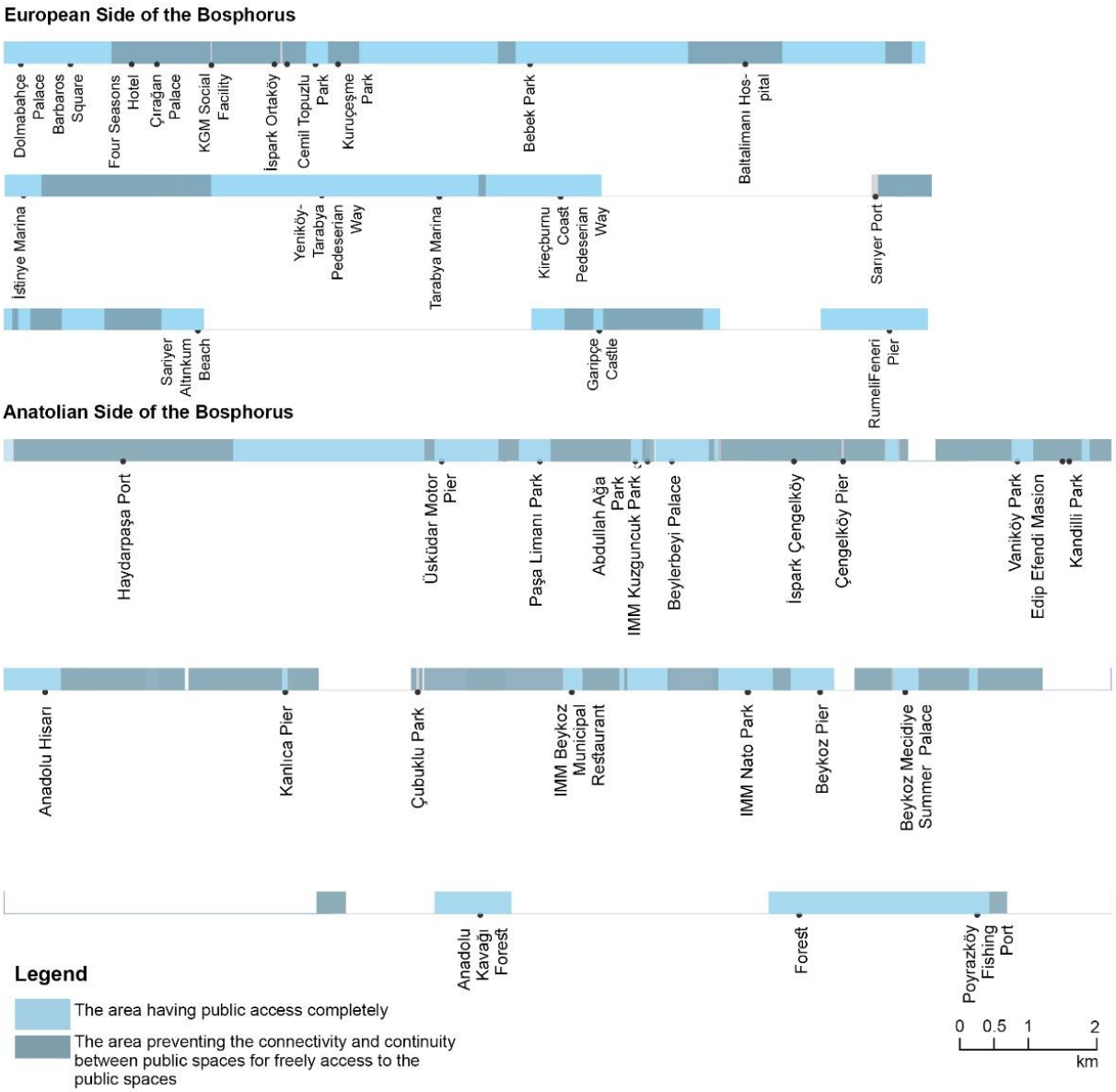

Figure 8. The diagram for results of the analysis in terms of public access (The maps organized by the authors).

The diagrams present public accessibility based on similarities or differentiations in activity and land use types on the coastlines. The accessibility evaluation by the knowledge extracted method supports planning and urban design decisions in terms of publicness on waterfront areas (Figure 8).

Conclusion

Waterfront areas are considered significant public spaces due to their contribution to the sense of place and belonging for citizens, as well as their connection between the city and the sea. Additionally, waterfront areas fulfil transportation and recreational needs for cities and citizens. The purpose of this study is to explore the complexity of publicness in the Bosphorus coastal area, thereby contributing to demonstrating the spatial relationship between public spaces and waterfront areas based on publicness and public space classification. Istanbul Bosphorus

coastal area does not have completely public access in terms of continuity along the coastline and presenting obstacle areas preventing connectivity between public spaces freely access.

Coastal cities have developed over time because of ancient city patterns, the impact of industrialization, and the effects of the post-industrialization era, which led to a retreat from waterfronts. Istanbul's coastal areas have a history of diverse land uses, including harbors, summer palaces and their parks, forest areas, military areas for protection, housing areas known historical waterfront mansions, industrial areas, and the residential areas associated with them throughout history.

The European Side has more public space areas (as positive spaces and ambiguous spaces) than the Anatolian Side. The Anatolian Side has more private spaces compared to the European Side, primarily due to Haydarpaşa Harbor and residential areas such as "yalı." Moreover, old industrial areas like the Beykoz Paşabahçe Glass Factory, Tekel Factory, and Deri Kundura (Shoe Production) Factory were located in Beykoz, in the northern part of the Anatolian Side. Since these industrial facilities are situated on the waterfront, they act as obstacles between citizens and the coastal area.

While the distribution of positive spaces is similar on both sides, the ratio of ambiguous spaces differentiates the European Side from the Anatolian Side. Ambiguous spaces are listed as semi-public areas like urban facility area. Moreover, ambiguous spaces introduce complexity to public space typology due to the uncertainty surrounding their ownership and the degree to which considered public or non-public (Carmona, 2010b). For example, educational areas are considered ambiguous spaces as they are publicly owned, but their function and usage are determined by users. Spatial analysis demonstrates that the rate of ambiguous spaces increases as one approaches the city center, such as Beşiktaş, which boasts a variety of public spaces.

The land property, multi-layered historical characteristics, non-comprehensive planning decisions, and transportation necessities lead to complexity in public spaces. Although there are a variety of types of public spaces, approximately half of the Bosphorus coastal area comprises positive spaces. Also, more than half of the coastal area is accessible to the public as positive and ambiguous spaces.

The waterfront areas have diverse dynamic characteristics like recreation, transportation and commercial hence, the areas are important part of the coastal cities that improving urban identity by strengthen relationship between citizens and the city. The study contributes to classify public spaces and accessibility analysis on coastal area based on activity and land uses characteristics in the waterfront areas for comprehensive urban planning for urban planners and urban designers. Further, the comprehensive classification supports developing efficacious strategies on the planning process for public access to the waterfront by defining the area providing the continuity public access, the area preventing this continuity and connectivity between public spaces throughout the coastal areas. The further works can improve public spaces classification on basis connectivity and continuity between public spaces on waterfront for urban design and planning strategies.

References

Akkar, M. (2005a). The changing 'publicness' of contemporary public spaces: a case study of the Grey's Monument Area, Newcastle upon Tyne. *Urban Design International*, 10, 95–113.

Akkar, Z. M. (2005b). Questioning the 'publicness' of public spaces in postindustrial cities. *Traditional Dwellings and Settlements Review,* 16, 75–91.

Al-Hagla, K. S. (2008). Towards a sustainable neighborhood: the role of open spaces. *International Journal of Architectural Research Archnet-IJAR, 2*(2), 162-177, DOI: 10.26687/archnet-ijar.v2i2.239

Banerjee, T. (2001*).* The future of public space: beyond invented streets and reinvented places*. Journal of the American Planning Association*, *67*(1), 9-24, DOI: 10.1080/01944360108976352

Carmona, M. (2010a). Contemporary public space: critique and classification, part one: critique. *Journal of Urban Design*, *15*(1), 123-148, DOI: 10.1080/13574800903435651

Carmona, M. (2010b). Contemporary public space, part two: classification. *Journal of Urban Design*, *15*(2), 157-173, DOI: 10.1080/13574801003638111

Carmona, M. (2015). Re-theorizing Contemporary Public Space*. Journal of Urbanism. 8*(4): 373–405. DOI: 10.1080/17549175.2014.909518

Carmona, M. & Wunderlich, F.M. (2012). *Capital Spaces: The Multiple Complex Public Spaces of a Global City.* London: Routledge.

Carr, S., Francis, M., Rivlin, L. G. & Stone, A. M. (1992). *Public Space*. Cambridge: Cambridge University Press.

Dines, N., Cattell, V., Gesler, W. & Curtis, S. (2006) *Public Spaces, Social Relations and Well-being in East London.* Bristol: The Policy Press.

Dovey, K. & Pafka, E. (2020). Mapping the publicness of public space, An access/control typology. In Mehta, V. & Palazzo, D. (Eds.), *Companion to Public Space* (1st ed., pp.234-248). *Routledge*. https://doi.org/10.4324/9781351002189

Ercan, M. A. & Memlük N. O. (2015). More inclusive than before?: The tale of a historic urban park in Ankara, Turkey. *Urban Design International*, *20*(3), 195-221. DOI:10.1057/udi.2015.5

Gehl, J. & Gemozoe, L. (2001). *New City Spaces.* Copenhagen: The Danish Architectural Press.

Hoyle, B. S. (1998). *Cities and Ports: Concepts and Issues.* Vegueta, 263-278.

Istanbul Planning Agency (2020). *Istanbul Spatial Analysis Report for Vision 2050*.

Ian, I.Y., Yung, E.H., Luo, M. J., Chan, E.H. & Chen, W.Z. (2020). A typological study of public open space in private developments in Hong Kong. *56th ISOCARP World Planning Congress in Doha, Qatar International Society of City and Regional Planner*.

Kohn, M. (2004). *Brave New Neighbourhoods: The Privatization of Public Space.* New York: Routledge.

Koramaz, K. E. & Turkoglu, H. (2014). İstanbul'da kentsel yeşil alan kullanimi ve kentsel yeşil alanlardan memnuniyet*. Planlama.* 24(1), 26-34. DOI: 10.5505/planlama.2014.03511

Langstraat F. & Van Melik R. (2013). Challenging the 'End of Public Space': A Comparative Analysis of Publicness in British and Dutch Urban Spaces. *Journal of Urban Design*, *18*(3), 429-448, DOI: 10.1080/13574809.2013.800451

Leclercq, E. & Pojani, D. (2023). Public space privatisation: are users concerned? *Journal of Urbanism: International Research on Placemaking and Urban Sustainability*, *16*(1), 1-18, doi: 10.1080/17549175.2021.1933572

Leclercq, E., Pojani, D. & Van Bueren, E. (2020). Is public space privatisation always bad for the public? mixed evidence from the United Kingdom. *Cities,* 100, 102649. doi: 10.1016/j.cities.2020.102649

Lynch, K. (1960). *The Image of the City*. Massachusetts: MIT Press.

Madanipour, A. (2003). *Public and Private Spaces of the City*. London: Routledge.

Malone, K. (2002) Street life: youth, culture and competing uses of public space. *Environment and Urbanization,* 14(2), 157–168.

Mantey, D. (2017*).* The 'publicness' of suburban gathering places: The example of Podkowa Leśna (Warsaw urban region, Poland). *Cities*, 60(2017), 1-12.

Mantey, D. & Kępkowicz, A. (2018). Types of public spaces: the polish contribution to the discussion of suburban public space. *The Professional Geographer*, 70(4), 633-654, DOI: 10.1080/00330124.2018.1443475

Mehta, V. (2014). Evaluating Public Space. *Journal of Urban Design*, 19:1, 53-88, DOI: 10.1080/13574809.2013.854698

Nemeth, J. & Schmidt, S. (2011). The privatization of public space: modeling and measuring publicness. *Environment and Planning B: Planning and Design*, 38, 5-23. DOI:10.1068/b36057

Ozkan, O. (2017). Culture of coastal city – change of city culture with re-created border: example Maltepe coastline. *Mimar.ist 59*(2), 46-51.

Sarıbıyık, F. (2022). Evaluation of public open spaces on urban waterfronts: the case of marmara waterfronts - Istanbul (Master Thesis). Istanbul Technical University.

Sandalack, B. A. & F. A. Uribe. 2010. Open space typology as a framework for design of the public realm. In *The faces of urbanized space architectural volumes*, ed. R. Barelkowski, 47–86. Poznan, Poland: Exemplum.

Seçmen, S. & Turkoglu, H. (2022). An approach for the evaluation of the spatial quality of urban waterfronts: the case of Istanbul. *The International Journal of Design in Society, 16*(1), 91-111. https://doi.org/10.18848/2325-1328/CGP/v16i01/91-111

Sennett, R. (1992). *The Fall of Public Man*. New York: W.W.Norton.

Sibley, D. (1995). *Geographies of Exclusion.* London: Routledge

Sorkin, M. (1992). *Variations on a Theme Park: The New American City and the End of Public Space*. New York: Hill and Wang.

Stanley, B. W., Stark, B. L., Johnston, K. L. & Smith, M. E. (2012). Urban Open Spaces in Historical Perspective: A Transdisciplinary Typology and Analysis. *Urban Geography,* 33(8), 1089-1117, DOI: 10.2747/0272-3638.33.8.1089

Timur, U. P. (2013). Urban waterfront regenerations. M. Özyavuz (Eds.), *Advances in Landscape Architecture* (pp. 169-206). IntechOpen.

Thomas, M. (1991). The Demise of Public Space. In V. Nadin, and J. Doak (Eds.), *Town Planning Responses to City Change* (pp. 209– 224). Avebury: Aldershot.

Türkoğlu, H. & Seçmen S. (2019). The role of urban waterfront parks on quality of life in İstanbul., *ITU A|Z Journal*, *16*(1) 53-66.

Zukin, S. (1995). *The Cultures of Cities*. Cambridge, MA: Blackwell.

Varna, G., & Tiesdell S. (2010). *Assessing the publicness of public space: the star model of publicness.* Journal of Urban Design *15* (4): 575–598. DOI: 10.1080/13574809.2010.502350

Yazgan, A. & Sel, D. B. (2014). *Integrated coastal zone management - Cultural heritage: Istanbul coastal areas*. 8th Symposium of Waterfront Engineering *(*pp. 125-137). Union Of Chambers Of Turkish Engineers And Architects, Chamber of Civil Engineer, Istanbul.

Yenen, Z., Enlil, Z. Ş., & Ünal, Y., (2016). *İstanbul a city of waterfronts or a city inland. Waterfronts: A New Frontier for Cities on Water*. (pp. 116-123). Venice, Italy.