Strategies for Small Public Space to Reclaim Urban Green

Muntasyir Al Wafi[1], Ece Kurt[1], Serengul Secmen[2]
[1] Graduate Student, Department of Architecture, Bahcesehir University
[2] Assistant Professor, Faculty of Architecture and Design, Bahcesehir University
Corresponding Email: muntasyir.alwafi@bahcesehir.edu.tr

Abstract
Small public urban green space is a category of urban public space characterised by its abundant quantity and widespread distribution. In many cities, like Karaköy in Istanbul, rapid development and privatisation are impacting city dwellers' well-being and ecological health. Over the years, the current state of urban green spaces in the city are declining. We believe these small public spaces need to be reclaimed and prioritised. Through this paper, we aimed to illustrate how even small public spaces can be transformed to green space. We conducted literature review and employed Jan Gehl's observation. Our findings suggest innovative solutions maximising the usability of existing spaces, by integrating adaptable design concepts that promote community engagement and enhance aesthetic appeal within sustainable parameters.

Keywords: *reclaiming green space, community health, public spaces, small space, privatisation impact.*

1. INTRODUCTION

Green spaces are essential urban infrastructures, especially in densely populated urban areas (Verheij et al., 2023). Urban parks and green spaces provide essential ecosystem services and public benefits (Wu et al., 2023). However, the scarcity of large open spaces is a significant issue in densely populated urban areas. This shortage makes urban green spaces, crucial for sustainable development and community well-being, highly valuable especially in high density cities (Akpinar, 2016). Haase et al. (2014) highlights the significant role of these urban green spaces in contributing to biodiversity, local climate regulation, and providing recreational opportunities. Moreover, the importance of green spaces for ecological sustainability and urban biodiversity (Kabisch et al., 2016). Significance of urban green spaces in densely built environments is also highlighted, emphasising their contribution to linking landscapes and communities (Benedict & McMahon, 2006). While urban green spaces serve various functions, including social, recreational, and cultural purposes, it also provides economic and environmental benefits (Haq, 2011). In addition, urban greenery aims to boost property values by improving aesthetics and functionality (Chen et al., 2022). In densely populated cities, the positive effects of green spaces are well-studied. They help reduce stress, enhance social cohesion, and contribute to overall mental well-being (Hartig et al., 2014; White et al., 2013). With rapid urbanisation on the rise, integrating green spaces into urban planning and policymaking has become more important (World Health Organization, 2016), supporting the idea that green space is a fundamental right.

Although it is widely acknowledged that green spaces have a positive impact on urban residents, the availability of such spaces in densely built cities adds another layer of complexity. This study suggests that the provision of small public urban green spaces could be a solution to this issue. According to Fei & Mao (2020), small public spaces constitute a distinct category within urban public spaces, they are widely distributed and compact. Since 1960, an increasing number of academics have recognized the importance of small public spaces and have researched methods to examine their utilisation (Hou et al., 2020). Small public space is one of the key built environment elements that provide venues for a variety of activities, may have a major impact on the quality of people's lives, and could even potentially contribute to both the physical and mental health of residents (Gilles-Corti, 2006). Research has shown that small

public urban green spaces offer numerous benefits, including improving self-perceived mental health regeneration (Peschardt et al., 2012). However, further analysis is needed to determine whether expanding these features is an effective approach for enhancing cities' liveability (Peschardt et al., 2012). Designing and evaluating small urban green spaces can promote the development of "green cities," mitigating the negative effects on well-being caused by rapid urban development (Jia et al., 2016). Ensuring an adequate supply of public green spaces is a vital aspect of achieving densification that effectively contributes to the development of more sustainable cities. While research on Small public urban green spaces is still limited, this study aims to address this gap by examining the availability of small public spaces and their relationship to urban green spaces.

We acknowledged the benefits provided by small public urban green spaces in an urbanising world are undeniable. Our research focuses on the main question: “How can green spaces be reclaimed in small public spaces?” We aimed to understand the intricate relationship between prioritising small public spaces and maximising their availability for urban green spaces. This will contribute to more informed urban planning decisions, ultimately enhancing the quality of life in these distinctive urban settings. This approach helps understand the relationship between urban development, community health, and environmental sustainability in small spaces. The structure of this paper includes an introduction emphasising the need for and solutions to enhancing small green spaces, a literature overview, a framework for reclaiming green space in a small urban space, a methodology section, and an analysis of Karaköy's public space as a project case study. Then, the paper concludes with a discussion of these findings.

2. DESIGNING SMALL GREEN PUBLIC SPACES WITHIN DENSE URBAN CONTEXT

A comprehensive framework for such projects must consider multiple factors to ensure maximum efficiency and functionality (Xi et al., 2024). In the quest to reclaim green spaces within the densely populated area, we need to consider the relationship between design elements and the established criteria for community health. The literature underscores the value of play and relaxation areas in fostering social interaction—a key aspect highlighting the importance of inclusive play structures and restful green corners for community well-being (Francis et al., 2012). The interaction among users is another criterion that can be enhanced by the thoughtful selection of trees and plant species (Kuo et al.,1998), which not only encourages gathering but also bolsters environmental and mental health through increased biodiversity and aesthetic appeal. Furthermore, the vital role of community engagement in maintaining and enhancing these urban green spaces (Krasny & Tidball, 2012), such as leisure facilities and community gardens, plays a significant role in promoting physical health and creating platforms for community engagement in urban spaces (Holland, 2004). The design's inclusivity, ensures that green spaces are seamlessly integrated into the urban environment (Amin, 2006), offering a welcoming embrace to a diverse populace. This inclusiveness is reflected in the presence of pedestrian pathways and public seating areas that cater to various needs, resonating with Gehl's (2011) principles for successful public spaces.

Table 1: *Pillars for the design of public green space (Source: Author’s*

Reclaiming Green Space		
Research keywords	**Criteria**	**Design Element**

Community Health (Kuo et al., 1998; Francis et al., 2012; Krasny & Tidball, 2012; Holland, 2004)	• Community Engagement • Users Interaction • Leisure Facilities • Access to greenery (experimental) • Impact on Ecology Viability	• Play • Relaxation area • Trees • Plant species selection
Public Space (Gehl, 2011; Amin, 2006)	• Openness and access • Inclusive design • Integration with the urban fabric	• Community gardens • Pedestrian pathways • Public seating areas • Interactive installations
Small Space (Zhong et al., 2023)	• Efficient Space Utilisation • Open Activity and Flexible Use • Vertical space utilisation	• Micro parks • Green walls/ Vertical gardens • Multi-tiered planters
Privatisation Impact (Hou & Rios, 2003; Angotti, 2008)	• Equity in space distribution • Public vs. private space delineation • Community rights to green space	• Public space protection • Public access agreements

In addressing the challenges of limited spaces, the need for efficient utilisation of space through open activity design, echoing the versatility of micro-parks and vertical gardens in providing green relief in urban density (Zhong et al., 2023). Furthermore, the equitable distribution of these spaces ensures that they serve as public assets rather than private commodities (Hou & Rios, 2003), emphasising the importance of public space protection and accessibility agreements as noted by Angotti (2008). The literature review (Table 1) forms the basis of this framework, we summarised research keywords from different studies with the aim to reclaim green space in densely urban areas. It highlights the importance of urban green spaces for city vitality, supporting this design approach and showing the link between human well-being and urban design. This study aimed to develop a systematic framework for cities facing similar challenges in transforming small urban areas. We evaluated the reclamation green space based on four criteria: community health, public space, small space, and privatisation impact. Then, we integrated design elements based on all research keywords and criteria.

3. METHODOLOGY

3.1 Case Study: Karaköy Public Ferry Square in Istanbul

Istanbul, with the population of 15,907,951 (Turkish Statistical Institute, 2022), experienced significant transformations due to rapid urbanization and development. Although these changes have facilitated economic growth, they have also caused urban sprawl and had adverse environmental and social effects (Erbas 2013). In recent years, public spaces in Istanbul have been losing their natural characteristics at an accelerated rate compared to the past. Today, public space in Istanbul, especially those who located in the waterfronts are predominantly developed with minimal natural green spaces and parks (Turkuoglu & Secmen, 2019). Public spaces located on urban waterfronts are considered valuable and unique because they combine natural water features with green spaces to fulfil the physical and social needs of urban residents (Turkuoglu & Secmen, 2019).

While there is no doubt that green space provides multiple benefits, the green space per person in Istanbul is only 7.04 m² (IBB, 2020), significantly lower than the minimum of 15 m2

suggested by the Ministry of Environment and Urbanization in Turkey, and even below the World Health Organization's recommendation of at least 9 m2 per person. Istanbul is divided into 39 districts, and there is a noticeable disparity in green space distribution across these districts, with most districts lacking sufficient urban green spaces. In Beyoglu, the district where Karaköy is located, the rate of green space is 2.7 m2 per person (Figure 2). Recent research indicates (Figure 1) that Istanbul ranks last among world cities with a green area ratio of 2.2%. Oslo leads with the highest green area ratio of 68%, followed by Singapore (47%), Vienna (46%), Chengdu (42.3%), and Zurich (41%). Alongside European cities, Asian cities also feature prominently in the top rankings. (World Cities Culture Report, 2018).

Figure 1 International Green Space Map (Source: Istanbul Buyuksehir Belediyesi in 2018).

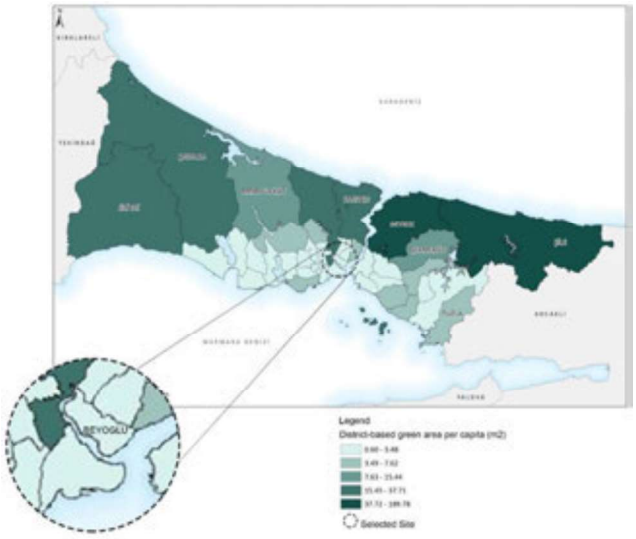

Figure 2 Istanbul's district-based green area per capita in m2 (Source: Istanbul Buyuksehir Belediyesi in 2018).

Figure 3 Beyoglu district zoning plan in 2023 (Source: Istanbul Buyuksehir Belediyesi).

Our study area, Karaköy where the ferry square is located (Figure 3), is one of Istanbul's public space waterfronts and one of the oldest and most historic districts of the city. This transformation highlights the challenge of integrating the available small public spaces within a rapidly developing environment. Karaköy is rich in heritage, balances the preservation of its historical identity with contemporary urban demands (Tepeli & Ocakci, 2017). Despite the limited size and the availability distributed in the upper-scale context, Karaköy have become vital for community engagement and cultural expression. These spaces, characterised by a blend of old and new architectural styles (Celik, 2023), especially after the redevelopment of Galataport as the major changes in the area, brought the area as a one of main public points.

Figure 4 Views from waterfront & current physical conditions of the site (e.g.: lack of seating areas, and ordinary facade designs) (Source: Author's).

The small public spaces in Karaköy, with the plan to integrate with the green spaces, play a crucial role in enhancing the urban fabric's health and vibrancy. Karaköy waterfront was specifically chosen for its status as a transient area, predominantly used for passing through rather than for specific activities, while there are more potential uses of the public square. The aim is to transform this space into a more vibrant and interactive area, encouraging community engagement and activities beyond just transit. Unfortunately, the redevelopment in Karaköy, as in many urban areas, is a decrease in green spaces due to development pressures and rapid urbanisation. Privatisation, a significant factor in this transformation, often prioritises commercial development over public spaces, impacting the availability and accessibility of green areas. Green spaces are crucial for increasing user interaction as they provide communal areas for socialising, relaxation, and engagement with nature, fostering a sense of community and enhancing the quality of urban life (Catel et al., 2008; Young et al., 2004). Integrating more green spaces in Karaköy can combat the negative effects of urban density, creating a healthier, more vibrant, and interactive urban environment.

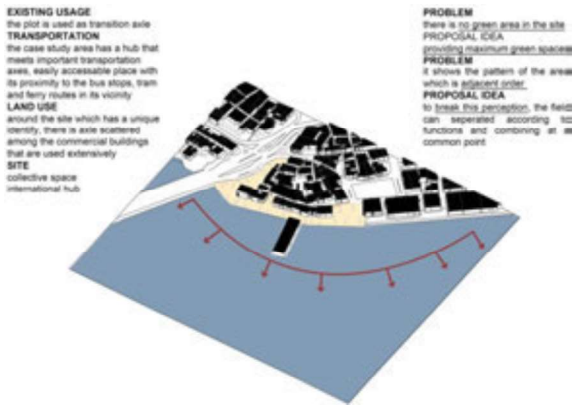

Figure 5 Image Diagram of the Site (Source: Author's).

Additionally, the specific selection of Karaköy for this study leverages its ongoing transition from a traditional to a more modernised urban area, which presents unique challenges and opportunities for green space integration. The neighbourhood's compact size and high population density make it a prime example of where small-scale interventions could have significant impacts. The transformation of underutilised or underappreciated small spaces integrated to active green areas could serve as a model for other urban centres facing similar issues of space constraints and urban densification. This approach not only aims to reclaim green space but also to redefine the function and perception of these areas to support sustainable urban living and ecological resilience.

3.2 Research Focus and Assumptions

Our research primarily concentrates on exploring how small public green spaces can be reclaimed and optimised for resident's use in dense urban areas like Karaköy, Istanbul. We formulated the following assumptions to guide our inquiry, based on the extensive literature review and observational methods by Jan Gehl:

1. Transforming small public spaces into green areas significantly enhances the ecological health and aesthetic appeal of urban environments, contributing positively to community well-being.
2. Community engagement and upkeep of urban green spaces increase their effectiveness and sustainability.
3. Adaptable design solutions that incorporate green elements, such as vertical gardens and micro-parks, are crucial in maximising the utility of confined urban spaces.
4. The integration of small green spaces into urban planning is essential for sustaining urban biodiversity and improving residents' quality of life, even in highly urbanised settings.

To substantiate these assumptions, our methodology encompasses a mixed-methods approach, employing both qualitative observations and quantitative data analysis. This methodology is implemented specifically in Karaköy, Istanbul, focusing on the detailed observation of existing public spaces and their current use and potential for transformation into vibrant, green areas.

3.3 Analysis and Synthesis

We conducted a thorough analysis of the space in the study area, and we considered the available size, location, and existing infrastructure. In this section, we present the findings of our analysis using Kevin Lynch's framework and Jan Gehl's analysis method to understand the urban design elements and the physical characteristics of the site in Karaköy, Istanbul. From the findings, we prioritised the integration of greenery to maximise the use of limited space and we proposed design aims to transform Karaköy into a vibrant and sustainable urban space, while keeping the harmony of historical preservation and contemporary urban living.

3.3.1 Site Analysis

For the site analysis, we used Kevin Lynch's framework (Figure 6) to bring forth the distinct of urban design elements in Karaköy. Lynchian techniques help create memorable and legible urban spaces, potentially enhancing residents' sense of attachment to the city (Larice & Macdonald, 2007). The Galata Port's emergence as a key node redefined the area's dynamics, overshadowing traditional squares and leading to a decline in their use. The ongoing construction nearby further impacts this landscape. This primary objective is to revitalise these public spaces, enhancing their functionality and appeal while preserving Karaköy's unique historical and cultural identity, thereby fostering a more engaging and vibrant community environment.

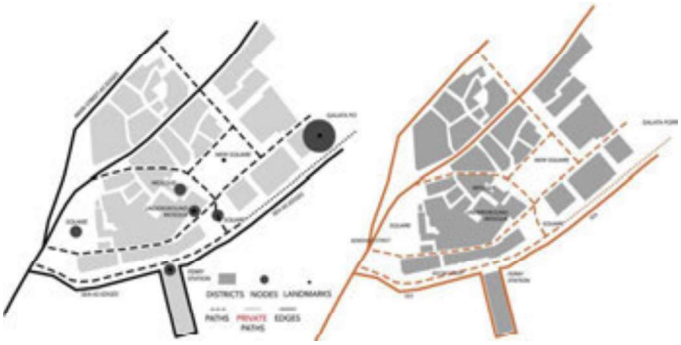

Figure 1 Lynch Analysis (Left) & Circulation Analysis (Right) (Source: Author's).

In this circulation analysis (Figure 6), this study examined the movement within Karaköy, noting its connectivity via tramway, ferry, and bus. Post-urban transformation, the focus shifted towards Galataport, leading to increased usage of the waterfront and squares primarily for transit purposes. Three potential squares were identified, and the removal of a multi-story parking area opened new possibilities for creating additional public space, further reshaping the area's dynamics, and offering opportunities for enhanced public engagement and revitalization.

3.3.2 Jan Gehl's Analysis – Physical Characteristic of the Site

Gehl (2011) analysed the relationship between urban space activities and the quality of the physical environment by categorizing activities into three types: necessary activities, optional activities, and social activities. Gehl argues that each of these types of urban space activities has different dependencies on the physical environment. We employed Jan Gehl's method for detailed observation of public spaces and human behaviour, this study gained insights into the utilisation of Karaköy's areas. We categorised activities into 'necessary,' like shopping or walking to bus stops, and 'optional,' such as jogging, sitting on benches, or fishing.

This distinction helps in understanding the engagement level in the public spaces of Karaköy. It becomes clear that while necessary activities are prevalent, there is ample scope to enhance optional activities, thereby enriching the social and recreational value of these spaces.

Figure 2 Physical Characteristics of the Site (Source: Author's).

Using Gehl's public space observation method from the questions how many, when, where, what, who, and how long, the analysis of Karaköy Square reveals that the ferry station, positioned at the forefront of the square, supports high pedestrian volume due to its 500-passenger capacity, peaking when ferries arrive, especially when ferries dock, but the train station sees less foot traffic. The square was frequented by individuals mainly aged 20-60, however as this study observed, there was a lack of family engagement. Moreover, activities range from necessary ones like transit to optional leisure pursuits, yet the space serves largely as a pass-through rather than a destination. The aim is to enhance this space's use, encouraging visitors to linger and engage more deeply with the environment.

3.3.3 Image Diagram

The detailed Image Diagram (Figure 10) provides a comprehensive look into Karaköy's urban framework. It's currently a transit route, characterized by the movement of people rather than a place where they stay and engage. Figure 8 shows the current situation of the proposed site as a hub; it has strong connections to Istanbul's public transport, making it easily accessible. The area's identity is shaped by the prevalent use of commercial buildings, which define its character. Despite being an important collective space, the issue stems from a notable lack of green areas, which are important for the quality of urban life, especially for the users. Addressing this, the proposal recommends introducing greenery to revitalize the space. Additionally, the area's spatial organization is reconsidered by the proposal, which suggests diversifying the layout to encourage various functions to integrate at a central point, fostering a more dynamic and interactive environment.

Figure 3 Current Situation of Proposed Site (Source: Author's).

~~3.~~4. DISCUSSION – A PROJECT CASE OF KARAKÖY

After analysed and synthesised the space in the study area, it reveals that the emergence of Galata Port has transformed the area's dynamics, leading to underutilized squares and a focus on transit use, especially post developments aimed at enhancing transport connectivity. The study identifies an opportunity to enhance optional and social activities within these spaces to enrich the potential of recreational value. Observations indicate that despite high pedestrian volumes at Karaköy Square, it serves mainly as a thoroughfare rather than a destination. The proposed redesign aims to introduce more greenery and reorganise the spatial layout, transforming the square into more vibrant, sustainable urban space that fosters a dynamic and engaging environment, improving the overall quality of urban life.

4.1 Discussion: A Design Approach for Karaköy Ferry Square to reclaim as an urban green space

We created a conceptual design approach along with the design program for a small public space to urban design that emphasizes the efficient use of limited space for green areas, the integration of technology for enhanced user experience, and the importance of community engagement in sustaining these green initiatives. This design approach aims to create an inclusive and dynamic environment while maintaining the density of the pedestrian flow in the area. This plan could serve as a model for other urban areas facing similar challenges of space limitation and the need for sustainable development.

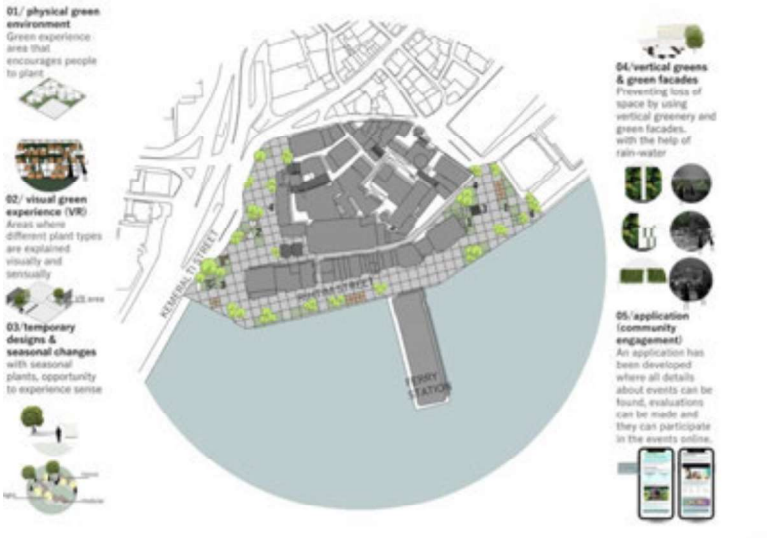

Figure 4 Strategies for Design Plan & Program Diagram (Source: Author's).

Figure 5 Program Image Diagram (Source: Author's).

We emphasise the efficient use of space through a multifaceted approach to urban greenery, designed to enhance both environmental sustainability and community well-being. Firstly, the plan includes physical green environments, areas where individuals can physically interact with nature. These spaces are traditional in nature, such as parks and gardens, designed to encourage active engagement with the environment and physical activity. Next, the visual green experience (VR) zones offer a unique, sensory way to experience greenery, potentially augmented by virtual reality technologies. Visual and sensory interactions with diverse plant life can enhance individuals' preference for and satisfaction with urban environments (Horiuchi et al., 2014; Greiner et al., 2004). This innovative element aims to educate and immerse visitors in diverse plant life and ecological settings without the constraints of physical space. Additionally, the plan incorporates temporary designs & seasonal changes, which use modular and adaptable installations that can be altered according to the seasons. This not only enhances the design flexibility of the area throughout the year but also meets the changing ecological and recreational needs of the community (Siu & Wong, 2015). Vertical greenery & green facades are another aspect, where vertical and building-integrated greenery are utilized to maximize the green space without expanding the footprint. This strategy involves the use of green walls and vertical gardens that are irrigated by harvested rainwater, making it a

sustainable option for urban greening. Vertical greening systems not only improve urban air quality but also reduce the urban heat island effect, making them an essential component of sustainable urban development (Susca et al., 2022)

Lastly, the introduction of a community engagement application highlights the plan's focus on interactive and participatory urban management. This mobile application is designed to keep the community informed about local green space events and initiatives, allowing residents to participate actively in the planning and enjoyment of their environment. It serves as a platform for feedback and engagement, ensuring that the green spaces serve the needs and preferences of those who use them. Incorporating a mobile application into Karaköy's urban development plan could significantly enhance user engagement (Borchers et al., 2023), particularly among the youth. This app could provide information on events and activities in the area, fostering community involvement and interaction. Alongside temporary and portable furniture designs, such technological integration would add to the dynamic and adaptable nature of Karaköy's public spaces. These initiatives align to make Karaköy's green spaces more accessible and enjoyable and ensure a harmonious blend of historical background and contemporary urban living. However, with Istanbul's seasonal changes, it needs to be mentioned that plants are planted based on the season as an opportunity to experience a sense of green according to the season.

4.2 Strategies

As a result of these proposed strategies, innovative green initiatives are being introduced to maximise the green space within the area. This project aims to integrate a variety of green elements: physical green spaces for recreation, visually engaging green experiences for education, adaptable designs for seasonal dynamism, vertical greenery to maximise limited space, and a smart app to enhance community engagement.

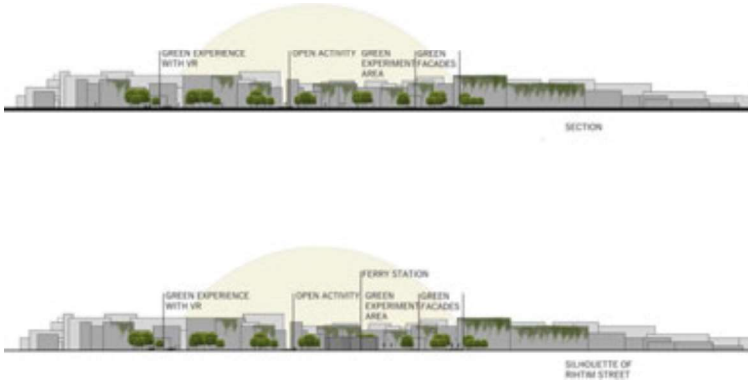

Figure 6 Section and Silhouette of the Site included with Strategies (Source: Author's).

Table 2 *Strategies for the design proposal (Source: Author's)*

Strategies	Visual	Aim	Successful Example	Expected Impact

Physical green environment		To create a tangible green environment in Karaköy that provides physical interaction with nature, enhances urban greenery, and offers recreational spaces for the community.	The High Line in New York City is an excellent example of converting an old railway line into an elevated green walkway.	-Improved air quality and provide natural shading. -Increased opportunities for physical outdoor activities, promoting health and wellness. -Enhanced green diversity and habitat provision in the urban setting.
Visual green experience		To develop an area where plant types and ecological concepts are explained through visual and sensory experiences, fostering educational engagement and aesthetic appreciation.	The Prinzessinnengarten in Berlin is a community garden where locals grow their own food and plants, fostering community interaction.	-Increased environmental awareness and education among residents. -Enhanced sensory experience, contributing to mental well-being and stress reduction. -A visually appealing urban landscape that attracts more users to visit
Temporary Design and Season Changes		To implement adaptable and temporary green designs that evolve with Istanbul seasons.	Nature Playground in Valbyparken, Copenhagen, which uses natural materials and encourages interactive play.	-A continuously changing landscape that keeps the urban environment fresh and engaging. -Educational insights into the seasonal aspects of plant life and urban biodiversity. -Encouragement of repeated visits and sustained interest in the green space.
Vertical Green and Green Facade		To incorporate vertical green structures and green facades in Karaköy, maximising green space in areas with limited ground space.	Bosco Verticale in Milan, Italy, integrates plants into its high-rise design, improving air quality and biodiversity.	-Innovative use of vertical space for greenery, increasing the total green area. -Improved building aesthetics.

Smart App for Community Engagement		To develop a smart application that facilitates community interaction, and participation in green space activities, and provides educational content about urban sustainability.	Love Your Park app in Philadelphia, USA. Allows residents to find local parks, learn about events and volunteer opportunities, and provides a platform for feedback and suggestions	-Strengthened community bonds through shared engagement in green initiatives. -Easy access to information and resources for sustainable urban living. -Increased participation in community events and environmental stewardship programs

4.5. CONCLUSION

The research conducted in Karaköy brings critical new insights into the integration of green spaces in small public urban areas, particularly through innovative and adaptable design solutions suitable for densely populated cities. This study breaks away from traditional urban design norms by demonstrating practical ways to transform minimal urban spaces into productive green areas. By employing micro-parks and vertical gardens, the research showcases how even limited spaces can be maximised for ecological and social utility, challenging the conventional approach to urban green spaces. One of the notable contributions of this study is its emphasis on adaptable design. The research highlights the use of modular and movable green infrastructures, such as portable garden installations and seasonal green walls. These adaptable solutions cater to the dynamic needs of urban environments and can be modified in response to seasonal changes and urban demands, offering a flexible alternative to the fixed nature of traditional green spaces. Furthermore, the study redefines the ecological role of small green spaces in urban settings, positioning them as integral elements of urban ecology. These spaces are portrayed not just as recreational areas but as crucial nodes that contribute significantly to urban biodiversity, thus enhancing their role from mere aesthetic enhancements to vital ecological assets.

The research also emphasises a community-driven approach to the management of green spaces, where local involvement extends beyond usage to encompass planning and maintenance. This participatory approach ensures that the green spaces meet the specific needs of the community and are more likely to be sustainable in the long term. Finally, the study offers new perspectives for policymaking, suggesting that urban planning should prioritise not only the inclusion of green spaces but also the incorporation of flexible designs and community involvement as central components of urban development. These insights advocate for policies that foster resilient urban environments, adaptable to both human and ecological needs, thereby enhancing the sustainability and liveability of cities.

One primary limitation is the scale and transferability of findings, as insights derived from Karaköy may not directly apply to different urban settings with varying cultural, economic, and environmental characteristics. There's a need to examine whether these design solutions can be effectively implemented in diverse urban landscapes to establish their broader applicability. For future research, comparative studies across different cities would be valuable to understand the universal applicability of the strategies developed in Karaköy. Longitudinal studies could provide data on the long-term ecological and social impacts of green space

interventions, offering a clearer picture of their effectiveness and sustainability. Furthermore, detailed economic and environmental impact assessments could elucidate the costs, benefits, and ecological impacts of these green initiatives.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

ACKNOWLEDGEMENTS

Preliminary studies of this research were prepared for the "Architecture Design Studio" master course under the topic of 'Public Space in Istanbul' that was held at Bahcesehir University in the 2023-2024 fall semester. We would like to thank the other course coordinators Asst. Prof. Dr. Dürnev Atılgan Yağan for her support and contributions.

REFERENCES

Akpinar, A. (2016) 'How is quality of urban green spaces associated with physical activity and health?,' *Urban Forestry & Urban Greening*, 16, pp. 76–83. https://doi.org/10.1016/j.ufug.2016.01.011.

Amin, A. (2008) 'Collective culture and urban public space,' *City*, 12(1), pp. 5–24. https://doi.org/10.1080/13604810801933495.

Angotti, T. (2008). *New York for sale: Community Planning confronts global real estate*. The MIT Press. http://www.jstor.org/stable/j.ctt5vjrgc

Benedict, M.A. and Mcmahon, E.T. (2012) *Green infrastructure linking landscapes and communities*. The Conservation Fund.

Borchers, M., Tavanapour, N., & Bittner, E. (2023). Designing mobile applications for citizen participation in urban planning. Hawaii International Conference on System Sciences. https://doi.org/10.24251/HICSS.2023.054

Cattell, V. *et al.* (2008) 'Mingling, observing, and lingering: everyday public spaces and their implications for well-being and social relations,' *Health and Place/Health & Place (Online)*, 14(3), pp. 544–561. https://doi.org/10.1016/j.healthplace.2007.10.007.

Chen, K., Lin, H., You, S., & Han, Y. (2022). Review of the impact of urban parks and green spaces on residence prices in the environmental health context. *Frontiers in Public Health*, *10*, 993801. https://doi.org/10.3389%2Ffpubh.2022.993801

Chen, K. *et al.* (2022) 'Review of the impact of urban parks and green spaces on residence prices in the environmental health context,' *Frontiers in Public Health*, 10. https://doi.org/10.3389/fpubh.2022.993801.

Çelik, Z. (2023). The remaking of istanbul: portrait of an ottoman city in the nineteenth century. Univ of California Press.

Erbas, A. E. (2013). Central business district planning and the sustainable urban development process in Istanbul. The Sustainable City VIII (2 Volume Set): Urban Regeneration and Sustainability, 179, 69-80. https://doi.org/10.2495/SC130061

Fei, X. and Mao, B. (2020) 'Study on the strategy of urban small public space planning based on the concept of Park City—Take the old town of Jiangling County in Jingzhou as an example,' *Current Urban Studies*, 08(01), pp. 107–114. https://doi.org/10.4236/cus.2020.81004.

Francis, J. *et al.* (2012) 'Creating sense of community: The role of public space,' *Journal of Environmental Psychology*, 32(4), pp. 401–409. https://doi.org/10.1016/j.jenvp.2012.07.002.

Gehl, J. (2011). Life Between Buildings: Using Public Space. Washington DC: Island Press.

Giles-Corti, B. *et al.* (2006) 'Development of a reliable measure of walking within and outside the local neighborhood: RESIDE's Neighborhood Physical Activity Questionnaire,' *Preventive Medicine*, 42(6), pp. 455–459. https://doi.org/10.1016/j.ypmed.2006.01.019.

Greiner, K. A., Li, C., Kawachi, I., Hunt, D. C., & Ahluwalia, J. S. (2004). The relationships of social participation and community ratings to health and health behaviors in areas with high and low population density. Social science & medicine, 59(11), 2303-2312. https://doi.org/10.1016/j.socscimed.2004.03.023

Haase, D. *et al.* (2014) 'A Quantitative Review of Urban Ecosystem Service Assessments: Concepts, models, and implementation,' *Ambio*, 43(4), pp. 413–433. https://doi.org/10.1007/s13280-014-0504-0.

Haq, S.M.A. (2011) Urban green spaces and an integrative approach to sustainable environment. *Journal of environmental protection*, *2*(5), pp.601-608. https://doi.org/10.4236/jep.2011.25069

Hartig, T., Mitchell, R., De Vries, S., & Frumkin, H. (2014). Nature and health. *Annual review of public health*, *35*, 207-228. https://doi.org/10.1146/annurev-publhealth-032013-182443

Holland, L. (2004) 'Diversity and connections in community gardens: a contribution to local sustainability,' *Local Environment*, 9(3), pp. 285–305. https://doi.org/10.1080/1354983042000219388.

Horiuchi, M., Endo, J., Takayama, N., Murase, K., Nishiyama, N., Saito, H., & Fujiwara, A. (2014). Impact of viewing vs. not viewing a real forest on physiological and psychological responses in the same setting. International journal of environmental research and public health, 11(10), 10883-10901. https://doi.org/10.3390/ijerph111010883

Hou, J. and Rios, M. (2003) 'Community-Driven place making,' *Journal of Architectural Education*, 57(1), pp. 19–27. https://doi.org/10.1162/104648803322336557.

Hou, J. *et al.* (2020) 'Quantifying the usage of small public spaces using deep convolutional neural network,' *PloS One*, 15(10), p. e0239390. https://doi.org/10.1371/journal.pone.0239390.

Istanbul Buyuksehir Belediyesi (2018) *Planlama yaklaşımı*. https://yaysis.istanbul/planlama-yaklasimi/istanbulda-yesil-alanlarin-arka-plani#:~:text=Ara%C5%9Ft%C4%B1rma%20sonu%C3%A7lar%C4%B1nda%20elde%20edilen%20verilere,(%41)%20%C5%9Fehirleri%20takip%20etmektedir. (Accessed: April 14, 2024).

Jia, Z., Tang, S., Luo, W., Li, S., & Zhou, M. (2016). Small scale green infrastructure design to meet different urban hydrological criteria. *Journal of Environmental Management*, *171*, 92-100. https://doi.org/10.1016/j.jenvman.2016.01.016

Kabisch, N. *et al.* (2016) 'Urban green space availability in European cities,' *Ecological Indicators*, 70, pp. 586–596. https://doi.org/10.1016/j.ecolind.2016.02.029.

Kuo, F.E., Bacaicoa, M. and Sullivan, W.C. (1998) 'Transforming Inner-City landscapes,' *Environment and Behavior*, 30(1), pp. 28–59. https://doi.org/10.1177/0013916598301002.

Larice, M., & Macdonald, E. (Eds.). (2007). *The urban design reader* (p. 439). New York, London: Routledge.

Peschardt, K. K., & Stigsdotter, U. K. (2013). Associations between park characteristics and perceived restorativeness of small public urban green spaces. *Landscape and urban planning*, *112*, 26-39. https://doi.org/10.1016/j.landurbplan.2012.12.013

Siu, K. W. M., & Wong, K. S. L. (2015). Flexible design principles: Street furniture design for transforming environments, diverse users, changing needs and dynamic interactions. Facilities, 33(9/10), 588-621. https://doi.org/10.1108/F-02-2014-0021

Susca, T., Zanghirella, F., Colasuonno, L., & Del Fatto, V. (2022). Effect of green wall installation on urban heat island and building energy use: A climate-informed systematic literature review. Renewable and Sustainable Energy Reviews, 159, 112100. https://doi.org/10.1016/j.rser.2022.112100

Tepeli, Ö. And Ocakçı, M. (2017). *"The Change of Identity and Memory on Urban Space with Project Impact: Karaköy Kemeraltı District."* ICONARCH IIII - International Congress of Architecture Memory of Place in Architecture and Planning, Konya, Turkey, pp.68-78.

Tidball, K.G. and Krasny, M.E. (2011) 'Urban Environmental Education From a Social-Ecological Perspective: Conceptual Framework for Civic Ecology Education,' *Cities and the Environment*, 3(1), pp. 1–20. https://doi.org/10.15365/cate.31112010.

Türkoğlu, H., & Seçmen, S. (2019). The role of urban waterfront parks on quality of life in İstanbul. A| Z ITU JOURNAL OF THE FACULTY OF ARCHITECTURE, 16(1), 53-66. https://doi.org/10.5505/itujfa.2019.23600

Verheij, J., Ay, D., Gerber, J. D., & Nahrath, S. (2023). Ensuring Public Access to Green Spaces in Urban Densification: The Role of Planning and Property Rights. *Planning Theory & Practice*, *24*(3), 342-365. https://doi.org/10.1080/14649357.2023.2239215

White, M. P., Alcock, I., Wheeler, B. W., & Depledge, M. H. (2013). Coastal proximity, health and well-being: Results from a longitudinal panel survey. *Health & place*, *23*, 97-103. https://doi.org/10.1016/j.healthplace.2013.05.006

World Cities Culture Forum. (2018). World Cities Culture Report. https://worldcitiesculturefo rum.com/wp-content/uploads/2018/09/World-Cities-Culture-Report-2018.pdf

Wu, J., Yu, J., & Oueslati, W. (2023). Open space in US urban areas: Where might there be too much or too little of a good thing?. *Journal of the Association of Environmental and Resource Economists*, *10*(2), 315-352. https://doi.org/10.7910/DVN/4YYUCG

Xia, H., Yin, R., Xia, T., Zhao, B., & Qiu, B. (2024). People-Oriented: A Framework for Evaluating the Level of Green Space Provision in the Life Circle from a Supply and Demand Perspective: A Case Study of Gulou District, Nanjing, China. *Sustainability*, *16*(3), 955. https://doi.org/10.3390/su16030955

Young, A.F., Russell, A. and Powers, J. (2004) 'The sense of belonging to a neighbourhood: can it be measured and is it related to health and well-being in older women?,' *Social Science & Medicine*, 59(12), pp. 2627–2637. https://doi.org/10.1016/j.socscimed.2004.05.001.

Zhong, W., Schroeder, T., & Bekkering, J. (2023). Designing with nature: Advancing three-dimensional green spaces in architecture through frameworks for biophilic design and sustainability. *Frontiers of Architectural Research*, *12*(4), 732-753. https://doi.org/10.1016/j.foar.2023.03.001