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FUNCTIONAL AND AESTHETIC INTEGRATION OF STREET FURNITURE IN URBAN PARK DESIGN

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Abstract. *The purpose* of this study is to analyze the role and conceptual foundations of modern street furniture within the broader context of urban park and mental health landscape design. It explores how street furniture contributes to both the functional and aesthetic dimensions of public space, influencing material choices, user interaction, and cultural significance. Particular attention is paid to clarifying the relationship between street furniture and spatial planning, identifying design approaches that enhance the overall effectiveness and visual quality of public environments.

Methodology. *This research employs a comprehensive literature review and case study analysis to investigate contemporary design strategies for integrating street furniture into public landscape environments. It focuses on examples drawn from mental health-oriented public spaces to evaluate the conceptual and practical coherence of urban furniture design. The study highlights principles of spatial harmony, functionality, and user-centered planning, aiming to uncover viable pathways toward integrating design aesthetics with everyday utility.*

Results. *The findings introduce a design framework that emphasizes the harmonious coexistence of aesthetics and environment in public landscape spaces. The proposed concept is grounded in user-centered criteria – visual engagement, participatory interaction, and psychological comfort. By addressing these dimensions, the study outlines how modern street furniture can foster inclusive, mentally supportive environments. The results contribute to the development of public spaces that align with collective psychological expectations and promote well-being through thoughtful spatial and object design.*

Scientific novelty. *This study proposes a comprehensive design approach that integrates street furniture with the spatial and aesthetic structure of urban park landscapes. It introduces the concept of a "dual-function environmental module" that simultaneously meets recreational, therapeutic, and visual needs of users. The research highlights how healing-oriented spatial zoning – through active and semi-active zones – combined with harmonized urban furniture placement can enhance user experience. The proposed model promotes a symbiotic relationship between aesthetics, functionality, and user interaction, which is underexplored in previous environmental design literature.*

Practical relevance. *This study provides a targeted analysis of the integration of architectural materials, aesthetic principles, and functional requirements in the context of public health-oriented urban spaces. It highlights how these components can be cohesively designed to enhance the usability, accessibility, and sensory experience of outdoor public areas. Emphasizing the role of street furniture within health-conscious urban environments, the research proposes design strategies that establish a symbiotic relationship between built elements and the surrounding landscape. These strategies are informed by cultural identity, civic engagement, and visual harmony, offering practical insights for the development of inclusive, sustainable, and emotionally supportive public spaces.*

Keywords: *urban furniture, urban park, public space, landscape design, design integration, symbiosis, public health, aesthetic value.*

INTRODUCTION

Urban park landscape and urban street furniture play a key role in shaping the well-being of urban residents. For research, it is also important to understand the relationship between street furniture and urban design. Street furniture is a way and carrier to supplement public space. However, the integration of modern street furniture into a health-centered landscape remains underexplored [1], especially in the context of achieving aesthetic harmony and functional efficiency. This study explores how contemporary design methods improve the availability and visual attractiveness of urban street furniture within urban parks.

From an aesthetic perspective, street furniture is not only functional infrastructure but also a crucial element in shaping the visual image and atmosphere of a city. Creus points out that urban furniture differs from residential furniture in that it is not chosen by users themselves [2]. Therefore, a deeper understanding and examination of these public urban elements are necessary. In contemporary cities, the placement of street furniture often tends to be redundant. If its relationship with the urban landscape and user aesthetic experience is not considered, it may instead disrupt the harmony and appeal of public spaces. A study in London shows that up to 70% of street furniture is deemed unnecessary or repetitive, highlighting the importance of evaluating it based on aesthetics and user experience [11].

The visual harmony between design and the environment is at the core of the aesthetic quality of urban furniture. Brancaglion proposed that good design should create a high level of perceptual interaction with users and their surroundings, an interaction that goes beyond functional matching to include the expression of aesthetic value. As part of the visual language of urban space, the form, material, color, and scale of street furniture must align with people's aesthetic expectations and cultural

backgrounds. Villarouco also emphasized that ergonomic assessments of urban landscapes should encompass perceptual and cultural dimensions, which often directly influence public judgments on the aesthetic value of street furniture. Ignoring users' aesthetic experiences and cultural differences can lead to visual distractions and even psychological discomfort. Therefore, to enhance the overall appeal and comfort of urban spaces, the design of street furniture must not only meet functional and human-scale requirements but also focus on its aesthetic expression and cultural adaptability in the urban landscape [6].

ANALYSIS OF RECENT RESEARCH

The concept of "urban street furniture" first emerged in the United Kingdom [2]. It can be precisely defined as a collection of public and private objects or installations situated within urban public spaces that serve specific functions or provide services for the general public. This category encompasses a broad range of elements, including various landscape installations along streets, public utilities integrated within urban environments, and environmental furnishings embedded in city spaces [13]. Items such as benches, flower beds, street lamps, sculptures, waste bins, and signage all fall under the umbrella of street furniture. Functionally, street furniture is akin to essential indoor furnishings – it integrates closely with the surrounding street environment, helping to create a distinct atmosphere and spatial identity. In the process of urban beautification and development, street furniture plays an undeniably pivotal role. Its design language, aesthetic distinctiveness, dynamism, and embedded beauty collectively reflect the prosperity, harmony, and progress of urban life. In a broader cultural context, street furniture can be seen as a tangible extension of a city's historical trajectory. More than just utilitarian components, these elements crystallize and elevate urban narratives, serving

as carriers of cultural memory and artistic meaning within the public realm [6].

In 2012, Professor Banu Bulduk emphasized the significant role urban furniture plays in cities, identifying it as a key medium through which the urban identity is expressed. One of the most iconic examples of urban furniture in Paris is the "Colonne Morris" (Fig. 1. Maurice advertising column) – a cylindrical structure used for posting posters, named after the French printer Gabriel Morris. Unlike standard bulletin boards, the Colonne Morris was specifically designed from the outset to display posters related to the performing arts – such as concerts, dance performances, opera, and theater – and later extended to include film promotions [2, p. 3392]. Interestingly, a similar concept had already emerged earlier in Berlin, Germany, where printer Ernst Litfass (1816–1874) invented a nearly identical poster column in 1854. These "Litfaßsäule" (Fig. 2. Litfaßsäule columns) began appearing on Berlin streets by 1855, functioning as public communication tools. These historical cases highlight how urban furniture has long served not only functional and aesthetic purposes but also as a strategic platform for communication – employed by government institutions, commercial entities, and the cultural sector to promote key activities and reinforce the urban visual identity [4].

Today, urban furniture continues to evolve as a medium for public communication and cultural representation, reflecting the increasing diversity of urban identities. This necessitates the design of public space elements that are culturally relevant, user-friendly, and responsive to contemporary needs. It also underscores the importance of achieving coherence between design and its environmental or architectural context, as both must harmonize to ensure a cohesive and engaging public realm [20].

In their seminal book *Urban Design: Street and Urban Space Furniture*, Clare Cooper Marcus and Carolyn Francis describe urban street furniture as "a key component of the public urban realm, encompassing a wide spectrum from utilitarian installations to decorative elements. These components – whether benches for rest, signage for orientation, waste bins for hygiene, or streetlights for ambiance – are not isolated objects, but rather integral elements that weave together the texture and spirit of the street". This interpretation emphasizes the holistic role street furniture plays in shaping the urban experience [5; 17; 18].

Jan Gehl and his colleagues have conducted in-depth studies on the relationship between public space and human activity, highlighting how urban furniture influences the dynamics of public life. His work demonstrates that various types of seating and rest infrastructure facilitate social interaction, thus offering a theoretical foundation for understanding the social value of urban furniture [7]. In *Life Between Buildings*, Gehl argues that the quality of urban design is closely tied to how well it encourages social engagement – positioning street furniture as a vital element for fostering interaction and communal life [13]. Yoshinobu Ashihara, though not focusing explicitly on street furniture, explores the aesthetics of streets from the perspectives of scale, spatial layering, and urban interfaces. His analyses provide an aesthetic framework within which street furniture, as a fundamental component of the streetscape, can be designed and arranged. This contributes to the creation of visually pleasing and emotionally resonant urban environments [8].

In 2025, the Rinaldi research team conducted a comprehensive study on the historical evolution, material applications, and functional-aesthetic characteristics of urban



Fig. 1. Maurice advertising column
(<https://frenchmoments.eu/morris-column-paris/>) Photo from open online archive. Accessed: [16.02.2022]



Fig. 2. Litfaßsäule column (<https://www.tip-berlin.de/stadtleben/geschichte/litfassaeulen-in-berlin-bilder/>) Photo from open online archive. Accessed: [02.02.2024]

furniture. Drawing on survey data collected from student populations, the team employed cross-tabulation and data visualization techniques – such as Venn diagrams and UpSetR plots – to analyze user preferences. The findings indicate that achieving a balance between aesthetic innovation and practical functionality is key to enhancing both urban identity and user comfort. This offers data-driven insights for decision-making in public space design [21]. However, the study does not deeply explore the differentiated needs of non-student groups or the cross-cultural adaptability of urban furniture. Utilizing a conceptual framework developed within the study as a tool for assessing the quality of the built environment and facilitating participatory design activities and co-design workshops, the researchers proposed a classification system for urban furniture – organized by domains, subdomains, and associated product categories. For each category, specific design strategies and contextual scenarios were defined. The results underscore the strategic role of tangible design elements as health-promoting touchpoints, highlighting the potential and significance of urban furniture in fostering healthier built environments.

Xinyi Tang's research team in China explored the design of urban furniture in community settings from the perspective of health promotion. Utilizing the Analytic Hierarchy Process (AHP), the team developed an evaluation framework comprising three primary criteria and eleven sub-criteria to assess the impact of urban furniture design on physical, psychological, and social health needs. The findings revealed that physical health needs were prioritized in design considerations, followed by psychological and social dimensions. Based on this, the researchers proposed a health promotion model aimed at optimizing urban furniture design to improve overall community health and residents' quality of life [22].

In 2022, the research team led by Anna M. Grabiec investigated material, functional, and aesthetic solutions for urban furniture in public spaces. By analyzing the historical development and prevailing trends in urban furniture, the study evaluated commonly used architectural materials as well as their functional and aesthetic characteristics. Using survey data collected from student populations, the authors identified user preferences and expectations regarding urban furniture [2, p. 414]. Statistical analysis of the results highlighted the current and emerging demands of users, contributing to the ongoing effort to balance aesthetics and comfort in urban design [6]. The study emphasizes how such a

balance can enhance both the urban image and the quality of public space experiences for residents [12].

While existing research has made substantial progress in exploring street furniture within disciplines such as art, architecture, and environmental design – particularly focusing on materials, functionality, aesthetics, and public well-being – there remains a noticeable gap in innovative design approaches for public space integration.

This study addresses this gap by applying case study analysis to examine how street furniture can be effectively integrated with landscape design. The findings suggest that achieving a balance between aesthetic value and functional utility is essential for creating street furniture that truly benefits users and supports the quality of urban public space.

PURPOSE

The purpose of this study is to explore integrated design strategies that enhance the spatial and aesthetic quality of street furniture in urban parks. The research seeks to examine how urban furniture can be functionally and visually harmonized with its surrounding environment to improve usability, spatial efficiency, and visual identity in public outdoor spaces. Through the analysis of selected case studies, the study aims to identify effective methods of integrating street furniture into the broader landscape design of urban parks, highlighting innovative solutions that promote cohesion, user engagement, and environmental aesthetics.

RESULTS AND DISCUSSION

For the analysis of public space landscape space planning and design scheme, four modern successful urban street furniture cases are adopted [8], which are based on the four urban street furniture cases that have the highest utilization rate in real life and have been widely discussed by the society. 1. London "steps" interesting concrete seat – 2017 raw edges studio design (Table 2, Figure 3). 2. Miami Knight petal seat – 2016 James Corner Field Operations design (Table 2, Figure 4). 3. River landscape and seat of Ukraine Dnipro new walking space – Sergey Filimonov, Natalia Kashirina (Table 2, Figure 5). 4. "Dewdrop Tower" Lighting Device 2024 Daxing Jizhong Design Studio in Beijing Olympic Park (Table 2, Figure 6).

Figure 3 shows the London "Steps" concrete seats crafted by Yael and Shay of Raw Edges Design Studio. The creative public seat is made of concrete, and each seat can be used for two people to sit together. Multiple seats are

Table 1

Modern urban street furniture case

Design Element	Case Study Example	Impact on Public Health Space
Seating Design	London "steps" fancy concrete seats	Encourages social interaction, improves aesthetics
Interactive Elements	Petal seats in Knights Square, Miami	Integrates nature into urban furniture, multifunctional
Cultural and aesthetic elements	Landscape of the new walking space in Dnipro (Ukraine)	Integration of the environment and the culture
Lighting Integration	Beijing's "dewdrop tower" lighting device	Enhances nighttime accessibility and aesthetics

Table 2

Urban street furniture case

Project	photo visualization
	
<i>Fig. 3a. London "steps" fancy concrete seats. Front view (Source: Self-drawn, Designer: James Corner, RLA, London 2013)</i>	<i>b. https://www.gooood.cn/knight-plaza-miami-by-james-corner-field-operations.htm.Photo from open online archive. Accessed: [21.10.2016]</i>
	
<i>Fig. 4a. Petal seats in Knights Square, Miami. Top view (Source: Self-drawn, Designer: raw edges, London 2017)</i>	<i>b. http://www.shalongart.com/art-2684-1.html. Photo from open online archive. Accessed: [29.11.2017]</i>
	
<i>Fig. 5a. Landscape of the new walking space in Dnipro, Ukraine. Top view (Source: Self-drawn, Designer: Sergey Filimonov, Ukraine 2021)</i>	<i>b. https://mooool.com/pedestrian-boulevard-in-dnipro-ukraine-by-filimonov-kashirina-architects.html Photo from open online archive. Accessed: [31.08.2023]</i>
	
<i>Fig. 6a. Beijing's "dewdrop tower" lighting device. Front view (Source: Self-drawn, Designer: JDaxing Jizi Desig, Beijing 2024)</i>	<i>b. https://www.archdaily.cn/cn/1025357/lu-zhu-ta-da-xing-ji-zi-she-ji-gong-zuo-shi.Photo from open online archive. Accessed: [07.01.2025]</i>

combined with each other, forming a unique small urban street landscape built from concrete components. The design cleverly borrows the shape of the armchairs, stairs, crosswalk edges and the low brick walls in the home. With the change of size, these seats gather together, like an elaborate piece of art, forming a fascinating outdoor landscape installation. Designer fully tap space potential, designed to redefine the streets of public space, make it is given priority to with concrete color in urban environment, at the same time can skillfully integrated into the surrounding natural scenery, attract urban residents in the stop, climb and relax, for the people in the busy city provides a unique leisure corner. Figure 4 shows the white petal tree pool seats in Knights Square in Miami, USA. The seats stand cleverly between the two buildings, with the Miami Perez Museum of Art on one side and the Frost Science Museum designed by Grimshaw Architects on the other. The seat is arranged in a unique shape of four petals [13]. All kinds of subtropical plants thrive in the tree pool, which not only adds a touch of natural vitality to the city, but also enriches the function of the seat with the change of climate and time. It can be used as a wall to resist the sun or cold wind, and meet different rest needs. Even at night, it has lighting function to bring warm atmosphere to the square. At the same time, as one of the important elements in the city street furniture, the tree pool seat perfectly integrates practicality and artistry, becoming a beautiful scenery line in the square [8, p. 12].

Figure 5 In the urban center of Ukraine, the pedestrian street landscape project designed by FILIMONOV & KASHIRINA architects becomes a model of a public space that is both functional and artistic. With the core concept of "place narrative" as the core, the project skillfully combines historical elements with modern design to reactivate public life in the city center [10]. The design of the pedestrian street fully reflects the versatility and flexibility. The design team has set up movable seats and rest areas in the street. This furniture can be flexibly adjusted according to different activity needs, which not only meets the daily rest needs of the citizens [23, p. 519], but also provides convenience for all kinds of public activities. At the same time, the pedestrian street also integrates a large number of green plants and natural elements, through the layout and selection of plants, to create a comfortable and pleasant microclimate, providing a leisure place for citizens to blend nature with the city [19, p. 47].

In the design, the team pays special attention to environmental integration and

cultural expression. The ring road around the pedestrian street is paved with red asphalt, which is combined with the natural primitive wooden lights and orange and red chairs to form a sharp visual contrast, injecting vitality into the urban space. In addition, the design team also integrated the excavated historical bricks into the sidewalk as paving stones, an ingenious design that not only retains the memory of the city's history, but also gives new cultural connotations to the space. The pedestrian street is also designed to emphasize interactivity and community participation. By setting up interactive installations and art sculptures, the design team encourages citizens to actively participate in the use of public space, enhancing the sense of belonging and identity to the space. These designs not only enhance the interest of the space, but also provide a public environment full of vibrant and artistic atmosphere for urban residents [7].

The landscape design project of Ukrainian urban pedestrian street provides a new idea for the design of urban public space through the combination of versatility, environmental integration, artistry and culture. It not only meets the daily needs of the citizens, but also enhances the cultural value and artistic atmosphere of the public space through the design, becoming a beautiful landscape in the city. This case shows how to transform the public space into a place that can not only promote the community interaction, but also show the urban cultural characteristics of the city through the design, which provides a valuable reference for the design of the public space in other cities. Figure 6 shows the "dew tower" lighting device in the Olympic Park. The device presents a three-story tower structure of 7.2 meters high, and the design is unique. During the day, the "dewdrop tower" presents a milky white round surface, just like the dew drops condensed on the petals of the grass leaves, crystal clear, emitting a natural and fresh beauty, and the natural landscape of the park. When the night falls and the lights come on, the "dewdrop Tower" changes instantly, creating a magical atmosphere through the unique lighting design, adding a romance and mystery to the night in the park. The color and brightness of the light are constantly changing, as if telling different stories, attracting tourists to stop and watch, and immerse themselves in this wonderful world of light and shadow [22].

From these four-design works, we can get a lot of inspiration about the urban street furniture design. First of all, the design should focus on the diversity and flexibility of

functions. For example, "Step" seat not only provides the rest function, but also stimulates the interaction between people and the space; the multifunctional design of petal tree pool seat changes with climate and time to meet the needs of people in different scenarios. Secondly, we should skillfully combine art and practical, like iron palm tree with exquisite sculpture art; "dew tower" lighting device with unique shape and lighting effect, beautify the environment and bring people unique visual experience [9]. Moreover, the design needs to consider the integration with the surrounding environment. Whether the "Step" seat is integrated into the natural scenery, or the petal tree pool seat and the surrounding buildings complement each other, both reflect the importance of harmonious coexistence of street furniture and the environment. Finally, excellent street furniture design should have the ability to trigger public interaction and thinking, through unique creativity and connotation, to attract citizens to participate in it, enhance their sense of identity and belonging to the urban space, so as to enhance the vitality and charm of the whole city [21]. These design works provide valuable examples for the design and development of urban street furniture, guiding the development direction of more humanized, artistic and functional urban street space in the future [1].

CONCLUSIONS

This paper analyzes theoretical foundations and practical cases of integrated design between urban park landscapes and street furniture. It further explores the design characteristics of modern street furniture within public landscape spaces and outlines strategies for optimizing its functionality. These include establishing a concept of harmonious coexistence between aesthetics and environment, achieving functional diversity and flexibility, and ensuring cohesive integration with the surrounding landscape.

Drawing on successful case studies such as the "Steps" seating in London, the petal-shaped benches at Miami Knights Plaza, the Dnipro embankment walking zone in Ukraine, and the "Dewdrop Tower" lighting installation in Beijing Olympic Park, the study identifies key design principles for unifying the aesthetic and functional value of urban street furniture.

Moreover, in light of the growing importance of mental health-oriented public environments, this research proposes specific design strategies tailored to modern landscape needs. These strategies offer both practical

methods and theoretical support for advancing the integrated development of urban parks and street furniture in future public space design.

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АНОТАЦІЯ

Лі Ченьсі, Булгакова Т. Функціональна та естетична інтеграція вуличних меблів у дизайн міських парків

Метою дослідження є аналіз ролі та концептуальних засад сучасних елементів вуличних меблів у ширшому контексті дизайну міських парків і ландшафтів, орієнтованих на підтримку ментального здоров'я. У роботі досліджено, як вуличні меблі сприяють і функціональному, й естетичному наповненню публічного простору, впливаючи на вибір матеріалів, взаємодію користувачів і культурну значущість середовища. Особлива увага приділяється уточненню взаємозв'язку між вуличними меблями та просторовим плануванням, а також визначенню підходів до дизайну, що підвищують загальну ефективність і візуальну якість громадських середовищ.

Методологія. У дослідженні використано комплексний підхід, що включає огляд літератури та аналіз прикладних кейсів сучасного дизайну з інтеграції вуличних меблів у публічні ландшафтні середовища. Особливий акцент зроблено на прикладах публічних просторів, орієнтованих на ментальне здоров'я, з метою оцінювання концептуальної та практичної узгодженості рішень у сфері дизайну вуличних меблів. У дослідженні висвітлено принципи просторової гармонії, функціональності та орієнтації на користувача, що дає змогу визначити ефективні шляхи інтеграції естетики дизайну з повсякденними функціональними потребами.

Результати. Розроблено концептуальну модель дизайну, що акцентує на гармонійному співіснуванні естетики й середовища в публічному ландшафті. Запропонована модель ґрунтується на критеріях, орієнтованих на користувача, як-от: візуальна залученість, інтерактивність і психологічний комфорт. Завдяки врахуванню цих чинників, дослідження демонструє, як сучасні вуличні меблі можуть сприяти створенню інклюзивного, ментально підтримувального середовища. Отримані результати сприяють розвитку публічних просторів, що відповідають колективним психологічним очікуванням і підвищують добробут завдяки продуманому просторовому й предметному дизайну.

Наукова новизна. У дослідженні запропоновано цілісний підхід до дизайну, що інтегрує вуличні меблі в просторову та естетичну структуру ландшафтів

міських парків. Уведено поняття «екологічний модуль подвійної дії», який одночасно виконує рекреаційні, терапевтичні та візуальні функції. Показано, що зонування простору з урахуванням активних та напівактивних зон у поєднанні з гармонійним розміщенням вуличних меблів покращує користувацький досвід. Запропонована модель сприяє формуванню симбіотичного зв'язку між естетикою, функціональністю та взаємодією з користувачем – аспекту, що раніше недостатньо висвітлювався в науковій літературі з дизайну середовища.

Практична значущість. Дослідження пропонує цілеспрямований аналіз взаємозв'язку архітектурних матеріалів, естетичних принципів і функціональних вимог у контексті громадських просторів, орієнтованих на збереження ментального здоров'я. Показано, як ці компоненти можуть бути узгоджено інтегровані для покращення зручності, доступності та сенсорного сприйняття відкритих громадських просторів. У роботі наголошено на ролі вуличних меблів у створенні міських середовищ, спрямованих на здоров'я населення, і запропоновано дизайнерські стратегії, що формують симбіоз між штучними об'єктами та навколишнім ландшафтом. Такі стратегії базуються на культурній ідентичності, громадській участі та візуальній гармонії й надають практичні орієнтири для розвитку інклюзивних, сталих і емоційно підтримувальних публічних просторів.

Ключові слова: вуличні меблі, міські парки, громадський простір, ландшафтний дизайн, інтеграція дизайну, симбіоз, ментальне здоров'я, естетична цінність.

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