

Research on the Design of Micro Green Space Landscape under the Guangzhou-Foshan Urban Integration

Zhaoxia Chen^{1*}

¹ Academy of Fine Arts, South China Normal University, Guangzhou, China

Email Address

1341673341@qq.com (Zhaoxia Chen)

*Correspondence: 1341673341@qq.com

Received: 26 December 2025; **Accepted:** 19 January 2026; **Published:** 18 March 2026

Abstract:

Against the background of the deepening Guangzhou-Foshan urban integration strategy, this study analyzes and examines the current conditions of diversified micro green space landscapes. In response to the core demands of urban functional integration, ecological network connectivity, and the symbiosis of humanistic characteristics in the process of urban integration, this research adopts literature review, case analysis, and design practice methods to systematically explore urban-integration-adaptive design pathways for the renewal of micro green spaces. A three-in-one micro green space design framework functional coordination, ecological interconnection, and cultural integration is proposed. The feasibility of this framework is verified through six types of micro green spaces, including street-corner green spaces and community-affiliated green spaces, as well as three typical case types: core urban type, boundary integration type, and transportation node type. This study provides theoretical and practical design references for micro green space landscape design from the perspective of urban integration.

Keywords:

Guangzhou-Foshan Urban Integration, Micro Green Space Landscape, Spatial Design, Functional Coordination, Ecological Interconnection

1. Introduction

The Guangzhou-Foshan metropolitan integration has transitioned from a phase characterized by infrastructure connectivity to a new stage emphasizing functional and quality-oriented coordination. On August 1, 2022, the 14th Five-Year Development Plan for Full-Area Guangzhou-Foshan Integration explicitly proposed the objective of “establishing an integrated urban-rural ecological green space system” [1], embedding the principle of ecological priority throughout the entire process of Guangzhou-Foshan metropolitan development. The plan calls for improving ecological corridors between the two cities, strengthening greening and landscape enhancement along intercity transportation corridors, and promoting urban renewal in a scientific and orderly manner, in line with the concepts of reserving land

for greenery, removing illegal structures to create green space, and inserting greenery into small and fragmented urban spaces.

In this context, the Regulations of Guangdong Province on Urban Greening were promulgated and officially came into force on January 1, 2024. The Regulations stipulate that governments at all levels shall improve incentive mechanisms for the greening of marginal and vacant land, and encourage the transformation of such spaces into “pocket parks.” As micro green spaces function as the “capillaries” of urban ecosystems and public space networks, they have emerged as a critical entry point for addressing ecological and livelihood deficiencies within the Guangzhou-Foshan metropolitan integration process.

This study clarifies the specific requirements imposed by Guangzhou-Foshan metropolitan integration on the landscape design of micro green spaces, and develops an update-oriented design framework for micro green spaces that is responsive to the demands of metropolitan integration. It further proposes practical and implementable design strategies and methods. In addition, the study provides theoretical guidance for micro green space renewal projects in both Guangzhou and Foshan, contributing to the enhancement of the quality of micro-scale landscape spaces within the full-area Guangzhou-Foshan metropolitan integration.

2. Related Work

2.1. Definition of Key Concepts

Guangzhou-Foshan metropolitan integration refers to the policy-guided process through which Guangzhou and Foshan achieve integrated development across multiple domains, including infrastructure, industry,

ecology, and public services, thereby forming a regional collaborative pattern characterized by “living in the same city and working in the same city.” Centered on high-density urban agglomerations as the primary spatial context, existing studies within the regional framework of Guangzhou-Foshan integration have developed a research trajectory characterized by a combination of “policy-driven initiatives, technological empowerment, and regional specificity.” At the level of planning strategies, research has largely focused on the objective of a “15-minute community life circle” in the Guangzhou-Foshan area, exploring approaches for integrating fragmented urban spaces [2]. This study focuses specifically on the dimensions of “ecological coordination” and “public space quality coordination,” thereby addressing existing gaps in the field.

Micro green spaces refer to small-scale green areas located within built-up urban environments, characterized by vegetation as their primary component while also accommodating recreational, ecological, and cultural functions. These include pocket parks, street-corner green spaces, and community-affiliated green areas, and they constitute the core spatial carriers of the “infill greening” approach under Guangzhou-Foshan metropolitan integration. Research in Guangzhou has emphasized the integration of smart technologies with local cultural expression. For example, in the renewal of micro green spaces along the Enning Road area in Liwan District, low-carbon technologies such as photovoltaic paving and intelligent irrigation systems have been adopted, alongside the incorporation of landscape elements inspired by Cantonese opera, achieving a synthesis of ecological performance and cultural representation [3].

In Shanghai, a series of more than ten pocket parks along Changping Road have been connected to form a “green corridor,” where a “three-dimensional dialogue” mechanism has been employed to incorporate public participation, offering valuable co-governance experience for cross-city micro green space development in the Guangzhou-Foshan context. Research conducted by Sweco Architects across 22 European cities indicates that industrial, commercial, and transportation areas represent the primary potential zones for micro green space expansion. Through regenerative design approaches, an additional 56,290 hectares of blue-green space could be created equivalent to approximately 400 Hyde Parks in London. In Mechelen, Belgium, motor vehicle lanes have been transformed into pedestrian green corridors, exemplifying a technical pathway that integrates “quantified ecological indicators” with infrastructure adaptation.

Furthermore, European studies have placed particular emphasis on issues of “green equity,” advocating for policy instruments that prioritize the provision of micro green spaces in disadvantaged communities.

The “3-30-300 rule” has consequently become an important reference standard in micro green space planning. Compared with domestic research, international studies and practices on micro green space landscape renewal emerged at an earlier stage, resulting in the development of multidimensional theoretical frameworks and diversified urban implementation models.

Landscape space renewal design refers to a systematic process of optimizing the landscape structure, functional layout, facility configuration, and cultural expression of existing micro green spaces, so as to better adapt them to urban development demands and residents usage needs. Singapore, as a representative high-density city in micro green space development, has focused its research on community-oriented, precision-based design and co-governance models. In contrast, European studies place greater emphasis on the ecological value and systemic regeneration of blue-green spaces. A study conducted by the architecture and engineering firm Sweco across 22 European cities indicates that industrial, commercial, and transportation areas represent the core potential zones for micro green space expansion; through regenerative design, an additional 56,290 hectares of blue-green space could be created, equivalent to approximately 400 Hyde Parks in London. In Lithuania, ecological retrofitting has been achieved through the development of rooftop forests, while in Mechelen, Belgium, vehicular roads have been transformed into pedestrian green corridors, forming a technical pathway characterized by the “quantification of ecological indicators and integration with infrastructure.” Moreover, European research places particular emphasis on issues of “green equity,” advocating for policy interventions to ensure the provision of micro green spaces in disadvantaged communities. The “3-30-300 green rule” has thus become an important reference standard for micro green space planning.

Overall, international research and practice on micro green space landscape renewal began relatively early, resulting in a multidimensional theoretical framework and diversified urban implementation models.

Based on the above research context, this study proposes three core design principles for micro green space landscape renewal under Guangzhou-Foshan urban integration: the principle of ecological corridor connectivity, the principle of functional module construction, and the principle of regional symbol translation, together with the innovative framework illustrated in Figure 1.

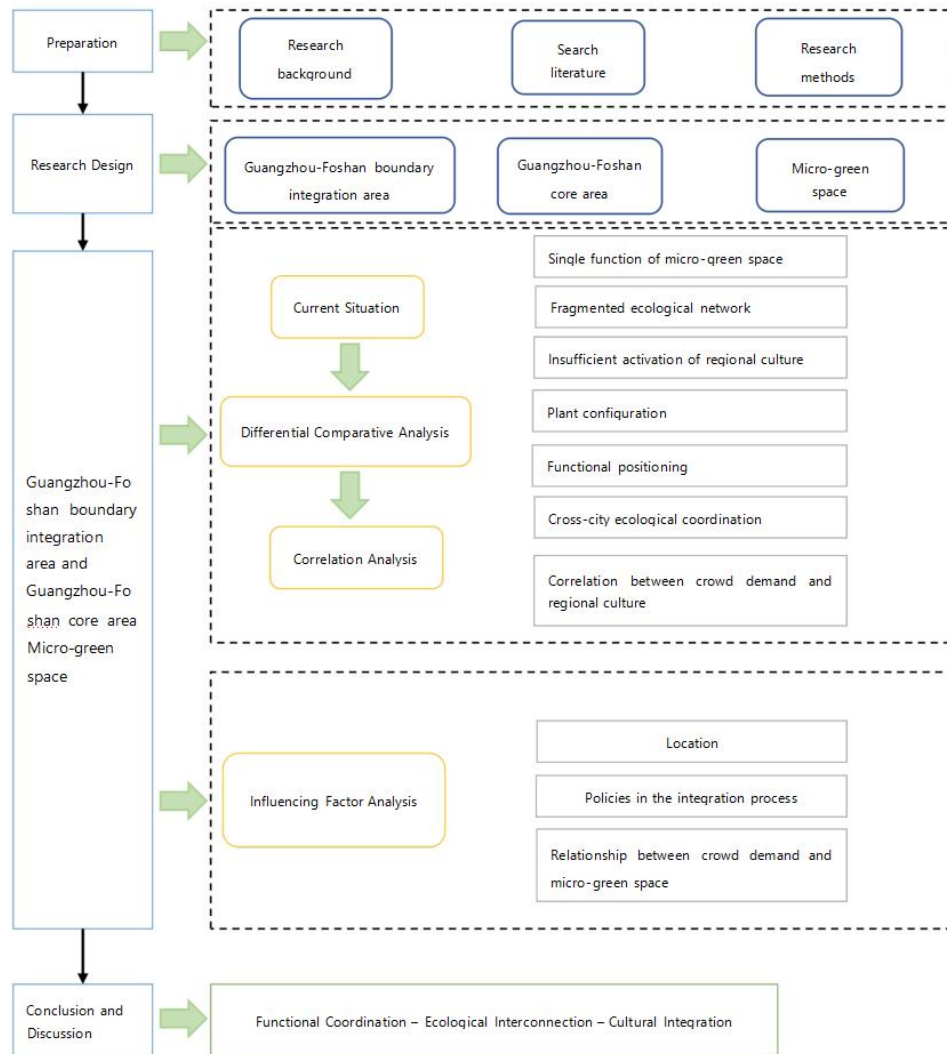


Figure 1. Research Framework of the Paper.

2.2. Current Status Analysis of Micro-Landscape Spaces under Guangzhou-Foshan Metropolitan Integration

In studies related to urban green spaces, Luo Xiao and colleagues defined urban green spaces as possessing a dual attribute of “vegetation coverage and openness”, thereby establishing a design orientation centered on Nanzhao culture and proposing multiple renewal strategies [4]. Fang Xin et al. employed a methodological approach combining “vector data processing and ArcGIS spatial analysis” to vectorize pocket parks in core areas and construct a corresponding geospatial database [5]. Chen Ming et al., building on GIS-based analyses, conducted research on the renovation and upgrading of small and micro green spaces in Beijings historic urban areas, proposing optimization strategies from multiple perspectives [6]. Pan Yi et al. likewise emphasized the dual attributes of urban green spaces, providing a theoretical basis for integrating small and micro green spaces into comprehensive urban planning frameworks [7].

Jane Jacobs highlighted the value of “small-scale planning and incremental renewal”, arguing that continuous, finegrained interventions are essential to urban vitality [8]. Liu Bingjiang discussed the role of small and micro green spaces as “supplements to the urban ecological system”, offering macro-level policy support for

recognizing their ecological significance [9]. Iwashita Hajime defined the concept of pocket parks, providing early theoretical foundations for the delineation of scale, functional positioning, and design philosophy of small and micro green spaces, and clarifying the core value of being “small yet practical” [10]. He Kun considered small and micro green spaces to be the core units of “urban green micro-circulation” in high-density cities, though his study did not address the application of digital technologies [11]. Zhai Yujia applied SPSS-based correlation and multiple linear regression analyses to derive practical recommendations, offering empirical evidence oriented toward youth users for the renewal of small and micro green spaces [12]. Deng Yangyang focused on the application of small-scale plant species in urban micro-spaces, emphasizing their ecological and functional value in the regeneration of urban “leftover spaces” [13].

Through an integrative review of the existing literature, it is evident that targeted research addressing cross-city coordination of ecological, functional, and cultural dimensions remains limited, thereby leaving significant scope for the present study. The overall framework of this paper is illustrated in Figure 1.

3. Research Objects and Case Analysis

3.1. Selection of Research Scope and Objects

The scope of this investigation covers the core areas of Guangzhou-Foshan metropolitan integration and is divided into two categories. The first comprises boundary integration zones, including the Liwan- Nanhai Jiaokou area, Baiyun-Sanshui Lishui, and Panyu-Shunde Chencun. The second includes urban core areas, such as Xiguan in Liwan District and Beijing Road in Yuexiu District in Guangzhou, as well as Zumiao in Chancheng District and Qiandeng Lake in Nanhai District in Foshan.

Following the principle of representativeness, five micro green spaces were selected for detailed analysis, encompassing six major typologies: street-corner green spaces, community-affiliated green spaces, trans- portation node green spaces, waterfront micro green spaces, pocket parks, and culturally themed micro green spaces, as summarized in Table 1 and Table 2.

Table 1. Classification of Six Types of Micro Green Spaces.

No. Type		Core Definition	Functional Positioning	Typical Spatial Carriers	Contextual Characteristics (Guangzhou-Foshan Region)
①	Street-Corner Green Space	Small-scale open space (50-500 m ²) dominated by vegetation, located at urban road intersections or unused street-corner parcels.	Alleviate traffic-related visual fatigue, provide short-term rest spaces, and enhance streetscape quality.	Arterial/secondary road intersections; commercial street corners	Adapted to high-pedestrian-flow areas (e.g., Baiyun-Sanshui Lishui Road intersection, Beijing Road in Yuexiu District) to meet passersbys

					immediate resting needs.
②	Community-Affiliated Green Space	Green spaces attached to residential communities (100-2000 m ²), including neighborhood gardens, courtyard greens, and fitness areas.	Support residents daily leisure, childrens activities, neighborhood interaction, and ecological regulation.	New/older residential neighborhoods; around community service centers	Cover Panyu-Shunde Chencun new communities and Liwan old neighborhoods, addressing residents "last-kilometer" greening demands.
③	Transportation Node Green Space	Functional green spaces (200-1000 m ²) around transportation hubs.	Guide pedestrian flow, alleviate waiting fatigue, and improve transportation node landscape quality.	Metro station entrances; bus transit hubs	Serve high-frequency cross-boundary commuters (e.g., Nanhai Qiandeng Lake Metro Station, Guangzhou South Railway Station), enhancing transportation environment comfort.
Leverage the regions					
		Ecological			dense water network (e.g.,
	Waterfront ④ Micro Green Space	Linear green corridors (5-20 m wide) along small urban water bodies.	restoration, waterfront leisure, and landscape connectivity.	Riverbanks/canals; around community artificial lakes	Baiyun-Sanshui Lishui River corridor) to integrate "water network + green network," supporting water-oriented recreational activities
	⑤ Pocket Park	Well-equipped open green spaces (100-1000 m ²) in residential/commercial concentrations.	Support daily leisure, neighborhood interaction, childrens activities, and temporary emergency use.	Between old residential blocks; around commercial complexes	Compensate for the lack of large urban parks in high-density areas (e.g., Liwan-Nanhai Jiaokou area), meeting residents "5-minute walking distance" leisure needs.
⑥	Cultural-Themed		Disseminate culture,		Aligned with Lingnan

	Micro Green Space	Green spaces integrating regional cultural elements, serving landscape and cultural exhibition functions.	create distinctive landscapes, provide recreational experiences, and build regional identity.	Surroundings of historic districts and intangible cultural heritage venues	culture (e.g., Chancheng Zumiao areas Cantonese opera-themed spaces) with huoyer gable walls and Lingnan plants to enhance regional identity and spatial recognizability.
--	-------------------	---	---	--	---

Table 2. Images of Micro Green Space Types.

①50-500 m ²	②100-2000 m ²	③200-1000 m ²	④5-20 m	⑤100-1000 m ²	⑥No fixed standard
					

3.2. Case Analysis of Micro Green Spaces under Urban Integration

3.2.1. Analysis of Boundary Integration Zones

In the process of regional collaborative development such as Guangzhou-Foshan metropolitan integration, urban boundary areas often serve as critical nodes for functional linkage and resource coordination, and their planning orientation directly influences the effectiveness of regional integration. To clearly present the key characteristics of such areas, Table 3: Classification of Boundary Integration Areas systematically compiles baseline information on selected boundary green spaces between Guangzhou and Foshan, including the name of each green space.

Table 3. Classification of Boundary Integration Zones.

No.	Green Space Name	Location	Characteristic Plant Species	Image	Design Key Points Analysis
①	Street-Corner Green Space at Jiaokou, Guangzhou-Foshan Boundary Area	Liwan District, Guangzhou	Ficus microcarpa; Bougainvillea; Ixora		1. <i>Ficus microcarpa</i> has a broad canopy that effectively meets shading requirements in street-corner settings. 2. <i>Bougainvillea</i> and <i>Ixora</i> are characterized by long flowering periods, enhancing the visual vitality of street-corner landscapes.
②	Community-Affiliated Green Space in Lishui, Nanhai District, Foshan	Nanhai District, Foshan	Cinnamomum camphora; Plumeria rubra; Ophiopogon japonicus		1. <i>Cinnamomum camphora</i> is an evergreen species with mosquito-repellent properties, contributing to improved comfort for residents' leisure activities. 2. <i>Plumeria rubra</i> , with its mild and pleasant fragrance, is well

					suited to creating a tranquil atmosphere within residential communities.
③	Transportation Node Green Space at Shayong Metro Station, Guangzhou-Foshan Intercity Metro	Liwan District, Guangzhou / Nanhai District, Foshan (Intercity Boundary Area)	Lagerstroemia speciosa; Zoysia tenuifolia; Nephrolepis cordifolia		1. <i>Lagerstroemia speciosa</i> provides shade during the summer months, effectively accommodating the waiting needs of high pedestrian volumes at metro entrances. 2. <i>Zoysia tenuifolia</i> exhibits strong trampling resistance, enabling it to withstand frequent and intensive pedestrian traffic.
④	Waterfront Micro Green Space at Jiaoxin, Baiyun District, Guangzhou	Baiyun District, Guangzhou	Taxodium distichum; Nelumbo nucifera; Salix babylonica		1. <i>Phragmites australis</i> and <i>Nelumbo nucifera</i> are well adapted to waterfront wetland environments and contribute to water purification and ecological regulation. 2. <i>Salix babylonica</i>, with its soft, pendulous branches, enhances the waterside experience and helps to create an inviting, people-oriented waterfront landscape.
⑤	Pocket Park at Yongqingfang, Liwan District, Guangzhou	Liwan District, Guangzhou	<i>Michelia alba</i> ; <i>Bougainvillea</i> ; <i>Gypsophila paniculata</i>		1. <i>Michelia alba</i> is characterized by a rich and pleasant fragrance, which is well aligned with the leisurely and restorative atmosphere of pocket parks. 2. <i>Bougainvillea</i>, with its vivid and eye-catching coloration, enhances visual appeal and strengthens the sites attractiveness for social interaction and photo-taking.
⑥	Cultural-Themed Micro Green Space in the Zumiao Area, Chancheng District, Foshan	Chancheng District, Foshan	<i>Delonix regia</i> ; <i>Bombax ceiba</i> ; <i>Nephrolepis cordifolia</i>		1. <i>Delonix regia</i> and <i>Bombax ceiba</i> are characteristic tree species of the Lingnan region and are well aligned with the cultural theme of the site. 2. <i>Delonix regia</i> blooms in summer while <i>Bombax ceiba</i> flowers in spring, together creating a seasonally expressive cultural landscape.

3.2.2. Analysis of Urban Core Areas

In the spatial practice of metropolitan integration within the Guangzhou-Foshan urban agglomeration, green spaces in urban core areas have transcended their role as purely ecological carriers and have become key nodes for accommodating core urban functions and facilitating regional spatial coordination. Clearly defining their planning orientation and functional characteristics is therefore a crucial prerequisite for optimizing regional spatial structure and enhancing the performance of urban core

areas. However, existing studies have provided relatively fragmented classifications and basic information regarding green spaces in urban core areas, and a consolidated dataset of their defining characteristics has yet to be established.

To address this research gap, Table 4 takes green spaces within the urban cores of Guangzhou and Foshan as the research sample, systematically organizing their names and focusing on an analysis of their key design features.

Table 4. Classification of Urban Core Areas.

No.	Green Space Name	Location	Characteristic Plant Species	Image	Design Key Points Analysis
①	Street-Corner Green Space in Tianhe CBD, Guangzhou	Tianhe District, Guangzhou	<i>Ficus microcarpa</i> ; <i>Bougainvillea</i> ; <i>Ixora</i>		1. <i>Ficus microcarpa</i> is a native tree species of the Lingnan region, characterized by a dense canopy that can rapidly provide shade for pedestrian flows in the urban core area. 2. <i>Bougainvillea</i> and <i>Ixora</i> feature long flowering periods and vibrant colors, contributing to the enhancement of streetscape vitality in the CBD.
②	Community-Affiliated Green Space in the Zumiao Area, Chancheng District, Foshan	Chancheng District, Foshan	<i>Cinnamomum camphora</i> ; <i>Plumeria rubra</i> ; <i>Ophiopogon japonicus</i>		1. <i>Cinnamomum camphora</i> is an evergreen species with mosquito-repellent properties, contributing to improved comfort and usability for residents' leisure activities within the core urban community. 2. <i>Plumeria rubra</i>, characterized by its mild and pleasant fragrance, helps to create a tranquil atmosphere and mitigates the sensory impacts of the bustling environment surrounding the Zumiao area.
③	Transportation Node Green Space at Yuexiu Park Metro Station, Guangzhou	Yuexiu District, Guangzhou	<i>Lagerstroemia speciosa</i> ; <i>Zoysia tenuifolia</i> ; <i>Nephrolepis cordifolia</i>		1. <i>Lagerstroemia speciosa</i> blooms in summer, providing both shade and ornamental value, and is well suited to the waiting needs of high pedestrian volumes at metro entrances. 2. <i>Zoysia tenuifolia</i> exhibits

					strong trampling resistance, enabling it to withstand intensive foot traffic in high-density transit node areas.
④	Waterfront Micro Green Space at Qiandeng Lake, Nanhai District, Foshan	Nanhai District, Foshan	Phragmites australis; Nelumbo nucifera; Salix babylonica		1. <i>Phragmites australis</i> and <i>Nelumbo nucifera</i> are well adapted to the waterfront conditions of Qiandeng Lake, contributing to water purification and the protection of the ecological environment in the urban core area. 2. <i>Salix babylonica</i>, with its flexible, drooping branches reflected on the lake surface, enhances the waterscape experience and supports the recreational and tourism-oriented character of the Qiandeng Lake area.
⑤	Pocket Park at Yongqingfang, Liwan District, Guangzhou	Liwan District, Guangzhou	<i>Michelia alba</i> ; <i>Bougainvillea</i> ; <i>Gypsophila paniculata</i>		1. <i>Michelia alba</i> is a characteristic flowering species of the Lingnan region, noted for its rich fragrance, and is well suited to the leisurely atmosphere of pocket parks. 2. <i>Bougainvillea</i>, with its vivid coloration, enhances visual appeal and contributes to the attractiveness of Yongqingfang as a popular cultural and tourism destination.
⑥	Cultural-Themed Micro Green Space at Qinghui Garden, Shunde District, Foshan	Shunde District, Foshan	<i>Delonix regia</i> ; <i>Bombax ceiba</i> ; <i>Nephrolepis cordifolia</i>		1. <i>Delonix regia</i> and <i>Bombax ceiba</i> are representative tree species of the Lingnan region, aligning with the cultural theme of Qinghui Garden. Their broad canopies provide effective shading for visitors. 2. <i>Delonix regia</i> produces striking red flowers in summer, while <i>Bombax ceiba</i> blooms in spring,

					together creating a seasonally expressive cultural landscape.
--	--	--	--	--	---

Table 4 clearly identifies the corresponding dominant functional attributes of each site, thereby providing standardized baseline characteristic data to support subsequent research on functional coordination mechanisms and spatial planning optimization strategies for green spaces in urban core areas.

3.3. Core Principles and Innovative Framework for Micro Green Space Landscape Renewal under Guangzhou-Foshan Urban Integration

3.3.1. Principle of Ecological Corridor Connectivity: Landscape Design for Weaving a Cross- City Green Network

The core logic is grounded in patch-corridor theory, aiming to overcome the ecological isolation of micro green spaces within the Guangzhou-Foshan metropolitan area by establishing an integrated ecological network through design interventions that link “points, lines, and planes” [14]. In practical design applications, ecological buffer zones with a width of 3-5 meters are established at the interfaces between micro green spaces and regional ecological corridors. Pedestrian paths and bicycle lanes are employed as connective elements to link micro green spaces with surrounding parks, while permeable paving materials such as colored asphalt and grass-planting bricks are used to construct a continuous circulation network. Ecological signage indicating green network routes and plant species is installed at key nodes to enhance legibility and ecological awareness.

3.3.2. Principle of Functional Module Formation: Micro Green Space Design Adapted to Diverse Needs

The core logic is demand-oriented, focusing on user needs and achieving a composite configuration of “transportation interchange-leisure and recreation-community services” through the integration of functional modules, while strengthening adaptive coordination with surrounding facilities.

Guided by this approach, micro green spaces along metro corridors and in areas with high commuter density are equipped with charging stations incorporating embedded USB interfaces and shading canopies, as well as smart information screens displaying real-time transportation and weather data.

In addition, at interfaces with metro entrances, landscape access corridors are designed using a combination of glass and steel structures and connected to adjacent commercial complexes, incorporating flower borders and wayfinding signage. Shared service facilities such as smart vending machines and eco-friendly public toilets are also provided in a unified manner to enhance functional integration and user convenience.

3.3.3. Principle of Regional Symbol Translation: Cultural Expression in Place-Based Landscape Design

The core logic lies in deeply exploring the shared cultural origins of Guangzhou and Foshan and translating abstract cultural symbols into tangible landscape elements through design, thereby avoiding homogenization and reinforcing cultural identity. To

this end, symbolic translation involves extracting the contour lines of traditional huogable walls and reinterpreting them in the design of feature walls and pergola roof forms, utilizing precast concrete combined with wood-like surface finishes.

In terms of contextual adaptation, areas surrounding historic and cultural districts adopt a strategy of “traditional spatial composition combined with modern materials”, incorporating meandering pathways and perforated screen walls, complemented by Lingnan-style bonsai plantings such as *Murraya paniculata* and *Sageretia theezans*. Near intangible cultural heritage exhibition areas, interactive cultural installations such as mask-themed graffiti walls and dragon boat-patterned mosaic pavements are introduced, accompanied by cultural interpretation signage employing stone materials and gilt lettering to enhance narrative clarity and user engagement.

3.3.4. Similarities and Differences between Micro Green Spaces in Urban Core Areas and Guangzhou-Foshan Boundary Integration Zones

Although the above principles provide a general framework for micro green space landscape renewal under Guangzhou-Foshan metropolitan integration, their specific applications inevitably vary across different

spatial contexts. In particular, micro green spaces located in urban core areas and those situated within Guangzhou-Foshan boundary integration zones exhibit both notable similarities and clear differences.

On the one hand, micro green spaces in both contexts share overlapping basic functions, comparable spatial utilization logics, and broadly similar standards for supporting facilities. In this sense, they function as small-scale green infrastructures that contribute to ecological regulation, short-term leisure, and improvements in urban environmental quality. On the other hand, significant differences emerge in terms of core functional positioning and the structure of user groups they primarily serve. Urban core micro green spaces tend to emphasize daily leisure, cultural representation, and tourism-oriented functions for relatively stable local populations, whereas boundary integration micro green spaces place greater emphasis on transitional use, cross-city connectivity, and commuter-oriented services for a more mobile and heterogeneous population.

Recognizing these similarities and differences provides an essential analytical foundation for understanding why renewal strategies must be differentiated across locational contexts. It also offers a conceptual basis for the selection and comparative analysis of typical renewal cases in the Guangzhou-Foshan region, as discussed in the following section.

3.4. Typical Cases and Strategy Analysis

In the process of enhancing spatial quality under Guangzhou-Foshan metropolitan integration, green space renewal practices must be adapted to the functional positioning and spatial constraints of diverse locational contexts, such as historic and cultural districts, intercity boundary integration zones, and urban transportation nodes. Consequently, the selection of renewal strategies and the effectiveness of their implementation exhibit notable heterogeneity and differentiated outcomes [15].

Table 5 selects three representative categories of green space renewal projects within the Guangzhou-Foshan region: historic and cultural areas, intercity boundary integration zones, and urban transportation nodes. The table systematically

synthesizes the locational and contextual characteristics of each case, and organizes their core renewal strategies across ecological, functional, and cultural dimensions, while also summarizing implementation outcomes and existing limitations.

Table 5. *Analysis of Typical Cases and Renewal Strategies.*

Case Type	Case 1: Yongqingfang pocket Park, Liwan District, Guangzhou Urban Core- Oriented Micro Green Space	Case 2: Riverside Micro Green Space in Lishui Town, Nanhai District, Foshan Boundary Integration- Oriented Micro Green Space	Case 3: Exit-Area Micro Green Space, Shayong Station, Guangzhou- Foshan Metro Transportation Node- Oriented Micro Green Space
Location and Con- text	Located in the core area of Guangzhou-Foshan metropolitan integration (Xiguan, Liwan District), adjacent to Chancheng District in Foshan, the site is surrounded by historic and cultural neighborhoods. Prior to renewal, the area consisted of an underutilized vacant parcel characterized by a single function and disordered vegetation structure.	Located at the Guangzhou- Foshan boundary (Lishui in Nanhai District-Jiaoxin in Baiyun District), adjacent to a tributary of the Pearl River, the site was previously an underutilized riverside open space. Prior to renewal, it suffered from ecological degradation and poor accessibility.	Located at the exit of Shayong Station on the Guangzhou-Foshan Metro, at the boundary between Liwan District in Guangzhou and Nanhai District in Foshan, the site previously consisted of temporary greening. Before renewal, it lacked leisure facilities and exhibited weak spatial integration with the metro entrance.
Ecological- Level Renewal Strategies	Lingnan native plant species were selected, and permeable paving was introduced to echo the “rain alley” landscape character of the historic Yongqing- fang district.	The site is integrated into the Pearl River ecological corridor through the introduction of aquatic vegetation to restore the riparian ecosystem, while pedestrian pathways are constructed to connect with the Jiaoxin Greenway in Baiyun District, Guangzhou.	A composite planting structure of trees, shrubs, and groundcover was adopted, incorporating trampling-resistant vegetation to enhance ecological stability.
Functional- Level Renewal Strategies	Facilities such as resting benches and small performance platforms were installed to accommodate the needs of both tourists and local residents, while fostering functional synergy with surrounding cultural and creative businesses.	Facilities including a river- side walkway, viewing plat- forms, and commuter rest areas were introduced to accommodate both inter-city commuters and local residents.	Elements such as commuter seating, bicycle parking areas, and intercity information screens were installed to strengthen transportation connectivity and transfer functions.
Cultural- Level Re- newal Strategies	Lingnan architectural motifs, such as arcade (qilou) lines and Manchurian-style windows, were incorporated, along with	Elements of “Guangzhou-Foshan water-town culture” were integrated through the installation of dragon boat-shaped landscape lighting, illustrating	The ground paving incorporates patterns inspired by the Guangzhou-Foshan Metro route map, enhancing cross-city

	the installation of “Xiguan Culture” interpretive panels, to express the shared historical and cultural origins of Guangzhou and Foshan.	the historical water-town connections between Lishui and Baiyun.	legibility and symbolic identity.
Outcomes and Limitations	Outcomes: Following renewal, the site has become a popular destination and social media landmark within the Guangzhou-Foshan region, demonstrating a high level of cultural recognition and public appeal. Limitations: The project does not sufficiently address integration with cross-city ecological corridors, and its functional design lacks targeted adaptations for intercity commuters within the metropolitan context.	Outcomes: The project has significantly enhanced commuting convenience and demonstrates strong functional adaptability for cross-city travel. Limitations: Cultural expression is relatively limited, and ecological connectivity with surrounding green spaces remains insufficient.	

The comparative framework of cases presented in this table provides a concrete empirical basis for subsequent analysis of the key challenges associated with green space renewal in different locational contexts and for distilling context-specific optimization strategies.

4. Conclusions and Prospects

4.1. Research Conclusions

This study focuses on the renewal design of micro green spaces under Guangzhou-Foshan urban integration. Through a combination of field surveys, case analyses, and policy interpretation, first-hand data were collected from five representative micro green spaces (covering six major types) located in boundary integration zones and urban core areas of Guangzhou and Foshan. By integrating relevant policy frameworks and operational data from case studies, the study identifies prevailing issues in existing micro green spaces and highlights the lack of a cross-city collaborative perspective in current research, thereby underscoring the necessity of this investigation.

At the theoretical level, this research moves beyond the limitations of traditional point-based optimization approaches. In response to the integrated demands for ecological coordination and public space quality under urban integration, it constructs a three-in-one framework of “functional coordination, ecological interconnection, and cultural integration”. This framework elucidates the transformation logic of micro green spaces from “isolated landscapes” to “cross-city collaborative nodes”, providing theoretical insights for landscape studies from the perspective of urban integration.

At the practical level, the study proposes a “problem-theory-pathway” solution for micro green space renewal in the Guangzhou-Foshan region. It clarifies differentiated

renewal directions for micro green spaces across various locations and types, and offers implementable strategies such as the selection of native plant species. Furthermore, it proposes a “joint management mechanism” to address cross-city maintenance challenges, supporting the construction of an integrated Guangzhou-Foshan ecological green space system while also offering references for other urban integration regions in China.

4.2. Future Prospects

Although this study has identified the core issues, theoretical framework, and practical pathways for micro green space renewal under Guangzhou-Foshan metropolitan integration, the dynamic nature of the integration process and the expanding functional value of micro green spaces suggest the need for further in-depth exploration in three key aspects.

First, future research could expand the scope of investigation to include a wider range of micro green space types across the entire Guangzhou-Foshan region. By incorporating long-term monitoring data, it would be possible to analyze post-renewal ecological benefits and social feedback, thereby testing the long-term effectiveness of the proposed “three-in-one” framework. Second, the integration of big data and GIS-based spatial analysis could be employed to construct visualized models of micro green spaces, enabling more precise alignment with user demand while exploring the application of low-carbon technologies in support of China’s “dual-carbon” goals. Finally, further efforts could be made to promote the formulation of dedicated cross-city coordination policies between the two municipalities, clarifying mechanisms for cost sharing and standard harmonization, and establishing a multi-stakeholder governance model characterized by “government leadership, community participation, and enterprise co-construction”, so as to enhance the overall effectiveness of metropolitan integration governance.

Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

Funding

This work was supported by the Research Project of Ordinary Universities in Guangdong Province (Humanities and Social Sciences): Environmental Design: Exploring Teaching Research and Innovation for Micro-Scale Landscapes in the Urban Central Areas of the Guangdong-Hong Kong-Macao Greater Bay Area (Project Number: 2024GXJK366).

Acknowledgments

The author would like to acknowledge Professor Chang Na, the supervisor, who helped the author determine the topic of the thesis, provided guidance and suggestions in the field of expertise.

References

- [1] General Office of the Guangzhou Municipal People’s Government and Office of the Foshan Municipal People’s Government. Notice on issuing the 14th Five-Year Plan for comprehensive guangzhou–foshan integration, August 2022. Accessed August 1, 2022.

- [2] Shanghai Municipal Bureau of Planning and Natural Resources. Action plan for the 15-Minute Community Life Circle in shanghai (2025), April 2025. Accessed April 27, 2025.
- [3] Chao, G. Research on the status and renovation of small micro-green spaces in the old city of beijing based on urban repair. Master's thesis, North China University of Technology, 2019.
- [4] Luo, X.; Guo, X.Y. Green spaces in the city: A study on the design of the jinzihe small park renewal in kunming. *Footwear Craft and Design*, 2023, 3(14), 111-113, .
- [5] Xin Fang and Xiaoyan Ma. A study on the distribution characteristics of pocket parks in the core area of beijing based on GIS. *Journal of Beijing Agricultural College*, 2020, 35(02), 94-99.
- [6] Chen, M.; Dai, F. A study on the service range and optimization layout of urban park green spaces in jiangnan district based on GIS. *Chinese Urban Forestry*, 2017, 15(03), 16-20, .
- [7] Pan, Y.; Liu, Q. Modern evolution of the concept of urban green space from the perspective of open space. *Urban Planning*, 2020, 44(04), 83-89.
- [8] Jacobs. *The Death and Life of Great American Cities*. Yilin Press, 2020.
- [9] Liu, B.J. Current situation and countermeasures of urban ecological construction in china. *Science and Technology Innovation Herald*, 2010, 34, 38.
- [10] Yang, L.M.; Shi, W.N.; Nobuyoshi Fujimoto. Pocket parks: A place for rest and use. *New Architecture*, 1991, 04, 54-57.
- [11] Wang, B.Y.; Feng, S.C.; Yu, Z.Q.; He, K.; Qin, Z.Y. Understanding the micro current status, frontiers, and prospects of urban micro-green space research. *Gardening*, 2023, 40(11), 89-97.
- [12] Fan, B.B.; Lu, Y.Z.; Yin, J.; Zhai, Y.J.; Yu, J.Y. The impact of urban micro-green space scale and type on young peoples perception preferences and recovery benefits. *New Architecture*, 2024, 06, 37-42.
- [13] Deng, Y.Y. Renovation and design optimization of small landscape plants in urban microspaces. *Molecular Plant Breeding*, 2025, 23(13), 4541-4546.
- [14] Lu, X.H.; Wang, Y.C.; Wang, R.J. Biodiversity of urban micro-green spaces: Values, nflu- encing factors, and enhancement methods. *Gardening*, 2023, 40(12), 22-29.
- [15] Tang, J.X. A study on the acoustic environment of urban micro-green spaces from a restorative perspective. Master's thesis, Qingdao University of Technology, 2024.



© 2026 by the author(s); licensee International Technology and Science Publications (ITS), this work for open access publication is under the Creative Commons Attribution International License (CC BY 4.0). (<http://creativecommons.org/licenses/by/4.0/>)