Research on the "Elderly-Friendly + Child-Friendly" Multifunctional Design of Pocket Parks in Urban Aged Residential Areas

Chenxi Wang

Shenzhen General Institute of Architectural Design and Research Co., Ltd., Hefei Branch, Hefei, Anhui, 230000, China

Keywords: Pocket park; Aged residential area; Elderly-friendly design; Child-friendly space; Multifunctional; Urban renewal

Abstract: As urban renewal progresses deeper alongside the increasingly prominent trends of population aging and declining birth rates, urban aged residential areas face numerous challenges such as scarce public space, outdated facilities, and single functions. Pocket parks, as a small-scale, high-efficiency form of urban public space, play an increasingly vital role in the renewal of these areas. This research focuses on the "Elderly-Friendly + Child-Friendly" multifunctional design of pocket parks within urban aged residential areas. Through analyzing their current development status and challenges, exploring the theoretical basis for multifunctional design, and combining this with exemplary domestic case studies, the study proposes design strategies across four dimensions: Age-Friendly Spatial Layout, Intergenerational Integration in Functional Configuration, Perceptual Experience in Landscape Design, and Universal Accessibility Ensuring Safety. The research demonstrates that the "Elderly-Friendly + Child-Friendly" multifunctional design can not only effectively enhance the spatial quality of aged communities but also foster intergenerational interaction and invigorate community vitality, holding significant importance for promoting high-quality urban development.

1. Introduction

In the deepening urbanization process, the renewal and renovation of aged residential areas have become crucial measures for enhancing urban quality and improving people's livelihoods. Pocket parks, characterized by their compact size, flexibility, and proximity to daily life, have emerged as an effective solution to the public space dilemma in these areas. However, current pocket park designs often adopt a "one-size-fits-all" standardized approach, overlooking the differentiated needs of various age groups, particularly the elderly and children. Against the backdrop of profound demographic shifts, a key challenge in pocket park design is how to integrate the functions of leisure and health maintenance for the elderly with play and development for children within limited space, thereby creating harmonious public spaces for intergenerational enjoyment.

2. Development Status and Challenges of Pocket Parks in Urban Aged Residential Areas

Pocket parks in urban aged residential areas face numerous practical difficulties. The most prominent is the deep-seated contradiction between limited spatial resources and increasingly diverse functional demands. This conflict manifests not only in physical space constraints but also in the fundamental challenge of effectively satisfying the differing needs of various age groups within the same space.

2.1 Contradiction between Limited Spatial Resources and Diverse Functional Demands

Aged urban residential areas built in the 1980s and 1990s often suffer from high building density, scarce public space, and low greening rates due to outdated planning concepts and construction standards ill-suited to contemporary urban living needs [1]. For instance, per capita public activity space in many Chinese aged communities is less than 2 square meters, far below current standards. In this context, pocket park construction faces the dilemma of "performing elaborate rituals in tiny

  DOI: 10.25236/icacel.2025.010

spaces" (maximizing functionality in confined areas). Within extremely limited space, designers must meet the usage needs of residents across all age groups while also addressing multiple functions like beautifying the environment, improving ecology, and fostering social interaction. The elderly require comfortable rest areas, accessible fitness facilities, and safe pedestrian environments. Children crave playful spaces, diverse activity equipment, and natural exploration areas. Middle-aged and younger adults expect spaces combining fitness, social gatherings, and parent-child interaction. This diversity and differentiation of functional needs clash sharply with finite spatial resources, rendering traditional functional zoning models ineffective.

2.2 Imbalance between Monotonous Facility Configuration and Diverse User Groups

A notable phenomenon in current pocket park renovations within aged communities is a significant emphasis on form over function. Facility configuration exhibits considerable homogeneity and superficiality. For example, commonly installed items include standardized fitness equipment, nearly identical benches, and simple, crude children's slides. While these meet basic needs at some level, they fail to adequately account for differences in the physiological characteristics, psychological needs, and behavioral patterns of different user groups. Facilities for the elderly often lack designs tailored to their specific requirements, such as careful consideration of handrail height, seat depth, and activity intensity. Children's facilities frequently suffer from low fun factor, insufficient challenge, and poor age-group differentiation. Crucially, current facility configurations typically adopt a segregated approach, separating elderly activity zones from children's play areas, lacking shared spaces or interactive facilities that promote intergenerational communication.

3. Theoretical Basis of "Elderly-Friendly + Child-Friendly" Multifunctional Design

The concept of "Elderly-Friendly + Child-Friendly" multifunctional design is not arbitrary but grounded in solid theoretical foundations. The Age-Friendly City concept provides crucial theoretical support and value orientation for this design practice, offering a scientific framework for achieving spatial integration across age groups at the micro scale.

3.1 Spatial Practice of the Age-Friendly City Concept

The Age-Friendly City concept emphasizes that urban spaces should meet the needs of the entire life cycle, from infants to the elderly, creating an inclusive, equitable, and sustainable living environment [2]. Originating from the WHO's "Age-Friendly Cities" and UNICEF's "Child-Friendly Cities" initiatives, this concept has evolved in practice into the more comprehensive Age-Friendly approach. In pocket park design, Age-Friendly means breaking down traditional age segregation and creating public spaces accessible and enjoyable for all age groups. The "Elderly-Friendly + Child-Friendly" multifunctional design, as a micro-scale embodiment of this concept, goes beyond merely juxtaposing elderly and children's zones. It creates scenarios for grandparent-grandchild enjoyment and intergenerational interaction through clever spatial organization, organic functional integration, and universally designed facilities. This design philosophy recognizes that while the elderly and children differ in physical and cognitive abilities, they share common ground in emotional needs and social desires.

3.2 Spatial Demand Analysis from an Environmental-Behavior Perspective

Environmental-Behavior studies show that human behavior patterns are profoundly influenced by spatial environments, and different age groups exhibit distinct behavioral characteristics in space usage. The elderly in public spaces tend towards static activities (e.g., resting, viewing, chatting), requiring comfortable seating, adequate shade, and good visibility. Due to strong social needs and preferences for familiar environments and neighborly interaction, spaces fostering a sense of belonging and security are essential. Children's spatial behavior is primarily dynamic exploration—cognizing the world, developing abilities, and building social skills through play. They need challenging and fun play equipment, diverse activity areas, and opportunities to engage

with nature. Crucially, their space use often involves caregivers, necessitating rest facilities near play areas for "supervision + rest" multifunctionality.

4. Design Strategies for "Elderly-Friendly + Child-Friendly" Multifunctional Pocket Parks

Based on the preceding theoretical analysis and practical needs, this research proposes a systematic design strategy across four dimensions, aiming to achieve functional integration and quality enhancement through multi-level, multi-angle approaches. Age-Friendly spatial layout serves as the primary strategy, establishing the foundation for spatial organization.

4.1 Age-Friendly Spatial Layout Design

Age-Friendly spatial layout emphasizes creating diverse activity places catering to different age groups within a constrained site through flexible, composite spatial organization strategies [3]. This approach abandons traditional functional zoning in favor of a "core-periphery" spatial structure. Functions with high sharing potential are placed centrally, while group-specific functions are arranged around the periphery. Clever circulation design achieves separation of dynamic/static zones and visual permeability. Simultaneously, employing a "time-sharing" strategy allows the same space to serve different groups at different times (e.g., morning exercise for seniors transforming into a children's playground in the afternoon), enabling temporal complementarity. Furthermore, creating multifunctional "transitional gray spaces" (e.g., pergolas, pavilions) serves as sheltered rest areas for the elderly while providing playful hide-and-seek spaces for children, achieving multiple benefits.

The renovation of Shanghai Lexingtong Green (Lexington Green) exemplifies this concept. The project features an 80-meter "People's Joy Corridor" as its spatial spine, using a large-span lightweight structure to ensure visual permeability and unimpeded flow inside and outside the corridor. The space beneath the corridor skillfully integrates shaded rest areas, a shared reading space, and green space management rooms, effectively addressing diverse needs like public recreation and community governance. Centered around the "Source of Joy" community stage, areas like shared fitness facilities and children's play spaces naturally blend with greenery. A 400-meter circular slow-running path organically connects the areas outside, beneath, and inside the corridor, forming an Age-Friendly spatial pattern suitable for all ages and activity levels.

4.2 Intergenerational Integration in Functional Configuration Design

Intergenerationally integrated functional configuration focuses on creating shared facilities and activity scenarios that promote interaction between different age groups. Through overlapping, transforming, and complementary functions, it maximizes spatial efficiency. This strategy emphasizes "Shared Priority, Dedicated Supplement": prioritizing facilities usable by multiple generations simultaneously, like musical fountains, landscape water features, and art installations, which attract children to play while providing visual enjoyment and conversation topics for the elderly. Simultaneously, installing "Grandparent-Grandchild Fun" play equipment—such as low-difficulty climbing structures, safe swing seats, and interactive fitness machines—encourages elderly participation in children's play, fostering bonding through companionship. Additionally, leveraging smart and technological means (e.g., interactive projections, musical floors, sensor lighting) creates novel and engaging experiential scenarios, stimulating participation across age groups and realizing a win-win of "joy for the elderly, enrichment for the young."

Shenzhen Shenwan Neighborhood Park (Shenwan Street Park) exemplifies consideration for diverse functional needs. The project utilizes a wind-powered rainwater garden system that lifts stored rainwater to an aqueduct bridge, forming a self-circulating water feature network. This dynamic waterscape provides ecological education, stimulating children's curiosity and exploration, while offering visually pleasing scenery for the elderly. A 320-meter slow-running path winds through golden trumpet tree groves and miscanthus grass communities, constructed with permeable concrete to provide a shared interface for community walkers, joggers, elderly strollers, children cyclists, and younger fitness runners. While the skate park primarily targets youth, its fair-faced

concrete texture and flowing curved forms also create an engaging viewing spot for the elderly and an interesting play backdrop for children, achieving functional diversity and sharing.

4.3 Perceptual Experience in Landscape Design

Perceptual experience landscape design emphasizes stimulating multiple senses to create rich, diverse spatial sensations for all ages, evoking emotional resonance and place identity. This approach carefully considers the differing perceptual characteristics of the elderly and children. While elderly may experience diminished vision/hearing, their emotional connection to the environment is more nuanced, with stronger affinity for familiar elements. Children are particularly sensitive to sensory stimuli like color, sound, and touch and are drawn to novel and fun environmental elements. Therefore, in plant selection, species that offer seasonal interest (flowering, foliage, form) and include fragrant flowers and interesting fruits are chosen—providing spring blooms, summer shade, autumn colors, and winter structure—creating a poetic environment for the elderly and serving as natural education resources for children.

Shanghai Yongjia Road Pocket Plaza (Yongjia Road Pocket Square) demonstrates unique landscape design. The project uses red permeable paving bricks resonating with the historical memory of the old city, evoking familiarity and belonging among elderly residents. Light-colored timber for beams, soffits, and seating systems creates a warm tactile feel, encouraging children to climb and touch safely. Weathering steel walls showcase rust-red patina, serving as educational "time textbooks." Notably, steel columns are painted with bright green fluorocarbon paint—a vibrant, leaping color that attracts children's attention, injects vitality into the space, and allows the elderly to sense the vibrancy of life.

4.4 Universal Accessibility Design Ensuring Safety

Universal accessibility design forms the foundational guarantee for truly Age-Friendly pocket parks. It demands meticulous consideration of the mobility limitations of the elderly and the safety needs of children to eliminate barriers and reduce risks. Examples include:

For the Elderly: Using gentle ramps instead of steps; installing continuous handrail systems; providing ample lighting to ensure barrier-free access for wheelchairs/walkers; designing seats considering ease of sitting/standing (appropriate height, reasonable backrest angle, sturdy armrests); using slip-resistant, durable ground materials to prevent wet-weather falls.

For Children: Ensuring play equipment meets safety standards; utilizing soft ground surfaces to cushion falls; applying rounded corners/edges to prevent injuries; installing railings around activity zones with clear sightlines for supervision.

The renovation of Shanghai Changli Garden (Changli Yuan) embodies this concept. The project uses a zigzagging path as its spatial skeleton. All paths feature barrier-free ramp designs with slopes below 1:20 to ensure smooth passage for wheelchairs and strollers. A covered walkway follows the path with rhythmic inward/outward variations. Pillar spacing and height are meticulously calculated to provide shade/shelter without hindering movement, also offering support points for elderly rest. The children's play area specifically uses colored rubber surfacing with good shock absorption to reduce injury risk from falls. The lighting system employs timed zoning control, ensuring safety for evening activities while creating a warm, comfortable ambiance.

Conclusion

The "Elderly-Friendly + Child-Friendly" multifunctional design of pocket parks in urban aged residential areas, achieved by comprehensively applying strategies of Age-Friendly spatial layout, Intergenerational Integration in functional configuration, Perceptual Experience in landscape design, and Universal Accessibility ensuring safety, represents not only innovation in design techniques but also progress in social governance concepts. It is a vital exploration in addressing demographic shifts and enhancing community living quality. In the future, as urban renewal advances, the multifunctional design of pocket parks will continue to develop in theoretical depth, technological innovation, and institutional refinement. We anticipate more design practices that adapt to local

conditions and implement precise policies, transforming every pocket park into a "Pocket of Happiness" where residents share a better life, infusing new vitality into sustainable urban development.

References

[1] HUANG Qixin. Research on Elderly-Friendly Renovation Design of Urban Pocket Parks[D]. Jimei University, 2025.

[2] LI Jianfen. Research on Architectural Activation Design of Pocket Parks in Aged Communities Under Urban Micro-Regeneration[C] // Chongqing Big Data and AI Industry Association, Chongqing Architecture Editorial Board, Chongqing Architecture Association. Proceedings of the Symposium on Smart Building and Intelligent Economy Construction (II). Hangzhou Linping Security Technology Co., Ltd., 2025: 617-620.

[3] LIU Yi, LEI Wen. Soundscape Ecological Micro-Regeneration in Aged Community Parks Under Carbon Neutrality Background[J]. Art & Design (Urban Edition), 2024, (12): 82-84.