

Pet-Friendly Mountain Trails: Integrating Ecological Restoration and Public Activity Spaces in Urban Natural Corridors

Di CHE^{1*}, Shuang HAO², Yanyu LONG¹, Xinrui XU³, Xue YANG²,
Yuan LIN¹, Huai HUANG¹, Xuan PENG¹, Rongyi XIE¹

¹ Shenzhen Weiming Design Consulting Co., Ltd., Shenzhen 518000, China

² Shenzhen Hupan Cultural Communication Co., Ltd., Shenzhen 518000, China

³ Shenzhen Hi Paw Cultural Creativity Co., Ltd., Shenzhen 518000, China

*CORRESPONDING AUTHOR

Address: Room 304, Tower C, Fantasia Year-Fragrant Year Plaza, Shahe Street, Nanshan District, Shenzhen 518000, China
Email: 61367009@qq.com

FEATURES

Mountain Trail; District Coordination;
Ecological Restoration; Public Space;
Nature Education; Pet-Friendly Design

PRACTICE REFLECTIONS

- Identifying natural corridors in high-density urban contexts to realize multiple functions, including mountain trails, nature education, and pet-friendly spaces, through nature-oriented low-intervention and cost-effective approaches
- Deconstructing design objectives and implementation strategies for mountain trails that balance urban ecological restoration with public activity spaces, providing a replicable reference for practice
- Advancing research on the usage needs and feedback of diverse urban residents, particularly pet owners, to inform the planning and design of multi-functional mountain trail spaces

1 Project Background

The “Mountains–Sea Connecting City Plan” in Shenzhen has established a hiking trail and mountain trail system known as the “Three Trails and Three Routes.” By connecting suburban natural sites through these trails, the system integrates urban and suburban areas both physically and in terms of lifestyle, and has initially formed a framework with demonstrative significance.



Fig. 1 A nature-friendly handcrafted trail designed with minimal intervention.

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Fig. 2 The Luofang Park Mountain Trail is integrated with greenways and cycling networks to connect natural systems and activity spaces into an urban green corridor.

Fig. 3 A low-intervention entrance design breaks through the retaining wall barrier.

There is an urgent need for representative, characteristic practices to take a leading role in the comprehensive design of urban-suburban spaces that integrate cross-boundary coordination, ecological restoration, and public service innovation.

The Wutong Mountain-Shenzhen Reservoir-Liantang area in Luohu District is highly representative in Shenzhen, both in terms of natural ecology—particularly biodiversity—and the history and culture of Shenzhen-Hong Kong exchanges and

regional development. “Threading the needle” through the city’s early high-density built-up areas to unlock the ecological and cultural landmark value of this area, and to create continuous suburban activity spaces within close reach of citizens, is of pioneering and exploratory significance.

Meanwhile, with the transformation of urban lifestyles and the growing demand for emotional companionship in recent years, the concept of “pet-friendly” has attracted widespread attention and become an

important indicator of a city’s inclusiveness and humanistic care. However, research and practice on extending the “pet-friendly” concept from commercial spaces to the urban public realm, particularly in well-preserved suburban natural areas, remain in their infancy. Constructing suburban public spaces that harmonize humans and nature while meeting the behavioral and psychological needs of both people and pets poses a new challenge for landscape design.

2 Design Process

2.1 Establishing Urban Natural Corridors Through District Coordination

The Luofang Park Mountain Trail extends for approximately 2 km through Maowo Mountain, located on the northwest bank of the Liantang River (a tributary in the upper reaches of the Shenzhen River), which serves as a boundary between Shenzhen and Hong Kong, China. It extends northward to Liantang Port, connecting with the Donghu Park Mountain Trail and the Shenzhen-Hong Kong cycling greenway.

District-level coordination has been undertaken since the design and construction of the Donghu Park Mountain Trail in 2024. Through this trail system,

Fig. 4 A handcrafted trail using locally sourced materials balances ecological protection and recreational use, with ecological construction techniques minimizing soil erosion.



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Fig. 5 Handcrafted trail resting facilities are strategically co-located with the interpretive system.



Fig. 6 Interpretive, interactive trail nodes enable visitors to “read” the mountain and the city.

the urban ecological and open space framework surrounding key ecological assets is extended to adjacent urban areas, establishing connectivity between natural and public activity spaces. In coordination with the enhancement of greenways and cycling paths, the area’s iconic urban natural ecological framework and urban nature experience network—comprising two mountain trails, the Wutong Greenway and the Shenzhen Reservoir Greenway—are integrated to form an accessible urban natural corridor for citizens.

2.2 Strategies for Low-Intervention and Cost-Effective Mountain Hiking Trails

The construction of the mountain trail focuses on key site-specific issues. First, critical problems were identified, such as spatial fragmentation caused by the retaining wall at the Luosha Road entrance and the risk of soil erosion along the original dirt-and-rock paths. Subsequently,

the low-intervention and cost-effective construction methods were employed to improve site quality and enhance the hiking experience.

Examples include the creation of an entrance “box” that provides a safe and comfortable passage while preserving the natural landscape, and the use of nature-based construction techniques tailored to local conditions to build handcrafted trails with both ecological resilience and recreational value. Guided by the principles of “zero increase in cement paving, zero loss of ecological resources, and zero impact on the natural environment,” the project enables hikers to move seamlessly between urban and suburban areas, fostering a deeper perception of and connection with nature while minimizing ecological impact.

2.3 Interpretive and Interactive Nature Education Trail

As a nature education trail, the Luofang

Park Mountain Trail adopts “symbiosis” as its central theme. It presents educational content highlighting the “symbiosis between plants and animals” within Lingnan forests, the “human–nature symbiosis” embodied in ecological construction techniques, and the “Shenzhen–Hong Kong symbiosis” shaped by the regional geographical landscape.

Through interpretive signage and interactive installations, these themes are translated into a series of observation and learning nodes along the trail. This approach allows for public engagement of “reading” the natural environment and experiencing ecological concepts in an interactive and immersive manner.

2.4 Pioneering the Concept of Pet-Friendly Mountain Trails

The project establishes Shenzhen’s first pet-friendly mountain trail by balancing trail safety with ecological compatibility for pets. This is achieved through the implementation of visual identity systems that emphasize natural elements and emotional connections, the development of layered signage and behavior guidance systems integrated with the natural environment, and the construction of innovative interactive facilities.

One of the most representative innovations is the “Pet Library,” which integrates pet sensory engagement with nature education. Recognizing that pets rely heavily on olfactory exploration, the facility features a “Pet Enrichment Branch Sharing Station” stocked with branches from plants such as *Zanthoxylum avicennae*, *Acronychia pedunculata*, and



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Fig. 7 Co-creation of the Pet Library.

Fig. 8 The Pet Library integrates pet engagement with nature education.

Fig. 9 Pet-friendly hiking experience along mountain trails.

Fig. 10 Pet-friendly visual signage and plant science interpretive signage incorporating pet-related knowledge.

Tetradium glabrifolium. These species are non-toxic to pets and naturally aromatic. The installation encourages pets to sniff and explore, providing environmental enrichment while also serving as a medium for nature education.

2.5 A Mountain Trail Co-created With Citizens

The co-creation process of the mountain trail engages diverse user groups, including nearby residents, families, hiking enthusiasts, and pet owners. By integrating volunteer activities with nature education, hiking experiences, and pet-related events, participants are invited to experience the trail firsthand,

provide feedback, and take part in its construction and maintenance. This approach enables users with diverse needs to contribute to the project and ultimately fosters shared recognition and adoption of the trail's design principles and usage philosophy.

3 Project Review

Following its completion and opening, the Luofang Park Mountain Trail has enhanced the district's accessible urban natural corridor network. Together with nearby trails and hiking routes, it has become a popular new option for outdoor recreation among residents. As the city's

first “pet-friendly” mountain trail, it has attracted many pet owners and generated extensive online engagement and discussion. The project's pioneering approaches in district coordination, suburban public space design, and pet-friendly design offer valuable references and serve as a distinctive demonstrative case of sustainable coexistence between urban and natural areas, guided by a hiking and mountain trail system.

Competing interests | The authors declare that they have no competing interests.

Project Name: Luofang Park Mountain Trail in Luohu District, Shenzhen

Location: Shenzhen, China

Size (area): 2 km (trail length)

Client: Urban Management and Comprehensive Law Enforcement Bureau of Luohu District, Shenzhen

Landscape Architecture: Shenzhen Weiming Design Consulting Co., Ltd.; Shenzhen Hupan Cultural Communication Co., Ltd.; Shenzhen Hi Paw Cultural Creativity Co., Ltd.

Project Team: Di Che, Yanyu Long, Yuan Lin, Huai Huang, Zuoshi Qin, Xuan Peng, Weisong Wang, Rongyi Xie, Lixia Yao, Lei Yu, Tingting Li, Yi Ding (landscape architecture); Shuang Hao, Xue Yang, Jiahao Chen, Ni Yang, Yuchu Huang (nature education interpretation system and activity planning); Xinrui Xu, Chengrong Zheng, Yujun Liu, Danni Yang, Bo Pang, Zhengyue Lin, Yayi Zhao, Zhenchuan Chen (pet-friendly design and planning); Minmin He, Fangting Li, Xinyi Shi (illustration drawing)

Collaborator: Department of Landscape Architecture, College of Architecture, Changsha University of Science and Technology

Supporting Institutions: Urban Environments and Human Health Lab, The University of Hong Kong; Peking University Shenzhen Institute; Peking University Planning and Design Institute, Shenzhen Branch

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