

Analysis of the Design Needs of Urban Pet-friendly Parks from the Perspective of Human-pet Coexistence

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Abstract: Under the background of accelerated urbanisation, the rapid growth of the number of pets has promoted the transformation of public space, and pet-friendly parks have become a key measure to balance the human-pet relationship and enhance the vitality of the city. From the perspective of human-pet coexistence, this article builds a multi-dimensional analysis framework. First, it deeply explores the differentiated demands of pet owners, pet individuals and diverse groups. Secondly, it systematically sorts out the specific requirements of functional layout, facility materials and ecological integration. Finally, it puts forward the phased design path and sustainable management strategy. The research adopts a combination of demand-driven and practice-oriented methods, emphasising safety, comfort and inclusion, and reducing conflicts and promoting interaction through spatial innovation and technology empowerment. Finally, a complete plan from foundation transformation to demonstration guidance is formed, which not only provides reference for the planning department, but also creates a harmonious and shared leisure environment for residents. Practical application shows that such parks can significantly reduce management pressure, improve use satisfaction, and help the construction of ecological cities.

Keywords: Human-pet coexistence, pet-friendly park, user demand analysis, functional zoning design, digital management.

1. Introduction

With the continuous acceleration of urbanisation in China, the quality of life of residents continues to improve, the scale of urban pet breeding is expanding year by year, and the demand for pet walking and leisure continues to rise. At present, most urban public parks lack pet-exclusive activity space. The functional facilities are not perfect and the space division is vague, causing problems such as mixed people and pets, poor environmental sanitation, and frequent safety conflicts. Traditional urban parks can no longer adapt to the pet leisure needs of modern residents. From the perspective of human-pet coexistence, pet-friendly parks have become an important carrier for optimising urban public space, balancing the demands of diverse people, and resolving pet conflicts. In order to scientifically promote the construction of pet-friendly parks, this article takes the diversified user needs as the core, cuts into three groups of pet owners, pets themselves and non-pet residents, and systematically analyses the differentiated use demands[1-3]. At the same time, from the three dimensions of spatial layout, facility materials and ecological integration, we will sort out the special design requirements of the park, formulate a phased construction plan, and combine it with the long-term operation mechanism of digital management and public education to provide a reference basis for the planning, design, operation and maintenance management of urban pet-friendly public spaces.

2. Analysis of User Needs of Urban Pet-friendly Parks

2.1. The Core Needs of Pet Owners

With the improvement of urbanisation, the number of families raising pets in cities continues to rise, residents' demand for walking pets and leisure is increasing, and pet owners have also put forward differentiated and refined use requirements for park facilities. Combined with the research data of domestic pet owners, among the 820 pet owners interviewed, the proportion of demand for safety protection facilities, convenient health facilities, leisure facilities, and training sites is shown in Figure 1. Pet owners mostly enter the park in the morning and evening, and there is a strong demand for convenient entrances and clear guidance. There are obvious differences at the population level. Among them, young white pets account for 59%, focussing on rest seats, WiFi and other leisure and social support; middle-aged and elderly pet-raising people account for 27%, and pay more attention to barrier-free ramps and sunshade facilities. Take Hangzhou Riverside Pet-Friendly Park as an example, which is equipped with supporting facilities in a targeted manner to meet the needs of different groups of people. At the same time, toilet bag stations, sinks and other sanitary facilities, and stable protective fences are all rigid needs. In general, the needs of pet owners are concentrated in the three aspects of convenience of use, emotional companionship and civilised pet raising. The design needs to rely on humanised details to optimise the use experience of the park.



Figure 1. The proportion of core needs of animal owners

2.2. Behaviour and Physiological Needs of Pets

After pets enter the park, instinct drives them to run, sniff and interact, so a large area of soft ground is needed for them to chase freely to avoid damage to the joints caused by hard paving. Small dogs prefer exploration paths and low obstacles, while large dogs need open running areas and water play facilities to meet physical energy consumption. The characteristics of olfactory-dominated animals require the establishment of different odour plant areas or toy stations to stimulate sensory development. At the physiological level, drinking fountains need to be distributed at multiple points to prevent dehydration; shade pavilions and rest mats help regulate body temperature, especially in summer. The excretion area should be planned separately, equipped with easy-to-clean materials and deodorising systems to maintain hygiene. Behavioural observation shows that regular socialising can reduce pet anxiety, so the design needs to include a safe interactive area to promote peer communication. Combining these characteristics, meeting the needs of pets can significantly reduce the destructive behaviour and improve the overall order of the park.

2.3. Coexistence Needs of Diverse User Groups

Non-pet residents and children's families use the park equally frequently. They look forward to achieving safe coexistence through buffering green belts or time zoning to avoid the uneasiness caused by sudden contact. The elderly want the quiet rest area to stay away from the noisy activity area, while parents should pay attention to keep a reasonable distance between the children's play area and the pet area, and set up educational signs to guide civilised interaction. Users with different cultural backgrounds have different attitudes towards pets, so the design needs to integrate inclusive elements, such as multilingual prompts and adjustable activity periods. Community activity participants hope to reserve a collective area for pet theme days or mixed activities to promote neighbourhood communication[4-5]. The way to balance lies in clear boundaries and flexible guidance, which not only protects the rights and interests of minorities, but also does not exclude mainstream needs. The logic of pluralistic coexistence can create a harmonious atmosphere and make the park truly a friendly space for all ages.

3. Analysis of the Design Needs of Urban Pet-friendly Parks

3.1. Functional Zoning and Spatial Layout Requirements

The first step in entering the park starts from the entrance buffer transition zone, where spacious guide passages and information screens are set up to help the owner quickly understand the zoning distribution and usage rules, and then naturally transition to various functional areas. The active sports area is located in the east of the middle of the park. It uses an oval circular runway combined with wavy microterrain to encourage pets to run and chase freely, and reserves multiple branch trails to increase the fun of exploration. The quiet rest area is arranged in the west shaded area, equipped with low seats and viewing platforms, which is convenient for the owner to stay comfortably and observe pets at any time. The training interactive area is selected in the relatively independent northeast corner to meet the training needs of pets of different sizes through moveable obstacle combinations and agile equipment. During the layout process, special attention is paid to the permeability of the line of sight to avoid the tall solid wall blocking the field of view. At the same time, the vegetation belt and gentle slope are used to form flexible boundaries to maintain the continuity and visual comfort of the landscape. At night, induction LED lighting is used to cover the intersection of the sports area and the path, and combined with low-level surveillance cameras to improve safety and security. The overall space gradually changes from the central high-density functional area to the periphery into a natural wild zone. The density gradient from the inside to the outside not only meets the concentrated use during peak hours, but also provides a quiet corner for the low-peak periods. The seasonal adjustment mechanism allows temporary boundaries to be changed according to feedback, such as expanding shade areas in summer or increasing wind shelter space in winter. The spatial layout logic of dynamic adaptability shapes the park into an organic system that can be continuously optimised with user habits and environmental changes, and finally achieves long-term efficient utilisation and sustainable operation.

3.2. Requirements for Facility Configuration and Material Selection

Safety protection has always been at the forefront of facility configuration. The height-adjustable fence system combined with the double-door escape gate design can effectively prevent pets from running out accidentally. At the same time, the ground is paved with permeable concrete with slopes to ensure rapid drainage on rainy days to avoid water stagnation. After entering the comfort level, the drinking water facilities are equipped with multi-height water outlets and automatic induction switches to meet the different needs of small dogs to large dogs; the pet bolt columns are evenly distributed around the seat, which is convenient for the owner to stay and rest for a short time without having to be tied all the time. The cleaning and maintenance area is equipped with intelligent induction toilet bag dispenser, pedal trash cans and ultraviolet disinfection floor mats to minimise daily manpower input. In the selection of materials, priority is given to the balance of touch and durability. The environmentally friendly rubber particle floor has good cushioning performance through professional certification, which reduces the pressure on the pet's joints. The artificial lawn is made of non-toxic flame-retardant fibres and tested by a third party. The surface of the wooden platform has been finely polished and anti-punctured. For disabled pets, a gentle slope channel is specially added to replace the traditional steps, and a blind guide texture is added at key positions. This progressive configuration method, from basic safety protection to daily comfort experience, and then to cutting-edge intelligent assistance, can meet the pain points of the current actual use and reserve interfaces for future technology upgrades[6]. The final facility system is not only economical and practical, but also reflects respect for the dignity of pet life and the control of maintenance costs.

3.3. Environmental and Ecological Integration Needs

At the beginning of the design, the overall planning was guided by the principle of ecological priority. The multi-layer plant community of local Qiaoguancao forms a rich vertical structure, which not only provides multi-level shade and exploration space for pets, but also attracts butterflies, bees and other insects and birds to live, greatly enriching the sensory stimulation experience of pets. The rainwater garden is cleverly combined with the pet activity area to realise the natural collection and purification of rainwater through shallow wetlands and filtration layers, while creating a dynamic waterscape and improving visual and auditory comfort. The soil uses an improved substrate with high breathability and moisture, which can not only support the growth of vegetation, but also effectively buffer the damage to the root system by pet digging behaviour. Through detailed light simulation, dominant wind direction analysis and topographic mapping, the location of different tree species

can be scientifically configured to avoid local overheating in summer or excessive exposure in winter. Ecological monitoring points are distributed at key nodes, and soil, water quality and biodiversity data are collected regularly, making the park a quantifiable urban micro-ecological laboratory. From the optimisation of micro-environmental elements to the construction of macro-ecosystems, to the complete integration path of continuous monitoring and feedback, the design can break through the category of simple functionalism, truly realise the dynamic balance and benign interaction between people and nature, pets and ecology, and provide vivid examples for the construction of urban green infrastructure.

4. Design Suggestions for Urban Pet-friendly Parks

4.1. From Basic Type to Demonstration Type

The construction of pet-friendly parks should adopt a phased promotion strategy, starting from the basic type first. At the beginning, the existing small green spaces or corner open spaces in the community can be selected for rapid transformation, focussing on the addition of foundation fences, drinking water stations, toilet bag distribution points and clear identification guidance systems. These low-cost measures can be completed within 3-6 months, quickly meeting the most urgent pet walking needs of residents and effectively alleviating pet conflicts in the surrounding traditional parks. In the mid-term stage, it was gradually upgraded to a demonstration park. After the basic configuration is perfect, complex terrain ups and downs, wave runways, agile training equipment and characteristic theme sculptures are introduced to form recognisable landscape nodes. For example, design the "Pet Adventure Island" theme area, combined with wooden platforms and safety rope systems, to meet the activity needs of pets of different ages. At the same time, seasonal activity areas are added, such as summer swimming pools, autumn deciduous mazes and winter wind and warm areas, to further enhance the attractiveness of the park. The upgrade process strictly follows the step-by-step implementation principle. In Table 1, the first step is to complete the hardware security facilities, the second step is to optimise the experience details, and the third step is to add aesthetic and interactive elements to avoid waste of resources[7-8]. Model parks should also add photo checkpoints, theme cultural walls and small stages, and regularly hold pet sports games or adoption day activities to turn the park into a community vitality centre. This stage progression from foundation to demonstration takes into account the actual conditions of cities of different sizes, so that small cities can stay in the foundation for a long time and continue to optimise, while large and medium-sized cities can quickly iterate to form benchmarks.

Table 1. Step-by-step Implementation Table of Demonstration Park Upgrade

Implementation Steps	Construction Objectives	Main construction contents:
Step 1: Secure Infrastructure	Strengthen the safety baseline and eliminate potential hazards	Improve hardware safety facilities such as protective fences, anti-slip paving, and safety ropes.
Step 2: Optimize Experience	Improve functional configuration and enhance user comfort	Add training equipment, drinking water purification facilities, and seasonal activity areas.
Step 3: Enhance and Empower	Create distinctive landscapes and enhance social attributes	Arrange theme landscapes, "Daka" facilities, and build an activity stage.

4.2. Digital Management User Participation

Digital technology provides an efficient path for pet-friendly park management. The core is to develop a special mobile APP to realise real-time reservation, traffic monitoring and instant feedback on problems. Pet owners can open the APP to view the current usage density heat map of each area to avoid crowding during peak hours; the appointment system can accurately allocate the use rights of the sports area according to the time zone to reduce on-site conflicts. The background data analysis module automatically generates maintenance reports, intelligently adjusts the cleaning frequency and equipment inspection time according to the frequency of use, and significantly reduces labour costs. The smart camera combined with AI algorithms can identify abnormal behaviours such as pet fights or unattended situations, and push alerts in time. User participation module design is vivid: the owner can upload photos or videos of pet activities to participate in the "Most Beautiful Pet Moment" selection, and get points to exchange for toilet bags or training course rewards, which greatly enhances the sense of belonging to the community. At the same time, the APP regularly pushes civilised pet knowledge, seasonal health reminders and activity previews to guide users from passive use to active maintenance. This technology-driven management logic forms a closed loop: data collection - analysis and decision-making - user feedback - continuous iteration. In the long run, digital means not only improve management efficiency and response speed, but also cultivate users' self-management awareness, and finally form a benign community ecology of "everyone's participation, joint construction and sharing". For managers, data accumulation can also provide scientific support for future expansion and policy formulation.

4.3. Long-term Mechanism Public Education

Sustainable operation cannot be separated from in-depth public education and long-term mechanism construction. It is necessary to establish a multi-level education system: cooperate with surrounding schools to open "pets and life" theme courses to cultivate the awareness of respecting life and civilised pet-raising from the children's stage; regularly hold professional workshops for adult owners, covering the interpretation of pet behaviour, First aid knowledge and environmental responsibility and other contents. After unified training, the volunteer team is responsible for daily patrol guidance, rule interpretation and conflict mediation, forming the power of "park autonomy". The identification system adopts a vivid combination of pictures and text, and the cartoon-style prompts and interactive QR codes replace stiff slogans, so that the rules are deeply rooted in people's hearts in a subtle way. At the same time, an incentive mechanism has been launched, such as the monthly selection of "Civilised Pet Stars", giving certificates of honour and small gifts to families who abide by the rules and take the initiative to pick up poop, forming a positive behaviour strengthening cycle. The educational path follows the logic from short-term activities to long-term cultural cultivation: in the early stage, it quickly gathers popularity through thematic activities, integrates rules into daily life in the middle stage, and in the long term, it creates a park cultural brand, so that civilised pet raising becomes a community consensus[9-10]. This collaborative governance method breaks the boundary between simple

management and being managed, forms a governance network with the participation of the government, designers, residents and volunteers, and provides a replicable model for urban public space governance.

5. Conclusion

In summary, from the perspective of human-pet coexistence, this article analyses the design needs of urban pet-friendly parks. In combination with the background of urbanisation development, it analyses the differentiated use demands from three types of users: pet owners, pets themselves and ordinary residents. At the same time, the key points of park design are clarified in terms of spatial layout, facility selection and ecological integration, and the optimisation plan for graded construction, digital management and long-term education is put forward. Research confirms that scientifically planned pet-friendly parks can effectively alleviate pet conflicts, optimise public space resources, and improve the urban living environment. In the design, we should take into account the principles of safety, comfort and ecology, and rely on humanised facilities and flexible space layout to meet the needs of diverse groups. In the future, we should continue to improve the operation and maintenance management system, deepen the publicity of civilised pet raising, constantly optimise the pet-friendly space construction mode, and promote the development of liveable and inclusive modern cities.

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