ISSN: 2710-0170

Research on Design Strategies for Community Sports Parks from the Perspective of Park City

Liwei Pang*

Country School of Landscape Architecture, Zhejiang A&F University, Hangzhou, China

* Corresponding Author

Abstract

To revitalize underutilized urban green spaces, enhance their spatial quality, and improve residents' well-being, this design adopts the "Park City" theory as its foundational perspective. Based on an in-depth investigation of the site's geographic location, topographical environment, and historical-cultural context, this study identifies several key issues: the idling of green spaces, the underutilization of natural resources, and the unmet demand for outdoor sports among surrounding residents. Guided by the "Park City" concept, the design introduces targeted interventions and green space attribute renewal strategies, specifically focusing on enhancing public accessibility and promoting multi-generational diverse activities. These proposed strategies inject vitality into the Qingliu River Sports Park, activate surrounding passive spaces, and satisfy the public's diverse needs for outdoor recreation. Furthermore, this research promotes the close integration of "Park City" theory with the practical construction of community sports parks.

Keywords

Park City; Community sports park design; All-age friendly.

1. Introduction

In February 2018, during his inspection of the Sichuan Tianfu New Area, General Secretary Xi Jinping proposed the "Park City" (Gongyuan Chengshi) concept, emphasizing that urban planning and construction should reflect the characteristics of a park city and leverage the ecological value of the city[1]. Following the models of the Garden City, Forest City, and Ecological Garden City, this is a novel green development paradigm advocating the principles of "ecology preceding space" and "the city situated within a park"[2]. Taking a people-centered approach, it organically integrates park forms with urban spaces, providing new perspectives for sustainable urban development. Under this development philosophy, community sports parks have emerged as one of the primary subjects for implementing the "Park City" practice.

Due to the accelerated pace of society and a sharp increase in work-related stress, people's physical and mental well-being has been negatively impacted. Concurrently, with societal development, public mindsets have gradually shifted toward pursuing leisure-oriented lifestyles, leading to an increasing demand for outdoor recreation spaces. However, surrounded by modern cities built on a foundation of reinforced concrete, people's opportunities to connect with nature are continuously diminishing. Engaging in physical exercise in natural environments is beneficial to both intellectual and physical development, and community sports parks provide a vital green space for residents to partake in sports activities. The construction of leisure-oriented community sports parks adjacent to residential areas has become a crucial strategy for elevating the level of urban public services, improving the urban living environment, enhancing residents' quality of life, and facilitating public participation in sports and fitness. It serves as a vital means to properly manage the relationship among

ISSN: 2710-0170

residents, parks, and the city. Therefore, resolving the contradiction between urban land limitations and the demand for outdoor sports spaces has become a core component of "Park City" construction.

Research on community sports parks in China is still in its infancy, and a unified, universally acknowledged definition has yet to be established. The construction planning guidelines of some cities mandate the utilization of urban vacant land, leftover spaces, and park green spaces[3] to develop outdoor fitness spaces that primarily serve sports and fitness functions while incorporating the general functions of community parks and providing corresponding fitness service facilities. Xu Qingsong argues that community sports parks integrate sports facilities and athletic programs to fulfill physical exercise functions, on the premise of ensuring the ecological and recreational functions of traditional community parks, thereby promoting the harmonious unity of humans and nature[4]. Focusing on community sports parks in Chongqing, Liu Jun et al. analyzed land use characteristics, user demographics, and topographical conditions, proposing specific construction methodologies: low-impact construction strategies and planning/design strategies that achieve quality enhancement through the composite use of space[5]. Xu Yong et al. believe that community sports parks can organically integrate green landscapes with sports activities, satisfying people's athletic needs and creating a comfortable, pleasant, and nature-returning urban green sports space[6].

Community sports parks occupy a significant position within international urban planning and construction systems[7-8]. As a communal public green space and a venue for various sports and recreational activities, the landscape design of the Box Hill Sports Park in Melbourne redefines the play area and addresses growing community needs through the use of vibrant graphics, making it an iconic and lively destination. The sports-and-health-themed Bangkok Rooftop Sports Park accommodates varying intensities of physical activity, utilizing the different visual perceptions generated by warm and cool tones to delineate zones for active and slow-paced (high- and low-intensity) sports. The Binyamina Sports Park in Israel caters to people of all ages; situated along a broad promenade connecting the coastal highway to the town, this public space provides a sports gathering venue for nearby residents, cyclists, and skaters.

In summary, both domestic and international spheres have achieved certain theoretical research outcomes regarding community sports parks and have applied them in practice to create diverse green sports spaces. However, practical construction cases that explicitly integrate with the "Park City" concept remain relatively scarce. Through the planning and construction of the Qingliu River Sports Park in Chuzhou City, this design will manifest the "Park City" development philosophy. Centered on ecology and aligned with users' needs, it aims to maximize the comprehensive benefits of the community sports park.

2. Existing conditions and problem identification

2.1. Analysis of existing conditions

2.1.1. Location analysis

The project site, designated for the Qingliu River Sports Park in Chuzhou City, encompasses a green space area of 42,457 square meters. It is geographically bounded by Jiuzi Avenue to the north, Binjiang North Road to the west, and the Fengshou Canal to the east. Currently, the site remains undeveloped. The surrounding land uses are predominantly green spaces and plazas, residential zones, and educational and research lands. These include densely populated nodes such as Qingliu Huagu Park, Linxi Shuyuan Residential Community, and Suchu Experimental School, resulting in a substantial pedestrian flow consisting primarily of local community residents. To the west, the site is adjacent to the Qingliu River—often referred to as the mother river of Chuzhou City—endowing the area with a profound cultural ambiance and distinct advantages in water resources.

ISSN: 2710-0170

2.1.2. Climate analysis

Chuzhou features a subtropical humid monsoon climate, primarily characterized by four distinct seasons, prominent monsoons, a humid atmosphere, and coinciding periods of rain and heat. Located in the convergence zone of cold and warm air currents from the north and south, the city experiences a balance of these air masses during June and July, resulting in the plum rain (Meiyu) season. However, some years may experience a brief or entirely absent plum rain season. The city records an average annual temperature of 15.4°C, an average annual precipitation ranging from 1000 to 1100 mm, and an average of 144 rainy days per year. Precipitation is moderate in spring, highly concentrated in summer, and sparse during autumn and winter. Consequently, the site possesses excellent climatic conditions, which are highly conducive to supporting various outdoor activities and implementing ecological construction.

2.1.3. Transportation analysis

Externally, the Qingliu River Sports Park is adjacent to major urban arterial roads and features convenient public transportation, facilitating easy access for city residents. Internally, the site remains undeveloped land with some abandoned trails but lacks a distinct circulation network. Based on preliminary field surveys, the site's topography is lower in the west and higher in the east. During the design process, these existing topographical conditions will be fully utilized to rationally organize the park's circulation routes.

2.1.4. User behavior analysis

According to preliminary field surveys and interviews, the demographics of the surrounding population are categorized into infants and toddlers (0-6 years old), adolescents (7-17 years old), young adults (18-45 years old), middle-aged adults (46-69 years old), and seniors (over 69 years old). The primary daily user groups are children and the elderly. Children are in a critical period of physical and mental development and require activities such as running and ball games; however, their exercise volume must be controlled to avoid adversely affecting their physical growth. Young adults possess stronger physical fitness and can engage in high-intensity sports such as long-distance running, basketball, and football to relieve stress and enhance muscle strength and cardiopulmonary function. Seniors predominantly engage in light-intensity exercises, such as walking, Tai Chi, and meditation, to improve physical flexibility and coordination and to prevent chronic diseases. In summary, the design aims to: provide exploratory and interactive sports facilities for children to stimulate their enthusiasm for physical activity; create stress-relief sports spaces for young adults; and foster slow-paced activity spaces for the elderly.

2.2. Summary of issues and opportunities

Through preliminary field surveys and research, the opportunities and challenges facing the site can be summarized as follows:

1. Significant Topographical Variations: The site exhibits an overall topographical trend of being lower in the east and higher in the west. It borders an urban waterway to the east and the Qingliu River to the west. The design will fully respect these topographical conditions to create an ecological landscape with rich vertical hierarchies.

2. Peripheral Location: Located in the suburban area of Chuzhou City, the site is relatively far from the city center, resulting in limited activity from the surrounding population. The design will focus on enhancing spatial openness and non-motorized accessibility (slow-mobility networks) to ensure convenient access for community residents.

3. Diverse User Demographics: Preliminary research reveals that the surrounding community residents encompass all age groups, including children, young adults, and the elderly. The design will introduce multi-generational activity programs to create an age-inclusive sports space that meets the diverse usage needs of all demographics.

ISSN: 2710-0170

3. Case studies

3.1. Chongqing Xinhubei Sports and Culture Park

Located in the northern part of Dadukou District, Chongqing, at the intersection of Shuangyuan Road, Shanchuan Road, and Shanhe Road, the Chongqing Xinhubei Sports and Culture Park is surrounded by dense residential areas that lack large-scale activity venues. Starting from the actual needs of surrounding residents, the design team fully utilized the site's original resources to create a community park that centers on sports culture and accommodates multi-generational activities. The internal topography of the park is relatively complex, with few flat areas. In terms of vertical design, the designers employed soft landscape treatments—such as gentle slopes, lawns, and hedges—to avoid the use of retaining walls and preserve the mountainous terrain characteristics as much as possible. Furthermore, in the children's activity zone, climbing spaces were designed by integrating the natural topography, and the site was paved with permeable materials to facilitate rainwater drainage. Additionally, an elderly fitness zone was established in an area with optimal winter sunlight exposure, complemented by deciduous trees to provide shade in other seasons, thereby creating a comfortable fitness environment for senior citizens.

3.2. Vanke One Base Sports Community

Adjacent to ShenYeShangCheng and situated between Bijiashan Park and Lianhuashan Park, this site was previously left idle due to railway route planning. To maximize the site's functionality, the designers injected vibrant sports concepts into it. Through a comprehensive design strategy emphasizing convenience, diversity, health, and naturalization, it brings a brand-new lifestyle experience to surrounding residents. The primary color palette of the site utilizes pink and white, creating a vibrant and lively atmosphere that conveys a strong and rich sense of spatial hierarchy to visitors. Furthermore, this sports community seamlessly connects the spatial realms of three different social groups through a "boundaryless" approach. A loop track links the skatepark and the basketball court, integrating competitive basketball, skateboarding, and BMX into an energetic sports arena that allows young people to unleash their vitality. With its high degree of openness and flexibility, the Vanke Sports Community has become a vital carrier of urban public space.

4. Design concepts and strategies

4.1. Design concept

Centered on the theme of "Vibrant Dream π" (representing infinite vitality and possibilities), this design integrates the "Park City" concept from the perspective of "multi-generational sports." Complementing the diverse elements surrounding the site, it aims to create an accessible, ecologically green, and highly dynamic inclusive sports hub for all. This approach establishes a green sports network that meets the emerging demands of modern community residents for outdoor recreation, ultimately realizing the "dream of multi-generational sports."

4.2. Design strategies

4.2.1. Strategy for integrating the "Park City" concept

Currently, land is often overdeveloped, causing severe damage to the natural ecological baseline and exacerbating the conflict between humanity and nature. The novel urban construction concept of the "Park City" was proposed specifically to address various "urban diseases" and maintain a harmonious, stable relationship between humans and nature. Linguistically and philosophically, this concept inherits the essence of "parks" (Yuan), focuses on the "city" (Cheng), and centers on the "public" (Gong)[9]. It facilitates the improvement of urban green space systems and the optimization of park layouts. Therefore, contemporary park

ISSN: 2710-0170

construction should adopt the "Park City" as a fundamental philosophy, focusing on the comprehensive enhancement of park service capacity, transportation networks, thematic characteristics, and ecological baselines to improve residents' quality of life.

4.2.2. Climate analysis

(1) Spatial Public Openness

This design emphasizes the non-motorized accessibility and open sharing of the community sports park. Externally, by fully considering the park's service radius, primary entrances and multiple secondary entrances are strategically placed to connect with user groups from various distances and directions, thereby achieving high social accessibility. Internally, diverse public spaces, such as open green lawns and understory recreational areas (shaded spaces beneath the tree canopy), are designed to encourage residents to explore the infinite possibilities of the site, fully realizing the shared use of the park.

(2) Multi-generational Diversification of Activities

As a crucial carrier for the outdoor activities of community residents, the community sports park must adopt a people-oriented approach centered on serving the local population. By comprehensively considering both the psychological and physiological functional demands of all age groups[10], the design incorporates diverse sports facilities and creates a rich variety of activity spaces. This approach ensures the multi-generational inclusion and diversification of activity types within the park.

5. Design scheme

5.1. Spatial structure

Taking the "multi-generational sports dream" as the starting point, this design establishes an overall spatial structure characterized by "One Axis, Two Loops, and Five Zones" "One Axis" refers to the central ecological green axis. "Two Loops" refer to the slow-mobility loop and the brisk-walking loop, categorized by exercise intensity. These two loops connect various nodes of the park, regulating the overall rhythm of physical activity across the site. "Five Zones" are delineated based on the diverse needs of different user groups and the site's inherent characteristics. The site is divided into the Floral Exploration Zone, Rhythmic Walking Zone, Extreme Activation Zone, Dynamic Ball-Sports Zone, and Waterfront Revitalization Zone.

The overall design forms a "Static-Dynamic-Static" spatial framework. Following a narrative sequence from "Dream Creation" to "Entering the Dream" and finally "Exiting the Dream," the intensity of sports activities shifts dynamically. This approach responds to the diverse usage needs of various demographic groups, endows the site with vibrant vitality, and provides visitors with a dynamic landscape experience.

5.2. Functional zoning

Integrating multidimensional elements such as surrounding land use, internal and external traffic conditions, topographical features, user demographics, and historical/cultural contexts, this design rationally delineates functional zones. By incorporating a variety of sports activities, it aims to stimulate public enthusiasm for exercise and enhance the site's inclusivity.

The site is mapped into five major zones, arranged according to varying combinations of exercise intensity and complemented by corresponding color variations. Interconnected by the dynamic loops, they form a comprehensive sports network system that awakens people's athletic cells, enriches the exercise experience, responds to diverse usage demands, and brings unprecedented vitality to the site.

(1) Floral exploration zone (Dream creation)

ISSN: 2710-0170

This zone includes cultural image displays, geometric tree arrays, and four-season floral borders, corresponding to the site's three entrances. Based on the direction and volume of pedestrian flow, the three entrance spaces are respectively defined as open, semi-open, and private spaces. Utilizing distinctive landscape structures and diverse flora, the integration of softscape and hardscape elements creates distinct entrance landscapes, serving as transitional bridges into the park's interior.

(2) Rhythmic walking zone (Dream exploration)

Running throughout the park via the inner and outer loops, this zone provides various exercise options such as strolling, brisk walking, and jogging for both the elderly and young adults. Along the way, constantly changing landscape elements boost visitors' enthusiasm for exploring the park. Furthermore, tracks of varying lengths cater to different groups' needs for exercise volume. Distance markers and smart interactive facilities will be installed along the routes to provide real-time exercise feedback, adding an element of fun to physical activities.

(3) Extreme activation zone (Entering the dream)

This area features extreme sports venues and lawn activation spaces. The extreme sports venues primarily serve adolescents, accommodating activities like skateboarding, BMX, and rock climbing, thereby fulfilling their dual needs for physical and mental conditioning. The open lawn spaces provide favorable conditions for multi-generational leisure activities, activating the site's infinite possibilities and high flexibility.

(4) Dynamic ball-sports zone (Entering the dream)

As a core component of the community sports park, this zone includes popular ball sports (e.g., basketball, tennis, table tennis) as well as dedicated activity areas for children and the elderly, creating a comprehensive multi-generational sports space. While meeting functional demands, the contrast of warm and cool color tones and the application of various paving materials are utilized to enhance both the aesthetic appeal and safety of the sports venues.

(5) Waterfront revitalization zone (Exiting the dream)

Bordering the Qingliu River to the west, the site possesses favorable aquatic resources for establishing a waterfront zone. Fully respecting the original topography, this design introduces a parent-child interactive water play area and a waterfront scenic viewing area. These spaces meet the diverse needs of different age groups for sightseeing, recreation, and relaxation. By unleashing people's innate affinity for water, it allows them to return to reality and nature, serving as one of the park's primary focal memory points (landmarks).

5.3. Circulation design

The overall road network of the site presents flowing, curvilinear forms that echo the design theme. The circulation system is divided into three hierarchical levels: a 5-meter-wide dynamic loop, a 3-meter-wide strolling path, and a 1.5-meter-wide scenic slow-traffic path.

As the primary pathway of the site, the dynamic loop will connect the park's main functional zones, satisfying both spatial accessibility and fire safety requirements. Additionally, a circular running track will be established on one side of this road, distinguished by different colors and paving materials, to meet the running and exercise needs of children, young adults, and the elderly, thereby enhancing the utilization efficiency of the park's pathways. The strolling paths guide visitors to various landscape nodes, forming an independent and self-contained system. The scenic slow-traffic paths primarily serve slow-paced activities such as walking and sightseeing, realizing internal non-motorized accessibility within the site.

5.4. Vertical design

Preliminary investigations revealed significant elevation differences between the site and surrounding planned roads. Internally, the site exhibits a topographical trend of being higher

ISSN: 2710-0170

in the west and lower in the east, and it contains numerous existing ponds. The design must comprehensively consider these three issues to formulate effective vertical design strategies.

First, the elevation difference between the site and the surrounding planned roads is approximately 2 meters. The design adopts a grading (sloping) approach integrated with terraced floral borders to manage this elevation change. Furthermore, the elevation difference between the highest and lowest points within the site is about 4 meters. The design will integrate terraced seating (grandstands) and suspended landscape bridges with the sports venues to enrich the park's overall visual and spatial hierarchy. The landscape bridge reaches a maximum height of approximately 7 meters, accommodating multiple functions such as sightseeing and exercise, and descends to a minimum height of about 2 meters to seamlessly connect with various nodes in the park. Finally, some existing ponds are retained to create both deep-water leisure spaces and shallow-water interactive spaces, establishing a multifunctional waterfront area that meets the diverse needs of different user groups.

5.5. Plant landscape design

The plant landscape design is divided into five planting zones: the Entrance Floral Border Zone, Understory Vitality Zone, Sparse Woods and Lawn Zone, Colorful Sports Zone, and Distinctive Waterfront Zone, which precisely correspond to the five major functional zones of the site.

(1) Entrance Floral Border Zone

Located at the site's entrances, this zone first utilizes a combination of differently colored flowers to enhance the visual impact of the floral borders. Additionally, appropriate plants are selected and combined based on their seasonal characteristics, striving to present the optimal scenery for each season. Furthermore, plants of varying heights are mixed to increase the spatial hierarchy of the borders, thereby highlighting the energetic image of the community sports park.

(2) Understory Vitality Zone

Situated in the site's brisk-walking areas, this zone primarily selects broad-leaved shade trees—such as Sycamore (Platanus), Japanese Pagoda Tree (Sophora japonica), and Chinese Tulip Tree (Liriodendron chinense)—as the upper canopy. These species provide shade in the summer and allow sunlight penetration in the winter, creating a comfortable understory exercise space while enriching the landscape experience.

(3) Sparse Woods and Lawn Zone

Located in the open lawn areas, the plant selection for the upper canopy mainly consists of Deodar Cedar (Cedrus deodara), Chinese Tallow (Sapium sebiferum), and Southern Magnolia (Magnolia grandiflora). The middle canopy is accented with Sweet Osmanthus (Osmanthus fragrans) and Cherry Blossoms (Prunus serrulata). Large open lawn spaces are preserved to create an inclusive, shared environment for interactive communication, enhancing the flexibility of the community sports park.

(4) Colorful Sports Zone

Situated in the ball-sports areas, this zone caters to a multi-generational demographic (children, young adults, and the elderly) and accommodates various types of sports. Diverse foliage-color tree species, such as Yulan Magnolia (Magnolia denudata) and Sycamore (Platanus), are selected to stimulate people's interest in exercise and echo the zone's theme of energetic sports.

(5) Distinctive Waterfront Zone

Located in the interactive water play areas, this zone utilizes native Chuzhou plants as the primary species. The upper canopy is dominated by Chinese Hackberry (Celtis sinensis), Japanese Zelkova (Zelkova serrata), and Chinese Tallow (Sapium sebiferum). This arrangement forms excellent visual corridors and creates an open waterfront space, enhancing visitors' sense of belonging and establishing another focal memory point for the park.

ISSN: 2710-0170

6. Conclusion

Based on preliminary investigations to understand the site's existing conditions, coupled with the study of relevant literature and case studies, this design identifies the site's core issues and uncovers its spatial plasticity. From the perspective of the "Park City" concept, and guided by the design principles of green ecology, public sharing, multi-generational activity, and a people-oriented approach, comprehensive design strategies were formulated. This approach aims to truly realize a new paradigm of "sports for all," injecting infinite possibilities into the site and establishing the Qingliu River Sports Park as a vibrant gateway image for Chuzhou City.

(1) Realizing the spatial accessibility and openness of the community sports park. In terms of spatial accessibility, the site's service radius is comprehensively considered to foster a "community life circle," thereby significantly enhancing accessibility. Regarding spatial openness, the site is delineated into multiple functional zones introducing various sports activities—such as skateboarding, BMX, and basketball—to create diverse sports spaces and elevate the overall openness of the environment.

(2) Realizing a multi-generational community sports park to satisfy the activity needs of all demographic groups. By integrating the behavioral and psychological characteristics of children, young adults, and the elderly, the design creates multi-functional and multi-scale spaces. Through the incorporation of sports activities with varying intensities, it successfully realizes the potential for multi-generational sports and recreation.

(3) Realizing the interactive and participatory nature of the community sports park. By installing a variety of participatory facilities—such as interactive running tracks, interactive landmarks, and smart check-in points—this design establishes a novel sports model. This fosters both human-to-human and human-to-environment interactions, delivering a brand-new sports experience and thereby cultivating an interactive, participatory community sports park.

As a product catalyzed by the "Park City" concept, the construction of community sports parks will fully leverage the functions of urban green spaces. Utilizing a green ecological baseline, this design reconstructs the spatial structure to form diversified spaces for fitness and social communication. Ultimately, it provides an excellent platform for people of all ages to engage in various sports activities, shaping a new era of multi-generational sports.

References

[1] Xinhua News Agency. (2018, February 27). Xi Jinping visits cadres and masses of all ethnic groups in Sichuan ahead of the Spring Festival. http://www.gov.cn/xinwen/2018-02/13/ content_ 5266673.htm#1 (in Chinese)

[2] Cheng, S., & Cheng, Y. (2018). From garden city to park city design: Dialectics of urban ecology and morphology. Chinese Landscape Architecture, 34(12), 41-45. (in Chinese)

[3] General Office of the State Council. (2020, October 10). Opinions of the General Office of the State Council on strengthening the construction of public fitness facilities and developing mass sports. Retrieved April 2, 2021, from http://www.gov.cn/zhengce/content/2020-10/10/ content 5550053. htm (in Chinese)

[4] J. Xu, Q. (2017). Research on the current situation and countermeasures of community sports parks in Changzhou. Journal of Changzhou Institute of Technology, (3), 74-79. (in Chinese)

[5] Liu, J., & Lan, M. (2021). Research on the coupling relationship between land use conditions and usage characteristics of community sports parks in mountainous cities: A case study of Chongqing metropolitan area. Landscape Architecture, 28(1), 104-111. (in Chinese)

[6] Xu, Y., Zhang, Y., Wang, W., et al. (2018). Research on the planning characteristics and influencing factors of sports parks from the perspective of healthy cities. Chinese Landscape Architecture, 34(5), 71-75. (in Chinese)

ISSN: 2710-0170

[7] Wang, H. (2018). "City in natural landscape, artificial landscape in city": Discussion on the planning and construction of park city. Chinese Landscape Architecture, 34(10), 22-27. (in Chinese)

[8] Lai, W. (2020). Research on the construction of the ecological system of community sports parks under the background of park city: Taking Chongqing community sports parks as an example. Idea & Design, (05), 4-9. (in Chinese)

[9] Wu, Y. (2018). Research on the conceptual connotation and practical path of "Park City". Chinese Landscape Architecture, 34(10). (in Chinese)

[10] Zhao, L. (2021). On landscape design strategies of community sports parks. Environmental Engineering, 39(05). (in Chinese)