

A Study on the Vitality of Inclusive Public Spaces Based on PSPL Methodology

The Case of Central District Blocks in Shenzhen

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Abstract

The rapid advancement in urban construction often overlooks individual user experience, resulting in some public spaces lacking vitality and inclusiveness. The design philosophy for public spaces is currently shifting from formalism toward a sense of place, and from mechanistic approaches to equity and justice. Shenzhen, as one of the few cities in the world built entirely in accordance with its urban planning blueprint, reflects the epitome of metropolis development in China over the past 30 years and carries landmark significance in the history of urban design. This paper takes Blocks 22/23 in Shenzhen's Futian central district as the research subject and analyzes the impact of different stakeholders on the vitality of public spaces through the collation of literature, design materials, and their development, design, operations, and maintenance. Utilizing the PSPL research method, the study assesses the multidimensional qualities of these blocks' public spaces with a focus on their vitality and fairness as experienced by diverse social groups and during various periods. Findings reveal success in spatial utilization, shared landscapes, and orderly traffic, yet challenges persist in adapting to the needs of multicultural identity, social interaction, and equitable accessibility of space. The conclusion of this research reflects a reevaluation of the transformation of physical spaces, emphasizing the new demand for barrier-free and universally accessible spaces, the new functions of cross-cultural exchanges and neighborhood connections, and the new vitality for daily use and seasonal themes. It provides actionable strategies for renovation, offering a more humane, fair, and vibrant design framework for future urban public space construction.

Keywords

Neighborhoods, Public space, Inclusiveness, Vibrancy

1. Introduction

The rapid development of urbanization is reshaping our understanding and design of public spaces. In the past, formalism-driven aesthetic pursuits have given way to a deeper focus on the spirit of place (Ashihara, 1985), a concept that emphasizes public spaces as dynamic stages for social interaction and cultural heritage. Jan Gehl encourages that design should exceed physical form to be a catalyst for interpersonal interplay and social vitality (Gehl, 2002). In China, the adoption of the "People's City" idea has improved the significance of equality and inclusivity in public spaces, representing a great contrast to Le Corbusier's early functionalist urban planning (Zhao et al., 2010). The present tendency in urban design combines these concepts with practice, where meticulously designed public spaces meet visual aesthetics and perform different social

functions (Punter, 2006), guaranteeing fair allocation of resources and allowing all social groups to enjoy the convenience and richness of urban life (Gosling & Gosling, 2005). This change shows a change in design philosophy and an important factor of the sustainable growth of cities for the future.

2. Research Methodology and Literature Review

2.1. Object of study

This research pays attention to Blocks 22/23 in the southern part of Shenzhen's Futian Central District, an area bordered by Yitian Road, Fuhua First Road, Xinzhou Road, and Shennan Avenue. This area acts as a microcosm of the 40-year history of Shenzhen's urban design growth (Zhao et al., 2019) (Figure 1). Blocks 22/23, known for their creativity and forward-thinking in urban design measure, have been one of the most representative cases in Shenzhen's urban design. While demonstrating Shenzhen's constant search for urban space quality and vitality (Chen, 2010), the planning, design, and careful administration of these blocks provide precious experience and instructions for the growth of other areas (Chen, 2006), including Nanshan and Qianhai. This research takes the public spaces in these blocks as the key subject, such as the central park, plazas (Figure 2), and pedestrian-friendly spaces along the streets (Figure 3). The design and layout of these spaces have been meticulously made to build a vibrant, connected, and inclusive urban environment.

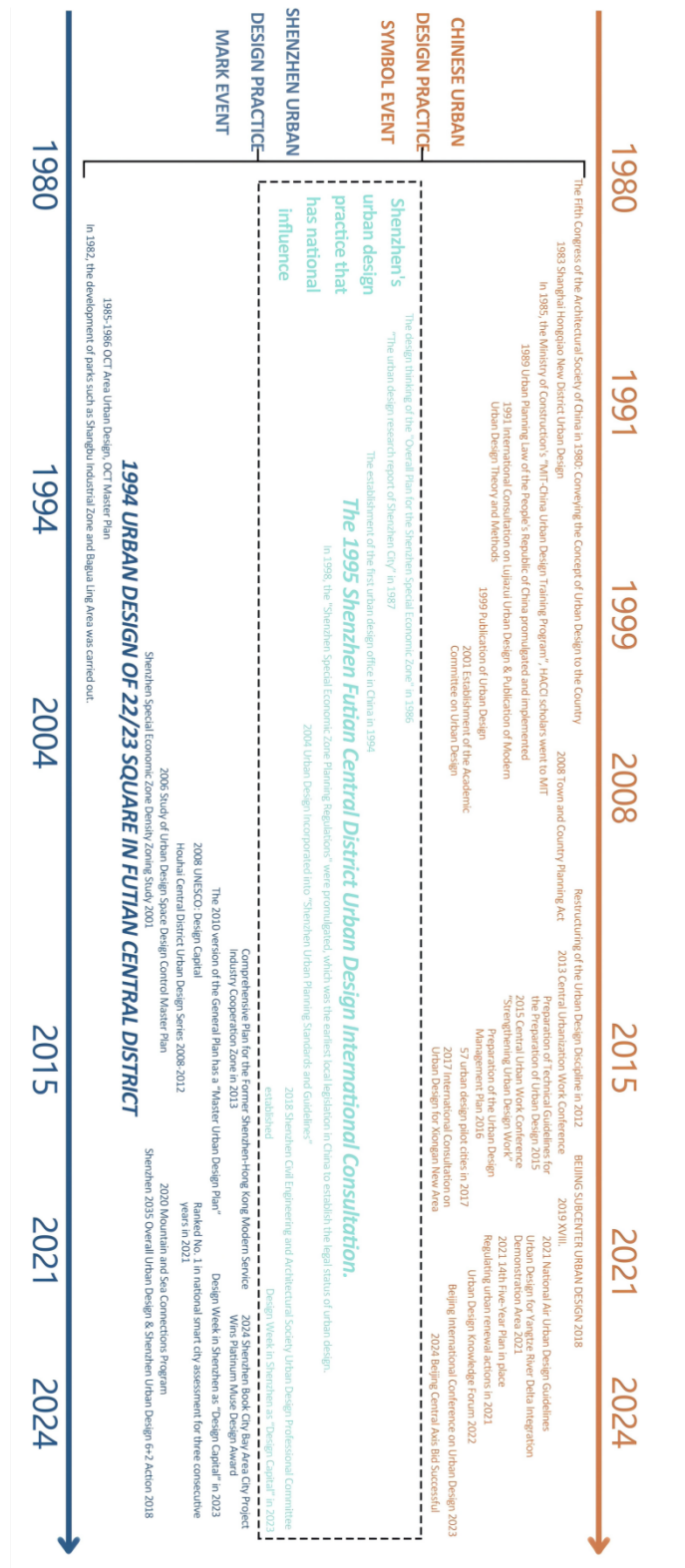
2.2. PSPL Research Method

Adopted by urban planning pioneer Jan Gehl in the late 1960s and early 1970s through specialized studies at the Royal Danish Academy of Fine Arts (Han & Hu, 2006), the Public Space-Public Life (PSPL) survey approach pays attention to the research on the inner association between spatial environments and public life by researching citizens' activity patterns in public spaces. The PSPL approach integrates rational analysis, sensory understandings, and practical experience, with its study range including detailed record of activity locations, participant numbers, activity kinds, and affecting elements in public spaces (Zhao et al., 2012). It adopts mapping, on-site counting, direct observation, and interviews (Zhao et al., 2012). These methods complement each other to offer an integrated picture of public space application.

This research adopted the PSPL approach to deeply evaluate public space quality in two urban blocks. On basis of site conditions and extensively accepted academic assessment norms (Wu & Zhao, 2024), core indexes including multicultural identity, social interaction (Chen & Feng, 2023), and spatial fairness and accessibility (Chen et al., 2024) were selected as standards for evaluating the quality of public spaces. These indexes show the function of the spaces and their effect on driving social integration and improving urban vitality. Adopting related norms and field study outcomes, specific benchmarks were set up for every assessment standard, shaping the foundation for objective scale ratings. Besides, a survey was designed to gather public subjective assessments, enabling an integrated evaluation of the merits and demerits in the vibrancy and inclusiveness of public spaces in the blocks. The second part of the research pays attention to observation of the allocation of people in public spaces during various time periods and research on the kind of public activities, and users' activity trends. This section is designed to offer empirical back for the constant improvement and useful administration of public spaces. Our data origins are diverse, such as on-site observations, public surveys, and Baidu heatmaps. The comprehensive research on this data provides an integrated and detailed opinion on knowing and enhancing the design and administration of public spaces.

2.3. Inclusive Public Space and Public Space Vitality Research Development

In the realm of urban public space studies, scholars have jointly summarized a rich landscape by paying attention to various aspects of the theme. The principle of placemaking highlights the significance of human factors in design (Wang & Bi, 2024), encouraging the building of public spaces with a sense of belonging and identity by combining the views and cultural contexts of community members. This shows attention to the



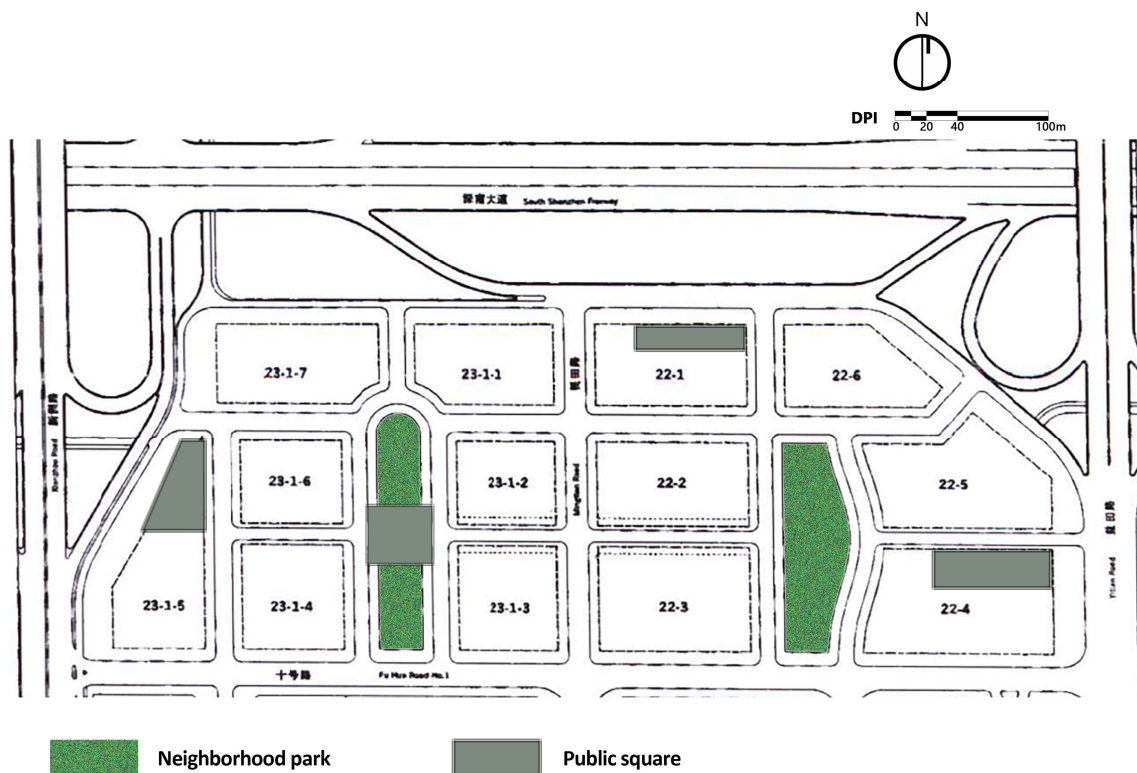


Figure 2. Neighborhood parks and public square.
Source: Image redrawn by the author from the original source

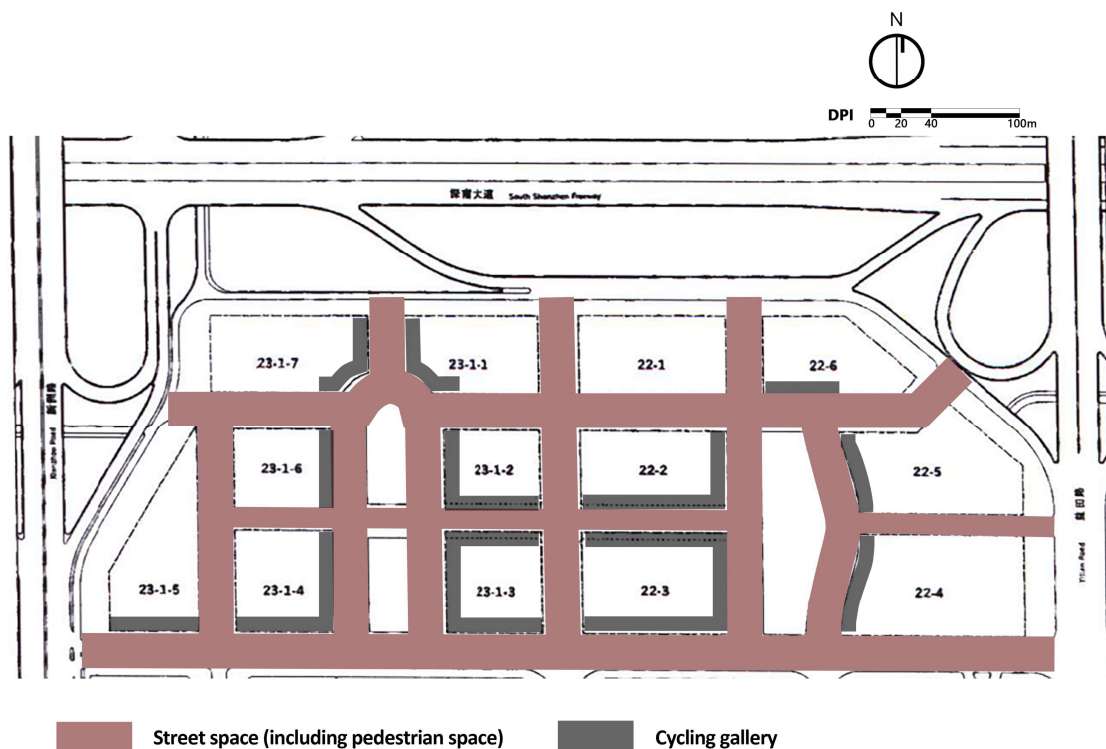


Figure 3. Street space. Source: Image redrawn by the author from the original source

social functions of public spaces and an in-depth insight into user demands. The Public Space-Public Life (PSPL) survey approach fully explores the association between human activities and spatial environments in public spaces, reflecting a "people-oriented" design philosophy. The principle of urban imagery (Lynch, 2001), beginning from the recognizability and layout of urban spaces, emphasizes spatial legibility and people's understandings of space, offering a key theoretical basis for urban planning and design. Spatial justice principle pays attention to the allocation of social resources, power, and chances (Harvey, 1996), emphasizing the significance of realizing social fairness and inclusivity through public space design. The idea of Privately Owned Public Spaces (POPS) adopts the publicization of private spaces (Yang, 2016), showing how policy incentives, regulatory supervision, multifunctional design, and community involvement can usefully improve the vibrancy and usability of public spaces.

Based on past studies, this research tries to show its innovation. By deeply analyzing and integrating the ideas of placemaking and spatial justice, it pays attention to the aesthetics and functionality of public spaces and highlights their deeper social importance and cultural identity. By employing the PSPL survey method, this research will conduct a detailed, multidimensional assessment of public space quality, comprehensively considering the interaction between physical attributes and social functions to provide an optimized perspective. Specifically, for immigrant cities like Shenzhen, this study will propose new functions for public spaces in promoting cross-cultural exchange, emphasizing the importance of accessible design to accommodate the needs of different social groups. Additionally, it advocates for the combination of daily usage and seasonal themes in design strategies to enhance the vibrancy of public spaces.

3. Public Space Survey

3.1. Neighborhood public space design control

3.1.1. Plot division

The design and administration process of the two blocks shows a great insight into public space vitality and the spirit of place. The spatial arrangement of the blocks stated with the improvement and modification of plot divisions, showing great attention to urban vitality and the effective application of public spaces from the early design stages. During the conceptual design stage, the plot divisions of the two blocks were modified three times (Chen, 2010) (Figure 4). The final plan, suggested by SOM, an American design enterprise, adopted two parks and streets within the plots and fell the blocks into small grids with a dense street network (Wang, 2018), changing them into open blocks. This was designed to improve urban vitality and enhance the performance of public space application (Huang, 2009).

3.1.2. Sector Control

A core measure in researching the spatial design of these blocks was volume regulation, guaranteeing orderliness and aesthetic unity in urban spaces. Initially, the blocks were carefully fallen into 13 smaller plots, every planned with towers surrounding small parks (Chen, 2015). The high-rise buildings were set back from the podiums, improving sightlines and ventilation and offering more chances for building public spaces (Liu, 1994). Strict control norms were used to details including the step-backs of the building sections, dimensions, and window-to-wall ratios to guarantee overall design coherence.

Nevertheless, during actual construction, modifications were made to better meet the practical circumstances of the plots, leading to 14 smaller blocks. This modification maintained the functionality and effectiveness of the spatial design. Satellite imagery showing the adjusted plot divisions and tower locations (Figure 6) clearly

illustrates the outcome of these adjustments. Through precise volume control, the design of Blocks 22/23 aimed to create a space that is both distinctive and harmonious, fostering urban vitality and enhancing the efficiency of public space use.

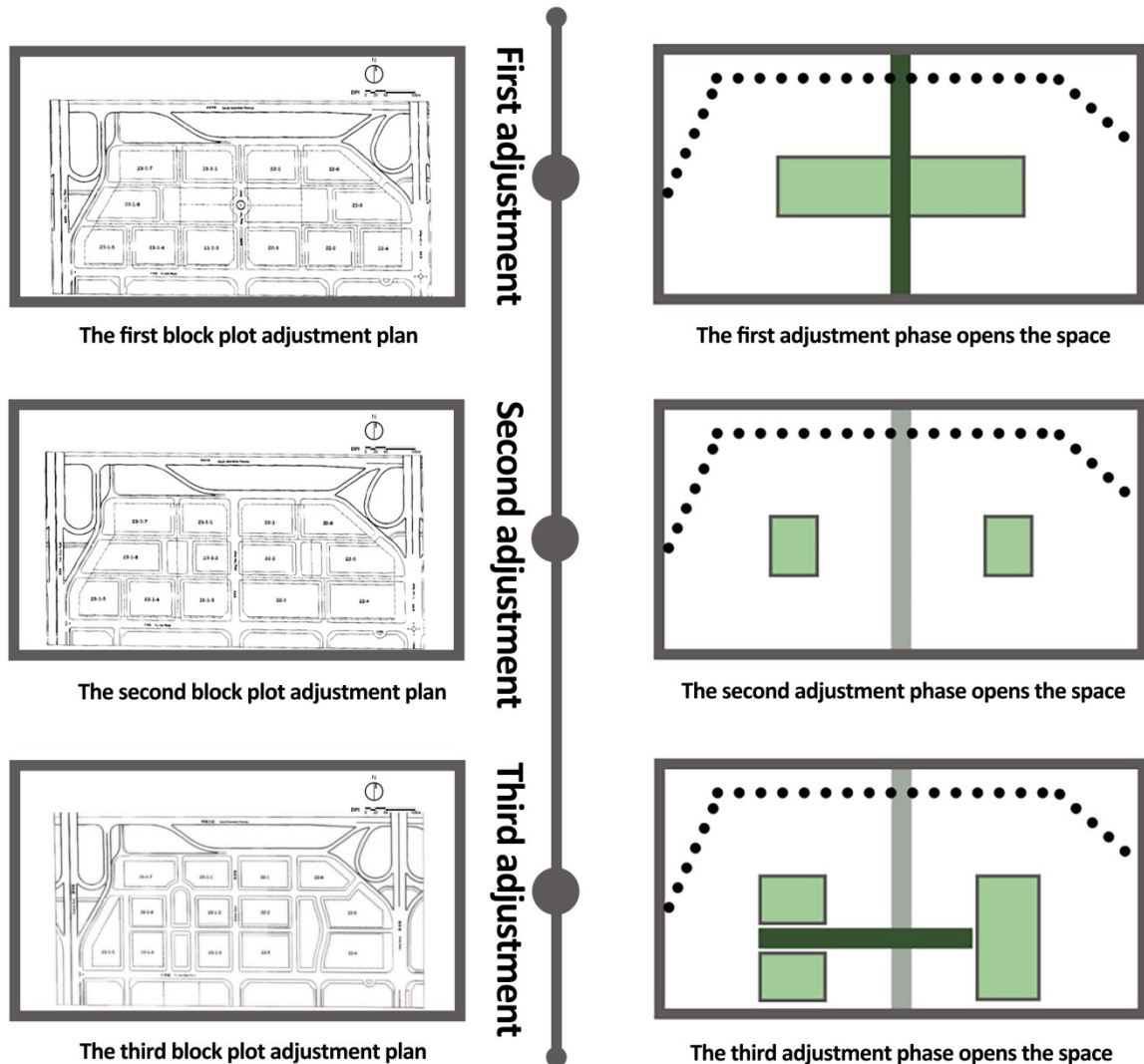


Figure 4. Neighborhood Parcel Adjustment.
Source: Urban Design and Architectural
Design of 22/23-1 Neighborhood in
Shenzhen Downtown Area

Figure 5. Neighborhood open space
realignment. Source: Authors

3.1.3. Open Space Maintenance Conception

In studying the strategies for cultivating open space within the blocks, the design evolved from concept to practice (Han & Zhang, 2004). Initially, designers borrowed the grand vision of Central Park in the U.S. and proposed a central greenbelt. As SOM's design progressed, this concept was refined into two distinctive parks and a lively Lantern Street, connected to form the green heart of the blocks (Wang, 2018) (Figure 5). This not only created vibrant open spaces but also, through the designers' clever arcade designs, established a

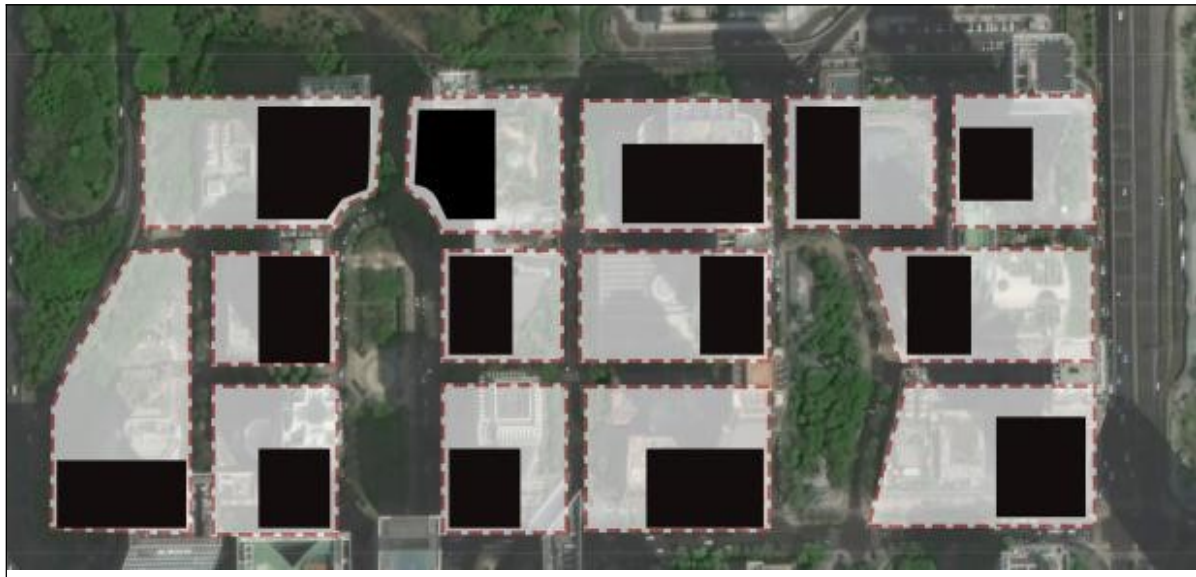


Figure 6. Distribution of tower locations within the Neighborhood. Source: Authors

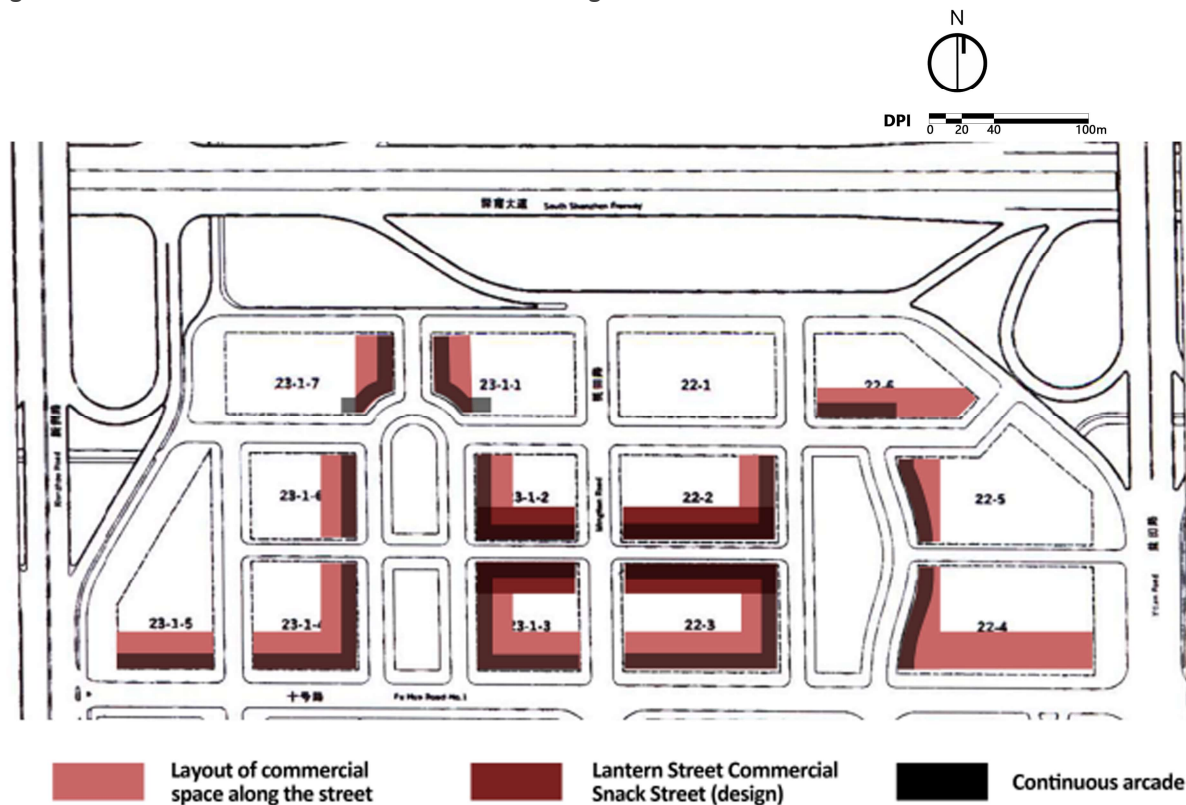


Figure 7. Neighborhood commercial space layout with continuous street interface.
Source: Image redrawn by the author from the original source.

continuous and attractive pedestrian street interface. The eastern park, originally planned with a large water feature, was adjusted during construction to include shrubbery, creating a winding, scenic walking path with a musical fountain at the entrance, offering a more tranquil space for citizens to relax. The western park retained its original design of lawns, gardens, and trees, providing a more intimate natural retreat. Both parks feature pedestrian-vehicle separation at their entrances, ensuring a comfortable visitor experience.

Additionally, the rooftop gardens of the buildings not only enhance space utilization but also increase urban greenery.

However, the open space design faced several challenges during implementation. In the original plot division phase, designers attempted to distribute public activity spaces across the individual plots. Due to the limitations of land use types and the independent layout of external spaces, these spaces could not be fully opened to the public, nor could they ensure an overall order of urban open spaces. To solve this problem, the designers proposed a new strategy: to separate ambiguous public activity spaces from the development plots and consolidate them into clear, cohesive urban public open spaces (Chen & Ye, 2009). This strategy improved land application performance and generated the "street wall" characteristic of buildings along the streets, guaranteeing the orderly layout of the urban street and plaza landscape. The first, second, and final modifications show a careful study of urban design difficulties and distinct craftsmanship. The first modification, with a "central green space" arrangement, improved the spatial character of the central nodes of the blocks. The second modification adopted a "dual-core cluster" layout, highlighting the independent identity of the blocks. The final plan, including the merits of the previous two, put forward a "clustered composite" spatial arrangement, applying the idea of a central pedestrian greenbelt to improve the horizontal associations between the two blocks and activate internal public life. The stores along the main streets were used to guarantee the continuity and completeness of the street interface, which further stimulated the commercial vibrancy of the streets (Liang et al., 2006) (Figure 7).

3.2. Evaluation of the quality of inclusive public spaces

3.2.1. Objective Scale

In evaluating the quality of public spaces, various public space design guidelines were referenced along with evaluation systems (Zhu, 2005) widely recognized by scholars and experts. Based on the actual facilities, three specific evaluation criteria were established: multicultural identity, social interaction, and spatial equity and accessibility. Multicultural identity includes elements such as multilingual signage and wayfinding systems, diverse dining services, cultural art installations, and multicultural festivals and events. Social interaction

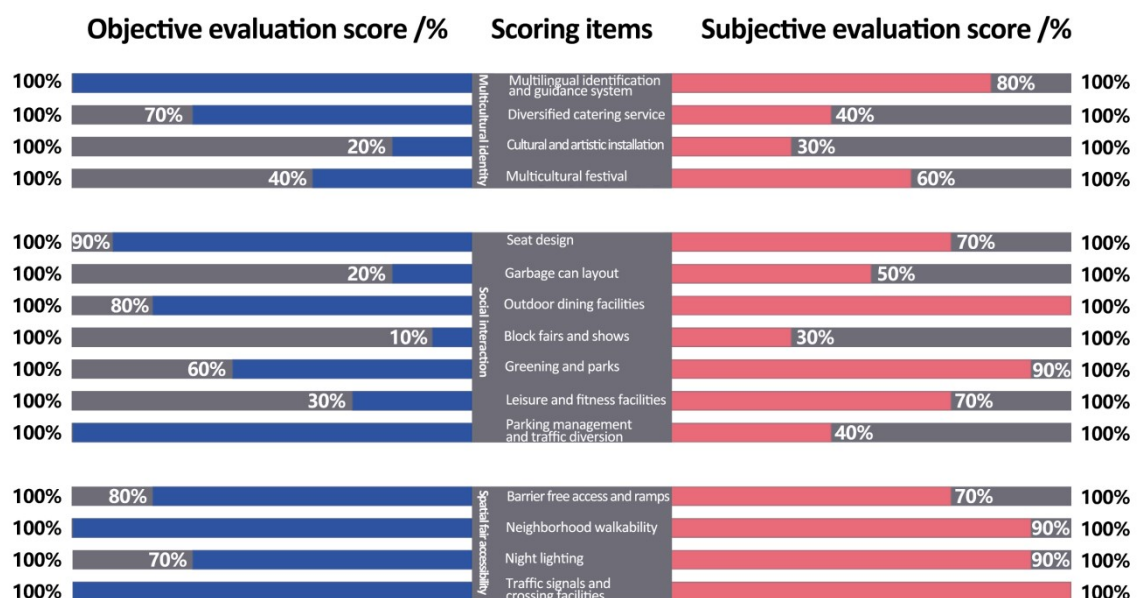


Figure 8. Comparison of subjective and objective evaluation results. Source: Authors

involves the design of seating, placement of trash bins, outdoor dining facilities, street markets and performances, greenery and parks, leisure and fitness facilities, and the management of parking and pedestrian-vehicle separation. Spatial equity and accessibility cover accessible ramps and pathways (Zhang & Yu, 2021), pedestrian walkability, nighttime lighting, and crosswalks and traffic signals. For the assessment of the public spaces within the blocks, guidelines like The Humane Metropolis: Guidelines for Designing Urban Open Spaces (Marcus & Francis, 1998) were followed. For instance, it specifies that every 30 square feet (about 2.8 square meters) of plaza space should have 1 foot (about 0.3 meters) of seating.

According to the Urban Environmental Sanitation Facility Planning Code and the Standards for the Placement of Urban Environmental Sanitation Facilities, commercial streets should have three-color trash bins every 25 to 50 meters, while general roads should have two-color trash bins every 80 to 100 meters. The evaluation was conducted by assigning scores based on these standards, with different rating levels of "adequate," "suitable," "average," and "insufficient," corresponding to scores of 2, 1, 0, and -1. Ultimately, through a combination of field surveys and collected data, the final scoring results for the objective evaluation scale were obtained (Figure8).

3.2.2. Subjective questionnaire

Through in-depth research on user activities and public life characteristics within the blocks, surveys and interviews were designed to understand the needs and behavior patterns of different groups. The objective evaluation indicators were simplified into subjective satisfaction survey content, and questionnaires were designed based on population types and activity distribution. A total of 156 valid questionnaires were collected, with participants mainly aged 18-35 (74 individuals), followed by 36-59-year-olds (51 individuals), and 60+ seniors (31 individuals). The primary users of the blocks include office workers, tourists, residents, business people, and delivery workers. Their daily activities can be categorized into four main areas: work and commuting, leisure and entertainment, commerce and shopping, and culture and communication.

3.2.3. Comparison of evaluations from different groups of people

Based on the survey and interview results, differences in how various groups use public spaces were analyzed. The survey showed that delivery workers reported the lowest satisfaction compared to other groups, indicating that their needs have not been adequately addressed (Figure 9). Thus, special attention should be given to improving the experience of delivery workers in public spaces. Different groups expressed generally high satisfaction with spatial equity and accessibility, though interviews were needed to verify the accuracy of the findings.

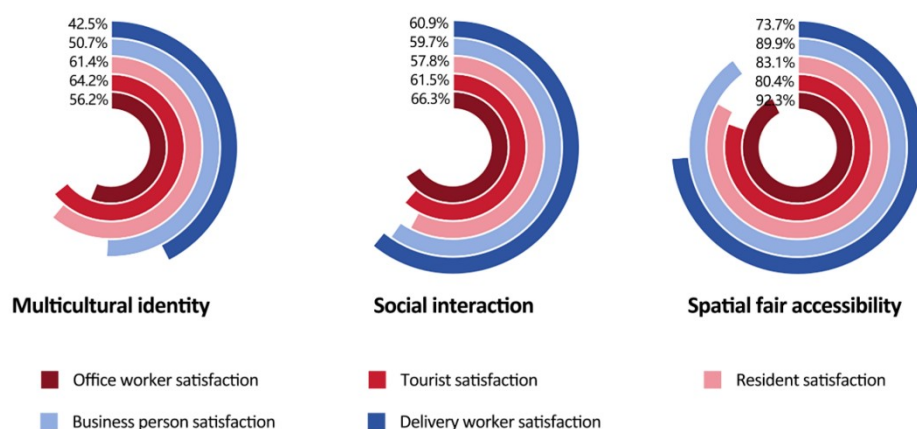


Figure 9. Comparison of evaluations from different groups of people. Source: Authors

3.3. Neighborhood Public Space Vitality Assessment

3.3.1. Neighborhood Heat Map

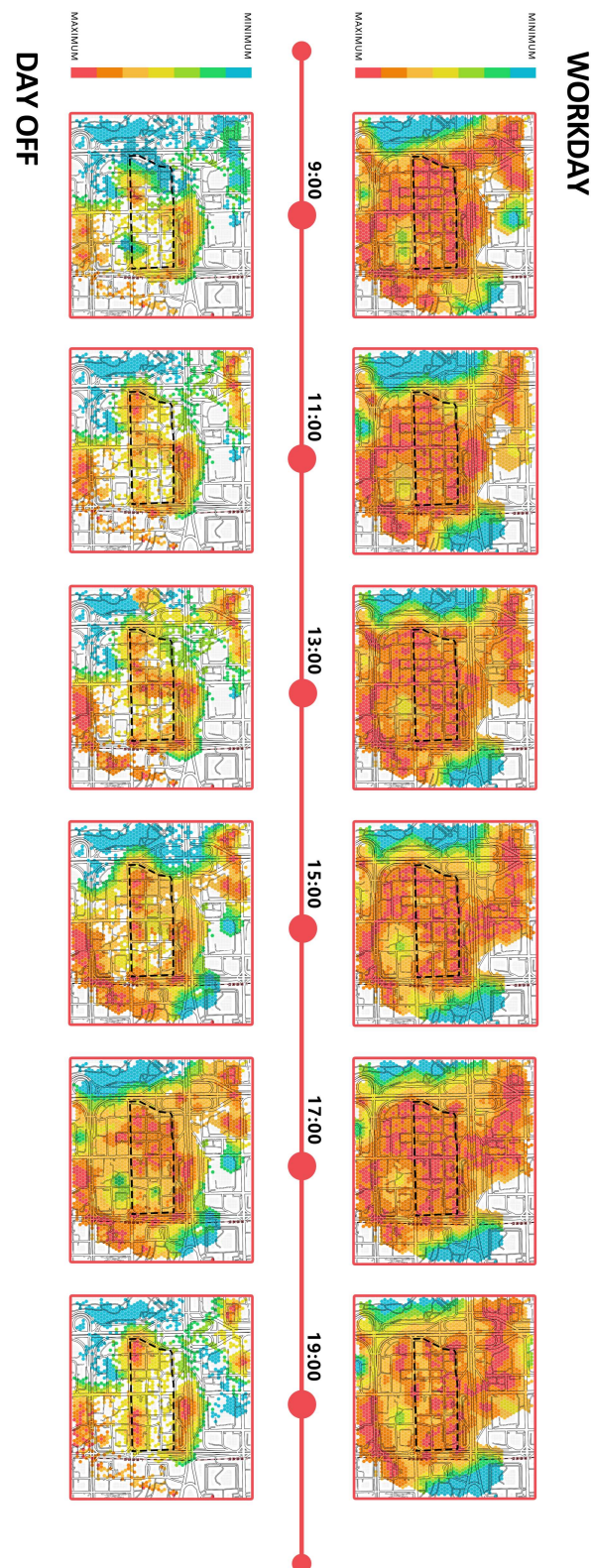


Figure 10. Neighborhood Heat Map. Source: Authors

A comparative analysis was conducted on the heat distribution during weekdays and weekends (Jiang et al., 2016), selecting typical days and evaluating six time periods—9:00, 11:00, 13:00, 15:00, 17:00, and 19:00—using Baidu heat maps. The results showed that the overall heat value on weekdays was significantly higher than in surrounding areas, with sustained high activity during peak hours (9:00-13:00). During the evening peak (17:00-19:00), the heat value gradually decreased, mainly concentrated around office areas and block roads. Notably, the area from Futian Station in the north to the interior of the blocks remained highly active. Both parks saw a marked increase in heat value during the lunchtime break (11:00-14:00), indicating dense crowds and high usage during this period. In contrast, weekend activity was also higher than surrounding areas, but the overall intensity was more moderate. In the evening hours (16:00-18:00), the blocks' vitality aligned with the active zone of the Ping An Financial Center to the south, presenting high activity levels. Comparisons revealed that the western park was more active than the eastern park.

3.3.2. Characteristics of crowd activities

The commuting patterns of office workers significantly impacted traffic flow within the blocks. During the morning peak, high concentrations of private cars, subways, and electric bikes caused traffic congestion. Around noon, as workers left for lunch, a shortage of dining facilities led to visible queues (Figure 11), and in hot weather, parks became the preferred spot for lunchtime breaks. However, the western park's proximity to the road, with frequent electric bike traffic, interfered with the restfulness of the environment. Traffic pressure eased somewhat during the evening rush hour (18:00-20:00).



Figure 11. Lunchtime neighborhood crowds line up to eat. Source: Authors



Figure 12. Problems with the parking and use of electric vehicles. Source: Authors

Tourists' activities were more dispersed, while some businesspeople opted for leisure in the blocks after meetings, though their overall numbers were relatively small. Residents' public activities were concentrated in the afternoon and evening, with older residents favoring the eastern park for its more interesting walking routes. However, insufficient nighttime lighting in the western park negatively impacted its evening use. Business people's activities overlapped with those of office workers, primarily occurring in hotels and commercial areas, mostly at midday and in the evening. Delivery workers reached their activity peak during lunch hours, but the lack of dedicated parking spaces and sunshade facilities for electric bikes (Figure 12) made working conditions challenging. Workers in busier commercial areas were notably active, while those in less thriving areas were more idle, using public space amenities for temporary rest.

3.3.3. Activity Survey

This study identified five primary types of public activities, with dining experiences being the most common, accounting for 36% of leisure time, followed by socializing (25%) and entertainment/fitness activities (17%),

while walking dogs and sightseeing accounted for 4% and 3%, respectively (Figure 13). Field observations and interviews revealed that users preferred social activities, such as visiting cafes, tea houses, and bars. Due to Shenzhen's hot climate, users tended to gather in cooler areas like parks or shaded spaces.

Based on literature reviews (Long & Zhou, 2016) and survey results, 10 public activities were selected for inclusivity-focused design in the questionnaire (Figure 14). The results showed that flea markets and outdoor movie screenings were the most popular, with 23% and 22% preference, respectively. Parent-child interactive games and painting/sketching activities followed at 14% and 13%. Activities like rollerblading, street music performances, yoga, meditation, and street dance were seen as supplementary, further enriching the inclusivity and vibrancy of the blocks.

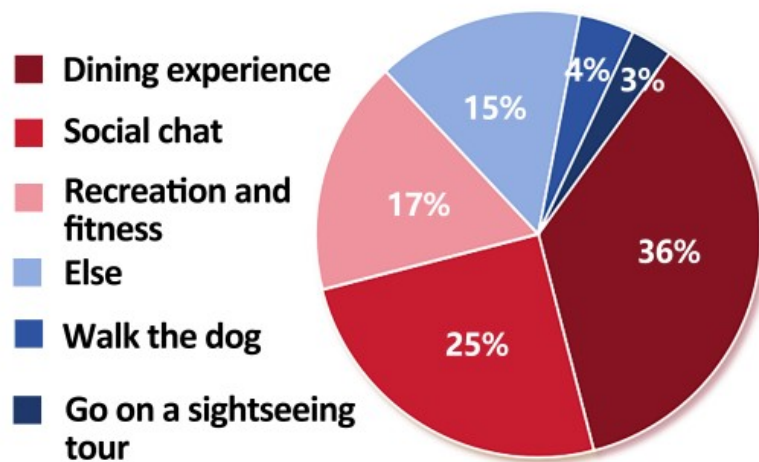


Figure 13. The five main public activities of the population. Source: Authors

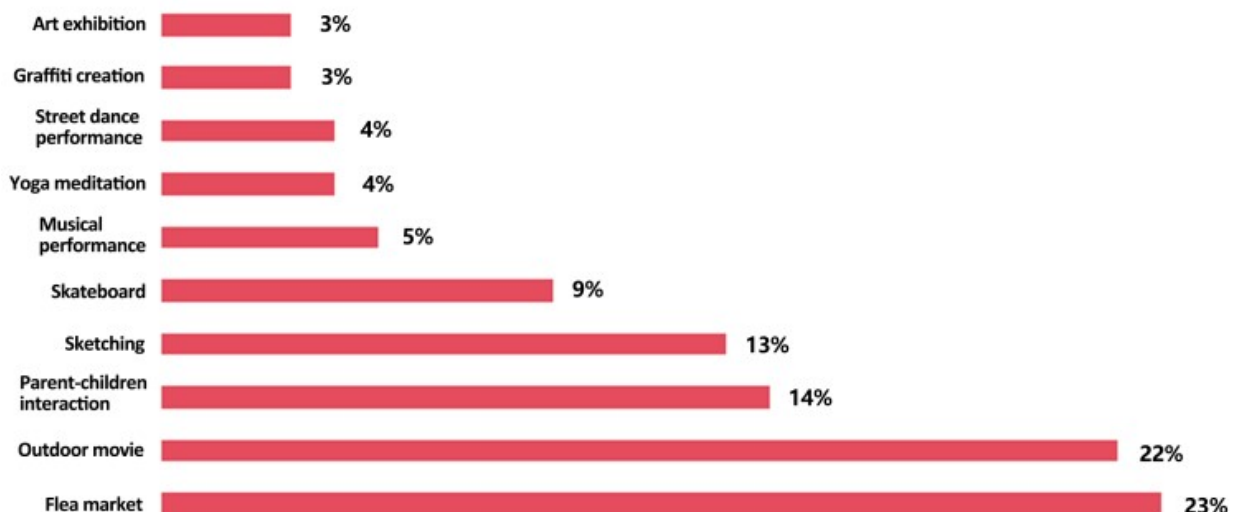


Figure 14. Results of a survey on willingness to engage in 10 public activities. Source: Authors

4. Survey Summary and Optimization Strategies

4.1. Inclusive Public Space Vitality Summary

4.1.1. Multicultural identity

By comparing the objective evaluation scale with the subjective questionnaire (Figure 8), it was found that the overall design of the blocks performed well in terms of plot division, volume control, open space development, and public facility management. However, there is room for improvement in multicultural identity, social interaction, and spatial equity and accessibility. Notably, "cultural art installations" received the lowest score, indicating that the blocks failed to adequately meet the needs of residents from diverse cultural backgrounds.

While the blocks did consider offering diverse dining services, the number is limited, making it difficult to satisfy the demands of groups with different cultural backgrounds. Multicultural festivals were primarily held in commercial facilities, failing to foster a broader sense of cultural identity. Overall, the design did not fully reflect a comprehensive consideration of multiculturalism.

4.1.2. Social interaction

The seating design and outdoor dining facilities in the blocks received high ratings, particularly for the cafes and green spaces along Lantern Street, which offer good aesthetic value. However, the parks lack sufficient accessible green spaces, limiting the diversity of social activities. Adding more social spaces within the lawn areas could further enhance social interaction. On the other hand, the distribution of trash bins is sparse, with inadequate color differentiation and small capacity, which hinders effective waste sorting. Although Lantern Street hosts festival events, these are relatively small in scale and lack a variety of public activities, such as markets and performances, which limits the potential for further social interaction.

4.1.3. Equitable accessibility of space

Spatial equity and accessibility initially scored well, but further investigation revealed significant issues with pedestrian experience, particularly conflicts between walkways and electric motorcycles. Despite the design's intention to separate pedestrians from vehicles, the frequent use of electric motorcycles, especially by delivery workers, has somewhat compromised the pedestrian experience. Additionally, while the office area's accessibility and nighttime lighting are relatively well-developed, the parks still have shortcomings, particularly in terms of lighting, which affects safety and accessibility at night.

4.2. Optimization Strategies

4.2.1. Strengthening overall operations management

To address the management and operation of public spaces, it is recommended to introduce the POPS (Privately Owned Public Spaces) (Xu, 2013) and PPP (Public-Private Partnership) (Geng et al., 2017) models. These collaborative approaches could enhance the utilization of public spaces while catering to the needs of diverse groups (Zhu & Cheng, 2021). In the current blocks, private consumer spaces like those in Lantern Street hotels are relatively closed off, leading to underutilization of some resources. Through adopting the POPS model, these private spaces could be changed into open spaces for commercial and public purposes, enhancing space use performance and offering sufficient rest areas for non-consumer groups such as delivery workers, guaranteeing fair access to public facilities. The PPP model could involve cooperation among the government, community, and enterprises to set up a long-term partnership (Geng et al., 2017), sharing accountability for funding and administration and guaranteeing that public space operations take into account the demands of various groups. There is a demand for installing more inclusive public rest facilities in the

blocks, including portable relaxation areas and shaded seating, which both delivery workers and residents can apply equally. This would assist in removing psychological obstacles between social classes, truly realizing spatial fairness and inclusivity.

4.2.2. Upgrading of public facilities

Presently, public facilities such as seating and outdoor dining areas are well-allocated in several areas, but to further improve these facilities, it is suggested to formulate a set of public facility planning norms (Oyama, 2024). These norms should clarify the requirements to guarantee that the facilities are convenient for various groups. Besides, more trash bins should be installed in public spaces, with color-coded designs to drive waste sorting and keep the blocks clean. In park lawn areas, adding outdoor loungers, shade frameworks, and nature-friendly paths could drive people to rest and involve in social activities, improving the practicality and comfort of public spaces.

Facilities should be further improved to satisfy the demands of delivery workers, electric bike users, and children. According to studies, delivery workers generally are short of appropriate areas to park their electric bikes, and during hot or inclement weather, they are short of facilities where they can rest and cool off. Hence, it is suggested to set up dedicated parking spots for electric bikes in core regions including Lantern Street and nearby parks, guaranteeing convenient and secure locations equipped with charging stations. Cooling facilities should be more extensively available and open to everyone, such as delivery workers, to guarantee they can enjoy the same amenities. Although roller skating and skateboarding are forbidden in commercial areas including Lantern Street, these activities are popular among teenagers. Hence, designated regions for roller skating and skateboarding should be established in nearby parks or plazas to satisfy this group's demands while avoiding disruption to commercial areas and pedestrian traffic.

4.2.3. Planning of public events

Setting up a long-term planning system for public activities in the blocks, combining with seasonal, holiday, and resident interests, would enable regular, diverse activities (Efremeno et al., 2024) that guarantee inclusivity for all groups. For instance, integrating outdoor movie screenings into flea markets could build cross-cultural, socially diverse scenes that advocate community involvement and promote an inclusive and vibrant block culture.

5. Conclusions

This research pays attention to the analysis of the vitality and inclusivity of public spaces in Blocks 22/23 of Shenzhen's Futian Central District. The blocks initially displayed cutting-edge urban planning ideas by careful plot division, shared landscape planning, and traffic administration, smoothly building an effective urban space. As an important milestone in Shenzhen's urban growth, this design set a benchmark for future urban planning, especially in enhancing space use and improving pedestrian-vehicle separation. Nevertheless, as society changes and novel professions such as delivery workers appear, the blocks must meet these novel needs, where enhancements are still required. Despite relatively well-developed infrastructure, areas including electric bike parking, rest facilities, and driving social interaction need further improvement. Through this research, we propose a series of recommendations, such as improving facility layouts, adding multifunctional rest spaces, and planning diverse public activities, to further enhance the inclusivity and vitality of the blocks.

The research on Blocks 22/23 in Shenzhen's Futian Central District not only highlights the lasting value of these blocks but also offers valuable insights for emerging areas like Qianhai and the Shenzhen Bay Super

Headquarters. By adopting these optimization strategies, these areas can more flexibly meet the needs of new professions and diverse populations, further advancing Shenzhen's development as a globally innovative city.

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