

A Study on the Optimization of Public Service Facilities in the Inclusive '15-Minute Community Life Circle' Based on Equity: A Case Study of Wujiaochang Sub-district, Shanghai

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Abstract

The concept of the "15-Minute Community Life Circle" aims to enhance urban quality of life, but it faces challenges related to social inclusivity in practice. This article takes Wujiaochang Sub-district in Yangpu District, Shanghai, as an example. Through participatory action research, it is found that while the distribution of existing public service facilities meets various indicators, there is a significant mismatch between their layout and the needs of different groups, making it difficult for vulnerable populations to equally access public services. Additionally, the current utilization of space is insufficiently flexible to substantively meet residents' needs. This article proposes two strategies: optimizing facility configuration and enhancing the use of flexible spaces, to improve the social inclusivity of the "15-Minute Community Life Circle".

Keywords: 15-Minute CLC, Inclusivity, Community Development, Participatory Action Research

1. Introduction

As the process of urbanization accelerates globally and people's living standards improve, residents' demands for daily services are becoming increasingly diverse, prompting a shift in urban development models from "scale expansion" to "quality enhancement." Against this backdrop, the concept of the "15-Minute City" was proposed by French scholar Carlos Moreno in 2016. This concept emphasizes the optimization of urban spatial structures to allow residents to meet their basic needs—such as housing, work, education, and healthcare—within a 15-minute walk or bike ride, thereby reducing commuting pressure and enhancing the convenience of life (Moreno et al., 2021). This idea has quickly resonated worldwide, with cities like Paris and Melbourne incorporating it into their planning practices, advancing urban planning from a "car-centric" approach to a "people-centric" one.

China introduced the concept of the "15-Minute Community Life Circle" for the first time at the inaugural World Cities Day Forum held by the Shanghai government in 2014 (Zhuang, 2014). This concept resonates with the global idea of the "15-Minute City" but places greater emphasis on service provision at the community level. In 2015, the United Nations formally adopted the 2030 Agenda for Sustainable Development, which includes Sustainable Development Goal 11 (SDG 11), emphasizing the need to "make cities and human settlements inclusive, safe, resilient, and sustainable," thereby providing an international framework for practices in China. In recent years, Shanghai has actively explored localized pathways that align with SDG 11, aiming to build a "People's City" that serves its residents.

In 2016, Shanghai released the "15-Minute Community Life Circle Planning Guidelines," which stipulate achieving the "Five Needs" goals of being "livable," "workable," "tourism-friendly," "educational," and "supportive of the elderly" within a 15-minute walking distance, thus creating safe, ecological, and comfortable communities (Shanghai Government, 2023). In 2018, the revised version of the "Standards for Planning and Designing Urban Residential Areas" published by the central government also incorporated the concept of time. The planning of residential areas considered the provision of facilities within different time dimensions, including 15-minute, 10-minute, and 5-minute living circles (Ministry of Housing and Urban-Rural Development, 2018). In 2023, Shanghai's "Three-Year Action Plan (2023-2025)" outlined detailed standards and indicators for the comprehensive promotion of the "15-Minute Community Life Cycle" (State Council of China, 2023). The document specifies that the population range for a 15-minute community life circle should be between 50,000 to 100,000, covering an area of approximately 3 to 5 square kilometres.

The Shanghai government defines the scope of street-level government (streets) as a community, with the street-level government responsible for providing infrastructure and convenience facilities for residents within

its jurisdiction. A 15-minute living circle is composed of multiple communities. Shanghai has been exploring the practice of the “15-Minute Community Life Circle” for nine years and has made significant progress, with the city-wide public service facility coverage exceeding 80% within a 15-minute reach (Ge et al., 2021).

Although the concept of the “15-Minute Community Life Circle” has achieved notable results in enhancing service convenience and supply, its focus primarily centres on physical space. In specific practical explorations, there remains a lack of an inclusive perspective, especially concerning vulnerable groups with limited mobility or scarce social resources—including the elderly, people with disabilities, children, and their caregivers—whose diverse needs are often not effectively addressed by existing facility layouts. This is specifically manifested in the following ways:

1. **Barriers to Physical Accessibility:** For instance, elderly individuals and people with disabilities are sensitive to walking environments (such as gradients and accessibility features) due to physical limitations. However, current planning often sets the “15-minute” threshold based on the mobility of healthy adults, and the inadequacy of road facilities results in a disconnection between nominal accessibility and actual usability.
2. **Insufficient Functional Adaptability:** The design of facilities tends to be overly simplistic. For example, community activity centres may lack areas for child care, making them unusable for dual-income families. Rehabilitation clinics may not be equipped with age-friendly signage, increasing the difficulty for individuals with cognitive impairments to navigate.
3. **Lack of Temporal and Spatial Inclusivity:** There can be mismatches between service hours and the schedules of different groups. For instance, community canteens may only operate during lunchtime on weekdays, thereby excluding families that require nighttime care. Additionally, canteens may only provide meals during designated eating times, making it inconvenient for elderly individuals who may want to rest after they finish eating.

Improving the quality of urban life has always been one of the goals pursued in urban planning. Under the context of the 15-Minute Community Life Circle, the provision of facilities has been significantly promoted and implemented. This study, conducted over a period of one year through planning work and interviews in the Wujiaochang Sub-district of Yangpu District, Shanghai, found that the service provision of facilities still requires inclusive optimization, mainly including: (a) enhancing the utilization of inefficient spaces, such as the misalignment between population and facility distribution leading to resource idleness or redundancy; (b) promoting flexible use of space, which mainly encompasses functional flexibility and temporal flexibility. Currently, some facilities have a singular function, making them difficult to meet the diverse needs of different groups. Time-wise, there is a need to guide different groups to use the same space at staggered times. The structure of the other sections of this article is as follows: the second section provides a literature review related to the current research for experience and basis; the third section explains the data and methodologies; the fourth section conducts a results analysis; and the fifth section offers relevant recommendations.

2. Literature Review

2.1 Overview of the “15-Minute Community Life Circle” at Home and Abroad

The concept of the “15-Minute City” can be traced back to E. Howard’s “Garden City,” proposed in 1890. Subsequently, Clarence Perry introduced the “Neighbourhood Unit” as a planning approach, using a 5-minute radius to define the neighbourhood’s boundaries. This concept emphasizes the convenience between urban facilities and citizen usage, highlighting the importance of creating a safe walking environment for residents within neighbourhood units (Sharifi, 2016). In the concept of the “Neighbourhood Unit,” the fundamental requirement of addressing transportation issues emerged, leading to a shift in planning models from attracting citizens to reducing the distance between citizens and their destinations. However, during the 1920s and 1930s, modernist planners, including Le Corbusier and Frank Lloyd Wright, began promoting modern urban planning, resulting in the separation of work and living environments (Pozoukidou and Chatziyiannaki, 2021). After World War II, the idea of “humanization” returned, with scholars advocating for mixed-use development, green spaces, walkable, and compact cities. In 2016, Carlos Moreno introduced the concept of the “15-Minute City,” which shares similar ideas with “Chrono-urbanism,” proposed by French urban planner and sociologist François Asher in 2001. Both

concepts aim to better serve urban residents through supporting nearby services. The method of “Chrono-urbanism” emphasizes the importance of urban rhythm in understanding urban life quality, particularly through the integration of spatial and temporal dimensions (Ye, 2006). China’s exploration of the “X-Minute City” concept is primarily reflected in the proposal and practice of the “15-Minute Community Life Circle.” In a 2015 article, Chai Yanwei used Beijing as an example, combining studies on living spaces in foreign cities with advancements in living circle planning practices. Based on temporal and spatial behaviours, he proposed constructing an urban living circle planning theoretical model centred around “basic living circles - commuting living circles - extended living circles - collaborative living circles” to address urban issues and optimize the structure of urban living spaces (Chai et al., 2015). In 2017, Li Meng proposed planning ideas and countermeasures for constructing the “15-Minute Community Life Circle” by examining the differences and issues between community supply and residents’ future needs, focusing on five systems: residence, employment, services, transportation, and leisure (Li, 2017). In conjunction with current practical research, Yang Baojun believes that the domestic practice of the “15-Minute Community Life Circle” improves social governance in China and serves as a spatial carrier for addressing urban ailments and enhancing residents’ quality of life (Planning Theory Editorial Board, 2020).

2.2 Mobility and Facility Equity

Research on community equity in foreign countries began relatively early, with attention drawn to issues of racial segregation around the year 2000. Sheller and Urry (2006) proposed the new mobilities paradigm to challenge the traditional social sciences’ neglect of mobility, constructing an interdisciplinary theoretical framework to analyse contemporary social mobility phenomena (Sheller and Urry, 2006). The social inequalities brought about by mobility have also garnered attention and discussion across various fields. Urry introduced the concept of unequal mobility, arguing that mobility is an important resource that reflects and reinforces power, with significant disparities existing in the mobility of different populations. Law (1999) pointed out that women’s mobility is constrained by social structures and emphasized the need to focus on the everyday mobility practices of different genders (Law, 1999). The mobility disadvantages faced by marginalized groups constrain individuals’ spatiotemporal behaviours, while social capital and power relations further reinforce mobility inequities (Chang & Zhang, 2022). In the field of urban studies, mobility theory is similarly applied to the research of social-spatial imbalances (Lynam et al., 2023). In China, the focus on community equity arises from the spatial segregation issues caused by rapid urbanization, with the field of urban planning paying more attention to the protection of spatial rights, the spatial allocation of public resources, and the reconstruction of social spaces (Zhou and Zhong, 2016).

Many scholars have found that various factors such as gender, income level, age, and housing type can influence an individual’s range of activity space (Wang et al., 2012). Currently, assessments based on residential space mainly rely on static measurements, neglecting the dynamic interactions between living environments and individual mobility. Different individuals display distinct behavioural patterns, and with advancements in technology, contemporary behavioural geography has developed various methods for measuring spatiotemporal accessibility based on “people.” (Jiang et al., 2014)

These measurement methods are primarily used to assess the actual enjoyment of parks and green spaces, such as calculating the number of visits to green spaces using mobile signal data (Xiao et al., 2019).

The evaluation of the equity of public service facilities can be divided into two aspects: equality and fairness. Jiang Haiyan summarized Western studies on the equity of national public services into three stages (Jiang et al., 2011): “regional equality, spatial fairness, and social equity.” Tang Zilai further differentiated between social equity and social justice (Tang and Gu, 2016), noting that the former assumes that the abilities and needs of various social groups are the same, whereas the latter recognizes the differences between groups and advocates for basic public services to be tilted towards specific socially disadvantaged groups.

2.3 Inclusive Sharing of Public Service Facilities

In recent years, the inclusive sharing of public service facilities has become a hot topic of research, encompassing aspects such as public spaces, public service facilities, and street designs. In the realm of community gov-

ernance, “inclusiveness” is increasingly regarded as one of the standards for assessing whether a community achieves good governance (Han and Ren, 2025). In terms of spatial inclusiveness, diverse spatial designs are essential components of resilient community planning, requiring consideration of the needs of various groups and the establishment of multifunctional activity areas (Du et al., 2025).

Research on the social attributes of community public spaces primarily focuses on the “humanistic” qualities of these spaces, paying attention to residents’ individualized needs and embodying the community’s humanistic care. Li Xinyang and others have proposed construction strategies for suitable public spaces from the perspective of combining the needs of the elderly and children (Li et al., 2015). From the angle of humanistic care, several scholars have noted the shared needs of different age groups within the community and have proposed design strategies for neighbourhood activity centres (Zhang et al., 2021), community centres (Ma & Zhang, 2022), and shared public facilities (Wu, 2023) based on the physical and mental needs and behavioural characteristics of the elderly and children.

Concerning shared streets, both domestic and international research has conducted extensive theoretical exploration and practical implementation. Current studies focus on functionality and integration, but there is a lack of flexible time-guiding strategies and concrete feedback on implementation.

2.4 Participatory Action Research

Sun Shiwen and Yin Yue (2004) trace public participation in urban planning back to the 1947 UK Town and Country Planning Act, which mandated that planning should grant the public the right to express their opinions (Sun and Yin, 2004). Zhang Fan, Li Xun, and other scholars (2022) note that participatory planning gained significant development abroad with the revival of liberal ideas and the emergence of civil rights movements in the 1960s. Taiwan began exploring “community building” early on, while mainland China initiated research on participatory community planning in the 1980s (Zhang and Li, 2022).

Participatory Action Research (PAR) is a community-centered research method that emphasizes democratic participation and co-creation of knowledge. Its core concept is “democratization of knowledge production,” meaning that residents shift from being traditional research subjects to co-researchers, directly participating in diagnosing issues, designing solutions, and implementing plans, thus promoting social change and restructuring power relations. This research method not only focuses on knowledge acquisition but also emphasizes achieving social equity and justice through participation and action (Chen, 2023).

In terms of community participation, PAR stresses the active involvement of community members, especially in the stages of problem identification, solution formulation, and implementation (Astoriga-Linerós et al., 2023). Comparatively, community members tend to rely on experts’ knowledge and participate less in the research process, which may affect the flexibility and effectiveness of the study (Graef and Sieber, 2018). To ensure effective communication in participatory research, researchers and participants should establish open and transparent communication channels to guarantee two-way information flow (Rosenthal and Khalil, 2010). Through continuous adjustments and adaptations during the research process, participants can play an active role in decision-making. Regarding the methods, processes, and models of participatory community planning, some studies have sought technical solutions to enhance public engagement. New technologies (Maffei et al., 2016; Saija L et al., 2017), such as image recognition and virtual reality, can lower participation barriers and invigorate public involvement. Additionally, creating different public participation scenarios, such as gardening or street experiences, can improve the public’s participatory experience (Cilliers & Timmermans, 2014). Many scholars, based on planning practice experiences from various regions, analyse the participation process and summarize public participation pathways and participatory community planning models suitable for China’s socio-economic development context (Liu et al., 2017; Liu et al., 2019).

Participatory community planning impacts the social space of communities. With the transformation and development of urban and rural areas in China and the awakening of public participation awareness, participatory

community planning is regarded as a process for addressing social issues in urban and rural regions and producing social space (Liu and Deng, 2016).

3. Research Methods and Case Studies

This study adopts a predominantly qualitative research approach through a mixed-methods framework, including local workshops and in-depth interviews. Stakeholders such as community residents and current students are treated as equal research partners. This approach is necessitated by the fact that the research area has a significant elderly population, and big data cannot objectively capture data on this demographic. Additionally, many existing studies on equity and inclusion rely heavily on quantitative data, which fails to uncover the genuine needs of residents in depth.

The theoretical foundation of Participatory Action Research (PAR) encompasses democracy, equality, liberation, and empowerment. It emphasizes an egalitarian relationship between researchers and participants, opposing the asymmetry found in traditional subject-object relationships. The methodology of PAR focuses on participation, collaboration, reflection, and action, employing various methods such as discussions, interviews, and observations to facilitate knowledge co-creation and action implementation. To ensure the scientific integrity of the research, this participatory planning includes four processes: identifying issues, understanding needs and strengths; proposing action plans and soliciting residents' opinions; reflecting on actions taken after multiple rounds of workshops to improve subsequent actions; and striving to ensure the interests of a broader range of groups.

3.1 Case Study

This case study focuses on the Wujiaochang Sub-district, located in the Yangpu District of Shanghai. It is situated in the core area of the Jiangwan-Wujiaochang urban sub-centre and covers an area of approximately 7.66 square kilometres, consisting of 32 subdistrict offices (with each subdistrict office managing a community). According to the data from the seventh national census conducted in 2020, the total resident population of the Wujiaochang Sub-district is 145,000, with a registered population of 119,200 and a permanent registered population of 98,500, resulting in a population density of nearly 20,000 people per square kilometre. The population aged 60 and above in Wujiaochang Sub-district is 36,080, accounting for 25% of the total population; the population aged 65 and above is 25,276, making up 17.5%. Considering that internationally a population proportion of 10% aged 60 and above or 7% aged 65 and above is often used as a criterion for a country or region to enter an aging society, the aging problem in Wujiaochang Sub-district is relatively pronounced.

In 2023, Shanghai initiated the construction of a 15-minute community living circle, planning for Wujiaochang Sub-district to be divided into four 15-minute living circles, with each circle serving a population of approximately 36,000 over an area of about 1.9 square kilometres. With the support of the "community planner" system, the research team can continuously follow up on community renewal efforts in Wujiaochang Sub-district, obtaining precise spatial data such as population data, facility POIs (points of interest), and road network data, which meet the analytical precision requirements. Furthermore, with the support of government street staff and community workers, the team conducted interviews and surveys via four participatory workshops to gather the genuine needs of the community, striving to fully incorporate the demands and opinions of diverse groups in response to the challenges of spatial equity and facility adaptability. During the research process, the workshops were divided into three stages: issue diagnosis, flexible co-creation, and consensus decision-making, focusing on in-depth discussions regarding the misalignment in facility supply and insufficient spatial flexibility.

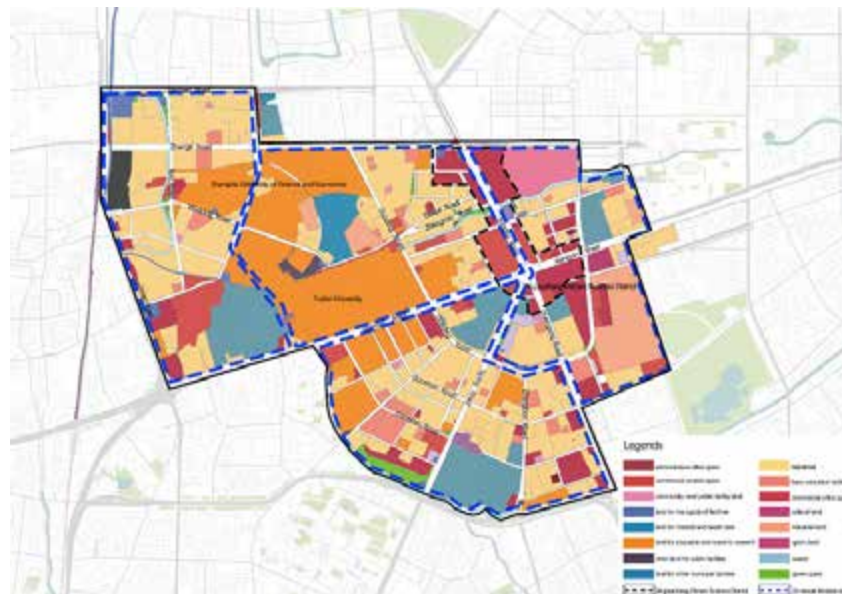


Figure 1. Existing Land-use and Planned four life-Circles in the area of Wujiaochang sub-district

3.2 Research Design

In the preliminary stage of the research, the research team organized survey groups, consisting of students with backgrounds in urban planning, who possess a certain level of professionalism and judgment. At the start of the study, four workshop locations were determined. The research group focused on identifying the fundamental issues related to facility usage in the area while promoting the construction of the “15-Minute Community Living Circle.” Concurrently, geographic analysis of facility locations was conducted, later shifting focus to the issues of misalignment in facilities and their flexible use. With the assistance of the local government, we conducted random street interviews and surveys within the subdistrict, aiming to engage a diverse range of groups. This direct communication method facilitated timely feedback on needs from stakeholders and their participation in the planning and design process.

3.2.1 Preliminary Discussions and Collection of Resident Opinions

The research team held preliminary discussions and gathered opinions in a small meeting room on the second floor of the Jingshi Bookstore, involving representatives from various grassroots government departments, the Fudan Community, the Urban Investment Company, and resident representatives. Representatives from the Wujiaochang subdistrict briefly presented the development history, planning policies, and current status of the subdistrict. The Urban Investment Company shared some of the ongoing planning content, while the community committee leadership introduced the goals and vision expected to be achieved during this renewal period, along with key design points and areas that need to be updated and renovated. The research team provided a brief report to the subdistrict office leaders on the preliminary preparations, the nature of the bottom-up participatory planning design, work timelines, and workshop methodologies, achieving a general consensus among participants. After the initial discussions, under the guidance of the community committee leadership, the design team conducted a site survey to gain a preliminary understanding of the site's boundaries, the current situation of important update points, traffic conditions, population dynamics, and usage needs.

3.2.2 Preliminary Analysis of Facility Locations and Population Data

The research team obtained multiple pieces of information regarding the locations of public service facilities and the seventh national census data in Wujiaochang Subdistrict. A simple analysis and processing of the base map was performed, and road network data was collected and processed to generate a network dataset, forming the basis for network analysis. The handling of population data involved entering the population data into the attribute table according to the jurisdiction of the community committees. Then, the data was visually represent-

ed on the map using a point density symbol system, where red represents the population aged 0-19, blue represents the population aged 60 and above, and orange-red represents the population aged 75 and above. Each point in the data represents 10 individuals, resulting in a population data base map. Building on this, an analysis of facility coverage was conducted using analytical tools for network analysis and service area analysis, setting interruption values for service radii of 300, 500, and 800 meters.

3.2.3 Multi-Round Scheme Design and Communication

Based on the feedback and data collected from two rounds of workshops, design strategies for the corresponding facilities were proposed. Additional workshops were held within Wujiaochang Subdistrict to continue gathering feedback from residents.

3.3 Data Analysis and Research Findings

3.3.1 Phase One: Collaborative Problem Diagnosis—Identification of Facility Supply Misalignment and Equity Challenges

In the first community workshop, the research team organized residents to draw daily activity trajectory maps based on spatiotemporal behaviour analysis from time geography. This helped collect information on residents' activity areas and assess the coverage of existing facilities. The results indicated a misalignment between facility supply and actual demand.

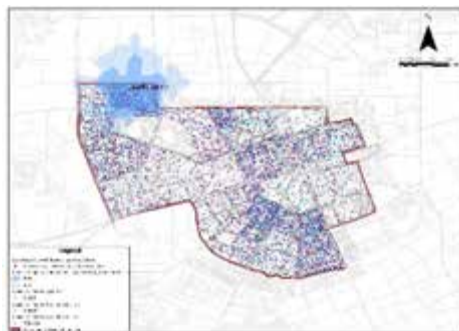


Figure 2: Coverage Map of Nursing Homes at the Township Level Within 500 and 800 Meters

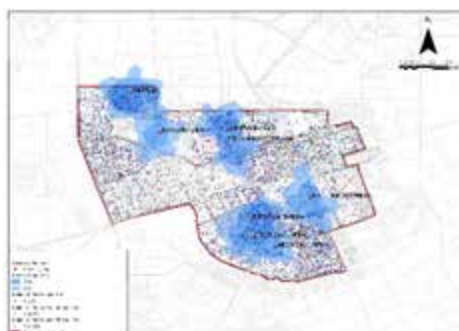


Figure 3: Service Radius of Community-Level Elderly Care Stations in Wujiaochang Subdistrict at 300 and 500 Meters

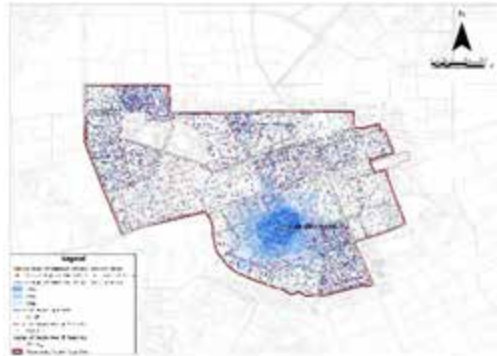


Figure 4: Community Cultural Activity Center in Wujiaochang Subdistrict.

There is a nursing home facility in the Wujiaochang Subdistrict (Figure 2). Considering the road network, a coverage analysis of 500 meters and 800 meters was conducted, revealing that its coverage is severely inadequate. Notably, the elderly population in the southeast direction of this subdistrict is significantly higher, yet there are no corresponding facilities available in that area.

In Wujiaochang Sub-district, there are eight community-level elderly care stations (Figure 3). After conducting a coverage analysis of each facility point within 300 meters and 500 meters, it was found that their coverage is also severely lacking. Furthermore, in the southeast and northwest directions of Wujiaochang Sub-district, the proportion of the elderly population is relatively high, but these areas lack community and elderly care stations. The subdistrict also has a community cultural activity centre (Figure 4), which, after analysis of its 300-meter, 500-meter, and 800-meter coverage, also showed severely insufficient coverage.

In addition to the inadequacies in elderly facility coverage and misalignment identified through geographical data analysis, the feedback from residents during street interviews mainly included the following points:

The elderly population faces limitations due to physical function, making it difficult for them to conveniently utilize the nominally "15-minute" green spaces and activity areas. Some public facilities, such as a nearby convenience restaurant, have high prices and do not cater to the taste preferences of older adults, causing elderly residents to seek alternative dining options that are farther away. Although the construction of the "15-Minute Community Living Circle" emphasizes walkability as an evaluation criterion, in practice, the age-friendly design and economic viability of facilities still require further optimization. Some elderly residents reported the complete absence of elevator services, a lack of accessibility features on the road, and difficulties in descending stairs due to the absence of elevators in residential buildings.



Figure 5: Photos from the Workshop and Feedback Collection

3.2.2 Stage Two: Co-creation Design - Adaptation and Expansion of Flexible Space Utilization

This stage clarified the equity shortcomings in the misalignment between facilities and population demands, highlighting the need for optimization in the refinement and adaptability of the “15-Minute Community Living Circle” concept in practice. The research methodology at this stage drew on the model of “co-creation workshops,” utilizing public participation to identify local development needs and organizing community planning around these issues to facilitate connections and consensus among various social stakeholders.

In the participatory design workshop of the second stage, the planning team introduced blank base maps for residents to document their spatial and temporal trajectories throughout the day (Figures 6 and 7). Residents were guided to describe their ideal design proposals, which the designers then illustrated, received feedback on, revised, and presented again. During the co-creation process, residents and planners engaged in discussions around the flexible use of space concerning functional co-location and time-sharing. The core issues and explorations included:



Figure 6: Residents record their travel times and locations for a day on a blank map.

Lack of Functional Complexity: Existing public spaces are mostly single-functional and cannot flexibly transform to meet the diverse needs of the elderly for daytime socialization, or the youth for nighttime cultural and creative activities or café gatherings. This indicates that the multifunctionality of community spaces is key to achieving “flexible utilization.” Research shows that the multifunctionality of community spaces can not only enhance space usage efficiency but also strengthen residents’ sense of belonging and participation.

Insufficient Time-sharing: Residents have proposed initiatives such as a trial nighttime pedestrian street in the Zhengsu Road area and the concept of shared streets. However, current facilities and management still lack mechanisms for flexible adjustment and guidance, failing to achieve efficient switching of crowds and time periods. This suggests that the time-sharing mechanism of community spaces is an important guarantee for achieving “flexible utilization.” Research indicates that the establishment of a time-sharing mechanism relies on flexible management strategies and active participation from residents.

Space Adaptability for Vulnerable Groups: Insufficient flexible utilization results in high usage thresholds for elderly people, children, and individuals with disabilities, especially during peak traffic periods and in terms of social activity demands. This indicates that the adaptability of community spaces is a core element in achieving “flexible utilization.” The adaptability of community spaces needs to consider not only the physical accessibility of the space but also the inclusivity of the social space.

During this stage, multiple rounds of simulations emphasized the necessity of multifunctional complexity and

staggered usage to enhance space equity and sharing. Additionally, it accumulated rich data on residents' preferences and usage scenarios. The research methods in this stage borrowed from the theoretical basis of "participatory design," emphasizing the integration of residents' subjective experiences and needs into the design process, thus achieving a "people-centred" community regeneration.

3.2.3 Phase Three: Consensus Decision-Making — Responding to Diverse Needs, Balancing Flexibility and Safety

In the consensus negotiation meeting of the third phase, the research team established a veto power for vulnerable groups based on the theory of deliberative democracy, along with a voting weight of 70% for residents and 30% for experts, to promote equal dialogue among multiple stakeholders. The meeting focused on the following key issues:

1. Facility Function Differentiation and Reconfiguration: How to promote the adaptation of old residential buildings for the elderly (such as installing elevators), enhance the flexibility of indoor activity spaces, and regenerate outdoor activity nodes within the existing building stock.

2. Equity Assurance: Representatives of vulnerable groups, such as the elderly and people with disabilities, explicitly expressed their core concerns about facility accessibility and economic feasibility, ensuring that the renewal plan is optimized for both physical and social equity. The equity of community spaces is a core element in achieving "flexible utilization," requiring consideration not only of the physical accessibility of spaces but also of the inclusivity of social spaces.

Through recordings and notes, the research team further explored the distribution of opinions and value trade-offs among residents during the negotiation process, enriching the diverse perspectives of spatial governance. The research methods in this phase drew from the theoretical foundation of "deliberative democracy," emphasizing the integration of residents' subjective experiences and needs into the decision-making process, thereby achieving a "people-centred" community renewal. Additionally, this phase reflects the application of the concept of "dual rationality," balancing between instrumental rationality (program design) and communicative rationality (consensus negotiation) (Li Qing and Lin, 2023).

4. Findings and Improvement Measures

In the third phase of the participatory planning work at Wujiaochang Sub-district, this article summarizes three core issues closely related to "misalignment of facilities" and "insufficient flexible use of space," based on residents' demands, current situation surveys, and on-site discussions. Additionally, corresponding improvement measures were developed based on the co-creation process.

4.1 Main Research Findings

1. Misalignment between Facility Supply and Diverse Needs

The research found that despite the nominally reasonable layout of public service facilities within the community according to the "15-minute living circle" standard, there are significant gaps in accessibility and economic adaptability for the elderly, children, and other vulnerable groups. For example, elderly residents generally report that community canteen prices are high and the food does not suit their tastes, making it difficult to meet their daily dining needs. In areas with a high proportion of elderly population, there is a lack of elderly care facilities. Although the community activity center has a certain level of coverage, the activities offered have some barriers to entry, which creates an invisible exclusion for many elderly individuals who do not possess special talents. Meanwhile, young people and working professionals report a lack of diverse commercial facilities and flexible social spaces.

2. Insufficient Flexibility in Space Function and Time Utilization

Regarding flexible usage, there are two aspects of flexibility needs: spatial flexibility and temporal flexibility. In the various workshop stages, residents generally expressed that the community space lacks flexibility and cannot meet the diverse needs of different groups at different times. For an idle space within the street, many elderly residents pointed out a desire for someone to organize and make use of it, as the street lacks multifunc-

tional spaces that can simultaneously accommodate daytime gatherings for the elderly and nighttime social activities for youth. The outdoor activity spaces primarily consist of single green areas or scattered seating, lacking diverse scene combinations.

Some community service facilities, such as canteens and activity centres, are only open during limited hours. Residents tend to leave quickly after eating and, on occasions when they want to gather with friends for tea, they struggle to find suitable indoor spaces, thus leading to the neglect of their off-peak usage needs in real life.

4.2 Improvement Measures

Based on the needs of community residents and feedback from participatory workshops, the research proposes targeted and actionable spatial improvement measures aimed at addressing the misalignment of facilities and the lack of flexible space utilization. The goal is to enhance the “15-minute community living circle” to better respond to the equitable needs of diverse populations. The specific measures include the following two main strategies:

1. Strategy 1: Activating Inefficient Spaces

In light of the current situation where some facilities are idle or underutilized, community renewal should start by “reactivating spatial potential.” This can be achieved through various methods to enable flexible and efficient space reuse. For instance, after the renovation of Guoding Road, four small micro-spaces of around ten square meters each were created. These spaces incorporate functions such as elderly services, party and community activity rooms, and reading rooms, which not only meet the diverse needs of residents but also enhance the overall appearance of the space through function implantation.

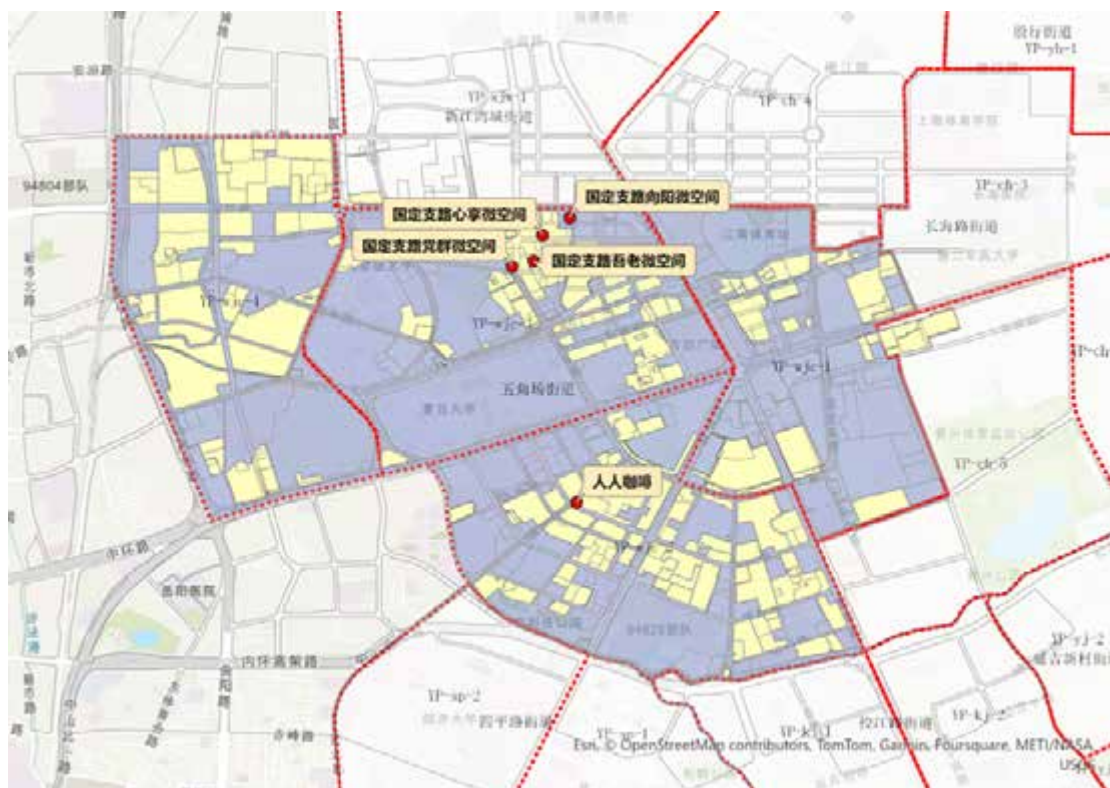


Figure 7. Distribution Map of “Six Arts Pavilion” in Wujiaochang Sub-district

Dynamic Demand Response System: A dynamic questionnaire link is established and distributed to residents through the neighbourhood committee to collect real-time usage preferences and feedback, enabling dynamic adjustments of space utilization.

5. Discussion

This study deepens the academic understanding of how the “15-minute community life circle” transforms from physical supply to social inclusivity, highlighting the key roles of precise facility supply and flexible spatial sharing in achieving spatial equity.

5.1 From “Nominal Accessibility” to “Substantial Accessibility”

The “15-minute life circle,” as a macro indicator, can only shift from “nominal accessibility” to “substantial accessibility” when it genuinely responds to the daily mobility capacities and temporal rhythms of different groups (such as the elderly, teenagers, and caregivers of children). The micro-renewal process within the community shows that disparities in accessibility due to factors like age, physical ability, and income directly limit fair distribution of services, necessitating more detailed data on population needs and adaptive modifications for contextual fit.

5.2 Flexible Utilization is Key to Bridging Service Gaps

The multi-round co-creation workshops in this study indicate that the functional complexity of spaces and staggered time sharing provide effective pathways to reconcile the shortage of spatial resources with the diverse needs of society. This aligns with international experiences such as Japan’s “shared streets” and Singapore’s community centers with time-sharing, where “flexibility” plays a role not only in the adjustment of physical spaces but also as a part of multi-stakeholder collaborative governance models.

5.3 Implications for Policy and Practice

This study suggests that to achieve the vision of a “15-minute community life circle,” it is necessary to prioritize both physical renewal and social governance, concurrently advancing spatial flexible transformations and diverse resident consultations. Efforts should span multiple scales from micro (neighbourhood and building levels) to macro (street and regional levels), dynamically responding to resident needs. Additionally, establishing a regular participatory governance mechanism can encourage residents to maintain long-term attention and involvement, forming a sustainable model of community co-construction and sharing.

6. Conclusion

Globally, the “15-minute community life circle” has become an important pathway for high-quality urban development and a human-centred transformation. This paper takes Wujiaochang Sub-district in Yangpu District, Shanghai, as a case study, combining a year-long field research and participatory workshops to focus on issues such as misalignment in facility supply and insufficient flexible utilization of space. It systematically summarizes the multidimensional challenges and potential improvement pathways encountered in actual updates. The research highlights several key points worth noting:

1. The issues of facility misalignment and spatial flexibility are core challenges to community equity. Small sample sizes and detailed interviews are necessary supports for big data analysis. Although the concept of the “15-minute life circle” emphasizes balanced distribution of basic service supply, significant disparities exist at the micro practice level regarding residents’ daily time arrangements, mobility abilities, and economic conditions, leading to a gap between nominal and actual accessibility.
2. Flexible spatial utilization and time-sharing are effective ways to resolve resource conflicts. Practical experience shows that flexible spatial conversion and time-sharing arrangements not only enhance the usage efficiency of existing facilities but also effectively alleviate usage conflicts among different groups.
3. Participatory governance and equity mechanisms are core guarantees for promoting community renewal. By introducing a three-phase workshop model of “co-creation, co-measurement, and co-decision-making,” along with governance innovations such as granting veto power to marginalized groups, the practice enables deep participation of residents in spatial transformations and ensures equity. It also highlights the complex trade-offs in community governance between safety, vitality, and equity.

However, the study still has limitations. Due to the long construction period, the proposed solutions could not be promptly implemented, and management measures were not timely executed or feedback obtained. A long-term dynamic monitoring system still needs to be established. Additionally, this research only analysed a few communities in Wujiaochang Sub-district, and the survey work did not unfold comprehensively, necessitating more in-depth research in the future.

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