

Strategies for Adaptive Retrofitting of Public Space in Older Communities in the Context of Inventory Renewal

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ABSTRACT

Urban renewal is one of the most important issues in contemporary urban economic development in China. With the continuous growth of the aging population and the change of the basic structure of the residents in old neighborhoods over time, it is crucial to provide community attention for the elderly in the public action areas of old neighborhoods. The article analyzes the current situation of public space in older neighborhoods and proposes strategies for creating space in older communities, aiming to provide effective suggestions for age-friendly renovation of older communities.

KEYWORDS

Stock regeneration; Old neighborhoods; Age-appropriate renovation; Public space.

1. INTRODUCTION

As the process of urbanization accelerates, many cities are facing problems such as tight land resources, aging infrastructure and irrational functional layout. In the 14th Five-Year Plan period, China's urbanization development has gradually moved towards an era of high-quality development. The development of urbanization has also gradually transitioned from incremental stage to the era of stock, and its focus will be on the revitalization of stock while restraining growth [1]. Old neighborhoods have become a huge stock in China's urbanization construction, and their reconstruction has become an important way for the government to improve the efficiency of construction funds. In 2001, China's population began to enter the aging period, and as of the end of 2021, the proportion of China's elderly population has exceeded 14%, and it is predicted that the elderly population will account for 34.9% of China's total population in 2050, which shows a clear trend of aging. As the size of the middle-aged and elderly population continues to expand, the challenges posed by population aging are becoming more and more prominent, and higher demands are being placed on the social service system for the elderly and public policies. In urban areas, most older people live in older neighborhoods that were built earlier, for example, in Beijing, 77% of older people live in homes built before the housing reform in 1998, and these "old and broken homes" face great challenges in terms of aging and comfort. With the passage of time, the living conditions and surrounding facilities in these old neighborhoods are no longer able to meet the needs of contemporary elderly people, so it is urgent to carry out ageing renovation in these old neighborhoods.

The CPC Central Committee and the State Council attach great importance to the work of ageing in place in the community, and have listed ageing in place in urban communities as one of the important tasks for improving people's livelihoods. The Fourteenth Five-Year Plan and the Vision 2035 Outline explicitly propose "implementing a national strategy for actively coping with population ageing",

elevating the work of actively coping with population ageing to the level of a national strategy, and calling for the improvement of the community-based home care service network and the promotion of ageing-adapted reconstruction of public facilities. This promotes the construction of age-friendly cities and meets the needs of the elderly to "enjoy a long life".

2. THEORIES AND POLICIES RELATED TO AGING

The concept of ageing-friendly design initially originated from the field of built environment, and the research on ageing-friendly design in China is relatively late. In 1995, Hu Renlu and Ma Guang published *Designing the Living Environment for the Elderly*, which proposed a basic theoretical framework for planning and designing the living environment for the elderly in China [2]. After entering the 21st century, research on ageing-friendly design has gradually increased. Xiong Wei combined with the physiological and psychological changes of the elderly, put forward the design countermeasures of rational layout of ageing-friendly units [3]; Zhou Yanmin et al. put forward the principles and points of ageing-friendly outdoor environment design according to the needs of outdoor activities of the elderly, and guided the development of a healthy aging society through the creation of outdoor environments [4]. In recent years, the degree of aging in China has been deepening. According to the estimation, by the "14th Five-Year Plan" period, Chinese people will gradually move towards the stage of moderate aging, and it is expected to move towards the stage of severe population aging at the age of about 2035. Under China's "9073" (90% home care, 7% community care, and 3% institutional care) model of aging, the family and the community have become important venues for healthy aging. [5]. In recent years, the government has continued to strengthen the construction of community-based elderly care services, and in addition to focusing on the health level of the elderly, it has also paid more attention to the impact of the community environment on the elderly.

Older neighborhoods carry the memories of their residents from the past and transmit the cultural genes of the city. However, with the passage of time, the aging infrastructure and the lack of recreational facilities in old neighborhoods have failed to meet the expectations of the elderly for a better life and high-quality housing. Therefore, the ageing transformation of old communities is an important means to enhance the construction of age-friendly cities.

3. PUBLIC SPACE AND ITS PROBLEMS IN OLDER NEIGHBORHOODS

3.1. Concept of Public Space in Older Communities

Older neighborhoods refer to residential areas that were constructed earlier, lack proper maintenance, are poorly managed, have inadequate municipal infrastructure, have inadequate community services, and have a strong desire from residents for renovation. In contrast, public space in older community areas includes areas that are frequently used by residents, such as streets, sidewalks, parks, plazas, fitness centers, and recreational areas.

3.2. Current Issues of Public Space in Older Neighborhoods

Older communities were built at an earlier age and often suffer from the problem of dilapidated equipment, which makes life inconvenient for residents. Previously, the renovation of old communities mainly focused on improving the facade, adding external wall insulation and renovating roof waterproofing, without really improving the living conditions and environment of residents. Through surveys, the following larger problems exist in older communities.

3.2.1. Security risks

The entrances and exits of public spaces in old neighborhoods often lack lighting facilities or have poor lighting conditions, which brings great inconvenience to the activities of the elderly, and even poses the risk of falling, seriously affecting their travel safety. The lack of effective monitoring systems in public spaces leads to inadequate security management of public spaces and a lower sense of security among residents.

3.2.2. Environment

Older neighborhoods generally lack public green space and have low green coverage. The lack of green space leads to a lack of recreational areas, air purification and temperature regulation. Public spaces in old neighborhoods are in poor hygiene and garbage is not cleaned up in a timely manner, affecting residents' quality of life and often plagued by noise and air pollution.

3.2.3. Community public toilets

The main problems include an insufficient number of public restrooms, a lack of barrier-free facilities at entrances and exits, difficulties in wheelchair access, and restrooms that do not meet the needs of wheelchair users. Since restrooms are places where accidents are high among the elderly, they should be designed from the perspective of the elderly.

3.2.4. Outdoor space for community elderly service facilities

In older neighborhood communities, the entrances and exits of existing facilities often lack barrier-free facilities, leading to problems such as difficulty in access for older persons. Parking lots do not take into account barrier-free design, making it difficult for older persons traveling in wheelchairs to enter and exit. There is a lack of outdoor space for activities, and the existing space has safety hazards that affect the experience of using it.

3.2.5. Community public transportation

Older neighbourhoods were established earlier, and the initial design did not adequately take into account the urbanization process and the surge in the number of vehicles, resulting in a severe shortage of off-street parking spaces. Some municipalities have added accessibility ramps to building entrances, but have neglected to make sidewalks accessible. As a result, older communities have failed to provide parking facilities commensurate with a modern society, and random parking of vehicles is common. This puts further pressure on and disrupts already problematic community traffic, causing great distress to the daily lives of community residents and highlighting safety hazards.

4. CONSTRUCTION OF A GOVERNANCE SYSTEM FOR AGEING STOCK RENEWAL

Building healthy ageing communities requires the participation of individuals, society and the Government. Ageing renewal is not a phased process that can be accomplished overnight, but rather a gradual and regularized approach to governance. The establishment of a multi-level governance system for ageing renewal should be based on the general idea of "goal-implementation-guarantee", and systematically sort out the various elements of ageing such as policy system, social environment, material culture, and so on, which are needed in the whole community [6]. It builds the goal of community ageing renewal, revitalizes the stock of space, implements the renewal details, and develops mechanisms to ensure the implementation of renewal. From the government, community, elderly service organizations to the public themselves, governance is no longer a single top-down approach, but aims to establish an integrated multi-level governance system with the goal of aging in place, government coordination as the foundation, community governance as the key, and market supply as the main body. At the same time, through community co-construction, integration and utilization of social resources, multi-party participation and cooperation, community screening of

high-quality senior care service providers, the establishment of a public monitoring platform, so that residents are personally involved in the process of governance and supervision, and gradually enhance the ability of residents to govern together and help each other, to expand the coverage of aging services, and to accelerate the creation of senior-friendly communities.

5. STRATEGIES FOR ADAPTIVE RETROFITTING OF PUBLIC SPACE IN OLDER COMMUNITIES

Ageing-friendly renovation of old residential communities means upgrading and remodeling them to meet the living needs and special requirements of the elderly. The goal of ageing-friendly renovation is to provide a safe, convenient and comfortable living environment for the elderly so that they can better enjoy their later years. At the same time, special consideration needs to be given to the physiological and psychological changes of the elderly. Ageing-friendly design must ensure that the building design is comfortable and barrier-free, and that humanistic care is integrated into the design process, in order to truly reflect the humanistic significance of ageing-friendly retrofitting.

5.1. Transformation of community activity spaces

Installation of additional age-appropriate activity facilities. Activity spaces in older communities should be equipped with additional low-intensity fitness equipment suitable for use by the elderly, such as tai chi wheels and strolling machines, with detailed instructions for use and safety tips. At the same time, rest areas with sunshades should be set up and ergonomic seats (with backrests and armrests) should be installed to enhance the comfort of use for the elderly. In addition, multi-functional activity areas (such as square dance areas and chess and cards areas) are opened up, and non-slip materials are used on the floor to ensure the safety of the elderly during their activities.

Barrier-free design optimization. The barrier-free design of the activity space is the core content of the ageing-friendly transformation. It is necessary to eliminate the difference in height between the ground and the floor, lay flat non-slip floor tiles, and add barrier-free ramps and handrails. The night lighting system should be equipped with inductive devices to avoid light blindness and ensure the safety of the elderly during nighttime activities.

Intergenerational interaction space design. By combining children's play areas with activity areas for the elderly (e.g., three-generation gardens), intergenerational exchanges can be promoted. In addition, the establishment of community gardening and planting areas and the encouragement of elderly people to participate in planting activities (e.g., the Community Garden Program) can not only enhance the sense of community participation among the elderly, but also improve the utilization rate of space [7].

5.2. Rehabilitation of Community Aged Care Facilities

Embedding composite elderly care facilities: setting up "vertical elderly care centers" in community complexes, providing chess and cards, reading and health monitoring services to meet the diversified needs of the elderly. At the same time, community cafeterias are introduced to provide nutritious meals and meal delivery services to solve the catering problems of the elderly.

Space modification of gate entrances and exits: wheelchair ramps can be set up at the entrances and exits of community aged-care facilities, and the design of wheelchair ramps should satisfy the three basic elements of anti-skidding, leveling and non-reflective surfaces. If it is difficult to set up a ramp, it can be designed as a lifting platform. Canopies can be set up above building entrances and emergency call facilities. If an elderly person has an accident at the entrance or exit, he or she can call the emergency personnel in the facility at any time. Lamps with sufficient brightness can be installed inside and outside the entrances, and sensor or switch-controlled lamps can also be used to

avoid darkness caused by the inability to sense, which can lead to accidental injuries of the elderly. Therefore, lamps and lanterns that can save energy appropriately while ensuring sufficient brightness should be selected.

5.3. Rehabilitation of community health service facilities

Rehabilitation of medical service spaces. Service reception areas such as registration offices, payment offices, medicine collection offices, medical guide desks and hospitalization offices should be equipped with low-level service counters with spacious accommodations for the elderly. Seats should be installed in areas such as registration, waiting and medicine collection, and report collection offices should be equipped with text displays and voice prompting devices. These remodeling measures will help to enhance the comfort and convenience of medical service venues and meet the practical needs of the elderly.

Modification of transportation space within the facility. For community health service stations on the second floor and above, an accessible elevator shall be installed to accommodate wheelchair use. Barrier-free guide signs shall be installed in front of the barrier-free elevator and low-level call knob in the waiting hall. Indoor corridors should be barrier-free with clear signage for access to healthcare. Continuous handrails should be installed on both sides of the corridor, and the height of the handrails should be between 800~900mm, and the floor should be smooth, non-slip and anti-glare. For areas where there is a height difference, ramps and handrails should be set up, and materials such as PVC and non-slip floor tiles should be used. Waiting seats can be set up in corridors where possible.

Setting up small medical stations. AEDs (automated external defibrillators) and first-aid kits have been installed in community public spaces, and green channels have been established with neighboring hospitals to shorten emergency treatment response times.

5.4. Community Public Toilet Rehabilitation

Accessible toilet configuration. When retrofitting age-friendly toilets with large space dimensions, two aspects need special attention: the width of the doorway and the size of the interior space of the toilet to accommodate older persons who may need to use a wheelchair in the future. Larger dimensions should be left as large as possible during remodeling to facilitate nursing care for the elderly when needed.

Freestanding and attached toilets in the community should include at least one accessible toilet and hand-washing sink. It is recommended that safety handrails and emergency call buttons be installed in accessible toilets for the convenience of the elderly and to enable them to call staff at any time. Doors should be designed to be convenient and easy to open, and waterproof and non-slip flooring materials should be chosen for the floor. For public places with two or more storeys, consideration can be given to installing accessible toilet seats on the ground floor.

5.5. Community Transportation System Improvements

Reasonably set up motor vehicle roads, combined with fire lanes and emergency lanes to set up special channels to ensure timely rescue in times of crisis. Older neighborhoods due to historical reasons, many have insufficient fire lanes or are occupied by illegal structures and other problems, the need for different situations to take appropriate measures. For motor vehicle entrances and exits, consideration should be given to setting up buffer sections to reduce the safety hazards caused by traffic congestion. In the renovation of entrances and exits of residential areas with mixed pedestrian and vehicular traffic, priority should be given to the walking safety of the elderly. If possible, entrances and exits for pedestrians and vehicles should be separated, and walking paths and motorized vehicle paths should be designed separately.

Optimizing the walking environment, widening sidewalks to more than 1.5 meters, removing obstacles that occupy the road, and ensuring smooth passage for wheelchairs. Add continuous blind alleys and voice-activated signals to assist visually impaired elderly people in traveling.

Establishing a community micro-circulation transportation system and installing battery-operated shuttle buses to connect internal community activity points with external transportation hubs. Designate parking spaces for the elderly, close to the entrances of public service facilities.

6. CONCLUDING REMARKS

Ageing in place is the most important way of ageing in China, and community ageing renovation is an inevitable process in the construction of ageing in place, which needs to address the needs of the elderly, improve community governance, optimize the planning and layout, and put forward renovation strategies in conjunction with field research. The aging transformation of old communities needs to be integrated with the concept of community living circle, and to improve the accessibility of buildings, roads and other environments, which requires the joint efforts of the government, social organizations and volunteers. Such comprehensive renovation can create a safer, more convenient and livable environment for the elderly to age at home, so that they can enjoy a happier and more fulfilling life in their old age.

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