

# *Research on the Distribution of Public Sports Facilities and Age-Friendly Renovations in an Aging Society*

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**Abstract:** This study delves into the adaptation of public sports facilities within the context of an aging society, critically examining issues such as the misalignment of existing facility designs with the needs of the elderly, insufficient funding and policy support, and low levels of social awareness and participation. To address these challenges, the paper proposes strategies aimed at optimizing facility design, enhancing policy support and financial investment, and elevating societal awareness and community involvement. The ultimate goal is to foster collaborative efforts across various sectors to improve the elderly's experience in utilizing public sports facilities, thereby enhancing their quality of life and promoting social equity and harmonious development.

## **1. Introduction**

In the face of global demographic shifts, the phenomenon of an aging society has emerged as one of the most pressing challenges confronting many countries today. As advances in medical technology and improvements in living standards continue to extend human longevity, the proportion of elderly individuals within the population is steadily rising. This demographic trend not only exerts a profound impact on economic development but also imposes new demands on various public services. Within this context, the imperative of providing better living conditions for the elderly, particularly through the optimization of public facilities to meet their specific needs, has become a focal point of attention across society. Public sports facilities, which play a crucial role in enhancing the quality of life for the elderly by promoting physical health, delaying the onset of aging, and fostering social interaction, are irreplaceable in this regard. However, many existing public sports facilities, initially designed with a focus on younger and middle-aged individuals, fail to adequately accommodate the actual needs of the elderly, thereby presenting numerous obstacles and inconveniences for them. Consequently, elderly-friendly adaptations have become an essential measure for improving the quality of life for the elderly and achieving social equity.

## **2. Characteristics and Needs of an Aging Society**

### **2.1 Characteristics of an Aging Society**

With the advancement of economic development and the elevation of medical standards, human

life expectancy has increased significantly, leading to a marked extension in the survival years of the elderly population compared to the past. The shifting population structure has caused the proportion of elderly individuals to gradually surpass that of younger, working-age populations in many countries, thus influencing the allocation of social resources and the construction of public service systems. The formation of an aging society compels various sectors to reassess traditional economic models and social policies, particularly in the areas of healthcare, eldercare services, and social welfare, where increasingly severe challenges are emerging<sup>[1]</sup>. As the labor force diminishes, the level of social productivity faces constraints, and the economic growth models that rely on a youthful workforce are being gradually overturned. The implications of population aging extend beyond the economy, inducing significant changes in cultural, educational, and family structures<sup>[2]</sup>. The contraction of traditional family structures and the prevalence of nuclear families have reduced the opportunities for the elderly to receive care and support within the family, thereby intensifying the pressure on social public services. In the face of such societal transformations, effectively addressing the challenges posed by aging has become a central concern for both government and academic circles.

## **2.2 The Elderly's Demand for Public Sports Facilities**

As the aging process intensifies, the elderly population's pursuit of a healthy lifestyle is becoming increasingly pronounced, and the importance of public sports facilities is growing accordingly. After entering retirement, the frequency and intensity of daily activities for the elderly tend to decline, making the maintenance of physical functions a critical factor influencing their quality of life. Public sports facilities, as vital spaces for the elderly to engage in physical exercise and social activities, directly impact their user experience and health benefits through the completeness of the facilities and the appropriateness of their elderly-friendly design<sup>[3]</sup>. The elderly often have higher expectations for the safety and convenience of public sports facilities, which encompasses not only the physical safety of the facilities but also the rationality of the activity designs and their adaptability to the physical conditions of the elderly. Given the general decline in physical capabilities among the elderly, sports facilities within public spaces should possess a certain degree of adjustability to accommodate the varying physical conditions of different elderly individuals<sup>[4]</sup>. The comfort of the environment within public sports facilities is another crucial aspect that the elderly prioritize. A pleasant environment and favorable climate conditions can significantly enhance the elderly's enthusiasm for participating in physical activities, thereby improving their overall physical and mental health. For many elderly individuals, public sports facilities serve not only as places for physical exercise but also as social platforms where they can meet new friends, maintain social connections, and alleviate feelings of loneliness. In the context of an aging society, the rational planning and elderly-friendly adaptation of public sports facilities will play an indispensable role in enhancing the quality of life for the elderly.

### 3. Current Allocation of Public Sports Facilities

#### 3.1 Quantity and Distribution of Public Sports Facilities

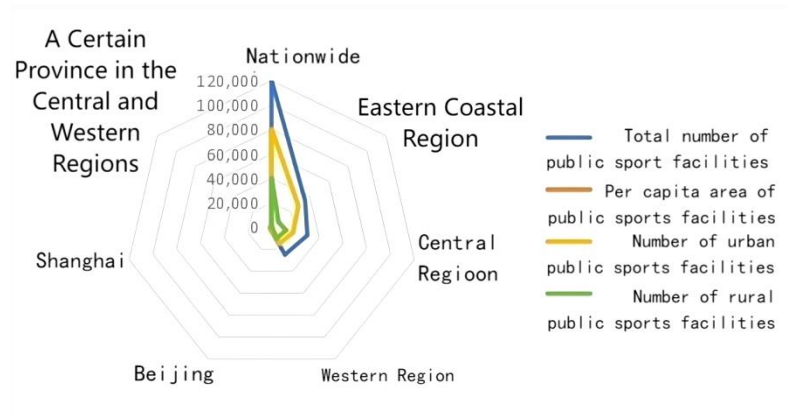


Figure 1: Distribution and Quantity of Public Sports Facilities Nationwide

There are significant disparities in the quantity and distribution of public sports facilities across the country, particularly between urban and rural areas Figure 1. Based on radar chart data, the current number and distribution of public sports facilities in China show obvious regional differences and urban-rural imbalances. The total number of public sports facilities nationwide has reached approximately 120,000, which is a relatively high level. The per capita area of public sports facilities is about 1,500 square meters. Urban areas have significantly more public sports facilities than rural areas, with about 90,000 facilities in cities compared to only around 30,000 in rural areas. The eastern coastal regions closely follow the national level in terms of the number of public sports facilities, with a total of around 60,000. However, there is a noticeable gap between urban and rural areas, with most facilities concentrated in cities and fewer in rural regions. The per capita area of public sports facilities in these regions is also relatively high, at around 1,200 square meters, indicating well-developed sports infrastructure. In central China, the total number of public sports facilities is about 30,000, which is far lower than in the eastern coastal regions. In the western regions, the number is even smaller, with only about 20,000 facilities. The per capita area of public sports facilities is also lower in these areas, at around 800 square meters in central China and 600 square meters in the west. Particularly in rural areas, the number of public sports facilities is extremely limited, further highlighting the regional disparities. In mega cities like Beijing and Shanghai, although the total number of public sports facilities is slightly lower than in the eastern coastal regions, with about 5,000 in Beijing and 4,500 in Shanghai, these facilities are mostly concentrated in urban areas, with very few or negligible numbers in rural areas. The per capita area of public sports facilities is about 1,000 square meters in Beijing and 900 square meters in Shanghai, demonstrating that first-tier cities have a certain advantage in providing sports venues for residents.

Community public sports facilities are widely distributed within the community, with a focus on areas where residents frequently engage in daily activities, such as near residential entrances, community squares, and green spaces Figure 2. Facilities suitable for low-intensity exercises by the elderly, such as basketball courts and table tennis tables, are arranged in flat and easily accessible locations to ensure convenient participation for older adults. Considering the social needs of the elderly, some sports facilities are also equipped with resting areas and seating, facilitating interaction and communication among older adults during breaks from exercise. With the advancement of aging-friendly renovations, the community has added more fitness equipment suitable for the elderly, such as Tai Chi push hands machines and walking machines. These facilities

are not only reasonably laid out but also fully consider the physical characteristics and fitness habits of the elderly, providing strong support for building a healthy aging community environment.

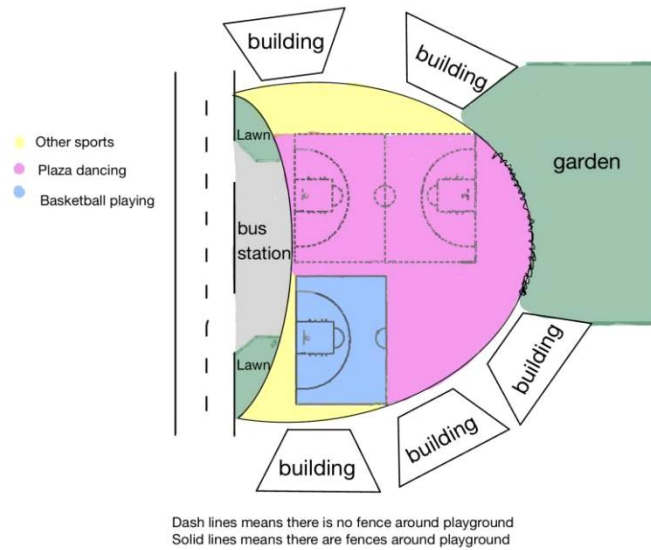


Figure 2: Layout of community

### 3.2 Primary Demographics Utilizing Public Sports Facilities

The primary users of public sports facilities are concentrated in the adult population aged 18 to 45 Table 1. This age group accounts for 75% of total usage, with young adults aged 18 to 30 making up the highest proportion at 40%. This indicates that this group has the most active demand for and participation in public sports facilities. People in this age group typically have better physical fitness, a strong interest in fitness and exercise, and the time and energy to engage in various sports activities. Following closely is the 31 to 45 age group, which accounts for 35% of usage. While this group often faces dual pressures from work and family, they still maintain a certain level of fitness demand. Especially for the purpose of staying healthy and relieving work-related stress, their participation in public sports facilities remains significant. In contrast, the participation rates for middle-aged and elderly groups, aged 46 to 60 and over 60, are lower, at 10% and 15% respectively. This may be due to the decline in physical functions with age, or the relatively lower demand and availability of public sports facilities for these age groups. However, the proportion of people over 60 is close to that of the 46 to 60 age group, indicating that with the advent of retirement, the elderly are finding more time to engage in physical exercise. Additionally, teenagers (under 18) account for 15% of usage, showing that while this group is smaller in number, they still have a noticeable presence in public sports facilities due to the emphasis on physical education in schools and the importance placed on exercise by parents.

Table 1: Age Distribution of Public Sports Facility Users

Age Group	Usage Proportion (%)
18-30 old	40%
31-45 old	35%
46-60 old	10%
Over 60 years old	15%
Youth (<18 years old)	15%

## 4. Challenges in Elderly-Friendly Adaptation

### 4.1 Inadequate Facility Design for the Elderly's Needs

In the context of an aging society, the design of public sports facilities has not sufficiently taken into account the special needs of the elderly, becoming a major obstacle to age-friendly renovations Figure 3. According to a survey of 300 elderly individuals, 67% of respondents stated that they experienced numerous inconveniences when using the current sports facilities. The main issues include a lack of accessible pathways, equipment heights that are not suitable, and complex operations. These factors not only affect the user experience of the elderly but also increase safety risks. Many fitness machines, such as treadmills, are designed based on the physical characteristics of adults and do not fully consider the activity capabilities of the elderly, making them feel uncomfortable when using them. Additionally, 53% of the elderly believe that the environmental design of public sports facilities does not meet their needs, citing insufficient rest areas, a lack of shade, and inadequate anti-slip measures on the ground. These factors reduce the willingness of elderly individuals to use the facilities.

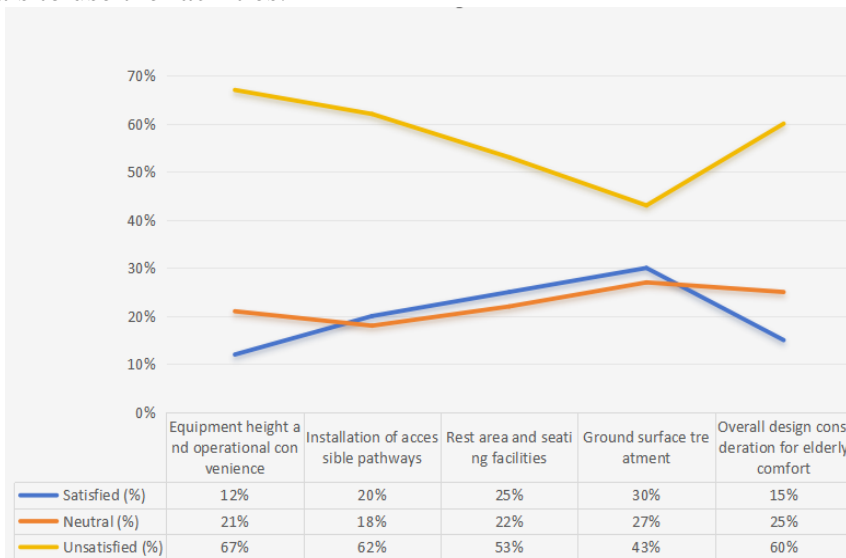


Figure 3: Survey on Elderly Satisfaction with Public Sports Facility Design

### 4.2 Insufficient Funding and Lack of Policy Support

Elderly individuals generally believe that age-friendly renovations face issues of insufficient funding and a lack of policy support Table 2. 58% of respondents think that inadequate funding directly affects the updating of facilities in public sports venues, while 22% have a neutral attitude, and 20% disagree with this view. Additionally, 47% of the elderly feel that policy support is insufficient and that the lack of incentives is another major factor hindering the progress of age-friendly renovations. 30% hold a neutral stance on this issue, while 23% believe that policy support is not the primary problem. Regarding funding priorities, 55% of respondents believe that the government should prioritize funding for age-friendly renovations, 25% have a neutral attitude, and 20% disagree. At the same time, elderly individuals express concerns about the long-term financial security of renovation projects. 60% believe that funding security issues affect the continued advancement of these projects, with only 18% having a neutral attitude and 22% disagreeing with this view. Lastly, 52% of elderly respondents think that age-friendly renovation projects face numerous challenges during implementation, especially in terms of funding and policy

support.

Table 2: Elderly Perceptions on Funding and Policy Support for Elderly-Friendly Adaptation

Question	Agree (%)	Neutral (%)	Disagree (%)
Insufficient funding affects facility upgrades	58%	22%	20%
Policy support is inadequate, lacking incentive measures	47%	30%	23%
Priority of funding for elderly-friendly adaptation in government projects	55%	25%	20%
Long-term funding guarantee for adaptation projects	60%	18%	22%
Challenges in advancing elderly-friendly adaptation projects	52%	28%	20%

### 4.3 Low Social Awareness and Participation

Social awareness and participation appear to be relatively weak in promoting age-friendly renovation projects. 64% of people believe that raising public awareness is crucial for advancing such projects, indicating that the majority recognize the necessity of these renovations, though 18% still oppose this view. Additionally, 62% agree that age-friendly renovation projects require more societal support, further suggesting that the current level of attention and investment in this area may be insufficient. During the implementation of age-friendly renovations, the lack of public awareness is also seen as a major factor hindering progress. 55% of respondents believe that insufficient public awareness affects the advancement of these projects, while only 15% disagree. This indicates that the public's understanding and participation in age-friendly renovations need further improvement. At the community level, participation is also relatively limited. Only 39% believe that community residents actively participate in age-friendly renovations, while 33% hold a neutral stance and 28% disagree. This highlights the need for greater enthusiasm at the community level in promoting such projects. Finally, 61% of respondents think that there is insufficient attention to the needs of the elderly, further emphasizing the marginalization of elderly issues in public discourse. More support and attention in terms of policy and resource allocation are needed from all sectors of society to meet the needs of the elderly and ensure the successful implementation of age-friendly renovation projects Figure 4.

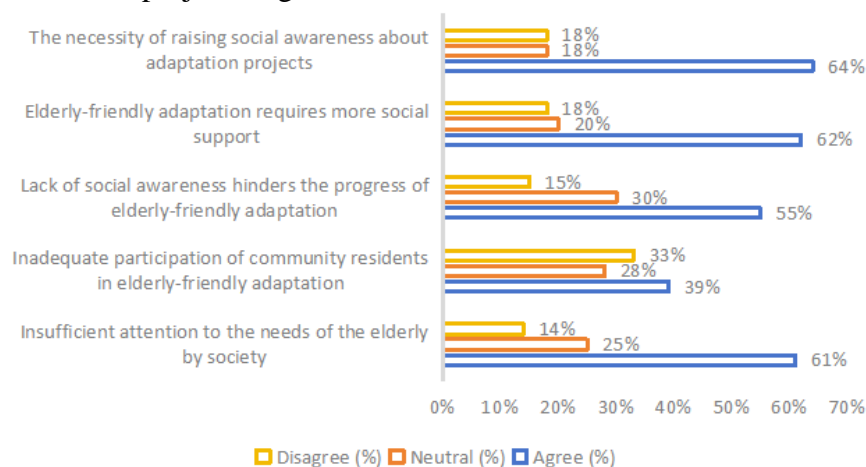


Figure 4: Elderly Perceptions on Social Awareness and Participation



## **5. Strategies for Elderly-Friendly Adaptation of Public Sports Facilities**

### **5.1 Optimization of Facilities and Elderly-Friendly Design**

Existing sports facilities are predominantly tailored to the needs of younger and middle-aged individuals, overlooking the significant variations in physical capabilities and mobility among the elderly. This discrepancy renders current facilities inadequate to meet the practical needs of older users. To address this issue, a comprehensive optimization of facility design is imperative, with a focus on elderly-friendly adaptations. This includes increasing the number of accessible pathways, adjusting the height and operational complexity of equipment to accommodate the diverse physical conditions of the elderly population. In the design of fitness equipment, the introduction of adjustable devices should be considered, ensuring that elderly individuals of varying physical strength and health conditions can use them easily and safely. The materials and surface treatments of facilities should emphasize anti-slip and anti-fall safety features to mitigate potential risks during use. Furthermore, given the elderly's heightened sensitivity to environmental comfort during physical activities, factors such as lighting, temperature, and ventilation within these facilities must be carefully considered to provide a more comfortable and secure exercise environment.

### **5.2 Strengthening Policy Support and Financial Investment**

The adaptation of public sports facilities to be elderly-friendly cannot be achieved without robust government policy support and sufficient financial investment. While facility optimization and design improvement are crucial elements of the adaptation process, their successful implementation is contingent upon strong policy frameworks and financial backing. To ensure the comprehensive advancement of elderly-friendly adaptations, government bodies should enact policies specifically targeting the construction and renovation of sports facilities for the elderly, clearly defining relevant standards and implementation guidelines to provide actionable directives for local governments and relevant institutions. On the financial front, governments should allocate a larger share of their budgets to prioritize the funding needs of elderly-friendly adaptation projects. The necessary funds for these adaptations encompass not only the renovation and maintenance of facilities but also related expenses such as health education for the elderly and the promotion of sports activities. A diversified approach to funding sources, including government appropriations, social donations, and corporate sponsorships, is essential to ensure that projects are adequately funded and sustainable over the long term.

### **5.3 Enhancing Social Awareness and Community Participation**

Raising social awareness requires a multifaceted approach, encompassing media campaigns, community education, and public events. Media outreach can leverage television, radio, the internet, and other mass media platforms to widely disseminate the principles and achievements of elderly-friendly adaptations, thereby increasing society's understanding of the importance of sports activities for the elderly. Community education also plays a pivotal role in enhancing social awareness. Community organizations can host health lectures, senior citizens' activity days, and other events to educate residents on the health needs of the elderly and the significance of elderly-friendly adaptations. Government and non-governmental organizations can collaborate to organize various public events, such as free fitness instruction and facility use training, to foster closer connections between the general public and the elderly, thereby strengthening societal responsibility and involvement. Increased community participation is critical to the successful implementation of elderly-friendly adaptations. Community residents are not only the users of

sports facilities but also the direct beneficiaries of adaptation projects. Therefore, it is essential to solicit and incorporate their opinions and suggestions throughout the adaptation process to ensure that the projects genuinely meet the practical needs of the elderly population.

## 6. Conclusion

Elderly-friendly adaptation, as a crucial response to the challenges of an aging society, plays an indispensable role in enhancing the quality of life for the elderly and fostering harmonious social development. The adaptation of public sports facilities to better accommodate the elderly is not only a response to their physical health and lifestyle needs but also a proactive step toward promoting social equity and sustainable development. By optimizing facility design, strengthening policy support and financial investment, and enhancing social awareness and community participation, it is possible to effectively address the myriad issues currently hindering the adaptation process, ensuring that the elderly can safely and conveniently utilize public sports facilities. In terms of facility optimization, it is vital to start from the actual needs of the elderly, improving the safety and usability of the facilities; regarding policy support and financial investment, the government should take a leading role by establishing comprehensive policies and funding mechanisms and encouraging widespread participation from all sectors of society; in improving social awareness and community participation, extensive education campaigns and active involvement of community organizations will serve as the driving forces behind successful elderly-friendly adaptations.

## References

- [1] Li, Y., Zhou, Q., Zhu, J., et al. (2024). *Research on optimization strategies for elderly-friendly issues in community parks in the central urban area of Chongqing*. *Green Technology*, (003), 026.
- [2] Yang, W. (2023). *The pace of elderly-friendly renovation of public facilities should be accelerated*. *China Elderly*.
- [3] Chen, X., & Ye, X. (2023). *The era value and practical path of elderly-friendly community sports parks in the context of active aging*. *Shandong Sports Science & Technology*, 45(5), 72-78.
- [4] Lin, S. (2022). *Indoor public space renovation technology for elderly-friendly adaptation of existing buildings*. *Scientific and Technological Innovation*, (12), 4.