

An Analysis and Exploration of the 15-Minute Living Circle Community Construction

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Abstract: With the acceleration of global urbanization and increasing demands for community governance, residents' needs for convenience, comfort, and a sense of community belonging have grown significantly. Traditional monocentric urban structures can no longer meet the diverse demands of residents, especially following the COVID-19 pandemic, which has intensified the reliance on community life and popularized the idea of "meeting daily needs close to home." The 15-minute living circle concept proposes that residents should have access to essential public services—such as education, healthcare, shopping, leisure, and cultural facilities—within a 15-minute walk or bike ride. This concept aims to improve community life convenience and efficiency, thereby enhancing residents' quality of life. Through literature review and domestic and international case studies, this research explores the characteristics, construction pathways, and challenges of 15-minute living circle communities. The findings indicate that the rational distribution of public facilities, multifunctional community design, sustainable development, and efficient community governance are key to realizing the 15-minute living circle. However, challenges such as land resource scarcity and unequal public resource allocation remain. The study concludes that through scientific planning, policy support, and the integration of smart technologies, cities can overcome these challenges by optimizing transportation systems and implementing intelligent community management, thus achieving sustainable development and improving residents' living standards and environmental quality.

Keywords: 15-minute living circle, community construction, urban planning, sustainable development, public services.

1. Introduction

In recent years, as global urbanization accelerates and community governance demands increase, residents' needs for convenience, comfort, and a sense of community belonging have surged. Traditional monocentric urban structures can no longer meet the increasingly diverse demands of residents. Particularly following the outbreak of the COVID-19 pandemic, reliance on community life has intensified, and the notion of "meeting daily needs close to home" has gained popularity. Consequently, major cities worldwide are actively exploring ways to enhance residents' quality of life by optimizing urban structures.

The 15-minute living circle refers to the ability of residents to access essential public services—such as education, healthcare, shopping, leisure, and cultural facilities—within a 15-minute walk or bike ride. This concept emphasizes the convenience and efficiency of community life and is dedicated to providing higher quality of life and well-being. Its core objective is to shorten residents' travel time by strategically locating public facilities, thereby enhancing living comfort [1]. For example, Paris's "15-Minute City" model aims to reduce residents' reliance on motorized transport, fostering a more self-sufficient community. Simultaneously, several Chinese cities, including Beijing, Shanghai, and Hangzhou, are advancing the planning of "15-minute community living circles," exploring urban layouts and community construction models that align with their developmental characteristics.

Researching the construction of 15-minute living circle communities is not only an exploration of enhancing urban residents' quality of life but also a vital means to address issues such as resource misallocation, traffic congestion, and uneven distribution of living facilities that arise during urban expansion [2]. This article aims to delve into the characteristics, construction challenges, domestic and international practices of 15-minute living circle communities through comprehensive literature analysis and to provide optimization suggestions, thereby offering guidance for urban planners and policymakers.

2. Core Characteristics of the 15-Minute Living Circle Community

2.1. Reasonable Layout of Comprehensive Facilities

The core of building a "15-minute living circle" community lies in the rational distribution of public service facilities. It is essential to strategically position educational, healthcare, shopping, leisure, cultural, and entertainment facilities within the community. A balanced distribution of these facilities forms the foundation for achieving the "15-minute" goal and is critical for enhancing residents' quality of life. Such layout can prevent over-concentration, improve resource utilization efficiency, and reduce quality of life disparities among different communities. Public facilities within the community should be scientifically planned according to population density and service radius to ensure that residents can access essential services in a short time [3]. Moreover, the convenience of public transportation and green travel options is a key aspect of community design. By increasing bike lanes and optimizing bus routes, reliance on private cars can be diminished, alleviating traffic pressure and reducing carbon emissions.

2.2. Construction of Multifunctional Communities

Multifunctional communities integrate residential, commercial, public services, and green spaces to enhance space utilization and shorten daily travel distances for residents. This design approach not only boosts community vitality but also improves residents' experiences in work, life, and leisure through multifunctional designs. For instance, by constructing small commercial centers, community hospitals, cultural centers, and parks around residential areas, residents' basic needs can be met, reducing the necessity for long-distance commuting and enhancing convenience and well-being [3].

2.3. Sustainable Development of the Community

Sustainable development is one of the essential principles of constructing "15-minute living circle" communities. The construction process should focus on creating a green ecological environment, such as promoting green buildings and optimizing energy use, leveraging renewable energy sources like solar and wind power, while also advancing resource recycling and environmental protection measures. Establishing a low-carbon, eco-friendly living environment can enhance residents' health and quality of life, reduce natural resource consumption, and achieve harmonious coexistence

between humans and the environment. Furthermore, the development of public green spaces and community parks can improve the environmental quality of the community while providing residents with venues for leisure, exercise, and social interaction, contributing to the livability of the community.

2.4. Efficient Community Governance and Public Participation

Efficient community governance and active resident participation are fundamental for the sustainable development of "15-minute living circle" communities. In this model, community residents engage in planning and management, enabling administrators to better understand actual community needs and propose rational suggestions. Additionally, the application of smart city technologies offers new avenues for community governance, such as smart lighting and parking systems, which enhance management efficiency and improve service delivery and infrastructure.

3. Challenges in Constructing 15-Minute Living Circle Communities

3.1. Land Resource Scarcity and Planning Difficulties

Space optimization is a key strategy for addressing land resource scarcity when constructing "15-minute living circle" communities. Particularly in highly urbanized areas, the rational layout of limited land resources becomes increasingly important. By conducting meticulous design and appropriate zoning within the community, space utilization can be improved, and land waste can be minimized. The core of space optimization involves organically integrating different functional zones, such as closely connecting residential, commercial, educational, and recreational facilities to form multifunctional, mixed-use communities. This layout cannot only reduce residents' travel times but also enhance the efficiency of public space utilization [4]. Furthermore, adopting the concept of "micro-renewal" for small-scale renovations of existing communities—such as optimizing road systems and adding walking and green spaces—can effectively integrate the "15-minute living circle" concept within limited land conditions. Planners must also consider the coordination of population and building density when formulating community layouts, ensuring that every inch of land provides efficient public services to residents.

3.2. Inequitable Distribution of Public Resources

Public resource allocation often exhibits significant imbalances among different communities, posing new challenges for the spatial layout of the "15-minute living circle." To address this issue, spatial planning should prioritize equitable distribution of public service facilities by introducing flexible space management mechanisms to rationally distribute educational, healthcare, and commercial facilities across regions, avoiding situations where some communities have excess facilities while others lack resources. Additionally, policies can be implemented to direct resources toward older urban areas, optimizing existing facilities to enhance quality of life. For example, increasing green spaces and recreational areas in older districts and updating public facilities can help narrow the gap with newly developed areas. Furthermore, in new development zones, it is crucial to rationally plan population distribution and facility layout to prevent excessive expansion that leads to resource surpluses. Ultimately, through reasonable spatial redistribution, equitable coverage of public services across communities can be achieved, ensuring that all residents enjoy high-quality living services.

3.3. Transportation and Travel Issues

Rational transportation planning is one of the cores of spatial layout in "15-minute living circle" communities. By optimizing road designs and pedestrian spaces, developing efficient slow-moving

systems, and establishing convenient public transportation networks, reliance on long-distance travel can be significantly reduced. Community planners can design pedestrian paths and bike lanes that closely connect residents' daily travel routes with major functional areas within the community, reducing unnecessary traffic flow. Furthermore, strategically positioning public transportation nodes is essential for optimizing transport. By linking community functional centers with urban mainlines, convenient transport hubs can be established to enhance public transportation usage and lower automobile travel demands, alleviating urban traffic pressures. Moreover, improving the connectivity between slow-moving and public transportation modes, ensuring safety and convenience of travel routes, will further enhance the green travel environment within the community, promoting the sustainable development of "15-minute living circle" communities.

3.4. Insufficient Funding and Policy Support

Community construction requires substantial financial support, especially for optimizing infrastructure and spatial layout, where insufficient funding often becomes a developmental bottleneck. Therefore, in the optimization process, diverse funding support models should be sought. Governments can adopt Public-Private Partnership (PPP) models to attract private investment in community space optimization and infrastructure construction [5]. For instance, in building public spaces such as green areas, parks, and pathways, social capital can be introduced to alleviate governmental financial pressures. Concurrently, governments should implement corresponding policies to encourage innovative spatial utilization methods, such as promoting mixed-use areas and composite buildings, enhancing efficient space utilization, and boosting community economic benefits and public service levels. The dual support of policies and funding will be crucial for optimizing community spatial layouts and promoting the implementation of the "15-minute living circle" concept.

4. Domestic and International Practices of the 15-Minute Living Circle Community

4.1. The "15-Minute City" Model in Paris: A Paradigm of Spatial Optimization and Community Integration

As the birthplace of the "15-minute city" concept, Paris has successfully enhanced urban community functionality through spatial optimization. Paris's core strategy involves placing essential services and resources within a 15-minute walking or biking range of residents, making urban life more convenient. By reducing the size of large blocks, transforming streets, and opening public spaces, Paris has successfully created "neighborhood units," allowing citizens to enjoy a wealth of cultural, medical, and educational services within their communities. This layout not only diminishes residents' dependence on long-distance commuting but also enhances the convenience of green travel by improving walking and biking networks. Another highlight of Paris's "15-Minute City" model is its policy encouragement to reduce vehicle usage, thereby lowering traffic congestion and pollution and making the urban environment more livable [6]. This successful experience in spatial optimization serves as a valuable example for global cities on enhancing community cohesion through rational functional zoning and public facility planning.

4.2. Exploration in Chinese Cities: Localization of the "15-Minute Living Circle" Practice

In China, cities such as Beijing, Shanghai, and Hangzhou have gradually begun advancing the construction of "15-minute living circles" by optimizing spatial layouts and functional completeness to enhance residents' quality of life. Beijing's "small block system" is a representative exploration of optimizing community spatial layouts. By reducing oversized blocks and concentrating essential

public service facilities (e.g., markets, fitness centers) within a 15-minute walking range, it effectively improves space utilization and enhances connectivity for walking and public transportation. Shanghai relies on "micro-renewal" projects to unify old communities with newly developed areas under a comprehensive functional community framework, enhancing living services and commercial facilities to provide residents with high-quality living services at their doorstep. Hangzhou, on the other hand, combines smart city technologies to achieve intelligent community management, enhancing residents' convenience while also strengthening efficient resource utilization and optimization. In promoting the "15-minute living circle," Chinese cities have demonstrated a high degree of flexibility and localization in optimizing spatial layouts tailored to the unique needs of different communities.

4.3. Other International Case Studies: Compact Spaces and Green Layouts

Internationally, urban planning concepts from Japan and Nordic countries also offer unique references for constructing "15-minute living circles." Japan's "compact city" concept features distinct characteristics in spatial optimization by encouraging residents to reside in central urban areas, thus reducing urban sprawl and traffic pressure. This layout results in a more compact urban space that efficiently utilizes limited urban land resources, suitable for high-density urban development needs. Nordic countries have achieved notable successes in optimizing green travel and public space, encouraging walking, biking, and enhancing public transportation networks to optimize residents' daily commuting experiences. Simultaneously, these countries emphasize ecological protection and the integration of public spaces, allowing residents to enjoy high-quality service facilities and pleasant green environments within their living circles. The green spatial layout and ecological construction in the Nordic model add a dimension of sustainable development to the "15-minute living circle."

Through the examination of these various city case studies, it is evident that optimizing urban space layout is central to constructing "15-minute living circles," where balanced service distribution and efficient green travel networks are key experiences in enhancing residents' quality of life. These experiences provide rich insights for cities worldwide in strengthening community cohesion and improving spatial resource utilization.

5. Recommendations for Optimizing the Construction of 15-Minute Living Circle Communities

5.1. Scientific Planning and Policy Support

When constructing "15-minute living circle" communities, planning should be based on factors such as urban population density, topography, and economic level to ensure the rationality and operability of community layouts. Governments should implement more flexible policies, such as tax incentives and land use policies, to encourage enterprises and communities to engage in the exploration and development of innovative community models [5].

5.2. Intelligent and Digital Community Management

Leveraging technologies such as big data and the Internet of Things can enhance the intelligence of community management. This includes optimizing community services and monitoring community environments through smart platforms, improving nighttime safety with smart lighting systems, and alleviating parking difficulties through intelligent parking systems, thus enhancing service precision and convenience. The application of smart city technologies in community management can effectively improve service delivery, enhancing residents' living experiences and satisfaction [7].

5.3. Multi-Stakeholder Collaboration and Resident Participation

Community construction necessitates close collaboration between governments, enterprises, and residents. The government should act as a policy maker and supervisor, while enterprises can provide funding support and technology [8]. Residents, as vital participants in community development, should engage in planning and decision-making processes through community forums and resident representative assemblies to enhance their sense of belonging and community identity, thereby strengthening community cohesion [9].

5.4. Optimization of Ecological Environment and Public Spaces

Communities built around the "15-minute living circle" should focus on enhancing ecological environments, such as increasing community greening rates and expanding open spaces to provide better leisure spaces for residents [10]. By improving the utilization efficiency of public spaces, the livability of the community can be further enhanced, promoting communication and interaction among residents. Establishing community parks, greenways, and public recreational spaces can offer residents a richer variety of outdoor activities, contributing to improved community health levels [11].

6. Conclusion

This study deeply explores the construction pathways and practical experiences of 15-minute living circle communities, drawing several important conclusions and insights. First, the results indicate that reasonable layout of public facilities, development of multifunctional communities, promotion of sustainable development, and efficient community governance and public participation are crucial factors for realizing 15-minute living circle communities. These measures not only enhance residents' quality of life and happiness but also effectively reduce reliance on long-distance commuting, promoting green travel and environmental protection.

The significance of this study lies in providing urban planners and policymakers with detailed cases and actionable recommendations to facilitate urban structural optimization and community development. By analyzing the practical experiences of cities like Paris, Beijing, and Shanghai, it reveals that rational planning of public facilities and transportation systems, enhancing community functional diversity, and emphasizing ecological environments and community governance are vital approaches to improving community livability and sustainable development. These insights offer valuable references for other cities, contributing to the advancement of community construction and urban development on a global scale.

However, this study also has some objective limitations. The research is primarily based on existing literature and case analysis, lacking field investigations and data verification. Different cities face distinct issues and challenges in implementing 15-minute living circle communities, which necessitates further in-depth studies. Additionally, as technology and society evolve, new technologies and concepts in community construction continually emerge. Integrating these innovations into the practice of 15-minute living circles will be an important direction for future research.

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