

A Study on the Retrofitting Model of Older Neighborhoods under the Perspective of Inventory Renewal

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Abstract: As China's urbanization moves from incremental expansion to stock optimization, the transformation of old urban districts has become a key task in improving the living environment of residents. At present, most of the old neighborhoods have problems such as irrational space utilization, aging infrastructure, and insufficient public service support, which seriously affect the residents' quality of life and the sustainable development of the city. Domestic old neighborhood renovation research has developed rapidly in recent years, forming various modes such as micro-renewal, demolition and reconstruction, functional composite, etc., while government-led and PPP modes and other renovation methods have also appeared. This study adopts the method of combining case analysis and policy interpretation, selects representative old district transformation cases in different regions, analyzes their transformation modes, implementation process, capital investment, and residents' participation in-depth, and summarizes the experiences and problems; and systematically combs through the relevant policy documents issued by the state and localities. The results of the study show that traditional transformation modes such as government-led have problems such as a single source of funding and insufficient social participation, and that residents' self-financing mode and enterprise investment mode also have their limitations. Through the PPP model of "government-led, enterprise cooperation and residents' participation", the funding pressure is effectively alleviated and the sustainability of the renovation project is realized. At present, the renovation is still facing challenges such as insufficient historical and cultural protection and lack of long-term maintenance mechanisms, but the future renovation of old neighborhoods will move forward in the direction of in-depth innovation of diversified modes, all-factor sustainable development, and synergistic governance enhancement of multiple subjects.

Keywords: Inventory Renewal, Old Neighborhood Renewal, Renovation Models, PPP Models

1. Introduction

With the accelerated development of China's urbanization, the problem of old urban districts is becoming more and more prominent, and most of the old districts and areas are now facing problems such as inefficient use of space, outdated infrastructure, and poor living environment. Therefore, China vigorously promotes the transformation of old urban neighborhoods, blocks, urban areas urban villages, etc., strengthens urban infrastructure construction and transformation, improves urban functions, restores the urban ecological environment, and protects and inherits urban history and

culture. Adhering to the principle of “physical examination before renewal, no physical examination, no renewal”, an integrated promotion mechanism for urban physical examination and urban renewal has been established [1]. Through urban check-ups, it will look for urgent, difficult, worrying, and desirable problems around the people, identify shortcomings and weaknesses affecting the city's competitiveness, carrying capacity, and sustainable development, and make these problems the focus of urban renewal and reconstruction.

According to data provided by the Ministry of Housing and Urban-Rural Development, in 2024, 56,000 new projects will be started to renovate old urban neighborhoods, more than 50,000 kilometers of various types of aging pipelines will be updated and renovated in the neighborhoods, more than 25,000 elevators will be added, and more than 500,000 parking spaces will be added. Positive results have been achieved in 106 complete community-building pilots across the country; 19 provinces (municipalities) have created 37 urban child-friendly space construction models; and 386 cities have built 2,254 new elderly service facilities [1]. In the next three years, relevant departments, as well as local governments, are expected to introduce more supportive policies to promote urban renewal to enter a new development period with multi-mode innovation, multi-mechanism support, multi-factor guarantee, and multi-body participation. In conclusion, in the context of urban development to stock optimization transformation, the study of urban renewal of old districts has a far-reaching impact on enhancing the comprehensive competitiveness of the city, improving the living environment of residents, and promoting social harmony and stability.

Urban renewal in foreign countries started earlier and has accumulated rich experience and research results. For example, Jane Jacobs discussed the maintenance and remodeling of community vitality in the process of urban renewal. European and American countries focus on sustainable community development and residents' participation, such as the community development projects in the United States, which emphasize the renewal and transformation of old communities through residents' self-governance and the participation of community organizations [1]. In Europe, many countries focus on historical and cultural preservation in the renovation, and through small-scale restoration and functional adjustment, old neighborhoods are allowed to adapt to the needs of modern life while retaining their historical appearance [2].

In recent years, the research on the transformation of old neighborhoods in China has been developing rapidly, and the micro-renewal model is characterized by small-scale and gradual renewal, focusing on the refined use of existing space and functional improvement, and preserving the original texture and social network of the community to the greatest extent possible. For example, Tianzifang in Shanghai has transformed its old lanes into a distinctive neighborhood of culture, creativity, and commerce through micro-renewal. The demolition and redevelopment mode is suitable for old neighborhoods with severely damaged buildings, irrational layouts, and difficulty in meeting the demand through local renovation. Functional composite mode integrates residential, commercial, and service functions in old districts to enhance the comprehensive service capacity of the district. For example, some old districts in Beijing have introduced new business models such as community pensions and shared offices to realize functional diversification [3].

At present, the renewal and transformation of old neighborhoods mainly have the traditional transformation modeled by the government and also have the modern innovation modeled by the app mode. Among them, the application of public-private partnership (PPP) mode in the transformation of old neighborhoods has received wide attention. Relevant studies have shown that PPP mode can effectively integrate the advantages of government and social capital, solve the problem of shortage of renovation funds, and improve the efficiency of project operation [4]. Wei Xiaocai has analyzed the operation mechanism and risk prevention of the PPP mode in detail, and in the practice of old neighborhood renovation, some local governments and enterprises have cooperated through the PPP

mode to complete the investment, construction, and operation of the project together and achieved good results [5].

This paper adopts the research idea of combining case analysis and policy interpretation. In terms of case analysis, select representative cases of transformation of old districts in different regions, analyze their modes of application, such as micro-renewal, demolition and reconstruction, functional composites, pp modes, etc., analyze the background of transformation, implementation process, financial input, residents' participation, and evaluation of the effect of transformation, and summarize the successful experiences and existing problems. In terms of policy interpretation, systematically sort out the policy documents related to the transformation of old districts issued by the state and local governments and analyze the influence of policy orientation on the choice of transformation mode, financial support, and technical standards. Through the policy interpretation, the government's role in the transformation of old neighborhoods and the focus of policy support are clarified. By combining case study and policy interpretation, a comprehensive and in-depth research framework is constructed to explore the transformation mode of old neighborhoods under the perspective of stock renewal from both practical and theoretical perspectives, to provide a reference basis for promoting the scientific development of the transformation of old neighborhoods.

2. Current status and challenges in the renewal of China's old neighborhoods

2.1. Analysis of the current situation of old neighborhoods

Most of the old neighborhoods in China were built in the 80s and 90s of the 20th century, and due to the limitations of the economic development level and planning concepts at that time, all kinds of problems in the old neighborhoods have gradually come to the fore. First of all, at the infrastructure level, the aging of equipment is serious, water and sewage pipes are blocked, power supply lines are aging and other problems occur frequently, greatly affecting the quality of residents' daily lives. Secondly, in terms of spatial layout, the early planning lacks foresight, with insufficient parking lots and scattered green spaces, making it difficult to meet the diversified needs of modern residents for a living environment [6]. At the same time, the lack of barrier-free environment construction has caused a lot of inconvenience to the elderly and the disabled in traveling. In terms of public services, the supporting facilities for education, medical care, and elderly care are not perfect, and residents face many problems in their daily lives. The community governance model is also relatively outdated and lacks a mechanism for resident participation, making it difficult to form effective community cohesion. In terms of the structure of residents, aging is intensifying, and the proportion of the elderly population continues to rise, making the demand for aging-friendly services and facilities more and more urgent [7]. In addition, the development of the rental market has led to a significant increase in the proportion of rentals in small areas, and the high mobility of tenants has brought new challenges to community management and services.

2.2. Older neighborhood challenges

There is a large demand for funds for the transformation of old neighborhoods, however, the current source of funds is a relatively single channel, overly dependent on the government's financial input. The government's financial pressure is greater, and it is difficult to maintain large-scale renovation projects in the long term[8]. At the same time, social capital is not highly motivated to participate in the renovation project, the long return on investment cycle and the uncertainty of income, resulting in a shortage of funds, and the sustainability of the subsequent operation and maintenance is also facing a test[9]. Residents of different ages, occupations, and economic statuses have different demands for the transformation of old neighborhoods. For example, young residents are more concerned about information technology construction and leisure and recreational facilities in the

community, while elderly residents pay more attention to aging renovation and medical service support. How to balance the interests of all parties and meet the diverse demands is a major challenge in the transformation of old neighborhoods. At present, some areas of the old neighborhood transformation mode are relatively single, remain in the infrastructure of simple repair and update level, the lack systematic and innovative transformation ideas. In the division of responsibility, the main body of responsibility is not clear, financial security is not in place, and other issues, while failing to fully consider the district's regional characteristics, cultural heritage, and the needs of the residents, it is difficult to achieve the high-quality development of old neighborhoods. In many old neighborhoods after the completion of the transformation, the lack of effective operation and maintenance mechanisms, resulting in the transformation of facilities and equipment can not be maintained promptly, damage, aging, and other problems, affecting the long-term maintenance of the transformation effect.

There are buildings of historical and cultural value in some old neighborhoods, but in the process of renovation, there is insufficient awareness of the protection of these buildings, and there is a lack of scientific and reasonable protection programs, which has led to the destruction of some of the historical and cultural buildings, and made it difficult to continue the historical and cultural lineage of the city. In the process of renovation of old neighborhoods, information communication between the government, communities, and residents is poor, and there are problems of asymmetric and non-transparent information. Residents have a limited understanding of the renovation program and the use of funds, resulting in low participation by residents and even misunderstanding and resistance to the renovation work.

Overall, the renewal and transformation of old neighborhoods in China have made some progress, but there are still challenges in terms of funding, management, technology, and maintenance.

2.3. Renewal and reconstruction model for old neighborhoods

2.3.1. Analysis of the traditional transformation model

The government-led mode refers to the mode of transformation of old districts in which the government is responsible for overall planning, organization and implementation, and capital investment [10]. This model has strong authority and executive power and can ensure the smooth progress of the transformation work. However, due to the heavy financial burden of the government and the difficulty of fully mobilizing social resources, the scope and depth of the transformation may be limited, while the operation and maintenance may also face financial pressure in the later period.

The residents' self-financing mode refers to the mode in which the residents raise their funds to carry out community transformation. This model can fully reflect the wishes of residents and increase their participation and sense of responsibility [11]. However, due to the limited economic capacity of individual residents and the difficulty of organization and coordination, the renovation projects are often small in scale, making it difficult to achieve overall improvement.

The enterprise investment model refers to the participation of enterprises in the transformation of old neighborhoods through investment to obtain certain economic benefits. This model can introduce market mechanisms and improve the efficiency and quality of the renovation [12]. However, enterprises tend to pay more attention to short-term economic benefits and may neglect the actual needs of residents and social benefits, resulting in a gap between the renovation project and residents' expectations.

2.3.2. Analysis of modern innovation models

In the practice of transformation of old neighborhoods, multiple innovative modes have provided an effective path for cracking the transformation problem and realizing common construction

governance and sharing. At present, PPP mode, TOD mode, social enterprise and community building mode and other typical practice paradigms have been formed.

The PPP model is a model in which the government and social capital jointly participate in the transformation of old neighborhoods through cooperation. The government plays the role of policy guidance and supervision, while the social capital provides financial and professional technical support. This model can give full play to the advantages of the government and social capital, ease the financial pressure on the government, and improve the operational efficiency and sustainability of the renovation project. However, in actual operation, the rights and obligations of the government and social capital need to be reasonably defined to ensure the fairness and public welfare of the project [13].

TOD mode takes the public transportation station as the core carries out comprehensive development in the surrounding area, and organically combines the functions of residence, commerce, and office. The application of TOD mode in the transformation of old neighborhoods can effectively enhance the accessibility of neighborhoods, improve the travel conditions of residents, and at the same time drive the economic development of the surrounding area. However, the model has higher requirements for urban planning and transportation support and is more difficult to implement [14].

The social enterprise-community co-construction model refers to the cooperation between social enterprises and community residents to carry out the transformation of old neighborhoods. Social enterprises play their professional advantages and provide technical and financial support, while community residents actively participate in the decision-making and implementation process. This model can fully mobilize the enthusiasm of community residents and achieve sustainable development of the community, while promoting the development of social enterprises and the integration of the community [15].

3. Application of the PPP model in the renewal of old neighborhoods

3.1. Mechanisms for updating the PPP model

3.1.1. Overview of the model

PPP is the abbreviation of Public-Private Partnerships, which in short refers to a way for the public sector to provide public goods or services by establishing partnerships with the private sector. Its core is to realize the efficient supply of public goods or services through complementary advantages, risk-sharing, and benefit-sharing. Although the private sector has a long history of involvement in the provision of public goods or services, the emergence of the PPP terminology is only a matter of the last 10 years. Before that, the widely used terms were Concession, BOT (Build-Operate-Transfer), PFI (Private Finance Initiate), etc. The PPP model is an important tool to promote the supply-side reform of public services, and through the in-depth cooperation between the government and the market, to realize the "1+1>2" effect as shown in Figure 1. Its success relies on clear system design, reasonable risk allocation, and efficient regulatory mechanisms, and is expected to play a greater role in the future in new urbanization, rural revitalization, green low-carbon, and other areas[16].

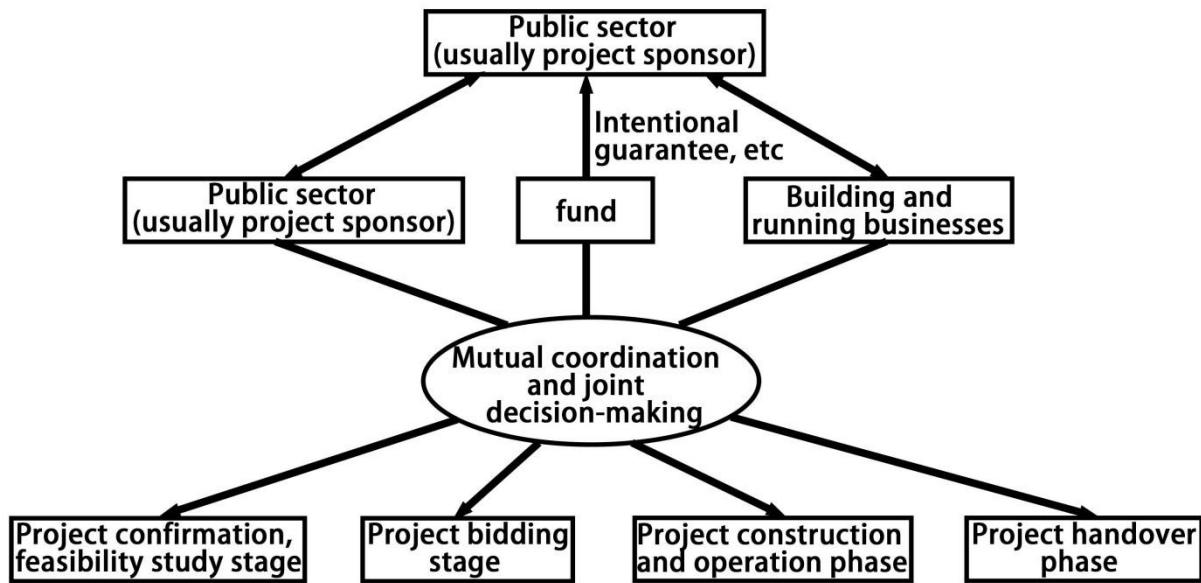


Figure 1: PPP model operation mechanism

3.1.2. Strengths and challenges

The PPP model brings many benefits to the renewal of old neighborhoods. In terms of funding, the introduction of social capital can share the government's financial pressure and generate returns through "user fees" and "government subsidies", forming a virtuous cycle. In terms of project operation, social capital improves project efficiency and operation level with professional ability, realizing efficient management of the whole life cycle. It also promotes collaboration among the government, enterprises and residents, and enhances the sense of participation of residents. In the long term, it promotes sustainable renewal and avoids the waste of short-term renovation.

However, there are also risks for all parties utilizing the model. The government has to control the risks of delayed approval, legal policies, design bidding and early termination in decision-making, procurement and transfer. The social capital side needs to deal with financing difficulties, completion of overdue, poor operation and other risks. Contract, breach of contract, social and force majeure risks are shared by both parties, the specific commitment program is clear in the contract.

3.1.3. Main participants and division of responsibilities under the model

The government plays the role of guide, regulator and partner in PPP projects. It is responsible for formulating policies and regulations, providing project planning and approval, overseeing project implementation, ensuring that retrofits meet public interest and quality standards, and providing necessary policy support and financial subsidies.

The social capital party is responsible for the investment, construction and operation of the project. It needs to have strong financial strength, rich project experience and professional technical ability to complete the renovation of old neighborhoods according to the contract requirements and provide quality services and realize reasonable returns during the operation period.

In terms of community and resident participation, the community and residents are the direct beneficiaries of the transformation of old neighborhoods and are also important participants. Through participation in demand research, program design and construction supervision, to ensure that the transformation meets the actual needs of residents and enhances their satisfaction and sense of achievement.

3.2. Typical cases of the PPP model

In July 2018, Vision Mind Management Consulting Company Limited (hereinafter referred to as the "Vision Group"), a private enterprise, signed a cooperation agreement with Jinsong Street in Chaoyang District, Beijing to carry out the transformation of old neighborhoods in Jinsong 1 and 2 (hereinafter referred to as the "Jinsong North Community") and gradually take over the overall property operation and management of Jinsong 1 to 8 (hereinafter referred to as the "Jinsong North Community"). ("Jinsong North Community") and will gradually take over the property operation and management of Jinsong Districts 1 to 8. In the Jinsong North Community Renovation Demonstration Project, Jinsong North constructed a "five-party linkage platform" consisting of "district-level coordination, street and township-led coordination, community coordination, residents' deliberation, and enterprise operation", and at the same time, explored a "marginally sustainable" funding model in the market-oriented operation [17]. At the same time in the market-oriented operation to explore the "micro-profit sustainable" funding model, in addition to the property management level to take the "first taste and then buy" approach, to promote community consultation and co-construction of common governance, etc., and ultimately to create a social capital to participate in the transformation of old neighborhoods is very exemplary "Jinsong Model Jinsong Model".

The traditional "government-public" binary cooperation model in the transformation of old neighborhoods faces the dilemma of insufficient government investment and weak participation ability of residents, social enterprises crack the problem through a dual role: on the one hand, as a "collaborative public service provider", they make up for the government's technical and resource shortcomings with their own investment and full-cycle professional services [18]. On the one hand, as a "public service synergist", it makes up for the government's technical and resource shortcomings with its own investment and full-cycle professional services, such as an enterprise that invested 30 million yuan to complete the demonstration renovation; on the other hand, as a "representative of residents' interests", it integrates itself into the community through immersive design and accurately connects to the residents' needs to solve the professional obstacles of residents' participation. Professional barriers to resident participation. In all stages of the renovation, the social enterprise builds a diversified mechanism to promote residents' participation: focusing on core demands and safeguarding the rights and interests of the disadvantaged to build trust in the planning stage, empowering residents to make decisions through the "five-party linkage" and "party members' deliberation" in the design stage, and integrating residents' experience in the operation stage, In the operation phase, residents are empowered to make decisions through the "five-party linkage" and "party members' deliberation"; in the operation phase, residents' experience is integrated and property and volunteer services are introduced to empower management; and in the governance phase, public spaces are created and cultural activities are organized to enhance community cohesion, forming an all-process participation system.

Through "immersive research + precise design", social enterprises enhance the breadth and representativeness of residents' participation and strengthen the "input legitimacy" of the renovation plan; guaranteeing the effectiveness of the renovation with professional investment, operation, design capability, and service awareness, and strengthen the "output legitimacy". The "output legitimacy" is highly compatible with the government's goal of solving people's livelihood problems and promotes the government to become an active partner. Its innovative practice breaks the drawbacks of the traditional model, not only relieves the pressure of one-way government investment, but also stimulates the residents' subjective consciousness through empowerment, empowerment, and builds an efficient cooperative production mode of "government guidance - enterprise collaboration - residents' participation" for the transformation of the old neighborhoods, which provides a replicable

model for the modernization of community governance. The modernization of community governance provides a replicable practice sample as shown in Figure 2 and Figure 3.



Figure 2: Jinsong north community renewal demonstration area [17]

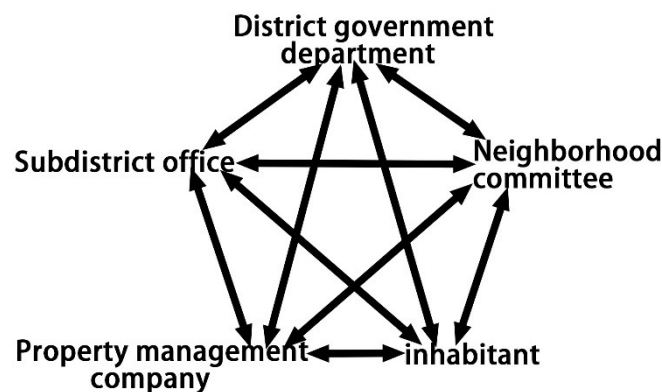


Figure 3: "Five-party linkage platform"

4. Implementation strategies for the renewal and transformation of old neighborhoods

4.1. Funding and multi-channel financing

The old neighborhood transformation faces the pain point of "big demand for funds, a single subject is difficult to undertake", and needs to build a diversified funding mechanism of "government guidance, social participation, and residents' sharing". First of all, strengthen the leveraging role of government financial funds, transformation into urban renewal special budget, integration of development and reform, housing construction, civil affairs and other departmental funds (such as guaranteed housing projects, old pipeline network renovation, and other special), prioritize the support of people's livelihood in areas of urgent need. Secondly, introduce social capital to participate in the development of operational resources, and revitalize the stock of assets in the district through the mode of "transformation+ operation", for example, using unused land to build community commercial, parking lots or pension facilities, and feeding back the transformation cost with the operational income; explore the PPP mode, and sign a long-term cooperation agreement with the enterprises, to share the pressure on the transformation fund. In addition, the establishment of a reasonable sharing mechanism for residents, through publicity and guidance to enhance the willingness of residents to renovate, and encourage participation in the form of "direct contribution,

withdrawal of provident fund, and transfer of future benefits", such as the installation of elevators, such as the payment of stratified payment, and the adjustment of property fees. In addition, innovative financial tools to support, and promote REITs pilot, urban renewal special bonds, etc., to broaden the long-term funding sources, the formation of a "financial subsidies - market operation - resident participation - financial support" three-dimensional financing network. The Government will also promote the pilot of REITs and special bonds for urban renewal.

4.2. Community building and resident participation mechanisms

The core of the transformation of old neighborhoods is "people-oriented", the need to build "decision-making, construction and management, sharing of results," the participation mechanism, to break the "government dry, the residents look at the" passive situation. First, build a multi-dimensional consultation platform, the establishment of a "community council + owners + social organizations + professional team" of the common governance network, through the residents of the Council, transformation program hearings, and other forms of transformation content (such as the functional layout, facilities selection, the use of funds) into the democratic decision-making, to ensure that the residents' needs accurate landing. For example, Shanghai's "Good Community Pioneer Action" introduces a community planner on-site to draw a blueprint for transformation with residents, realizing the whole process of "residents' demands - program design - construction supervision". The whole process of "residents' demands - program design - construction supervision" is realized. Secondly, it establishes a mechanism for coordinating interests and balances the demands of multiple subjects using policy propaganda, public announcement of compensation programs, and third-party mediation in response to conflicts of interest in the transformation (such as the impact of sunlight and space allocation), to avoid the dilemma of "transformation is a contradiction". Furthermore, to cultivate community self-governance capacity, through the organization of volunteer teams, the establishment of a transformation supervision team, guide residents to participate in the construction process supervision, follow-up property management, and the formation of "transformation - maintenance - enhancement of" long-term self-governance mode. For example, in the Jinsong district of Beijing, through the "property + resident" model of co-construction, the property fee income from the renovation is used for facility maintenance, realizing the community's self-blood support.

4.3. Smart communities and sustainable development

The transformation of old neighborhoods needs to incorporate the concepts of intelligence and greening and enhance the efficiency of space use and livability and resilience. In terms of smart community construction, the first is to build a community digital management platform, integrating functions such as security monitoring, property management, and convenient services, and realizing real-time monitoring of the status of facilities (such as elevator failure early warning and energy consumption data collection) through Internet of Things (IoT) technology to reduce management costs; the second is to implant aging-appropriate smart facilities, such as retrofitting intelligent door access control, health monitoring systems, and barrier-free navigation, to meet the needs of the aging society; and the third is to Using digital technology to optimize public space, such as activating community cultural scenes through AR guides or soliciting residents' creativity through online platforms to achieve dynamic updating of public space. At the level of sustainable development, focusing on the application of green technology, such as roof photovoltaic, rainwater recycling, energy-saving renovation, etc., to reduce carbon emissions in the community; promoting the concept of "micro-renewal", preserving the historical buildings and community memories, and avoiding large-scale demolition and construction, for example, retaining the style of the riding tower during the renovation of Yongqingfang, Guangzhou, and realizing a new community space through "embroidery

work". For example, Yongqingfang in Guangzhou retained the style of the riding tower during the renovation and realized the integration of the old and the new through "embroidery work". At the same time, the construction of a "transformation - operation - iteration" dynamic mechanism, reserved for the upgrade of intelligent facilities interface, according to the changing needs of the residents to continue to optimize the function, so that the old district from "one-time transformation "to" sustainable growth ".

5. Conclusion

This study explores the transformation of old neighborhoods in China from the perspective of stock renewal. With the shift of urbanization to stock optimization, the transformation of old neighborhoods has become an important initiative to enhance urban quality and improve people's livelihood. There are many problems in the traditional transformation mode, and modern innovative modes such as PPP, TOD, and other integration of resources of multiple subjects can effectively solve the funding and operation problems, but currently still face challenges such as insufficient historical and cultural protection and lack of long-term maintenance mechanism. In the future, the transformation of old neighborhoods presents three major trends, the depth of innovation of diversified modes, the formation of a full-cycle development model; the sustainable development of all elements, wisdom and green technology as a standard, and focus on the functional renewal and cultural continuity; the upgrade of multi-principal synergistic governance, the residents from the passive to the active co-construction.

The present study is limited in that the case studies focus on the eastern part of the country, with insufficient exploration of the applicability of retrofitting in the central and western parts of the country and urban villages, and weak tracking of the long-term mechanism of community governance and the quality of life of the residents after the retrofitting process. Follow-up studies can expand the geographical samples, introduce sociological perspectives to assess the impact of transformation and explore innovative applications of digital technology to support the transformation of old neighborhoods from "physical regeneration" to "socio-spatial-cultural" composite regeneration. This will provide support for the transformation of old neighborhoods from "physical renewal" to "social-spatial-cultural renewal".

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