

XXVIII International Seminar on Urban Form
ISUF2021: URBAN FORM AND THE SUSTAINABLE AND PROSPEROUS CITIES
29th June – 3rd July 2021, Glasgow

**Research on the Micro-renewal of Urban Residential
Communities in the Post-Epidemic Era**

Liu Jun Chen 1

1College of Architecture and Urban Design, Tongji University, China

Abstract.

The rapid development of modern cities, the continuous expansion of the area, and the scale effect brought by the agglomeration of the population also bring the risk of rapid spread of diseases. As a unit of urban organization, the community became the main isolation unit during major public health incidents and played an important role in delaying the spread of the epidemic. Especially in the residential community, from the ecological circle that undertakes residential functions to meet the needs of prevention and control, medical care, commerce, and convenient services. At the same time, it exposes disadvantages such as insufficient public space and insufficient supporting facilities. During the emergency period, different types of residential communities have adopted similar management methods and changes in local spatial morphology, some of which will gradually become public consciousness and be integrated into future community renewal and design.

In the post-epidemic era, the resilient cities and healthy cities theories have promoted changes in residential community space. The idea of urban micro-renewal comes from the reflection on large-scale urbanization and over-rational urban planning to improve the quality of residential areas and achieve sustainable development. It has the characteristics of strong restoration, strong continuity, and gradual renewal.

This article first sorts out existing urban residential micro-renewal cases and research directions from the morphological changes of urban areas, residential clusters, and building units. Then explores and innovates the methods and content of micro-renewal from the perspective of epidemic prevention. In response to the top-down prevention and control measures of city managers and the bottom-up spatial transformation of residents, it promotes the evolution of formal and informal urban forms. This paper is subsidized by NSFC project which is named as NO.51978468.

Keywords: *Micro-renewal, Shanghai, Urban Residential Communities, Post-epidemic Era*

Introduction

China's urban development has entered the era of stock, and the highly institutionalized and structured urban government governance system can no longer meet the needs of the new era.

At present, Shanghai has very rich urban micro-renewal activities. There are many micro-renewal practical projects, but related academic research and completion evaluation standards are lagging behind. Most of these micro-updates are guided by the government to provide policy guidelines, site selection recommendations, approval facilitation, special funding support, and planning knowledge training. Designers are used as bridges and links to provide technical support. Residents and social capital participate in their efforts; for the old urban space Re-inject vitality, and ultimately achieve the overall improvement of the living environment, employment environment, business environment, and cultural environment. Compared with the earlier practice, the relatively lagging behind is related

academic combing and research, and the lack of evaluation scales and measurement standards for the diversity of urban micro-renewal methods and the effectiveness after completion.

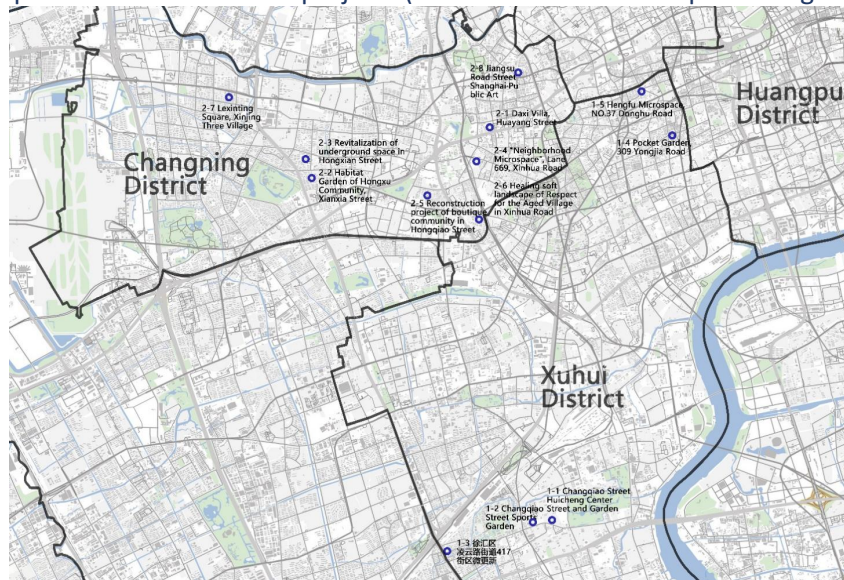
The epidemic in 2019 reminds city managers from the perspective of public safety that People’s City is first of all a safe city for prevention and control. Measures such as controlling entrances and exits during the anti-epidemic period, setting up emergency tents, and making full use of community public spaces have exposed the problems of community management and design. Short board. Some of these measures can be designed and organized as general measures for normalized prevention. Based on this, this practice selected twelve groups of community micro-renewal projects in Xuhui District and Changning District, Shanghai, as the research case.

Background

This survey selected 13 micro-renewal projects in Changning District and Xuhui District, of which 8 are in Changning District, 5 are in Xuhui District; 6 are in the inner ring, 6 are between the inner ring and the middle ring, and 1 Located between the Central Ring and the Outer Ring. These projects are the case library of Shanghai Urban Public Space Design Promotion Center and representative cases published in academic journals in the past two years.

The goal of this research is to first summarize the Shanghai community micro-renewal project in terms of space use, transportation organization, facilities, safety and variability, landscape design and artistic construction. Secondly, for the assessment of the current status of the use of micro-update projects, the management measures of epidemic prevention, prevention and control cycle, space use and changes are investigated, and the impact of micro-updates on community epidemic prevention and control in six dimensions is studied through questionnaires. Finally, summarize the adaptive strategies for some communities.

Figure 1: Map of the Micro-Renewal projects (Based on the Baidu Map of Shanghai)



Source: Made by the author

Table 1: Name of the Micro-Renewal projects

Changning District	Xuhui District
1-1.Changqiao Street Huicheng Center Garden	2-1. Daxi Villa, Huayang Street

1-2. Changqiao Street Sports Garden	2-2. Habitat Garden of Hongxu Community, Xianxia Street
1-3. Public space renewal in 417 block of Lingyun Road	2-3. Revitalization of underground air defense space in Hongxian District, Xianxia Street
1-4. Pocket Garden, 309 Yongjia Road	2-4. "Neighborhood Microspace", Lane 669, Xinhua Road, Xinhua Street
1-5. Hengfu Microspace, No. 37 Donghu Road	2-5. Reconstruction project of boutique community in Hongqiao Street
	2-6. Healing soft landscape of Respect for the Aged Village in Xinhua Road
	2-7. Lexinting Square, Xinjing Three Village, Beixinjing Street

Source: Made by the author

1. Types and characteristics of micro-renewal

According to the spatial relationship between the reconstruction object and the community to which it belongs, it is divided into three types: internal site reconstruction, intermediary zone reconstruction, and external space reconstruction.

1.1 Internal site reconstruction

The renovation of the internal sites of a single community includes the micro-renewal of the local space in the community such as projects 1-2, 2-3 and 2-7, and the overall renewal of the community as 2-5. The former improves the activity space and types of residents in the community by improving the local space of the community; the latter reforms all aspects of the community. Including roads, greening, convenient service facilities, etc., to improve the overall spatial quality of the community, thereby improving the quality of life of residents.

The characteristic of this kind of micro-update is that its public space is usually cohesive and the area is not too large. Before the renovation, such public space is usually a negative space in the community. Without proper functional limitation and utilization, it is difficult for residents to stay in such a space, which also reduces the opportunities for community communication and emotional promotion. The main feature of this kind of micro-renewal is to create a complex functional space based on the actual needs of the residents of the community, focusing on daily leisure projects such as fitness and rest, to achieve a more refined and rich-level design, and to meet the residents' various needs in a small area.

1.2 Intermediary zone reconstruction

Multi-community integration public space micro-update is a unified update of multiple communities with integrated property management like 1-3. The micro-updates are distributed in all parts of the block, including the interior of the community and the public space of the block, and enhance the space of the entire residential area Quality and quality of life.

The object of such micro-renewal is often the intersection of the various districts before the transformation, mainly through the function. Micro-updates are oriented to the composite needs of residents in each community, and the functions are still daily-oriented. Compared with the micro-updates in a single community, it adds neighborhood living rooms, commercial streets, waterfront spaces, community farms, etc. to be more comprehensive. Comprehensive functional space with more land. This kind of micro-renewal is more diverse and complete in terms of function, which promotes

communication between residential areas and is more extroverted. However, in terms of management, it is difficult to achieve integrated unified management because it is located at the junction of various communities. During the epidemic, most of them are closed and disabled, and the maintenance of the micro-update is difficult.

1.3 External space reconstruction

The public open space outside the community is not affiliated to any community, and is open to the public, such as 1-1, 1-4, and 1-5. It is free to enter and exit, has multiple functions, and its scale, geographic location, and purpose of use are different. The society provides space for activities and communication.

This kind of micro-update is characterized by larger area, more commercial and urban, setting up external-oriented functional spaces such as cafes, exhibitions, etc., and will carry part of the city's functions, such as network nodes for historical and cultural blocks, garbage sorting resource stations Wait. The space after the micro-update is usually rich in crowds and activity types, and the space quality and vitality are good. During wartime, it can be used for storage of crops, small medical points, etc.

2. Methodology

Adopt a problem-oriented research method: evaluate the two dimensions of "community normal prevention in peacetime" and "community emergency management and control in wartime". Evaluation indicators include six aspects: risk weakening, smart governance, health improvement, space isolation, temporary reconstruction, and lifeline protection, with a total of 15 elements.

After summarizing and scoring, the two more special cases of 1-4 Yongjia Road Pocket Square and 1-5 Hengfu Microspace were removed, and the average scores of the remaining items were calculated, and the differences were compared with cases one by one.

1-1 Huicheng Center Garden

Huichengyuan is above average in terms of temporary renovation and lifeline protection, and scores low in terms of risk weakening and smart governance. The four communities surrounding the central garden of Huicheng Garden have poor internal space conditions, lacking open public activity space, blank strategic backup, various living facilities, etc., and the external shared central garden is used as a supplement for the internal space of the community. The micro-renewal is activated, but due to the implementation of the community closure measures during the war, it is still not enough to improve the shortcomings of risk reduction.



Figure 2. Photo by the author, the Evaluation table of 1-1

1-2 Changqiao Street Sports Garden

The overall score of the sports garden is relatively high, of which the score is very prominent in the aspect of temporary reconstruction, and the score is also high in the aspect of space isolation and lifeline protection. The self-organizing power of the community is very superior, and it has played an important and active role in the daily management of the community. Volunteers' one-to-five assistance is also conducive to the protection of the community's wartime lifeline; the deployment of the Xuhui District community planner has also promoted the community Of micro-updates.

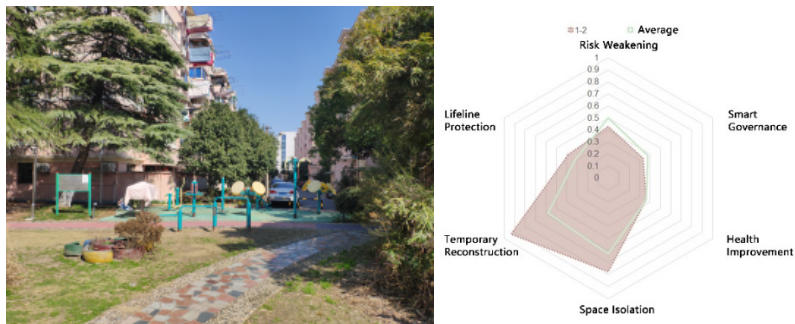


Figure 3. Photo by the author, the Evaluation table of 1-2

1-3 Public space renewal in 417 block of Lingyun Road

The scores of the 417 block are higher than average, and the overall micro-update quality is high. As a block with integrated multi-community property management, the overall space and resources are relatively abundant, and it can be uniformly deployed, making it a higher potential in the construction of resilient communities. The 417 block has also begun to explore some smart governance, which has advantages over other cases.

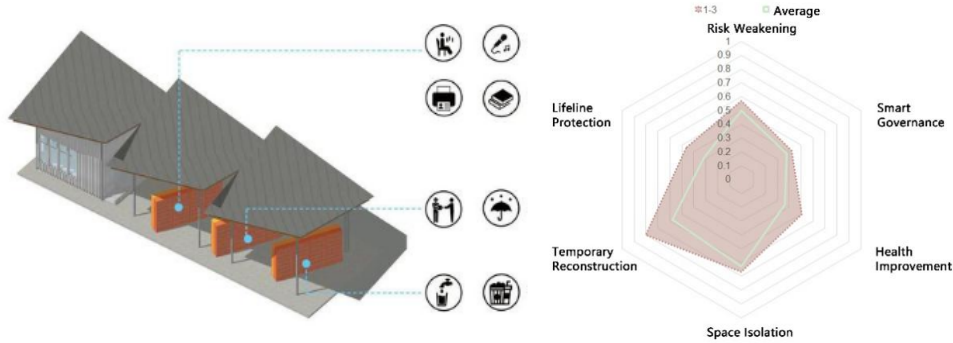


Figure 4. Photo by the author, the Evaluation table of 1-3

2-1 Daxi Villa

Micro-updates focus on public open spaces and serve the needs of residents in daily life, with obvious functional orientation, lack of epidemic prevention and control, and negligence in management. Horizontal comparison, with risk reduction functions, but smart governance and health improvement need to be added.

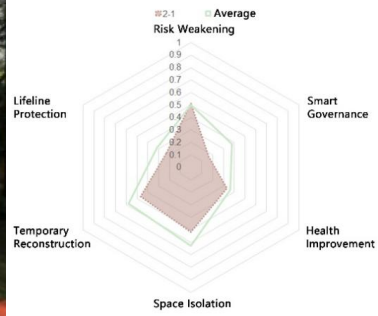


Figure 5. Photo by the author, the Evaluation table of 2-1

2-2 Habitat Garden of Hongxu Community

Temporary renovation and space isolation are more prominent, and the remaining parts score lower. In horizontal comparison, due to its small scale, consisting of only 5 houses for husbands, there is a natural disadvantage in terms of risk reduction and health improvement. There are not enough types of supporting facilities in the community, so the strategic margin at the risk weakening level is small, there is no internal medical facilities, no smart express cabinets, etc.; it cannot meet the needs of indoor fitness chess and cards.

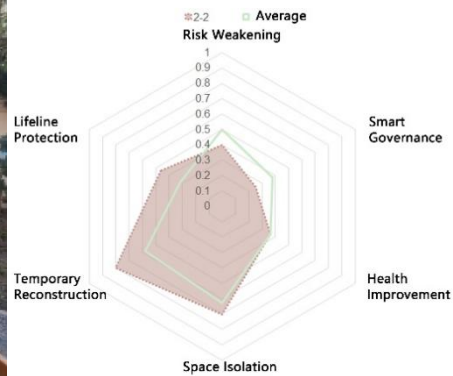


Figure 6. Photo by the author, the Evaluation table of 2-2

2-3 Revitalization of underground air defense space

The community lacks supporting facilities and micro-renewal has not been fully used. In horizontal comparison, the basement indoor space is closed and cannot play the role of indoor public space; the main activity space is the hard square on the underground space, lacking outdoor soft landscapes such as green space and parks, so the health improvement scores are low.

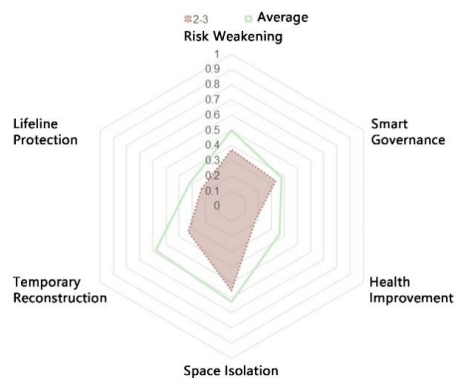


Figure 7. Photo by the author, the Evaluation table of 2-3

2-4 "Neighborhood Microspace", Lane 669,

There are few supporting facilities in this community, and micro-renewal is fully utilized: stacking express delivery, library, neighborhood communication space. Because of the small space, there are defects in the part of health improvement and lifeline protection. As it is a semi-open space, temporary renovation is more likely.



Figure 8. Photo by the author, the Evaluation table of 2-4

2-5 Healing soft landscape of Respect for the Aged Village

Outstanding performance in risk reduction and health improvement, other aspects are less than average. The community is large and has undergone overall renovation. It has multiple squares and complete facilities, so it scores high in risk reduction; it has an open activity center, green spaces and other landscapes, and outstanding health improvement. However, the daily operation and management organization of the community is lacking.



Figure 9. Photo by the author, the Evaluation table of 2-5

2-6 Healing soft landscape of Respect for the Aged Village

The community's renovation time was early, the scope of renovation was small, and the overall community environment was poor. In horizontal comparison, the square and supporting service facilities are complete but old, and the risk reduction is poor; there is a lack of indoor activity space, and outdoor fitness, soft landscape, and health improvement is obviously poor.

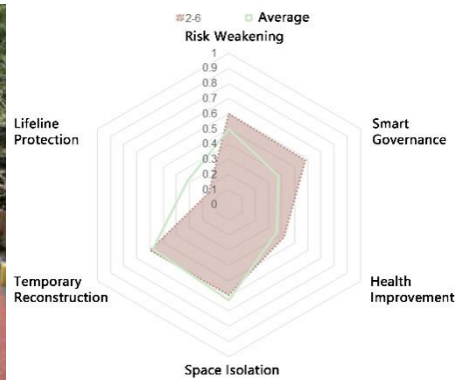


Figure 10. Photo by the author, the Evaluation table of 2-6
2-7 Lexinting Square

The community's renovation time was early, the scope of renovation was small, and the overall community environment was poor. In horizontal comparison, the square and supporting service facilities are complete but old, and the risk reduction is poor; there is a lack of indoor activity space, and outdoor fitness, soft landscape, and health improvement is obviously poor.

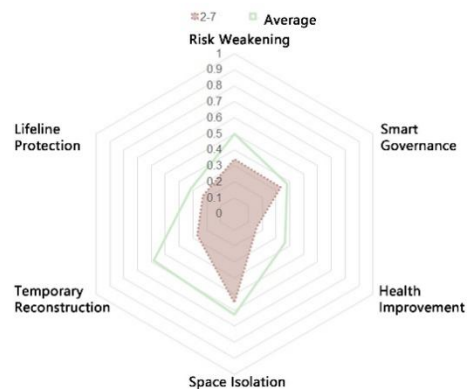


Figure 11. Photo by the author, the Evaluation table of 2-6

3. Strategy Comparison

There are some weaknesses in existing micro-updates. First, in public space, micro-renewal places and facilities have been shelved or abandoned. Secondly, the relatively open area in the community can be used as a place for the concentration and distribution of anti-epidemic materials, as well as for the placement and classification of domestic garbage; for the use of original functions, it can also be combined with WeChat applets and Internet information filling methods to allow residents Use in batches and time periods.

At the same time, it should be realized that the community update can no longer meet the needs, and planning is needed to cope with the diverse needs. For example, implementing long-term tracking services; combining community renewal with community governance; creating an online sharing platform for continuous space construction; forming and continuously absorbing outstanding designers to form a team and preparing practical guidelines to guide the community to update common issues.

4. Conclusion

After literature research, the normalized prevention and control strategy is summarized. First of all, in the planning and response to urban renewal, health and safety elements should be integrated into the urban physical examination, improve the comprehensive disaster prevention and control capabilities of the old city, provide convenient and complete living services, create healthy and pleasant green public places, and strengthen the resilience of land use And flexibility, and strengthen community autonomy and management capabilities.

Secondly, in terms of community personnel management, especially the mobilization of human resources, the trinity of community volunteers, community neighborhood committees, and police is required.

Third, in the mobilization of related resources, nucleic acid testing and large-scale elimination, measures for collective relocation, centralized isolation, and epidemic prevention and control exercises should be considered.

Fourth, in the use of traditional hardware facilities, the traditional way of guarding, you can set up tents or place small containers at the entrance, and build temporary board houses. At the same time, personnel can be used to issue access cards, check health codes, and measure body temperature.

Finally, in the new smart solution, it is recommended to adopt the "Internet + epidemic prevention and control" approach. For example, smart terminals are installed in the home, O2O procurement, water and electricity heating and maintenance, smart identification systems are installed at the door of the community; parking guidance, contactless channel guidance, and public facilities system management.

Acknowledgment

This paper is subsidized by NSFC project which is named as NO.51978468.

References

1. Chen Min. (2020). Shanghai practice of micro-renewal of urban space, *Architecture Journal*, vol.10, pp. 29-33.
2. Song Xiaolong, Huang Yan. (2000) "Micro-circulation" Protection and Renewal——Theories and Methods of the Conservation Planning of Beijing's North and South Long Street Historic Districts. *Urban Planning*, vol.11, pp. 59-64.
3. Wu Jie.(2019) Research on the micro-renewal planning of traditional blocks based on "urban acupuncture and moxibustion"—Taking the Baziqiao block in Hailing District, Taizhou City as an example. *Housing and Real Estate Production*, vol. 03, pp. 81-82.
4. Wu Liangyong. (1994) Beijing Old City and Ju'er Hutong. *China Construction Industry Press*.
5. Wu Yutao. (2020) Research on the micro-renewal design strategy of the old residential blocks in the old city of Anshun in Guizhou Province. *Beijing University of Architecture and Architecture*.
6. Yang Jianqiang, Zhu Yuxi, Liu Fangqi, Wang Mingrui. (2020) Urban renewal facing the post-epidemic era. *Journal of Western Human Settlements and Environment*, vol. 35(05), pp. 25-30.