

Strategies for Spatial Reconstruction along the Street in the Old Urban Area Based on the Block System of Shenyang City

Xiaozhou Yang¹, Paul Jones²

1 Department of art, Northeastern University, Shenyang 110189, China

2 Faculty of Architecture, Design and Planning, University of Sydney, Wilkinson Building (G04), 148 City Road, Darlington NSW 2008

ABSTRACT. *The street space in old urban areas in many Chinese cities is relatively narrow, with street networks dense. The layout of old neighborhoods is not in line with the living mode of modern residents and city master plans, which makes the old urban areas prone to traffic congestion and environmental degradation. The streets in the old urban area in Shenyang City are disordered in structure, restraining the city's vitality and playing a negative role in city development and management. Based on the current situation of the block system, the paper puts forward the strategies for spatial reconstruction of streets in the old urban area in Shenyang by means of analyzing several streets space along the old neighbourhoods.*

KEYWORDS: *Block system; Old Neighborhood; Street space; Reconstruction; Strategy*

1. Introduction

With the rapid development of urbanization and upward trajectory of urban population growth, many cities have developed new urban areas either by infill development or edge development to increase their population capacity. The construction of the new infill districts is relatively new, and the living environment has improved significantly. Many residents prefer to live in the new districts, given the old urban areas are lacking in construction and building standards, and population is gradually decreasing. The vitality and transportation links to the old urban areas has declined. In this context, this paper aims to suggest strategies to optimize the street network structure and solve problems of space transformation along street in the old urban areas.

Old Neighbourhoods, refers to blocks of residential buildings erected before June, 2000 with legal property rights or usufruct of house. With rapid urbanization, the adverse features of old neighbourhoods have become apparent, namely, inefficient space layout, low-quality building construction, functional-insufficiency, poor landscaping, high energy consumption and aging infrastructure. With the implementation of housing reform in 1990's, diversified forms of housing property generated unclear ownership structure of real estate market, resulting in non-supervision of some old neighbourhoods, and their resulting status as "abandoned quarters". According to statistics of Shenyang Housing Bureau. By 2017, Shenyang has 796 "abandoned quarters" of which 314 of them are designated for reconstruction on *Three-Year Action Plan for Upgrading of Residential Quarters, Shenyang (2018-2020)*.

Squatter area is composed of constructions built more than 40years, with brick-timber or brick-concrete structure. Common problems existing in these buildings were weak anti-disaster ability (earthquake, flood and fire hazard, etc.), deficient functions (no independent bathroom, kitchen, and central heating and water supply, etc.) and insufficient living space and public roads and landscape. Giving the unsound construction quality and low heritage values, according to Measures for the Demolition of Housing in Squatter Area in Shenyang (1998), many of these buildings were demolished and others are going to be or have already been putting on the listing of demolition.

Before 1980's most of neighbourhood, now classified as old neighbourhoods, were attached to state-owned enterprise or public institutions in terms of worker dormitory and staff housing. With industrial restructuring and reform in the mid 1990's, a large scale of factories shut down or relocated in suburbs yet the residential use constructions remained. As one of the most important industrial bases, Shenyang used to be of prosperity of traditional industrial economy. A large number of factories, workshops and streets were listed as heritage sites with remarkable heritage significance. In some cases, old neighbourhood, as part of relative constructions of

industrial region, were put onto the preservation lists as well. (historical events, aesthetic significance)

Emerging of commercialisation of housing in 1990's spawned the exploding on private housing market. Old neighbourhood as the product of the transition period of government and enterprises housing system reform, once captured a large proportion of the Shenyang estate market. (data) Buildings in this period were principally invested and constructed by government, institutions, enterprises and some by private developers. Despite communal facilities disrepair, surface damage and poor landscape, old neighbourhoods were still capable to accommodate daily living. However, by the beginning of 21st century, old neighbourhoods had been rapidly displaced by new residential quarters under the updated "economy oriented" housing mechanism. For expanding land profit, plenty of old neighbourhoods were demolished for new constructions as they were not capable to meet the needs of higher living quality and low construction cost, even some of them possessed certain heritage values and city context impact.(typical building form, low aesthetic significance)

Residential Quarter is a dwelling pattern of modern city, consisting of several forms of buildings (high-rise, multi-storeys, house, etc.). Residential quarters are generally managed as gated community with communal facilities and exclusive landscape amenity. Living infrastructure of residential quarter is basically provided by the municipal service and responsibilities for daily management and maintenance are taken by the property management agency.

Reconstruction of old neighbourhood: Compared with new residential quarters, lacking formal estate management and maintenance caused unregulated development of old neighbourhoods. In order to solve low quality of old constructions and living environment and to enhance neighbourhood vitality, renovation and comprehensive options are designated by municipal government for different types of old neighbourhoods.

Table 1 Overview of development of different types of old neighbourhoods

	Type	Construction Standard	Mode	Finance	Development options	Implementation	Resettlement Policy/Monetary indemnity	Outcome
Old Neighbourhoods	Old N with historical and industrial values, aesthetic significance	H	Government guide + market operation+ public participation	- Developer - Property units - Residents	- Preservation and upgrading with old use - Function reshaping and adaptive reuse with new/old use	- LGAs - Property units - Estate management companies	N/A	Urban renewal
		L			- Repairing and new design involvement with old use - Function reshaping and adaptive reuse with new/old use			
	Old N in typical building forms but with low aesthetic significance	H	Government guide + market operation+ public participation	- Developer - Property units - Residents	- Function reshaping and adaptive reuse with new/old use - Repairing and new design involvement with old use	- LGAs - Property units - Estate management companies	N/A	Urban renewal
		L			- Repairing and new design involvement with old use - Demolishing and rebuilding with new/old use			
	Old N with no obvious heritage values but with reflection of city context (Frequently designated as Squatter Area)	H	Government guide + market operation+ public participation Government oriented	N/A	- Demolishing and rebuilding with new/old use - Function reshaping and adaptive reuse with new use	- LGAs - Property units - Estate management	N/A	Urban renewal / Urban redevelopment
		L			- Demolishing and rebuilding with new/old use			
Squatter Area	Old N with no heritage values	L	Government oriented	Government Special Fund (Bank, national enterprises,	Demolishing and rebuilding with new/old use	SOEs	Both	Urban redevelopment

				property units)				
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Streets in Old Urban Areas have different space forms and functions in accordance with the surrounding construction environment. Streets in the old neighbourhoods with historical and industrial values are generally developed in the city-scale system in terms of low density, high accessibility and mixed land use; streets in the old neighbourhoods with typical building forms but low aesthetic significance or with no obvious heritage values but with reflection of city context tend to be developed in the community-scale system which adopt grid street network, high density, mixed function and pedestrian-oriented.

2. Planning and construction management of the old city urban areas

According to the relevant opinions on urban planning and construction management issued by the State Council in February 2016, the network structure of the block should be further optimized, and the internal streets should be publicized to solve the problems existing in the old urban areas. There are a series of problems in the streets of the old urban areas, for example, environmental pollution is relatively serious, traffic congestion is difficult to solve, layout confusion does not meet the needs of modern people, low street network density cannot meet actual needs, and the street along the line is relatively narrow, resulting in relatively crowded living and difficult to gather vitality in the old urban area. Small blocks are the most basic unit in urban function. High-density development mode can promote the development of cultural, social and economic activities to a large extent, and plays an important role in the city. Many foreign works have already stated that opening small-scale street and increasing the number and area of streets can well meet the needs of residents and improve the vitality of the city. The domestic old-fashioned street research system is relatively inadequate, and there is a lack of in-depth research on the reconstruction of spatial reconstruction along the street in the old urban area.

3. Research on the spatial reconstruction along the street in the old urban area under the block system

The street of a certain area in Shenyang City studied by the author is a typical street in the old block. The street is located in the old town, and the two sides are mainly dominated by large residential areas, interspersed with shops along the street. The area has been dating back nearly 30 years, and the residential community is very large and has the title of a million people. Due to the large number of residents and the long time of the residential community, the degree of privatization of internal streets is very serious, and the branch network is relatively small, which hinders the circulation of streets during peak periods. In terms of public transportation, its cross section is narrow, and there are fewer bus distribution points. In the early and late peak, the street is occupied by parking, which reduces the attractiveness of the block as a whole.

The study will be conducted via analyzing three picked streets along different types of old neighborhoods in Shenyang. The issues will be presented in several aspects, namely, the quality of the old neighborhoods, street scale, transportation form, commercial format, open space, etc. Three streets in different blocks are picked as case studies as follow:

(1) 10th South Street, Tiexi district is located in Gongrencun neighborhood which is of high historical and cultural significance in urban development in Shenyang. It was generated from a link path in small blocks which were packed with residential buildings of workers. 10th South Street was expanded when the factories were shut down and the old constructions were well preserved and reused. However, it has been hard to meet the demand of accumulating population and more complex living situations due to the irrational street layout, low building density and single living amenity. (Fig 1.)



Figure. 1 10th South Street, Tiexi district

(2) 144 alley, 1st pathway South is located along the north side of Xingsheng Quarter in Shenhe district. It has been repaired and redeveloped as Xingsheng Quarter was designated as a typical sample of regeneration of old neighbourhood in Shenyang. 144 alley, 1st pathway South was about 15metres wide and residential buildings are erected on both side of the street, the scale of the street is proper for the pedestrianized zones, however the street space is largely occupied by vehicles due to the lack of parking areas of Xingsheng Quarter and inevitable parking demands of private retails.(Fig 2)

*Figure. 2 144 alley, 1st pathway South, Shenhe district*

(3) Huiwu Street is located next to the east side of the 11th Arts District in Shenhe district. The 11th Arts District was developed as a complex by reusing the old residential buildings and consequential created a connective business environment for private retails. The buildings are of low historical significance but with reflection of the industrial context of Shenyang, so the street is kept as its original scale. However, the visual quality of streetscape is low because of the lack of rational strategies for retail development and insufficiency public infrastructure and living amenity causes the depressed vitality of the old neighbourhood.(Fig3.)

*Figure. 3 Huiwu Street, Shenhe district*

3. Strategies for street space reconstruction in old neighborhood areas

3.1 Strategy for reconstruction of small-scale block

Firstly, the block scale is sorted out in time. According to actual demand and urban planning in recent ten years, the block scale is renovated, and the internal street publicity situation is strictly managed and maintained.

3.2 Strategy for optimization of network structure

On the basis of ensuring that the function of branch streets is fully brought into play, one-way traffic streets are formulated, intersections are thinned according to actual needs, public transport streets are introduced, and

pedestrian streets and bicycle lanes are cleaned up and built to meet the daily needs of residents. Branches mainly include pedestrian streets, bicycle streets, and public transport principles. Branches can meet the needs of many trunk streets, and play a good role in diversion after connecting the trunk streets. One-way traffic can reduce the conflict points, improve the communication ability of streets, and improve the speed of operation. One-way traffic can also improve the accident probability of accident-prone places and facilitate residents to cross the street.

3.3 Integration strategy of open space commercial formats along the street

When sorting out the commercial formats along the street, it should be developed from a three-dimensional perspective, integrate various formats, create rich and exciting business activities, which can well promote employment and increase the vitality of the city. Three-dimensional development is to mix the functions of street buildings up and down, the upper aims to meet the housing needs, and the lower aims to meet the business model, to better improve the utilization rate. Attention should be paid to the combination of diverse urban functions such as residential, cultural, and commercial and service experience in planning to rich the commercial format of the neighborhoods and increase employment opportunities. The exchange of diverse economic activities can make the streets full of vitality.

3.4 Sharing strategy of public living space along the line

The fence of the district can be reformed according to the actual needs, and the surrounding land can be more modernized planning, to give more shared living space to the city. The area is divided to meet the needs of residents in the square dance, walking, and sports, so that more people can feel the shared resources in the city and promote the harmonious exchanges between people.

The specific transformation elements are shown in Figure 4.

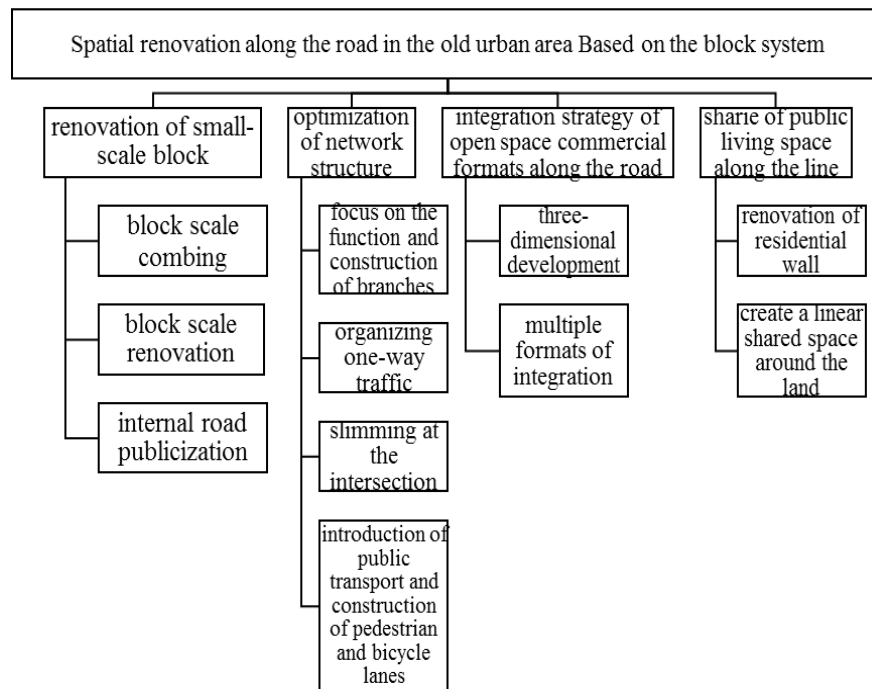


Figure.4 Elements of Spatial Reconstruction along Street

4. Conclusion

When planning the spatial reconstruction of the block system in the old urban areas, it is necessary to carry

out key reforms on the outstanding problems according to the characteristics of the city. It can start from transforming the street scale, optimizing the network structure, opening the commercial space, and integrating the living space to form a shared, pluralistic and inclusive urban development situation. On the one hand, it satisfies the needs of commercial formats, enhances the vitality of the city; and on the other hand, it meets more humanized demands to improve the overall image and city appeal of the city. However, it is worth noting that some small blocks have not yet been promoted in urban construction. It is also necessary to carry out better research based on the combination of the actual situation of the block system and the needs of construction and development.

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