

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

**“Sharing Mosaic”: Study on Regeneration Strategy of Industrial Heritage in Urban Design —Take Hanyang Iron Factory as an Example**

Ms Yuqiu Liu

Architectural Programming and Typology Studies Group, Department of Architecture, College of Architecture and Urban Planning, Tongji University, China

**Abstract**

*In the aspect of urban renewal, the monotonous “super block” mode of industrial area in contemporary China causes low efficiency of space utilization and indifferent communities. Therefore, it is essential to share the big blocks with multiple land-use and various patterns of development. This paper takes the Hanyang Iron Factory in Wuhan, China, as an example, to explore the optimal scale of sharing blocks in regeneration of industrial heritage. The paper surveys on the operation conditions of retail stores in four regeneration projects in Wuhan and categorizes the shops by amount, location, area, shape of floor plan and measures their economic and social performance. Results of the performed study show that “Sharing Mosaic” blocks, which combine the scattered space of the whole site through pleasant small-scale streets and buildings, greatly increase the accessibility and efficiency of the original site. Accordingly, the paper proposes a new regeneration strategy: Firstly, to provide more possibilities of sharing, the original 150 meters super block is divided into small 60 to 75 meters plots; secondly, design six different modes of function-sharing plots, combining commercial, residential, cultural and other functions; thirdly, various scale of modular units for different types of sharing space are inserted into the central of each plot, generating plenty of dynamic cores. By dividing the super block into diverse small-scale function-sharing plots which allow for diverse cultural landscape, the “Sharing Mosaic” pattern blurs the boundary of functional zones and create more space for people to share, revitalizing the old industrial area. With the help of these appropriate scale and patterns of development, an organic social structure network has been reweven for the depressed site, providing reference for similar cases. This paper is subsidized by NSFC project which is named as <Research on Time and Space Elements and Expression System of "Sharing Architecture">, NO.51978468.*

**Keyword:** Industrial Heritage Regeneration, Block Scale, Hanyang Iron Factory

**Introduction and Background**

As the fast development of cities keeps demanding for plenty of empty space for new facilities, China have been faced with the urgent issue of “urban regeneration fever” since 1980s. Meanwhile, the orientation of economic structure in China nowadays has gradually reverted from manufacture industry to service sector, leading to the result of tremendous abandoned industrial land. These two phenomenon naturally attracts Chinese government and developers’ attention to regeneration of industrial heritage.

However, the high-speed urbanization of modern cities has brought a number of issues to the regeneration of industrial heritage. The symbols of the splendid history of the ancient city were pulled down in order to build hotels, restaurants, shopping centers and so on. Nowadays, people may have already forget the precious memory of the city’s history so we have to seek out theses lost memories. The increasing need of

land in downtown for building new high-rise skyscrapers have largely influence the survival of historic remains.

Due to the needs of mass production, the block scale of industrial area in China in 1900s was quite large, which varied from 300m to 500m. Such “super blocks” bring convenience of central administration by single property, but at the same time, give hinder to diversity and various format of economy which decreases the vitality of communities. Consequently, the current scale of blocks in those area isn’t suitable for the regeneration of heritage and development of abandoned industrial land. A new frame of urban form should be come up with by the urban designers to retrieval the lost lands.

In this situation, the whole research spots on one specific urban renewal case of Hanyang Iron Factory in Wuhan, China. The site used to be a famous iron factory, which greatly advanced the modernization of China in 20th century. Similar to most old industrial zone in 1900s, the size of blocks in the current district is about 400m in width with large-scale factory buildings remains. At present, the whole site is surrounded by high-rise apartments which were built in recent five years. As the iron factory has stopped to produce steel products, the historic factory buildings are now abandoned.

In addition, Hanyang District has a great number of foreign companies and the future Wuhan Consular Section will be built in this area. As a result, the policy of the renewal urban planning of the Wuhan government on the Hanyang district aims at creating a “Three Core Town”: an international Trading Center, a national famous historical and cultural city and a habitable city. All these goals focus on transform Hanyang from an original depressed industrial area to a center for interaction in both economic and cultural aspect.

### **Methodology: Case Study on Retail Business in Wuhan**

Under such circumstances, so as to define the optimal developing mode for the Hanyang Iron Factory regeneration project, the paper researches on the economic operation situation of retail stores in Wuhan and takes four samples in different typology of business as examples. By comparing the statistics of these four kinds of retail district, the research try to find the relationship between the scale of the store (area of shop, storey of building etc.) and its economic benefits (vacancy rate, renting price etc.) and accordingly figure out the optimal developing scale for the regeneration of Hanyang Iron Factory District.

#### **Case one: Hanzheng Street**

Located at the Hankou historic district of Wuhan, Hanzheng Street is the biggest and first retail market in the central China since the economic reformation and opening up period. The main merchandise sells here is small handcrafts and goods sold wholesale. As the commercial area here is developed gradually in the old town of the city, the stores in Hanzheng Street are in various size and the scale is basically small due to the texture of the ancient Hankou Town.

### Case two: Wuhan Plaza CBD

The Wuhan Plaza business area located along the middle part of Jiefang Road in the central area of Wuhan City, included Wuhan International Mall, World Trade Center, New World Department store etc. Because of the ideal location and great density of population, renting price in this area is high, and the form of retail in this district is stores mainly at the lower levels of department stores.

### Case three: Jiangnan Road Historic District

Jiangnan road is parallel to the Yangtze River and is famous for full of old buildings built in combined Chinese and western architectural style. So the street scale in this area is relatively small, shops are mostly situated at the townhouse of the old residential area along the street. Retail in this district is primary selling traditional stores and brand products.

### Case four: Hankoubei World Trading Center

Unlike the above cases, the Hankoubei World Trading Center is built in the new town of Hankou District. As a result, the scale of the buildings in this area is quite large and the format of business is monogamous. Different type of stores in the market is clearly laid in distinct function zones and the space arrangement of stores is planned uniformly, in three basic scales of shops——4m to 8m, 8m to 8m and 9m to 9m.

**Table 1. Operation Situation of Retail Stores in Four Typical Commercial Area in Wuhan**

	Area of the plot	Market area	Vacancy Rate	Location	Typology	Storey	Scale of store	Renting Price
Hanzheng Street	3.46 km <sup>2</sup>	0.6 km <sup>2</sup>	< 10%	Old Town	Lower levels of Townhouse	1-2	5 m <sup>2</sup> to 100m <sup>2</sup>	100 RMB/m <sup>2</sup> per month
Wuhan Plaza CBD	0.06 km <sup>2</sup>	0.21 km <sup>2</sup>	10% to 20%	Downtown	Department Stores	5-7	30 m <sup>2</sup> to 400 m <sup>2</sup>	2000 RMB/m <sup>2</sup> per month
Jiangnan Road Historic District	0.32 km <sup>2</sup>	0.93 km <sup>2</sup>	< 5%	Downtown	Mixture of Department Stores and Shopping Streets	Mixed	20 m <sup>2</sup> to 500 m <sup>2</sup>	1000 RMB/m <sup>2</sup> per month
Hankoubei World Trading Center	1.02 km <sup>2</sup>	0.7 km <sup>2</sup>	> 30%	New Town	Newly-built Modular Single Floor Unit	4-5	4m x 8m, 8m x 8m, 9m x 9m	50 RMB/m <sup>2</sup> per month

## Results and Discussions

### Factor One: Scale of the Store

In this paper, the scale of store in each commercial zone is weighed by the area and diversity of shop units. When it comes to the scale of store, shops on Jiangnan Road is the most diverse, from 20m<sup>2</sup> to 500m<sup>2</sup>, when the shops in Hankoubei World Trading Center is designed only in three fixed area.

### **Factor Two: Economic Benefits**

The benefits of retailing is valued by comparing the vacancy rate and renting price of each area. From the above table, we can see that the vacancy rate of Hanzheng Street and Jiangnan Road is quite low, both under 10%, and the highest is Hankoubei World Trading Center, with an amount of higher than 30%. In the aspect of renting price, Wuhan Plaza CBD is the highest, nearly 40 times the price of the Hankoubei District.

### **Relationship of the Two Factors**

The paper finds two main results concerning the relationship of the former two factors:

First, smaller scale brings lower vacancy rate of retailing business in Wuhan. Statistic shows that the area of retail stores in area where land use is mainly residential, is commonly in small scale, for instance, shops in the Hanzheng Street can be small as only 5m<sup>2</sup>, the store only take up half of the first level of the old townhouse building. However, while stores are much smaller than that in the Wuhan Plaza CBD, the vacancy rate of Hanzheng Street is lower than the department stores in CBD area.

Second, the result of the research indicates that the more diverse the scale of the stores is, the more vital the retail industry is. In the Jiangnan Road Historic District, the range of area of shops is the largest with the lowest vacancy rate, which shows that the diverse type of retail stores attract more businesses. And in turn, the various formats of commerce bring more possibility of consumption, which arouse more interaction of people to activate the sluggish old town.

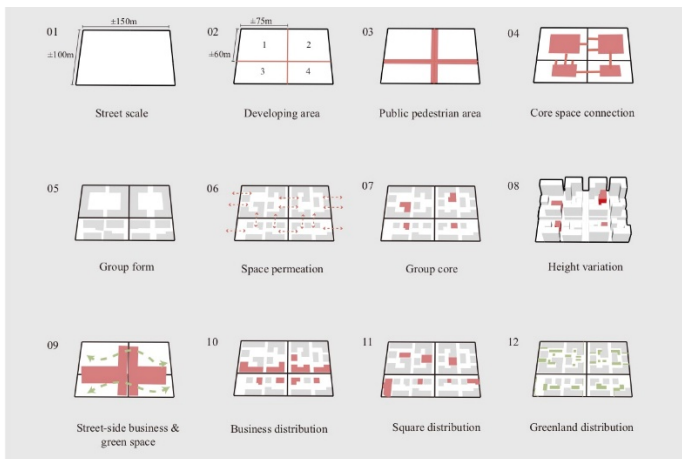
Consequently, the design of the form of the stores should focus on creating small scale blocks and more flexible format of commercial area which can adapt to different kinds of retailers.

### **Regeneration Strategy**

From the above case study of four typical commercial zone in Wuhan, we can clearly see that blocks with small human-scale and diverse development units can bring vitality and regenerate the old towns. Since the scale of blocks in the original site is quite large, making it quite possible for people to find the scale unsuitable to interact with each other and The over-size gardens and playground in the center of the zone can't arouse people's enthusiasm for outdoor activities, we have to adopt new strategy to deal with the culture and urban plan issues. With the development of globalization, the multi-culture phenomenon let the "cultural mosaic" policy become a possible strategy for the renaissance of the historic community.

### **Step One: Regenerate the grid of the block**

The original road grid of the area is currently a one-way structure, with only one main entrance in the north part linked to the Qintai Road and the factory buildings are arranged along the central lane in East-West direction. Such form of traffic system is chiefly based on a unique pattern which can best serve for the fixed work of flow manufacture progress of steel products. And due to the huge size of industrial products, the blocks are in large scale, on the contrary, unfriendly to the human scale of creating community. As a result, the division of the original block is essential in the beginning of the design. The design first subdivides the “super blocks” into a 150m to 100m plot, and define the size of specific developing area units varied from 60m to 75m. As the original block of large plot is divided into small plot, which is suitable for the optimal size of different shops, step one generates a large number of dynamic streets like capillaries, extending to the whole site and revitalizing the old industrial area. By transforming the nonhuman scaled industrial immense blocks into “small blocks, narrow streets” mode, which is quite common in most European countries, the new block scale brings in more possibility for interaction.



**Figure 1.** Procedure on transformation of grid system.

### Step Two: Plug in mosaic-like mixed texture in the blocks

The design try to compose six form of mixed-use block mode: High-rise office block with open terrace for the public activities, residential area with mixed retail modular units, townhouses with lower-level stores along the street, office buildings with podium for commercial use, pedestrian malls with upper housing and independent business area surrounding multi-storeys residence. By setting various kinds of developing mode, the form of each blocks can be unique and diverse instead of a uniformly planned “New City”. This step not only brings higher economic benefits but also recall people’s memory of the diverse old city with complex texture all mixed in one area, building a cultural brand for the industrial heritage regeneration project.

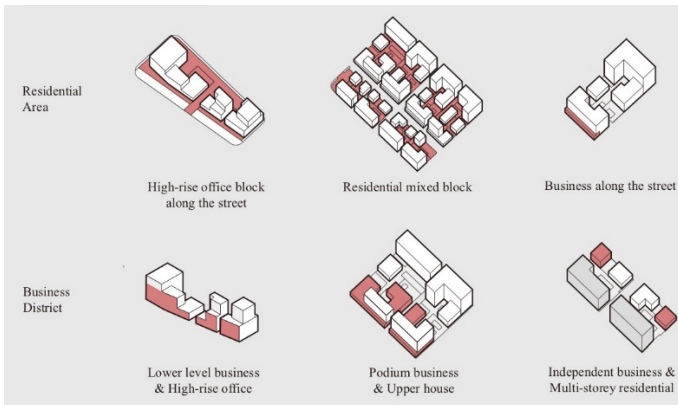


Figure 2. Six mixed development mode.

### Step Three: Create “Sharing Mosaic”

In the middle of each block, place diverse kinds of core space for people to communicate and interact with each other. These sort of cores aren’t exclusively used by each block but shared by different crowds in various form, for example, rose garden, visitor center, outdoor traditional food market, citizen gym center and so on, just resembling the pattern of mosaic—an art of collage and produce harmony with different colors or materials. Meanwhile, according to the conclusions of the research on the circulation of foreigners and native residents in this area, the public space is divided into three main parts: First, the core area of historic buildings. Second, the East-West axis (foreigners streamline). Third, the North-South axis (native residents streamline). As a result, by planning an intersected pedestrian system in the two axis and a “walking circle” corridor around the central heritage reservation area, the cluster of block units are bonded together, composing a vertical “Sharing Mosaic”.

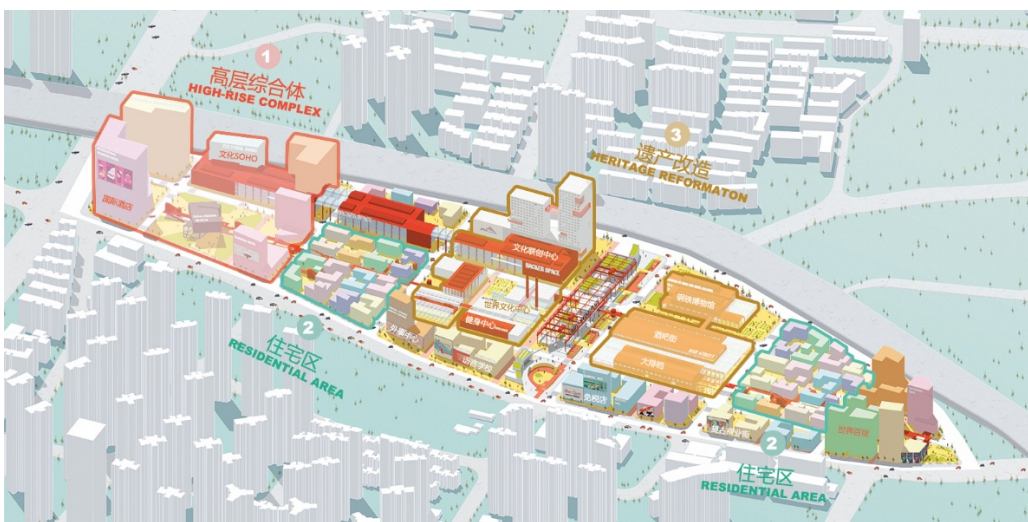


Figure 3. Sharing Mosaic System.

## Node Design: Reformation of electric Furnace Factory

In order to realize the cultural mosaic community transformation, the electric furnace factory is divided into several small-scale shops. Considering the living habit of international friends who like to live in the townhouse and enjoy the traditional Chinese snack street with large stalls, the design combines the two cultures to form a complex recreational and commercial place. The small scale street type and modular unit implantation can plug in new function inside the factory building without destroying the original historical building structure, and allow more people to carry out various activities here.

On the second floor, a large-scale workshop space is reserved to combine with the front hall of the iron and steel Museum, which is connected to the south part of the campus, to become a transitional place between commercial space and exhibition space. This newly-built open space can be used as an art gallery or lecture hall introducing local culture. Here are places where residents and visitors can have cultural communication and interaction, as one type of the "Sharing Mosaic".

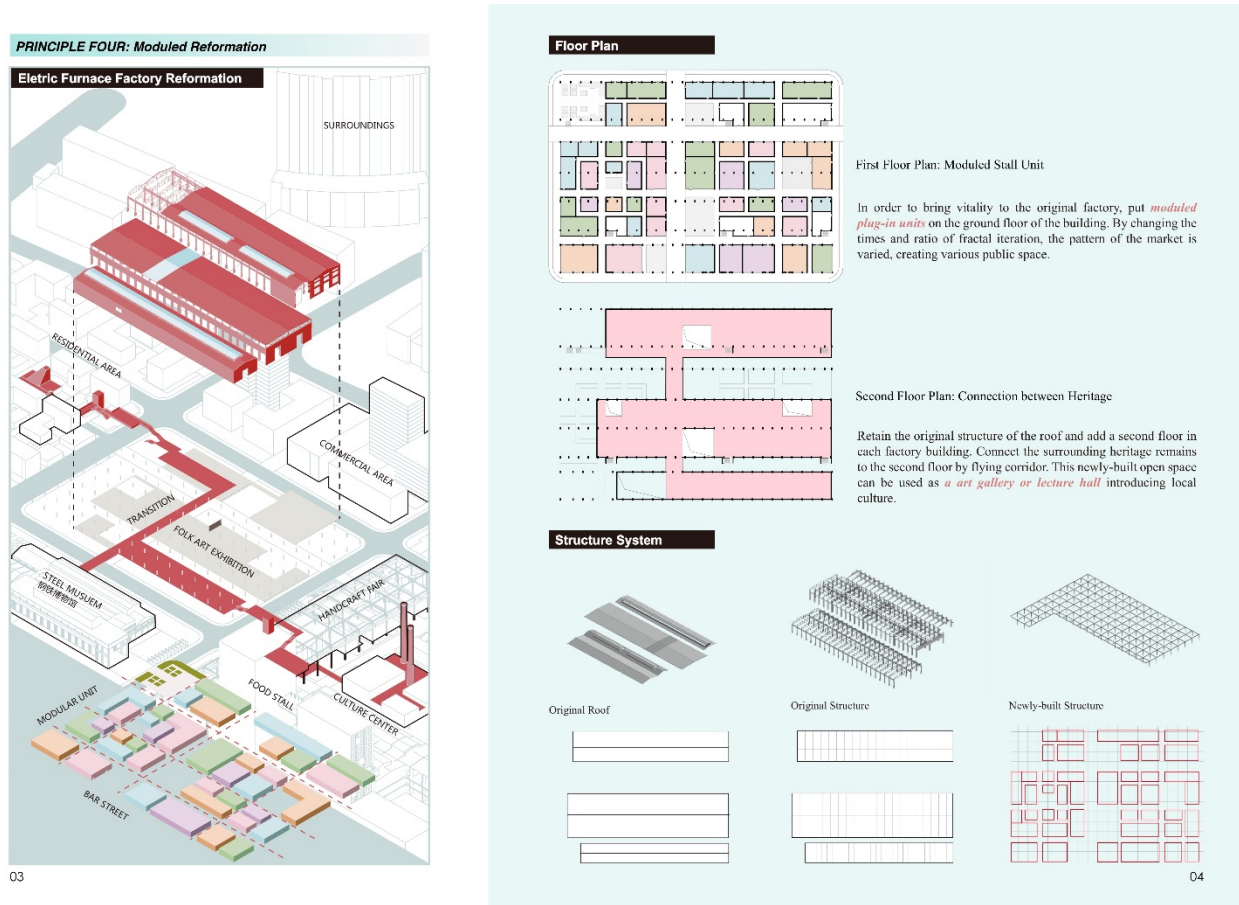


Figure 4. Node design: Reformation of Electric Furnace Factory Building.

## Conclusion

The vitality of the block is actually the embodiment of the active degree of economic and cultural activities. By surveying four different type of commercial area in Wuhan, the research finds the result that smaller and

"Sharing Mosaic": study on regeneration strategy of industrial heritage in urban design ——take Hanyang iron factory as an example

more cultural diverse blocks can create more vigorous community: mixed function block allows for more activities, smaller scale increases the amount of mixture and more diverse format of businesses brings higher economic benefits.

The paper comes up with the following "Sharing Mosaic" regeneration strategy: smaller grid, mixed mosaic block and sharing core. The proper mix of functions creates a variety of block activities to release continuous vitality of the block; Diversified formats and commercial brands attract diversified consumers; Rich public space for people to share creates firm bonds between communities. So as to provide reference for similar cases in the design of regeneration projects of industrial heritage.

## References

1. Ningrui Du, Yi Wu, Guoen Wang. (2021) 'The Spatial Impact of the New Retail Environment on the Transformation and Development of the Physical Market', *Urban and Rural Planning Z1*, 128-136.
2. Bin Fang, Yousong Ge. (2019) 'The Evolution of Block Patterns and the Discussion on the Appropriate Scale of Block in the Development Course of Block System', *Urban Development Studies* 5, 34-40.
3. Fenglin Zhang, Qingyu Zhang, Bin An. (2018) 'Analysis on the scale characteristics of road network and block in Tianjin downtown', *Proceedings of China urban transport planning annual meeting 2018*, 1-13.