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The morphological study on heritage architecture: A planning proposal for the Left Street in Nanjing, China

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Abstract

China provides a unique context to explore heritage architecture within the current trend of globalization. The empirical focus of this study is heritage building in contemporary urban China, which has become targeted for a new round of redevelopment. Departing from previous studies that emphasized China's urban policy reforms of land and urban development, this paper spotlights the role of heritage buildings in making contemporary urban China from a morphological perspective. Through a case study of The Left Street area in Nanjing, this paper examines how heritage elements in the built environment can be selectively recycled and inserted into the newly created urban space. It also demonstrates the possible ways a western morphological approach can be practiced in the Chinese context.

Keywords

heritage building; urban conservation; morphological period; control planning

1. Introduction

Over the past three decades, Chinese urban planners have inadvertently involved in an unprecedented urban expansion. Through institutional innovation of land ownership and land policy, a new mode that strongly promoted Chinese urbanization had been created. In the process of rapid urbanization, many environmental, ecological and social problems occurred. Due to the lack of experience and imperfect policies to preserve urban heritage, a large number of old buildings with various urban memory replaced by modern buildings, it makes the city gradually lose its unique social-cultural characteristics. Unlike stone materials of western buildings, most of China's ancient buildings were made of wood, they suffered varying degrees of destruction after undergoing history and war. In this case, the preservation of historical buildings has become an important task of urban decision makers. After 1978, Land and housing reform made the appearance of demolishing low-rise houses (*Weifang*, danger house) in inner cities, which is the most important tool used by local government to get the land property from residence. The government transfer land-use right to developer, they consist the public-private partnership (PPP) to get economic gain. Due to lack the clearly definition of "danger house", some buildings that with special historical meaning were demolished, even if they were in good condition (Ren, 2011). It was demonstrated that many historical cities have been losing their original features, especially in historical cities where the large-scale redevelopment has generated great pressure and problems for heritage buildings in last few decades. Thus, many guidelines and laws of urban heritage conservation were published since the reawaken of historical conservation in the early 1980s. Although many historical buildings, districts and cities were protected and maintained under these policies, the underpinning recognition, evaluation and operation system are still far from being well developed. (Whitehand, Gu, Whitehand & Zhang, 2011).

The global discussion of authenticity plays an important role in the research of heritage studies. Authenticity is also subject to various interpretations depending on the cultural context (ICOMOS 1965). It is the key to understand renovation projects from different perspectives (history, culture, politics, etc.) in local practice (Zhu, 2015). In the Chinese heritage system, the idea of authenticity can be interpreted as "restore the old as it was", which refers to make the heritage building in historical condition. The PPP used the concept of "authenticity" to reconstruct the historical area and made them look like in a special period of history through the building type. How to select the historical building is always a critical problem in Chinese urban preservation. Thus, departing from previous studies that focused on China's policy changes in land and urban development, this study explores the role of historical

architecture in spatial restructuring by studying morphological changes. Through a detailed case study of The Left Street area, I examined the transformation process of case area by concerning the idea of the “morphological period” of Conzen’s English school. Finally, this paper proposes a control planning proposal for its preservation planning and explores the adoption of western urban morphology theories in the Chinese context.

2. Literature Review of morphology study

Urban morphology includes two research fields in the western theory: geography and architecture. Moudon (1994) proposed that urban morphology study was mainly divided into the British school and Italian school before 1990s. M. R. G. Conzen, a geographer, who was the representative of the English school. Through the detailed urban plane analysis of Alnwick, a small town in the north of Newcastle, the basic research framework of urban morphology was preliminarily established (Conzen, 1960). The study not only proposed the method of understanding the evolution of urban form by following the process of historical development, but also made the independent property plot as the smallest analysis unit to carry out the study of large scale. Conzen also made a series of important contributions to morphological study. First, he established basic analysis elements of town planning: street, plot and building; second, he proposed the morphological approach by using the detailed historical map with fieldwork and literature analysis as research methods; third, he developed a series concepts of morphology study, the morphological period was one of the main ideas. The morphological periods have time sequence, the forms in earlier morphological period was predominant forms to the next morphological period (Conzen, 1960). In order to understand the development of urban form, the main question is how to explain the built environment changes and why they change. Therefore, the concept of morphological period of Conzen, which can help to reveal the historical changes and characteristics of each morphological period. It defined a new way for understanding historical cities through a comprehensive interpretation of morphological characteristics that was not limited to preserving relic units or monuments, but extended to urban tissue and social sustainability.

Although this subject was increased discussion of the Western world over the past 15 years (Whitehand, 2009), it is not well known in China. it is less known in China. The translation into Chinese of best known work of Conzen(1960)-*Alnwick, Northumberland: a study in town-plan analysis*, which improved the dissemination of his approach in Chinese context. In the recent 10 years, there are limited studies has explored the application of Conzenian approach to Chinese conservation issues. These works were conducted by J.W.R. Whitehand, Gu Kai, Tian Yinsheng and Chen Fei, by whom a series of morphological studies have been carried out at several historical area in Beijing, Guangzhou, Pingyao and Nanjing. These studies were published in papers, including *Research on Chinese urban form retrospect and prospect*, 2006; *Urban conservation in China Historical development, current practice and morphological approach*, 2007; *Urban morphology and conservation in China*, 2011; *Fringe belts and socioeconomic change in China*, 2011. Some doctoral students in South China University of Technology concentrated on the morphological evolution of Guangzhou, including morphological analysis of historical area of Guangzhou (Zhang, 2012) and the *characteristics of urban morphological transformations and development mechanisms: a case study of Guangzhou since 1949*(Huang, 2012). These works provided new ideas of urban study in China.

In recent years, some Chinese scholars such as Duan Jin and Ding Wowo, who are always exploring the potential of morphological approach to Chinese issues. Although two very important worldwide congresses have been centered on morphological topics (International Congress of ISUF at Nanjing University and Space Syntax Conference at Southeast University), the real influence of Western urban morphology in China is still weak. A common understanding of morphological approach is that it can be used to examine transitional changes of physical urban form, which can explain the factors of transformation process. Thus, next sections will establish an analysis framework to examine the Left Street area through morphological approach. Focusing on the question of how historical elements are selectively recycled and used to propose a planning proposal for the further development. The paper concludes by highlighting the ideas from western morphology theories that can be used as an appropriate method for studying Chinese cities.

3. Methodology

Although the conservation guidelines proposed the main idea of conservation project, how to appropriate select the historical elements in conservation planning project is still the main problem. Having been inspired by the effective and far-reaching English approach, this study aims to proposed the analysis framework to interpret how the historical elements in built environment can be selectively recycled and how these elements can help propose the control planning of historical feature area. In the light of previous studies and identified key concept, the analysis framework is proposed to explore the case study:

Firstly, by defining morphological periods that are linked with historical evolution. In this study, four morphological periods are chosen that can represent the transitional changes that are from the “Ming-Qing dynasties period”(1368-1644) to the “after 1980s period” (1980-present). Nanjing was the capital of the Ming dynasty (1368-1644) and the Republic of China (1912-1949), so these two periods formed the main historical feature of this area.

Secondly, representative characteristics of the building types are analyzed of each morphological period, which characterized one period and provided the basis for the next. The building types are related to the social culture of that period and provide value for morphological characteristics. At the same time, the morphological maps of each period are displayed, which can help us understand the morphological characteristics of each period.

Thirdly, the main idea of the transformation project is to restore the main historical feature of the Left Street area. In order to propose an appropriate planning proposal, meaningful historical buildings are selected. Three layers of control planning are mapped through morphological study as conclusion.

4. Case study- the Left Steet area in Nanjing, China

4.1 Case area

Nanjing is located in southwestern Jiangsu, it is the second largest city in the East China with 2500 square kilometers of urban land area. Due to the geographical position, Nanjing has a prominent place in Chinese history and culture. Historically, it was the capital of the six Dynasties of China, which caused Nanjing become an important center of culture, politics, economy, transportation network, and tourism for a long time. Nanjing was the capital of Ming dynasty (1368-1644), the imperial urban planning formed the main historical pattern of Nanjing. In 1912, as the capital of Republic of China, the western architecture characteristics were added to the previous pattern. This period appeared many buildings that have characteristics with epoch.

In 1982, the first list of historical-cultural cities was proposed by the State Council of China, Nanjing was one of them. According to the state conservation guidelines, the main idea of conservation planning in Nanjing was to protect the historical pattern and characteristics.. In 1992, Nanjing municiple modified the conservation planning guideline that was based on the first draft. This new guideline included five parts: the feature of the city, the pattern of ancient capital, the historical architectural feature and cultural reproduction. Because lack of policy measures to ensure, the perservation of historical elements still had serious problems, such as buildings and ancient rivers etc. Therefore, many historical elements were gradually demolished and destructed during urban renovation process. At this time, the urban heritage conservation system has not yet formed in Nanjing. After 20 years, based on previous two drafts of conservation planning guideline, the third draft of the conservation planning guideline was proposed in 2002. According to the overall pattern of city, the new guideline proposed three layers of conservation: the relic unit, the historical feature street and the historical feature area. There were 22 historical feature areas were circled in this guideline, the Left Street feature area is one them.

The case area is sited on northwest of the Yangtze River in Pukou district (Figure 1). It delimited from east to Zhu Jiashan River, west to YanShan Avenue and south to TaiXi Road. The total planning area is 27.84 ha. The alternate name of area is Ming-Qing Street, “The Left” was the name of garrison institution in Ming Dynasty. In Republic of China, this district was divided into East Gate Town and The Left Town, the name of the area is original from here. Nowadays, the main street of area still named The Left street, from south to Yu Shikou Street and north to the bridge in front of The Left Street N.36. The length is 1060m and the width is 4.4 m (Figure 2) .

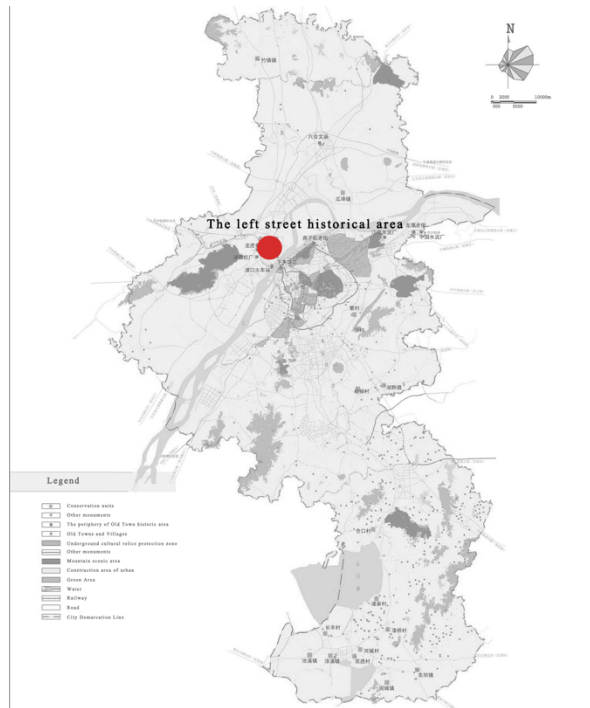


Figure.1 The location of The Left Street in urban context.

Source: Edited by author (The basic map published by Nanjing Planning Bureau)

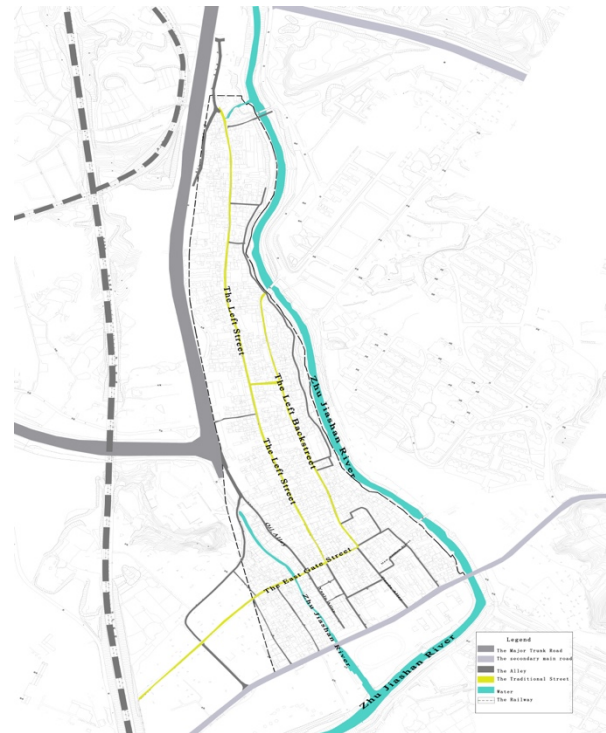


Figure. 2 The boundary and the path of the Left Street

Source: by author

4.2 Morphological study of case area

Starting from Ming-Qing period (1368-1911) to contemporary period(2000s), there are four morphological periods identified in the development of the Left Street area, which represents social-cultural, political and functional requirements in each period. The main morphological characteristics are mapped and briefly interprets the characteristics studied from each morphological period. The Table 1 shows the morphological maps.

Ming-Qing Period (1368-1911)

In the case area, due to the historical buildings were developed from the Si-He-Yuan model, the morphological characteristics of these two periods were very similar. This study merges these two dynasties in one morphological period. As the capital of the Ming dynasty, many feature residential buildings in Nanjing formed in this period, which has various historical values in the contemporary city.

Si-He-Yuan is a classic type of residential building in China, the original form was created in the 1700BC Shang Dynasty, which was formed through four buildings with one courtyard (Figure.3). The buildings were 1-2 story that was related to local cultural and geographical conditions. The case study area is in Nanjing- one city of Jiangnan area in Chinese history. The main historical buildings were constructed with white walls and black roofs that suitable for the local environment. The wall is high gable that is also named Matou-Wall in Chinese, it not only can prevent fire but also can make decorative function. The black roof is constructed with Yingshan Style (Ying-Shan-Shi). This traditional house type had developed from the spatial demand of local lifestyle in this period. During this morphological period, almost every home had a courtyard as a public space and to connect the entrance and daily living space. The courtyard is surrounded by houses, and according to different social levels, the building function distribution is somewhat different. In general, the higher social class had the larger courtyard, and the richer building combination and function. This area was also the main commercial area during this period, forming the building type of 'front shop back factory' or 'front shop back residence'. The shops faced the street and arranged along the terrain that gradually shaped the traditional commercial street (Figure 4). The most common type of house in this period still exists today, but it has become dilapidated and used by multiple households. In case area, the historical buildings of the Ming-Qing period are mainly distributed on both sides of The Left Street, the street pattern is retained as in history.

These morphological characteristics are closely related to the social culture of this period and have certain cultural value for the case area.

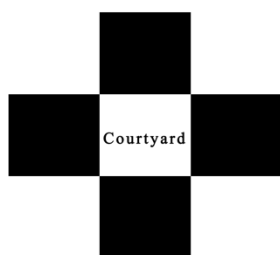


Figure.3 The idea of Si-He-Yuan
Source: By author



Figure. 4 The traditional street form of Ming-Qing period
Source: By author

Republic of China period (1912-1949)

In Chinese history, the Republic of China was a special period. During this period, due to the failure of the Opium War, China entered a semi-colonial period, and a large amount of Western culture poured into China. Chinese architectural styles have also been integrated into Western architectural styles, especially in colonial areas. The architecture of the Republic of China in Nanjing is a major part of modern Chinese architecture and has experienced a process from copying Western architecture to fusion of Chinese and Western styles. In the case area, the building type of this period continues the courtyard layout of the previous morphological period, but the building type incorporates Western elements, such as Western Roman columns. Decorative elements with traditional Chinese patterns are added to the main parts of the eaves, walls, doors and windows, forming a type of building that combines Chinese and Western styles. The famous residence in the case area is Yang Guangsheng's residence which has been listed as a cultural relic unit. The buildings of this period are mainly distributed around the buildings of Ming-Qing Dynasties.

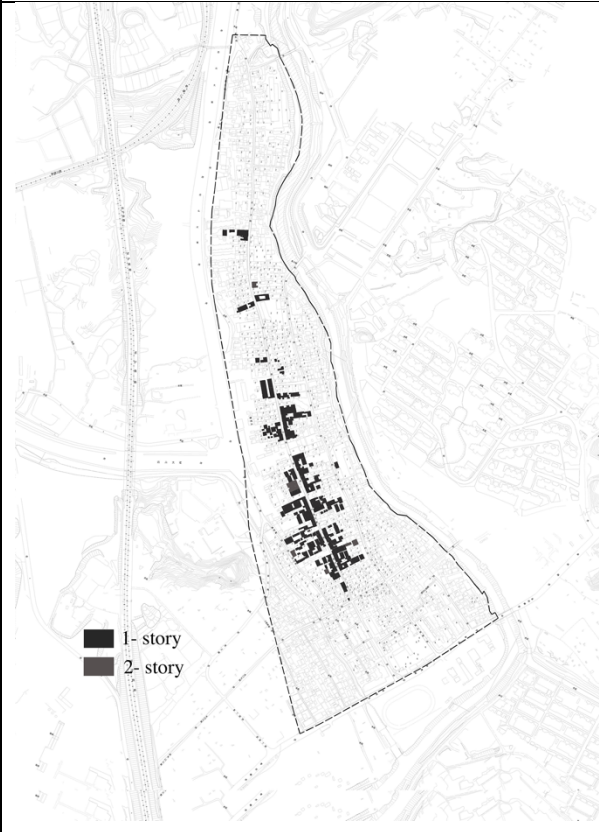
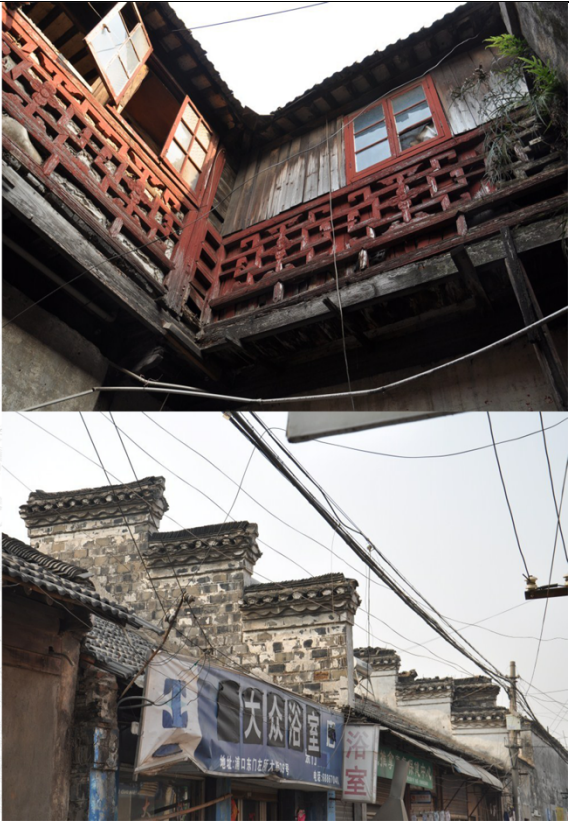
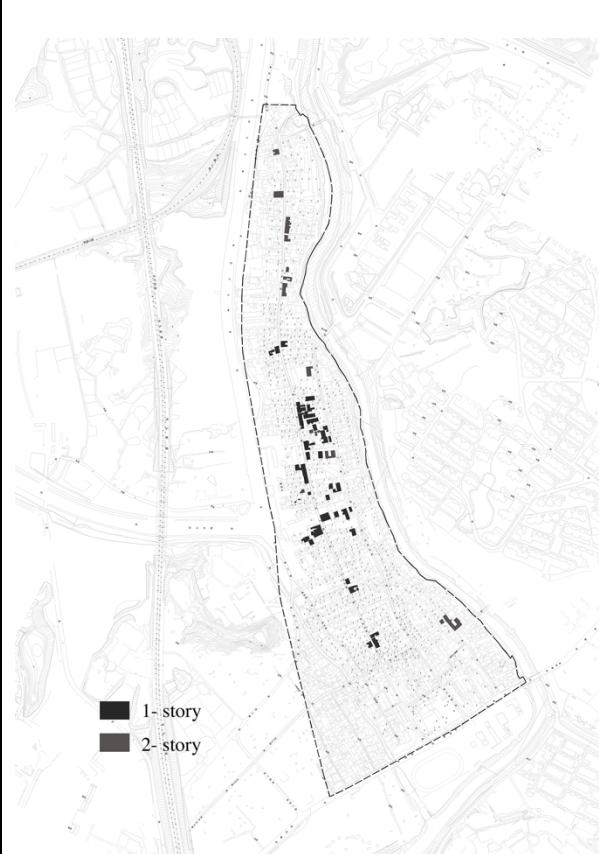

1950s-1980s period

In 1949, the New China was founded after experiencing war. Due to historical and political reasons in the early stage, a large number of private houses appeared in major cities. During this period, the construction market was in a chaotic stage, and there was a lack of clear standards for architectural design and construction. Therefore, there were serious quality problems of buildings during this period, such as single building layout, low-quality building materials, unstable building structures, and chaotic living spaces. In the case area, due to the increasing population, 3-4 floors of buildings and the layout of apartments appeared. The building type is gradually incompatible with the previous two morphological periods, reflecting the special social-cultural background of this period. At present, the quality of these buildings has safety hazards and cannot meet the living demand of contemporary residents. These buildings are located at the intersection of Dongmen Street, Zuo Street, etc.

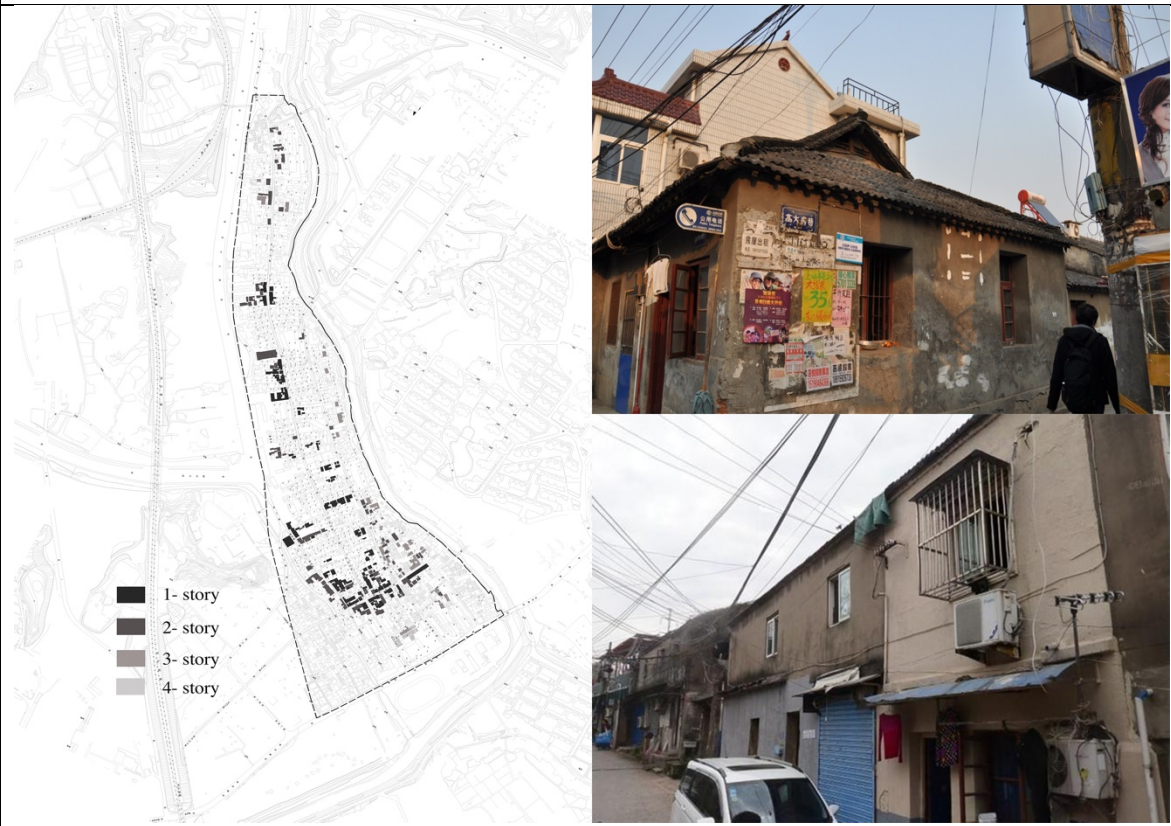
After 1980s period

In 1980, China's housing system began to reform, and the policy of "commodification of housing" emerged. At that time, the buildings were constructed mainly to solve the living problem, and the quality of buildings was very low. In modern times, these buildings are disrepair for many years and are leased out to migrant workers. In the case area, the buildings after the 1980s were distributed in the outer area. The morphology characteristics of the Ming and Qing Dynasties disappeared during this period.

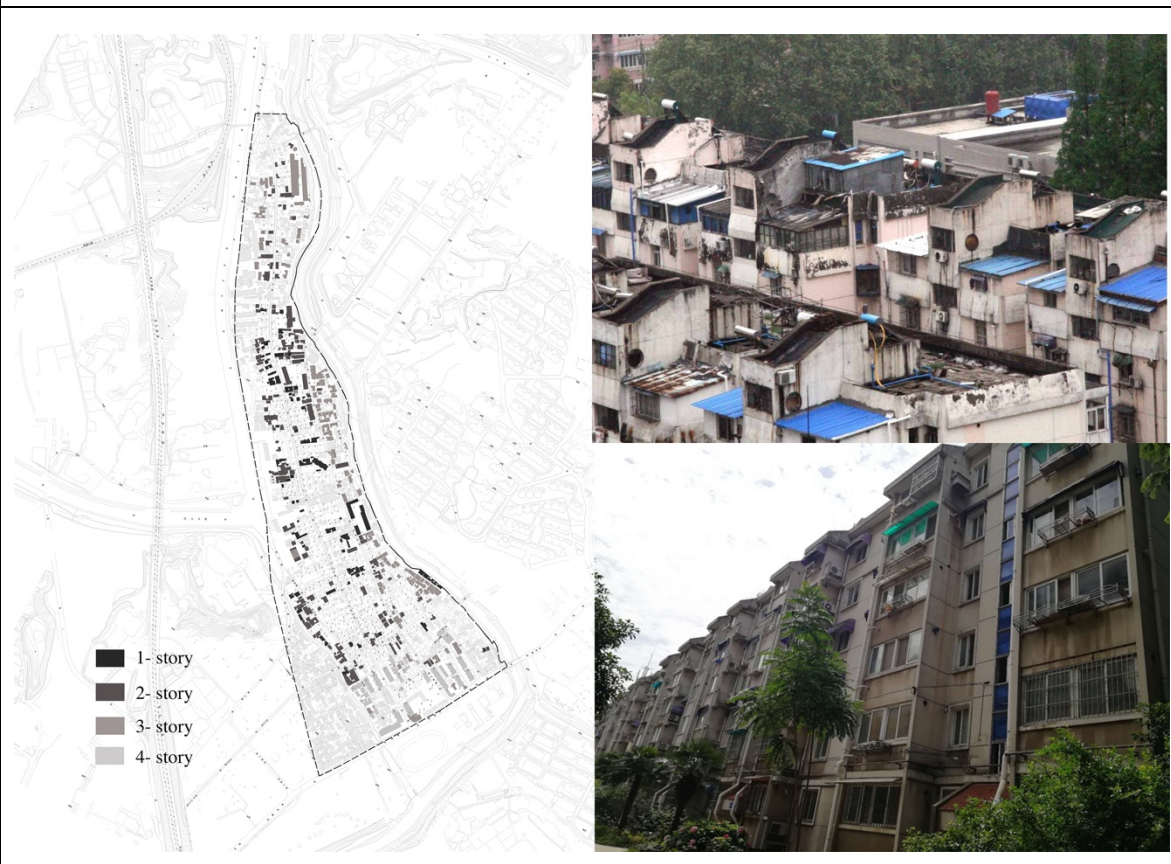
Table 1. Morphological characteristics of each period (By author)

1. Ming-Qing period: 1368-1911	
	
2. Republic of China period (1912-1949)	
	

3. From 1950s to 1980s



4. After 1980s



4.3 The analyses of morphological characteristics

According to the morphological analysis, morphological maps have been drawn to represent the morphological characteristics of each period. The morphological relationship between the first two periods is in a continuous stage, the building type of the second period incorporates the characteristics of the times on the basis of the first period. In the case area, the building type of the first period was concentrated on the two sides closest to the main street, the buildings of the Republic of China spread out on this basis. The buildings in these two periods are dominated by courtyard type, which has a certain cultural value. The historical buildings are 1-2 stories, the ratio of the street to the building is 1:1.5 or 1:2, and the spatial scale is comfortable for living. The morphological characteristics of the third period-'1950s-1980s period' are partly changes from previous periods, few characteristics have been continued.

Most historical characteristics are covered by new characteristics and appeared 3-4 stories building type. The proportions of buildings and streets are beginning to lose balance. There are a large number of buildings were built 'after the 1980s period' in the case area, mainly distributed in the periphery of buildings in the third period, especially along the south side of Zhu Jiashan River. These buildings are completely inconsistent with historical buildings in the Ming-Qing period, most of them are listed as 'danger houses' (*Weifang*) in contemporary cities. In general, the morphological characteristics of the first morphological period was gradually disappeared. Figure 5 shows the morphological characteristics of these periods.

5. Discussion and the control planning proposal

The morphological study is generally regarded as an effective approach to study the transitional transformation process of historical area. The analysis of each morphological period can reveal the relationship between the building type and social culture, especially the local daily life. This approach can help to select the meaningful historical elements that can be recycled to create new urban space.

Based on the morphological analysis, a control planning proposal is proposed as follows (Figure 6). Three planning layers are delineated through previous morphological studies:

The first layer is the most important area, it refers to residence houses of the Ming-Qing period and the Republic of China, which with good quality and various historical values. These historical buildings can be restored and inserted into the renovation project. The main point is to restore the morphological characteristics of historical buildings and streets that can redisplay the historical landscape of the first two periods. These historical buildings have great significance to the cultural inheritance of the area. This layer is suggested to be preserved as the main part and cannot be demolished. During the renovation process, each courtyard can be used as a unit to restore the original pattern. It can be changed locally to meet the demands of feature protection and practical functions in the contemporary city.

The second layer is proposed as a core area, some building features are similar to the first layer. In order to restore the original pattern, this layer can be restored on the basis of morphological characteristics of the first two periods. The purpose is to enhance the continuation of the physical form and the spatial atmosphere of the traditional streets, as well as the local living space. This layer is recommended to be partially retained and restored, some coordination buildings can be demolished.

The third layer is the control area, which refers to the buildings located at the edge of the case area. The building types on this layer are mainly concentrated in the '1950-1980s' to the 'after 1980s'. Previous morphological analysis has mentioned that due to the special background of the times, the building types of these two periods have broken with the previous two periods, and there are many problems with quality. Because they have less cultural value and can no longer meet the living needs of the contemporary city, this layer is recommended to demolish or reconstruct according to the needs.

6. Conclusion

This study attempts to address issues of historical buildings in urban preservation projects. It proposes a morphological analysis framework to examine urban physical form in the Chinese context. By analyzing the Left Street area, four morphological periods are defined according to the local history and building typology, which can

help to interpret the relationship between morphological characteristics and social culture. Through morphological analysis, this study determines whether the morphological characteristics of different periods are continuity, partial continuity, and fracture under the drastic changes of fast urban development. The morphological study shows that the historical morphological characteristics have gradually disappeared from the “Ming-Qing period” to “after the 1980s”. The morphological characteristics of the fourth period are completely different from those of the first period. The representative morphological characteristics of each period were mapped, including building, plot, and street. These characteristics can provide suggestions for the preservation of historical buildings in the urban transformation process.

The study examined the historical elements of the built environment that can be selected by examining the morphological characteristics. When an area started to change, the social and political at that time were the main driven forces, which were embedded in buildings. Although these factors have weakened over time, those elements existed in physical form and have been carved into the culture. These meaningful historical elements should be considered for the conservation planning proposal in the contemporary city.

In general, this study demonstrates the morphological approach has significance to study the urban historical area in China, which can be made to understand the degree of continuity of morphological characteristics in each period. This can contribute to achieving sustainable historical urban planning, and can be generalized to other Chinese cities. Therefore, more morphological researches are still needed to assess the appropriate to other areas in the Chinese context.

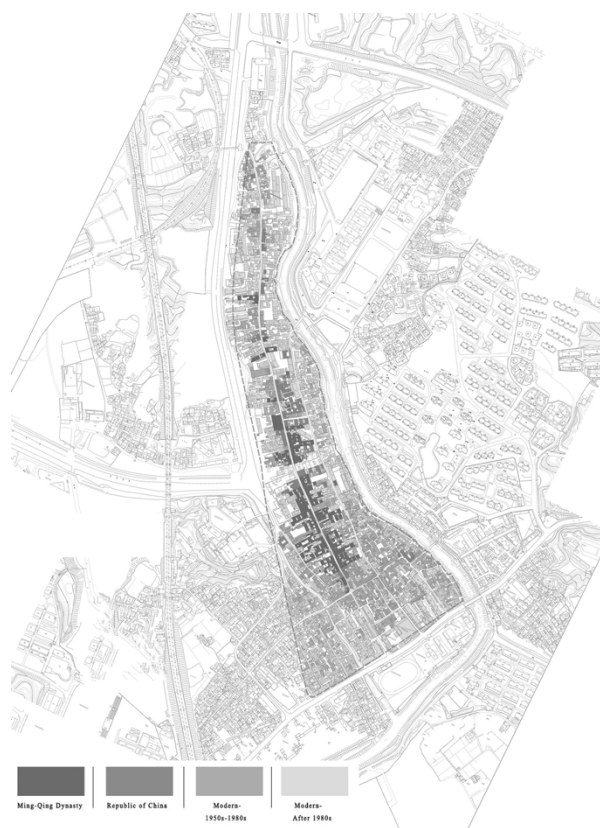


Figure 5. The morphological of case area
Source: by author

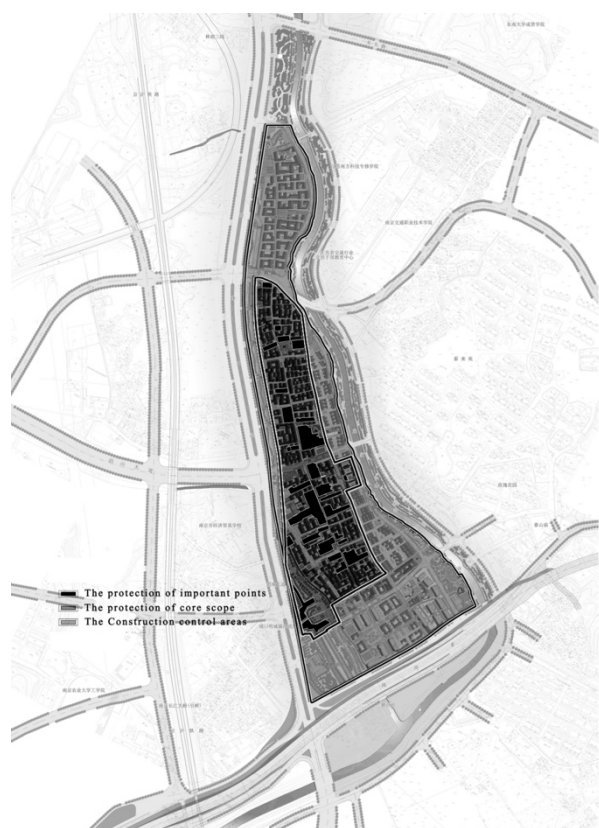


Figure 6. The control planning proposal
Source: by author

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