Research on Renovation Planning of Traditional Hutong—Take Beijing Juer Hutong Renovation Project as Axample

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Abstract. The architectural language of traditional hutong plays a carrier role in local history and culture. The traditional hutong architectural language is refined as a prototype, and some essence is extracted from the architectural ontology and transmitted to the new hutong design, so that the new hutong architecture has certain social and humanistic thoughts. It also has contemporary characteristics, which is the current direction of hutong renovation. This paper conducts pre-design planning research on the renovation project of contemporary juer hutong in Beijing, and explores various techniques in the renovation and reconstruction design of contemporary traditional hutong.

1. Introduction
By the end of 2016, with the resident population of 21.729 million in Beijing, far more than the international urban residents hold rate, population size has gone beyond the current social economic and technological conditions. With the resource bearing limit, all kinds of high-level and high-rise residential will expand the city in the vertical direction, as far as possible in a horizontal direction compression living space, even by administrative means, "the introduction of control indicators" of the installation of the counties.

Figure1. Before hutong reconstruction
However, in Xicheng district, located between the second and third ring roads of Beijing, the living capacity of hutongs in the old city is very low. This leads to a point of view in the architecture and planning academia: reduce the area of the ancient city, re-plan and transform the quadrangle courtyard that does not meet the needs of modern life, and apply modern technology to meeting the needs of new culture. Oppose the comprehensive preservation of hutongs, think that the utilization of space is too low, not conducive to the realization of Beijing's goal of becoming an international metropolis. The emergence of different opinions shows that people attach great importance to people's livelihood and culture, and these thoughts will continue.

2. Analysis of current conditions

2.1. The origin of hutong
The characteristics are shown as follows: most of the hutong in Beicheng follow the urban planning of the yuan dynasty and are horizontal, horizontal and vertical, while the hutong in Nancheng are influenced by the trend of river channels and commercial communication roads, forming many hutong that are neither in the south nor in the north. As the main road form of Beijing, hutong plays a carrier role in Beijing's history and culture, and the formation of hutong reflects the humanistic thoughts of the feudal society.

2.2. Repair and protection of hutongs
In order to protect hutong in the old city, since 2002, the municipal cultural relics department organized forces to investigate thousands of groups of court yard Dwellings in the old city. After careful comparison and analysis, and listening to the opinions of various parties, 658 valuable courtyard dwellings were selected for protection in 2003. Since the end of 2003, the municipal planning department organized the investigation and protection research on the status of hutong, analyzed and discussed the status survey, historical evolution and protection policies of hutong, and held the Beijing hutong protection exhibition.

![Figure 2. Existing landscape of hutong](image)

3. Based on the analysis of the status quo of planning

3.1. Poor infrastructure
The original hutong life was full of attractions, and residents living in hutong were reluctant to move, some for a few years or even several lifetimes. Even old houses purlin, old houses with broken brick walls. Even if outside the house under the heavy rain, the house under the light rain, they also reluctant to "Norway house", after all, "broke home value". However, under the impact of the tide of market economy, this situation is quietly changing, and many people no longer miss hutong life. On the one hand, many hutongs are falling into disrepair with each passing day, and the public facilities in hutongs
are not perfect. In particular, the residents living in hutongs and courtyards have to gather around a public water pipe to wash rice and vegetables, and queue up for lavatory rinsing basin. On the other hand, most of the people living in hutong are the poorest in Beijing, and their lives are still very poor, far from modern life.

Therefore, hutong cattle life has become a backward and shabby way of life. Not only the young people are not willing to live in hutong, but also the old people who were born in hutong, grow in hutong and are old in hutong are not willing to live in hutong.

3.2. Backward current conditions

The damage to the hutongs is too bad. As a result of alley and quadrangle courtyard place old city, Beijing quadrangle courtyard great majority is old house, come disrepair to lose for many years raise, the scale of dangerous house already was as high as 50% above. Weeds crack density distribution on the wall, not to be outdone, scrambling to climb on the roof, the old tile gives a person the feeling vulnerable, walking in the process, could not help but beat a few walls, shout people unreal impression of falling dust, put focus fire place house, hutong has already can't withstand the wind and rain. Moreover, the illegal construction in the compound is dense, and the hutongs cannot withstand the impact of the economic wave. Take Beijing hutongs as an example, it can be said that Beijing hutongs hinder the economic development. Beijing hutongs occupy a large number of prime areas. From the low price of Beijing, if all the hutongs are overthrown and replaced by commercial streets or residential buildings, the economic benefits will be greatly increased by several or even dozens of times. In today's profit-oriented society, the destruction of hutongs is just a matter of price. In fact, there is still a surplus in hutong, but the property developers and some people have not reached the price they both like.

3.3. Original layout of hutong

The large-scale urban development promoted by economic development is approaching the traditional urban texture of Beijing. The old buildings, the chaotic construction, the change of neighborhood relations, and the lack of necessary sanitation facilities lead to the great urban problems of this beautiful and peaceful living space -- the quadrangle courtyard is gradually becoming the hell for ordinary people, the private paradise for the rich, and the theme park for tourists. Population density is high, living conditions are very poor. However, hutong municipal infrastructure is seriously backward, and residents have no conditions to realize modern life. Hutong and courtyard dwellings are also in urgent need of repair and transformation. The sanitary conditions in the old buildings have become a huge obstacle to the improvement of residents' living standards. The traditional hutong has become a heart disease for old residents, a paradise for the rich and a theme park for visitors. For these buildings to be sustainable, improved sanitation is essential. This kind of progress does not necessarily require large-scale civil construction, small-scale transformation can achieve results.

Figure 3. Node diagram of hutong road

4. Summary of planning methods and countermeasures
4.1. Principles of hutong reconstruction
"Planning for the protection of famous historical and cultural cities in Beijing during the 11th five-year plan period" : hutong should maintain its original pattern during the protection and renovation, and should not be widened in principle. Reporters learned yesterday, the city planning commission, city is built appoint, municipal cultural relics bureau jointly issued the guidelines for the Beijing old city renovation and protection technology, to the restoration project scale, category, and yard, houses, hutong repair according to the national standards, to regulate the behavior of the old housing renovation and transformation, security building quality and living with function.

4.2. Renovation points
Faced with the decline and abuse of urban cells, we need to change the reality from the life level. It is not necessary to adopt large-scale reconstruction, but can insert some small scale elements, like a magnet to renew living conditions and activate neighborhood relations; And other old houses complement each other and give life to each other. At the same time, these elements should have the possibility of reproduction and achieve the recovery of the whole community by changing local conditions on the basis of adapting to various living needs. Thus, people who have lived here for generations can continue to live here happily, and these elements will become part of the history, the urban cells of metabolism

4.3. Community supporting services
Courtyard dwellings is no toilet, hutong is almost dry toilet, "fragrance miles." In the face of modern life, the function of hutongs begins to decline. The chaotic streets and lanes, standing water after rain, illegal rental and construction, fatal fire hazards, and almost every hutong is unable to avoid the small business gathering, the hutong culture we are proud of is disappearing, and has gradually become synonymous with slums.

5. Summary
The renovation of juer hutong is a scientific research project of "renovation and renewal, combination of old and new" in the traditional quadrangle courtyard area under the premise of coordinating the traditional features of the ancient capital. Its prominent features are: the traditional quadrangle courtyard single-family residential form and modern unit form of housing, each unit in the form as a single individual, functional transportation combined into an organic whole, constituting the basic unit of living. In terms of architectural design, the kitchen, toilet and other facilities not found in the original traditional
quadrangle courtyard are added for each household to facilitate life. After completion, each group of buildings basically retains the combination of large courtyards, which is a good continuation of the old neighborhood communication mode, maintains the original traditional hutong structure to the maximum extent, and maintains the regional space of traditional residential courtyards of the former courtyard dwellings. In terms of facade appearance, it maintains the original style, which is called "courtyard dwellings like" or "siheyuan of buildings" by the society. It is not a passive continuation of the tradition, but a study of the traditional architectural form and characteristics, combined with the local construction technology to transform it. The language is constructed by selecting distinctive forms and using modern methods to improve, abstract and recreate them.

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