

A Preliminary Study of the Reconstruction of Urban Residential Public Space in the Context of the “Top-down” Construction Model in China: Based on Research of TianZiFang District in Shanghai and Residential Space in Hangzhou

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Abstract—With the economic growth and rapid urbanization after the reform and openness, some of China's fast-growing cities have demolished former dwellings and built modern residential quarters. The blind, incomplete reference to western modern cities and the one-off construction lacking feedback mechanism have intensified such phenomenon, causing the citizen gradually expanded their living scale with the popularization of car traffic, and the peer-to-peer lifestyle gradually settled. The construction of large-scale commercial centers has caused obstacles to small business around the residential areas, leading to space for residents' interaction has been compressed. At the same time, the advocated Central Business District (CBD) model even leads to the unsatisfactory reconstruction of many historical blocks such as the Hangzhou Southern Song Dynasty Imperial Street. However, the popularity of historical spaces such as Wuzhen and Hongcun also indicates the collective memory and needs of the street space for Chinese residents. The evolution of Shanghai TianZiFang also proves the importance of the motivation of space participants in space construction in the context of the “top-down” construction model in China. In fact, there are frequent occurrences of “reconstruction”, which may redefine the space, in various residential areas. If these activities can be selectively controlled and encouraged, it will be beneficial to activate the public space as well as the residents' intercourse, so that the traditional Chinese street space can be reconstructed in the context of modern cities.

Keywords—Rapid urbanization, traditional street space, space re-construction, bottom-up design.

I. BACKGROUND INTRODUCTION

A. Traditional Chinese Settlement Model

THE Lifang system originated from the Zhou Dynasty. It was originally a residence system established by the rulers to manage a large number of residents of different classes in the city. Because of the serious class contradiction in China's ancient feudal society, the rulers prioritized their own security and defense system when establishing cities, instead of public services [1]. In this social context, according to [2], the rulers divided the entire city into a number of closed residential areas, which called “Li” or “Fang”. Business and other activities were also restricted to a certain place as market called “Shi” with walls around and just opened during the day. Each residential

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unit had a corresponding official management to ensure that the entrance and exit of the residential unit were closed at night without any public activities.

Since the beginning of Zhou Dynasty, the traditional urban residential quarters in China have adopted the Lifang system, the largest of which is the Chang'an City, the capital of the Tang Dynasty. Reference [1] shows Chang'an City Planning used the north-south and east-west streets to divide the land into a basic unit called “Fang”. There were special gates and pillars as the boundary between inside and outside. Each street had a cross street to divide it into four blocks. And each of the four areas had a small cross street to do further division, in which there were several irregular alleys interspersed, and residential buildings based on courtyard layout. Because of the complete facilities and supplies in each “Fang”, the usual living range of residents was almost limited to Lifang.

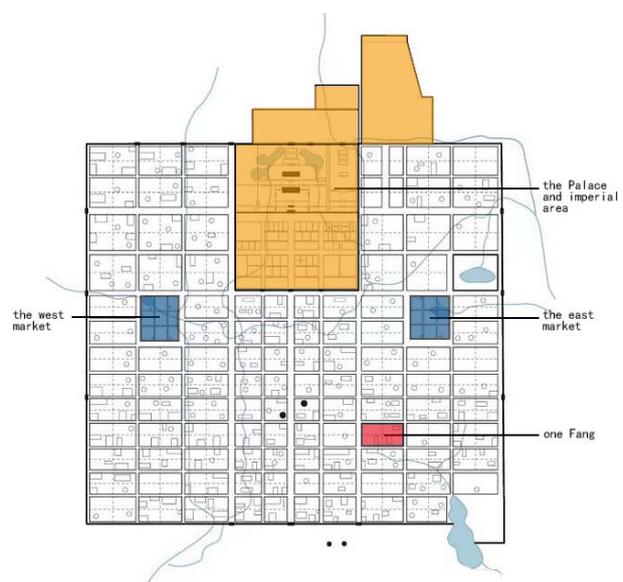


Fig. 1 Map of Chang'an City in Tang Dynasty

On the premise of the Lifang system, both sides of the main streets were high walls of the residential units. However, in the Song Dynasty, as the development of commerce required

compromises with the rulers, commercial activities gradually overflowed the originally planned areas and began to occupy the streets. When the Song Dynasty government began to levy money for "invasion of street houses", it recognized the legitimacy of commercials along the streets, so the shops along the streets opened one by one and formed a bustling market [3]. The space boundary between Fang and Fang was broken, and the buildings facing the street side produced more commercial functions, and the square wall gradually disappeared. It can be seen from the Song Dynasty famous painting "The Riverside Scene at Qingming Festival" that there were already prosperous markets at that time. Riversides, bridgeheads and street markets were all places for public activities, gathering a large number of people.

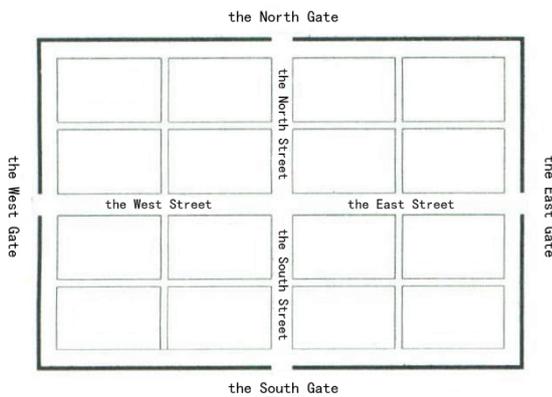


Fig. 2 Map of one "Fang" in Chang'an City

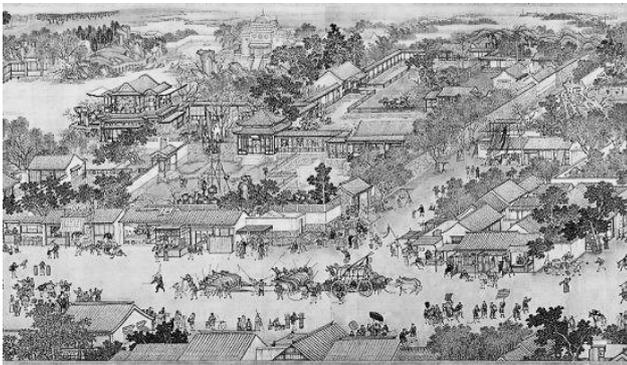


Fig. 3 The painting "The Riverside Scene at Qingming Festival"

Although the initial formation of the Lifang system was to facilitate the management of the city's personnel, and the number and layout of the Fang were more based on factors as Fengshui, the urban planning methods thus formed a unique residential pattern in China - the street-alley-courtyard model. The street is a wide road, and usually is a public occasion where residents can contact with others publicly. Lanes are small roads. Although the city has no rigid boundaries with the development of the city, due to the limited scope of activities of residents, the lanes and alleys in the small block are still Semi-private. While the courtyard is a residential or a mixed place with several families, it has stronger privacy, in which the

activities often only contain a small range of neighbors, friends for contacts. Under such a pattern system, the communication spaces of urban residents are the streets and alleys, as well as public places such as riversides, bridgeheads, and markets [4]. These places have their own functional value, as well as the role of group communication because of the activities of the residents. Due to the circulation and evolution of the streets and courtyard living patterns, residents' lives in the city are also under the transition from public space to semi-private spaces, and finally to private spaces.

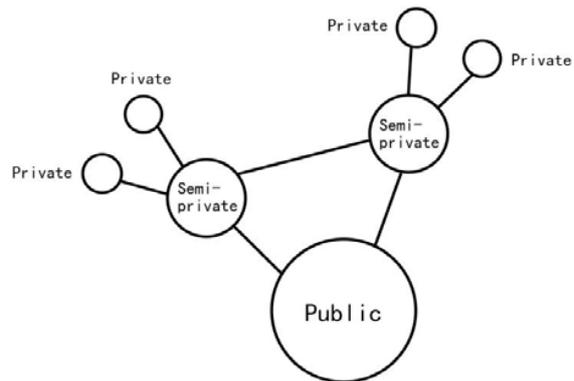


Fig. 4 Transition space diagram

B. Modern Chinese Urban Development and Block Planning

Since the 19th century, the exchanges with China and western countries have become closer. At the end of the 19th century, China began to study the western urban planning methods, and sent scholars to study abroad and later return to China for urban construction. However, studying the superficial phenomena of western urban design has made some planning a paper-based discussion, and has no substantive effect on urban development and residents' lives. For example, influenced by the Baroque plan, there have been many large streets in the form of radial and diagonal lines in the planning of some cities, as well as numerous giant sculptures and structures as the landmark of important intersection.

After 1949, China's urban development also experienced multiple stages. Reference [5] shows, since 1952, numerous Chinese cities have resumed production and started large-scale industrial construction. While relieving employment pressure and upgrading the national economy, the city has also served the industry with providing various municipal living facilities and houses for industrial production. After the reform and opening up in 1978, the Chinese economy began to develop rapidly. The city increased its consumption function on the basis of production. Under the premise of economic construction, the executive also began to pay attention to urban planning and provided living spaces to deal with the proliferating urban population. However, as the awareness of historical protection had not yet been promoted at that time, old low-rise houses have been quickly replaced by multi-storey houses, and the blocks have been re-planned. The "company compound" residential form was still inherited, with which the work areas were arranged adjacent to the living areas, and the

neighbors were also colleagues. Although the mutual familiarity between the neighborhoods can stimulate the vitality of the community, in general, such a way of living lacks subjective initiative, and it is still a "top-down" management and construction system.

After 1986, China's planned commodity economy transitioned to the socialist market economy, which enabled the residence commercialization and the improvement of people's living environment. However, urban construction at this time was still at the expense of resource consumption. Water systems especially small rivers and creeks in the city were also buried or blocked. After 1996, as the emergence and promotion of private cars greatly changed residents' way of travel, the road network and the viaduct roads were quickly established, leading to the city scale expanded rapidly [6].

The problems of historical blocks and environmental protection have gradually gained attention, and the emergence of the meshed roads, the demolition of a large number of old urban areas and the construction of new cities has led to the problem that all the cities exactly looks the same. After entering the new century, the concept of sustainable development was implemented. While improving the public facilities of the city, the government also implemented measures such as coordinating development of large, medium and small cities and towns, and avoiding large-scale demolition and construction. But it cannot be ignored that there are still many problems left to be solved.

C. The Existence of Traditional Space Requirements

Due to the rapid increase of urban population, industries and businesses are developing rapidly in cities, with the fact that urban land is in short supply, most of the residential buildings are not low-rise traditional houses, but high-rise residential buildings with high volume rate and convenient vertical transportation. The number of multi-storey homes has also been gradually reduced. The promotion of car traffic has gradually increased the scale of the road. The main streets of the city have been widened to four lanes or more, and the small streets that were not available to two-way traffic have also been ameliorated. In smaller lanes, most of the space also cannot be defined as "internal space" because of the occasional driving needs. The change of residential form and the change of streets make the traditional street-allay space gradually disappear with the development of the city. However, the residents' collective memory and the demand for transition space make the traditional street space into a new form retaining in the lives of residents. In fact, there are transitional spaces everywhere in Chinese cities, where people keep their private life at a certain distance from the public space to obtain a comfortable living experience. For example, the gates of residential areas are rarely directly facing the main road even if it is near the main street, and will choose to face the branch road. In the residential community, there are public activity spaces for the residents, such as the community garden, the overhead spaces under the residential buildings, and the hall on the ground floor of each building [7]. These spaces are public to the individual's house, but private as well compared to the external urban spaces. This

feature is also similar to the traditional street-allay space. People keep the privacy of the living environment through the transition, and maintain daily social activities in a small group of familiar neighbors. At the same time, the popularity of famous historical districts and villages such as Wuzhen and Hongcun also shows the people's emotional inclination towards traditional space and architecture. Wuzhen is located in Tongxiang, Jiaying City, Zhejiang Province. It is a typical ancient town in the south of China. Because of the great protection of local dwellings, the wide scope of old town, and the dense water system, which is one of the characteristics of Jiangnan region, Wuzhen attracted a large number of tourists with timely and appropriate tourism development and management. Although Wuzhen uses traditional dwellings as its main highlight point, the interior of the dwellings was remodeled and the layout of the entire scenic spot was reshaped. Almost all the aborigines in the town were moved, with the unified management by tourism industry personnel, grasping the quality of the scenic streets and hotels, and creating a historical atmosphere with appropriate street scales and rare number of people [8]. Strictly speaking, Wuzhen cannot restore the true face of traditional neighborhoods, and the residential space of ordinary cities can hardly learn from it. But it still gains much love and yearning from tourists. The popularity of historical blocks and ancient towns reflects people's preference for traditional space, and it also shows the scarcity of this pleasant walking scale space in residents' daily life.

II. PROBLEM FINDING

With the rapid development of the economy, the city's functions have become increasingly rich, while the urban road network improved. The urban land has been rapidly occupied and spread to the surrounding suburbs, that has brought many problems to the development of public space in the settlement.

A. Increased Travel Distance, Simplification of Walking Space and Squeezed Residential Business Intensify Point-to-Point Lifestyle

Since private cars have entered people's daily lives, travel distances have gradually become longer. With the improvement of public transportation such as buses and subways, the peer-to-peer lifestyle has gradually dominated.

Taking Hangzhou City as an example, the division of urban land plot is relatively small. The same plot is usually constructed in a unified design and construction mode. Due to the constrained land use, the need for investment recovery and personnel management, most developers will choose to build the plot into a single-function area. For example, almost all the buildings in residential areas are dwellings. Although a small amount of shops will still be arranged along the edge of the plot, the space in front of the street shops will inevitably be squeezed due to the widening of urban roads. Most of the space on the sidewalk is used to pass rather than stay.

Due to people's preference for the CBD model, commercial plots tend to evolve into commercial excess. Linping, which is the government centre of Yuhang District, Hangzhou, can be

taken as an example. The south of the city is full of new buildings because of the urban expansion, where three commercial complexes covering more than 60,000 square meters are gathered in just 1 kilometer. However, due to the fact

that the lack of residents nearby and limited consumption capability, two of the commercial complexes are not satisfactory.

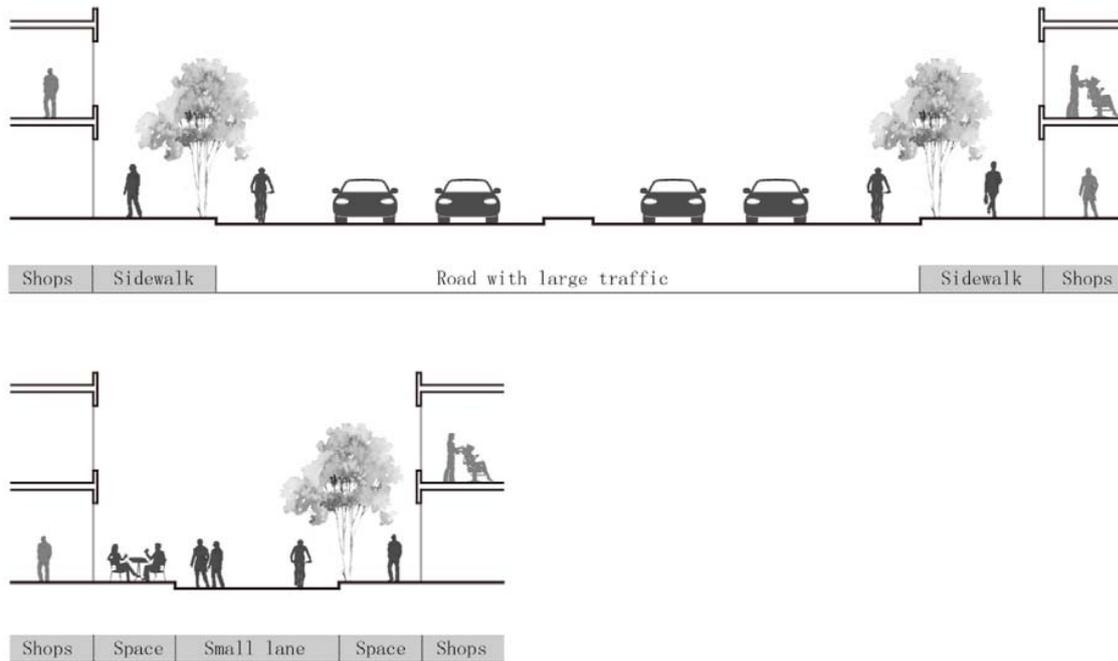


Fig. 5 Street space contrast



Fig. 6 Map of the three adjacent commercial complexes

The urban space with too clear functional divisions intensifies the point-to-point life mode. The reduction of pedestrian traffic near residential areas further squeezes the living space of small businesses. The majority of stores will be replaced quickly except a small number of stable businesses, leading to a harmful circulation.

B. Some of the Western Urban Design Patterns Do Not Apply to the Chinese Living Habits

At the beginning of China's modern urban planning, it was

also the time to start a large-scale exchange and cultural collision with the western countries. Although many plans especially those copy from Western cities have not been implemented, the cities are more or less influenced by the western patterns still leave traces. However, the planning model that was learned does not necessarily apply to China's urban environment. In the other words, the same forms such as buildings and places have different roles in different regional cultures and habits.

Take the square as an example, which has been created in modern Chinese cities. However, the use of squares was originally different in Chinese and Western history.

The open space system of western cities is mostly centered on the square. Reference [9] shows that, in the ancient times, the Western Square was an important place for commodity trading, information exchange and religious activities, gradually integrating into the citizens life. From the historical perspective, the square is a space for public communication for Western urban residents, but not for Chinese citizens. Due to the urban model of street and courtyard space, the public activities were almost in the streets, alleys, or courtyards. Even if the space such as the bridgehead is relatively open, those kinds of areas were usually not large. The plaza mainly served the feudal sovereignty, such as the Temple Square, the Altar Square and the Palace Square, which were not open to the public on weekdays, or just opened for specific festivals.

The squares in modern Chinese cities are also different from

the traditional squares in the West. As Fig. 7 shows, western traditional squares are mostly surrounded by buildings, forming a complete internal corner as an activity space, while the squares of Chinese cities are mostly surrounded by roads, leading to the squares an external space. In contrast, the areas surrounded by buildings and other structures in the streets can form an internal corner that facilitates communication activities. The squares of Chinese cities are mostly used for large-scale activities such as dancing and kite flying. Although those huge squares provide public activities for nearby residents, it is more common and convenient for others to take activities at the doorway or in the alleys near their home.

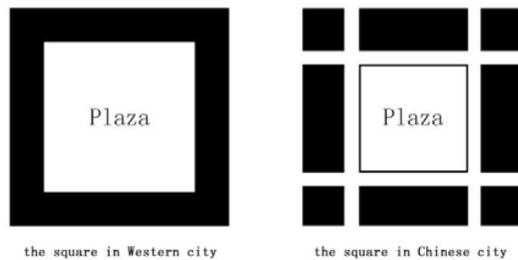


Fig. 7 Contrast between the Chinese square and the Western square

C. Residential Planning Focus on the Whole but Lack Details

Many Chinese urban settlements focus on the whole but lack of details and cannot stimulate interaction activities. For example, many plans seem to be available on the drawings, but they will still be incomplete when they are carried out; some space is it difficult to be recognized and utilized because of its scale defects; the space with single function ignores the diversification of residents' activities, reducing the frequency of use [5]. The one-off design subsequently lacks of feedback, resulting in the phenomenon that the existing space cannot be effectively used, and residents who want to reconstruct the space has no way to implement it. The inactivation of space reduces the frequency of activities among residents, which is not conducive to construct an ideal neighborhood community.

Judging from the three issues above, most of the shortcomings caused by the "top-down" planning and construction methods. The preference of policy makers, designers and investors may make planning unprofitable. Designers will be easy to build different cities with the same approach when unfamiliar with the local living environment and culture. Lack of detailed design and users feedback can lead to situations where the design is not in line with actual use.

III. PROBLEM SOLVING AND ACTUAL CASE

According to the cause for the actual problem, the "bottom-up" feedback mechanism and the self-issuance of residents can help solve and alleviate the problem. People-oriented construction planning is the prerequisite for the rational use of space.

Maslow puts forward the concept of demand hierarchy in his theory. As Fig. 8 shows, he divides demand into Physiological needs, Safety needs, Love and belonging, Esteem and Self-realization, arranged from lower level to higher level [10]. Love

and belonging can be understood as the need to establish emotions with relatives, friends or a group [7]. In the understanding of some scholars, it can also be translated to the needs of interpersonal communication. The physiological needs and security needs of Chinese urban residents today are basically guaranteed. According to Maslow's theory, residents have the ability to meet the needs of interpersonal communication.



Fig. 8 Maslow's hierarchy of needs

Urban residential areas are crowded places, where a large number of exchange activities take place. Jan Gehl mentioned in his book "Communication and Space" that life in outdoor space is both an independent quality and a possible beginning [11]. People give feedback while being influenced by external factors, whose behavior has a probability to stimulate more possibilities. A suitable space can promote the activities of the crowd, while people's activities can also create or change a space. If the designers can make a slight adjustment to the space that already exists according to the actual use, it may be able to effectively promote the occurrence of communication activities.

The current urban form has basically taken shape, thus large-scale demolition and alteration will not only change the original style of the city, but also require huge capital as a support. In this case, micro-update is a viable practice, which does not require excessive economic costs, but can also be arranged in more detail according to the respective situation of different settlements.

A. Shikumen Residential Area Update in Shanghai

Shanghai Tianzifang is famous for its historical value and artistic atmosphere in the whole country even the world. At the same time, although the process was somehow fortuitous, it is also a typical case of residential renewal through "bottom-up" model.

The Shikumen building appeared along with the Lanes, which emerged in the middle of the 19th century and is based on the traditional style of folk houses in the south of the Yangtze River. Most of the immigrants in Shanghai came from Jiangsu and Zhejiang Province. Therefore, the residential houses in the Lanes were born out of traditional Quadrangle Dwellings,

which were also influenced by the Western concept of Row Houses. These buildings had stone-framed door with triangular or circular-shaped sills on it, thus were called "Shikumen", which means "stone gate building" [12].

In the process of urban development in modern Shanghai, the supply of land has been in short supply while the population has increased dramatically. Therefore, the new and simple Shikumen, which is more concise, has followed. Since the 20th century, Tianzifang experienced the change from factory space to industrial space, then to art space, and finally to the commercial space [13]. Every time space changed, new actors joined. And the relationship between the various parties involved in this space was constantly changing as well.

In the 1920s, Tianzifang was in the boundary of the former French Concession and Chinese residential area, and was composed of the French Concession Administrative District, Residential Area and Factory District in lanes. In the 1950s, a large number of private factories and enterprises were nationalized. The intervention of government power changed the spatial form, and Tianzifang was transformed into an industrial area. During this period, the transformation of space from private to public was completed under the control of administrative power, who imposed one-way control over community space.

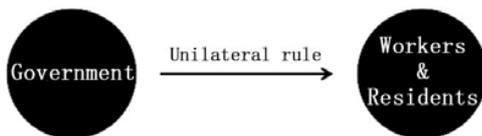


Fig. 9 The relationship between participants in Tianzifang in the 1950s

In the 1990s, the industrial restructuring in Shanghai made the factory gradually abandoned. The government tried to attract a group of artists and designers by transfer and replacement of old warehouses to studios. The government has established a cooperative relationship with art workers by providing cheap venues, while the artists provided brand resources and reputation in return, which finally enhanced the popularity of Tianzifang.

In 2004, Tianzifang's old-fashioned residential houses were listed for demolishing for new buildings to bring the government and developers economic feedback. Reference [13] shows that, during the demolition publicity time, the non-governmental groups represented by scholars and artists issued a strong call to protect historical buildings. Residents rented houses to guarantee their own interests in special periods. Social power finally defeated administrative power, and the original space of Tianzifang was preserved.

Along with the expansion of the popularity, a large amount of commercial capital poured into Tianzifang to occupy the space of artistic creation, making the space more and more commercialized. At the same time, the contradiction between tourists and the community's aborigines has further intensified. So, the administrators have to intervene to control the situation. The relationship between merchants, government, tourists, aborigines and artists was more complicated. The exchanges

and collisions between different groups have constantly affected the spatial form of Tianzifang.

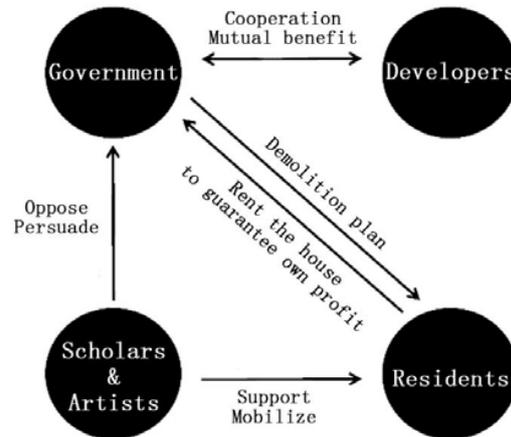


Fig. 10 The relationship between participants in Tianzifang in 2004

Nowadays, although the proportion of catering business is controlled, a large number of commodity commercial and tourism businesses are still rushing into Tianzifang. Most residents move out of Tianzifang because of the economic benefits by selling the houses, and the conflicts with merchants and tourists. The update of Tianzifang has promoted the great exchanges of various groups and gained prosperity for a period of time. But now, although the original street space culture has been retained, the participants in those area have changed greatly. However, Tianzifang's experience is contingent and cannot be the only model for the transformation of all Shikumen settlements. After Tianzifang became famous, the influx of commercial capital was difficult to block. But for other general settlements, such a situation is relatively rare. Even if there is a small number of residents renting their house as other functions, it is easy to control. However, without the feedback of commercial income, the government will substantially reduce the amount of funds invested in residential renewals in order to avoid deficit. Therefore, it is more appropriate to improve the "residential type" renewals, which is to improve the infrastructure in the settlements.

Taking the case of Bugaoli, another Shikumen settlement in Shanghai, the government has invested in the infrastructure of the old community, which has effectively improved the living environment of the residents. At the same time, some of the aborigines also renovated and repaired the original dwellings for rental benefits. As micro-updates have significantly improved the living environment, the residents themselves can exert their subjective initiative and consciously maintain the order and environment of the settlement [14].

The update of the Shikumen settlements reflects the fact that the upward feedback and interaction of the participants can better adjust the direction of planning under the premise of the "top-down" construction environment. While the same space may be used differently in different periods, the participants should have the right to actively define and reconstruct the space within the appropriate range. At the same time,

administrative power needs to control the whole situation properly, so as to avoid the situation out of control.



Fig. 11 Infrastructure renewal of the dwellings in Bugaoli

B. Linping Residential Area

Liping is the administrative center of Yuhang District, Hangzhou. The rapid development has enabled Linping to expand to the surrounding areas rapidly, forming the layout that the old settlements in the middle and surrounded by the new city. The difference between the two is really obvious.



Fig. 12 The scale of new residential area in Linping



Fig. 13 The centralized activity venue

The layout of the streets in the old areas basically follows the

old form. Because the blocks are relatively small, the streets have a suitable scale, with several small businesses interspersed between the settlements. As the density of the main roads is low, the traffic volume inside the residential area is relatively small. From the main road to the residential area, one can clearly feel the change of traffic flow and the environment. However, parking has become a problem because the underground space in the old city has not been utilized. The indoor and outdoor spaces of some settlements that were originally formed by residents through self-issuance have been rectified. With the courtyard walls around the dwellings demolished, the open space downstairs directly faces the parking space. Thus, the small-scale activities near the residential buildings cannot continue. People have to re-find the right space for activities, such as the green parks or street shops.

The rectification of the area near the residential buildings has made it impossible to maintain some small businesses within those areas, while the street shops outside the residential area are better choices. Such an old block seems to retain the street space, but the space inside the lane is difficult to support communication activities, unable to reflect the practical role of its semi-private public space, and is difficult to preserve the transition of residents' life from public to private.

The neighborhood of the new urban areas is relatively large. Taking the new residential area in the north of Linping as an example, a residential area occupies an entire block, usually 300-400 m on one side as shown in Fig. 14, and all around by the main road with a large traffic volume. The traffic entering the settlement is directly connected to the residential road by the main road, and there is no relatively small street as a transition.

The interior of the new urban residential community is rich in space, and there are also well-designed green gardens. But, the indoor and outdoor activities are limited and single compared to the street space. A better-conditioned community will build a residential activity center to provide residents with a fixed activity venue and facilities. However, these places also appear in the form of blocks, and the flow of people has a strong direction. At the same time, due to management problems, it is difficult for businesses to enter the community. The trails inside the settlements are mostly for passing use, but not an ideal place for social. The size of the new urban district is huge and the function of the block is single, which limits the interaction of the occupants. However, despite the constraints of the physical environment, it is still common to see "rebuild" and "reuse" activities on the street. For example, residents gather in front of the street shops to chat, play chess in the shade of trees on the sidewalks, bring portable tables and chairs to cool in the park, and perform ball games in the open space in residential areas. If developers can simply classify such multiple activities, create a space that will stimulate it, such as creating a semi-enclosed space on the street to facilitate people to play chess or chat. The activities are conducive to attracting people.



Fig. 14 People playing Chinese Chess on the sidewalk near the street



Fig. 15 Children playing under the eaves

Today's administrators have noticed the diversity of residents' activities and began to create small spaces. For example, in a densely populated residential street park, there are steps in the park to facilitate people to stay. There is also a plastic runway on the sidewalk next to the park for people who love jogging. However, these facilities may also be different from the actual use. Because most of the parks are uncovered, people's activities may be restricted in hot summers and rainy days. In fact, the summer activities are mostly under the eaves. After the first designing, the administrator should also collect information about the residents' living habits and entertainment activities, and provide feedback channels about use of the space to help carrying out small-scale improvement and construction in a more scientific and meticulous manner.

IV. DISCUSSION

In general, the planning and construction of modern Chinese cities is based on a "top-down" pattern. The administrators will carry out unified construction of the city according to the development plan and the actual situation. However, due to the wide scope of construction, the overall planning is slightly rough and cannot consider more details. After the administrators divide the land and define the main functions, the urban areas such as residential quarters, streets, commercial areas, and green spaces are all built and evolved separately. If

one space is introduced by a new model or making certain changes, it will also not affect the construction of other spaces, that is difficult for each different area to cooperate with each other. And the construction is one-off and lack of feedback mechanism from the participants, which is not only difficult to make up for the details of the design, but also hard to cope with the changes.

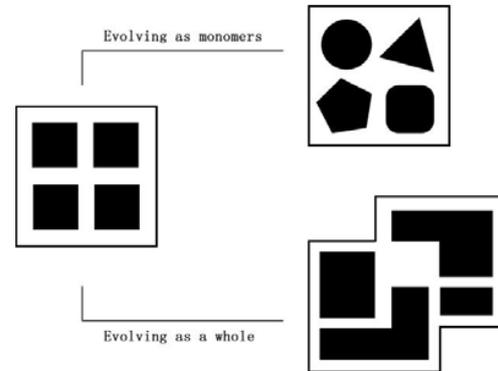


Fig. 16 Separation and integration of development

The overall "top-down" administrative pattern is difficult to change, but can be improved in such a large context, and can add the user's "bottom-up" subjective initiative and information feedback mechanism. On the one hand, designers can re-integrate the previously split urban functions. The diversity of residents' living activities determines the diverse needs of public spaces. It is hard to meet all the needs of communication by just create a single square. Some activities take place on the streets, some outdoors, and some in the business areas. That requires us to incorporate all elements related to residence into consideration, rather than think about how to improve just one aspect.

At the micro level, the administrators should provide basic and simple communication conditions, such as making simple enclosed spaces, or reserved ambiguous space while providing and improving public greening and infrastructure, to promote the occurrence of exchange activities. On the other hand, residents find and use the space mentioned above according to their own needs, and may also bring their own portable facilities (such as folding tables and chairs, broadcast equipment, etc.) to make specific use of space. Those activities and requirements feedback to the original overall planning. And the administrators can use these feedbacks to preserve or correct the space for further smooth progress of the activities. After these interactions being active, it is possible to create new spaces, or to get multiple definitions of a single space, thus inspiring more possibilities for residents' life.

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